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## REPORT ON

# Guidance Document on Water and Mass Balance Models for the Mining Industry

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REPORT

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# Executive Summary

Mine water management plans are an essential component of mining projects to 1) ensure sufficient availability of water for mining operations; 2) confirm there is enough capacity within the mine water management infrastructure (*i.e.,* ponds and reservoirs) to handle the anticipated flows and volumes; 3) manage the quantity and chemical quality of released mine effluents to minimize impacts on the receiving environment; and 4) develop mitigation and/or remediation measures to minimize impacts on the receiving environment. Mine site water and mass balance models support the development of water management plans. The objective of this document is to provide guidance in the development of integrated water and mass balance models for mine development operating tailings or heap leach facilities. The document is intended for government, industry and consultants in the mining sector and addresses various water resource components of the mine planning process in order to assist with mine design and operations, while ensuring the protection of the environment. The topics addressed in this guidance document are relevant to mining projects in general; however the regulatory framework will vary from region to region.

Environmental assessment regulations related to the development of mining projects and water resources management in the Canada are managed by the national and provincial/territorial environmental assessment review processes and similarly, water licenses are issued by regulatory agencies or water boards across the country.

The life cycle phases of mining projects are described in this guidance document, and include initial phases (exploration, feasibility and planning), mine development phases (construction and operations), closure and reclamation. Initial phases relate to field programs and desktop studies intended to build the data and knowledge base, including the design of water management infrastructure and development of a water management plan to support the development of mining projects and the licensing and permitting review process. An integrated water and mass balance model for the mine site must be developed during these initial phases. Such a model is essential to demonstrate that the water management plan will provide adequate water for the mine operations and sufficient capacity for anticipated flows and volumes, will minimize environmental impacts on the receiving environment, and will address measures to manage environmental impacts. The water and mass balance model must cover the whole mine life cycle, from the start of mine development to a date sufficiently far in the future where the reclaimed landscape is considered self-sustaining following complete closure of the mine (*i.e.,* post-closure). The model simulates the movement of water within the components of the water management infrastructure and project operating areas, and calculates chemical loadings to each mine component.

Water and mass balance models for mining are intended to assist mine operators with mine site water management, and regulators with the assessment of regulatory compliance. The models are frequently used to assess water management alternatives, key infrastructure components, and the uncertainty underlying current and future water management scenarios. Deterministic models operate with set inputs for the prediction of average water quantity and quality conditions, and for specific scenarios (*e.g.,* extreme cases, sensitivity analysis, and climate change). Probabilistic models, which may be used for uncertainty analysis, use stochastic inputs to explicitly represent uncertainty and/or variability in the system that is being modelled and provide the likelihood of occurrence of a result. Inputs for both types of models will include the following:

- Mine process and dewatering inputs (*e.g.,* mine plan, production rate, and production characteristics);
- Physical inputs (*e.g.,* drainage basin, topography, and land uses);
- Climate inputs (*e.g.,* temperature, precipitation, snow on the ground, and evaporation);
- Hydrologic inputs (*e.g.,* runoff coefficients, regional runoff and flow regime); and
- Water quality inputs such as a time series of concentrations or loadings for all water quality constituents from all water sources involved in the mine development.

Model outputs include the range of flows, water volumes and constituent concentrations at selected locations in the mine development area, including mine effluent release points, and the receiving environment. Predicted effluent discharge water quality must be compared against regulatory and licensed thresholds (*i.e., Metal Mining Effluent Regulations*), and mitigation or treatment measures must be modelled and implemented to improve effluent water quality, when appropriate. Predicted concentrations at locations in the receiving environment will be compared against background levels and applicable thresholds (*i.e.,* guidelines or objectives for the protection of aquatic life or drinking water) to determine appropriate water management alternatives.

Sensitivity and uncertainty analyses must be performed to determine potential variability in water quantity and quality model results from corresponding changes in the values of model inputs in order to conservatively assess the potential impacts from the mine project to the aquatic environment. An assessment of climate change impacts on water quantity and quality may also be incorporated in the water and mass balance model sensitivity and uncertainty analyses.

Two generic Excel-based deterministic water and mass balance model templates are included with this guidance document, one for mines incorporating tailings facilities and one for mine incorporating heap leach facilities. The model templates include the typical components required for the calculation of water movements within the mine development area and for the prediction of mine water chemical quality. **It remains the responsibility of the user to verify the validity of the model for their mine development(s) and to perform required adjustments to the model's structure and equations to satisfy the needs of their specific project(s). Golder cannot be held responsible for any water balance results produced by other users with model template provided.**

The model templates provided may be limited in their flexibility to model all aspects of water and mass balancing for a mine development. General purpose simulators may provide a more user friendly interface for model development, and may provide additional features and flexibility to simulate and assess the performance of more elaborate water management systems. Examples of commercially available simulators are provided in this guidance document.

Predicting mine effluents flows and associated water quality in the receiving environment may require the use of specialised models that have been widely acknowledged by practitioners and tested by experts. These models may also be required for components of the water management infrastructure (*i.e.,* large and deep tailings ponds and pit lakes) that may not easily be modelled in spreadsheet-based models or general purpose simulators. Examples of such specialised models are also provided in this guidance document.

# Study Limitations

This document, including all text, data, tables, plans, figures, drawings, the water and mass balance model template and other documents contained herein, has been prepared by Golder for the sole benefit of Environment Canada and Yukon Government. It represents Golder's professional judgement based on the knowledge and information available at the time of completion. Golder is not responsible for any unauthorized use or modification of this document. **Golder cannot be held responsible of any water and mass balance results produced by other users with the deterministic Excel-based model templates provided with this guidance document. It remains the responsibility of the user to verify the validity of the model for their mine development(s) and to perform required adjustments to the model's structure and equations to satisfy the needs of their project(s).** All third parties relying on this document do so at their own risk.

Golder does not endorse any of the publicly or commercially available software or programs cited in this report. The citations are only provided as examples of possible tools for addressing water management issues in mining projects.

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# Acknowledgment

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# List of Acronyms

| | |
|---|---|
| AANDC: | Aboriginal Affairs and Northern Development Canada |
| ARD: | Acid rock drainage |
| CCME: | Canadian Council of Ministers of the Environment |
| CDA: | Canadian Dam Association |
| CDJ: | Canadian Department of Justice |
| CEAA: | Canadian Environmental Assessment Act |
| CEPA: | Canadian Environmental Protection Act |
| CYFN: | Council for Yukon First Nations |
| DFO: | Department of Fisheries and Oceans Canada; Fisheries and Oceans Canada |
| EC: | Environment Canada |
| EEM: | Environmental effects monitoring |
| EPA: | United States Environmental Protection Agency |
| FPTCDW: | Federal-Provincial-Territorial Committee on Drinking Water |
| GYT: | Government of Yukon Territory |
| IPCC: | Intergovernmental Panel on Climate Change |
| ML: | Metal leaching |
| MAC: | Mining Association of Canada |
| MMER: | Metal Mining Effluent Regulations |
| PLS: | Pregnant leach solution |
| TAC: | Transportation Association of Canada |
| TMF: | Tailings management facility |
| UFA: | Umbrella Final Agreement |
| WERF: | Water Environment Research Foundation |
| YESAA: | Yukon Environmental and Socio-Economic Assessment Act |
| YESAB: | Yukon Environmental and Socio-Economic Assessment Board |
| YWA: | Yukon Waters Act |
| YWB: | Yukon Water Board |

# 1.0 INTRODUCTION

Water management is an essential component of mining as water ingress must be controlled to gain access to the mine workings (*i.e.,* open pits or underground facilities) and water is typically required in ore extraction processes. The quantity and chemical quality of released mine effluents must also be managed, since this source of water may have a detrimental impact on the receiving environment and downstream water users. Baseline and impact assessment studies on the aquatic environment (*i.e.,* surface water and groundwater quantity and quality, and benthic and aquatic habitats) in the area potentially affected by a proposed mine project are required to support the regulatory review process, and the licensing and/or permitting of such a development. These studies would be dependent in part on the design of mine water management infrastructure and the development of mine water management plans in order to:

- Ensure there is sufficient water available for mine operations;
- Confirm there is enough capacity within the mine water management infrastructure (*i.e.,* ponds and reservoirs) to handle the anticipated flows and volumes;
- Manage the quantity and chemical quality of released mine effluents to minimize potential impacts on the receiving environment; and
- Develop mitigation and/or remediation measures to minimize or prevent impacts on the receiving environment.

The objective of this document is to provide guidance in the development of water and mass balance models for mine developments in Canada with some specific consideration related to the Yukon Territory. In this document, water and mass balance modelling specifically refers to the characterization of quantity and chemical quality of mine effluents through all phases of the mine life. Such models support the development of water management plans for a mine site. The document is intended for government, industry and consultants in the mining sector and addresses various water resource components of the mine planning process to assist mining design and operations for the protection of the environment. The content of this document from Sections 3 to 7 applies to all regions of Canada.

A lack of adequate linkages between water and mass balance modelling formulations has historically been seen as a major limitation in management plans developed for water quantity and quality assessments of mine projects. Therefore, this guidance document primarily focuses on the development of integrated water and mass balance models, and includes examples of Excel-based templates for developing preliminary water and mass balance models. One template applies from mine developments incorporating tailings facilities, while the other template addresses mines incorporating heap leach facilities. It is acknowledged that mines may include both tailings and heap leach facilities; however each template considers the use of only one type of facilities.

The preparation of this guidance document and the Excel templates were supported by a review of the literature on water management applicable to the mining industry. Further details on the references used in this document are presented in Appendix A.

# 2.0 LEGISLATIVE AND REGULATORY FRAMEWORK

This section summarizes regulations applicable in Canada for environmental assessments related to the implementation of mine developments. The section focuses specifically on regulations that are relevant to water resources issues.

## 2.1 Federal Requirements

Federal agencies typically involved in the review process and/or on review panels include Fisheries and Oceans Canada (DFO), Environment Canada (EC), Natural Resources Canada (NRCan), Transport Canada (TC) and/or Aboriginal Affairs and Northern Development Canada (AANDC) through the Canadian Environmental Assessment Act (CEAA). In the Yukon Territory, the Yukon Environmental and Socio-economic Assessment Board (YESAB) administers the environmental assessment process in order to assess the effects of new and existing projects, including mining developments, and other activities in the Yukon under the authority of the Yukon Environmental and Socio-Economic Assessment Act (YESAA). A variety of federal environmental assessment acts regulate the EA processes in the two other territories. Federal agencies may provide views and information related to water resources based on their respective regulations and acts. These legislative requirements for Environment Canada include but are not limited to the following:

- The *Canadian Environmental Protection Act* (CEPA, 1999): The objective of the Act is pollution prevention and the protection of the environment and human health in order to contribute to sustainable development. Control instruments assisting in the achievement of this objective include:
  1) The development of pollution prevention and environmental emergency plans; and
  2) The application, within environments receiving mine effluents, of standard thresholds on water quality constituent concentrations for the protection of aquatic life (CCME, 2007) or drinking water (FPTCDW, 2008).
- The *Fisheries Act* (CDJ, 2010): This Act directs assessments of impacts on fish and fish habitat from changes in water quantity in the receiving aquatic environment. The objective of the pollution prevention provisions of the Act is the prevention and control of pollutants affecting fish. Furthermore, the *Metal Mining Effluent Regulations* (MMER) (EC, 2002) are included under the *Fisheries Act* to provide a legal framework for:
  1) Flow and water quality monitoring of metal mine effluents; and
  2) The implementation of environmental effects monitoring (EEM) studies for assessing the impact of metal mine effluent on fish and benthic communities in the aquatic receiving environment.

The MMER ensures there are national baseline minimum standards of environmental performance for all Canadian metal mines while providing a scientifically defensible basis for assessing the need for more stringent measures to protect fish, fish habitat and fisheries on a site-specific basis (MMER-RIAS).

## 2.2 Yukon Territory Requirements

The YESAB is the main environmental assessment process in the territory. Review of water resources issues by the YESAB is supported by the Yukon Water Act (YWA) (GYT, 2003), which legislates water use in the territory. The YWA has specific regulations for the use and/or the discharge of waste into water. Responsibility for the YWA is divided among the Yukon Water Board (YWB) and territorial departments including Energy, Mines and Resources Yukon, and Environment Yukon.

The YWB is an independent administrative board established under the YWA. The YWB issues licenses for water use by mining projects based on their application requirements (YWB, 2009). The YWB cannot issue a water license, or set terms of a license contrary to a decision document issued under the YESAA. A proponent applying for a water license must include a decision document issued under YESAA with its application.

# 3.0 MINING PROJECTS

This section details the life cycle phases of mining projects, and specific issues related to water management within each phase. The components of the mine infrastructure and of the lands within the mine development area that would impact water management, including water sources and their associated chemical signature, are also described in this section.

## 3.1 Mine Life Cycle

The mine life cycle outlined in the Environmental Code of Practice for Metal Mines (EC, 2009) considers the following phases:

1) Exploration;
2) Feasibility;
3) Planning;
4) Construction;
5) Operations; and
6) Closure and Reclamation.

Phases 1 to 3 encompass field programs and desktop studies intended to build the data and knowledge base of a project's local and regional areas, and include the design of water management infrastructure, and the development of water management plans and water and mass balance models. These are required to support the development of mining projects and the review processes for licensing and permitting. Phases 1 to 3 are briefly discussed in Section 3.1.1.

Phases 4 to 6 constitute mine development and operational activities that are conducted within the mine footprint. Water management plans apply to the period when these activities are implemented. Phases 4 to 6 are detailed in Section 3.1.2.

Phases may overlap over the entire mine life cycle. Exploration, feasibility and planning may occur for deposits in areas adjacent to site of construction, operation and reclamation of an existing mine. Ongoing planning, review and updating of management plans is anticipated to be pursued on existing mine areas during the construction, operations and closure and reclamation phases in order to refine previous planning efforts based on newly observed in-field conditions. Closure and reclamation will always be the last completed phase of the mine cycle at a specific site.

### 3.1.1 Exploration, Feasibility and Planning

The primary objective of the exploration phase is the identification of mineralized areas and the subsequent assessment of ore quantity and quality, and estimation of the ore deposit geometry. Assuming an adequate quantity and quality of potential ore is identified to move forward to the feasibility phase, the data collected during the exploration phase would be used for preliminary planning of mine layout, ore processing design, and estimating the cost of developing and operating a mine. Preliminary assessment of water resources issues should be initiated during the exploration phase, and would typically include:

1) Geochemical surveys to sample a range of rocks and soils at the mine for chemical analysis;
2) Identification of watersheds, streams and lakes potentially affected by the mine development;
3) Identification and characterization of permafrost;
4) Hydrogeologic surveys, including drilling of monitoring wells, to assess basic groundwater characteristics such as the depth to the water table and artesian conditions;
5) Installation of a meteorological station for use in characterizing the local climate regime;
6) Identification of potential water sources (surface and groundwater) for mine activities;
7) Installation of hydrometric stations to characterize surface water quantity; and
8) Initiation of water sampling programs to establish the chemistry of water sources.

The feasibility phase involves an assessment of mineral reserves and investment returns based on technical, legal and economic considerations. The selection of the mining and waste management methods is also made during the feasibility study as a function of safety, economics, practicality and environmental considerations. The feasibility phase should include preliminary work on the following:

1) Characterization of climate, hydrometric, hydrogeologic, ground temperature and water quality conditions in the mine development area based on executed field programs and available site, local and regional data;
2) Estimation of acid rock drainage (ARD) and metal leaching (ML) potential from geochemical surveys for the mine development area including those conducted during the exploration phase, planned for the feasibility phase, and other existing surveys in the region;
3) Feasibility level design of waste and water management infrastructure; and
4) Development of a feasibility level water balance (typically a deterministic average monthly or annual water balance is completed at this stage).

The identification of data gaps related to the assessment of water resources impacts is accomplished in the feasibility phase, in order to assist in the design of baseline field programs required to characterize the surface water and groundwater environmental settings. The frequency of monitoring for these file programs will vary with the needs of the project, but must be sufficient to fill the identified data gaps. The assessment of potential project impacts on the environment requires use of these baseline data during the planning phase.

All aspects of the mine are planned in detail during the planning phase, including mining, ore separation and waste handling processes, as well as site infrastructure needs, schedules for construction and commissioning of facilities and all planning associated with the environmental aspects of operations. These details are required to support the review processes for licensing and permitting. An integrated water and mass balance model is developed in detail during the planning phase and encompasses the construction, operation and closure and reclamation phases of the mine. The water and mass balance model is required to demonstrate a water management plan that:

1) Provides sufficient water for the operation of the mine;

2) Provides sufficient capacity to handle the anticipated flows and volumes;

3) Manages the quantity and chemical quality of mine effluents to minimize potential impacts on the receiving environment; and

4) Addresses mitigation, remediation or compensation measures for minimizing or preventing impacts on the receiving environment.

### 3.1.2 Construction, Operations, and Closure and Reclamation

The construction, operations, closure and reclamation phases constitute mine development and operational activities that are conducted within the mine footprint. The water and mass balance model must apply to the period from when these activities are implemented up to final closure and reclamation.

Two water and mass balance model Excel templates were developed (Section 5) with this document, one for mines with tailings facilities and one for mines with heap leach facilities. Beneficiation processes involving tailings facilities include the crushing of the ore into fine particles, following by chemical reactions for the extraction of the resource. Beneficiation processes for heap leach facilities consist of irrigating an ore pile with a chemically reactive solution to collect the resource in a Pregnant Leach Solution (PLS) from the pile, then extracting the resource from the leached solution. Different water uses and recycling activities are involved in these processes, and therefore affect the water and mass balance at the mine. Figures 1 and 2 conceptually illustrate the potential drainage sources, pathways and discharges that would be expected for overlapping construction, operations and reclaimed areas, for mines with tailings facilities and heap leach facilities, respectively. Mines may use both tailings and heap leach facilities; however each template considers the use of only one type of facility.

In Figures 1 and 2, any water that is not in contact with mine or construction processes (*i.e.,* non-contact water) or does not originate from lands influenced by mine or construction processes would typically be diverted to the extent possible and allowed to discharge directly in the surrounding receiving environment. All of the remaining water pathways (including groundwater) illustrated in Figures 1 and 2 would normally be collected, monitored and treated as necessary, before being discharged to the receiving environment.

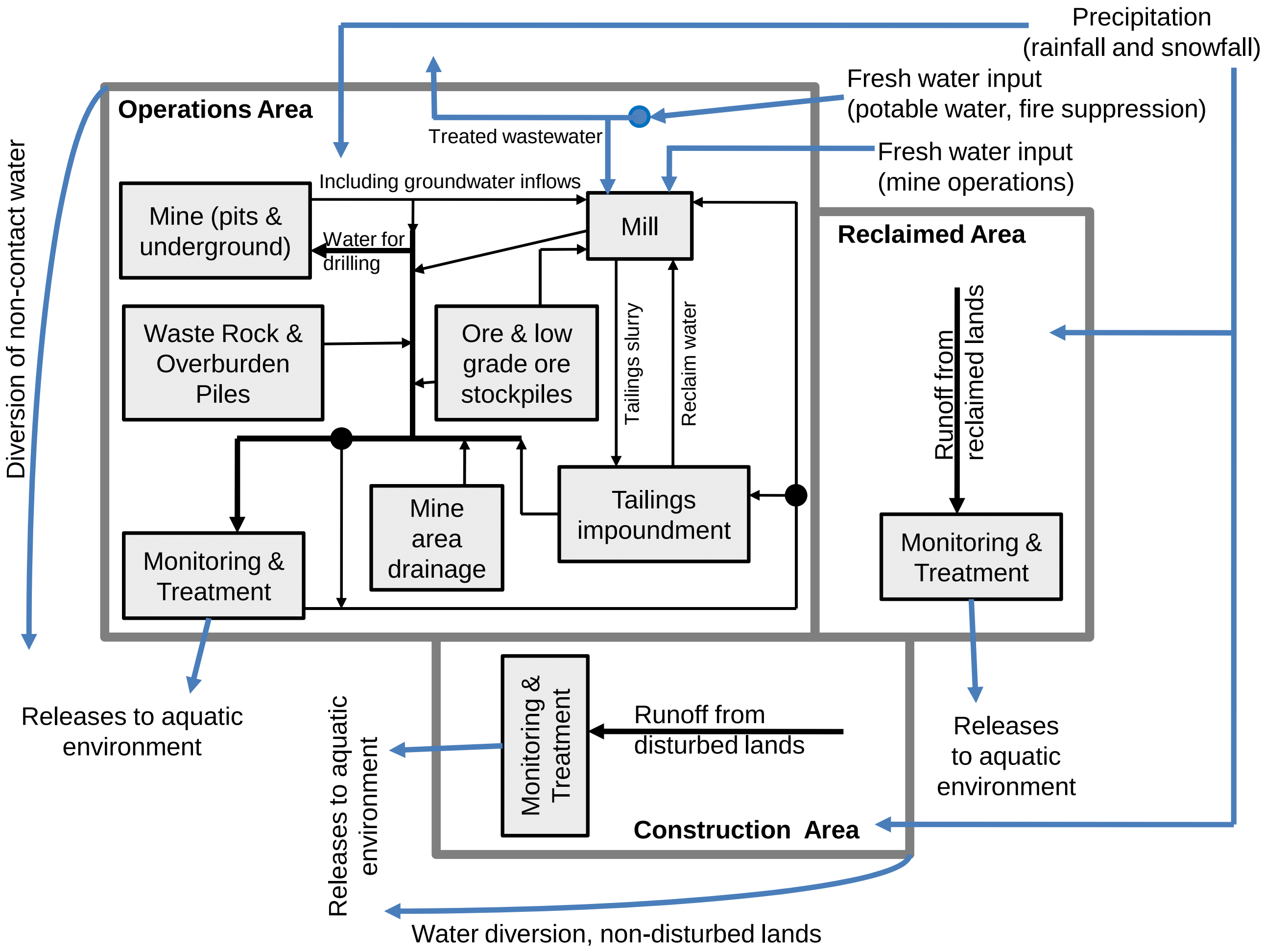


*Figure 1: Conceptual Diagram of Drainage Sources, Pathways and Discharges for Mines Operating Tailings Facilities (adapted from Price 2009)*

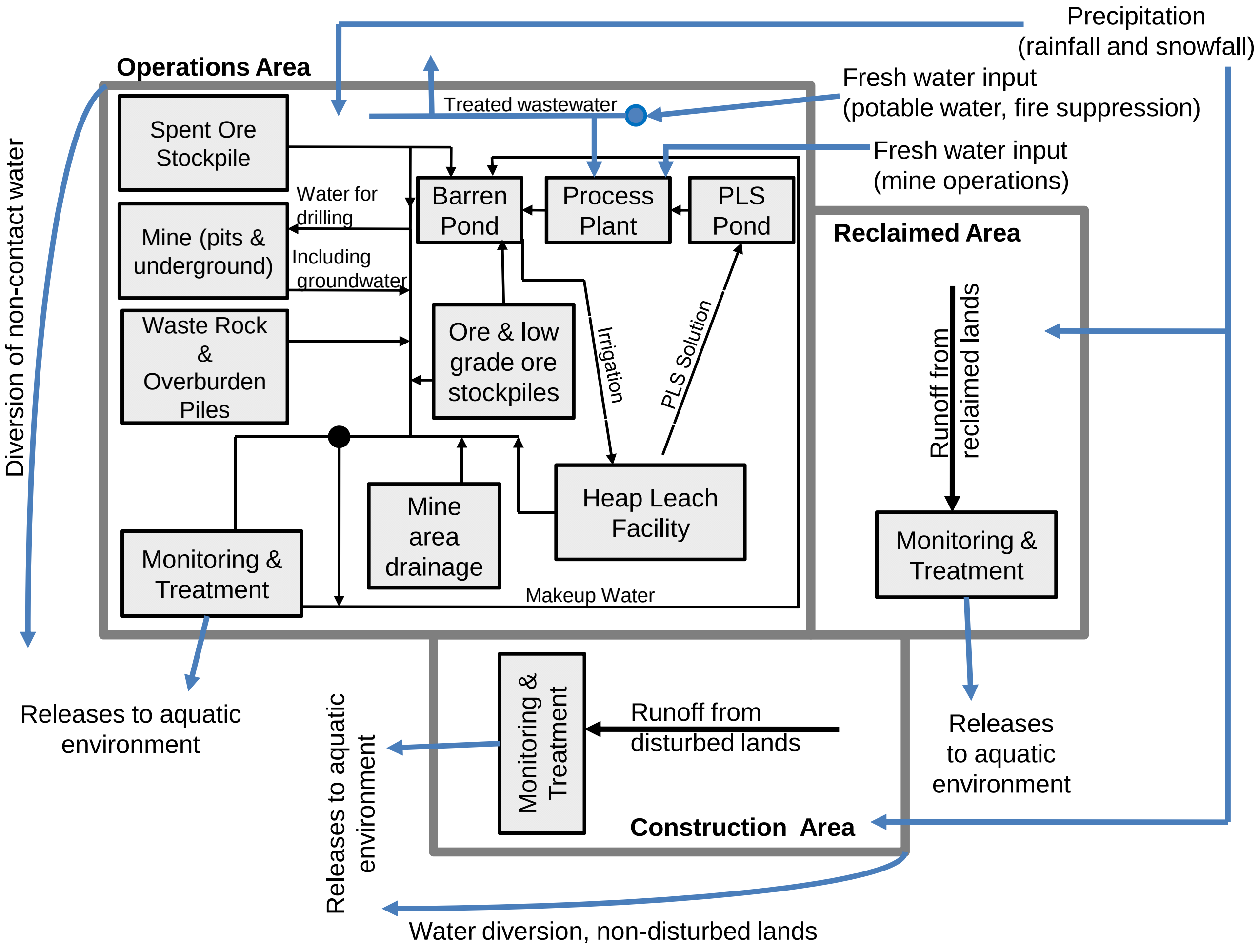


*Figure 2: Conceptual Diagram of Drainage Sources, Pathways and Discharges for Mines Operating Heap Leach Facilities (adapted from (Price 2009 and Van Zyl, 1988).*

Water and mass balance models are used to simulate the movement of water within the components of the water management infrastructure during the construction, operations, closure and reclamation phases, based on conveyance and retention capacity requirements determined during the design effort. The design of water management infrastructure and the development of the water and mass balance model would typically be advanced conjointly.

Further details on the construction, operations and reclaimed phases and areas are provided below, along with a discussion on associated meteorological and water quantity and quality monitoring requirements.

## *Construction*

The construction phase is the period when the mine infrastructure (waste and water management infrastructure, plants, shops/warehousing, housing and offices) are built and may include pre-stripping for open pit development (particularly if pre-strip material is used for site construction), development of borrow pits or quarries, and/or construction of the underground access shafts/ramps and surface facilities for underground mines. The construction area constitutes lands where no mining activities are occurring and therefore may be subject to different treatment requirements for water being discharged to the environment than areas in the operational phase. A construction area becomes an operations area when mining activities are initiated.

Water management infrastructure constructed during the construction phase may include ditches, culverts, bridges and pipes for diversion systems and the conveyance of water within the disturbed lands. Operation ponds (*e.g.,* mine workings sumps, and freshwater, tailings, heap leach cells, process water and waste rock ponds) and treatment ponds (*e.g.,* sedimentation and polishing ponds) may also be constructed. Temporary infrastructure components, which are used only during the construction phase, will likely be designed based on relatively small return periods according to practices provided in the Land Development Guidelines for the Protection of Aquatic Habitat (DFO, 1993), for example. Permanent infrastructure components that are intended to be in place during mine operations will likely be designed using comparatively higher return periods as established based on risk assessments outlined in the Dam Safety Guidelines (CDA, 2007).

Runoff from undisturbed lands would typically be diverted away from construction areas to the extent possible (Figure 1) to minimize the amount of water requiring treatment. Nevertheless, a water quantity and quality monitoring program must be in place (EC, 2002 and 2009) to measure the impacts of construction activities, and determine adjustments to treatment processes, as required. Also, the diversion or manipulation of a watercourse or stream requires regulatory authorisations, design considerations, construction monitoring and possibly compensation depending on the watercourse morphology and fish habitat values.

Suspended solids are typically the main water quality concern in construction areas. Best management practices (TAC 2005) should be implemented to control erosion and minimize sediment generation, and the use of sedimentation ponds should be considered for the treatment of sediment laden water prior to release to the environment. All of the material expected to be excavated (*e.g.,* borrow material, waste rock either used for construction or placed in waste rock dumps) or disturbed during construction (*e.g.,* access/site wide road cut and fill material, plant site disturbances) must also be identified and characterized for ARD/ML potential during the feasibility and planning phases of a project (EC, 2009). The resulting chemical contribution to the water management system must then be quantified to determine if other treatment options are required in addition to suspended solid settling.

## *Operations*

The operations phase is the period when mining activities are ongoing, including ore extraction and processing, and management of mine wastes (*i.e.,* tailings, heap leach facility, waste rock). The operations area constitutes the lands where mining activities are occurring. Construction and reclaimed areas may also be included within the operations area if their waters are directed to the operations area monitoring and treatment facilities.

Runoff from undisturbed lands within or reporting to the operations area (*i.e.,* non-contact water) should be diverted to the extent practicable to minimize the amount of water requiring monitoring and possible treatment. Contact water would ultimately be directed to a monitoring and treatment facility (Figure 1). As is the case for construction areas, a water quantity and quality monitoring program must be in place (EC 2002 and 2009) to monitor the impacts of operations activities and determine necessary adjustments to treatment processes, as required.

Sources of chemical load to water management infrastructure from water affected by mine processes *(i.e.,* contact water) include mine workings (open pit and underground facilities), ore and low grade ore stockpiles, waste rock and overburden stockpiles, tailings, the mill, and drainage from other mine areas (roads and various mine infrastructure). The source loads will be dependent on water contributions (*i.e.,* direct precipitation, surface runoff and groundwater) and the characteristics of the materials of which the water has come into contact. Freshwater make-up for mine processes is also a source of chemical load. All of these sources are further detailed in Section 3.2.

Water management infrastructure used for the mine operations area should be designed based on return periods established from risk assessments (CDA, 2007). As for the construction phase, the water and mass balance model would be used to simulate the movement of water within the water management infrastructure components and would be developed in conjunction with the design effort. Details would also need to be incorporated in the model on the operation, maintenance and surveillance of the following;

- Major ponds (*e.g.,* freshwater and process water reservoirs);
- Minor ponds (e.g., storm overflow ponds, catch ponds);
- Reclaim pond in the tailings management facility (TMF); or
- Heap Leach Facilities and the associated PLS and Barren Solution (BS) containment facilities.

Guidelines for the development of Operation, Maintenance and Surveillance Manuals for major mine water infrastructure are provided in the Dam Safety Guidelines (CDA, 2007), the Mining Association of Canada (MAC) guide to the management of tailings facilities (MAC, 1998) and the MAC document on developing an operation, maintenance and surveillance manual for tailings and water management facilities (MAC, 2005).

### *Closure and Reclamation*

The closure and reclamation phase of a project is the period when mining activities have permanently ceased. The reclaimed area must include landscape and drainage features that are intended to be permanent. These features should be analogous to the natural landscape and drainage systems in terms of dynamic stability, robustness, longevity and self-healing mechanisms. A reclaimed area may be a standalone drainage area with its own monitoring and treatment facility (if necessary) apart from that of the operation areas (Figure 1). Ultimately all construction and operation areas must be converted to reclaimed area.

Sources of chemical loads within reclaimed areas would be the same as those of the operations areas, although reclamation measures such as re-vegetation, overburden/waste rock capping, liner installation or removal of contamination would possibly reduce the magnitude of these loadings. The effects of these measures would have to be incorporated into the water and mass balance model for an adequate simulation of quantity and chemical quality of water released to the environment during closure and reclamation.

A monitoring and treatment facility would still be expected for the reclaimed area, although the required treatment processes may evolve over time. Active treatment may be required in the early stage of closure, but could eventually be replaced with passive treatment processes such as wetlands or engineered lakes from pits or tailings ponds, in order to achieve a sustainable landscape and drainage systems.

The water quantity and quality monitoring program implemented for the construction and operations phases would still be required for closure and reclamation. However, the program may be gradually modified (including phased out) and eventually stopped entirely once it is demonstrated that the chemical quality of water discharged from the reclaimed areas has achieved the project discharge criteria (*i.e.,* in post-closure).

### *Monitoring from Construction to Closure and Reclamation*

Data collection will be required from the exploration to the planning phases for establishing the baseline aquatic and environmental settings possibly impacted by the mine project (EC 2009). The collected data will provide support for the impact assessment of the mine project as part of YESAA and for establishing water license conditions for the operation of the mine (including mine effluent discharge criteria). This baseline monitoring will include water quantity and quality measurements, as well the measurement of local meteorological variables.

Water quantity monitoring will also be required from the closure and reclamation phases for the measurement of flow or volumes of water released to the aquatic environment from all project discharge points. Monitoring of flows in the aquatic environment is also required to assess or predict receiving water quality. Likewise, water quantity monitoring must be implemented at least from the start of the feasibility phase and be ongoing from construction to the closure and reclamation phases. Water quality monitoring involves regular field measurements and sampling of water for the analysis of water quality constituents. The suites of water quality parameters assessed and their monitoring frequency will be established in the water license issued by the YWB and will be tailored according to each mine phase (*i.e.,* construction to closure and reclamation phases) based on the assessment of environmental impacts produced during the licensing and permitting review processes.

Water quantity and quality monitoring plans for the mine project are prepared during the feasibility and planning phases and designed to allow assessment of all discharge points and the receiving aquatic environment. The plan will define the monitoring locations, frequency, parameters and method of sampling. Sampling may be conducted manually or in combination with the use of automated monitoring systems including for example, pressure transducers, conductivity probes, etc.

The monitoring locations identified within the mine site will also assist with the operation of site water management infrastructure by the mine operator. Flows, volumes and/or water levels at intermediate locations (*e.g.,* PLS ponds, BS ponds, tailings ponds, process water ponds, and fresh and reclaim water pumping systems) within the mine site are recommended to support water management decisions and operations at the site, and the validation of the water and mass balance model.

In addition to water quantity and quality monitoring, the measurement of meteorological variables construction to closure and reclamation is essential to water management operations and validation of the water and mass balance model. Indeed, at least one meteorological station must be installed at the mine site as soon as is practical during the exploration or feasibility phases, and should be equipped to monitor temperature, humidity, rainfall, snowfall, snow on the ground, wind speed and direction, pan evaporation and radiation. Snow surveys for the estimation of snow density and water equivalent are also recommended.

Site climate data is used to characterize the effects of the atmosphere on the water management infrastructure of the mine, notably water contributions (*e.g.,* rainfall) and losses (*e.g.,* evaporation and sublimation). These data would either represent direct inputs to the water and mass balance model (*e.g.,* rainfall) or would provide support for the development of inputs to that model (*e.g.,* air temperature, snowfall and snow on the ground for the estimation of snowmelt using the degree-day method; or humidity, wind speed and radiation for the estimation of evaporation and snowmelt from energy balance models). Extreme rainfall, rain on snow and wind events are also determined from the climate data and used for the design of water management infrastructure.

## 3.2 Water Components of the Mine

This section briefly describes the water management components within the construction, operations and reclaimed areas in Figures 1 and 2. Particular attention is given to these components as sources of chemical loadings.

### 3.2.1 Fresh Water Inputs and Diversions

Freshwater input to the mill during operation from surface and groundwater sources, and/or from non-contact water diversions in operations areas and undisturbed lands, are all sourced from the existing environment. The chemical signature from these pathways is anticipated to be similar to that determined from characterisation of the baseline environment (feasibility and planning phases). Freshwater input to the mill constitutes a chemical loading that will impact the chemistry of water circulating on the operations area of the mine site.

As noted previously, best management practices (TAC 2005) for the control of erosion and sediment generation must be considered in the design and implementation of diversion channels in order to minimize the mobilization and release of suspended solids to the receiving environment.

### 3.2.2 Mine Pit and Underground Facilities

Mine pit and underground facilities are excavated areas, as are quarries and borrow pits developed during the construction phase. The characteristics of the rock and soil surfaces exposed during the excavation process directly influences the chemical loadings in water drained from these areas. These previously unexposed surfaces can be subject to physical and chemical weathering, such as oxidation followed by mobilization of oxidized metal residues by surface runoff or underground seepages. Fine particles (*i.e.,* suspended solids) generated from the excavation process may also be mobilized by water drainages.

The chemical signature of water sources from excavated areas will be dependent on the geochemical properties of the material comprised in the rock and soil formations being excavated. This signature would be established from geochemical surveys and analyses performed during the exploration, feasibility and planning phases on soil and rock samples collected at the mine development area. Other significant factors impacting the chemical signature of these water sources include:

- Backfill: Any material backfilling excavated areas is a source of chemical loading. The chemical signature would be established from geochemical samplings and analysis conducted on the material.
- Blasting: Residues of nitrogen compounds (*i.e.,* ammonia, nitrate and nitrite) may be generated from blasting material (*i.e.,* ammonium-nitrate) used in excavated areas. These residues may be mobilized by water drainages in these areas and their quantities would be dependent on blasting practice and performance.
- Groundwater: Groundwater inflow to the excavation, pit or underground workings may also impact the overall water quality of the water accumulating in these facilities. The groundwater quality of the region is typically characterized during the exploration, feasibility and planning phases of the project. Additional consideration may be required to address the impacts of pit dewatering or diversions of pit inflow that results in drawing down the water table near the pit.

### 3.2.3 Stockpiles

Stockpiles of materials may be present during, and persist through, various phases of a mine project (*i.e.,* exploration through construction, operations and into closure and reclamation). For any type of stockpile, chemical loadings will be dependent on the source material (*e.g.,* the current mine area, old exploration areas, etc) and the age of the stockpile. Geochemical analyses must consider these two factors in the assessment of potential chemical loadings from a stockpile. Other considerations may include water volumes infiltrating into the stockpiles and, seeping from their bases. Further details for several types of stockpiles are provided below.

#### *Waste Rock and Overburden*

Waste rock and overburden are material from excavated areas with an insufficient fraction of commodities (*i.e.,* solid hydrocarbons, metals and minerals) to economically justify further processing. These materials are typically stockpiled on site for long-term storage and/or re-use in closure and reclamation. Chemical loadings from surface runoff and leaching water originating from waste rock and overburden stockpiles will be dependent on the material geochemical properties and age of the stockpile. Physical characteristics also to consider in the prediction of the chemical signature of water drained from stockpiles include (Price, 2009):

- The amount of material surfaces exposed to physical and chemical weathering;
- Particle sizes of the material (access to reactive minerals);
- Stockpile construction and resulting structural features (deposition method, segregation as a function of particle size, surface exposed to weathering, hydraulic conductivity);
- Particle breakdown and migration during and after construction;
- Hydrologic characteristics such as amount of precipitation, infiltration and hydraulic conductivity; and
- Mitigation measures, such as covering and lining.

### *Ore and Low Grade Ore*

Ore is material from excavated areas with an adequate fraction of commodities to economically justify further processing. This material is often temporarily stockpiled on site prior to processing or shipping to an off-site processing facility. Considerations for the prediction of chemical loadings from water drained from ore and low-grade ore stockpiles are the same as those for waste rock and overburden stockpiles (*i.e.,* geochemical properties of the material and physical characteristics of the stockpile such as surface exposed to weathering, particle sizes and hydrologic characteristics).

### *Tailings and Spent Ore*

Tailings and spent ore are the waste products resulting from the processes used to extract the commodities from the ore material. Tailings are the fine grained products of comminution of the ore and the residue after extraction of the commodity of interest by flotation or other processes. Spent ore is the residue of heap leach processing of either run-of-mine or crushed ore. The factors to consider in the prediction of the drainage chemistry from tailings (Price, 2009) are:

- The geochemical and physical properties of the ore material;
- Processing methods for commodity extraction, including particle size reduction and added chemicals;
- Added processing to allow specific disposal, or use as backfill or construction material;
- Process water use (*i.e.,* a combination of several sources such as fresh water, drainage water from several stockpiles, tailings pond water, and water from other mine drainage areas);
- Deposition methods, which impact material segregation, and surface weathering; and
- Mitigation measures, such as covering and lining.

## 3.2.4 Heap Leach Solution Circulation System

As illustrated in Figure 2, this system consists of a circular conveyance of water among the following facilities: the BS pond, the heap leach facility, the PLS pond and the process plant. As part of the heap leach operation, ore is placed on a lined pad (*i.e.,* the heap leach facility) and is irrigated with an acid leach solution, from the BS pond. Water leaching from the pad constitutes a solution commonly referred to as a pregnant leach solution or PLS (i.e. a solution loaded with leached metals), and is conveyed though a collection system to the PLS pond. Water from the PLS pond is then directed to the process plant to extract the metal from that PLS solution. Finally, the water from the process plant is conveyed to the BS pond to complete the circulation system. The factors to consider in the prediction of the drainage chemistry from the heap leach facilities (barren pond, heap leach facility, PLS pond and process plant) are the following;

- Reagents applied to the leach solution;
- Water sources in the circulation system (*i.e.,* recycled, fresh water inputs, precipitations, and water from other areas of the mine); and
- Processing methods for commodity extraction.

### 3.2.5 Mine Drainage Areas and Disturbed Lands for Construction

Mine drainage areas consist of all lands in the operations areas other than mine workings, stockpiles, mills and water ponds. These lands would include infrastructure supporting the mine, such as the maintenance and tool shops, warehouses, explosive storage and handling areas, residential and administrative buildings, airstrips, ports, and road and rail networks. The lands would typically be stripped of vegetation, with the soil or rock surface subject to erosion and weathering. Therefore, the chemical signature of water drained from these lands would be impacted by land erosion, the effect of weathering on native ground, material used for the construction of the mine infrastructure and the presence of other potential contaminants such as process solutions, explosives, hydrocarbons, and other waste materials.

Disturbed lands for construction consist of lands that have been stripped but where mining activities have yet to take place. Similar to mine drainage areas, the chemical signature of water from disturbed lands would be impacted by land erosion and weathering of exposed native soils and construction materials.

### 3.2.6 Reclaimed Lands

Reclaimed lands consist of areas previously used for operations or construction, and which have since been developed as sustainable landscape and drainage systems, either during operations as concurrent reclamation, or following the end of mining activities in that area. The chemical composition of water reporting from these lands will be dependent upon the mine facilities reclaimed (*i.e.,* mine workings and stockpiles). However, loadings from these sources would be expected to be reduced by reclamation activities such as covering and capping of stockpiles, overburden and waste rock, or flooding of open pits. The objective of reclamation activities would be to ultimately return chemical loadings from these lands to project specific criteria for closure and reclamation.

### 3.2.7 Monitoring and Treatment Areas

Water contributions from land impacted by the mining development (*i.e.,* construction, operations and reclaimed areas) must be monitored throughout all the mine phases, and if necessary, treated before being discharged to the receiving environment. The monitoring program would involve field measurements of in-situ parameters (*e.g.,* temperature, pH, conductivity, oxygen reduction potential and dissolved oxygen), as well as the collection of water samples for further chemical analysis, in order to assess potential source loadings, water treatment performance and adjustments to mining or treatment activities as required.

Mine effluent discharged to the receiving environment is governed by the discharge criteria defined in the project water license and needs to meet the minimum water quality thresholds at the discharge outfall as defined under the *Metal Mining Effluent Regulations* (EC, 2002). Meeting water quality thresholds for the protection of aquatic life (CCME, 2007) or drinking water (FPTCDW, 2008) would typically require establishing compliance monitoring location(s) in the receiving environment.

As noted above, monitoring of water quantity and quality at intermediate locations (*e.g.,* stockpile water collection ponds, tailings pond, process water pond, underground workings and freshwater sources) within the mine site during construction, operation and closure and reclamation is necessary for operational purposes. The data gathered from this monitoring is used for the validation and refinement of the water and mass balance model developed for the mine project and for supporting decisions on adjusting mining and treatment activities.

A broad range of water treatment measures may be used depending on the needs of the mine development. A sedimentation pond is expected for the collection of any surface water discharge from the mine footprint. Flocculation may sometimes be required to promote suspended solid removal in addition to settling. Chemical and/or biological treatment measures may be required to reduce elevated concentrations of dissolved constituents and would typically involve the use of a polishing pond or a water treatment plant depending on the recommended treatment processes.

For reclaimed areas, effluent treatment will be required until monitoring results completed under MMER indicate that the chemical quality of the water is acceptable for direct discharge to the receiving environment without further treatment. Additional follow-up may be required where MMER monitoring is no longer in place particularly when site closure has been achieved but further monitoring may be warranted. Depending on the effluent chemical signature, treatment may evolve from active (*i.e.,* engineered chemical and biological facilities) to passive treatment approaches, such as wetlands or pit lakes, in order to create self-sustaining landscapes and drainage systems. Natural biochemical (*e.g.,* substance decay) and physical (*i.e.,* settling) processes involved in wetlands and lakes may be sufficient to treat moderate levels of several water quality constituents at relatively low operational and maintenance costs.

# 4.0 WATER AND MASS BALANCE MODELLING FOR MINING

Water and mass balance models are decision support tools for mining projects intended to assist operators with mine site water management. Models are extremely useful for regulators to assess whether a project has potential for significant environmental effects on water quality. Models are frequently used in the mining industry to substantiate water management alternatives, design key infrastructure components, and assess the uncertainty underlying current and future water management scenarios. They allow assessment of several mine plan options, and enable evaluation of environmental impacts over the mine life and assessment of cumulative effects and risks over time.

Water and mass balance models exist in deterministic and probabilistic formulation. Deterministic models operate with set inputs for the prediction of average water quantity and quality conditions and the evaluation of specific scenarios (*i.e.,* extreme cases, climate change and sensitivity analysis). Probabilistic models use stochastic inputs in the form of probability distributions to explicitly represent uncertainty and/or variability in the system that is being modelled. The output results are also expressed in the form of probability distributions and provide the likelihood of occurrence of a result. Probabilistic model formulations are used for uncertainty analyses.

Simple average monthly or annual deterministic simulations may be all that is required for feasibility, but increased model complexity and the ability for stochastic simulations will be required as the mine proceeds to the planning, construction, operations and closure and reclamation phases.

This section provides a general description for developing water and mass balance models for mining projects. The model components addressed in this section include:

1) The general settings of models in terms of the spatial and temporal modelling domains and selection of results displays;

2) The generation of model inputs;

3) Required model outputs; and

4) Additional modelling considerations such as climate change, and sensitivity and uncertainty analyses.

## 4.1 Water and Mass Balance Model General Settings

Water and mass balance models must be developed to specifically characterize the mining project under study. Spreadsheets, general purpose simulators or water-related specialised models are tools and components to be used in the development of a water and mass balance modelling package. The type of model selected must be based on sound engineering judgment, the phase of mine life being modelled, and an understanding that even the most sophisticated and detailed models are only an approximation of what may occur. A reasonable degree of accuracy would be required; however, the main intent of a model is to allow assessment of the different factors that may impact water management at the mine site (*e.g.,* changes in climate conditions, dimensions of a reclaim pond, or mitigation measures applied to a stockpile). Such an assessment may be conducted through sensitivity and/or uncertainty analysis, and would be used to support the establishment of the most appropriate water management practices and infrastructure for the mine site.

Simple average monthly or annual deterministic models may be sufficient for feasibility level simulations; however, increased model complexity and/or stochastic simulations may be required as the mine proceeds to the planning, construction, operations and closure and reclamation phases. The resulting modelling package must be developed to provide predictions that are both realistic and conservative.

Water and mass balance models must be developed during the initial feasibility and planning phases to cover the whole mine life cycle period from the start of mine development to a date sufficiently far in the future where the reclaimed landscape is considered self-sustaining following complete closure of the mine. A common practice for relatively small mining projects extending over a short period of time is to develop a dynamic model for deterministic or probabilistic simulation of the entire mine cycle, from development to closure and reclamation. However, the modelling burden of such an approach may eventually become onerous for projects of larger magnitude or extending over a significant period of time. In such cases, the strategy would be to model select periods of the mine cycle (*i.e.,* model only the mine plan and water management infrastructure in place at a given period of the mine life). Two modeling options would be applicable under this strategy:

- Model water quantity and quality for each select period over one year, for several different climate scenarios; typically the average climate conditions and representative wet and dry climates (*e.g.,* 10 or 100 year dry or wet yearly precipitation); and/or
- Model water quantity and quality over a longer simulation time (*e.g.,* 50 years), using the mine plan and water management infrastructure in place for the selected period for the entire simulation time (this modelling task must be done for each selected period).

The first option is relatively simple and straightforward, and would typically be implemented over a hydrologic year, typically defined from October 1 to September 30 depending on local hydrologic conditions, mainly to better capture the progression of the snowpack growth and depletion. The second option requires long time series of model inputs (*i.e.,* climate variables, inflows and water quality constituent concentrations or sources waters), but a wide array of combinations of climate, flows and source water concentration conditions would be expected in the longer simulation. The second option has been applied to several environmental impact assessments in the Athabasca oil sands region of Northern Alberta (Shell, 2005 and 2007; Imperial, 2005; Suncor, 2005). A sufficient number of periods must be selected to include all phases of the mine life, from construction to closure and reclamation. The periods should also conservatively capture expected critical changes in mining activities that will potentially impact water quantity and quality predictions. In further stages of planning, the number of periods and their position in time during the mine life would be updated to reflect adjustments in the mine development plan.

The spatial domain defined in models must include all construction, operations and reclaimed areas planned for the mine life. Changes in the extent of these areas over time must be incorporated in dynamic models simulating the entire mine life, whereas modelling of mine development periods must reflect the extent of these areas over the period of time being simulated. In further stages of planning, the models must be updated to reflect any adjustments to the extent of the construction, operations, and reclaimed areas.

Models must be developed to provide results (*i.e.,* range of flows, water quantity and quality) at select locations (or display nodes) within the mine footprint and in the receiving environment. The selection of locations in the receiving environment must include at a minimum locations where compliance with proposed or regulatory water quality thresholds must be met to satisfy regulatory review processes. The selection of locations within the mine footprint should target specific sources of chemical loadings *(e.g.,* tailings ponds, stockpile water collection ponds, etc.) to assist in the review and development of mining and treatment processes.

Model development should include a conceptual water balance schematic and a list of flow components to facilitate model review by peers, regulators and other stakeholders involved in the regulatory review process. A summary of model assumptions (*e.g.,* runoff coefficients, runoff during winter, planned discharge points, and infrastructure operational criteria) and consulted documentation must also be included to facilitate review. Appendix B (sheets 7, 8 and 9) presents an example water balance schematic and associated list of flow components and assumptions. The model general settings (*i.e.,* modelling period, spatial domain and expected results) should be clearly defined from the early stage of the project. Initial consultations between the mine operator and regulators on these settings are strongly recommended to establish a clear understanding of expectations prior to undertaking model development.

## 4.2 Model Inputs

### 4.2.1 Mine Process and Dewatering Inputs

The mine plan serves as the primary information source for the development of the water and mass balance model. The mine plan is essentially a schedule that defines the progression over time of vegetation and overburden stripping, pit and/or underground development, stockpiles and tailings deposition, overburden deposition and re-vegetation for reclamation and closure.

Production characteristics at the mill and/or thickener will also be required for input to the water and mass balance model. Typical model inputs from the operation of the processing mill and thickener may include:

- Ore throughput;
- Minimum freshwater requirement;
- Make-up, reclaim and/or recycle water requirements;
- For mines with tailings facilities;
  - Tailings production and tailings slurry water (or solids) content; and
  - Water incoming and leaving the mill with the ore processed.
- For mines with heap leach facilities;
  - Irrigation rate for heap leach circuits; and
  - Saturated water content and residual water content after drain down.

Other operational processes or constraints, such as pumping and water storage capacities, discharge windows, and other water requirements (*e.g.,* dust control, fire suppression, and potable water) may also be required.

Dewatering activities from mine workings (*i.e.,* open pits or underground facilities) may constitute an appreciable water source to the mine site. Water volumes extracted from dewatering activities also represent inputs to the water and mass balance, and are typically estimated from hydrogeologic studies.

### 4.2.2 Physical Inputs

Physical inputs may not be direct inputs to water and mass balance models. However, these inputs are used to establish drainage basins and determine runoff coefficients that can be used in the models to characterize hydrologic productivity (*i.e.,* water quantity from a watershed) within the mine development area and the surrounding environment. Typical physical inputs can include, but are not limited to, topography, land uses and associated runoff coefficients based on vegetation, soil, surficial geology and presence of permafrost.

Water and mass balance models that characterize hydrologic productivity using runoff coefficients (as is the case with the model presented in Section 5) are typically sensitive to such coefficients. Such models remain acceptable if the modelling time step is relatively long (*e.g.,* monthly). However, the selection of model runoff coefficients should be supported with adequate assumptions and/or data, including physical, climate (Section 4.2.3) and hydrologic and hydrogeologic (Section 4.2.4) inputs. These coefficients should also be included as parameters in the model sensitivity analysis.

Other physical inputs required to develop water and mass balance models include storage (area or volume as a function of depth, or bathymetry), flow and/or pumping capacities of water management infrastructure components that are expected on the mine site, such as ditches, culverts, bridges, ponds, pipes, pumps and siphons. The design of these components is typically advanced conjointly with the development of the water and mass balance model.

### 4.2.3 Climate Inputs

Climate inputs will be established from existing meteorological data within the region of the mining projects. Environment Canada and regional governments operate weather and flow monitoring stations which may provide a major source of regional meteorological data for the project. Data from private operators may sometimes be obtained. It is always recommended to install at least one meteorological station within the mine development area, preferably during the exploration or feasibility phases and no later than the initial stages of the planning phase. More than one station may be required for projects affected with variable climate conditions over the local surface area, including for a mine footprint spreading over several valleys or significant elevation differences (orographic effects). A meteorological station will provide the necessary local data to assist in assessing long term climate characteristics that are representative of the local conditions at the mine site. Meteorological stations are affordable, relatively easy to install and operate, and may be fitted to allow remote data access. The station should be kept active for the remaining phases of the mine development; that is, from construction to closure and reclamation.

The climate inputs will affect the modelled quantity of water available for mining activities and consequently will impact the modelled water quality at the effluent discharge locations. Primary climate variables are temperature, precipitation (*i.e.,* rainfall and snowfall), snow on the ground and evaporation. Temperature data are often used with physical inputs (Section 4.2.2) for the determination of runoff coefficients (*i.e.,* temperature is not a direct input to the models), while the other primary climate variables are often used as direct climate inputs to water and mass balance models. Additional climate variables may include humidity, radiation, wind speed and direction, and snow characteristics (depth, density and water equivalent). These variables, along with temperature, can be used for the calculation of snowmelt, evapotranspiration and sublimation inputs to water and mass balance models. Precipitation and wind data are also used for the design of water management infrastructure.

Climate inputs to water and mass balance models are typically expressed in the form of time series. The type of series produced may include the long term average repeated on an annual basis, extreme dry or wet conditions for sensitivity analyses, long time series (*e.g.,* 50 years) derived from observed data for modelling periods, or randomly generated series for uncertainty analyses.

### 4.2.4 Hydrologic and Hydrogeologic Inputs

Hydrologic and hydrogeologic data may or may not represent direct inputs to the water and mass balance models. These inputs would however be employed to determine runoff coefficients on lands within the mine development area and the surrounding environment, and potential inflows into open pits and underground workings. Flow time series from regional hydrometric stations would be used conjointly with precipitation data and physical characteristics for the derivation of regional runoff coefficients. Installation of hydrometric stations for monitoring flows in streams within or near the mine development area is necessary to determine the local runoff and flow regime. Likewise, groundwater boreholes and wells would give an indication of local groundwater table elevations on a seasonal basis, flow direction, recharge and flow rates, and potential artesian conditions. These monitoring stations should be in place during the feasibility and planning phases, and be active as required throughout the operations, closure and reclamation phases.

Additional hydrologic and hydrogeologic data would include, but not be limited to the following:

1) Ice cover and open water characteristics (*i.e.,* thickness, initiation and break dates);
2) Water levels, surface areas, bathymetry and volumes in water bodies potentially affected by the mine development;
3) Flow regime of local and regional streams potentially affected by the mine development;
4) Observed groundwater seepage from valley walls and in the open pits; and
5) Observed groundwater flow into underground mine workings, when applicable.

### 4.2.5 Water Quality Inputs

Time series of concentrations or loadings, for all water quality constituents, from all water sources involved in the mine development must be incorporated in the water balance models to:

- Determine the mass of each water quality constituent circulating in the mine water management system; and
- Estimate the resulting constituent concentrations in the mine effluents.

The required time series varies with the modelling option selected (Section 4.1). Possible options include:

- Long term average concentrations (*i.e.,* daily, weekly, monthly or seasonal concentrations, depending on availability) when the modelling option involves selected periods of the mine cycle assessed over one year;
- Long term average concentrations repeated on an annual basis for a dynamic simulation over the entire mine life; or
- Randomly generated concentration time series from probability distributions of concentrations developed based on sample or geochemical analysis for a dynamic simulation over the entire mine life or as input to long term simulations on selected periods of the mine cycle (time series can be generated to a resolution as fine as a daily time step).

In the first option, modelling an extreme high or low concentration time series should also be done as part of a sensitivity analysis, while a year of extreme high or low concentrations at critical periods of the mine life should be inserted in the model series for the second option. In these two options, the selected extremes must nevertheless be realistic, in order to provide a representative outcome for the project. The third option should include modelling randomly generating time series of extreme high or low concentrations as a sensitivity analysis, and/or randomly generating multiple time series (*e.g.,* 500 or 1000 per constituent, per water source) for uncertainty analysis. For all options, the time series must be developed with data from analytical results of water samples or geochemical inputs, which are discussed further below.

### Water Sampling

Water sampling programs should be implemented during the feasibility and planning phases in order to establish baseline water quality conditions. The samples obtained would be considered representative of background water quality for freshwater inputs to the mine, runoff from undisturbed land, groundwater, and water bodies in the receiving environment. Sampling from other water sources may also be collected once the mine is active to validate geochemical surveys and analyses. Water sampling programs must assist in characterizing possible seasonal variations in water quality constituent concentrations. Sampling is expected to be undertaken several times over the course of a year, and may be as frequent as monthly during the feasibility and planning phases in areas with little or no historical samples. Sampling frequencies from the construction to the closure phases are established under the mine water license and will typically be dependent on the type of waters (*i.e.,* natural and mine waters). Sampling programs should include winter sampling (during the sampling campaign, specific justifications such as dry or frozen streams, waterbodies or wells should be provided when sampling could not be achieved at a given location).

Basic statistical characteristics (*i.e.,* mean, median or specific high or low percentile) on the concentrations obtained from these samples may be sufficient for building constant or seasonally varying time series repeated on an annual basis. Probability distributions must be fit on these concentrations for building randomly generated time series. A basic methodology for fitting probability distributions on concentration data is provided in EPA (1991). Figure 3 incorporates this methodology and complements outputs with additional features such as outlier detection and definition of minimum and maximum bounds to assist in the generation of time series within representative ranges of observed concentrations.

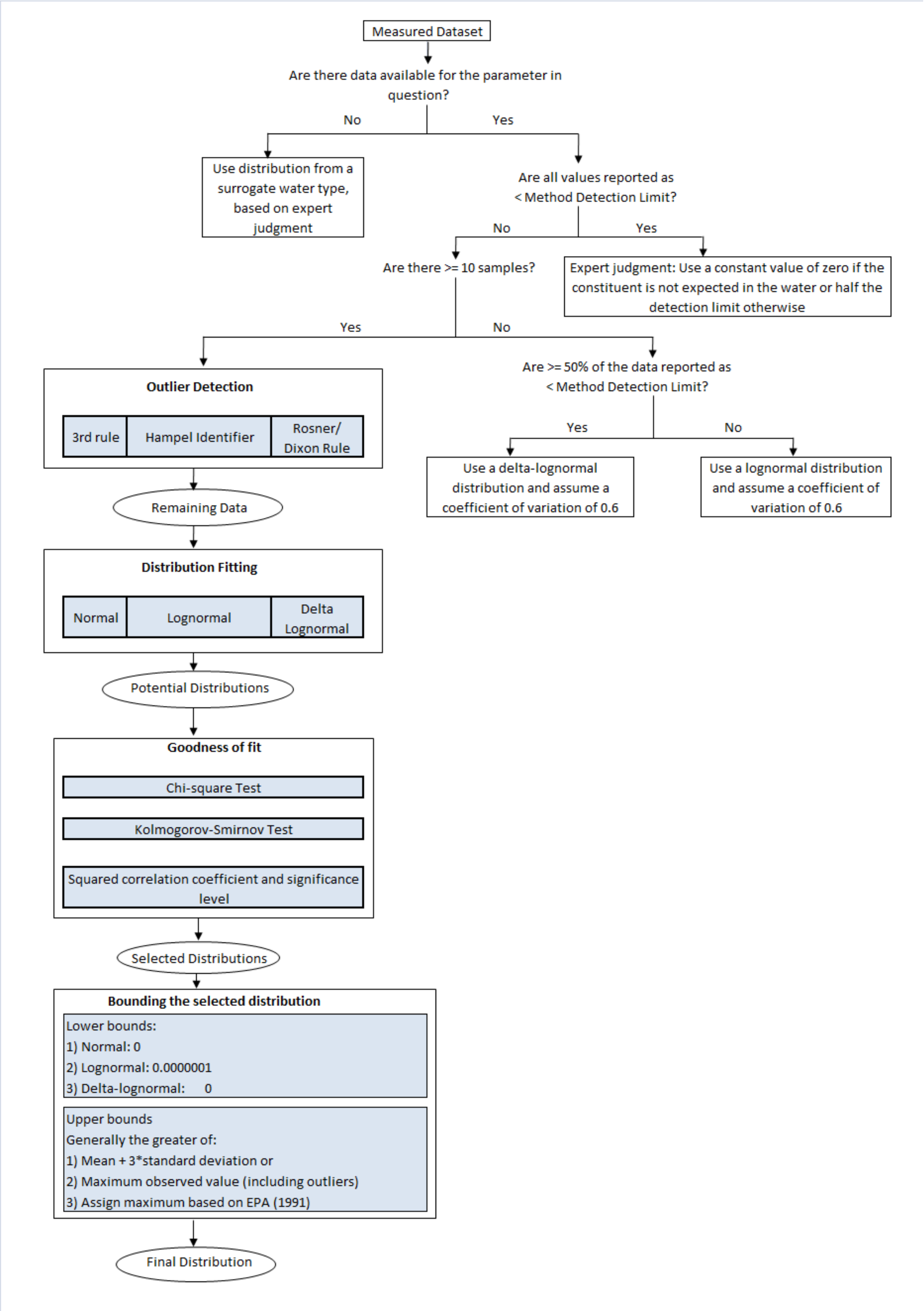


*Figure 3: Steps for the Production of Randomly Generated Concentration Time Series from Water Samples*

## Geochemical Inputs

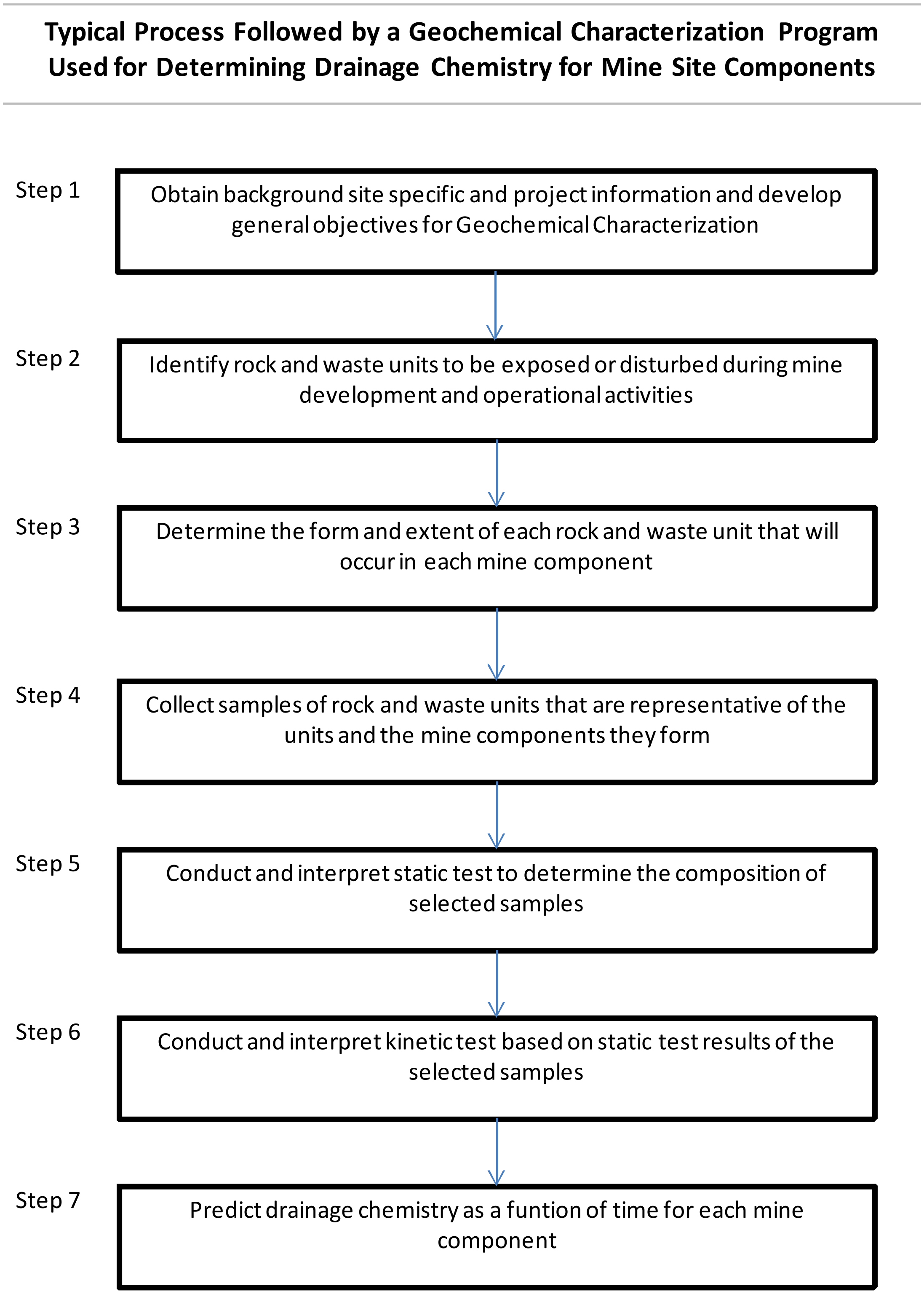
Soil and rock samples should be tested during the exploration, feasibility and planning phases to determine the geochemical properties, including ARD/ML potential, of material excavated, used or processed as part of the mine development. Required data and methodology for geochemical (ARD/ML) characterization are outlined in: Price (1997 and 2009), Price et al (1998), MEND (2005), EC (2009) and INAP (2009). These referenced documents provide guidance for determining and obtaining geochemical inputs for various mine site components and also provide the considerations and limitations for each characterization methodology.

The objective of a geochemical characterization is to obtain information necessary to predict potential water quality constituent concentrations in water drained from mine workings, stockpiles and tailings ponds. From the exploration to the planning phases, water quality model inputs for mine site components will mostly be derived from the results of static testing and kinetic testing as part of geochemical characterization programs. These programs could include testing of waste rock that may have been exposed during previous exploration or mining work. During operations, on-site monitoring data or data from field test facilities can be used to confirm and/or revise the geochemical inputs used.

The methodology for mine site drainage chemistry predictions is illustrated in Figure 4 as adapted from Price (2009). Steps 1 to 3 of the geochemical characterization program are intended to define the objectives of the geochemical program and develop a general understanding of the relative timing of potential issues. Geochemical desktop studies and field programs are developed from these steps. Regional and local geology, climate, hydrology, hydrogeology and geology data will be collected and used to get an understanding of the changes to physical, geochemical, biological and engineering properties and processes as they relate to water quality.

Steps 4 through 6 are implemented to determine what materials must be sampled and to select samples that are potentially representative of those materials. Sample selection must account for the potential physical and spatial variability in material types that may be present on site. Once samples are collected, they are typically sent to a lab to first undergo static and then possibly kinetic testing. Static tests provide one-time (snap-shot) results whereas kinetic tests provide time dependent rates of chemical reactions. Typically kinetic tests are limited to samples identified from the static testing to be representative of a material to be characterized.

Step 7 of the geochemical program encompasses the data analysis and interpretations from both static and kinetic tests to interpret the potential drainage of the various mine site components. This step is typically conducted through the use of modelling software to support the prediction of drainage chemistry. Basic statistics (*i.e.,* mean, median or specific high or low percentile) may be extracted from these predictions and a probability distribution may be selected based on reasonable assumptions for the production of randomly generated time series.



**Typical Process Followed by a Geochemical Characterization Program Used for Determining Drainage Chemistry for Mine Site Components**

Step 1 Obtain background site specific and project information and develop general objectives for Geochemical Characterization

Step 2 Identify rock and waste units to be exposed or disturbed during mine development and operational activities

Step 3 Determine the form and extent of each rock and waste unit that will occur in each mine component

Step 4 Collect samples of rock and waste units that are representative of the units and the mine components they form

Step 5 Conduct and interpret static test to determine the composition of selected samples

Step 6 Conduct and interpret kinetic test based on static test results of the selected samples

Step 7 Predict drainage chemistry as a funtion of time for each mine component

*Figure 4: Methodology for the Prediction of Concentrations from Rock and Soil Samples (adapted from Price 2009)*

### 4.2.6 Model Input Uncertainties

Uncertainties will likely be induced in the estimation of the model inputs (Section 4.2.1 to 4.2.5), and will potentially be related to relatively short existing data records, sparse regional monitoring, and/or data gaps in regional and local monitoring programs. Uncertainties may be addressed through:

- Sensitivity analysis, where inputs are varied one at a time to determine the potential variation in model results (variation of the inputs must be sufficiently large to provide conservative modelling results); and
- Uncertainty analysis, where several realisations of the inputs are defined and fed to the model to define the range of potential results.

These types of analyses and effects on modelling are discussed further in Section 4.4.

## 4.3 Outputs

Outputs from the model will be the ranges of flows, water volumes or water levels, and constituent concentrations at selected locations in the mine development area, including mine effluent release points, and the receiving environment. Result summaries in the form of basic statistical characteristics, such as the mean, median, high and low percentiles, and variations though time, should be presented in tabular format for both water quantity and quality.

Water quality of effluent discharges must be compared against regulatory and licensed thresholds (*i.e.,* MMER). Certain constituents in effluent discharge may exceed the thresholds, and consequently mitigation or treatment measures must be modelled and implemented to improve effluent water quality.

In the case of discharge locations in the receiving environment, predicted concentrations as a result of mine activities must be compared against background concentrations and project-specific thresholds based on aquatic life and drinking water guidelines. Predicted constituent concentrations may exceed background concentrations and/or thresholds. The probability of these exceedances should be calculated and an aquatic and health assessment on these constituents might be required to support the regulatory review process or environmental effect monitoring studies.

Depending on the parameter being presented and the range in model results, the result summary tables may possibly be divided into representative seasons. Water quantity and quality outputs may also be presented in graphs as support to the summary tables. Time series graphs are typical for flows, water volumes or water levels, and may also be used for constituent concentrations. Figure 5 illustrates an example of a time series graph of modelled water volume and water level in a tailings pond with continuous deposition of tailings over time. Figure 6 is an example of a time series graph applied to a water quality constituent. Such a graph may be produced for each water quantity variable and each water quality constituent, for each selected location. However, time series graphs may become cumbersome if they depict long periods of time. Figure 7 is an alternative by which the time series of a select variable is sorted in ascending order to present the model results in terms probability of occurrence (or attainment). This type of graph is particularly suited for the assessment of water quality constituents where the probability of exceeding a given threshold may be read directly from the figure.

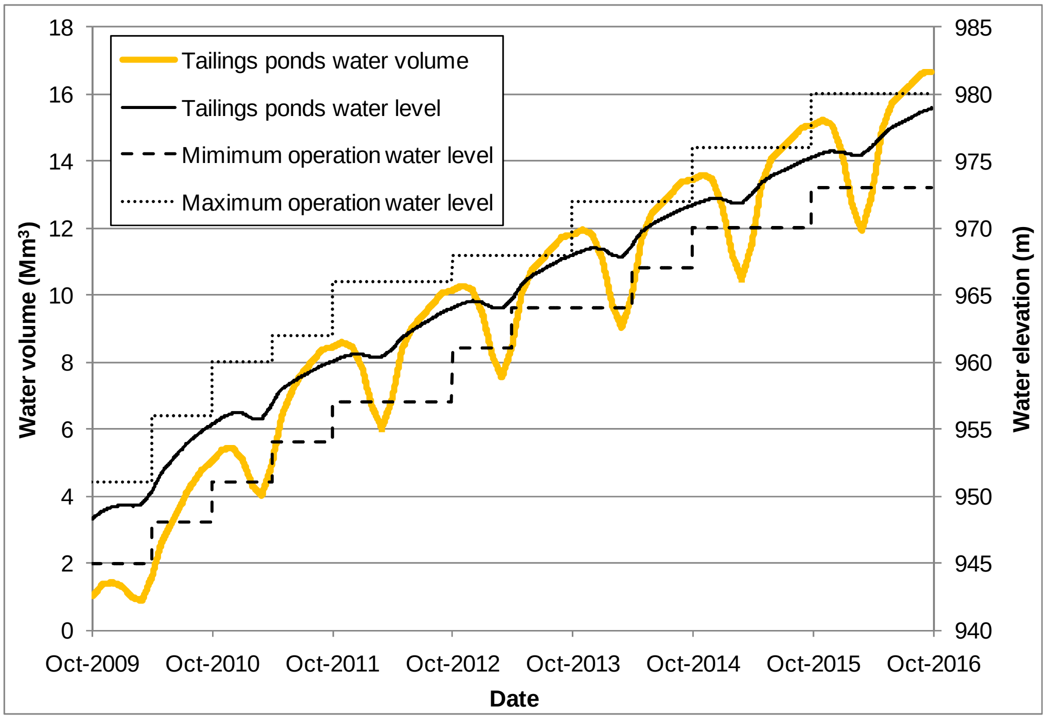


*Figure 5: Water Volume and Level of a Tailings Pond with Continuous Tailings Deposition.*

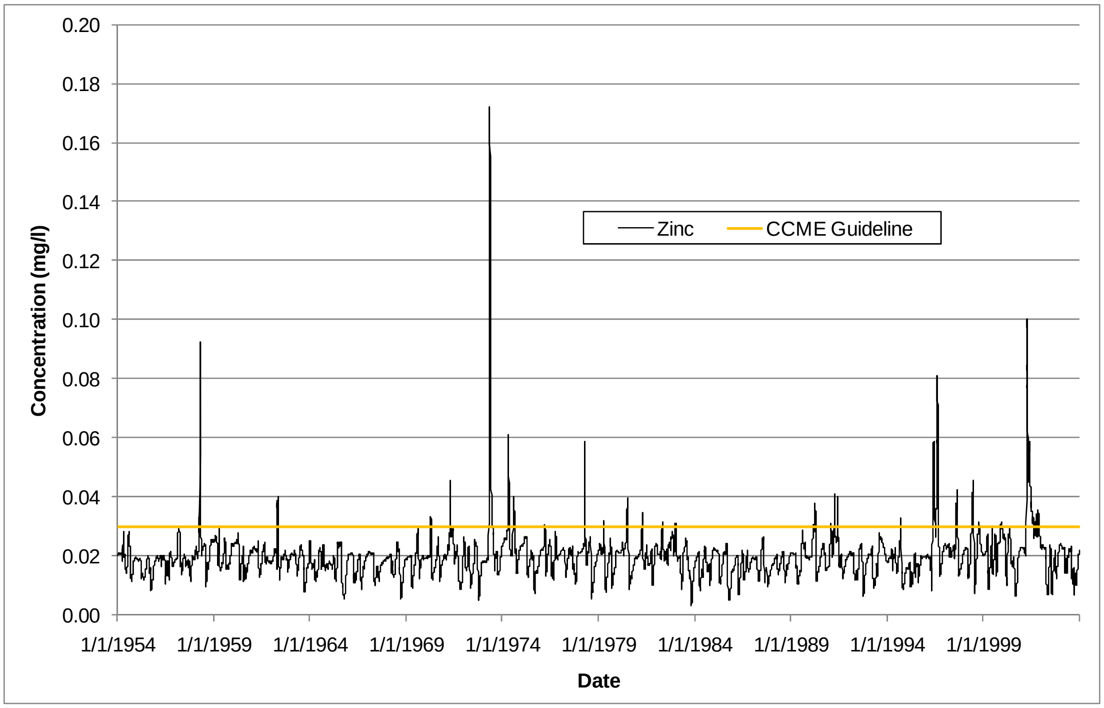


*Figure 6: Time Series of Predicted Concentrations at a Selected Location*

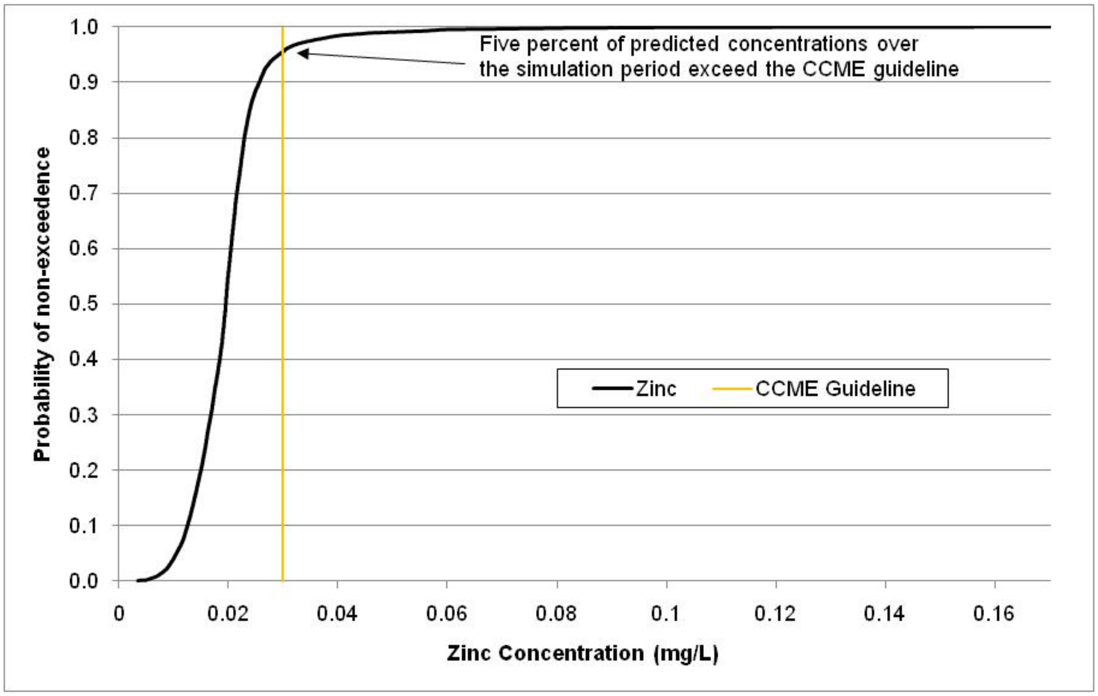


*Figure 7: Frequency Distribution of Predicted Concentrations at a Selected Location*

## 4.4 Additional Modelling Considerations

### 4.4.1 Sensitivity and Uncertainty Analyses

Sensitivity and uncertainty analyses are used to determine the impacts of changes in the model inputs. Uncertainties will be introduced in the estimation of model inputs and parameters (*e.g.,* runoff or snowmelt coefficients) due to relatively short data records, sparse regional monitoring, and/or data gaps in regional and local monitoring programs. The objective of the analyses are to evaluate the potential magnitude of changes in modelled water quantity and quality results from corresponding changes in the values of model inputs for a conservative assessment of potential impacts from the mine project to the aquatic environment.

A sensitivity analysis is the process whereby the value (or time series) of one model input is changed while keeping the other inputs unchanged in order to determine the relative influence of the changed input on simulation results. The input parameters identified as generating large variations in simulation results for a small variation in their value are considered sensitive. Further studies or field programs may be required to obtain greater confidence in the assignment of the model values for these inputs. Sensitive model inputs parameters may also be further considered in an uncertainty analysis.

Uncertainty associated with water quantity and quality inputs may be considered by fitting probability distributions to observed data and using several sets of sampled data from the distribution as inputs into the model. Each sampled data set represents a possible realisation of climate, hydrologic and water quality conditions affecting the mine project. Each realisation is fed into the model to produce corresponding outputs (*i.e.,* flows, volumes, constituent concentrations). The results from all realisations are then compiled to establish a distribution for each output. This form of uncertainty analysis is often referred to in practice as Monte Carlo simulations. Results of the uncertainty analysis are typically summarized by extracting relevant percentiles from the output distributions (*e.g.,* the 5th and 95th percentile to obtain the 90% confidence band).

Figure 8 illustrates the process of uncertainty analysis assuming the development of 200 realisations for inputs comprised of flows, constituent concentrations and typical water quantity and quality parameters, such as seepage rates and decay for degradable constituents. Figure 9 also presents an example results summary for a given water quality constituent where predicted concentrations for the expected average conditions are bounded by the 5th and 95th percentiles determined from uncertainty analysis.

Conclusions on sensitivity and uncertainty analysis should demonstrate a reasonable understanding of the changes effected by varying given model inputs and the interactions between the model inputs.

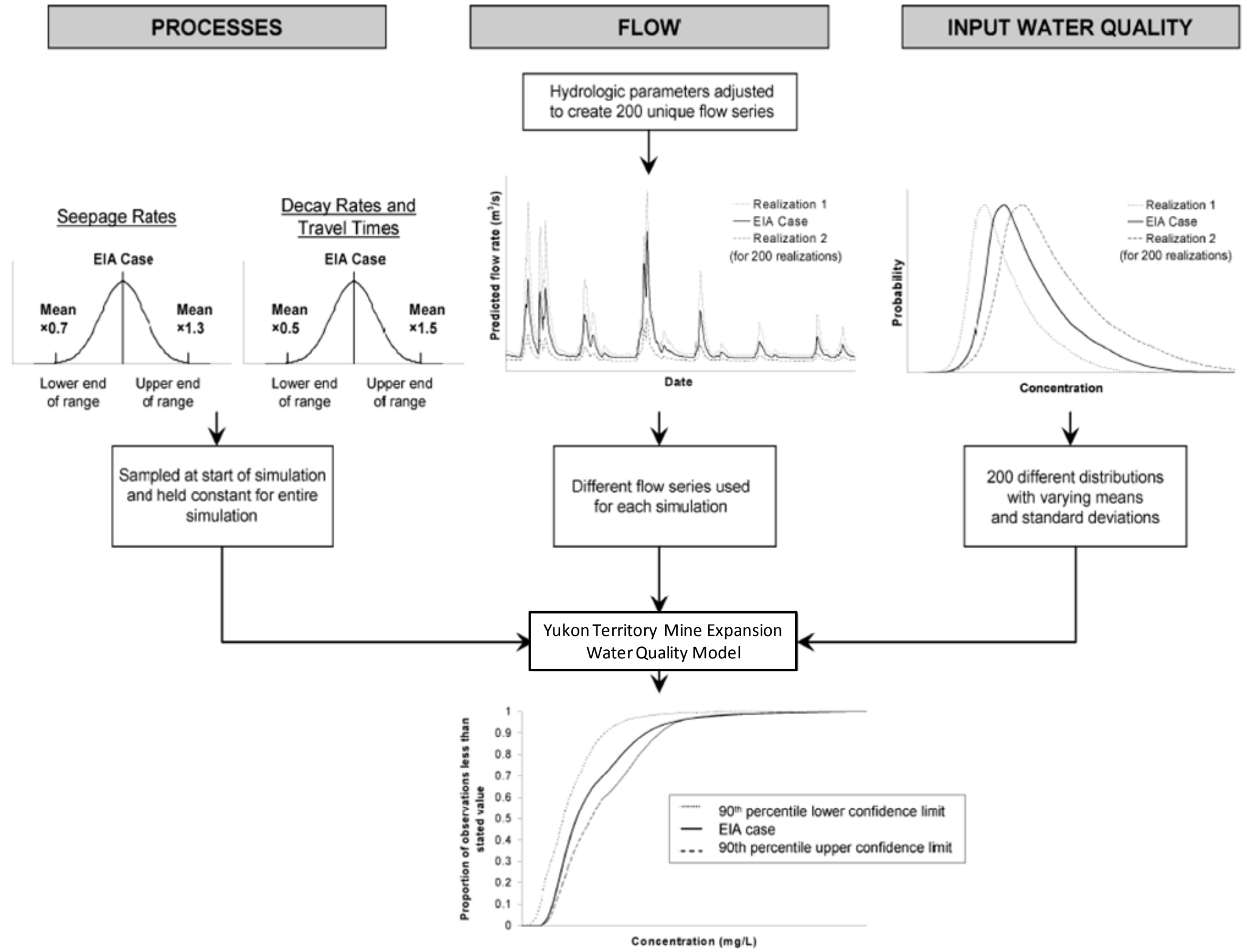


*Figure 8: Uncertainty Analysis Formulation*

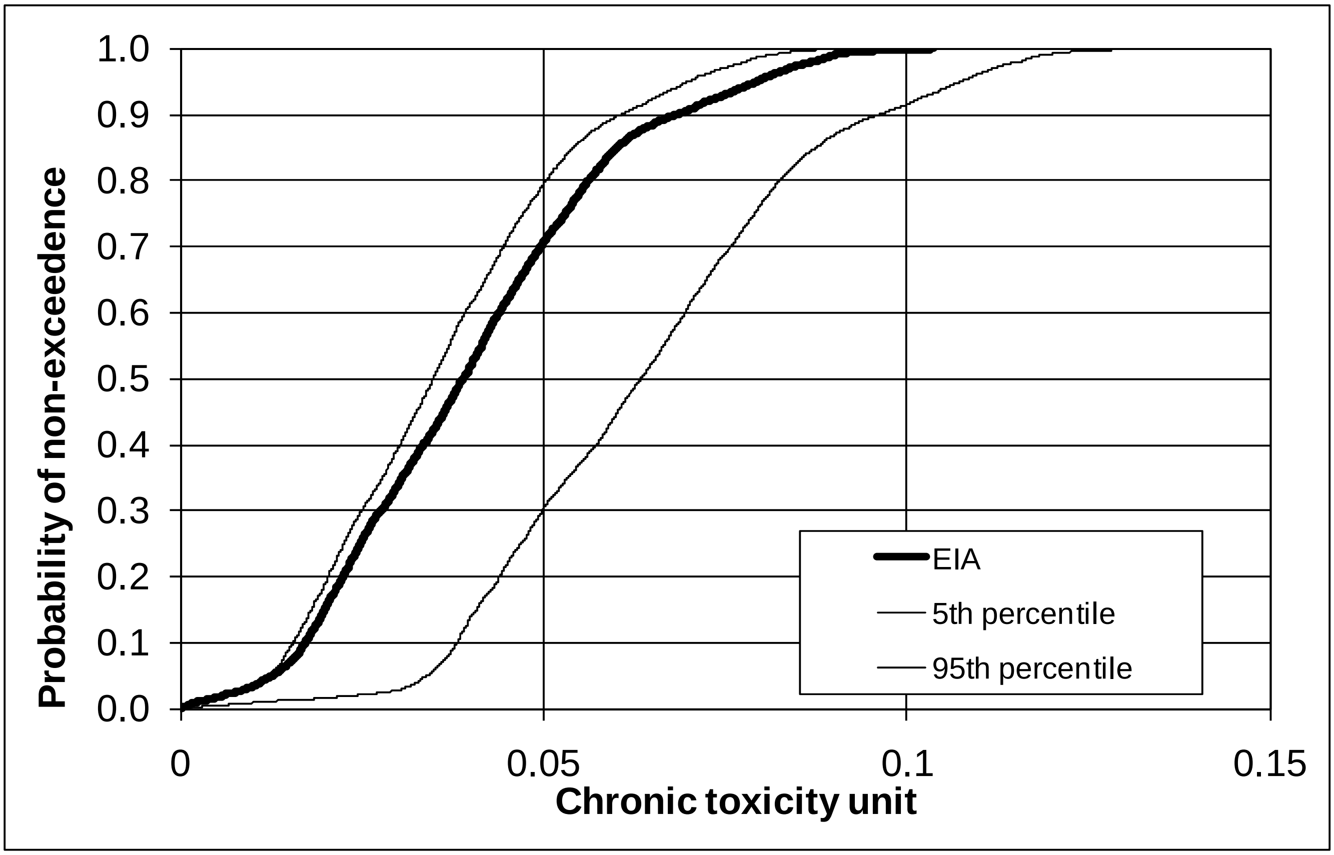


*Figure 9: Range of Frequency Distribution of Concentration Predictions*

### 4.4.2 Climate Change

Climate change predictions for typical climate periods and various regions across the world, including Canada and the Yukon, are presented in the report of the Intergovernmental Panel on Climate Change (IPCC, 2007). These are regional predictions and may be used for preliminary assessment during the feasibility phase of mining projects. As an example typical climate period predictions specific to the Yukon are also provided in the advice letter on assessing potential impacts of future climate change in Yukon Territory (EC, 2006). A copy of this letter is provided in Appendix C (this advice letter may be updated from time to time without notice). The assessment of the impact of climate changes on predictions of water quantity and quality involves running the water and mass balance model with scenarios of predicted future air temperature and precipitation.

An assessment of climate change impacts may also be incorporated in the water and mass balance model uncertainty analysis. Instead of using the historical climate conditions, the model would run input realisations that consider a future scenario of air temperature and precipitation. The consequent bands of water quantity and quality predictions can be compared with those obtained for uncertainty analyses completed with the historical climate, and/or with the expected average conditions (see Figure 10 as an example).

Similar to sensitivity and uncertainty analyses, conclusions on climate analysis should demonstrate a reasonable understanding of the changes effected by varying given model inputs and the interactions between the model inputs.

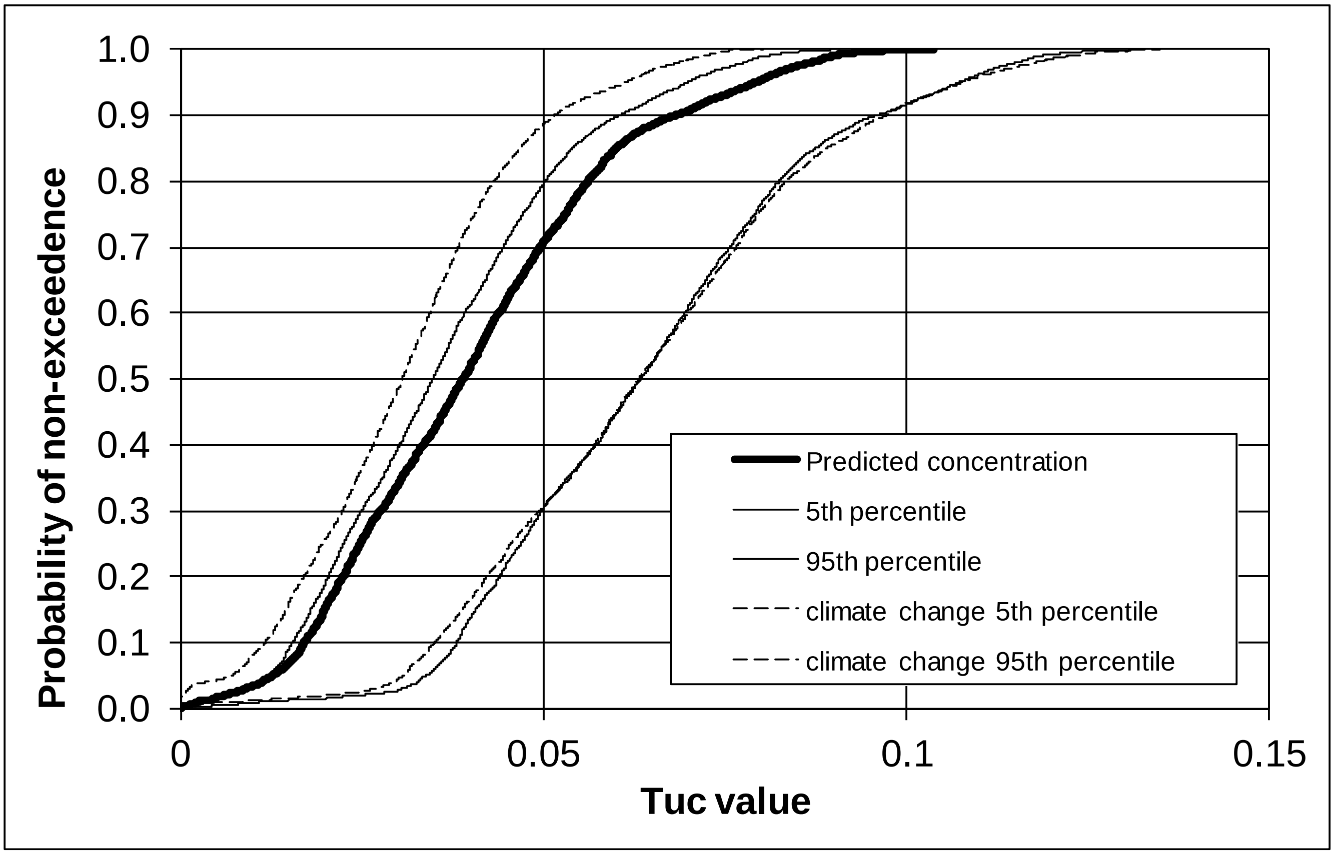


*Figure 10: Range of Frequency Distribution of Concentration Predictions Incorporating Climate Change Effects*

# 5.0 EXCEL-BASED DETERMINISTIC WATER AND MASS BALANCE MODEL

A simple deterministic water and mass balance model built on linked Excel spreadsheets may be adequate, along with sound engineering judgment, to provide a basic understanding of flows and effluent water quality over a given range of operating and climatic conditions. The Excel-based deterministic water and mass balance models accompanying this guidance document are meant to provide a generic template for the calculation of water movements within the mine development area and for the prediction of mine water chemical quality. The following sections provide instruction in the use of the model templates, including a brief summary of the model structure and operations. The model templates for mines with tailings facilities and mines with heap leach facilities are designed as much as possible using the same template, with some differences. The Introduction sheets of the Excel spreadsheet template, the water balance model description sheets, and the climate inputs parameter sheets are common to both templates (see Section 5.1). Subsequent sections diverge and are therefore described in sections 5.2 for tailings facilities and 5.3 for heap leach facilities. Appendix B and Appendix C presents illustrations of the model spreadsheets. The required model input information is indicated by orange shaded cells in the spreadsheets.

## 5.1 Model Templates Introduction, Description and Climate Inputs

### 5.1.1 Main Assumptions of the Excel Spreadsheet Model

The Excel spreadsheet model templates are based on very simplified assumptions and greater model complexity may be required to assess the performance of more elaborate water management systems and complex mining project conditions. Key assumptions in the development of the accompanying Excel-based monthly water and mass balance model include the following:

- Each sub-watershed pond is equipped with pumps or a discharge structure that can evacuate all of the monthly inflows (*i.e.,* there is no net accumulation/storage of water in the ponds);
- There are sufficient monthly inflows to satisfy all water demands on an infrastructure by infrastructure basis (the accompanying model will highlight the negative values when the inflows are insufficient); and
- Hydrologic productivity (*i.e.,* water quantity from a watershed) is characterized in the water and mass balance model by the runoff coefficients, which in turn are determined with the support of physical, climate and hydrologic and hydrogeologic inputs (Section 4).

**It remains the responsibility of the user to verify the validity of the model for their mine developments and to perform required adjustments to the model's structure and equations to satisfy the needs of their projects. Golder cannot be held responsible of any water balance model and/or model results produced by other users using the model template provided.**

The current structure of the model is primarily intended to demonstrate the integration of a mass balance with a water balance, and may be used as a preliminary assessment tool in estimating the required capacity of mine water management infrastructure at a given site. Adjustments to the structure and equations of the model will be required to incorporate site- and infrastructure-specific characteristics. These characteristics would allow refinement of the first key assumption presented above, and would notably include:

- The pumping capacity of all pump systems;
- The storage-elevation curves of all ponds and reservoirs at the mine site;
- The discharge-elevation curves of all outlets at the mine site; and
- Operational guidelines, such as minimum and maximum operating water levels of ponds and reservoirs, as well as physical constraints (*e.g.,* crest elevation) of these retention structures.

It is expected that these characteristics would be implemented and updated gradually as part of ongoing review and refinement of the model.

Addressing the second key assumption involves the implementation of conditional rules in the model structure to prevent water storages from producing negative volumes (*e.g.,* if the water elevation of the tailings pond is below the minimum operating level, then no water can be pumped from that pond to the mill in the model). These conditional rules would be built based on the storage- and discharge-elevation curves and operational guidelines that are specific to the components of the water management infrastructure planned for the mine site.

### 5.1.2 Introduction Sheets of the Excel Spreadsheet Model

Sheets 1 to 4 contain general information about the model and the mine site.

- Sheet 1 is the model cover sheet where basic project information is input by the user (*e.g.,* mine name, owner, location, ore mined, modelled mine year, etc.).
- Sheet 2 presents the Table of Contents (TOC) for the model. The TOC should be updated to reflect any changes made to the model.
- Sheet 3 presents a brief explanation of the project and site characteristics. The information entered in this sheet is meant to provide general background information for peers and regulators that are not necessarily familiar with the project. The information presented in sheet 3 is not used elsewhere in the model.
- Sheet 4 presents commonly used units, symbols and abbreviations. The user should update this sheet to reflect the units and symbols that are of importance for the mining project.

### 5.1.3 Water Balance Model Description

Sheets 5 to 9 describe the model philosophy, approach and set-up, in addition to providing a brief explanation of flows and assumptions related to the mine project.

- Sheet 5 provides information about the modelling philosophy and cautions users to keep the model as simple as practical and avoid building unnecessary sophistication that is not warranted. It also provides information regarding the simulation period covered.

- Sheet 6 provides information on how the model is set-up and the characteristics that typical deterministic water and mass balance models should have. The user should update this sheet to reflect any changes made to the model.
- Sheet 7 briefly explains the flows and assumptions used in the model. The user should update this sheet to reflect any changes made to the model. The information presented in this sheet is an essential component of any model documentation to facilitate model review by peers, regulators and other stakeholders involved in the project and regulatory review process.
- Sheets 8 and 9 present the water balance flow diagram and its associated list of flow components. Models should always include a conceptual water balance schematic and a list of flow components to facilitate model development and review. The user **must** update sheets 8 and 9 to reflect project specific conditions and settings.

### 5.1.4 Climate Input Parameters

Sheet 10 summarizes the precipitation, runoff and evaporation data used in the model. The user must update this sheet to reflect site precipitation, runoff and evaporation conditions. The monthly mean precipitation is required to generate an annual monthly distribution. The user can also enter an annual precipitation based on design criteria or the water management scenarios being assessed (*e.g.,* mean, wet or dry years). The selected annual precipitation will be distributed on a monthly basis based on the annual mean precipitation distribution. Runoff factors per catchment area are also required from the user. Additionally, monthly runoff expressed as a percentage of accumulation is required to account for winter snow accumulation. Similarly, the annual mean pan evaporation is required to generate the monthly evaporation distribution. The user must also select an annual evaporation amount (typically, mean, wet or dry years) that will be distributed on a monthly basis. A factor to convert pan evaporation to lake evaporation should be provided, when applicable. All assumptions must be well documented and referenced.

Completing the tables for short-term design storm events and annual long-term precipitation statistics is not essential to the model. However, the values in these two tables may be used when assessing water management scenarios and selecting an annual precipitation for flow modelling.

Developing a water and mass balance model using monthly precipitation is typically acceptable for the initial phases of the project (*i.e.,* exploration and feasibility). However, considering precipitation at a shorter time step (*e.g.,* daily) may subsequently be required for subsequent project phases. Using rainfall and rain-on-snow events of short durations (*i.e.,* 24 hours or less, depending on the watershed time of concentration) will be required for the detailed design of water management infrastructure.

## 5.2 Mines Operating Tailings Facilities

### 5.2.1 Operating Data & Flows Associated with Processing the Ore

Sheets 11 to 15 present the operating data and flows associated with processing of the ore. The planned production schedule over the mine life is entered in Sheet 11 (production schedule details). The production schedule may vary throughout the mine life depending on the mine operation. The schedule is meant to provide a mine life overview; however, the water balance model only considers one year at a time, and as a result the user must enter the production year to model in the production schedule summary table.

The mine year is defined in the Excel spreadsheet to match a hydrologic year, typically from October 1 to September 30 depending upon the local hydrologic conditions. While the spreadsheet is suited to model a period of one year in the life of the mine, using hydrologic years remains recommended if the spreadsheet is expanded to dynamically simulate the entire life of the mine in order to properly represent important natural processes such as the growth and depletion of the snowpack. If necessary, the operating data would be set to zero for the portion of the first hydrologic year when the mine is not yet active.

Operating data on the ore and tailings production, flows impacting the mill water balance, and other flows impacting the model are entered in Sheet 12.

No input of information is required in Sheets 13 to 15. Instead, these sheets use the information entered in Sheet 12 to estimate the process make-up freshwater requirements and losses at the mill, and to compute the operating data and flows associated with processing the ore. Specifically:

- Sheet 13 presents an estimation of the freshwater make-up required at the mill, as well as the water lost to evaporation and spillage at the mill;
- Sheet 14 calculates the operating data and flows associated with processing the ore using the calculations and formulas detailed within this sheet; and
- Sheet 15 presents the summary of the mill water balance and flows associated with processing the ore. The monthly flows presented in this sheet are used in subsequent model sheets for water and mass balance calculations.

### 5.2.2 Flows Associated with Runoff from Precipitation

Sheets 16 to 23 present the flows associated with runoff from precipitation. In Sheet 16, the user must input information on the watershed and sub-watershed areas for the mine site. These areas may change as the mine develops, and as such, Sheet 16 should be updated to reflect the planned catchment areas for the mine year being modelled. The information from Sheet 16 is used in subsequent model sheets to calculate runoff flows.

Sheets 17 to 23 present the flows, per sub-watershed, associated with runoff from precipitation for the flow components presented in the flow logic diagram (Sheet 8). No user input is necessary as these sheets perform calculations based on the input catchment areas from Sheet 16 and the precipitation inputs from Sheet 10.

### 5.2.3 Evaporation, Seepage and Miscellaneous Flows

Sheets 24 to 26 present the evaporation losses, the seepage flows and other flows. Sheet 24 calculates evaporation losses based on the input lake evaporation from Sheet 10 and the pond areas for each sub-watershed, as defined in Sheet 16. No input of information is required in Sheet 24.

Sheet 25 calculates seepage flows based on user input daily estimates, and the monthly seepage flows to and from each modelled pond is calculated. It is important to note that seepage flows reporting to the environment, under the definition of the MMER, are considered as final effluent discharges. As such seepage flows may require monitoring for flow rate and quality before being released to the environment.

Sheet 26 calculates other flows such as water for dust control, potable water and treated sewage, based on information from Sheet 12 and user inputs. The monthly distribution of the annual dust control water volume is required to be input on Sheet 26.

### 5.2.4 Water Balance – Modelled Flows

Sheets 27 to 35 present the modelled flows per sub-watershed. A summary of the monthly flows for each flow component of the sub-watershed presented in the flow logic diagram (Sheet 8) is presented on Sheets 27 to 33. Sheet 34 presents a summary of each modelled flows/losses on a monthly basis. Sheet 35 presents a summary of the key inputs that were used in the water balance model. No user input is required in Sheets 27 to 35.

### 5.2.5 Mass Balance – Effluent and Receiving Water Quality

Sheets 36 to 47 present the mass balance module. In Sheets 36 and 37, the user inputs the constituent concentrations associated with runoff, precipitation, discharge and seepage for each flow component presented in the flow logic diagram (Sheet 8).

Sheet 36 requires input of concentrations associated with mine flows, while Sheet 37 requires input for the receiving environment, upstream of each compliance point. The constituent concentration values entered in these sheets are used in Sheets 38 to 44 for mass loading calculations based on the flows computed in previous sheets.

Sheet 45 calculates the modelled water quality at the identified mine effluent discharge points. The water quality, expressed as a concentration, is based on the discharge load and associated flow rate calculated in previous sheets.

Sheet 46 presents the water quality criteria for the following:

- Metal Mining Effluents Regulations (EC, 2002);
- Canadian guidelines for the protection of aquatic life (CCME, 2007); and
- Canadian guidelines for drinking water (FPTCDW, 2008).

**It remains the responsibility of the user to verify that Sheet 46 uses the most up-to-date water quality criteria for their mine development.**

Sheet 47 presents the estimated water quality at select compliance points in the receiving environment based on the loadings associated with the mine effluent discharge, and the estimated loadings associated with the receiving environment upstream from the compliance point. The user is required to input the water quality criteria for each parameter of concern in the orange shaded cells based on the references provided in Sheet 47. The computed concentration of a parameter will be highlighted with a purple shade if and where it exceeds the selected water quality criteria.

## 5.3 Mines Operating with Heap Leach Facilities

### 5.3.1 Operating Data & Flows Associated with Processing the Ore

Sheets 11 to 17 present the operating data and flows associated with processing of the ore. The planned production schedule over the mine life is entered in Sheet 11 (production schedule details). The production schedule may vary throughout the mine life depending on the mine operation. The schedule is meant to provide a mine life overview; however, the water balance model only considers one year at a time, and as a result the user must enter the production year to model in the production schedule summary table.

The mine year is defined in the Excel spreadsheet to match a hydrologic year, typically from October 1 to September 30 depending upon the local hydrologic conditions. While the spreadsheet is suited to model a period of one year in the life of the mine, using hydrologic years remains recommended if the spreadsheet is expanded to dynamically simulate the entire life of the mine in order to properly represent important natural processes such as the growth and depletion of the snowpack. If necessary, the operating data would be set to zero for the portion of the first hydrologic year when the mine is not yet active.

Operating data on the heap's ore, flows impacting the process plants, and other flows impacting the model are entered in Sheet 12.

Operating data affecting the heaps solutions collection/application system are entered on sheet 14. The data includes irrigation rates and volumes of ore that will undergo water losses due to saturation, processes, and drain down from saturation to residual ore moisture content. The sheet is designed to provide maximum flexibility in accommodating both permanent and on-off heap leach systems.

No input of information is required in Sheets 13, 15 and 16. Instead, these sheets use the information entered in Sheet 12 to estimate the process make-up freshwater requirements and losses at the process plant, and to compute the operating data and flows associated with processing the ore. Specifically:

- Sheet 13 presents an estimation of the freshwater make-up required at the mill/process plant, as well as the water lost to evaporation and spillage at the mill;
- Sheet 15 calculates the operating data and flows associated with processing the ore using the calculations and formulas detailed within this sheet; and
- Sheet 16 presents the summary of the mill/process plant water balance and flows associated with processing the ore. The monthly flows presented in this sheet are used in subsequent model sheets for water and mass balance calculations.

### 5.3.2 Flows Associated with Runoff from Precipitation

Sheets 17 to 26 present the flows associated with runoff from precipitation. In Sheet 17, the user must input information on the watershed and sub-watershed areas for the mine site. These areas may change as the mine develops, and as such, Sheet 17 should be updated to reflect the planned catchment areas for the mine year being modelled. The information from Sheet 17 is used in subsequent model sheets to calculate runoff flows.

Sheets 18 to 26 present the flows, per sub-watershed, associated with runoff from precipitation for the flow components presented in the flow logic diagram (Sheet 8). No user input is necessary as these sheets perform calculations based on the input catchment areas from Sheet 17 and the precipitation inputs from Sheet 10.

### 5.3.3 Evaporation, Seepage and Miscellaneous Flows

Sheets 27 to 30 present the evaporation losses, the seepage flows and other flows. Sheet 27 calculates evaporation losses based on the input lake evaporation from Sheet 10 and the pond areas for each sub-watershed, as defined in Sheet 17. No input of information is required in Sheet 27.

Sheet 28 calculates seepage flows based on user input daily estimates, and the monthly seepage flows to and from each modelled pond is calculated. It is important to note that seepage flows reporting to the environment, under the definition of the MMER, are considered as final effluent discharges. As such seepage flows may require monitoring for flow rate and quality before being released to the environment.

Sheet 29 calculates other flows such as water for dust control, potable water and treated sewage, based on information from Sheet 12 and user inputs. The monthly distribution of the annual dust control water volume is required to be input on Sheet 29.

Sheet 30 calculates monthly distribution of the water volume and water losses from the heaps collection/application system based on the information from Sheet 12 and Sheet 14. No input of information is required in Sheets 30.

### 5.3.4 Water Balance – Modelled Flows

Sheets 31 to 42 present the modelled flows per sub-watershed. A summary of the monthly flows for each flow component of the sub-watershed presented in the flow logic diagram (Sheet 8) is presented on Sheets 31-40. Sheet 41 presents a summary of each modelled flows/losses on a monthly basis. Sheet 42 presents a summary of the key inputs that were used in the water balance model. No user input is required in Sheets 31 to 42.

### 5.3.5 Mass Balance – Effluent and Receiving Water Quality

Sheets 43 to 53 present the mass balance module. In Sheets 43 and 44, the user inputs the constituent concentrations associated with runoff, precipitation, discharge and seepage for each flow component presented in the flow logic diagram (Sheet 8).

Sheet 43 requires input of concentrations associated with mine flows, while Sheet 44 requires input for the receiving environment, upstream of each compliance point. The constituent concentration values entered in these sheets are used in Sheets 45 to 53 for mass loading calculations based on the flows computed in previous sheets.

Sheet 54 calculates the modelled water quality at the identified mine effluent discharge points. The water quality, expressed as a concentration, is based on the discharge load and associated flow rate calculated in previous sheets.

Sheet 55 presents the water quality criteria for the following:

- Metal Mining Effluents Regulations (EC, 2002);
- Canadian guidelines for the protection of aquatic life (CCME, 2007); and
- Canadian guidelines for drinking water (FPTCDW, 2008).

**It remains the responsibility of the user to verify that Sheet 55 uses the most up-to-date water quality criteria for their mine development.**

Sheet 56 presents the estimated water quality at select compliance points in the receiving environment based on the loadings associated with the mine effluent discharge, and the estimated loadings associated with the receiving environment upstream from the compliance point. The user is required to input the water quality criteria for each parameter of concern in the orange shaded cells based on the references provided in Sheet 47. The computed concentration of a parameter will be highlighted with a purple shade if and where it exceeds the selected water quality criteria.

# 6.0 GENERAL PURPOSE SIMULATORS FOR WATER AND MASS BALANCE MODELS

The spreadsheet-based deterministic model template presented in Section 5 may be limited in its flexibility to model the water and mass balance of a given mine development. Increased length of the simulation period and greater complexity of the water management infrastructure and operations may eventually lead to a spreadsheet -based model that becomes too onerous or cumbersome to operate effectively.

This section introduces select general purpose simulators that may be used as an alternative to spreadsheet-based deterministic water and mass balance models. Comparatively, these simulators tend to provide a more convivial user interface for model development and use more complex conditional operators (*e.g.,* if, or, and statements; probability distributions; etc.). Therefore, they are typically used to simulate and assess the performance of more elaborate water management systems.

## 6.1 Conceptualization of the Model Components

The water balance flow diagram with its flow components described in Section 5.2 is an essential component in the development of a water and mass balance model regardless of the modelling platform used. The development of such a flow diagram and associated description of flow components should be undertaken prior to using any general purpose simulator. This diagram will help identify the simulation building blocks needed to represent the water management infrastructure and operations of the mine.

## 6.2 Examples of Simulators

This section provides a summary of select commercially available simulators. Their description in this guidance document does not constitute an endorsement of these tools. Instead, the descriptions are intended to illustrate the typical capabilities that would be expected of any simulator.

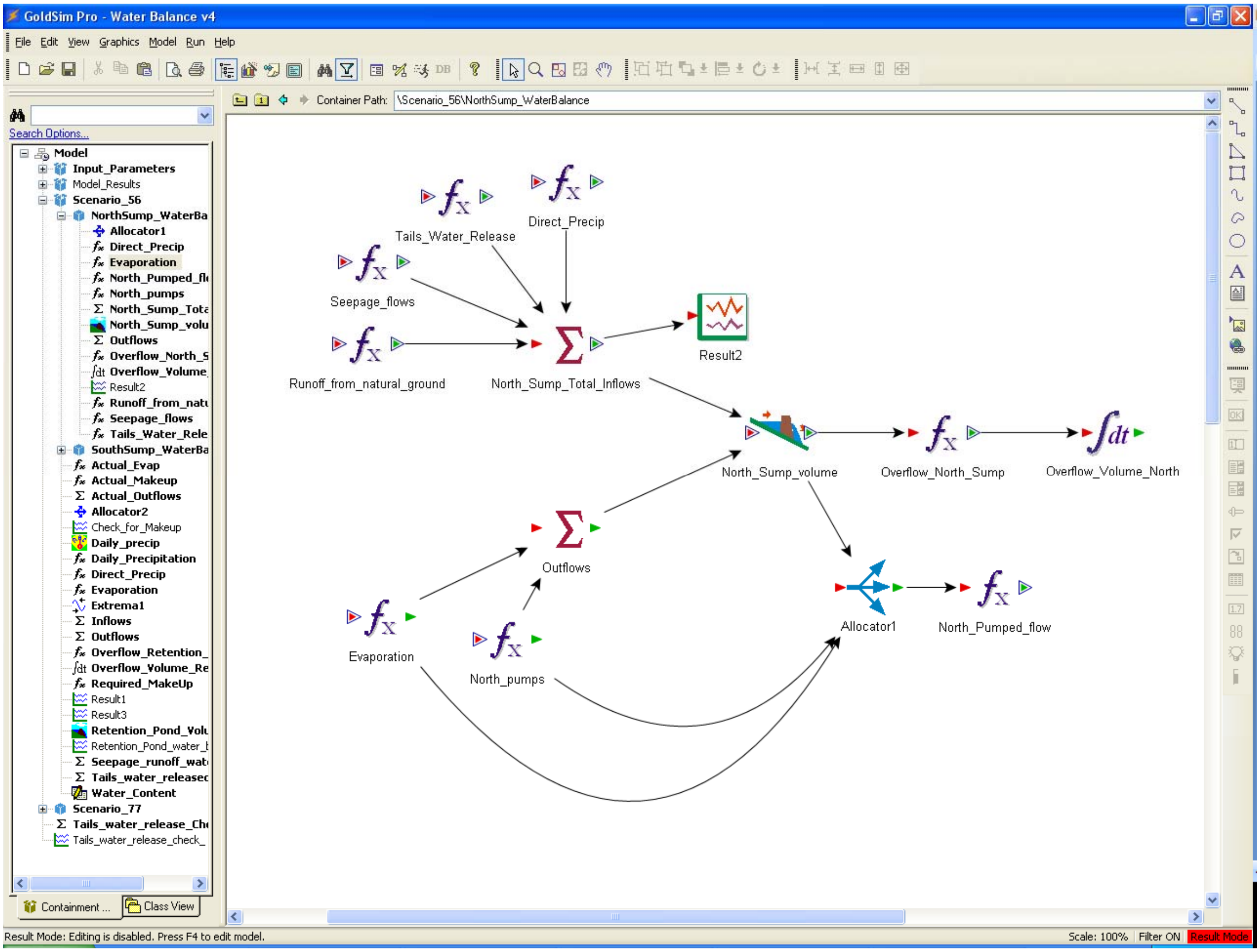
### 6.2.1 GoldSim

GoldSim is a general-purpose simulator that provides the features and flexibility to simulate the performance of all types of engineered systems. In particular, it is frequently used in the mining industry to substantiate water management alternatives, design key infrastructure components, assess the uncertainty underlying water management scenarios, perform sensitivity analyses, and to conduct mass balance water quality simulations. Figure 11 presents an example GoldSim user interface screenshot from a typical GoldSim water balance model.

The advantages of GoldSim over simple spreadsheet-based deterministic models include the following:

- GoldSim models can be developed to provide more graphical and intuitive representation of the water management processes and components;
- The ability to explicitly represent uncertainties in the water management systems;
- The capability to undertake both deterministic and probabilistic simulations with the same base model;

- The ability to incorporate water quality along with water quantity within the same model;
- The ability to vary the simulation period within the same base model;
- The flexibility in modelling varying time-dependent conditions (*e.g.,* mill throughput; process water sources; sump operations) throughout the mine life in the same base model; and
- The ability to interact with various external file formats (*e.g.,* Excel, Access, etc.).



Result Mode: Editing is disabled. Press F4 to edit model.

*Figure 11: Typical GoldSim User Interface Screenshot*

### 6.2.2 MATLAB Simulink

MATLAB is an object-oriented programming environment for scientific computing that 1) is typically used for modelling engineering systems; and 2) can perform computationally intensive simulations that require an extensive use of arrays, matrices and graphical analysis of data. Simulink is a general purpose simulator built to use MATLAB’s extensive libraries of functions. Simulink provides an interactive graphical user interface environment to model, simulate, and analyse dynamic systems, and test a variety of time-varying systems. Since Simulink is an integral part of MATLAB, it is easy to switch back and forth during the analysis process; thereby permitting the user to take advantage of features offered in both environments. Models in the Simulink environment are hierarchical. This provides the capacity to manage complex designs by segmenting models and using top-down approaches. Figure 12 presents an example MATLAB Simulink user interface screenshot for a systems model.

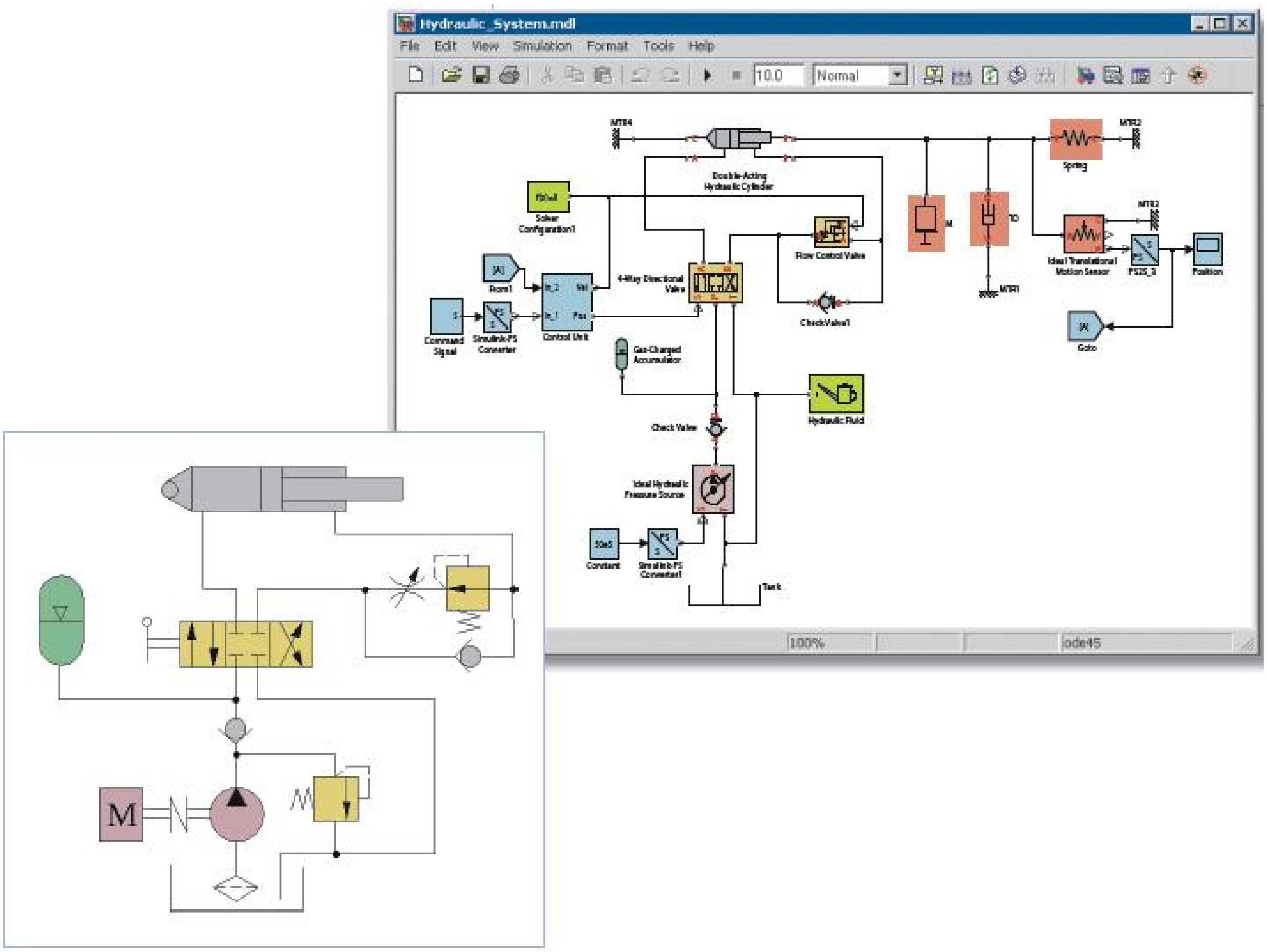


*Figure 12: Typical Simulink User Interface Screenshot (Hydraulic System)*

### 6.2.3 Stella

Stella is an intuitive icon-based graphical interface designed to simplify model building. The Stella modelling environment is designed to facilitate the mapping, modelling, simulation and communication of dynamic processes. Figure 13 presents an example Stella user interface screenshot, while the following summarizes select advantages of the Stella modelling environment in comparison to simple spreadsheet-based deterministic models:

- Ability to simulate a system over time;
- Model equations are automatically generated and easily accessible by the modeller;
- Provides the capacity to perform sensitivity analyses;
- Allows for models to run partially in order to focus the analysis on specific sectors, modules or model time frames;
- Clearly communicates system inputs and outputs and demonstrates outcomes; and
- Provides dynamic data import/export links to MS Excel.

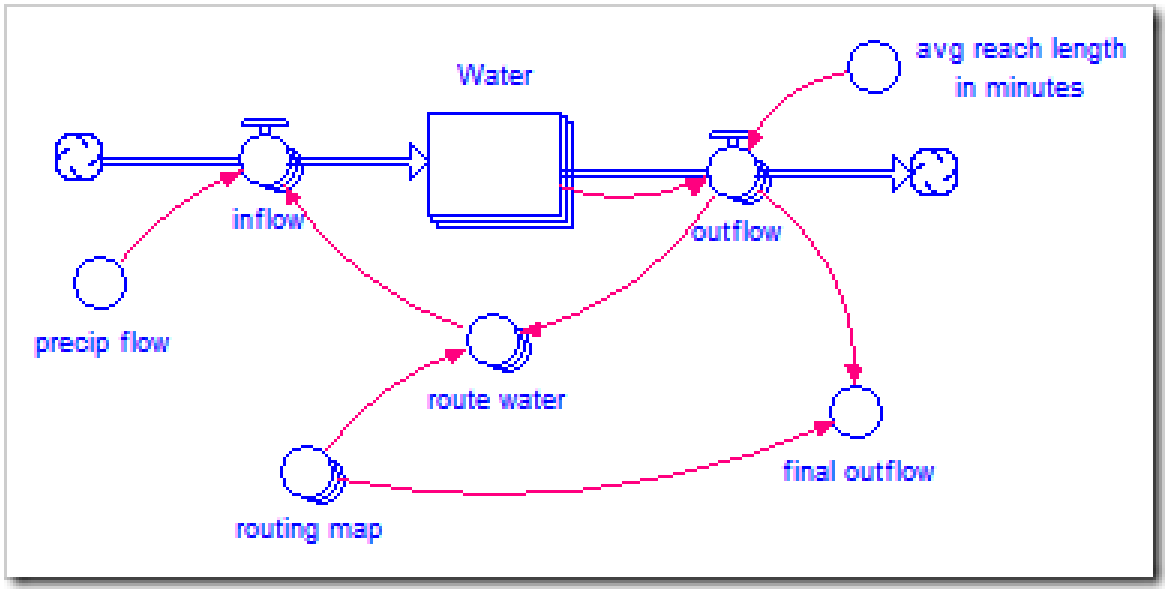


*Figure 13: Typical Stella User Interface Screenshot (Watershed Modelling)*

# 7.0 SPECIALISED WATER-RELATED MODELS

Predicting mine effluent flows and associated water quality in the receiving environment may require the use of specialised loading and receiving water models widely acknowledged by practitioners and tested by experts. Loading and receiving water models simulate the movement and transformation of pollutants through lakes, streams, rivers, estuaries, or near shore ocean areas (EPA, 1997). These models may also be required for components of the water management infrastructure (*i.e.,* large and deep tailings ponds and pit lakes) that may not easily be modelled in spreadsheet-based models or general purpose simulators.

This section presents a summary of select loading and receiving water models; however, the summary is **not** intended as an exhaustive list of available models. Further, the selection of the models presented in this document does not constitute an endorsement, but only a statement of their capability. The information presented below is based on the *Compendium of Tools for Watershed Assessment and TMDL Development* (EPA, 1997) and the WERF report on *Water Quality Models* (WERF, 2001).

Further details on available loading and receiving models, ecological assessment techniques and models, model selection criteria, and a model selection tool are provided in the above mentioned references.

## 7.1 Hydrologic and Water Quality Models

Hydrologic and water quality models are used to determine the quantity of pollutant loading delivered from a watershed land surface to a receiving water body (WERF, 2001). These models are also used to evaluate changes in pollutant quantity and quality that result from changes in land use. They also simulate the chemical and biological processes that occur within a water body system, based on external inputs and reactions.

The EPA (1997) compendium groups hydrologic and water quality models by how they address changes over time. Some models use steady-state formulations and others use dynamic (time-varying) formulations. Dynamic models allow for the detailed evaluation of time-varying inputs, such as non-point sources, and the examination of short- and long-term receiving water responses. However, they require a significant level of effort in order to prepare data input files; set up, calibrate, and validate the model; and process the output data.

The following provides a brief summary of typical steady-state and dynamic water quality models.

### *GWLF*

The Generalized Watershed Loading Functions (GWLF) model, developed at Cornell University, is typically used to evaluate the effect of various land management practices and land surface characteristics on downstream point and non-point loadings of sediment and nutrients. The model has comparatively low input requirements, and model results can be used to identify and rank pollution sources, and evaluate watershed management program alternatives and the impact of land uses (EPA, 1997). A significant limitation of GWLF is that it does not account for loadings of toxics and metals.

### *HSPF*

Hydrological Simulation Program – FORTRAN (HSPF) is a comprehensive modelling system for the simulation of watershed hydrology and water quality for point and nonpoint loadings, and is applicable to conventional and toxic organic pollutants. The model is frequently used in Total Maximum Daily Load (TDML) studies, and is available for free from the EPA website. The model uses time histories for precipitation, temperature, solar radiation, land surface characteristics and land management practices to simulate the processes that occur in a watershed. Water quality and quantity results are expressed as time histories and model predictions include flow rates, temperature, sediment loads, toxic pollutants, nutrients, and other constituent concentrations in the water column. A pre-processing database management and expert system for HSPF has been developed to support and process large amounts of simulation input and output.

## 7.2 Hydrodynamic Models

Hydrodynamic models are typically used to simulate circulation, transport, stratification and depositional processes within receiving water bodies such as reservoirs and controlled river systems. They provide the capacity to simulate flow controls from hydraulic structures and water movement in water bodies such as streams, lakes, tailings ponds, and pit lakes based on bathymetry and shoreline geometry. Model computation may also include physical processes such as tidal and wind effects, buoyancy forcing, turbulent momentum, and mass transport (EPA, 1997). Some hydrodynamic models can be externally coupled with water quality models, while others are internally coupled to water quality and toxic simulation programs.

The following provides a brief summary of three such models.

### *EFDC*

Environmental Fluid Dynamics Computer Code (EFDC) is a general purpose three-dimensional hydrodynamic numerical model. The EFDC model is typically used with the Water Quality Analysis Simulation Program (WASP; presented below). It can be applied to a wide range of boundary layer type environmental flows that can be regarded as vertically hydrostatic. The model has the capacity to simulate the following:

- Density and geometry induced circulation;
- Tidal and wind driven flows;
- Spatial and temporal distributions of salinity, temperature and sediment concentration;
- The wetting and drying of shallow areas;
- Hydraulic control structures; and
- Vegetation resistance for wetlands.

### WASP

The Water Quality Analysis Simulation Program (WASP) is a general-purpose modelling system that provides capacity to assess the fate and transport of conventional and toxic pollutants in surface water bodies. The modular nature of the program allows for user-written routines to be incorporated into the model structure. WASP can be applied to 1D, 2D and 3D problems and is designed for linkage with other hydrodynamic models, such as EFDC (presented above). The model includes modules for water quality/eutrophication and toxics characterization. Users are required to input information on geometry, advection and dispersive flows, settling and resuspension rates, boundary conditions, external loadings (point and nonpoint source), and initial conditions. The WASP modelling system has been used in a wide range of regulatory and water quality management applications for rivers, lakes, and estuaries (EPA, 1997).

### CE-QUAL-W2

CE-QUAL-W2 is a two-dimensional, laterally averaged, hydrodynamic and water quality model that is best applied to stratified water bodies like reservoirs and narrow estuaries, where large variations in lateral velocities and constituents do not occur. The water quality and hydrodynamic routines are directly coupled; however, the water quality routines may be updated less frequently than the hydrodynamic time step, which can reduce the computation burden for complex systems. The model simulates the interaction of physical factors such as flow and temperature regimes, chemical factors such as nutrients, and algal interactions. The constituents are arranged in four levels of complexity, permitting flexibility in the model application. The first level includes materials that are conservative and non-interactive, or do not affect other materials in the first level. The second level allows the user to simulate the interactive dynamics of oxygen-phytoplankton-nutrients, while the third level allows simulation of pH and carbonate species, and the fourth level allows simulation of total iron. The model has been widely applied to rivers, lakes reservoirs, and estuaries.

## 7.3 Effluent Mixing Models

Effluent mixing models assess contaminant mixing in the vicinity of a point-source effluent discharge. They can be used to model near field mixing characteristics of mine effluent released to a watercourse or water body through a surface outfall or a diffuser. The following provides a brief summary of two typical and commonly used effluent mixing models.

### CORMIX

The Cornell Mixing Zone Expert System (CORMIX) is a US EPA supported mixing zone model and decision support system for the environmental impact assessment of regulatory mixing zones resulting from continuous point source discharges. CORMIX emphasizes the role of boundary interaction to predict steady-state mixing behaviour. The model can be used to evaluate discharge compliance with regulatory constraints, and can account for non-conservative pollutants with first-order decay and wind effects on plume mixing. CORMIX also allows for the analysis of submerged single-point discharges, submerged multiport diffuser discharges, and buoyant surface discharges.

### *VP*

VISUAL PLUMES (VP) simulates single and multiple submerged aquatic plumes in arbitrarily stratified ambient flow. It can be used for modelling discharges in marine and fresh water, with multiple outfall types and configurations, and with buoyant and dense plumes. VP features conservative tidal background-pollutant build-up and sensitivity analysis capabilities. The model interface and manager allow preparation of common inputs for running two initial dilution (near-field) plume models. Two far-field algorithms are then automatically initiated beyond the zone of initial dilution. The near-field models are relatively sophisticated mathematical models for analyzing and predicting the initial dilution behaviour of aquatic plumes, while the far-field algorithms are relatively simple implementations of far-field dispersion equations.

# 8.0 CONCLUSION

This document provides guidance on the development of integrated water and mass balance models for mine development in Canada. The document is intended for government, industry and consultants in the mining sector and addresses various water resource components of the mine planning process to assist mine design and operations for the protection of the environment. An overview is given on the federal regulations applicable to environmental assessments related to the implementation of mine developments in the Canada. The document also provides a brief overview of the life cycle and water management related issues related to mining projects.

This guidance document provides a general description of inputs and outputs expected in the development of water and mass balance models for mining projects. Additional modelling considerations such as climate change, sensitivity and uncertainty analysis are also discussed. Two Excel-based deterministic water and mass balance models are provided with the guidance document as templates. Instructions in the use of the model template include a brief summary of the model structure and operations.

The model templates may be limited in their flexibility to model the water and mass balance of a particular mine development. Greater model complexity may be required to simulate and assess the performance of more elaborate water management systems and complex mining projects conditions. General purpose simulators may be used as an alternative to the accompanying Excel-based model template and are also briefly presented in this guidance document.

**It remains the responsibility of the user to verify the validity of the model for their mine developments and to perform required adjustments to the model's structure and equations to satisfy the needs of their projects. Golder cannot be held responsible of any water balance model and/or model results produced by other users using the model template provided.**

Predicting mine effluents flows and associated water quality in the receiving environment may require the use of specialised models widely acknowledged by practitioners and tested by experts. These models may also be required for components of the water management infrastructure (*i.e.,* large and deep tailings ponds and pit lakes) that may not be easily modelled in spreadsheet-based models or general purpose simulators. Examples of such specialised models are provided in this guidance document.

## 9.0 CLOSURE

We trust this report meets your current needs at this time. If you have any questions, feel free to contact the undersigned.

**GOLDER ASSOCIATES LTD.**

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|---|---|
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CDA (Canadian Dam Association). 2007. Dam Safety Guidelines. Canadian Dam Association, Moose Jaw, SK.

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EC (Environment Canada). 2009. Environmental Code of Practice for Metal Mines. Mining Section, Mining and Processing Division, Public and Resources Sectors Directorate, Environmental Stewardship Branch.

EPA (Environmental Protection Agency). 1991. Technical Support Document for Water Quality-Based Toxics Control. Report EPA505-2-90-001, Office of Water Enforcement and Permits, Office of Water Regulations and Standards, United States Environmental Protection Agency, Washington, DC.

EPA (Environmental Protection Agency). 1997. Compendium of Tools for Watershed Assessment and TMDL Development. Report EPA841-B-97-006, Office of Water, United States Environmental Protection Agency, Washington, DC.

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GYT (Government of Yukon Territory). 2003. Yukon Waters Act. Statutes of the Yukon, Chapter 19, assented on March 20.

Imperial (Imperial Oil Resources Ventures Limited). 2005. Kearl Oil Sands Project, Mine Development. Volume 1 to 9, submitted to Alberta Energy and Utilities Board and Alberta Environment, prepared by Imperial Oil Resources Ventures Limited in association with Golder Associates Ltd., Axys Environmental Consulting Ltd., Komex International Inc., and Nichols Applied Management, July 2005, Calgary, Alberta, Canada.

INAC (Indian and Northern Affairs Canada). 1992. Guidelines for Acid Rock Drainage Prediction in the North. Northern Mine Environment Neutral Drainage Studies No. 1.

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INAP (International Network for Acid Prevention). 2009. Global Acid Rock Drainage Guide (GARD Guide). Accessed from http://www.gardguide.com/.

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Shell (Shell Canada Limited). 2007. Jackpine Mine Expansion & Pierre River Mine Project Application and Environmental Impact Assessment. Volumes 1, 2, 3, 4 and 5, submitted to Alberta Energy and Utilities Board and Alberta Environment, December 2007, Calgary, AB, Canada.

Van Zyl. 1988. Introduction to Evaluation, Design and Operation of Precious Metal Heap Leach Projects. Society of mining engineers Inc

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TAC (Transportation Association of Canada). 2005. National Guide to Erosion and Sediment Control on Roadway Project. Ottawa, ON.

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YWB (Yukon Water Board). 2009. Licensing Guidelines for Type A Quartz Mining Undertakings. Yukon Water Board, May.

# APPENDIX A

## Annotated Bibliography

CCME (Canadian Council of Ministers of the Environment). 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Summary table. Updated December, 2007. In: Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg. *This document is a summary table of water quality guidelines for the protection of aquatic life in freshwater and marine environments. Guidelines are provided for a wide range of water quality constituents including for many typically assessed in the evaluation of mine effluent, such as metals and major ions. The document has been updated on a regular basis.*

CDA (Canadian Dam Association). 2007. Dam Safety Guidelines. Canadian Dam Association, Moose Jaw, SK. *This document provides principles and guidelines for the development of safety management, operation, maintenance and surveillance practices for dam structures. Recommendations are also given for the preparation of emergency preparedness protocols, undertaking of dam safety reviews, and completion of analyses and assessments related to dam construction. The document is typically used for the selection of design criteria for dams, including for dam infrastructure required in mining development.*

CDJ (Canadian Department of Justice). 1992. Canadian Environmental Assessment Act – Consolidation. *This Act is a federal statute that requires federal departments to conduct environmental assessments for prescribed projects and activities before providing federal approval or financial support. The Act defines the projects to be assessed, describes the assessment process to follow, and outlines the responsibilities of the federal authorities and project proponents during the assessment process.*

CDJ (Canadian Department of Justice). 2010. Fisheries Act – Consolidation. Current to January 2010. *The Act is a federal law that deals with three important subjects: 1) management and monitoring of fisheries; 2) conservation and protection of fish and fish habitat; and 3) pollution prevention. The main provisions intended to conserve and protect fish habitat and prevent pollution of fisheries waters are set out in Sections 34 to 43 of the act. Subsection 34(1) states that fish habitat means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes. Section 35, the main provision dealing with habitat protection states that: (1) no person shall carry out any work or undertaking that results in the harmful alteration, disruption or destruction (HADD) of fish habitat; and (2) no person shall contravene subsection (1) by causing the alteration, disruption or destruction of fish habitat by any means or under any conditions authorized by the Minister or under regulations made by the Governor in Council under this Act. Most projects that affect fish habitat are evaluated with reference to Section 35 of the act.*

CEPA. 1999. Canadian Environmental Protection Act. *The goal of the Act is to contribute to sustainable development (i.e., meets the needs of the present generation without compromising the ability of future generations to meet their own needs). The Act 1) makes pollution prevention the cornerstone of national efforts to reduce toxic substances in the environment; 2) sets out processes to assess the risks to the environment and human health posed by substances in commerce; 3) imposes timeframes for managing toxic substances; 4) provides a wide range of tools to manage toxic substances, other pollution and wastes; 5) ensures the most harmful substances are phased out or not released into the environment in any measurable quantity; 6) includes provisions to regulate vehicle, engine and equipment emissions; 7) strengthens enforcement of the Act and its regulations; 8) encourages greater citizen input into decision-making; and 9) allows for more effective cooperation and partnership with other governments and Aboriginal peoples.*

DFO (Department of Fisheries and Oceans Canada). 1993. Land Development Guidelines for the Protection of Aquatic Habitat. Compiled and edited by Barry Chilibeck, Department of Fisheries and Oceans Canada, and Geoff Chislett and Gary Nonis, Ministry of Environment, Lands and Parks, second printing, September 1993. *This document provides guidelines on erosion and sediment control measures and on design of water management infrastructure. The purpose of these guidelines is to protect fish populations and their habitat from the damaging effects of land developments, and may be applied for a broad range of development activities, including mining.*

EC (Environment Canada). 2002. Metal Mining Effluent Regulations. Annexed to the Fisheries Act, registration SOR/2002-222, published in the Canada Gazette Part II, Vol. 136, No. 13. *The metal mining effluent regulations (MMER) prescribe authorized concentration limits for deleterious substances in mine effluents that discharge to waters frequented by fish. The regulated parameters are arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids (TSS), Radium 226, and pH. The MMER apply to all Canadian metal mines (except placer mines) that exceeded an effluent flow rate of 50* $m^3$ *per day at any time after the Regulations were registered. Mines are defined as facilities where ore is mined or milled and include mines under development, new mines, and reopened mines. The MMER apply to effluent from all final discharge points (FDPs) at a mine site. An FDP is defined in the Regulations as a point beyond which the mine no longer exercises control over the quality of the effluent. The MMER also outlines requirements for effluent flow and chemical quality monitoring, and for environmental effect monitoring (EEM) studies.*

EC (Environment Canada). 2006. Advice on Assessing Potential Impacts of Future Climate Change on PMF and PMP in Yukon Territory, Canada. Letter from Paul H. Whitfield, Meteorological Service of Canada, Environment Canada, to Benoit Godin, Environment Canada, Whitehorse, Yukon, March 8. *This study focuses on how future climate change (temperature and precipitation) might be accounted for in determining the future probable maximum precipitation and flood (PMP and PMF) at a given location. Using Coupled Global Climate Models (CGCM) with grid boxes centering on locations of hydrometric stations in Yukon, maximum increases of temperature compared to the 1961-1990 baseline may vary from 4.4°C to 6.8°C by the end of this century, and maximum increases of precipitation from 5% to nearly 20%, depending on the watershed location in the territory. Maximum increases of precipitation and temperature show a clear spatial pattern in Yukon, with greatest potential increases occurring in the north, and the least in the south. These findings may have important implications to determining PMP and PMF in the Yukon.*

EC (Environment Canada). 2009. Environmental Code of Practice for Metal Mines. Mining Section, Mining and Processing Division, Public and Resources Sectors Directorate, Environmental Stewardship Branch. *This document describes operational activities and associated environmental concerns for the mining sector. The document applies to the complete life cycle of mining, and environmental management practices are recommended to mitigate the identified environmental concerns. Recommended practices include the development and implementation of environmental management tools, the management of wastewater and mining wastes, and the prevention and control of environmental releases to air, water and land.*

EPA (Environmental Protection Agency). 1991. Technical Support Document for Water Quality-Based Toxics Control. Report EPA505-2-90-001, Office of Water Enforcement and Permits, Office of Water Regulations and Standards, United States Environmental Protection Agency, Washington, DC. *This document provides guidance on procedures for use in the water quality-based control of toxic pollutants, and presents recommendations to regulatory authorities faced with the task of controlling the point source discharge of toxic pollutants. In particular, the document provides a statistical methodology for the characterisation of water quality samples, including the fitting of probability distributions on constituent concentrations obtained from these samples.*

EPA (Environmental Protection Agency). 1997. Compendium of Tools for Watershed Assessment and TMDL Development. Report EPA841-B-97-006, Office of Water, United States Environmental Protection Agency, Washington, DC. *This document provides summaries on various hydrodynamics, water quality and mixing zone models, which may be of use for the prediction of constituent concentrations in streams and water bodies. Recommendations on model selection and application are also provided. The document is similar in content to WERF (2001).*

FPTCDW (Federal-Provincial-Territorial Committee on Drinking Water). 2008. Guidelines for Canadian Drinking Water Quality Summary Table. Federal-Provincial-Territorial Committee on Health and the Environment, Health Canada, May. *This document is a summary table of drinking water quality guidelines for the protection of human health. Guidelines are provided for a wide range of water quality constituents including for many typically assessed in the evaluation of mine effluent, such as metals and major ions. This document is updated on a regular basis.*

GYT (Government of Yukon Territory). 2003. Yukon Waters Act. Statutes of the Yukon, Chapter 19, assented on March 20. *This Act regulates the use of water in the Yukon Territory. The Act notably includes the prohibition of waste deposition, outlines the process of water licensing and defines the role of the Yukon Water Board.*

Imperial (Imperial Oil Resources Ventures Limited). 2005. Kearl Oil Sands Project, Mine Development. *This document compiles the environmental impact assessment completed for the Kearl Oils Sands Project in the Athabasca oil sands region of Alberta. This assessment uses a modelling option where water quality constituent concentrations are predicted for selected periods of the mine life, using long time series of randomly generated concentrations for source waters.*

INAC (Indian and Northern Affairs Canada). 1992. Guidelines for Acid Rock Drainage Prediction in the North. Northern Mine Environment Neutral Drainage Studies No. 1. *This document provides a set of guidelines for the prediction of acid rock drainage (ARD) in northern Canada. The objectives of this document are: 1) to provide a brief summary of the processes which control ARD; 2) to identify aspects of the northern climate, geology, topography and mining practices affecting ARD in the north; 3) to describe key technical aspects of prediction testing and interpretation of results; and 4) to present guidelines for sampling and ARD prediction testing programs specific to northern conditions.*

INAC (Indian and Northern Affairs Canada). 1993. Umbrella Final Agreement – Council for Yukon Indians. Agreement between the Government of Canada, the Council for Yukon Indians and the Government of Yukon, signed in Whitehorse, May 29. *This Agreement is a political or policy document between the Government of Canada, Government of Yukon and Yukon First Nations as represented by the Council of*

*Yukon First Nations (CYFN). The Agreement is a common template for negotiating First Nation Final Agreements. It is important to note that the Umbrella Final Agreement, on its own, is not a legally enforceable document because all of its provisions are contained in each First Nation Final Agreement; however, these provisions have lawful effect.*

INAC (Indian and Northern Affairs Canada). 2005. Yukon Environmental and Socio-Economic Assessment Act. Registration SOR/2005-379, published in the Canada Gazette Part II, Vol. 139, No. 25. *The purposes of the act are to: 1) provide a comprehensive, neutrally conducted assessment process applicable in Yukon; 2) require that, before projects are undertaken, their environmental and socio-economic effects are considered; 3) protect and maintain environmental quality and heritage resources; 4) protect and promote the well-being of Yukon Indian persons, their societies and Yukon residents generally, as well as the interests of other Canadians; 5) ensure that projects are undertaken in accordance with principles that foster beneficial socio-economic change without undermining the ecological and social systems on which communities, their residents, and societies in general, depend; 6) recognize and, to the extent practicable, enhance the traditional economy of Yukon Indian persons and their special relationship with the wilderness environment; 7) guarantee opportunities for the participation of Yukon Indian persons and make use of their knowledge and experience in the assessment process; 8) provide opportunities for public participation in the assessment process; 9) ensure that the assessment process is conducted in a timely, efficient and effective manner that avoids duplication; and 10) provide certainty to the extent practicable with respect to assessment procedures, including information requirements, time limits and costs to participants.*

IPCC (Intergovernmental Panel on Climate Change). 2007. Regional Climate Projections. By Christensen, J. H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magana Rueda, L. Mearns, C.G. Menéndez, J. Raiasanen, A. Rinke, A. Sarr and P. Whetton. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H. L. Miller (eds).]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. *This document summarizes predictions of potential changes in temperatures and precipitation for typical climate periods and for large regions covering all landmasses of the world.*

MAC (Mining Association of Canada). 1998. A Guide to the Management of Tailings Facilities. Ottawa, ON, September. *This Guide presents a framework to manage tailings facilities in a safe and environmentally responsible manner through the full life cycle of the mine components: from site selection and design, through construction and operation, to eventual decommissioning and closure. The guide is meant to be adapted to specific sites, individual company policies and local regulatory and community requirements.*

MAC (Mining Association of Canada). 2005. Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities. Ottawa, ON, December. *This document serves as a guide to the preparation of operation, maintenance and surveillance (OMS) manuals for tailings and water management facilities, as a component of an overall site management framework. The document recommends rationale, organization and contents for an OMS manual, and describes procedures that should be addressed.*

Price, W.A. 1997. Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia. British Columbia Ministry of Employment and Investment, Energy and Minerals Division. *These guidelines outline the common questions relating to each phase of acid rock drainage (ARD) and metal leaching (ML) predictions, and discuss the materials and methods appropriate to each phase. Items addressed in the guidelines are: 1) basic understanding of mining, geology, weathering and environmental chemistry; 2) selection of test materials and methods; 3) interpretation of test results; 4) understanding of the limitations and potential flaws in test procedures; 5) adequate sampling characterisation; and 6) consistency in test procedures.*

Price, W.A. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. Work performed for MEND Program, by CANMET – Mining and Mineral Sciences Laboratories, Natural Resources Canada, Smithers, BC. *The objective of this manual is to provide guidance on how to characterize existing drainage chemistry and to predict future drainage chemistry with sufficient accuracy to prevent significant environmental impacts. The manual discusses procedures to follow and factors to consider in planning programs, collecting samples, selecting test materials, conducting static and kinetic tests, presenting data and interpreting the results.*

Price, W.A. and J.C. Errington. 1998. Guidelines for Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia. British Columbia Ministry of Energy and Mines. *This document is a complement to Price (1997) and is intended to describe generic requirements and outline common errors, omissions and constraints related to the assessment of acid rock drainage (ARD) and metal leaching (ML).*

Shell (Shell Canada Limited). 2005. Muskeg River Mine Expansion Project Application and Environmental Impact Assessment. *This document compiles the environmental impact assessment completed for the Muskeg River Mine Expansion Project in the Athabasca oil sands region of Alberta. This assessment uses a modelling option where water quality constituent concentrations are predicted for selected periods of the mine life, using long time series of randomly generated concentrations for source waters.*

Shell (Shell Canada Limited). 2007. Jackpine Mine Expansion & Pierre River Mine Project Application and Environmental Impact Assessment. *This document compiles the environmental impact assessment completed for the Kackpine Mine Expansion and Pierre River Mine Project in the Athabasca oil sands region of Alberta. This assessment uses a modelling option where water quality constituent concentrations are predicted for selected periods of the mine life, using long time series of randomly generated concentrations for source waters.*

Suncor (Suncor Energy Inc.). 2005. Voyageur Project Application and Environmental Impact Assessment. *This document compiles the environmental impact assessment completed for the Voyageur Project in the Athabasca oil sands region of Alberta. This assessment uses a modelling option where water quality constituent concentrations are predicted for selected periods of the mine life, using long time series of randomly generated concentrations for source waters.*

TAC (Transportation Association of Canada). 2005. National Guide to Erosion and Sediment Control on Roadway Projects. Ottawa, ON. *This Guide is intended to assist in assessing project risks, defining appropriate levels of effort and specifying proper erosion and sediment control measures to cost-effectively protect the environment for the life of the project while meeting legislative and regulatory requirements.*

WERF (Water Environment Research Foundation). 2001. Water Quality Models: A Survey and Assessment. Project 99-WSM-5, Water Environment Research Foundation, Alexandria, VA, USA. *This document provides summaries on various hydrodynamic and water quality models, which may be used for the prediction of constituent concentrations in streams and water bodies. Recommendations on model selection and application are also provided. The document is similar in content to EPA (1997).*

YWB (Yukon Water Board). 2009. Licensing Guidelines for Type A Quartz Mining Undertakings. Yukon Water Board, May. *The purpose of these Guidelines is to publicize the criteria for the Board's deliberations regarding the licensing of Type A Quartz Mining Undertakings and to clarify the Board's expectations on such applications. The Guidelines are intended to set out a framework of principles and policies that the Board can apply in its licensing deliberations. The document states that the Board may deviate from or supplement the Guidelines, and may require specific licence conditions for particular undertakings, on a case-by-case basis.*

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# APPENDIX B

## Input and Output Sheets of the Excel-Based Water and Mass Balance Model for Tailings Facilities

For Discussion Purposes Only

# Guidance Document - Template
# Water and Mass Balance Model

## Operating Data & Site Deterministic Flow and Water Quality Model for Mine Development

**Golder cannot be held responsible of any water and mass balance results produced by others with this model template. It remains the responsibility of the user to verify the validity of the model for their mine development(s) and to perform required adjustments to the model's structure and equations to satisfy the needs of their specific project(s).**

| | |
|---|---|
| Mine | Enter mine name here |
| Owner(s) | Enter owner(s) name here |
| Operator | Enter operator's name here |
| Location | Enter mine location here |
| Product | Enter ore mined here |
| Revision # | Enter revision number here (*e.g.* , Rev. 1) |
| Date | Enter date here |
| Level of study | Enter level of study here (*e.g.* , feasibility, detail design) |
| Modeled Mine Year | Enter the modelled mine year here |
| Project # or Name | Enter project number here |

Orange shaded cells require data input from the user. Relevant data is automatically transferred to other sheets.

**Golder Associates**

# Sheet 2
# Table of Contents

**Update this page to reflect the model organization**

# Sheet 3

# Project & Site Characteristics

(brief explanations)

**Example**

| **Background** | |
|---|---|
| Mine | Enter mine name here |
| Location | Enter mine location here |
| Product | Enter ore mined here |
| Revision # | Enter revision number here (e.g., Rev. 1) |
| Date | Enter date here |
| Project # | Enter project number here |

| **Project** | |
|---|---|
| Type of mine | Open pit and/or underground |
| Type of ore body | Enter type of ore body here |
| Ore reserve | Enter ore reserve here |
| Production rate | Enter estimated production rate here |
| Extraction process | Enter extraction process here |
| Geochemistry issues | Enter known geochemistry issues here |

| **Site** | |
|---|---|
| Elevation | Enter approximate site elevation here |
| Topography | Enter general topography description here |
| Vegetation | Enter general vegetation description here |
| Precipitation (mean annual) | Enter mean annual precipitation here |
| Evaporation (mean - pan or lake) | Enter mean evaporation here; clarify if pan or lake |
| Temperature range | Enter average temperature range here |
| Bedrock geology | Enter brief bedrock geology description here |
| Surficial geology | Enter brief surficial geology description here |
| Seismic risk (high, medium, low) | Enter seismic risk here |
| Watersheds | Enter total watershed area here |
| Receiving watershed | Enter name of receiving watershed here |
| Local population | Enter approximate local population number here |
| Downstream user requirements | Enter downstream user requirements here |
| Social constraints | Enter brief description of social constraints here |
| Archaeological constraints | Enter brief description of archaelogical constraints here |
| Environmental constraints | Enter brief description of environmental constraints here |

**Note:**
1. Input from the user is **suggested** in the orange shaded cells on this sheet.
2. Information presented in this sheet is for **user information only** and is not used elsewhere in the model.

# Sheet 4

# Commonly Used Units, Symbols and Abbreviations

## FACTORS

| | |
|---|---|
| G | giga *(billion $10^9$)* |
| M | mega *(million $10^6$)* |
| k | kilo *(thousand $10^3$)* |
| c | centi *(hundredth $10^{-2}$)* |
| m | milli *(thousandth $10^{-3}$)* |
| µ | micro *(millionth $10^{-6}$)* |

## LENGTH

| | |
|---|---|
| m | metre *(basic unit)* |
| km | kilometre (*1,000 m)* |
| cm | centimetre *(1/100 m)* |
| mm | millimetre *(1/1,000 m)* |
| µm or µ | micrometre *(1/1,000,000 m)* |

## VOLUME

| | |
|---|---|
| V | volume *($V_v$ - voids, $V_s$ - solids, $V_w$ - water, $V_t$ - total)* |
| L | Litre *(1,000 $cm^3$)* |
| $m^3$ | cubic metre |
| $cm^3$ | cubic centimetre |
| gal | gallon *(US or imperial as stated)* |
| M-$m^3$ | million cubic metres |

## MASS ***(Note 1)***

| | |
|---|---|
| g of gm | gram *("g" is also used for acceleration due to gravity)* |
| kg | kilogram *(1,000 g - basic unit)* |
| t | ton *(1,000 kg - metric unless otherwise stated)* |

## TIME

| | |
|---|---|
| sec or s | second *(basic unit)* |
| min | minute |
| hr or h | hour |
| mo | month |
| y or yr | year |

## AREA

| | |
|---|---|
| ha | hectare *(10,000 $m^2$)* |
| $km^2$ | square kilometre *(1,000,000 $m^2$)* |
| $m^2$ | square meter |
| $cm^2$ | square centimetre |

## SOIL (TAILINGS) PROPERTIES

| | |
|---|---|
| e | void ratio *(volume voids / volume solids)* |
| n | porosity *(volume voids / total volume)* |
| $\omega$ | water content by solids mass *(mass water / mass dry solids - **Note 2**)* |
| $\omega_t$ | water content by total mass *(mass water / total mass - **Note 2**)* |
| $\omega_v$ | water content by total volume *(volume water / total volume)* |
| S or $C_w$ | slurry density *(mass solids / total mass - **Note 3**)* |
| $C_v$ | solids content by total volume *(volume solids / total volume - **Note 3**)* |
| s | degree of saturation *(volume water / volume voids)* |
| $\rho$ | density *(mass / unit volume - **Note 4**)* |
| $\rho_s$ | density of solid particles *(mass solids / volume of solids)* |
| $\rho_d$ | dry density *(dry mass solids / total volume)* |
| $\rho_t$ | total or bulk density *(total mass / total volume)* |
| $\rho_w$ | density of water (liquor, supernatant) *(mass water / volume water)* |
| $\rho'$ | bouyant density ($\rho_{t\,(saturated)} - \rho_w$) |
| $G_s$ | specific gravity of solid particles ($\rho_s / \rho_w$) ***(Note 5)*** |
| $\sigma$ | pressure of stress |

## NOTES:

1 "Mass" and "Weight" are often incorrectly interchanged. Mass (or inertia) is a constant of an object irregardless of where it is in the universe. It is a measure of the amount of matter that an object contains and it controls the response of an object to an applied force. Weight is the gravitational force that causes a downward acceleration. This is Newton's second law (F=Ma) where Weight = mass x g (acceleration due to gravity).

2 In soil mechanics water content "$\omega$" is expressed as a percentage of the mass of water to the dry mass of solids. In process engineering water content "$\omega_t$" is normally expressed as the mass of water over the total mass (solids plus water).

3 In pumping terminology the symbol for slurry density is "$C_w$" and solids content by volume is "$C_v$"

4 "Unit Weight" is often incorrectly used instead of "density". An older symbol for density (in imperial units) was "γ" which is now reserved for unit weight.

5 The density of water ($\rho_w$) in the metric system is unity, therefore "$G_s$" of the solid particles and "$\rho_s$" have the same value.

6 The mass balance module assumes mass conservation. For non-conservative parameters, the use of thermodynamic equilibrium software, such as PHREEQC, is recommended.

# Sheet 5

# Modelling Philosophy

Water Management is an essential component of mining as water must be controlled to gain access to the mine workings and is typically required in ore extraction processes. The quantity and chemical quality of released mine effluents must also be managed since this source of water may have an impact on the receiving environment and downstream water users. The precipitation and process flows have to pass through a disposal facility over the entire life of a mine. The challenge is to allow this to safely happen over a wide range of climatic and operating conditions in a facility that is continuously growing and expanding.

Water and mass balance models are decision support tools for mining projects and are intended to assist operators with mine site water management, and regulators with the assessment of regulatory compliance. Models are frequently used in the mining industry to substantiate water management alternatives and key infrastructure components, and to assess the uncertainty underlying current and future water management scenarios. They allow assessment of several mine plan options, and evaluate environmental impacts over the mine life and assess cumulative effects and risks over time.

A simple deterministic water and mass balance model built on linked Excel spreadsheets, along with sound engineering judgment, may be adequate to provide a basic understanding of flows and effluent water quality over a given range of operating and climatic conditions. This deterministic water and mass balance model is meant to summarize the components required for the calculation of water movements within the mine development area, and be used for the prediction of mine water chemical quality. The model is based on simplified assumptions and greater model complexity may be required to assess the performance of more elaborate water management systems and complex mining projects conditions.

Ultimately, simulation software (*e.g.* , GoldSim or other) should be used to develop dynamic flow models and predict long term contaminant loadings and environmental performance over the entire life of a mine using precedent precipitation data. The water chemistry parameters, contaminant loadings and rates of contaminant decay can be input into such models.

The use of a spreadsheet-based deterministic model may limit the flexibility to model the water and mass balance of a mine development. Increased length of the simulation period and greater complexity of the water management infrastructure and operations will eventually lead to a spreadsheet -based model that becomes too onerous to operate. General purpose simulators may be used as replacements to spreadsheet-based deterministic water and mass balance models. Refer to the Guidance document for more information on limitations of spreadsheet-based deterministic models and a discussion on general purpose simulators and more complex loading and receiving water models.

# Sheet 6

# Model Set-up

**APPROACH**

As is discussed on the previous sheet, a deterministic water and mass balance model is a predictive tool that is used to predict flows, mass loadings and/or concentrations, and to develop a water management plan over a wide range of operating and climatic conditions for a mine site that is continuously growing and expanding over a period of many years. Care must be taken not to build sophistication into the model that is not warranted. The model should be a living tool that can evolve as the mine develops. A suitable deterministic water and mass balance model should have the following characteristics:

- Simple to use with easily recognizable input data;
- Transparent (easy to understand, scrutinize, and criticize - any flow can be easily checked);
- Easy to vary the model input data to represent changes in the mine operations;
- Able to carry out sensitivity analyses to determine the significance of various flows; and,
- Capable of being used by designers, operating personnel and regulators during the design and operating life of the mine

**NOTES**

- The model is essentially a collection of the data that is required to develop the water management plan for a potential mine site.
- This flow model template is developed using linked Excel spreadsheets. Input data are only required in the orange shaded cells. The calculations are automatically carried out and linked to the relevant cells on other sheets.
- Sheet 7 decsribed the flows and assumptions used in the model. The user should update this sheet to reflect any changes made to the model.
- Sheets 8 and 9 present the water balance flow diagram and its associated list of flow components. The user must update sheets 8 and 9 to reflect project specific conditions and settings.
- Precipitation, runoff and evaporation data are input on Sheet 10. The data on this sheet can be easily manipulated to model the impact of varying climatic conditions.
- The production schedule information is required on Sheet 11 so that flow predictions can be made as the mine develops. However, this flow model template was developed to only consider 1 mine year at a time.
- Some input parameters are required for the calculation of flows associated with the processing of the ore. These are listed on Sheet 12 entitled "Operating Data". In addition any miscellaneous flows that could impact water management on site must be provided on this sheet.
- The basic tailings and waste rock properties should be understood. Sheet 12 in the model template is where the basic properties can be summarized.
- If the fresh make-up water that is required in the mill, and the losses in the mill to evaporation and spillage are not provided, they can be simply estimated by assuming them as a percentage of the total flow through the mill and then calculating the volume of water per ton of ore milled on Sheet 13 entitled "Estimation of Fresh Process Make-up Water Required in the Mill & Losses to Evaporation and Spillage in the Mill".
- The calculated (derived) data and monthly flows associated with the processing of the ore are automatically calculated on the Sheet 14 entitled "Calculated Operating Data & Flows Associated with Processing the Ore".
- The user must input information on the watershed and sub-watershed areas for the mine site in Sheet 16. This information is used in subsequent model sheets to calculate runoff flows.
- Sheet 46 presents reference water quality criteria from the Metal Mining Effluents Regulations (EC, 2002), Canadian guidelines for the protection of aquatic life (CCME, 2007), and Canadian guidelines for drinking water (FPTCDW, 2008).
- The remaining sheets are the actual water and mass balance model computations and results including Sheets 17 to 23 "Flows Associated with Runoff from Precipitation", Sheet 24 "Evaporation Losses", Sheet 25 "Seepage Flows", Sheet 26 "Miscellaneous Flows", Sheets 27 to 33 "Accumulated Flows", Sheet 34 "Summary of Flows", Sheet 35 "Summary of Key Input Data Used in this Model Run", and Sheets 38 to 44 "Computed Loads". Sheets 45 and 47 present the estimated effluent concentrations and water quality at the compliance points, respectively.

# Sheet 7
# Explanation of Flows & Assumptions Used in the Model

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

1 Each sub-watershed pond is equipped with pumps or a discharge structure that can evacuate, on a monthly basis, all of the monthly inflows (*i.e.,* there is no net accumulation in the ponds on a monthly basis).

2 The collection ponds are all operated empty so that storm events or the total spring runoff can be safely collected, monitored and treated, if required, before being discharged to the environment.

3 It is assumed that the site is located in the northern hemisphere with a cold winter climate that has no runoff in the months from December to March (*i.e.* , the monthly runoff is accumulated for release during the following freshet), 50% of computed monthly runoff is released in November and April (*i.e.* , the remainder is accumulated for release during the following freshet), and 100% is released in all the other months (this assumption needs to be updated by the user, based on site conditions).

4 The collection ponds are operated empty so that storm events or the total spring runoff can be safely collected, monitored and treated, if required, before being discharged to the environment.

5 The model covers an entire year to summarize flows on an annual basis, with the staring month to be defined by the user (typically the period extend from October to September).

6 The model must start in a month with 100% of runoff - not a month when freezing results in partial or zero runoff.

7 Mine development years should be defined on the same period as the model years (*i.e.,* based on a hydrologic year), or a calendar should be developed and inserted in the model depicting the relationship between the hydologic and mine years.

8 The mill site and camp are located in the same collecting watershed.

9 The water that collects in the open pit, the tailings facility and the waste rock dump is discharged (pumped) to the collection pond in the water treatment plant watershed. This model does not consider the presence of a water treatment plant (this assumption needs to be updated by the user).

10 It is assumed that water demands, primarily at the mill, can be met by inflows (the model will highlight the negative values when the inflows are insufficient).

11 The fresh make-up water comes from an external, off site source such as groundwater or a surface water body.

12 The potable water comes from an external off site source. Sewage rate is assumed to be a percentage of the potable water and will be treated separately prior to discharge to the Mill & Camp site pond.

13 Other make-up water for the mill (other than fresh water) comes from the Tailings pond, Mine Workings pond and Waste Rock and Overburden pond.

14 This model has three planned discharge points to the environment (see flow diagram on Sheet 8) and should be updated to best represent the planned mine operations.

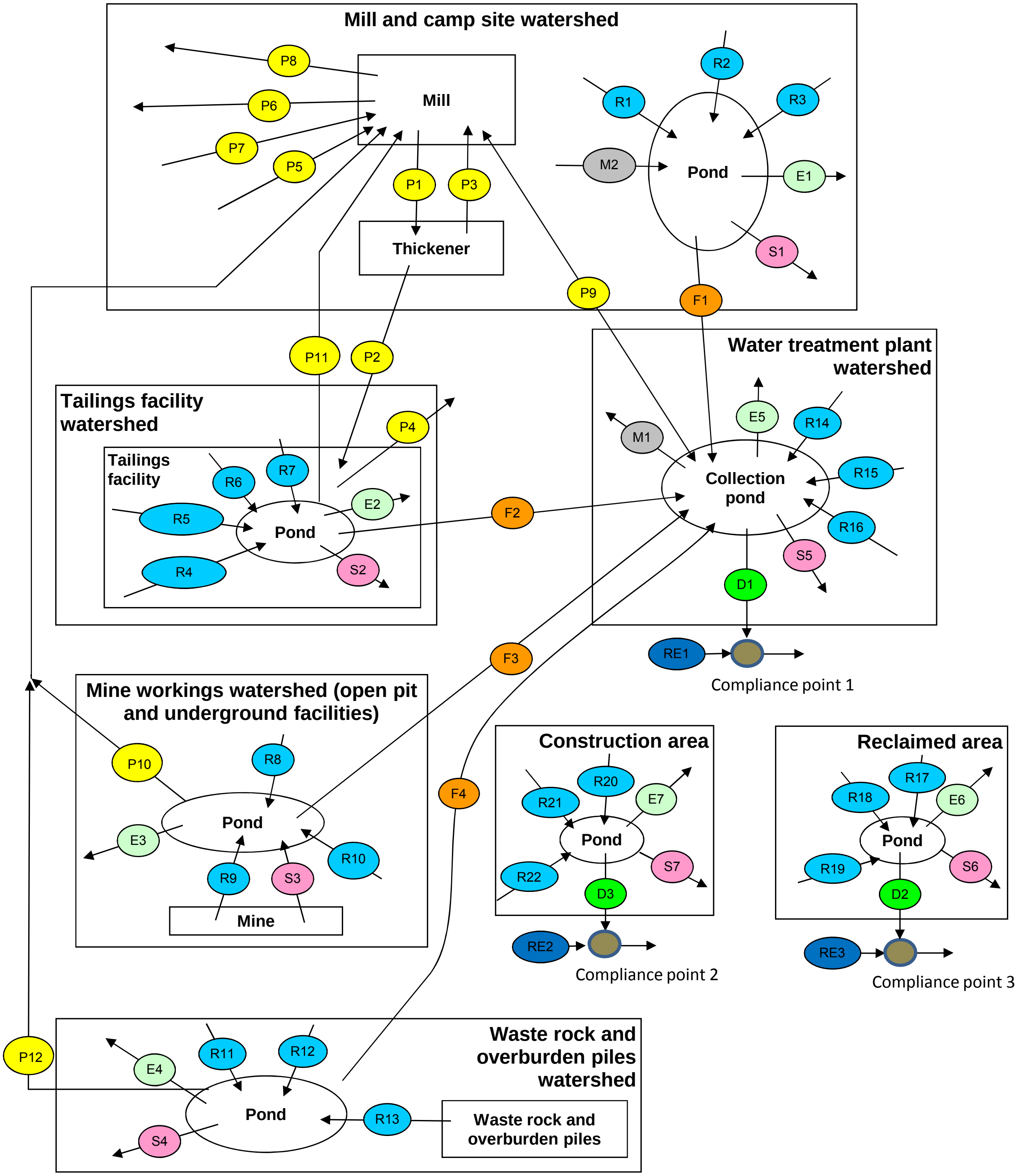
15 It is assumed that the seepage from each pond is a loss to the system and is not recovered. However, if it does have to be collected and treated, the flows are available to design the collection and pumping systems.

# Sheet 8

# Flow Logic Diagram

**Example**

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |



# Sheet 9

# List of Flows

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| Area | Flow No. | Description |
|---|---|---|
| **Flows associated with the ore and tailings production (P)** | P1 | **Discharge from the mill to the tailings thickener** |
| | P2 | **Discharge from thickener to tailings disposal facilty** |
| | P3 | **Overflow from the thickener recycled to the mill** |
| | P4 | **Water retained in the consolidated tailings mass** |
| | P5 | **Moisture going into the mill with the ore** |
| | P6 | **Moisture leaving the mill in the concentrate** |
| | P7 | **Fresh make-up water required in the mill** |
| | P8 | **Losses in the mill to evaporation and spillage etc.** |
| | P9 | **Water that is either required to run the mill from the tailings facility, collection ponds on site or an external source (arrow pointing to the mill), or excess process water that cannot be recycled from the thickener and has to be discharged to the water treatment collection pond (arrow pointing to the water treatment collection pond).** |
| | P10 | **Make-up water from the Mine Workings** |
| | P11 | **Reclaim Water from the tailings impoundment to the Mill** |
| | P12 | **Make-up water from the waste rock and overburden piles** |

| Area | Flow No. | | Description |
|---|---|---|---|
| **Flows associated with runoff from precipitation (R)** | R1 | **Mill and Camp Site** | Runoff from natural ground |
| | R2 | | Runoff from prepared ground |
| | R3 | | Precipitation direct to the pond |
| | R4 | **Tailings Facility** | Runoff from natural ground |
| | R5 | | Runoff from prepared ground |
| | R6 | | Precipitation direct to the pond & wet tailings |
| | R7 | | Runoff from dry tailings beach |
| | R8 | **Mine Workings** | Runoff from natural ground |
| | R9 | | Runoff from the pit walls |
| | R10 | | Precipitation direct to the pond |
| | R11 | **Waste rock and Overburden Piles** | Runoff from natural ground |
| | R12 | | Runoff from the waste rock and overburden piles |
| | R13 | | Precipitation direct to the pond |
| | R14 | **Water Treatment** | Runoff from natural ground |
| | R15 | | Runoff from prepared ground |
| | R16 | | Precipitation direct to the pond |
| | R17 | **Reclaimed Area** | Runoff from natural ground |
| | R18 | | Runoff from reclaimed ground |
| | R19 | | Precipitation direct to the pond |
| | R20 | **Construction Area** | Runoff from natural ground |
| | R21 | | Runoff from construction ground |
| | R22 | | Precipitation direct to the pond |

| Area | Flow No. | Description |
|---|---|---|
| **Evaporation from ponds (E)** | E1 | **From the Mill and Camp site pond** |
| | E2 | **From the Tailings pond & wet tailings** |
| | E3 | **From the Mine Workings pond** |
| | E4 | **From the Waste Rock and Overburden Piles pond** |
| | E5 | **From the collection pond at the Water Treatment Plant** |
| | E6 | **From the Reclaimed Area Pond** |
| | E7 | **From the Construction Area Pond** |
| **Seepage (S)** | S1 | **From the Mill and Camp site pond** |
| | S2 | **From the Tailings pond** |
| | S3 | **Seepage into the Mine Workings** |
| | S4 | **From the Waste Rock and Overburden Piles pond** |
| | S5 | **From collection pond at the Water Treatment Plant** |
| | S6 | **From the Reclaimed Area pond** |
| | S7 | **From the Construction Area pond** |
| **Miscellaneous flows (M)** | M1 | **Water for dust control (from the collection pond at the Water Treatment Plant)** |
| | M2 | **Treated sewage water discharged to the Mill and Camp site pond** |
| **Surface flows between elements (F)** | F1 | **From Mill and Camp site pond to collection pond at the Water Treatment Plant** |
| | F2 | **From Tailings pond to collection pond at the Water Treatment Plant** |
| | F3 | **From Mine Workings pond to collection pond at the Water Treatment Plant** |
| | F4 | **From Waste Rock and Overburden Piles pond to collection pond at the Water Treatment Plant** |
| **Discharge to environment (D)** | D1 | **From the Water Treatment Plant polishing pond to the environment** |
| | D2 | **From the Reclaimed Area pond to the environment** |
| | D3 | **From the Construction Area pond to the environment** |
| **Receiving Environment (RE)** | RE1 | **Receiving environment upstream of D1** |
| | RE2 | **Receiving environment upstream of D2** |
| | RE3 | **Receiving environment upstream of D3** |

# Sheet 10

**Example**

## Precipitation, Runoff & Evaporation Data

| | | | | | |
|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Revision No:** | Enter revision number he | **Modeled Mine year:** | Enter the modelled mine year here |
| **Project #:** | Enter project number here | **Date:** | Enter date here | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Meteorological Station(s)** | - | Location | | | | | |
| | - | Elevation (m) | | | | | |
| | - | Distance from the site (km) | | | | | |

| **Precipitation** | | | | **Factored Runoff** (Note 1) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **Annual precipitation selected for flow modelling (mm/yr)** → | | **900** | From natural ground | | From prepared ground (around mill site etc.) | | From ponds and wet tailings | | From dry tailings beach | | From Waste Rock and Overburden Piles | | From Mine Workings | | From Reclaimed Area | | From Construction Area | | Monthly runoff **(Note 3)** |
| | **Mean** | **Monthly Distribution (Note 2)** | **Precip-itation** | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Expressed as a % of accumu-lation |
| | (mm) | (% of total) | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | (%) |
| Oct | 102.0 | 11.3 | 102.0 | 0.70 | 71.4 | 0.80 | 81.6 | 1.00 | 102.0 | 0.40 | 40.8 | 0.70 | 71.4 | 0.80 | 81.6 | 0.00 | 0.0 | 0.00 | 0.0 | 100 |
| Nov | 88.0 | 9.8 | 88.0 | 0.70 | 61.6 | 0.80 | 70.4 | 1.00 | 88.0 | 0.40 | 35.2 | 0.70 | 61.6 | 0.80 | 70.4 | 0.00 | 0.0 | 0.00 | 0.0 | 50 |
| Dec | 74.0 | 8.2 | 74.0 | 0.70 | 51.8 | 0.80 | 59.2 | 1.00 | 74.0 | 0.40 | 29.6 | 0.70 | 51.8 | 0.80 | 59.2 | 0.00 | 0.0 | 0.00 | 0.0 | 0 |
| Jan | 59.0 | 6.6 | 59.0 | 0.70 | 41.3 | 0.80 | 47.2 | 1.00 | 59.0 | 0.40 | 23.6 | 0.70 | 41.3 | 0.80 | 47.2 | 0.00 | 0.0 | 0.00 | 0.0 | 0 |
| Feb | 44.0 | 4.9 | 44.0 | 0.60 | 26.4 | 0.70 | 30.8 | 1.00 | 44.0 | 0.40 | 17.6 | 0.70 | 30.8 | 0.80 | 35.2 | 0.00 | 0.0 | 0.00 | 0.0 | 0 |
| Mar | 58.0 | 6.4 | 58.0 | 0.60 | 34.8 | 0.70 | 40.6 | 1.00 | 58.0 | 0.40 | 23.2 | 0.70 | 40.6 | 0.80 | 46.4 | 0.00 | 0.0 | 0.00 | 0.0 | 0 |
| April | 62.0 | 6.9 | 62.0 | 0.60 | 37.2 | 0.70 | 43.4 | 1.00 | 62.0 | 0.40 | 24.8 | 0.70 | 43.4 | 0.80 | 49.6 | 0.00 | 0.0 | 0.00 | 0.0 | 50 |
| May | 81.0 | 9.0 | 81.0 | 0.70 | 56.7 | 0.80 | 64.8 | 1.00 | 81.0 | 0.40 | 32.4 | 0.70 | 56.7 | 0.80 | 64.8 | 0.00 | 0.0 | 0.00 | 0.0 | 100 |
| June | 78.0 | 8.7 | 78.0 | 0.70 | 54.6 | 0.80 | 62.4 | 1.00 | 78.0 | 0.40 | 31.2 | 0.70 | 54.6 | 0.80 | 62.4 | 0.00 | 0.0 | 0.00 | 0.0 | 100 |
| July | 77.0 | 8.6 | 77.0 | 0.70 | 53.9 | 0.80 | 61.6 | 1.00 | 77.0 | 0.40 | 30.8 | 0.70 | 53.9 | 0.80 | 61.6 | 0.00 | 0.0 | 0.00 | 0.0 | 100 |
| Aug | 85.0 | 9.4 | 85.0 | 0.70 | 59.5 | 0.80 | 68.0 | 1.00 | 85.0 | 0.40 | 34.0 | 0.70 | 59.5 | 0.80 | 68.0 | 0.00 | 0.0 | 0.00 | 0.0 | 100 |
| Sept | 92.0 | 10.2 | 92.0 | 0.70 | 64.4 | 0.80 | 73.6 | 1.00 | 92.0 | 0.40 | 36.8 | 0.70 | 64.4 | 0.80 | 73.6 | 0.00 | 0.0 | 0.00 | 0.0 | 100 |
| **TOTAL** | **900.0** | **100.0** | **900.0** | **0.68** | **613.6** | **0.78** | **703.6** | **1.00** | **900.0** | **0.40** | **360.0** | **0.70** | **630.0** | **0.80** | **720.0** | **0.00** | **0.0** | **0.00** | **0.0** | |

| **Evaporation** (Note 4) | | | | | |
|---|---|---|---|---|---|
| **Month** | **Annual Evaporation selected for flow modelling (mm/yr)** → | | **750** | **Lake evaporation used in the flow model** | |
| | **Pan (measured) or calculated lake evaporation** | | | | |
| | **Mean** | **Monthly distribution** | **Value to which the factor is applied** | **Factor from pan to lake** (Note 5) | **Used in flow model** |
| | (mm) | (% of total) | (mm) | | (mm) |
| Oct | 45.0 | 6.00 | 45.0 | 0.70 | 31.5 |
| Nov | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Dec | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Jan | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Feb | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Mar | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| April | 25.0 | 3.33 | 25.0 | 0.70 | 17.5 |
| May | 130.0 | 17.33 | 130.0 | 0.70 | 91.0 |
| June | 155.0 | 20.67 | 155.0 | 0.70 | 108.5 |
| July | 180.0 | 24.00 | 180.0 | 0.70 | 126.0 |
| Aug | 135.0 | 18.00 | 135.0 | 0.70 | 94.5 |
| Sept | 80.0 | 10.67 | 80.0 | 0.70 | 56.0 |
| **TOTAL** | **750.0** | **100.00** | **750.0** | **0.70** | **525.0** |

| **Precipitation & evaporation in years that are wetter or dryer than the mean year** (Note 6) | | | | |
|---|---|---|---|---|
| **Annual Return Period** | **Precipitation** | | **Evaporation** | |
| | Wetter | Dryer | Wetter | Dryer |
| Years | (mm/yr) | | (mm/yr) | |
| mean | 900 | | 750 | |
| 5 | | | | |
| 10 | | | | |
| 25 | | | | |
| 50 | | | | |
| 100 | 1,200 | 625 | 500 | 900 |
| 1000 | | | | |

**NOTES:**

1 The runoff factor is the percentage of the precipitation that runs off and ends up in the pond(s). It takes into account evapo-transpiration and infiltration. From natural ground it might be on the order of 20 to 70 % depending on the degree of ground saturation, the magnitude of the rainfall and the time of year. It will be greater from prepared surfaces and pit walls. For modelling purposes it can be assumed that 100 % of the precipitation that falls on the pond and wet tailings beach ends up in the pond. The runoff from a dry tailings beach is considerably less depending on the degree of saturation of the tailings. Flow measurements are seldom available to correlate with precipitation to establish runoff factors at a new mine site.

2 For years that are wetter and dryer than the mean year, it may be necessary to assume that the monthly distribution of precipitation is the same as the distribution in the mean year due to a lack of data.

3 A flow model must be able to account for winter snow accumulation by entering a runoff distribution as a percentage of the total accumulated to date. For example if there is no runoff in January, February and March and 100% runoff in April then the total winter's accumulation for the three months will enter the inflow side of the water balance in April. **For the flow model to function properly the precipitation and evaporation data entered on the table has to start and end in months that 100% of the factored runoff is discharged.**

4 "Pan evaporation" is a measured value. The evaporation that actually occurs from a water surface is called the "lake evaporation". Lake evaporation is typically about 70 % of the measured pan evaporation but this could vary depending on the climatic conditions and the time of year. Evaporation can also be calculated based on climatic conditions.

5 If calculated lake evaporation is used, then the factor entered in the pan evaporation to lake evaporation column is zero for each month.

6 Values of precipitation and evaporation in this table are provided by the user for safekeeping (i.e., they have no effect in the model). The user must select the desired precipitation and evaporation values, and input them into Cells D12 and D30, in order for these values to take effect in the model.

7 🟧 Information required (data input cells). 🟦 Values used in the flow model.

# Sheet 11

# Production Schedule

Example

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | **Revision No:** | Enter revision number here (e.g., Rev. 1) |
| **Project #:** | Enter project number here | **Date:** | Enter date here |
| **Modeled Mine year:** | 5 | | |

## Production Schedule Summary

| Year | Ore | | | Waste rock | | | Waste rock / ore ratio | Stock piled low grade ore |
|---|---|---|---|---|---|---|---|---|
| | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | - | (t/y) |
| 5 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |

Select production year to model

## Production Schedule Details

| Year | Ore | | | Waste rock | | | Waste rock / ore ratio | Stock piled low grade ore |
|---|---|---|---|---|---|---|---|---|
| | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | - | (t/y) |
| -3 | | | 0 | 1,000,000 | | 1,000,000 | | |
| -2 | | | 0 | 3,000,000 | | 3,000,000 | | |
| -1 | | | 0 | 3,000,000 | | 3,000,000 | | |
| 1 | 2,000,000 | | 2,000,000 | 8,000,000 | | 8,000,000 | 4.00 | |
| 2 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 3 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 4 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 5 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 6 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 7 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 8 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 9 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 10 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 11 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 12 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 13 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 14 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 15 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 16 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 17 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 18 | 5,000,000 | | 5,000,000 | 15,000,000 | 300,000 | 15,300,000 | 3.06 | |
| 19 | 5,000,000 | 500,000 | 5,500,000 | 15,000,000 | 50,000 | 15,050,000 | 2.74 | |
| 20 | 5,000,000 | 600,000 | 5,600,000 | 2,000,000 | 50,000 | 2,050,000 | 0.37 | |
| 21 | | 700,000 | 700,000 | | 30,000 | 30,000 | 0.04 | |
| 22 | | 600,000 | 600,000 | | 30,000 | 30,000 | 0.05 | |
| 23 | | 400,000 | 400,000 | | 20,000 | 20,000 | 0.05 | |
| 24 | | 200,000 | 200,000 | | 0 | 0 | 0.00 | |
| | | | 0 | | | 0 | | |
| | | | 0 | | | 0 | | |
| TOTAL | 97,000,000 | 3,000,000 | 100,000,000 | 287,000,000 | 480,000 | 287,480,000 | 2.87 | 0 |

Note:

1 The production schedule will vary depending on the mining operation. The above schedule is presented to provide a mine life overview. **The water balance model, however, will consider one year at a time only.** The modelled year is selected in the production schedule summary.

2 The above *Production Schedule Details* table should be expanded to reflect the full mine life, as needed. The user should verify that links from the *Production Schedule Summary* table are also updated to reference the expanded *Production Schedule Details* table.

3 Mine years need to match the hydrologic year selected as calculations for slurry water are based on the mine year. A typical hydrologic year is from October to September.

▨ Required information should be entered in the orange shaded cells

# Sheet 12
# Operating Data

**Example**

**Nominal and design values:** Nominal values are based on the planned annual mill throughput averaged over 365 days per year. The nominal values are used to size the tailings facility and for the flow (water balance) modelling. The design values are larger and take into account the availability of the mill (% of the year that the mill is available to operate) plus an appropriate factor of safety. The design values are used to size and design the process facilities, pipelines and pumping systems. A word of caution - sometimes process designers define nominal and design values differently.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Symbol** | **Source** (Note 1) | **Tailings stream** | | | **Units** (metric) |
| **Revision #:** | Enter revision number here (e.g., Rev. 1) | | | **1** | **2** | **Total** | |
| **Date:** | Enter date here | | | Surface disposal | Underground disposal | | |
| **Project #:** | Enter project number here | | | | | | |
| **Ore production** | | | | | | | |
| - | Ore reserve *(design tonnage)* | | | - | - | 100.00 | Mt |
| - | Planned annual mill throughput *(nominal production rate)* | | | - | - | 5,000,000 | t/y |
| - | Mill availability *(% of the year that the mill is available to operate - usually 90 to 95%)* | | | - | - | 90.0 | % |
| - | Factor of safety on the design value | | | - | - | 1.00 | - |
| **Tailings production** | | | | | | | |
| - | Tailings / ore ratio *(the difference is concentrate)* | | | - | - | 0.975 | - |
| | **or** tailings mass if tonnage is higher than the ore *(high precipitates)* | | | - | - | | t/d |
| - | % of tailings to surface disposal & underground backfill | | | 100.0 | 0.0 | 100 | % |
| - | Specific gravity of tailings particles | $G_s$ | | 3.00 | 3.00 | | - |
| - | Density of liquor (supernatant) | $\rho_\omega$ | | 1.00 | 1.00 | | $t/m^3$ |
| - | Discharge slurry density of the tailings from the mill to the thickener(s) | $S_1$ | | - | - | 40.0 | % solids |
| - | Discharge slurry density of the tailings from the thickener to disposal facility | $S_2$ | | 40.0 | 40.0 | - | % solids |
| - | Assumed deposited void ratio *(Void volume / total volume)* | e | | 0.90 | 0.85 | - | - |
| **Flows impacting the mill water balance** | | | | | | | |
| - | Water content of the ore going into the mill *(% of total mass of ore)* | $\omega_2$ | | - | - | 4.0 | % |
| - | Water leaving the mill in the concentrate (Note 2)<br>Moisture content if leaving by truck *(% of total mass of concentrate)* | $\omega_3$ | | - | - | 10.0 | % |
| | **OR** slurry density if leaving by pipeline | $S_3$ | | - | - | 0.0 | % solids |
| - | Minimum fresh (clean) make-up water required in the mill *(% of total water in the tailings)* | | | - | - | 10.00 | % |
| - | Water lost in the mill to evaporation and spillage *(% of total water in the tailings)* | | | - | - | 2.00 | % |
| **Miscellaneous flows impacting the flow model** | | | | | | | |
| - | Water used for dust control *(taken from one of the ponds)* | M1 | | - | - | 500 | m$^3$/day |
| - | Potable water from an external source (no. of workers x vol./worker/day) | | | - | - | 150 | m$^3$/day |
| - | Sewage *(estimated as a % of potable water)* | M2 | | - | - | 85 | % |
| - | Make-up water from Mine Workings | P10 | | - | - | 0 | m$^3$/mo |
| - | Reclaim water from the Tailings Pond | P11 | | - | - | 0 | m$^3$/mo |
| - | Make-up water from Waste Rock and Overburden Piles | P12 | | - | - | 0 | m3/mo |
| **Waste rock** | | | | | | | |
| - | Specific gravity | $G_s$ | | - | - | 2.80 | - |

**Notes:** 1 Sources of information could be either the owner / operator, contractors, or consultants.

2 Water established from moisture content and slurry density are summed together for determining the value of P6. Typically only one of the two is used (the input of the unused option should then be set equal to zero in this sheet.

🟧 Required information must be entered in the orange shaded cells. The values are then automatically linked to the following two calculation sheets where the relevant calculations are carried out.

## Sheet 13

**Example**

# Estimation of Fresh Process Make-up Water Required in the Mill & Losses to Evaporation & Spillage in the Mill

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Project #** | Enter project number here | **Date:** | Enter date here |

The fresh water requirements and losses to evaporation and spillage are normally provided by the process designer. If not they can be estimated as cubic metres of water per metric ton of ore milled ($m^3/t$) using the following simple procedures. They are normally relatively small flows.

- The tailings typically goes through a mill at a slurry density (S) of say 30 to 40 % solids by mass. The total process water per metric ton of dry tailings produced from ore processing is therefore (1/S - 1).
- The fresh make-up water in the mill is typically 3 to 10 % of total water going through the mill.
- The water lost to evaporation and spillage in the mill can be assumed to be 0.5 to 2.0 % of the total water going through the mill.

### Fresh make-up water required in a mill (reagent mixing, gland water, etc.)

| Slurry density of tailings from the mill to the thickner S (%) | Fresh water required (Flow P7) | |
|---|---|---|
| | % | $m^3$/t of ore milled (1/S - 1) x % |
| 40.00 | 10.0 | 0.150 |

### Water lost to evaporation and spillage in a mill

| Slurry density of tailings from the mill to the thickner S (%) | Water lost to evaporation & spillage (P8) | |
|---|---|---|
| | % | $m^3$/t of ore milled (1/S - 1) x %) |
| 40.00 | 2.00 | 0.030 |

**Notes:** 1 Input of data is not required on this sheet. The slurry density and % water is automatically transferred from "Operating Data Sheet" and the calculations are done on this sheet and the results are automatically transferred to the " 14 Calculated Data" sheet (Sheet 14).

# Sheet 14

# Calculated Operating Data & Flows Associated with Processing the Ore

**Example**

**<u>Nominal</u> <u>and</u> <u>design</u> <u>values</u>:** Nominal values are based on the planned annual mill throughput averaged over 365 days per year. The <u>nominal</u> <u>values</u> are used to size the tailings facility and for the flow (water balance) modelling. The design values are larger and take into account the availability of the mill (% of the year that the mill is available to operate) plus an appropriate factor of safety. The <u>design</u> <u>values</u> are used to size and design the process facilities, pipelines and pumping systems. A word of caution - sometimes process designers define nominal and design values differently.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Date:** | Enter date here | | | | | |
| **Revision #** | Enter revision number here (e. | **Project #** | Enter project number here | | | | | |

| | | Indicator | | Flow No. (Note 1) | Source or Calculation | Tailings stream | | | Units (metric) |
|---|---|---|---|---|---|---|---|---|---|
| | | Letter | Symbol | | | Surface Disposal | Underground disposal | Total | |
| **Ore production** | | | | | | | | | |
| - Ore reserve | | A | | | Sheet 12 | - | - | 100.00 | Mt |
| - Nominal ore production | Planned annual | B | | | Sheet 12 | - | - | 5,000,000 | t/y |
| | Monthly | C | | | B / 12 | - | - | 416,667 | t/mo |
| | Daily | D | | | B / 365 | - | - | 13,699 | t/d |
| - Life of mine | | E | | | A / B | - | - | 20.0 | years |
| - Mill availability *(% of the year the mill is available to operate)* | | F | | | Sheet 12 | - | - | 90.0 | % |
| - Factor of safety on the design value | | G | | | Sheet 12 | - | - | 1.00 | - |
| - Design daily milling rate | | H | | | D / F x G | - | - | 15,221 | t/d |
| **Tailings** | | | | | | | | | |
| - Tailings / ore ratio | | I | | | Sheet 12 | - | - | 0.975 | - |
| - Mass of concentrate per month | | J | | | C - C x I | - | - | 10,417 | t/mo |
| - % of tailings to surface disposal and underground backfill | | K | | | Sheet 12 | 100 | 0 | 100 | % |
| - Nominal tailings production | Total | L | | | A x I x K | 97.50 | 0.00 | 97.50 | Mt |
| | Annual | M | | | B x I x K | 4,875,000 | 0 | 4,875,000 | t/y |
| | Monthly | N | | | C x I x K | 406,250 | 0 | 406,250 | t/mo |
| | Daily | O | | | D x I x K | 13,356 | 0 | 13,356 | t/d |
| - Design daily tailings production rate | | P | | | O x / F x G | 14,840 | 0 | 14,840 | t/d |
| - Tailings specific gravity | | | $G_s$ | | Sheet 12 | 3.00 | 3.00 | - | - |
| - Density of liquor (supernatant) | | | $\rho_\omega$ | | Sheet 12 | 1.00 | 1.00 | - | t/m$^3$ |
| - Assumed void ratio of deposited tailings | | | e | | Sheet 12 | 0.90 | 0.85 | - | - |
| - Dry density of deposited tailings | | | $\rho_d$ | | $G_s \times \rho_\omega / (1 + e)$ | 1.58 | 1.62 | - | t/m$^3$ |
| - Volume of deposited tailings *(based on nominal values)* | Total | Q | | | $L / \rho_d$ | 61.75 | 0.00 | 61.75 | M-m$^3$ |
| | Annual | R | | | $M / \rho_d$ | 3,087,500 | 0 | 3,087,500 | m$^3$/y |
| | Monthly | S | | | $N / \rho_d$ | 257,292 | 0 | 257,292 | m$^3$/mo |
| | Daily | T | | | $O / \rho_d$ | 8,459 | 0 | 8,459 | m$^3$/d |
| **Monthly <u>nominal</u> flows associated with ore production (Notes 2 & 3)** | | | | | | | | | |
| **Water in the tailings being discharged from the mill to the tailings thickener** | | | | | | | | | |
| - Discharge slurry density *(% solids in total mass of tailings)* | | | $S_1$ | | Sheet 12 | - | - | 40.0 | % solids |
| - Volume discharged | | U | | P1 | $N / S_1 - N$ | - | - | 609,375 | m$^3$/mo |
| **Water in the tailings being discharged from the tailings thickener to tailings facility** | | | | | | | | | |
| - Discharge slurry density *(% solids in total mass of tailings)* | | | $S_2$ | | Sheet 12 | 40.0 | 40.0 | - | % solids |
| - Volume discharged | | V | | P2 | $N / S_2 - N$ | 609,375 | 0 | 609,375 | m$^3$/mo |
| **Overflow from the thickener recycled to the mill** | | W | | P3 | U - V | - | - | 0 | m$^3$/mo |
| **Water retained in consolidated deposited tailings** **assuming saturation** | | | | | | | | | |
| - Saturated water content of deposited tailings *(% of dry mass of tailings)* | | | $\omega_1$ | | $e_1/G_s$ | 30.0 | 28.3 | - | % |
| - Volume retained in the tailings | | X | | P4 | $N \times \omega_1$ | 121,875 | 0 | 121,875 | m$^3$/mo |
| **Moisture in the ore going into the mill.** | | | | | | | | | |
| - Water content of ore going into the mill *(% of total dry mass of ore)* | | | $\omega_2$ | | Sheet 12 | - | - | 4.0 | % |
| - Volume entering the mill | | Y | | P5 | $C \times \omega_2$ | - | - | 16,667 | m$^3$/mo |
| **Water leaving the mill with the concentrate** | | | | | | | | | |
| - Water content if leaving by truck *(% of total mass of concentrate)* | | | $\omega_3$ | | Sheet 12 | - | - | 10.0 | % |
| - Slurry density if leaving by pipeline *(% solids by mass)* | | | $S_3$ | | Sheet 12 | - | - | 0.0 | % solids |
| - Volume of water if leaving the mill by truck | | Z | | P6 | $J \times \omega_3$ | - | - | 1,042 | m$^3$/mo |
| OR Volume of water if leaving by pipeline | | | | | $J \times / S_3 - J$ | - | - | 0 | m$^3$/mo |
| **Fresh (clean) make-up water required in the mill from an external source** | | | | | | | | | |
| - Volume per nominal ton of ore milled | | AA | | | Sheet 13 | - | - | 0.150 | m$^3$/t |
| - Volume entering the mill | | BB | | P7 | C x BB | - | - | 62,500 | m$^3$/mo |
| **Water lost in the mill to evaporation and spillage** | | | | | | | | | |
| - Volume per nominal ton of ore milled | | CC | | | Sheet 13 | - | - | 0.030 | m$^3$/t |
| - Volume lost in the mill | | DD | | P8 | C x DD | - | - | 12,500 | m$^3$/mo |
| **Reclaim and Make-up water to the mill from mine site water storage structures** | | | | | | | | | |
| - Make-up water to the Mill from the Mine Workings | | EE | | P10 | Sheet 12 | - | - | 0 | m$^3$/mo |
| - Reclaim water to the Mill from the Tailings pond | | FF | | P11 | Sheet 12 | - | - | 0 | m$^3$/mo |
| - Make-up water to the Mill from the Waste Rock and Overburden Piles pond | | GG | | P12 | Sheet 12 | - | - | 0 | m$^3$/mo |
| **Water that is either required to run the mill from the tailings facility, collection ponds on site or an external source *(a positive number),* or excess process water that cannot be recycled from the thickener and has to be discharged to the water treatment collection pond *(a negative number)*.** | | | | | | | | | |
| - Volume of water | | HH | | +P9A or -P9B | P1 + P6 + P8 - P5 - P7 - P10 - P11 -P12 - P3 | - | - | 543,750 | m$^3$/mo |

**Notes:**

1 Monthly flows are used in the model. It is assumed that the density of water is unity for the calculations.

2 **Input data are not required on this sheet. The inputs are automatically transferred from previous sheets. The calculations are done on this sheet and linked to other relevant sheets.**

| | | |
|---|---|---|
| 622,917 | Flows into the mill | } Must be equal |
| 622,917 | Flows out of the mill | |

# Sheet 15

Example

# Summary of Flows Associated with Processing the Ore

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision # :** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Relevant operating data for the model run** | | |
|---|---|---|
| Nominal production rate | 13,699 | t/d |
| Tailings discharge slurry density from the mill | 40.0 | % solids |
| Thickened tailings slurry density | 40.0 | % solids |
| Mininum clean make-up water required in the mill | 10.00 | % of total flow through the mill |

| **Flow** | | | **Monthly volume** (m$^3$/month) |
|---|---|---|---|
| P1 | Water in the tailings discharged from the mill to the thickener | | 609,375 |
| P2 | Water in the tailings discharged from the thickener(s) to disposal | | 609,375 |
| P3 | Overflow from the thickener(s) | | 0 |
| P4 | Water retained in the consolidated deposited tailings | | 121,875 |
| **-** | *Water discharged from the consolidated tailings mass (P2 - P4)* | | *487,500* |
| P5 | Moisture going into the mill with the ore | | 16,667 |
| P6 | Water leaving the mill in the concentrate | By truck | 1,042 |
| | | By pipeline | 0 |
| P7 | Minimum fresh (clean) make-up water required in the mill | | 62,500 |
| P8 | Water lost in the mill to evaporation and spillage | | 12,500 |
| P9A<br>or<br>P9B | Water that is either required to run the mill the tailings facility, collection ponds or another external source **(P9A - a positive number),** or excess process water that cannot be recycled from the thickener(s) and has to be discharged to the Water Treatment pond **(P9B - a negative number)** | | 543,750 |
| P10 | Make-up water to the Mill from the Mine Workings pond | | 0 |
| P11 | Reclaim water to the Mill from the Tailings Pond | | 0 |
| P12 | Make-up water to the Mill from the Waste Rock and Overburden Piles pond | | 0 |
| Total water required to run the mill (P7 clean + P9 other) | | | 606,250 |

**Notes:**

1 Input of data is not required on this sheet. This is only a summary sheet. The values are automatically transferred from Sheet 14 "Calculated Operating Data & Flows Associated with Processing the Ore".

2 The flow numbers and colours correspond to the flows on Sheet 14 "Calculated Operating Data and Flows Associated with Processing the Ore".

| | | |
|---|---|---|
| 622,917 | Flows into the mill | Must be equal |
| 622,917 | Flows out of the mill | |

# Sheet 16
# Watershed Areas

**Example**

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Watershed** | | **Sub Watersheds**[1] | | | **Flow Number** |
|---|---|---|---|---|---|
| Facility | Area (ha) | Collecting area | % of total | $(m^2)$ | |
| Mill & Camp Site | 1500.00 | Natural ground | 40 | 6,000,000 | R1 |
| | | Prepared ground[2] | 50 | 7,500,000 | R2 |
| | | Collection pond | 10 | 1,500,000 | R3, E1 |
| | | TOTAL | 100 | 15,000,000 | - |
| Tailings Facility | 2500.00 | Natural ground | 50 | 12,500,000 | R4 |
| | | Prepared ground[2] | 5 | 1,250,000 | R5 |
| | | Pond & wet tailings | 25 | 6,250,000 | R6, E2 |
| | | Dry tailings beach | 20 | 5,000,000 | R7 |
| | | TOTAL | 100 | 25,000,000 | - |
| Mine Workings | 1000.00 | Natural ground | 75 | 7,500,000 | R8 |
| | | Prepared ground[2] | 15 | 1,500,000 | R9 |
| | | Collection pond | 10 | 1,000,000 | R10, E3 |
| | | TOTAL | 100 | 10,000,000 | - |
| Waste Rock and Overburden Piles | 200.00 | Natural ground | 40 | 800,000 | R11 |
| | | Waste rock and Overburden piles | 55 | 1,100,000 | R12 |
| | | Collection pond | 5 | 100,000 | R13, E4 |
| | | TOTAL | 100 | 2,000,000 | - |
| Water Treatment Plant | 100.00 | Natural ground | 45 | 450,000 | R14 |
| | | Prepared ground[2] | 40 | 400,000 | R15 |
| | | Pond | 15 | 150,000 | R16, E5 |
| | | TOTAL | 100 | 1,000,000 | - |
| Reclaimed Area | 0.00 | Natural ground | 45 | 0 | R17 |
| | | Reclaimed ground | 45 | 0 | R18 |
| | | Pond | 10 | 0 | R19, E6 |
| | | TOTAL | 100 | 0 | - |
| Construction Area | 0.00 | Natural ground | 45 | 0 | R20 |
| | | Construction ground | 45 | 0 | R21 |
| | | Pond | 10 | 0 | R22, E7 |
| | | TOTAL | 100 | 0 | - |
| **TOTAL** | **5,300.00** | - | - | 53,000,000 | - |

**Note:**

1 The sub-watersheds are subdivided by percentages which may change as the mine develops.

2 Prepared ground is defined as paved ground, roads, industrial areas or ground of low permeability.

🟧 Data input is required in the orange shaded cells. The calculations are carried out in the other cells and the relevant data is automatically transferred to other sheets.

# Sheet 17

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Mill and Camp Site

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From ponds and wet tailings** | **From dry tailings beach** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| **Nov** | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| **Dec** | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| **Jan** | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| **Feb** | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| **Mar** | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| **April** | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| **May** | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| **June** | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| **July** | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| **Aug** | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| **Sept** | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| **TOTAL** | **613.6** | **703.6** | **900.0** | **360.0** | **630.0** | **720.0** | **0.0** | **0.0** | |

| | Runoff Flow ($m^3$ / month) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** → | **R1 - Natural ground** | | | | **R2 - Prepared ground** | | | | **R3 - Collection Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 16) → | **6,000,000** | | | | **7,500,000** | | | | **1,500,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R1** Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R2** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R3** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 428,400 | 428,400 | 428,400 | 0 | 612,000 | 612,000 | 612,000 | 0 | 153,000 | 153,000 | 153,000 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 369,600 | 369,600 | 184,800 | 184,800 | 528,000 | 528,000 | 264,000 | 264,000 | 132,000 | 132,000 | 66,000 | 66,000 | 0 | 0 | 0 | 0 |
| **Dec** | 310,800 | 495,600 | 0 | 495,600 | 444,000 | 708,000 | 0 | 708,000 | 111,000 | 177,000 | 0 | 177,000 | 0 | 0 | 0 | 0 |
| **Jan** | 247,800 | 743,400 | 0 | 743,400 | 354,000 | 1,062,000 | 0 | 1,062,000 | 88,500 | 265,500 | 0 | 265,500 | 0 | 0 | 0 | 0 |
| **Feb** | 158,400 | 901,800 | 0 | 901,800 | 231,000 | 1,293,000 | 0 | 1,293,000 | 66,000 | 331,500 | 0 | 331,500 | 0 | 0 | 0 | 0 |
| **Mar** | 208,800 | 1,110,600 | 0 | 1,110,600 | 304,500 | 1,597,500 | 0 | 1,597,500 | 87,000 | 418,500 | 0 | 418,500 | 0 | 0 | 0 | 0 |
| **April** | 223,200 | 1,333,800 | 666,900 | 666,900 | 325,500 | 1,923,000 | 961,500 | 961,500 | 93,000 | 511,500 | 255,750 | 255,750 | 0 | 0 | 0 | 0 |
| **May** | 340,200 | 1,007,100 | 1,007,100 | 0 | 486,000 | 1,447,500 | 1,447,500 | 0 | 121,500 | 377,250 | 377,250 | 0 | 0 | 0 | 0 | 0 |
| **June** | 327,600 | 327,600 | 327,600 | 0 | 468,000 | 468,000 | 468,000 | 0 | 117,000 | 117,000 | 117,000 | 0 | 0 | 0 | 0 | 0 |
| **July** | 323,400 | 323,400 | 323,400 | 0 | 462,000 | 462,000 | 462,000 | 0 | 115,500 | 115,500 | 115,500 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 357,000 | 357,000 | 357,000 | 0 | 510,000 | 510,000 | 510,000 | 0 | 127,500 | 127,500 | 127,500 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 386,400 | 386,400 | 386,400 | 0 | 552,000 | 552,000 | 552,000 | 0 | 138,000 | 138,000 | 138,000 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **3,681,600** | | **3,681,600** | | **5,277,000** | | **5,277,000** | | **1,350,000** | | **1,350,000** | | **0** | | **0** | |

**Notes:**

| | | |
|---|---|---|
| | 1 | Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet. |
| | 2 | The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows". |
| | 3 | The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff. |

# Sheet 18

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Tailings Facility

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| Month | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| | **From natural ground** | **From prepared ground** | **From ponds and wet tailings** | **From dry tailings beach** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| **Nov** | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| **Dec** | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| **Jan** | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| **Feb** | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| **Mar** | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| **April** | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| **May** | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| **June** | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| **July** | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| **Aug** | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| **Sept** | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| **TOTAL** | **613.6** | **703.6** | **900.0** | **360.0** | **630.0** | **720.0** | **0.0** | **0.0** | |

## Runoff Flow ($m^3$ / month)

| **Runoff #** → | **R4 - Natural ground** | | | | **R5 - Prepared ground** | | | | **R6 - Pond & wet tailings** | | | | **R7 - Dry tailings beach** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Area ($m^2$)** (from Sheet 16) → | **12,500,000** | | | | **1,250,000** | | | | **6,250,000** | | | | **5,000,000** | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R4** Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R5** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R6** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R7** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 892,500 | 892,500 | 892,500 | 0 | 102,000 | 102,000 | 102,000 | 0 | 637,500 | 637,500 | 637,500 | 0 | 204,000 | 204,000 | 204,000 | 0 |
| **Nov** | 770,000 | 770,000 | 385,000 | 385,000 | 88,000 | 88,000 | 44,000 | 44,000 | 550,000 | 550,000 | 275,000 | 275,000 | 176,000 | 176,000 | 88,000 | 88,000 |
| **Dec** | 647,500 | 1,032,500 | 0 | 1,032,500 | 74,000 | 118,000 | 0 | 118,000 | 462,500 | 737,500 | 0 | 737,500 | 148,000 | 236,000 | 0 | 236,000 |
| **Jan** | 516,250 | 1,548,750 | 0 | 1,548,750 | 59,000 | 177,000 | 0 | 177,000 | 368,750 | 1,106,250 | 0 | 1,106,250 | 118,000 | 354,000 | 0 | 354,000 |
| **Feb** | 330,000 | 1,878,750 | 0 | 1,878,750 | 38,500 | 215,500 | 0 | 215,500 | 275,000 | 1,381,250 | 0 | 1,381,250 | 88,000 | 442,000 | 0 | 442,000 |
| **Mar** | 435,000 | 2,313,750 | 0 | 2,313,750 | 50,750 | 266,250 | 0 | 266,250 | 362,500 | 1,743,750 | 0 | 1,743,750 | 116,000 | 558,000 | 0 | 558,000 |
| **April** | 465,000 | 2,778,750 | 1,389,375 | 1,389,375 | 54,250 | 320,500 | 160,250 | 160,250 | 387,500 | 2,131,250 | 1,065,625 | 1,065,625 | 124,000 | 682,000 | 341,000 | 341,000 |
| **May** | 708,750 | 2,098,125 | 2,098,125 | 0 | 81,000 | 241,250 | 241,250 | 0 | 506,250 | 1,571,875 | 1,571,875 | 0 | 162,000 | 503,000 | 503,000 | 0 |
| **June** | 682,500 | 682,500 | 682,500 | 0 | 78,000 | 78,000 | 78,000 | 0 | 487,500 | 487,500 | 487,500 | 0 | 156,000 | 156,000 | 156,000 | 0 |
| **July** | 673,750 | 673,750 | 673,750 | 0 | 77,000 | 77,000 | 77,000 | 0 | 481,250 | 481,250 | 481,250 | 0 | 154,000 | 154,000 | 154,000 | 0 |
| **Aug** | 743,750 | 743,750 | 743,750 | 0 | 85,000 | 85,000 | 85,000 | 0 | 531,250 | 531,250 | 531,250 | 0 | 170,000 | 170,000 | 170,000 | 0 |
| **Sept** | 805,000 | 805,000 | 805,000 | 0 | 92,000 | 92,000 | 92,000 | 0 | 575,000 | 575,000 | 575,000 | 0 | 184,000 | 184,000 | 184,000 | 0 |
| **TOTAL** | **7,670,000** | | **7,670,000** | | **879,500** | | **879,500** | | **5,625,000** | | **5,625,000** | | **1,800,000** | | **1,800,000** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 19

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Mine Workings (Open Pit and Underground Facilities)

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From ponds and wet tailings** | **From dry tailings beach** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| **Nov** | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| **Dec** | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| **Jan** | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| **Feb** | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| **Mar** | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| **April** | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| **May** | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| **June** | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| **July** | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| **Aug** | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| **Sept** | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| **TOTAL** | **613.6** | **703.6** | **900.0** | **360.0** | **630.0** | **720.0** | **0.0** | **0.0** | |

| | Runoff Flow ($m^3$ / month) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** | **R8 - Natural ground** | | | | **R9 - Pit walls** | | | | **R10 - Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 16) | **7,500,000** | | | | **1,500,000** | | | | **1,000,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R8** Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R9** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R10** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 535,500 | 535,500 | 535,500 | 0 | 122,400 | 122,400 | 122,400 | 0 | 102,000 | 102,000 | 102,000 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 462,000 | 462,000 | 231,000 | 231,000 | 105,600 | 105,600 | 52,800 | 52,800 | 88,000 | 88,000 | 44,000 | 44,000 | 0 | 0 | 0 | 0 |
| **Dec** | 388,500 | 619,500 | 0 | 619,500 | 88,800 | 141,600 | 0 | 141,600 | 74,000 | 118,000 | 0 | 118,000 | 0 | 0 | 0 | 0 |
| **Jan** | 309,750 | 929,250 | 0 | 929,250 | 70,800 | 212,400 | 0 | 212,400 | 59,000 | 177,000 | 0 | 177,000 | 0 | 0 | 0 | 0 |
| **Feb** | 198,000 | 1,127,250 | 0 | 1,127,250 | 52,800 | 265,200 | 0 | 265,200 | 44,000 | 221,000 | 0 | 221,000 | 0 | 0 | 0 | 0 |
| **Mar** | 261,000 | 1,388,250 | 0 | 1,388,250 | 69,600 | 334,800 | 0 | 334,800 | 58,000 | 279,000 | 0 | 279,000 | 0 | 0 | 0 | 0 |
| **April** | 279,000 | 1,667,250 | 833,625 | 833,625 | 74,400 | 409,200 | 204,600 | 204,600 | 62,000 | 341,000 | 170,500 | 170,500 | 0 | 0 | 0 | 0 |
| **May** | 425,250 | 1,258,875 | 1,258,875 | 0 | 97,200 | 301,800 | 301,800 | 0 | 81,000 | 251,500 | 251,500 | 0 | 0 | 0 | 0 | 0 |
| **June** | 409,500 | 409,500 | 409,500 | 0 | 93,600 | 93,600 | 93,600 | 0 | 78,000 | 78,000 | 78,000 | 0 | 0 | 0 | 0 | 0 |
| **July** | 404,250 | 404,250 | 404,250 | 0 | 92,400 | 92,400 | 92,400 | 0 | 77,000 | 77,000 | 77,000 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 446,250 | 446,250 | 446,250 | 0 | 102,000 | 102,000 | 102,000 | 0 | 85,000 | 85,000 | 85,000 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 483,000 | 483,000 | 483,000 | 0 | 110,400 | 110,400 | 110,400 | 0 | 92,000 | 92,000 | 92,000 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **4,602,000** | | **4,602,000** | | **1,080,000** | | **1,080,000** | | **900,000** | | **900,000** | | **0** | | **0** | |

**Notes:**
1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows".
3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 20

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Waste Rock Dump and Overburden Piles

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From ponds and wet tailings** | **From dry tailings beach** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| **Nov** | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| **Dec** | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| **Jan** | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| **Feb** | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| **Mar** | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| **April** | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| **May** | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| **June** | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| **July** | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| **Aug** | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| **Sept** | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| **TOTAL** | **613.6** | **703.6** | **900.0** | **360.0** | **630.0** | **720.0** | **0.0** | **0.0** | |

| | **Runoff Flow ($m^3$ / month)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** → | **R11 - Natural ground** | | | | **R12 - Dumped waste rock** | | | | **R13 - Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 16) → | **800,000** | | | | **1,100,000** | | | | **100,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R11** Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R12** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R13** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 57,120 | 57,120 | 57,120 | 0 | 78,540 | 78,540 | 78,540 | 0 | 10,200 | 10,200 | 10,200 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 49,280 | 49,280 | 24,640 | 24,640 | 67,760 | 67,760 | 33,880 | 33,880 | 8,800 | 8,800 | 4,400 | 4,400 | 0 | 0 | 0 | 0 |
| **Dec** | 41,440 | 66,080 | 0 | 66,080 | 56,980 | 90,860 | 0 | 90,860 | 7,400 | 11,800 | 0 | 11,800 | 0 | 0 | 0 | 0 |
| **Jan** | 33,040 | 99,120 | 0 | 99,120 | 45,430 | 136,290 | 0 | 136,290 | 5,900 | 17,700 | 0 | 17,700 | 0 | 0 | 0 | 0 |
| **Feb** | 21,120 | 120,240 | 0 | 120,240 | 33,880 | 170,170 | 0 | 170,170 | 4,400 | 22,100 | 0 | 22,100 | 0 | 0 | 0 | 0 |
| **Mar** | 27,840 | 148,080 | 0 | 148,080 | 44,660 | 214,830 | 0 | 214,830 | 5,800 | 27,900 | 0 | 27,900 | 0 | 0 | 0 | 0 |
| **April** | 29,760 | 177,840 | 88,920 | 88,920 | 47,740 | 262,570 | 131,285 | 131,285 | 6,200 | 34,100 | 17,050 | 17,050 | 0 | 0 | 0 | 0 |
| **May** | 45,360 | 134,280 | 134,280 | 0 | 62,370 | 193,655 | 193,655 | 0 | 8,100 | 25,150 | 25,150 | 0 | 0 | 0 | 0 | 0 |
| **June** | 43,680 | 43,680 | 43,680 | 0 | 60,060 | 60,060 | 60,060 | 0 | 7,800 | 7,800 | 7,800 | 0 | 0 | 0 | 0 | 0 |
| **July** | 43,120 | 43,120 | 43,120 | 0 | 59,290 | 59,290 | 59,290 | 0 | 7,700 | 7,700 | 7,700 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 47,600 | 47,600 | 47,600 | 0 | 65,450 | 65,450 | 65,450 | 0 | 8,500 | 8,500 | 8,500 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 51,520 | 51,520 | 51,520 | 0 | 70,840 | 70,840 | 70,840 | 0 | 9,200 | 9,200 | 9,200 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **490,880** | | **490,880** | | **693,000** | | **693,000** | | **90,000** | | **90,000** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 21

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| Form cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From ponds and wet tailings** | **From dry tailings beach** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| **Nov** | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| **Dec** | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| **Jan** | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| **Feb** | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| **Mar** | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| **April** | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| **May** | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| **June** | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| **July** | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| **Aug** | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| **Sept** | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| **TOTAL** | **613.6** | **703.6** | **900.0** | **360.0** | **630.0** | **720.0** | **0.0** | **0.0** | |

| | **Runoff Flow ($m^3$ / month)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** | **R14 - Natural ground** | | | | **R15 - Prepared ground** | | | | **R16 - Collection Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 16) | **450,000** | | | | **400,000** | | | | **150,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R14** Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R15** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R16** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 32,130 | 32,130 | 32,130 | 0 | 32,640 | 32,640 | 32,640 | 0 | 15,300 | 15,300 | 15,300 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 27,720 | 27,720 | 13,860 | 13,860 | 28,160 | 28,160 | 14,080 | 14,080 | 13,200 | 13,200 | 6,600 | 6,600 | 0 | 0 | 0 | 0 |
| **Dec** | 23,310 | 37,170 | 0 | 37,170 | 23,680 | 37,760 | 0 | 37,760 | 11,100 | 17,700 | 0 | 17,700 | 0 | 0 | 0 | 0 |
| **Jan** | 18,585 | 55,755 | 0 | 55,755 | 18,880 | 56,640 | 0 | 56,640 | 8,850 | 26,550 | 0 | 26,550 | 0 | 0 | 0 | 0 |
| **Feb** | 11,880 | 67,635 | 0 | 67,635 | 12,320 | 68,960 | 0 | 68,960 | 6,600 | 33,150 | 0 | 33,150 | 0 | 0 | 0 | 0 |
| **Mar** | 15,660 | 83,295 | 0 | 83,295 | 16,240 | 85,200 | 0 | 85,200 | 8,700 | 41,850 | 0 | 41,850 | 0 | 0 | 0 | 0 |
| **April** | 16,740 | 100,035 | 50,018 | 50,018 | 17,360 | 102,560 | 51,280 | 51,280 | 9,300 | 51,150 | 25,575 | 25,575 | 0 | 0 | 0 | 0 |
| **May** | 25,515 | 75,533 | 75,533 | 0 | 25,920 | 77,200 | 77,200 | 0 | 12,150 | 37,725 | 37,725 | 0 | 0 | 0 | 0 | 0 |
| **June** | 24,570 | 24,570 | 24,570 | 0 | 24,960 | 24,960 | 24,960 | 0 | 11,700 | 11,700 | 11,700 | 0 | 0 | 0 | 0 | 0 |
| **July** | 24,255 | 24,255 | 24,255 | 0 | 24,640 | 24,640 | 24,640 | 0 | 11,550 | 11,550 | 11,550 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 26,775 | 26,775 | 26,775 | 0 | 27,200 | 27,200 | 27,200 | 0 | 12,750 | 12,750 | 12,750 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 28,980 | 28,980 | 28,980 | 0 | 29,440 | 29,440 | 29,440 | 0 | 13,800 | 13,800 | 13,800 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **276,120** | | **276,120** | | **281,440** | | **281,440** | | **135,000** | | **135,000** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 22

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Reclaimed Areas

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From ponds and wet tailings** | **From dry tailings beach** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| **Nov** | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| **Dec** | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| **Jan** | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| **Feb** | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| **Mar** | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| **April** | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| **May** | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| **June** | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| **July** | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| **Aug** | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| **Sept** | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| **TOTAL** | **613.6** | **703.6** | **900.0** | **360.0** | **630.0** | **720.0** | **0.0** | **0.0** | |

### Runoff Flow (m$^3$ / month)

| **Runoff #** → | **R17 - Natural ground** | | | | **R18 - Reclaimed ground** | | | | **R19 - Pond** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Area (m$^2$)** (from Sheet 16) → | **0** | | | | **0** | | | | **0** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R17** Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R18** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R19** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 23

# Flows Associated with Runoff from Precipitation

Example

## Subwatersheds: Construction Areas

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| Month | Factored Precipitation (from Sheet 10) (mm) | | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|---|
| | From natural ground | From prepared ground | From ponds and wet tailings | From dry tailings beach | From Waste Rock and Overburden Piles | From walls of open pit | From reclaimed area | From construction area | |
| Oct | 71.4 | 81.6 | 102.0 | 40.8 | 71.4 | 81.6 | 0.0 | 0.0 | 100 |
| Nov | 61.6 | 70.4 | 88.0 | 35.2 | 61.6 | 70.4 | 0.0 | 0.0 | 50 |
| Dec | 51.8 | 59.2 | 74.0 | 29.6 | 51.8 | 59.2 | 0.0 | 0.0 | 0 |
| Jan | 41.3 | 47.2 | 59.0 | 23.6 | 41.3 | 47.2 | 0.0 | 0.0 | 0 |
| Feb | 26.4 | 30.8 | 44.0 | 17.6 | 30.8 | 35.2 | 0.0 | 0.0 | 0 |
| Mar | 34.8 | 40.6 | 58.0 | 23.2 | 40.6 | 46.4 | 0.0 | 0.0 | 0 |
| April | 37.2 | 43.4 | 62.0 | 24.8 | 43.4 | 49.6 | 0.0 | 0.0 | 50 |
| May | 56.7 | 64.8 | 81.0 | 32.4 | 56.7 | 64.8 | 0.0 | 0.0 | 100 |
| June | 54.6 | 62.4 | 78.0 | 31.2 | 54.6 | 62.4 | 0.0 | 0.0 | 100 |
| July | 53.9 | 61.6 | 77.0 | 30.8 | 53.9 | 61.6 | 0.0 | 0.0 | 100 |
| Aug | 59.5 | 68.0 | 85.0 | 34.0 | 59.5 | 68.0 | 0.0 | 0.0 | 100 |
| Sept | 64.4 | 73.6 | 92.0 | 36.8 | 64.4 | 73.6 | 0.0 | 0.0 | 100 |
| TOTAL | 613.6 | 703.6 | 900.0 | 360.0 | 630.0 | 720.0 | 0.0 | 0.0 | |

| | Runoff Flow ($m^3$ / month) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Runoff # | R20 - Natural ground | | | | R21 - Construction ground | | | | R22 - Pond | | | | | | | |
| Area ($m^2$) (from Sheet 16) | 0 | | | | 0 | | | | 0 | | | | | | | |
| Month | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | R20 Actual monthly runoff (total available x % runoff) | Left over each month (total available -actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | R21 Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | R22 Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | |

| Notes: | | |
|---|---|---|
| | 1 | Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet. |
| | 2 | The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 34 "Summary of Flows". |
| | 3 | The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff. |

# Sheet 24
# Evaporation Losses

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Lake Evaporation** (from Sheet 10) (mm) |
|---|
| 31.5 |
| 0.0 |
| 0.0 |
| 0.0 |
| 0.0 |
| 0.0 |
| 17.5 |
| 91.0 |
| 108.5 |
| 126.0 |
| 94.5 |
| 56.0 |
| **525.0** |

## Evaporation Losses (m$^3$ / month)

| **Location** → | **Mill & camp site pond** | **Tailings pond & wet tailings** | **Mine Workings pond** | **Waste rock and Overburden Piles pond** | **Water Treatment Collection pond** | **Reclaimed Area Pond** | **Construction Area Pond** | | **Total** |
|---|---|---|---|---|---|---|---|---|---|
| **Flow #** → | **E1** | **E2** | **E3** | **E4** | **E5** | **E6** | **E7** | | |
| **Area (m$^2$)** (from Sheet 16) → | 1,500,000 | 6,250,000 | 1,000,000 | 100,000 | 150,000 | 0 | 0 | 0 | |
| **Oct** | 47,250 | 196,875 | 31,500 | 3,150 | 4,725 | 0 | 0 | 0 | 283,500 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 26,250 | 109,375 | 17,500 | 1,750 | 2,625 | 0 | 0 | 0 | 157,500 |
| **May** | 136,500 | 568,750 | 91,000 | 9,100 | 13,650 | 0 | 0 | 0 | 819,000 |
| **June** | 162,750 | 678,125 | 108,500 | 10,850 | 16,275 | 0 | 0 | 0 | 976,500 |
| **July** | 189,000 | 787,500 | 126,000 | 12,600 | 18,900 | 0 | 0 | 0 | 1,134,000 |
| **Aug** | 141,750 | 590,625 | 94,500 | 9,450 | 14,175 | 0 | 0 | 0 | 850,500 |
| **Sept** | 84,000 | 350,000 | 56,000 | 5,600 | 8,400 | 0 | 0 | 0 | 504,000 |
| **TOTAL** | **787,500** | **3,281,250** | **525,000** | **52,500** | **78,750** | **0** | **0** | **0** | **4,725,000** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The columns are the calculated monthly evaporation that are summarized on Sheet 34 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

# Sheet 25
# Seepage Flows

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Location →** | | **From Mill & Camp site pond** | **From Tailings pond** | **Seepage into the Mine Workings pond** | **From Waste Rock and Overburden Piles pond** | **From Water Treatment collection pond** | **From Reclaimed area pond** | **From Construction Area pond** | | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Seepage # →** | | **S1** | **S2** | **S3** | **S4** | **S5** | **S6** | **S7** | | | |
| **Seepage estimate (m3/day) →** | | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 0 | 0 | |
| **Days/ month** | **Month** | **Seepage ($m^3$ / month)** | | | | | | | | | |
| 31 | **Oct** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 30 | **Nov** | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 0 | 0 | 210,000 |
| 31 | **Dec** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 31 | **Jan** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 28 | **Feb** | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | 0 | 0 | 196,000 |
| 31 | **Mar** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 30 | **April** | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 0 | 0 | 210,000 |
| 31 | **May** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 30 | **June** | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 0 | 0 | 210,000 |
| 31 | **July** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 31 | **Aug** | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 31,000 | 0 | 0 | 217,000 |
| 30 | **Sept** | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 0 | 0 | 210,000 |
| 365 | **TOTAL** | **365,000** | **365,000** | **365,000** | **365,000** | **365,000** | **365,000** | **365,000** | **0** | **0** | **2,555,000** |

**Notes:**

1 Seepage estimates are user-input data. Data are input in the orange shaded cells. The calculations are carried out in the other cells and the relevant data is automatically transferred to other sheets.

2 The information is automatically transferred from other sheets or is calculated on this sheet, except for seepage estimates.

3 The table should start with the same month as the runoff sheets.

4 Seepage released directly to the environment is considered an effluent under MMER and is subject to monitoring requirements.

# Sheet 26

# Miscellaneous Flows

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | **Enter revision number here (e.g., Rev. 1)** |
| | **Date:** | Enter date here | **Model year:** | **Enter the modelled mine year here** |

| **Flow** → | **Water for dust control** | | | **Potable Water** | **Treated Sewage** | | | |
|---|---|---|---|---|---|---|---|---|
| **Flow Number** → | **M1** | | | | **M2** | | | |
| **From Sheet 12** ($m^3$/day) → | Maximum Possible Water for dust control ($m^3$/day) | Percentage used each month ↓ | Volume ↓ | ($m^3$/day) | % of potable water that becomes sewage | | | |
| | 500 | (%) | ($m^3$) | 150 | 85 | | | |

| **days/ month** | **Month** | **Flow ($m^3$ / month)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | **Oct** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 30 | **Nov** | 15,000 | 50 | 7,500 | 4500 | 3,825 | | | |
| 31 | **Dec** | 15,500 | 0 | 0 | 4650 | 3,953 | | | |
| 31 | **Jan** | 15,500 | 0 | 0 | 4650 | 3,953 | | | |
| 28 | **Feb** | 14,000 | 0 | 0 | 4200 | 3,570 | | | |
| 31 | **Mar** | 15,500 | 0 | 0 | 4650 | 3,953 | | | |
| 30 | **April** | 15,000 | 50 | 7,500 | 4500 | 3,825 | | | |
| 31 | **May** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 30 | **June** | 15,000 | 100 | 15,000 | 4500 | 3,825 | | | |
| 31 | **July** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 31 | **Aug** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 30 | **Sept** | 15,000 | 100 | 15,000 | 4500 | 3,825 | | | |
| 365 | **TOTAL** | **182,500** | | **107,000** | **54,750** | **46,538** | | | |

**Notes:**

1 Input data are only required in the orange shaded cells. Other information is extracted from other sheets or is calculated on this sheet.

2 The columns are the calculated monthly miscellaneous flows that are summarized on Sheet 34 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

# Sheet 27
# Accumulated Flow
## Mill & Camp Site Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow F1 to WTP collection pond** ($m^3$/month) |
|---|---|---|---|---|---|---|---|---|---|
| | +R1 | +R2 | +R3 | +M2 | -E1 | -S1 | | | |
| | Runoff from natural ground (from sheet 17) | Runoff from prepared ground (from sheet 17) | Precipitation on the pond (from sheet 17) | Treated sewage (from sheet 26) | Evaporation from the pond (from sheet 24) | Seepage (from sheet 25) | | | |
| **Oct** | 428,400 | 612,000 | 153,000 | 3,953 | -47,250 | -31,000 | | | 1,119,103 |
| **Nov** | 184,800 | 264,000 | 66,000 | 3,825 | 0 | -30,000 | | | 488,625 |
| **Dec** | 0 | 0 | 0 | 3,953 | 0 | -31,000 | | | 0 |
| **Jan** | 0 | 0 | 0 | 3,953 | 0 | -31,000 | | | 0 |
| **Feb** | 0 | 0 | 0 | 3,570 | 0 | -28,000 | | | 0 |
| **Mar** | 0 | 0 | 0 | 3,953 | 0 | -31,000 | | | 0 |
| **April** | 666,900 | 961,500 | 255,750 | 3,825 | -26,250 | -30,000 | | | 1,831,725 |
| **May** | 1,007,100 | 1,447,500 | 377,250 | 3,953 | -136,500 | -31,000 | | | 2,668,303 |
| **June** | 327,600 | 468,000 | 117,000 | 3,825 | -162,750 | -30,000 | | | 723,675 |
| **July** | 323,400 | 462,000 | 115,500 | 3,953 | -189,000 | -31,000 | | | 684,853 |
| **Aug** | 357,000 | 510,000 | 127,500 | 3,953 | -141,750 | -31,000 | | | 825,703 |
| **Sept** | 386,400 | 552,000 | 138,000 | 3,825 | -84,000 | -30,000 | | | 966,225 |
| **TOTAL** | **3,681,600** | **5,277,000** | **1,350,000** | **42,585** | **-740,250** | **-365,000** | **0** | **0** | **9,308,210** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

4 The total flow F1 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 28
# Accumulated Flow
## Tailings Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow** |
|---|---|---|---|---|---|---|---|---|---|
| | +R4 | +R5 | +R6 | +R7 | +P2 | -P4 | -E2 | -S2 | **F2** to collection pond |
| | Runoff from natural ground (from sheet 18) | Runoff from prepared ground (from sheet 18) | Precipitation on the pond (from sheet 18) | Precipitation on Dry tailings beach (from sheet 18) | Discharged with thickeded tailings (from sheet 15) | Water tied up in the tailings (from sheet 15) | Evaporation from the pond (from sheet 24) | Seepage (from sheet 25) | ($m^3$/month) |
| **Oct** | 892,500 | 102,000 | 637,500 | 204,000 | 609,375 | -121,875 | -196,875 | -31,000 | 2,095,625 |
| **Nov** | 385,000 | 44,000 | 275,000 | 88,000 | 609,375 | -121,875 | 0 | -30,000 | 1,249,500 |
| **Dec** | 0 | 0 | 0 | 0 | 609,375 | -121,875 | 0 | -31,000 | 456,500 |
| **Jan** | 0 | 0 | 0 | 0 | 609,375 | -121,875 | 0 | -31,000 | 456,500 |
| **Feb** | 0 | 0 | 0 | 0 | 609,375 | -121,875 | 0 | -28,000 | 459,500 |
| **Mar** | 0 | 0 | 0 | 0 | 609,375 | -121,875 | 0 | -31,000 | 456,500 |
| **April** | 1,389,375 | 160,250 | 1,065,625 | 341,000 | 609,375 | -121,875 | -109,375 | -30,000 | 3,304,375 |
| **May** | 2,098,125 | 241,250 | 1,571,875 | 503,000 | 609,375 | -121,875 | -568,750 | -31,000 | 4,302,000 |
| **June** | 682,500 | 78,000 | 487,500 | 156,000 | 609,375 | -121,875 | -678,125 | -30,000 | 1,183,375 |
| **July** | 673,750 | 77,000 | 481,250 | 154,000 | 609,375 | -121,875 | -787,500 | -31,000 | 1,055,000 |
| **Aug** | 743,750 | 85,000 | 531,250 | 170,000 | 609,375 | -121,875 | -590,625 | -31,000 | 1,395,875 |
| **Sept** | 805,000 | 92,000 | 575,000 | 184,000 | 609,375 | -121,875 | -350,000 | -30,000 | 1,763,500 |
| **TOTAL** | **7,670,000** | **879,500** | **5,625,000** | **1,800,000** | **7,312,500** | **-1,462,500** | **-3,281,250** | **-365,000** | **18,178,250** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F2 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 29
# Accumulated Flow
## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow** |
|---|---|---|---|---|---|---|---|---|---|
| | +R8 | +R9 | +R10 | -E3 | +S3 | | | | **F3** **to collection pond** |
| | Runoff from natural ground (from sheet 19) | Runoff from pit walls (from sheet 19) | Precipitation on the pond (from sheet 19) | Evaporation from the pond (from sheet 24) | Seepage into the open pit (from sheet 25) | | | | ($m^3$/month) |
| **Oct** | 535,500 | 122,400 | 102,000 | -31,500 | 31,000 | | | | 759,400 |
| **Nov** | 231,000 | 52,800 | 44,000 | 0 | 30,000 | | | | 357,800 |
| **Dec** | 0 | 0 | 0 | 0 | 31,000 | | | | 31,000 |
| **Jan** | 0 | 0 | 0 | 0 | 31,000 | | | | 31,000 |
| **Feb** | 0 | 0 | 0 | 0 | 28,000 | | | | 28,000 |
| **Mar** | 0 | 0 | 0 | 0 | 31,000 | | | | 31,000 |
| **April** | 833,625 | 204,600 | 170,500 | -17,500 | 30,000 | | | | 1,221,225 |
| **May** | 1,258,875 | 301,800 | 251,500 | -91,000 | 31,000 | | | | 1,752,175 |
| **June** | 409,500 | 93,600 | 78,000 | -108,500 | 30,000 | | | | 502,600 |
| **July** | 404,250 | 92,400 | 77,000 | -126,000 | 31,000 | | | | 478,650 |
| **Aug** | 446,250 | 102,000 | 85,000 | -94,500 | 31,000 | | | | 569,750 |
| **Sept** | 483,000 | 110,400 | 92,000 | -56,000 | 30,000 | | | | 659,400 |
| **TOTAL** | **4,602,000** | **1,080,000** | **900,000** | **-525,000** | **365,000** | **0** | **0** | **0** | **6,422,000** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F3 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 30
# Accumulated Flow
## Waste Rock and Overburden Piles Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows (m$^3$/month)** | | | | | | | | **Total flow** **F4** to collection pond (m$^3$/month) |
|---|---|---|---|---|---|---|---|---|---|
| | +R11 | +R12 | +R13 | -E4 | -S4 | | | | |
| | Runoff from natural ground (from sheet 20) | Runoff from dumped waste rock (from sheet 20) | Precipitation on the pond (from sheet 20) | Evaporation from the pond (from sheet 24) | Seepage (from sheet 25) | | | | |
| **Oct** | 57,120 | 78,540 | 10,200 | -3,150 | -31,000 | | | | 111,710 |
| **Nov** | 24,640 | 33,880 | 4,400 | 0 | -30,000 | | | | 32,920 |
| **Dec** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -28,000 | | | | 0 |
| **Mar** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **April** | 88,920 | 131,285 | 17,050 | -1,750 | -30,000 | | | | 205,505 |
| **May** | 134,280 | 193,655 | 25,150 | -9,100 | -31,000 | | | | 312,985 |
| **June** | 43,680 | 60,060 | 7,800 | -10,850 | -30,000 | | | | 70,690 |
| **July** | 43,120 | 59,290 | 7,700 | -12,600 | -31,000 | | | | 66,510 |
| **Aug** | 47,600 | 65,450 | 8,500 | -9,450 | -31,000 | | | | 81,100 |
| **Sept** | 51,520 | 70,840 | 9,200 | -5,600 | -30,000 | | | | 95,960 |
| TOTAL | **490,880** | **693,000** | **90,000** | **-52,500** | **-365,000** | | | | **977,380** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F4 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 31
# Accumulated Flow
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | | | | **Total flow D1 to Environment** ($m^3$/month) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | +R14 | +R15 | +R16 | -E5 | -S5 | -M1 | +F1 | +F2 | +F3 | +F4 | -P9 | |
| | Runoff from natural ground (from Sheet 21) | Runoff from prepared ground (from Sheet 21) | Precipitation on the pond (from Sheet 21) | Evaporation from the pond (from Sheet 24) | Seepage (from Sheet 25) | Water for dust control (from Sheet 26) | Flow from mill & camp site watershed (from Sheet 27) | Flow from tailings faciilty watershed (from Sheet 28) | Flow from mine workings (from Sheet 29) | Flow from waste rock and overburden piles (from Sheet 30) | Make-up water demand to the mill (fom Sheet 14) | |
| **Oct** | 32,130 | 32,640 | 15,300 | -4,725 | -31,000 | -15,500 | 1,119,103 | 2,095,625 | 759,400 | 111,710 | -543,750 | 3,570,933 |
| **Nov** | 13,860 | 14,080 | 6,600 | 0 | -30,000 | -7,500 | 488,625 | 1,249,500 | 357,800 | 32,920 | -543,750 | 1,582,135 |
| **Dec** | 0 | 0 | 0 | 0 | -31,000 | 0 | 0 | 456,500 | 31,000 | 0 | -543,750 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -31,000 | 0 | 0 | 456,500 | 31,000 | 0 | -543,750 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -28,000 | 0 | 0 | 459,500 | 28,000 | 0 | -543,750 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | -31,000 | 0 | 0 | 456,500 | 31,000 | 0 | -543,750 | 0 |
| **April** | 50,018 | 51,280 | 25,575 | -2,625 | -30,000 | -7,500 | 1,831,725 | 3,304,375 | 1,221,225 | 205,505 | -543,750 | 6,105,828 |
| **May** | 75,533 | 77,200 | 37,725 | -13,650 | -31,000 | -15,500 | 2,668,303 | 4,302,000 | 1,752,175 | 312,985 | -543,750 | 8,622,020 |
| **June** | 24,570 | 24,960 | 11,700 | -16,275 | -30,000 | -15,000 | 723,675 | 1,183,375 | 502,600 | 70,690 | -543,750 | 1,936,545 |
| **July** | 24,255 | 24,640 | 11,550 | -18,900 | -31,000 | -15,500 | 684,853 | 1,055,000 | 478,650 | 66,510 | -543,750 | 1,736,308 |
| **Aug** | 26,775 | 27,200 | 12,750 | -14,175 | -31,000 | -15,500 | 825,703 | 1,395,875 | 569,750 | 81,100 | -543,750 | 2,334,728 |
| **Sept** | 28,980 | 29,440 | 13,800 | -8,400 | -30,000 | -15,000 | 966,225 | 1,763,500 | 659,400 | 95,960 | -543,750 | 2,960,155 |
| **TOTAL** | **276,120** | **281,440** | **135,000** | **-78,750** | **-365,000** | **-107,000** | **9,308,210** | **18,178,250** | **6,422,000** | **977,380** | **-6,525,000** | **28,848,650** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow D1 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

5 The user should be aware that make-up flows satisfied from the collection pond (flow P9) are not actual flows but represent make-up demand. The user must verify in Sheet 31 that make-up demands are satisfied (no cells should be shaded pink). The user must find alternative make-up source if flow P9 is not sufficient.

# Sheet 32
# Accumulated Flow
## Reclaimed Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows (m$^3$/month)** | | | | | | | | **Total flow<br>D2 to environment<br>(m$^3$/month)** |
|---|---|---|---|---|---|---|---|---|---|
| | +R17 | +R18 | +R19 | -E6 | -S6 | | | | |
| | Runoff from natural ground (from Sheet 22) | Runoff from Reclaimed ground (from Sheet 22) | Precipitation on the pond (from Sheet 22) | Evaporation from the pond (from Sheet 24) | Seepage (from sheet 25) | | | | |
| **Oct** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Nov** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **Dec** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -28,000 | | | | 0 |
| **Mar** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **April** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **May** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **June** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **July** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Aug** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Sept** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **TOTAL** | **0** | **0** | **0** | **0** | **-365,000** | **0** | **0** | **0** | **0** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow D2 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 33
# Accumulated Flow
## Construction Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow** |
|---|---|---|---|---|---|---|---|---|---|
| | +R20 | +R21 | +R22 | -E7 | -S7 | | | | **D3 to environment** |
| | Runoff from natural ground (from Sheet 23) | Runoff from construction ground (from Sheet 23) | Precipitation on the pond (from Sheet 23) | Evaporation from the pond (from Sheet 24) | Seepage (from Sheet 25) | | | | ($m^3$/month) |
| **Oct** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Nov** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **Dec** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -28,000 | | | | 0 |
| **Mar** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **April** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **May** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **June** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **July** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Aug** | 0 | 0 | 0 | 0 | -31,000 | | | | 0 |
| **Sept** | 0 | 0 | 0 | 0 | -30,000 | | | | 0 |
| **TOTAL** | **0** | **0** | **0** | **0** | **-365,000** | **0** | **0** | **0** | **0** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 34 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow D3 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 34
# Water Balance Summary of Flows

**Example**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Project #:** | Enter project number here | **Date:** | Enter date here | **Revision #** | Enter revision number here (e.g., Rev. 1) | **Model year:** | modelled mine year here |

| | | | Flow ($m^3$) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **April** | **May** | **June** | **July** | **Aug** | **Sept** | **TOTAL** |
| **Flows associated with processing the ore** | | | | | | | | | | | | | | | |
| P1 | Discharge from the mill to the tailings thickener | | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 7,312,500 |
| P2 | Discharge from thickener to tailings disposal facilty | | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 609,375 | 7,312,500 |
| P3 | Overflow from the thickener recycled to the mill | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P4 | Water retained in the consolidated tailings mass | | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 121,875 | 1,462,500 |
| P5 | Moisture going into the mill with the ore | | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 16,667 | 200,000 |
| P6 | Moisture leaving the mill in the concentrate | | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 12,500 |
| P7 | Fresh make-up water required in the mill | | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 62,500 | 750,000 |
| P8 | Losses in the mill to evaporation and spillage etc. | | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 12,500 | 150,000 |
| P9 | Water that is either required to run the mill from the tailings facilit | | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 543,750 | 6,525,000 |
| P10 | Make-up water from the Mine Workings | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P11 | Reclaim Water from the tailings impoundment to the Mill | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P12 | Make-up water from the waste rock and overburden piles | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Flows associated with runoff from precipitation** | | | | | | | | | | | | | | | |
| R1 | Mill and Camp Site | Runoff from natural ground | 428,400 | 184,800 | 0 | 0 | 0 | 0 | 666,900 | 1,007,100 | 327,600 | 323,400 | 357,000 | 386,400 | 3,681,600 |
| R2 | | Runoff from prepared ground | 612,000 | 264,000 | 0 | 0 | 0 | 0 | 961,500 | 1,447,500 | 468,000 | 462,000 | 510,000 | 552,000 | 5,277,000 |
| R3 | | Precipitation direct to the pond | 153,000 | 66,000 | 0 | 0 | 0 | 0 | 255,750 | 377,250 | 117,000 | 115,500 | 127,500 | 138,000 | 1,350,000 |
| R4 | Tailings Facility | Runoff from natural ground | 892,500 | 385,000 | 0 | 0 | 0 | 0 | 1,389,375 | 2,098,125 | 682,500 | 673,750 | 743,750 | 805,000 | 7,670,000 |
| R5 | | Runoff from prepared ground | 102,000 | 44,000 | 0 | 0 | 0 | 0 | 160,250 | 241,250 | 78,000 | 77,000 | 85,000 | 92,000 | 879,500 |
| R6 | | Precipitation direct to the pond & wet tailings | 637,500 | 275,000 | 0 | 0 | 0 | 0 | 1,065,625 | 1,571,875 | 487,500 | 481,250 | 531,250 | 575,000 | 5,625,000 |
| R7 | | Runoff from dry tailings beach | 204,000 | 88,000 | 0 | 0 | 0 | 0 | 341,000 | 503,000 | 156,000 | 154,000 | 170,000 | 184,000 | 1,800,000 |
| R8 | Mine Workings | Runoff from natural ground | 535,500 | 231,000 | 0 | 0 | 0 | 0 | 833,625 | 1,258,875 | 409,500 | 404,250 | 446,250 | 483,000 | 4,602,000 |
| R9 | | Runoff from the pit walls | 122,400 | 52,800 | 0 | 0 | 0 | 0 | 204,600 | 301,800 | 93,600 | 92,400 | 102,000 | 110,400 | 1,080,000 |
| R10 | | Precipitation direct to the pond | 102,000 | 44,000 | 0 | 0 | 0 | 0 | 170,500 | 251,500 | 78,000 | 77,000 | 85,000 | 92,000 | 900,000 |
| R11 | Water for dust control (from the | Runoff from natural ground | 57,120 | 24,640 | 0 | 0 | 0 | 0 | 88,920 | 134,280 | 43,680 | 43,120 | 47,600 | 51,520 | 490,880 |
| R12 | | Runoff from the waste rock and overburden piles | 78,540 | 33,880 | 0 | 0 | 0 | 0 | 131,285 | 193,655 | 60,060 | 59,290 | 65,450 | 70,840 | 693,000 |
| R13 | | Precipitation direct to the pond | 10,200 | 4,400 | 0 | 0 | 0 | 0 | 17,050 | 25,150 | 7,800 | 7,700 | 8,500 | 9,200 | 90,000 |
| R14 | Water Treatment | Runoff from natural ground | 32,130 | 13,860 | 0 | 0 | 0 | 0 | 50,018 | 75,533 | 24,570 | 24,255 | 26,775 | 28,980 | 276,120 |
| R15 | | Runoff from prepared ground | 32,640 | 14,080 | 0 | 0 | 0 | 0 | 51,280 | 77,200 | 24,960 | 24,640 | 27,200 | 29,440 | 281,440 |
| R16 | | Precipitation direct to the pond | 15,300 | 6,600 | 0 | 0 | 0 | 0 | 25,575 | 37,725 | 11,700 | 11,550 | 12,750 | 13,800 | 135,000 |
| R17 | Reclaimed Area | Runoff from natural ground | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R18 | | Runoff from reclaimed ground | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R19 | | Precipitation direct to the pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R20 | Construction Area | Runoff from natural ground | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R21 | | Runoff from construction ground | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R22 | | Precipitation direct to the pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Evaporation** | | | | | | | | | | | | | | | |
| E1 | From the Mill and Camp site pond | | -47,250 | 0 | 0 | 0 | 0 | 0 | -26,250 | -136,500 | -162,750 | -189,000 | -141,750 | -84,000 | -740,250 |
| E2 | From the Tailings pond & wet tailings | | -196,875 | 0 | 0 | 0 | 0 | 0 | -109,375 | -568,750 | -678,125 | -787,500 | -590,625 | -350,000 | -3,281,250 |
| E3 | From the Mine Workings pond | | -31500 | 0 | 0 | 0 | 0 | 0 | -17,500 | -91,000 | -108,500 | -126,000 | -94,500 | -56,000 | -525,000 |
| E4 | From the Waste Rock and Overburden Piles pond | | -3,150 | 0 | 0 | 0 | 0 | 0 | -1,750 | -9,100 | -10,850 | -12,600 | -9,450 | -5,600 | -52,500 |
| E5 | From the collection pond at the Water Treatment Plant | | -4,725 | 0 | 0 | 0 | 0 | 0 | -2,625 | -13,650 | -16,275 | -18,900 | -14,175 | -8,400 | -78,750 |
| E6 | From the Reclaimed Area Pond | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E7 | From the Construction Area Pond | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Seepage** | | | | | | | | | | | | | | | |
| S1 | From the Mill and Camp site pond | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| S2 | From the Tailings pond | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| S3 | Seepage into the Mine Workings | | 31,000 | 30,000 | 31,000 | 31,000 | 28,000 | 31,000 | 30,000 | 31,000 | 30,000 | 31,000 | 31,000 | 30,000 | 365,000 |
| S4 | From the Waste Rock and Overburden Piles pond | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| S5 | From collection pond at the Water Treatment Plant | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| S6 | From the Reclaimed Area pond | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| S7 | From the Construction Area pond | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| **Miscellaneous flows** | | | | | | | | | | | | | | | |
| M1 | Water for dust control (from the collection pond at the Water Trea | | 15,500 | 7,500 | 0 | 0 | 0 | 0 | 7,500 | 15,500 | 15,000 | 15,500 | 15,500 | 15,000 | 107,000 |
| M2 | Treated sewage water discharged to the Mill and Camp site pond | | 3,953 | 3,825 | 3,953 | 3,953 | 3,570 | 3,953 | 3,825 | 3,953 | 3,825 | 3,953 | 3,953 | 3,825 | 46,538 |
| **Surface flows between elements** | | | | | | | | | | | | | | | |
| F1 | From Mill and Camp site pond to collection pond at the Water Tre | | 1,119,103 | 488,625 | 0 | 0 | 0 | 0 | 1,831,725 | 2,668,303 | 723,675 | 684,853 | 825,703 | 966,225 | 9,308,210 |
| F2 | From Tailings pond to collection pond at the Water Treatment Pla | | 2,095,625 | 1,249,500 | 456,500 | 456,500 | 459,500 | 456,500 | 3,304,375 | 4,302,000 | 1,183,375 | 1,055,000 | 1,395,875 | 1,763,500 | 18,178,250 |
| F3 | From Mine Workings pond to collection pond at the Water Treatn | | 759,400 | 357,800 | 31,000 | 31,000 | 28,000 | 31,000 | 1,221,225 | 1,752,175 | 502,600 | 478,650 | 569,750 | 659,400 | 6,422,000 |
| F4 | From Waste Rock and Overburden Piles pond to collection pond | | 111,710 | 32,920 | 0 | 0 | 0 | 0 | 205,505 | 312,985 | 70,690 | 66,510 | 81,100 | 95,960 | 977,380 |
| **Discharge to the environment** | | | | | | | | | | | | | | | |
| D1 | From the Water Treatment Plant polishing pond to the environme | | 3,570,933 | 1,582,135 | 0 | 0 | 0 | 0 | 6,105,828 | 8,622,020 | 1,936,545 | 1,736,308 | 2,334,728 | 2,960,155 | 28,848,650 |
| D2 | From the Reclaimed Area pond to the environment | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| D3 | From the Construction Area pond to the environment | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Note:** Input of data is not required on this sheet, The information is automatically transferred from the other sheets.

The user should be aware that make-up flows satisfied from the collection pond (flow P9) are not actual flows but represent make-up demand. The user must verify in Sheet 31 that make-up demands are satisfied (no cells should be shaded pink). The user must find alternative make-up source if flow P9 is not sufficient.

# Sheet 35

Example

## Summary of Key Input Data Used in this Model Run

| Background information (from Cover Sheet) | |
|---|---|
| Mine | Enter mine name here |
| Product | Enter ore mined here |
| Revision # | Enter revision number here (e.g., Rev. 1) |
| Date | Enter date here |
| Level of study | Enter level of study here (e.g., feasibility, detail design) |
| Model year | Enter the modelled mine year here |
| Project # | Enter project number here |

| Operating data (from Sheet 12) | | |
|---|---|---|
| Ore reserve | 100.00 | Mt |
| Production rate | 5,000,000 | t/y |
| Mill availability | 90 | % |
| Factor of safety | 1.00 | - |
| Tailings / ore ratio | 0.975 | - |

| Water inputs (from Sheet 12) | | |
|---|---|---|
| Ore water content | 4.0 | % of total weight |
| Water leaving in concentrate | 10.0 | % of total weight |
| Minimum clean water required in the mill | 10.0 | % of total water in tailings |
| Water lost in mill to evaporation & spillage | 2.0 | % of total water in tailings |
| Water required for dust control | 500 | $m^3/d$ |
| Potable water required | 150 | $m^3/d$ |
| Portion of potable water to sewage | 85 | % |

| Precipitation & evaporation (from Sheet 10) | | |
|---|---|---|
| 100 year dry return precipitation | 625 | mm/y |
| Mean precipitation | 900 | mm/y |
| 100 year wet return precipitation | 1,200 | mm/y |
| Precipitation used | 900 | mm/y |
| Runoff factor - natural ground | 68 | % |
| Runoff factor - prepared ground | 78 | % |
| Runoff factor - ponds and wet tailings | 100 | % |
| Runoff factor - dry tailings | 40 | % |
| Runoff factor - waste rock and overburden piles | 70 | % |
| Runoff factor - walls of open pit | 80 | % |
| Runoff factor - reclaim areas | 0 | % |
| Runoff factor - construction areas | 0 | % |
| 100 year dry return pan evaporation | 900 | mm/y |
| Mean pan evaporation | 750 | mm/y |
| 100 year wet return pan evaporation | 500 | mm/y |
| Pan evaporation used | 750 | mm/y |
| Factor - pan to lake evaporation | 0.70 | % |

| Collecting watershed areas (from Sheet 16) | | |
|---|---|---|
| Mill and camp site | 15,000,000 | $m^2$ |
| Tailings facility | 25,000,000 | $m^2$ |
| Open pit mine | 10,000,000 | $m^2$ |
| Waste rock and Overburden Piles | 2,000,000 | $m^2$ |
| Water Treatment Collection pond | 1,000,000 | $m^2$ |
| Reclaimed areas | 0 | $m^2$ |
| Construction areas | 0 | $m^2$ |
| TOTAL | 53,000,000 | $m^2$ |

**Notes:** 1 Input data are not required on this sheet. The information is automatically linked from the cover and Sheets 10, 12, and 16.

# Sheet 36 (1 of 6)
# Mass Balance Module
## Input Concentrations

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from Natural Ground These concentration will be assigned to Flows: R1, R4, R8, R11, R14, R17, R20

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from prepared ground These concentration will be assigned to Flows: R2, R5, R15

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with direct precipitation on ponds These concentration will be assigned to Flows: R3, R6, R10, R13, R16, R19, R22

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from dry tailings beach These concentration will be assigned to Flows: R7

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from pit walls These concentration will be assigned to Flows: R9

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 36 (2 of 6)
# Mass Balance Module

Example

## Input Concentrations

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from the waste rock and overburden piles These concentration will be assigned to Flows: R12

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with discharge from thickener to tailings facility These concentration will be assigned to Flows: P2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with seepage into the Mine Workings These concentration will be assigned to Flows: S3

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from reclaimed ground These concentration will be assigned to Flows: R18

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from construction ground These concentration will be assigned to Flows: R21

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.in subsequent sheets for mass loading calculations.

# Sheet 36 (3 of 6)

# Mass Balance Module

## Input Concentrations

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with treated sewage water from the mine camp These concentration will be assigned to Flows: M2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 36 (4 of 6)
# Mass Balance Module
## Input Concentrations

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from Natural Ground These concentration will be assigned to Flows: R1, R4, R8, R11, R14, R17, R20

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from prepared ground These concentration will be assigned to Flows: R2, R5, R15

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with direct precipitation on ponds These concentration will be assigned to Flows: R3, R6, R10, R13, R16, R19, R22

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from dry tailings beach These concentration will be assigned to Flows: R7

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from pit walls These concentration will be assigned to Flows: R9

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 36 (5 of 6)

# Mass Balance Module

## Input Concentrations

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from the waste rock and overburden piles These concentration will be assigned to Flows: R12

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with discharge from thickener to tailings facility These concentration will be assigned to Flows: P2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with seepage into the Mine Workings These concentration will be assigned to Flows: S3

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from reclaimed ground These concentration will be assigned to Flows: R18

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Concentration associated with runoff from construction ground These concentration will be assigned to Flows: R21

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 36 (6 of 6)

# Mass Balance Module

## Input Concentrations

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with treated sewage water from the mine camp These concentration will be assigned to Flows: M2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 37 (1 of 2)
# Mass Balance Module

Example

## Input Concentrations and Flows from Receiving Environment, Upstream from the Compliance Point

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Flow and Concentration associated to the receiving environment at compliance point 1

| Month | RE1 | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow (m³/month) | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 2

| Month | RE2 | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow (m³/month) | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 3

| Month | RE3 | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow (m³/month) | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration and flows tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The values entered in this sheet are used in subsequent sheets for mass loading calculations.
The user should note that the dark orange shaded cells are for flow input. These represent the flows that are measured or estimated upstream of the compliance point.

# Sheet 37 (2 of 2)
# Mass Balance Module

Example

## Input Concentrations and Flows from Receiving Environment, Upstream from the Compliance Point

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Flow and Concentration associated to the receiving environment at compliance point 1

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 3

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note:** The concentration and flows tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 38 (1 of 2)
# Computed Loads
## Mill & Camp Site Watershed

**Example**

| From cover sheet | **Mine:** | Enter mine name here | | |
|---|---|---|---|---|
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R1 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | al Dissolved So | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R2 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | al Dissolved So | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R3 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | al Dissolved So | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads from M2 (flow from sheet 26 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | al Dissolved So | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Load for F1**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | al Dissolved So | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 38 (2 of 2)
# Computed Loads
## Mill & Camp Site Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R1 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R2 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R3 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R3 (flow from sheet 27 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Load for F1**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 39 (1 of 4)
# Computed Loads
## Tailings Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R4 (flow from sheet 28 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R5 (flow from sheet 28 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R6 (flow from sheet 28 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R7 (flow from sheet 28 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 39 (2 of 4)
# Computed Loads
## Tailings Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at P2 (flow from sheet 28 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Load for F2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 39 (3 of 4)
# Computed Loads
## Tailings Facility Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R4 (flow from sheet 28 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R5 (flow from sheet 28 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R6 (flow from sheet 28 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R7 (flow from sheet 28 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 39 (4 of 4)
# Computed Loads
## Tailings Facility Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at P2 (flow from sheet 28 * Concentrations from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Load for F2**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

For Discussion Purposes Only

# Sheet 40 (1 of 4)
# Computed Loads

## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R8 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | Suspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R9 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | Suspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R10 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | Suspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at S3 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | Suspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 40 (2 of 4)
# Computed Loads
## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Load for F3**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 40 (3 of 4)
# Computed Loads
## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R8 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R9 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R10 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at S3 (flow from sheet 29 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet.  The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 40 (4 of 4)
# Computed Loads
## Mine Workings Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Load for F3**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 41 (1 of 2)
# Computed Loads

## Waste Rock and Overburden Piles Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R11 (flow from sheet 30 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R12 (flow from sheet 30 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R13 (flow from sheet 30 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Load for F4**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 41 (2 of 2)
# Computed Loads
## Waste Rock and Overburden Piles Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R11 (flow from sheet 30 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R12 (flow from sheet 30 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R13 (flow from sheet 30 * Concentrations from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Load for F4**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 42 (1 of 4)
# Computed Loads
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R14 (flow from sheet 31, parameters from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R15 (flow from sheet 31, parameters from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R16 (flow from sheet 31, parameters from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at F1 (from sheet 38)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** 1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 42 (2 of 4)
# Computed Loads
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project :** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at F2 (from sheet 39)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at F3 (from sheet 40)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at F4 (from sheet 41)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads for D1**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 42 (3 of 4)
# Computed Loads
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R14 (flow from sheet 31, parameters from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R15 (flow from sheet 31, parameters from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R16 (flow from sheet 31, parameters from sheet 36)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at F1 (from sheet 38)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** 1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 42 (4 of 4)
# Computed Loads
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at F2 (from sheet 39)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenur | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at F3 (from sheet 40)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenur | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at F4 (from sheet 41)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenur | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads for D1**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenur | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 43 (1 of 2)
# Computed Loads
## Reclaimed Area Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R17 (flow from sheet 32, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R18 (flow from sheet 32, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R19 (flow from sheet 32, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at D2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 43 (2 of 2)
# Computed Loads
## Reclaimed Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R17 (flow from sheet 32, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R18 (flow from sheet 32, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R19 (flow from sheet 32, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at D2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 44 (1 of 2)
# Computed Loads
## Construction Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R20 (flow from sheet 33, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R21 (flow from sheet 33, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R22 (flow from sheet 33, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Discharge at D3**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 44 (2 of 2)
# Computed Loads
## Construction Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R20 (flow from sheet 33, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R21 (flow from sheet 33, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Computed Loads at R22 (flow from sheet 33, parameters from sheet 36)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Discharge at D3**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 45 (1 of 2)
# Concentrations at Discharge Point

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Concentrations at D1**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | Magnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Concentrations at D2**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | Magnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Concentrations at D3**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | Magnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

# Sheet 45 (2 of 2)
# Concentrations at Discharge Point

**Example**

| From cover sheet | **Mine:** | Enter mine name here | | |
|---|---|---|---|---|
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Concentrations at D1**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Concentrations at D2**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Concentrations at D3**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

# Sheet 46
# Water Quality Criteria - Reference

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**The water quality criteria presented here are provided for reference purposes and do not constitute a comprehensive list of water quality criteria for a mine site. This list must be updated based on mine operations.**
**If a parameter of concern is not listed here, the reference documents should be consulted and this table should be updated accordingly.**

| Parameters | | | Sulphate | Chloride | Cyanide | Total Ammonia | Nitrate | Nitrite | Sodium | Aluminium | Antimony | Arsenic | Barium | Boron | Cadmium | Chromium | Copper | Iron | Lead | Magnesium | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Thallium | Tin | Uranium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit | | | mg/L | mg/L | mg/L | mg/L | mg nitrate /L | mg nitrite nitrogen/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| MMER(1) | | MAX Monthly mean(2) | | | 1 | | | | | | | 0.5 | | | | | 0.3 | | 0.2 | | | | | 0.5 | | | | | | 0.5 |
| | | MAX Grab(3) | | | 2 | | | | | | | 1 | | | | | 0.6 | | 0.4 | | | | | 1 | | | | | | 1 |
| CCME Water Guidelines | Drinking Water Community Guidelines(10) | MAC | | | 0.2 | | 45(12) | 3.2(12) | | | 0.006 | 0.01 | 1 | 5 | 0.005 | 0.05 | | | 0.01 | | | 0.001 | | | 0.01 | | | | 0.02 | |
| | | AO/OG | ≤500 | ≤250 | | | | | ≤200 | 0.1/0.2(11) | | | | | | | ≤1 | <0.3 | | | ≤0.05 | | | | | | | | | ≤5 |
| | Canadian Water Quality Guidelines for the Protection of Aquatic Life(4) | Freshwater | | | 0.005 (as free cyanide) | 0.019 (in-ionized) | 13(8) | 0.06(9) | | 0.005 - 0.1(5) | | 0.005 | | | 0.000017(6) | 0.0089 (Cr(III))<br>0.001 (Cr(VI)) | 0.002 - 0.004(6) | 0.3 | 0.001 - 0.007(6) | | | 0.000026 (Inorganic)<br>0.000004 (Methylmercury) | 0.073 | 0.025 - 0.150(6) | 0.001 | 0.0001 | 0.0008 | | | 0.03 |

**Notes:**

1 All concentrations are for total values (MMER, 2002)
2 Maximum Monthly Mean Authorized Concentration in a Composite Sample
3 Maximum Authorized Concentration in a Grab Sample
4 Guideline values apply to the total element or substance in an unfiltered sample, unless otherwise specified (CCME, 2006)
5 pH dependant parameter
6 Hardness dependant parameter
7 Valence dependant parameter
8 Guidelines are expressed in mg nitrate/L. This value is equivalent to 2.9 mg nitrate-nitrogen/L for freshwater aquatic life
9 Guidelines are expressed in mg/ nitrite nitrogen/L. This value is equivalent to 0.197 mg nitrite/L
10 Guidelines for Canadian Drinking Water Quality (Health Canada, 2008)
11 This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance values of 0.1 mg/L applies to conventional treatment plants and 0.2 mg/L applies to other types of treatment systems
12 Guidelines are expressed as mg/L and are equivalent to 10 mg/L as nitrate-nitrogen. Where nitrate and nitrite are determined separately, levels of nitrite should not exceed 3.2 mg/L
MAC Maximum Acceptable Concentration
AO Aesthetic Objective
OG Operational Guidance Values

# Sheet 47 (1 of 2)
# Water Quality at the Compliance Points

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Water Quality (concentration) at Compliance Point 1**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **WQ Criteria** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Water Quality (concentration) at Compliance Point 2**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **WQ Criteria** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Water Quality (concentration) at Compliance Point 3**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesiun | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **WQ Criteria** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Notes:** The user is required to input in the orange shaded cells the water quality criteria for each parameter of concern based on the references provided in Sheet 46

Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

🟪 Purple shaded cells indicate that the water quality at the compliance point is above the Selected Criteria

# Sheet 47 (2 of 2)
# Water Quality at the Compliance Points

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Water Quality (concentration) at Compliance Point 1**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **WQ Criteria** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Oct** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **July** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Water Quality (concentration) at Compliance Point 2**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **WQ Criteria** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Water Quality (concentration) at Compliance Point 3**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **WQ Criteria** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Oct** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Nov** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **April** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **May** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **June** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **July** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Aug** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Sept** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |

**Notes:** The user is required to input in the orange shaded cells the water quality criteria for each parameter of concern based on the references provided in Sheet 46

Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

🟪 Purple shaded cells indicate that the water quality at the compliance point is above the Selected Criteria

# APPENDIX C

## Input and Output Sheets of the Excel-Based Water and Mass Balance Model for Heap Leach Facilities

# Guidance Document - Template
# Water and Mass Balance Model

## Operating Data & Site Deterministic Flow and Water Quality Model for Mine Development

**Golder cannot be held responsible of any water and mass balance results produced by others with this model template. It remains the responsibility of the user to verify the validity of the model for their mine development(s) and to perform required adjustments to the model's structure and equations to satisfy the needs of their specific project(s).**

| | |
|---|---|
| Mine | Enter mine name here |
| Owner(s) | Enter owner(s) name here |
| Operator | Enter operator's name here |
| Location | Enter mine location here |
| Product | Enter ore mined here |
| Revision # | Enter revision number here (*e.g.* , Rev. 1) |
| Date | Enter date here |
| Level of study | Enter level of study here (*e.g.* , feasibility, detail design) |
| Modeled Mine Year | Enter the modelled mine year here |
| Project # or Name | Enter project number here |

Orange shaded cells require data input from the user. Relevant data is automatically transferred to other sheets.

**Golder Associates**

# Sheet 2
# Table of Contents

**Update this page to reflect the model organization**

Sheet

# Sheet 3

# Project & Site Characteristics

(brief explanations)

**Example**

| **Background** | |
|---|---|
| Mine | Enter mine name here |
| Location | Enter mine location here |
| Product | Enter ore mined here |
| Revision # | Enter revision number here (e.g., Rev. 1) |
| Date | Enter date here |
| Project # | Enter project number here |

| **Project** | |
|---|---|
| Type of mine | Open pit and/or underground |
| Type of ore body | Enter type of ore body here |
| Ore reserve | Enter ore reserve here |
| Production rate | Enter estimated production rate here |
| Extraction process | Enter extraction process here |
| Geochemistry issues | Enter known geochemistry issues here |

| **Site** | |
|---|---|
| Elevation | Enter approximate site elevation here |
| Topography | Enter general topography description here |
| Vegetation | Enter general vegetation description here |
| Precipitation (mean annual) | Enter mean annual precipitation here |
| Evaporation (mean - pan or lake) | Enter mean evaporation here; clarify if pan or lake |
| Temperature range | Enter average temperature range here |
| Bedrock geology | Enter brief bedrock geology description here |
| Surfacial geology | Enter brief surficial geology description here |
| Seismic risk (high, medium, low) | Enter seismic risk here |
| Watersheds | Enter total watershed area here |
| Receiving watershed | Enter name of receiving watershed here |
| Local population | Enter approximate local population number here |
| Downstream user requirements | Enter downstream user requirements here |
| Social constraints | Enter brief description of social constraints here |
| Archaeological constraints | Enter brief description of archaeological constraints here |
| Environmental constraints | Enter brief description of environmental constraints here |

**Note:**
1. Input from the user is **suggested** in the orange shaded cells on this sheet.
2. Information presented in this sheet is for **user information only** and is not used elsewhere in the model.

# Sheet 4
# Commonly Used Units, Symbols and Abbreviations

## FACTORS

| | |
|---|---|
| G | giga *(billion $10^9$)* |
| M | mega *(million $10^6$)* |
| k | kilo *(thousand $10^3$)* |
| c | centi *(hundredth $10^{-2}$)* |
| m | milli *(thousandth $10^{-3}$)* |
| µ | micro *(millionth $10^{-6}$)* |

## LENGTH

| | |
|---|---|
| m | metre *(basic unit)* |
| km | kilometre (*1,000 m)* |
| cm | centimetre *(1/100 m)* |
| mm | millimetre *(1/1,000 m)* |
| µm or µ | micrometre *(1/1,000,000 m)* |

## VOLUME

| | |
|---|---|
| V | volume *($V_v$ - voids, $V_s$ - solids, $V_w$ - water, $V_t$ - total)* |
| L | Litre *(1,000 $cm^3$)* |
| $m^3$ | cubic metre |
| $cm^3$ | cubic centimetre |
| gal | gallon *(US or imperial as stated)* |
| M-$m^3$ | million cubic metres |

## MASS *(Note 1)*

| | |
|---|---|
| g of gm | gram *("g" is also used for acceleration due to gravity)* |
| kg | kilogram *(1,000 g - basic unit)* |
| t | ton *(1,000 kg - metric unless otherwise stated)* |

## TIME

| | |
|---|---|
| sec or s | second *(basic unit)* |
| min | minute |
| hr or h | hour |
| mo | month |
| y or yr | year |

## AREA

| | |
|---|---|
| ha | hectare *(10,000 $m^2$)* |
| $km^2$ | square kilometre *(1,000,000 $m^2$)* |
| $m^2$ | square meter |
| $cm^2$ | square centimetre |

## SOIL (TAILINGS) PROPERTIES

| | |
|---|---|
| e | void ratio *(volume voids / volume solids)* |
| n | porosity *(volume voids / total volume)* |
| $\omega$ | water content by solids mass *(mass water / mass dry solids - **Note 2**)* |
| $\omega_t$ | water content by total mass *(mass water / total mass - **Note 2**)* |
| $\omega_v$ | water content by total volume *(volume water / total volume)* |
| S or $C_w$ | slurry density *(mass solids / total mass - **Note 3**)* |
| $C_v$ | solids content by total volume *(volume solids / total volume - **Note 3**)* |
| s | degree of saturation *(volume water / volume voids)* |
| $\rho$ | density *(mass / unit volume - **Note 4**)* |
| $\rho_s$ | density of solid particles *(mass solids / volume of solids)* |
| $\rho_d$ | dry density *(dry mass solids / total volume)* |
| $\rho_t$ | total or bulk density *(total mass / total volume)* |
| $\rho_w$ | density of water (liquor, supernatant) *(mass water / volume water)* |
| $\rho'$ | buoyant density ($\rho_{t\ (saturated)} - \rho_w$) |
| $G_s$ | specific gravity of solid particles ($\rho_s$ / $\rho_w$) ***(Note 5)*** |
| $\sigma$ | pressure of stress |

## NOTES:

1 "Mass" and "Weight" are often incorrectly interchanged. Mass (or inertia) is a constant of an object iregardless of where it is in the universe. It is a measure of the amount of matter that an object contains and it controls the response of an object to an applied force. Weight is the gravitational force that causes a downward acceleration. This is Newton's second law (F=Ma) where Weight = mass x g (acceleration due to gravity).

2 In soil mechanics water content "$\omega$" is expressed as a percentage of the mass of water to the dry mass of solids. In process engineering water content "$\omega_t$" is normally expressed as the mass of water over the total mass (solids plus water).

3 In pumping terminology the symbol for slurry density is "$C_w$" and solids content by volume is "$C_v$"

4 "Unit Weight" is often incorrectly used instead of "density". An older symbol for density (in imperial units) was "$\gamma$" which is now reserved for unit weight.

5 The density of water ($\rho_w$) in the metric system is unity, therefore "$G_s$" of the solid particles and "$\rho_s$" have the same value.

6 The mass balance module assumes mass conservation. For non-conservative parameters, the use of thermodynamic equilibrium software, such as PHREEQC, is recommended.

# Sheet 5

# Modelling Philosophy

Water Management is an essential component of mining as water must be controlled to gain access to the mine workings and is typically required in ore extraction processes. The quantity and chemical quality of released mine effluents must also be managed since this source of water may have an impact on the receiving environment and downstream water users. The precipitation and process flows have to pass through a disposal facility over the entire life of a mine. The challenge is to allow this to safely happen over a wide range of climatic and operating conditions in a facility that is continuously growing and expanding.

Water and mass balance models are decision support tools for mining projects and are intended to assist operators with mine site water management, and regulators with the assessment of regulatory compliance. Models are frequently used in the mining industry to substantiate water management alternatives and key infrastructure components, and to assess the uncertainty underlying current and future water management scenarios. They allow assessment of several mine plan options, and evaluate environmental impacts over the mine life and assess cumulative effects and risks over time.

A simple deterministic water and mass balance model built on linked Excel spreadsheets, along with sound engineering judgment, may be adequate to provide a basic understanding of flows and effluent water quality over a given range of operating and climatic conditions. This deterministic water and mass balance model is meant to summarize the components required for the calculation of water movements within the mine development area, and be used for the prediction of mine water chemical quality. The model is based on simplified assumptions and greater model complexity may be required to assess the performance of more elaborate water management systems and complex mining projects conditions.

Ultimately, simulation software (*e.g.* , GoldSim or other) should be used to develop dynamic flow models and predict long term contaminant loadings and environmental performance over the entire life of a mine using precedent precipitation data. The water chemistry parameters, contaminant loadings and rates of contaminant decay can be input into such models.

The use of a spreadsheet-based deterministic model may limit the flexibility to model the water and mass balance of a mine development. Increased length of the simulation period and greater complexity of the water management infrastructure and operations will eventually lead to a spreadsheet -based model that becomes too onerous to operate. General purpose simulators may be used as replacements to spreadsheet-based deterministic water and mass balance models. Refer to the Guidance document for more information on limitations of spreadsheet-based deterministic models and a discussion on general purpose simulators and more complex loading and receiving water models.

# Sheet 6

# Model Set-up

### APPROACH

As is discussed on the previous sheet, a deterministic water and mass balance model is a predictive tool that is used to predict flows, mass loadings and/or concentrations, and to develop a water management plan over a wide range of operating and climatic conditions for a mine site that is continuously growing and expanding over a period of many years. Care must be taken not to build sophistication into the model that is not warranted. The model should be a living tool that can evolve as the mine develops. A suitable deterministic water and mass balance model should have the following characteristics:

- Simple to use with easily recognizable input data;
- Transparent (easy to understand, scrutinize, and criticize - any flow can be easily checked);
- Easy to vary the model input data to represent changes in the mine operations;
- Able to carry out sensitivity analyses to determine the significance of various flows; and,
- Capable of being used by designers, operating personnel and regulators during the design and operating life of the mine

### NOTES

- The model is essentially a collection of the data that is required to develop the water management plan for a potential mine site.
- This flow model template is developed using linked Excel spreadsheets. Input data are only required in the orange shaded cells. The calculations are automatically carried out and linked to the relevant cells on other sheets.
- Sheet 7 described the flows and assumptions used in the model. The user should update this sheet to reflect any changes made to the model.
- Sheets 8 and 9 present the water balance flow diagram and its associated list of flow components. The user must update sheets 8 and 9 to reflect project specific conditions and settings.
- Precipitation, runoff and evaporation data are input on Sheet 10. The data on this sheet can be easily manipulated to model the impact of varying climatic conditions.
- The production schedule information is required on Sheet 11 so that flow predictions can be made as the mine develops. However, this flow model template was developed to only consider 1 mine year at a time.
- Some input parameters are required for the calculation of flows associated with the processing of the ore. These are listed on Sheet 12 entitled "Operating Data". In addition any miscellaneous flows that could impact water management on site must be provided on this sheet.
- The basic waste rock properties should be understood. Sheet 12 in the model template is where the basic properties can be summarized.
- If the fresh make-up water that is required in the Process Plant and the losses in the Process Plant to evaporation and spillage are not provided, they can be simply estimated by assuming them as a percentage of the total flow through the Process Plant and then calculating the volume of water per ton of ore Process Planted on Sheet 13 entitled "Estimation of Fresh Process Make-up Water Required in the Process Plant & Losses to Evaporation and Spillage in the Process Plant".
- The calculated (derived) data and monthly flows associated with the processing of the ore are automatically calculated on the Sheet 16 entitled "Calculated Operating Data & Flows Associated with Processing the Ore".
- The user must input information on the watershed and sub-watershed areas for the mine site in Sheet 17. This information is used in subsequent model sheets to calculate runoff flows.
- Sheet 55 presents reference water quality criteria from the Metal Mining Effluents Regulations (EC, 2002), Canadian guidelines for the protection of aquatic life (CCME, 2007), and Canadian guidelines for drinking water (FPTCDW, 2008).
- The remaining sheets are the actual water and mass balance model computations and results including Sheets 18 to 27 "Flows Associated with Runoff from Precipitation", Sheet 28 "Evaporation Losses", Sheet 29 "Seepage Flows", Sheet 30 "Miscellaneous Flows",Sheet 30 "Irrigation Flows", Sheets 31 to 40 "Accumulated Flows", Sheet 41 "Summary of Flows", Sheet 42 "Summary of Key Input Data Used in this Model Run", and Sheets 43 to 53"Computed Loads". Sheets 54 and 56 present the estimated effluent concentrations and water quality at the compliance points, respectively.

# Sheet 7
# Explanation of Flows & Assumptions Used in the Model

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

1 Each sub-watershed pond is equipped with pumps or a discharge structure that can evacuate, on a monthly basis, all of the monthly inflows (*i.e.,* there is no net accumulation in the ponds on a monthly basis).

2 The collection ponds are all operated empty so that storm events or the total spring runoff can be safely collected, monitored and treated, if required, before being discharged to the environment.

3 It is assumed that the site is located in the northern hemisphere with a cold winter climate that has no runoff in the months of December, January, and February (*i.e.* , the monthly runoff is accumulated for release during the following freshet), 50% of computed monthly runoff is released in November and March (*i.e.* , the remainder is accumulated for release during the following freshet), and 100% is released in all the other months (this assumption needs to be updated by the user).

4 The collection ponds are operated empty so that storm events or the total spring runoff can be safely collected, monitored and treated, if required, before being discharged to the environment.

5 The model covers an entire year to summarize flows on an annual basis, with the starting month to be defined by the user (typically the period extend from October to September).

6 The model must start in a month with 100% of runoff - not a month when freezing results in partial or zero runoff.

7 Mine development years should be defined on the same period as the model years (*i.e.,* based on a hydrologic year), or a calendar should be developed and inserted in the model depicting the relationship between the hydrologic and mine years.

8 The Process Plant and camp watershed are located in the same collecting watershed.

9 The water that collects in the open pit, the heap leach facility, spent ore stockpile and the waste rock dump is discharged (pumped) to the collection pond in the water treatment plant watershed. This model does not consider the presence of a water treatment plant (this assumption needs to be updated by the user).

10 It is assumed that water demands, primarily at the Process Plant, can be met by inflows (the model will highlight the negative values when the inflows are insufficient).

11 The fresh make-up water comes from an external, off site source such as groundwater or a surface water body.

12 The potable water comes from an external off site source. Sewage rate is assumed to be a percentage of the potable water and will be treated separately prior to discharge to the treatment pond.

13 Other make-up water for the Barren Pond (other than fresh water) comes from the Mine Workings pond, Waste Rock and Overburden pond and Spent Ore Stockpile.

14 This model has three planned discharge points to the environment (see flow diagram on Sheet 8) and should be updated to best represent the planned mine operations.

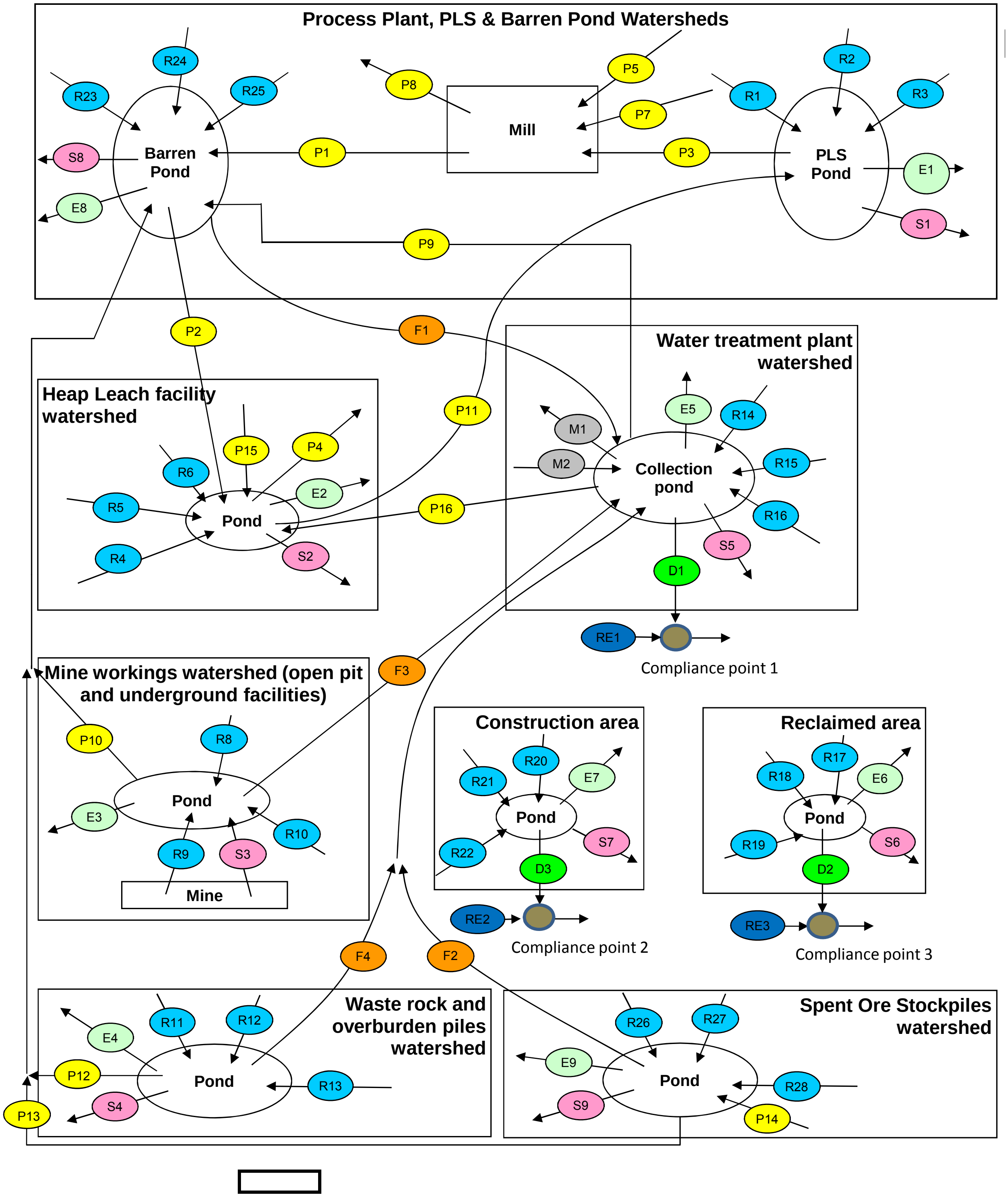
15 It is assumed that the seepage from each pond is a loss to the system and is not recovered. However, if it does have to be collected and treated, the flows are available to design the collection and pumping systems.

# Sheet 8

## Flow Logic Diagram

**Example**

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year her |



# Sheet 9

# List of Flows

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| Area | Flow No. | Description | |
|---|---|---|---|
| **Flows associated with the ore production and the solution collection and application system (P)** | P1 | **Discharge from the Process Plant to the Barren Pond** | |
| | P2 | **Discharge from Barren Pond to Heap Leach facility** | |
| | P3 | **Discharge from the PLS to the Process Plant** | |
| | P4 | **Water retained in the Heap Leach Facility** | |
| | P5 | **Moisture going into the Process Plant with the ore** | |
| | P7 | **Fresh make-up water required in the Process Plant** | |
| | P8 | **Losses in the Process Plant to evaporation and spillage etc** | |
| | P9 | **Makeup Water from the Water Treatment Plant to the Barren Pond** | |
| | P10 | **Make-up water from the Mine Workings** | |
| | P11 | **PLS from the Heap Leach Facility to the PLS Pond** | |
| | P12 | **Make-up water from the Waste Rock and Overburden Piles** | |
| | P13 | **Make-up water from the Spent Ore Stockpile** | |
| | P14 | **Draindown from the Spent Ore Stockpile** | |
| | P15 | **Draindown from the Heap Leach Facility** | |
| | P16 | **Rinse Water from the Water Treatment Plant to Heap Leach Facility** | |
| **Flows associated with runoff from precipitation (R)** | R1 | **PLS Pond** | Runoff from natural ground |
| | R2 | | Runoff from prepared ground |
| | R3 | | Precipitation direct to the pond |
| | R4 | **Heap Leach Facility** | Runoff from natural ground |
| | R5 | | Runoff from prepared ground |
| | R6 | | Precipitation direct to the pond |
| | R8 | **Mine Workings** | Runoff from natural ground |
| | R9 | | Runoff from the pit walls |
| | R10 | | Precipitation direct to the pond |
| | R11 | **Waste rock and Overburden Piles** | Runoff from natural ground |
| | R12 | | Runoff from the waste rock and overburden piles |
| | R13 | | Precipitation direct to the pond |
| | R14 | **Water Treatment** | Runoff from natural ground |
| | R15 | | Runoff from prepared ground |
| | R16 | | Precipitation direct to the pond |
| | R17 | **Reclaimed Area** | Runoff from natural ground |
| | R18 | | Runoff from reclaimed ground |
| | R19 | | Precipitation direct to the pond |
| | R20 | **Construction Area** | Runoff from natural ground |
| | R21 | | Runoff from construction ground |
| | R22 | | Precipitation direct to the pond |
| | R23 | **Barren Pond** | Runoff from natural ground |
| | R24 | | Runoff from construction ground |
| | R25 | | Precipitation direct to the pond |
| | R26 | **Spent Ore Stockpile** | Runoff from natural ground |
| | R27 | | Runoff from construction ground |
| | R28 | | Precipitation direct to the pond |
| **Evaporation from ponds (E)** | E1 | **From the PLS Pond** | |
| | E2 | **From the collection pond at the Heap Leach Facility** | |
| | E3 | **From the collection pond at the Mine Workings** | |
| | E4 | **From the collection pond at the Waste Rock and Overburden Piles** | |
| | E5 | **From the collection pond at the Water Treatment Plant** | |
| | E6 | **From the Reclaimed Area Pond** | |
| | E7 | **From the Construction Area Pond** | |
| | E8 | **From the collection pond at the Barren Pond** | |
| | E9 | **From the collection pond at the Spent Ore Stockpiles** | |
| **Seepage (S)** | S1 | **From the PLS Pond** | |
| | S2 | **From the Heap Leach Facility** | |
| | S3 | **From the Mine Workings** | |
| | S4 | **From the Waste Rock and Overburden Piles** | |
| | S5 | **From the collection pond at the Water Treatment Plant** | |
| | S6 | **From the Reclaimed Area Pond** | |
| | S7 | **From the Construction Area Pond** | |
| | S8 | **From the Barren Pond** | |
| | S9 | **From the Spent Ore Stockpiles** | |
| **Miscellaneous flows (M)** | M1 | **Water for dust control (from the collection pond at the Water Treatment Plant)** | |
| | M2 | **Treated sewage water discharged to the Water Treatment Plant** | |
| **Flows to Treatment (F)** | F1 | **From Barren pond to collection pond at the Water Treatment Plant** | |
| | F2 | **From Spent Ore Stockpiles pond to collection pond at the Water Treatment Plant** | |
| | F3 | **From Mine Workings pond to collection pond at the Water Treatment Plant** | |
| | F4 | **From Waste Rock and Overburden Piles pond to collection pond at the Water Treatment Plant** | |
| **Discharge to Environment (D)** | D1 | **From the Water Treatment Plant polishing pond to the environment** | |
| | D2 | **From the Reclaimed Area pond to the environment** | |
| | D3 | **From the Construction Area pond to the environment** | |
| **Receiving Environment Flow (RE)** | RE1 | **Receiving environment upstream of D1** | |
| | RE2 | **Receiving environment upstream of D2** | |
| | RE3 | **Receiving environment upstream of D3** | |

## Sheet 10

**Example**

# Precipitation, Runoff & Evaporation Data

| | | | | | |
|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Revision No:** | Enter revision number h | **Modeled Mine year:** | Enter the modelled mine year here |
| **Project #:** | Enter project number here | **Date:** | Enter date here | | |

| | | | | | |
|---|---|---|---|---|---|
| **Meteorological Station(s)** | - Location | | | | |
| | - Elevation (m) | | | | |
| | - Distance from the site (km) | | | | |

| **Precipitation** | | | | **Factored Runoff** (Note 1) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **Annual precipitation selected for flow modelling (mm/yr)** → | | **950** | From natural ground | | From prepared ground (around Process Plant | | From ponds | | From Waste Rock, Overburden, and Spent Ore Stockpiles | | From Mine Workings | | From Reclaimed Area | | From Construction Area | | Monthly runoff **(Note 3)** |
| | **Mean** | **Monthly Distribution (Note 2)** | **Precip-itation** | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Runoff factor | Factored runoff used in the flow model | Expressed as a % of accumu-lation |
| | (mm) | (% of total) | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | | (mm) | (%) |
| Oct | 102.0 | 11.3 | 107.7 | 0.70 | 75.4 | 0.80 | 86.1 | 1.00 | 107.7 | 0.70 | 75.4 | 0.80 | 86.1 | 0.75 | 80.8 | 0.85 | 64.1 | 100 |
| Nov | 88.0 | 9.8 | 92.9 | 0.70 | 65.0 | 0.80 | 74.3 | 1.00 | 92.9 | 0.70 | 65.0 | 0.80 | 74.3 | 0.75 | 69.7 | 0.85 | 55.3 | 50 |
| Dec | 74.0 | 8.2 | 78.1 | 0.70 | 54.7 | 0.80 | 62.5 | 1.00 | 78.1 | 0.70 | 54.7 | 0.80 | 62.5 | 0.75 | 58.6 | 0.85 | 46.5 | 0 |
| Jan | 59.0 | 6.6 | 62.3 | 0.70 | 43.6 | 0.80 | 49.8 | 1.00 | 62.3 | 0.70 | 43.6 | 0.80 | 49.8 | 0.75 | 46.7 | 0.85 | 37.1 | 0 |
| Feb | 44.0 | 4.9 | 46.4 | 0.60 | 27.9 | 0.70 | 32.5 | 1.00 | 46.4 | 0.70 | 32.5 | 0.80 | 37.2 | 0.75 | 34.8 | 0.85 | 23.7 | 0 |
| Mar | 58.0 | 6.4 | 61.2 | 0.60 | 36.7 | 0.70 | 42.9 | 1.00 | 61.2 | 0.70 | 42.9 | 0.80 | 49.0 | 0.75 | 45.9 | 0.85 | 31.2 | 50 |
| April | 62.0 | 6.9 | 65.4 | 0.60 | 39.3 | 0.70 | 45.8 | 1.00 | 65.4 | 0.70 | 45.8 | 0.80 | 52.4 | 0.75 | 49.1 | 0.85 | 33.4 | 100 |
| May | 81.0 | 9.0 | 85.5 | 0.70 | 59.9 | 0.80 | 68.4 | 1.00 | 85.5 | 0.70 | 59.9 | 0.80 | 68.4 | 0.75 | 64.1 | 0.85 | 50.9 | 100 |
| June | 78.0 | 8.7 | 82.3 | 0.70 | 57.6 | 0.80 | 65.9 | 1.00 | 82.3 | 0.70 | 57.6 | 0.80 | 65.9 | 0.75 | 61.8 | 0.85 | 49.0 | 100 |
| July | 77.0 | 8.6 | 81.3 | 0.70 | 56.9 | 0.80 | 65.0 | 1.00 | 81.3 | 0.70 | 56.9 | 0.80 | 65.0 | 0.75 | 61.0 | 0.85 | 48.4 | 100 |
| Aug | 85.0 | 9.4 | 89.7 | 0.70 | 62.8 | 0.80 | 71.8 | 1.00 | 89.7 | 0.70 | 62.8 | 0.80 | 71.8 | 0.75 | 67.3 | 0.85 | 53.4 | 100 |
| Sept | 92.0 | 10.2 | 97.1 | 0.70 | 68.0 | 0.80 | 77.7 | 1.00 | 97.1 | 0.70 | 68.0 | 0.80 | 77.7 | 0.75 | 72.8 | 0.85 | 57.8 | 100 |
| **TOTAL** | **900.0** | **100.0** | **950.0** | **0.68** | **647.7** | **0.78** | **742.7** | **1.00** | **950.0** | **0.70** | **665.0** | **0.80** | **760.0** | **0.75** | **712.5** | **0.85** | **550.5** | |

| **Evaporation** (Note 4) | | | | | |
|---|---|---|---|---|---|
| **Month** | **Annual Evaporation selected for flow modelling (mm/yr)** → | | **750** | **Lake evaporation used in the flow model** | |
| | **Pan (measured) or calculated lake evaporation** | | | | |
| | **Mean** | **Monthly distribution** | **Value to which the factor is applied** | **Factor from pan to lake** (Note 5) | **Used in flow model** |
| | (mm) | (% of total) | (mm) | | (mm) |
| Oct | 45.0 | 6.00 | 45.0 | 0.70 | 31.5 |
| Nov | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Dec | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Jan | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Feb | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| Mar | 0.0 | 0.00 | 0.0 | 0.70 | 0.0 |
| April | 25.0 | 3.33 | 25.0 | 0.70 | 17.5 |
| May | 130.0 | 17.33 | 130.0 | 0.70 | 91.0 |
| June | 155.0 | 20.67 | 155.0 | 0.70 | 108.5 |
| July | 180.0 | 24.00 | 180.0 | 0.70 | 126.0 |
| Aug | 135.0 | 18.00 | 135.0 | 0.70 | 94.5 |
| Sept | 80.0 | 10.67 | 80.0 | 0.70 | 56.0 |
| **TOTAL** | **750.0** | **100.00** | **750.0** | **0.70** | **525.0** |

| **Precipitation & evaporation in years that are wetter or dryer than the mean year** | | | | |
|---|---|---|---|---|
| **Annual Return Period** | **Precipitation** | | **Evaporation** | |
| | Wetter | Dryer | Wetter | Dryer |
| Years | (mm/yr) | | (mm/yr) | |
| mean | 900 | | 750 | |
| 5 | | | | |
| 10 | | | | |
| 25 | | | | |
| 50 | | | | |
| 100 | 1,200 | 625 | 500 | 900 |
| 1000 | | | | |

| **Storm Events** (after a precedent wet period) | | |
|---|---|---|
| **Return period** | **Precip-itation** | **Duration** |
| Years | (mm) | Hours |
| 5 | | |
| 10 | | |
| 25 | | |
| 50 | | |
| 100 | 100 | 24 |
| 1000 | | |
| PMP | | |

**PMP** - Probable maximum precipitation

**NOTES:**

**1** The runoff factor is the percentage of the precipitation that runs off and ends up in the pond(s). It takes into account evapo-transpiration and infiltration. From natural ground it might be on the order of 20 to 70 % depending on the degree of ground saturation, the magnitude of the rainfall and the time of year. It will be greater from prepared surfaces and pit walls. For modelling purposes it can be assumed that 100 % of the precipitation that falls on the pond ends up in the pond. Flow measurements are seldom available to correlate with precipitation to establish runoff factors at a new mine site.

**2** For years that are wetter and dryer than the mean year, it may be necessary to assume that the monthly distribution of precipitation is the same as the distribution in the mean year due to a lack of data.

**3** A flow model must be able to account for winter snow accumulation by entering a runoff distribution as a percentage of the total accumulated to date. For example if there is no runoff in January, February and March and 100% runoff in April then the total winter's accumulation for the three months will enter the inflow side of the water balance in April. **For the flow model to function properly the precipitation and evaporation data entered on the table has to start and end in months that 100% of the factored runoff is discharged.**

**4** "Pan evaporation" is a measured value. The evaporation that actually occurs from a water surface is called the "lake evaporation". Lake evaporation is typically about 70 % of the measured pan evaporation but this could vary depending on the climatic conditions and the time of year. Evaporation can also be calculated based on climatic conditions.

**5** If calculated lake evaporation is used, then the factor entered in the pan evaporation to lake evaporation column is zero for each month.

**6** 🟧 Information required (data input cells). 🟦 Values used in the flow model.

# Sheet 11

# Production Schedule

Example

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | **Revision No:** | Enter revision number here (e.g., Rev. 1) |
| **Project #:** | Enter project number here | **Date:** | Enter date here |
| **Modeled Mine year:** | 5 | | |

## Production Schedule Summary

| **Year** | **Ore** | | | **Waste rock** | | | **Waste rock / ore ratio** | **Stock piled low grade ore** |
|---|---|---|---|---|---|---|---|---|
| | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | **-** | (t/y) |
| 5 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |

Select production year to model

## Production Schedule Details

| **Year** | **Ore** | | | **Waste rock** | | | **Waste rock / ore ratio** | **Stock piled low grade ore** |
|---|---|---|---|---|---|---|---|---|
| | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | Open pit (t/y) | Under-ground (t/y) | Total (t/y) | **-** | (t/y) |
| -3 | | | 0 | 1,000,000 | | 1,000,000 | | |
| -2 | | | 0 | 3,000,000 | | 3,000,000 | | |
| -1 | | | 0 | 3,000,000 | | 3,000,000 | | |
| 1 | 2,000,000 | | 2,000,000 | 8,000,000 | | 8,000,000 | 4.00 | |
| 2 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 3 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 4 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 5 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 6 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 7 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 8 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 9 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 10 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 11 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 12 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 13 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 14 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 15 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 16 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 17 | 5,000,000 | | 5,000,000 | 15,000,000 | | 15,000,000 | 3.00 | |
| 18 | 5,000,000 | | 5,000,000 | 15,000,000 | 300,000 | 15,300,000 | 3.06 | |
| 19 | 5,000,000 | 500,000 | 5,500,000 | 15,000,000 | 50,000 | 15,050,000 | 2.74 | |
| 20 | 5,000,000 | 600,000 | 5,600,000 | 2,000,000 | 50,000 | 2,050,000 | 0.37 | |
| 21 | | 700,000 | 700,000 | | 30,000 | 30,000 | 0.04 | |
| 22 | | 600,000 | 600,000 | | 30,000 | 30,000 | 0.05 | |
| 23 | | 400,000 | 400,000 | | 20,000 | 20,000 | 0.05 | |
| 24 | | 200,000 | 200,000 | | 0 | 0 | 0.00 | |
| | | | 0 | | | 0 | | |
| | | | 0 | | | 0 | | |
| **TOTAL** | 97,000,000 | 3,000,000 | 100,000,000 | 287,000,000 | 480,000 | 287,480,000 | 2.87 | 0 |

Note:

**1** The production schedule will vary depending on the mining operation. The above schedule is presented to provide a mine life overview. **The water balance model, however, will consider one year at a time only.** The modelled year is selected in the production schedule summary.

**2** The above *Production Schedule Details* table should be expanded to reflect the full mine life, as needed. The user should verify that links from the *Production Schedule Summary* table are also updated to reference the expanded *Production Schedule Details* table.

**3** Mine years need to match the hydrologic year selected as calculations for slurry water are based on the mine year. A typical hydrologic year is from October to September.

🟧 Required information should be entered in the orange shaded cells

# Sheet 12
# Operating Data

**Example**

**Nominal and design values**: Nominal values are based on the planned annual Process Plant throughput averaged over 365 days per year. The nominal values are used to size the heap facility and for the flow (water balance) modelling. The design values are larger and take into account the availability of the Process Plant (% of the year that the Process Plant is available to operate) plus an appropriate factor of safety. The design values are used to size and design the process facilities, pipelines and pumping systems. A word of caution - sometimes process designers define nominal and design values differently.

| | | | | | |
|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Symbol** | **Source**<br>(Note 1) | **Value** | **Units**<br>(metric) |
| **Revision #:** | Enter revision number here (e.g., Rev. 1) | | | | |
| **Date:** | Enter date here | | | | |
| **Project #:** | Enter project number here | | | | |

| | | Symbol | Source (Note 1) | Value | Units (metric) |
|---|---|---|---|---|---|
| **Ore production** | | | | | |
| - | Ore reserve *(design tonnage)* | | | 100.00 | Mt |
| - | Planned annual Process Plant throughput (nominal production rate) | | | 5,000,000 | t/y |
| - | Process Plant availability (% of the year that the Process Plant is available to operate - | | | 90.0 | % |
| - | Factor of safety on the design value | | | 1.00 | - |
| **Heap Leach Facility** | | | | | |
| - | Stacked Dry Density | | | 170% | (tonnes/m$^3$) |
| - | Density water | | | 1.00 | (m$^3$/tonnes) |
| - | Saturated Moisture Content | | | 15% | % Ore Moisture |
| - | Residual Moisture Content (after draindown) | | | 11% | % Ore Moisture |
| - | Ore Specific Gravity | $G_s$ | | 2.70 | - |
| - | Run of Mine (ROM) Ore Moisture Content | | | 3% | % Ore Moisture |
| - | Moisture Addition for Agglomeration | | | 4% | % Ore Moisture |
| - | Leach Cycle time | | | 60 | days |
| **Flows impacting the Process Plant water balance** | | | | | |
| - | Water content of the ore going into the Process Plant<br>(% of total mass of ore) | | | 4.0 | % Ore Moisture |
| - | Minimum fresh (clean) make-up water required in the Process Plant<br>(% of total water used for irrigation) | | | 0.5% | % |
| - | Water lost in the Process Plant to evaporation and spillage<br>(% of total water used for irrigation) | | | 2.0% | % |
| **Miscellaneous flows impacting the flow model** | | | | | |
| - | Water used for dust control *(taken from one of the ponds)* | M1 | | 500 | m$^3$/day |
| - | Potable water from an external source (no. of workers x vol./worker/day) | | | 150 | m$^3$/day |
| - | Sewage *(estimated as a % of potable water)* | M2 | | 85 | % |
| - | Make-up water from Mine Workings | P10 | | 10 | m$^3$/mo |
| - | Make-up water from Waste Rock and Overburden Piles | P12 | | 20 | m$^3$/mo |
| - | Make-up water from Spent Ore Stockpile | P13 | | 30 | m$^3$/mo |
| **Waste rock** | | | | | |
| - | Specific gravity | $G_s$ | | 2.80 | - |

**Notes:**

1 Sources of information could be either the owner / operator, contractors, or consultants.

2 Water established from moisture content and slurry density are summed together for determining the value of P6. Typically only one of the two is used (the input of the unused option should then be set

🟧 Required information must be entered in the orange shaded cells. The values are then automatically linked to the following two calculation sheets where the relevant calculations are carried out.

# Sheet 13

**Example**

# Estimation of
# Fresh Process Make-up Water Required in the Process Plant & Losses to Evaporation & Spillage in the Process Plant

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Project #** | Enter project number here | **Date:** | Enter date here |

The fresh water requirements and losses to evaporation and spillage are normally provided by the process designer. If not they can be estimated as cubic metres of water per metric ton of ore Process Planted (m3/t) using the following simple procedures. They are normally relatively small flows.

- The fresh make-up water in the Process Plant is typically 3 to 10 % of total water going through the Process Plant.
- The water lost to evaporation and spillage in the Process Plant can be assumed to be 0.5 to 2.0 % of the total water going through the Process Plant.

## esh make-up water required in a Process Plant (reagent mixing, gland water, dust control at the crusher e

| Nominal Monthly Irrigation Volume ($m^3$) | Fresh water required (Flow P7) | |
|---|---|---|
| | % | Percentage Nominal Monthly Irrigation Volume ($m^3$) |
| 303,000 | 0.50% | 1,515 |

## Water lost to evaporation and spillage in a Process Plant

| Nominal Monthly Irrigation Volume ($m^3$) | Water lost to evaporation & spillage (P8) | |
|---|---|---|
| | % | Percentage Nominal Monthly Irrigation Volume ($m^3$) |
| 303,000 | 2.00% | 6,060 |

**Notes:** 1 Input of data is not required on this sheet. The Nominal Monthly Irrigation Volume and % water is automatically transferred from "Operating Data Sheet" and the "Irrigation Flows Sheet" and the calculations are done on this sheet and the results are automatically transferred to the " 15 Calculated Data" sheet (Sheet 15).

# Sheet 14
# Rinse, Irrigation, Draindown Data

**Example**

| | | |
|---|---|---|
| **Mine:** | | Enter mine name here |
| **Revision #:** | | Enter operator's name here |
| **Date:** | | Enter mine location here |
| **Project #:** | | Enter date here |

**Irrigation Rates:** Irrigation water consists of leach solution from the barren pond. Flow rates can be input monthly in $m^3$/day. Increases can be made in a month that a cell is started to be irrigated to account for agglomeration and saturation losses if the irrigation system has capacity for increased flow. Irrigation can also be lowered to account for months when rinse water is being applied to the heap leach facility. Monthly flows are calculated in sheet 30 "Irrigation Flows" and contibute to flow P2.

**Rinse Rate: Rinse water is used to at regular intervals to neutralise the spent ore in a on-off heap leach pad or at the end of mine life of a perminent pad heap leach facility. Rinse water is taken from the water treatment plant in order determine the availability of water. The user may wish to specify it been taken from a specific facility using the flows P10, P12, and P13. Monthly Flows are calculated in sheet 30 "Irrigation Flows" and contibute to flow P16.**

**Agglomeration: Agglomeration is the water used for agglomerating the finer particles of ore to ensure more uniform percolation of leach solution through the heap. Agglomeration can be done prior to or after placement on the heap pad. The sheet below allows the input of the volume of ore that will have water losses due to agglomeration. Monthly flows are calculated in sheet 30 "Irrigation Flows" and contibute to flow P4.**

**Moisture Lost to Saturation of the Ore Moisture lost to the saturation of ore is comprised of the run of mine ore moisture content, water used for agglomeration, and the remaining mositure required to bring the ore to saturation. This flow is the remaining water required to bring the ore to stauration. Some of this water will be permanently retained within the heap while some will be drain down to a residual saturation content. Monthly flows are calculated in sheet 30 "Irrigation Flows" and contribute to flow P4.**

**Draindown: Draindown is the difference between the ores moisture content at saturation and residual ore moisture content after draindown. Draindown volumes will either report to the spent ore stockpile or the heap leach facility depending on the user choice below. Monthly flows are calculated in sheet 30 "Irrigation Flows" and contibute to flows P14 or P15.**

## Production Schedule Details

**Irrigation ($m^3$/day)**

| Month | Year | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| Oct | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sept | 0 | 0 | 0 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 12000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Rinse to Heap Leach Facility ($m^3$/day)**

| Month | Year | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Agglomeration of the Ore ($m^3$/of Ore)**

| Month | Year | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Moisture Lost to Saturation of the Ore ($m^3$/of Ore)**

| Month | Year | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Select location of Ore Draindown**

Ore Draindown to Heap Leach facility (P14)

**Draindown ($m^3$ of Ore)**

| Month | Year | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 528,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# Sheet 15

## Calculated Operating Data & Flows Associated with Processing the Ore

**Example**

**<u>Nominal</u> <u>and</u> <u>design</u> <u>values:</u>** Nominal values are based on the planned annual Process Plant throughput averaged over 365 days per year. The <u>nominal</u> <u>values</u> are used to size the Heap Leach Facility and for the flow (water balance) modelling. The design values are larger and take into account the availability of the Process Plant (% of the year that the Process Plant is available to operate) plus an appropriate factor of safety. The <u>design</u> <u>values</u> are used to size and design the process facilities, pipelines and pumping systems. A word of caution - sometimes process designers define nominal and design values differently.

| **Mine:** | Enter mine name here | **Date:** Enter date here | **Indicator** | | **Flow No.** (Note 1) | **Source or Calculation** | **Total** | **Units** (metric) |
|---|---|---|---|---|---|---|---|---|
| **Revision #** | Enter revision number here ( | **Project #** Enter project number here | | | | | | |
| | | | **Letter** | **Symbol** | | | | |
| **Ore production** | | | | | | | | |
| - Ore reserve | | | A | | | Sheet 12 | 100.00 | Mt |
| - Nominal ore production | Planned annual | | B | | | Sheet 12 | 5,000,000 | t/y |
| | Monthly | | C | | | B / 12 | 416,667 | t/mo |
| | Daily | | D | | | B / 365 | 13,699 | t/d |
| - Life of mine | | | E | | | A / B | 20.0 | years |
| - Process Plant availability (% of the year the Process Plant is available to operate) | | | F | | | Sheet 12 | 90.0 | % |
| - Factor of safety on the design value | | | G | | | Sheet 12 | 1.00 | - |
| - Design daily Process Planting rate | | | H | | | D / F x G | 15,221 | t/d |
| **Heap Leach Facility** | | | | | | | | |
| - Stacked Dry Density | | | I | | | Sheet 12 | 1.70 | t/$m^3$ |
| - Ore Specific Gravity | | | J | | | Sheet 12 | 2.70 | - |
| - Saturated Moisture Content | | | K | | | Sheet 12 | 15.0% | % Ore Moisture |
| - Residual Moisture Content (after draindown) | | | L | | | Sheet 12 | 11.0% | % Ore Moisture |
| - Ore Moisture Content | | | M | | | Sheet 12 | 3.0% | % Ore Moisture |
| - Moisture Addition for Agglomeration | | | N | | | Sheet 12 | 4.0% | % Ore Moisture |
| - Drain Down Moisture Content | | | O | | | K-L | 4.0% | % Ore Moisture |
| - Additional water lost to saturation | | | P | | | K-M-N | 8.0% | % Ore Moisture |
| **Monthly <u>nominal</u> flows associated with ore production (Notes 2 & 3)** | | | | | | | | |
| **Volume of Water Used for the Irrigation of the Heap (includes Make-up water, Agglomeration & Dust Control, ROM Ore Moisture, and Irrigation water** | | | | | | | | |
| **Excess Volume from the Process Plant to the Barren Pond** | | | | | | | | |
| - Volume discharged | | | Q | | P1 | Sheet 32 | 1,680,815 | $m^3$/mo |
| **Water from the Barren Pond being irrigated to the heap leach facility** | | | | | | | | |
| - Volume Irrigated to Heap | | | R | | P2 | Sheet 30 | 303,000 | $m^3$/mo |
| **Excess Volume from the Process Plant to the Barren Pond** | | | | | | | | |
| - Volume discharged | | | S | | P3 | Sheet 31 | 1,682,737 | $m^3$/mo |
| **Water retained in ore pore spaces** | | | | | | | | |
| - Agglomeration water (% of total dry mass of ore) | | | T | | | N | 4.0% | % |
| - Agglomeration Water | | | U | | | Sheet 30 | 2,992 | $m^3$/mo |
| - Percentage Water content of ore locked into at saturation (does not include agglomeration and ROM Ore Moisture) (% of total dry mass of ore) | | | V | | | P | 8.0% | $m^3$/mo |
| - Saturation losses in Ore (not including agglomeration and ROM Ore Moisture) | | | W | | | Sheet 30 | 5,984 | |
| - Total Volume retained in the Heap Leach Facility | | | X | | P4 | Sheet 30 | 11,220 | $m^3$/mo |
| **Moisture in the ore going into the Process Plant.** | | | | | | | | |
| - Water content of ore going into the Process Plant (% of total dry mass of ore) | | | Y | | | M | 3.0% | % |
| - Water content of ore going into the Process Plant (% of total dry mass of ore) | | | Z | | P5 | Sheet 30 | 2,244 | $m^3$/mo |
| **Fresh (clean) make-up water required in the Process Plant from an external source** | | | | | | | | |
| - Percentage of nominal irrigation volume to heap to be used as frehswater makeup | | | AA | | | Sheet 13 | 0.50% | % |
| - Freshwater makeup | | | BB | | P7 | Sheet 13 | 1,515 | $m^3$/mo |
| Water lost in the Process Plant to evaporation and spillage | | | | | | | | |
| - Percentage of nominal irrigation volume to heap to be used as the volume lost at Proceess Plant for spillage and evaporation | | | CC | | | Sheet 13 | 2.0% | % |
| - Volume lost in the Process Plant | | | DD | | P8 | Sheet 13 | 6,060 | $m^3$/mo |
| **Reclaim and Make-up water to the Process Plant from mine site water storage structures** | | | | | | | | |
| - Make-up water to the Barren Pond from the Mine Workings | | | EE | | P10 | Sheet 12 | 10 | $m^3$/mo |
| - PLS from the Heap Leach to the PLS Pond | | | FF | | P11 | Sheet 44 | 1,671,800 | $m^3$/mo |
| - Make-up water to the Barren Pond from the Waste Rock and Overburden Piles pond | | | GG | | P12 | Sheet 12 | 20 | $m^3$/mo |
| - Make-up water to the Barren Pond to the PLS Pond | | | HH | | P13 | Sheet 12 | 30 | $m^3$/mo |
| **Reclaim and Make-up water to the Process Plant from mine site water storage structures** | | | | | | | | |
| - Ore Drain Down to the Heap Volume from Saturated to Residual moisture Content | | | II | | P14 | Sheet 30 | 2,992 | $m^3$/mo |
| - Ore Drain Down to the Spent Ore Stockpile Volume from Saturated to Residual moisture Content | | | JJ | | P15 | Sheet 30 | 0 | $m^3$/mo |
| **Rinse Water From the Treatment Plant to the Heap Leach facility** | | | KK | | | | | |
| - Rinse Water to the Heap Leach Facility from the Water treatment Plant | | | LL | | P16 | Sheet 30 | 1,320,000 | $m^3$/mo |
| **Environmental Inflows and Outflows from the PLS system** | | | | | | | | |
| - Runoff from PLS Ponds Natural Ground Catchment | | | MM | | R1 | Sheet 18 | 4,318 | $m^3$/mo |
| - Runoff from PLS Ponds Prepared Ground Catchment | | | NN | | R2 | Sheet 18 | 6189.07 | $m^3$/mo |
| - Runoff From PLS Ponds Pond | | | OO | | R3 | Sheet 18 | 1583.33 | $m^3$/mo |
| - Runoff from Barren Ponds Natural Ground Catchment | | | PP | | R23 | Sheet 19 | 4317.93 | $m^3$/mo |
| - Runoff from Barren Ponds Prepared Ground Catchment | | | QQ | | R24 | Sheet 20 | 6189.07 | $m^3$/mo |
| - Runoff From Barren Ponds Pond | | | RR | | R25 | Sheet 21 | 1583.33 | $m^3$/mo |
| - Evaporation from the PLS Pond | | | SS | | E1 | Sheet 27 | 875.00 | $m^3$/mo |
| - Seepage from the PLS Pond | | | TT | | S1 | Sheet 28 | 304.17 | $m^3$/mo |
| - Evaporation from the Barren Pond | | | UU | | E8 | Sheet 27 | 875.00 | $m^3$/mo |
| - Seepage from the Barren Pond | | | VV | | S8 | Sheet 28 | 304.17 | $m^3$/mo |
| **Water that is either required to run the process plant *(a positive number),* or excess process water that cannot be recycled and has to be discharged to the water treatment collection pond *(a negative number)*.** | | | | | | | | |
| - Volume of water. | | | XX | | P9 | P2+E1+S1+E8+S8-P5-P7-P9-P10-P11-P12-P13-R1-R2-R3-R23-R24-R25 | -1,388,381 | $m^3$/mo |

**Notes:**

1 Monthly flows are used in the model. It is assumed that the density of water is unity for the calculations.

2 **Input data are not required on this sheet. The inputs are automatically transferred from previous sheets. The calculations are done on this sheet and linked to other relevant sheets.**

| | |
|---|---|
| 🟨 1,699,799 | Flows into the Process Plant,PLS Pond, and Barren Pond |
| 🟦 1,699,799 | Flows out of the Process Plant,PLS Pond, and Barren Pond |

# Sheet 16

**Example**

## Summary of Flows Associated with Processing the Ore

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision # :** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Relevant operating data for the model run** | | |
|---|---|---|
| Nominal production rate | 13,699 | t/d |
| Residual Ore Moisture Content | 11% | % Ore Moisture |
| Saturation Moisture Content | 15% | % Ore Moisture |
| Minimum clean make-up water required in the Process Plant | 0.5% | % of total flow through the Process Plant |

| **Flow** | | **Monthly volume** (m$^3$/month) |
|---|---|---|
| P1 | Discharge from the Process Plant to the Barren Pond | 1,680,815 |
| P2 | Discharge from Barren Pond to Heap Leach facility | 303,000 |
| P3 | Discharge from the PLS to the Process Plant | 1,682,737 |
| P4 | Water retained in the Heap | 11,220 |
| P5 | Moisture going into the Process Plant with the ore | 2,244 |
| P7 | Fresh make-up water required in the Process Plant | 1,515 |
| P8 | Losses in the Process Plant to evaporation and spillage etc | 6,060 |
| P9 □or □F1 | Water that is either required to run the process plant (a positive number), or excess process water that cannot be recycled and has to be discharged to the water treatment collection pond (a negative number). | -1,388,381 |
| P10 | PLS from the Heap Leach Facility to the PLS Pond | 10 |
| P11 | Make-up water from the waste rock and overburden piles | 1,671,800 |
| P12 | Make-up water from the waste rock and overburden piles | 20 |
| P13 | Make-up water from the Spent Ore Stockpile | 30 |
| P14 | Draindown from the Spent Ore Stockpile | 2,992 |
| P15 | Draindown from the Heap Leach Facility | 0 |
| P16 | Rinse water to the Heap from the Water Treatment Plant | 1,320,000 |
| R1,R2,R3,R23 ,R24,R25 | Sum of Runoff Inputs | 24,181 |
| E1,E8,S1,S8 | Sum of Seepage and Evaporation Losses | 2,358 |
| Total water required to run the Process Plant (P7 clean + P9 other+P16) | | 1,321,515 |
| Total water required to be discharge from the Barren pond to the water treatment plant (F1) | | 1,388,381 |

**Notes:**

1 Input of data is not required on this sheet. This is only a summary sheet. The values are automatically transferred from Sheet 15 "Calculated Operating Data & Flows Associated with Processing the Ore".

2 The flow numbers and colours correspond to the flows on Sheet 15 "Calculated Operating Data and Flows Associated with Processing the Ore".

| | | |
|---|---|---|
| 1,699,799 | Flows into the Process Plant,PLS Pond, and Barren Pond | Must be equal |
| 1,699,799 | Flows out of the Process Plant,PLS Pond, and Barren Pond | |

# Sheet 17
# Watershed Areas

**Example**

| | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Watershed** | | **Sub Watersheds[1]** | | | **Flow Number** |
|---|---|---|---|---|---|
| Facility | Area (ha) | Collecting area | % of total | ($m^2$) | |
| PLS Pond | 20.0 | Natural ground | 40 | 80,000 | R1 |
| | | Prepared ground[2] | 50 | 100,000 | R2 |
| | | Collection pond | 10 | 20,000 | R3, E1 |
| | | TOTAL | 100 | 200,000 | - |
| Heap Leach Facility | 100.0 | Natural ground | 45 | 450,000 | R4 |
| | | Prepared ground[2] | 50 | 500,000 | R5 |
| | | Pond | 5 | 50,000 | R6, E2 |
| | | TOTAL | 100 | 1,000,000 | - |
| Mine Workings | 200.0 | Natural ground | 75 | 1,500,000 | R8 |
| | | Prepared ground[2] | 15 | 300,000 | R9 |
| | | Collection pond | 10 | 200,000 | R10, E3 |
| | | TOTAL | 100 | 2,000,000 | - |
| Waste Rock and Overburden Piles | 100.0 | Natural ground | 40 | 400,000 | R11 |
| | | Waste rock and Overburden piles | 55 | 550,000 | R12 |
| | | Collection pond | 5 | 50,000 | R13, E4 |
| | | TOTAL | 100 | 1,000,000 | - |
| Water Treatment Plant | 40.0 | Natural ground | 45 | 180,000 | R14 |
| | | Prepared ground[2] | 40 | 160,000 | R15 |
| | | Pond | 15 | 60,000 | R16, E5 |
| | | TOTAL | 100 | 400,000 | - |
| Reclaimed Area | 10.0 | Natural ground | 45 | 45,000 | R17 |
| | | Reclaimed ground | 45 | 45,000 | R18 |
| | | Pond | 10 | 10,000 | R19, E6 |
| | | TOTAL | 100 | 90,000 | - |
| Construction Area | 20.0 | Natural ground | 45 | 90,000 | R20 |
| | | Construction ground | 45 | 90,000 | R21 |
| | | Pond | 10 | 20,000 | R22, E7 |
| | | TOTAL | 100 | 180,000 | - |
| Barren Pond | 20.0 | Natural ground | 40 | 80,000 | R23 |
| | | Prepared ground[2] | 50 | 100,000 | R24 |
| | | Pond | 10 | 20,000 | R25, E8 |
| | | TOTAL | 100 | 200,000 | - |
| Spent Ore Stockpile | 300.0 | Natural ground | 40 | 1,200,000 | R26 |
| | | Prepared ground[2] | 55 | 1,650,000 | R27 |
| | | Collection pond | 5 | 150,000 | R28, E9 |
| | | TOTAL | 100 | 3,000,000 | |
| **TOTAL** | **810.00** | - | - | 8,070,000 | - |

**Note:**

| | |
|---|---|
| 1 | The sub-watersheds are subdivided by percentages which may change as the mine develops. |
| 2 | Prepared ground is defined as paved ground, roads, industrial areas or ground of low permeability. |
| 🟧 | Data input is required in the orange shaded cells. The calculations are carried out in the other cells and the relevant data is automatically transferred to other sheets. |

# Sheet 18

# Flows Associated with Runoff from Precipitation

## Subwatersheds: PLS Pond

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

| | **Runoff Flow ($m^3$ / month)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** → | **R1 - Natural ground** | | | | **R2 - Prepared ground** | | | | **R3 - Collection Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 17) → | **80,000** | | | | **100,000** | | | | **20,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R1** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R2** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R3** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 6,029 | 6,029 | 6,029 | 0 | 8,613 | 8,613 | 8,613 | 0 | 2,153 | 2,153 | 2,153 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 5,202 | 5,202 | 2,601 | 2,601 | 7,431 | 7,431 | 3,716 | 3,716 | 1,858 | 1,858 | 929 | 929 | 0 | 0 | 0 | 0 |
| **Dec** | 4,374 | 6,975 | 0 | 6,975 | 6,249 | 9,964 | 0 | 9,964 | 1,562 | 2,491 | 0 | 2,491 | 0 | 0 | 0 | 0 |
| **Jan** | 3,488 | 10,463 | 0 | 10,463 | 4,982 | 14,947 | 0 | 14,947 | 1,246 | 3,737 | 0 | 3,737 | 0 | 0 | 0 | 0 |
| **Feb** | 2,229 | 12,692 | 0 | 12,692 | 3,251 | 18,198 | 0 | 18,198 | 929 | 4,666 | 0 | 4,666 | 0 | 0 | 0 | 0 |
| **Mar** | 2,939 | 15,631 | 7,815 | 7,815 | 4,286 | 22,483 | 11,242 | 11,242 | 1,224 | 5,890 | 2,945 | 2,945 | 0 | 0 | 0 | 0 |
| **April** | 3,141 | 10,957 | 10,957 | 0 | 4,581 | 15,823 | 15,823 | 0 | 1,309 | 4,254 | 4,254 | 0 | 0 | 0 | 0 | 0 |
| **May** | 4,788 | 4,788 | 4,788 | 0 | 6,840 | 6,840 | 6,840 | 0 | 1,710 | 1,710 | 1,710 | 0 | 0 | 0 | 0 | 0 |
| **June** | 4,611 | 4,611 | 4,611 | 0 | 6,587 | 6,587 | 6,587 | 0 | 1,647 | 1,647 | 1,647 | 0 | 0 | 0 | 0 | 0 |
| **July** | 4,552 | 4,552 | 4,552 | 0 | 6,502 | 6,502 | 6,502 | 0 | 1,626 | 1,626 | 1,626 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 5,024 | 5,024 | 5,024 | 0 | 7,178 | 7,178 | 7,178 | 0 | 1,794 | 1,794 | 1,794 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 5,438 | 5,438 | 5,438 | 0 | 7,769 | 7,769 | 7,769 | 0 | 1,942 | 1,942 | 1,942 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **51,815** | | **51,815** | | **74,269** | | **74,269** | | **19,000** | | **19,000** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 19

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Barren Pond

**Example**

| From cover sheet | | | | |
|---|---|---|---|---|
| | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of Open Pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

### Runoff Flow ($m^3$ / month)

| **Runoff #** | **R23- Natural ground** | | | | **R24 - Prepared ground** | | | | **R25- Collection Pond** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Area ($m^2$)** (from Sheet 17) | **80,000** | | | | **100,000** | | | | **20,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R23** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R24** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R25** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 6,029 | 6,029 | 6,029 | 0 | 8,613 | 8,613 | 8,613 | 0 | 2,153 | 2,153 | 2,153 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 5,202 | 5,202 | 2,601 | 2,601 | 7,431 | 7,431 | 3,716 | 3,716 | 1,858 | 1,858 | 929 | 929 | 0 | 0 | 0 | 0 |
| **Dec** | 4,374 | 6,975 | 0 | 6,975 | 6,249 | 9,964 | 0 | 9,964 | 1,562 | 2,491 | 0 | 2,491 | 0 | 0 | 0 | 0 |
| **Jan** | 3,488 | 10,463 | 0 | 10,463 | 4,982 | 14,947 | 0 | 14,947 | 1,246 | 3,737 | 0 | 3,737 | 0 | 0 | 0 | 0 |
| **Feb** | 2,229 | 12,692 | 0 | 12,692 | 3,251 | 18,198 | 0 | 18,198 | 929 | 4,666 | 0 | 4,666 | 0 | 0 | 0 | 0 |
| **Mar** | 2,939 | 15,631 | 7,815 | 7,815 | 4,286 | 22,483 | 11,242 | 11,242 | 1,224 | 5,890 | 2,945 | 2,945 | 0 | 0 | 0 | 0 |
| **April** | 3,141 | 10,957 | 10,957 | 0 | 4,581 | 15,823 | 15,823 | 0 | 1,309 | 4,254 | 4,254 | 0 | 0 | 0 | 0 | 0 |
| **May** | 4,788 | 4,788 | 4,788 | 0 | 6,840 | 6,840 | 6,840 | 0 | 1,710 | 1,710 | 1,710 | 0 | 0 | 0 | 0 | 0 |
| **June** | 4,611 | 4,611 | 4,611 | 0 | 6,587 | 6,587 | 6,587 | 0 | 1,647 | 1,647 | 1,647 | 0 | 0 | 0 | 0 | 0 |
| **July** | 4,552 | 4,552 | 4,552 | 0 | 6,502 | 6,502 | 6,502 | 0 | 1,626 | 1,626 | 1,626 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 5,024 | 5,024 | 5,024 | 0 | 7,178 | 7,178 | 7,178 | 0 | 1,794 | 1,794 | 1,794 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 5,438 | 5,438 | 5,438 | 0 | 7,769 | 7,769 | 7,769 | 0 | 1,942 | 1,942 | 1,942 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **51,815** | | **51,815** | | **74,269** | | **74,269** | | **19,000** | | **19,000** | | **0** | | **0** | |

**Notes:**

| | | |
|---|---|---|
| | 1 | Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet. |
| | 2 | The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows". |
| | 3 | The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff. |

# Sheet 20

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Heap Leach Facility

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumulation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

| | **Runoff Flow ($m^3$ / month)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** | **R4 - Natural ground** | | | | **R5 - Heap Leach Pad** | | | | **R6 - Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 17) | **450,000** | | | | **500,000** | | | | **50,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R4** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R5** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R6** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 33,915 | 33,915 | 33,915 | 0 | 37,683 | 37,683 | 37,683 | 0 | 5,383 | 5,383 | 5,383 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 29,260 | 29,260 | 14,630 | 14,630 | 32,511 | 32,511 | 16,256 | 16,256 | 4,644 | 4,644 | 2,322 | 2,322 | 0 | 0 | 0 | 0 |
| **Dec** | 24,605 | 39,235 | 0 | 39,235 | 27,339 | 43,594 | 0 | 43,594 | 3,906 | 6,228 | 0 | 6,228 | 0 | 0 | 0 | 0 |
| **Jan** | 19,618 | 58,853 | 0 | 58,853 | 21,797 | 65,392 | 0 | 65,392 | 3,114 | 9,342 | 0 | 9,342 | 0 | 0 | 0 | 0 |
| **Feb** | 12,540 | 71,393 | 0 | 71,393 | 16,256 | 81,647 | 0 | 81,647 | 2,322 | 11,664 | 0 | 11,664 | 0 | 0 | 0 | 0 |
| **Mar** | 16,530 | 87,923 | 43,961 | 43,961 | 21,428 | 103,075 | 51,538 | 51,538 | 3,061 | 14,725 | 7,363 | 7,363 | 0 | 0 | 0 | 0 |
| **April** | 17,670 | 61,631 | 61,631 | 0 | 22,906 | 74,443 | 74,443 | 0 | 3,272 | 10,635 | 10,635 | 0 | 0 | 0 | 0 | 0 |
| **May** | 26,933 | 26,933 | 26,933 | 0 | 29,925 | 29,925 | 29,925 | 0 | 4,275 | 4,275 | 4,275 | 0 | 0 | 0 | 0 | 0 |
| **June** | 25,935 | 25,935 | 25,935 | 0 | 28,817 | 28,817 | 28,817 | 0 | 4,117 | 4,117 | 4,117 | 0 | 0 | 0 | 0 | 0 |
| **July** | 25,603 | 25,603 | 25,603 | 0 | 28,447 | 28,447 | 28,447 | 0 | 4,064 | 4,064 | 4,064 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 28,263 | 28,263 | 28,263 | 0 | 31,403 | 31,403 | 31,403 | 0 | 4,486 | 4,486 | 4,486 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 30,590 | 30,590 | 30,590 | 0 | 33,989 | 33,989 | 33,989 | 0 | 4,856 | 4,856 | 4,856 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **291,460** | | **291,460** | | **332,500** | | **332,500** | | **47,500** | | **47,500** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 21

# Flows Associated with Runoff from Precipitation

Example

## Subwatersheds: Mine Workings (Open Pit and Underground Facilities)

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| Month | From natural ground | From prepared ground | From Ponds | From Waste Rock and Overburden Piles | From walls of open pit | From reclaimed area | From construction area | |
| Oct | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| Nov | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| Dec | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| Jan | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| Feb | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| Mar | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| April | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| May | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| June | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| July | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| Aug | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| Sept | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

### Runoff Flow (m$^3$ / month)

| Runoff # | R8 - Natural ground | | | | R9 - Pit walls | | | | R10 - Pond | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area (m$^2$) (from Sheet 17) | 1,500,000 | | | | 300,000 | | | | 200,000 | | | | | | | |
| Month | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | R8 Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | R9 Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | R10 Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| Oct | 113,050 | 113,050 | 113,050 | 0 | 25,840 | 25,840 | 25,840 | 0 | 21,533 | 21,533 | 21,533 | 0 | 0 | 0 | 0 | 0 |
| Nov | 97,533 | 97,533 | 48,767 | 48,767 | 22,293 | 22,293 | 11,147 | 11,147 | 18,578 | 18,578 | 9,289 | 9,289 | 0 | 0 | 0 | 0 |
| Dec | 82,017 | 130,783 | 0 | 130,783 | 18,747 | 29,893 | 0 | 29,893 | 15,622 | 24,911 | 0 | 24,911 | 0 | 0 | 0 | 0 |
| Jan | 65,392 | 196,175 | 0 | 196,175 | 14,947 | 44,840 | 0 | 44,840 | 12,456 | 37,367 | 0 | 37,367 | 0 | 0 | 0 | 0 |
| Feb | 41,800 | 237,975 | 0 | 237,975 | 11,147 | 55,987 | 0 | 55,987 | 9,289 | 46,656 | 0 | 46,656 | 0 | 0 | 0 | 0 |
| Mar | 55,100 | 293,075 | 146,538 | 146,538 | 14,693 | 70,680 | 35,340 | 35,340 | 12,244 | 58,900 | 29,450 | 29,450 | 0 | 0 | 0 | 0 |
| April | 58,900 | 205,438 | 205,438 | 0 | 15,707 | 51,047 | 51,047 | 0 | 13,089 | 42,539 | 42,539 | 0 | 0 | 0 | 0 | 0 |
| May | 89,775 | 89,775 | 89,775 | 0 | 20,520 | 20,520 | 20,520 | 0 | 17,100 | 17,100 | 17,100 | 0 | 0 | 0 | 0 | 0 |
| June | 86,450 | 86,450 | 86,450 | 0 | 19,760 | 19,760 | 19,760 | 0 | 16,467 | 16,467 | 16,467 | 0 | 0 | 0 | 0 | 0 |
| July | 85,342 | 85,342 | 85,342 | 0 | 19,507 | 19,507 | 19,507 | 0 | 16,256 | 16,256 | 16,256 | 0 | 0 | 0 | 0 | 0 |
| Aug | 94,208 | 94,208 | 94,208 | 0 | 21,533 | 21,533 | 21,533 | 0 | 17,944 | 17,944 | 17,944 | 0 | 0 | 0 | 0 | 0 |
| Sept | 101,967 | 101,967 | 101,967 | 0 | 23,307 | 23,307 | 23,307 | 0 | 19,422 | 19,422 | 19,422 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **971,533** | | **971,533** | | **228,000** | | **228,000** | | **190,000** | | **190,000** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41"Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 22

# Flows Associated with Runoff from Precipitation

## Subwatersheds: Waste Rock Dump and Overburden Piles

**Example**

| From cover sheet | | | | |
|---|---|---|---|---|
| | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

**Runoff Flow (m$^3$ / month)**

| **Runoff #** → | **R11 - Natural ground** | | | | **R12 - Dumped waste rock** | | | | **R13 - Pond** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Area (m$^2$)** (from Sheet 17) → | **400,000** | | | | **550,000** | | | | **50,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R11** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R12** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R13** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 30,147 | 30,147 | 30,147 | 0 | 41,452 | 41,452 | 41,452 | 0 | 5,383 | 5,383 | 5,383 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 26,009 | 26,009 | 13,004 | 13,004 | 35,762 | 35,762 | 17,881 | 17,881 | 4,644 | 4,644 | 2,322 | 2,322 | 0 | 0 | 0 | 0 |
| **Dec** | 21,871 | 34,876 | 0 | 34,876 | 30,073 | 47,954 | 0 | 47,954 | 3,906 | 6,228 | 0 | 6,228 | 0 | 0 | 0 | 0 |
| **Jan** | 17,438 | 52,313 | 0 | 52,313 | 23,977 | 71,931 | 0 | 71,931 | 3,114 | 9,342 | 0 | 9,342 | 0 | 0 | 0 | 0 |
| **Feb** | 11,147 | 63,460 | 0 | 63,460 | 17,881 | 89,812 | 0 | 89,812 | 2,322 | 11,664 | 0 | 11,664 | 0 | 0 | 0 | 0 |
| **Mar** | 14,693 | 78,153 | 39,077 | 39,077 | 23,571 | 113,383 | 56,691 | 56,691 | 3,061 | 14,725 | 7,363 | 7,363 | 0 | 0 | 0 | 0 |
| **April** | 15,707 | 54,783 | 54,783 | 0 | 25,196 | 81,887 | 81,887 | 0 | 3,272 | 10,635 | 10,635 | 0 | 0 | 0 | 0 | 0 |
| **May** | 23,940 | 23,940 | 23,940 | 0 | 32,918 | 32,918 | 32,918 | 0 | 4,275 | 4,275 | 4,275 | 0 | 0 | 0 | 0 | 0 |
| **June** | 23,053 | 23,053 | 23,053 | 0 | 31,698 | 31,698 | 31,698 | 0 | 4,117 | 4,117 | 4,117 | 0 | 0 | 0 | 0 | 0 |
| **July** | 22,758 | 22,758 | 22,758 | 0 | 31,292 | 31,292 | 31,292 | 0 | 4,064 | 4,064 | 4,064 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 25,122 | 25,122 | 25,122 | 0 | 34,543 | 34,543 | 34,543 | 0 | 4,486 | 4,486 | 4,486 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 27,191 | 27,191 | 27,191 | 0 | 37,388 | 37,388 | 37,388 | 0 | 4,856 | 4,856 | 4,856 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **259,076** | | **259,076** | | **365,750** | | **365,750** | | **47,500** | | **47,500** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 23

# Flows Associated with Runoff from Precipitation

Example

## Subwatersheds: Spent Ore Stockpile Watershed

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

**Runoff Flow ($m^3$ / month)**

| **Runoff #** → | **R26 - Natural ground** | | | | **R27 - Spent Ore Stockpile** | | | | **R28 - Collection Pond** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Area ($m^2$)** (from Sheet 17) → | **1,200,000** | | | | **1,650,000** | | | | **150,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R26** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R27** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R28** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 90,440 | 90,440 | 90,440 | 0 | 124,355 | 124,355 | 124,355 | 0 | 16,150 | 16,150 | 16,150 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 78,027 | 78,027 | 39,013 | 39,013 | 107,287 | 107,287 | 53,643 | 53,643 | 13,933 | 13,933 | 6,967 | 6,967 | 0 | 0 | 0 | 0 |
| **Dec** | 65,613 | 104,627 | 0 | 104,627 | 90,218 | 143,862 | 0 | 143,862 | 11,717 | 18,683 | 0 | 18,683 | 0 | 0 | 0 | 0 |
| **Jan** | 52,313 | 156,940 | 0 | 156,940 | 71,931 | 215,793 | 0 | 215,793 | 9,342 | 28,025 | 0 | 28,025 | 0 | 0 | 0 | 0 |
| **Feb** | 33,440 | 190,380 | 0 | 190,380 | 53,643 | 269,436 | 0 | 269,436 | 6,967 | 34,992 | 0 | 34,992 | 0 | 0 | 0 | 0 |
| **Mar** | 44,080 | 234,460 | 117,230 | 117,230 | 70,712 | 340,148 | 170,074 | 170,074 | 9,183 | 44,175 | 22,088 | 22,088 | 0 | 0 | 0 | 0 |
| **April** | 47,120 | 164,350 | 164,350 | 0 | 75,588 | 245,662 | 245,662 | 0 | 9,817 | 31,904 | 31,904 | 0 | 0 | 0 | 0 | 0 |
| **May** | 71,820 | 71,820 | 71,820 | 0 | 98,753 | 98,753 | 98,753 | 0 | 12,825 | 12,825 | 12,825 | 0 | 0 | 0 | 0 | 0 |
| **June** | 69,160 | 69,160 | 69,160 | 0 | 95,095 | 95,095 | 95,095 | 0 | 12,350 | 12,350 | 12,350 | 0 | 0 | 0 | 0 | 0 |
| **July** | 68,273 | 68,273 | 68,273 | 0 | 93,876 | 93,876 | 93,876 | 0 | 12,192 | 12,192 | 12,192 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 75,367 | 75,367 | 75,367 | 0 | 103,629 | 103,629 | 103,629 | 0 | 13,458 | 13,458 | 13,458 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 81,573 | 81,573 | 81,573 | 0 | 112,163 | 112,163 | 112,163 | 0 | 14,567 | 14,567 | 14,567 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **777,227** | | **777,227** | | **1,097,250** | | **1,097,250** | | **142,500** | | **142,500** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 24

# Flows Associated with Runoff from Precipitation

**Example**

## Subwatersheds: Water Treatment Watershed

| | | | | |
|---|---|---|---|---|
| Form cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

| | Runoff Flow ($m^3$ / month) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** → | **R14 - Natural ground** | | | | **R15 - Prepared ground** | | | | **R16 - Collection Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 17) → | **180,000** | | | | **160,000** | | | | **60,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R14** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R15** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R16** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 13,566 | 13,566 | 13,566 | 0 | 13,781 | 13,781 | 13,781 | 0 | 6,460 | 6,460 | 6,460 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 11,704 | 11,704 | 5,852 | 5,852 | 11,890 | 11,890 | 5,945 | 5,945 | 5,573 | 5,573 | 2,787 | 2,787 | 0 | 0 | 0 | 0 |
| **Dec** | 9,842 | 15,694 | 0 | 15,694 | 9,998 | 15,943 | 0 | 15,943 | 4,687 | 7,473 | 0 | 7,473 | 0 | 0 | 0 | 0 |
| **Jan** | 7,847 | 23,541 | 0 | 23,541 | 7,972 | 23,915 | 0 | 23,915 | 3,737 | 11,210 | 0 | 11,210 | 0 | 0 | 0 | 0 |
| **Feb** | 5,016 | 28,557 | 0 | 28,557 | 5,202 | 29,116 | 0 | 29,116 | 2,787 | 13,997 | 0 | 13,997 | 0 | 0 | 0 | 0 |
| **Mar** | 6,612 | 35,169 | 17,585 | 17,585 | 6,857 | 35,973 | 17,987 | 17,987 | 3,673 | 17,670 | 8,835 | 8,835 | 0 | 0 | 0 | 0 |
| **April** | 7,068 | 24,653 | 24,653 | 0 | 7,330 | 25,316 | 25,316 | 0 | 3,927 | 12,762 | 12,762 | 0 | 0 | 0 | 0 | 0 |
| **May** | 10,773 | 10,773 | 10,773 | 0 | 10,944 | 10,944 | 10,944 | 0 | 5,130 | 5,130 | 5,130 | 0 | 0 | 0 | 0 | 0 |
| **June** | 10,374 | 10,374 | 10,374 | 0 | 10,539 | 10,539 | 10,539 | 0 | 4,940 | 4,940 | 4,940 | 0 | 0 | 0 | 0 | 0 |
| **July** | 10,241 | 10,241 | 10,241 | 0 | 10,404 | 10,404 | 10,404 | 0 | 4,877 | 4,877 | 4,877 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 11,305 | 11,305 | 11,305 | 0 | 11,484 | 11,484 | 11,484 | 0 | 5,383 | 5,383 | 5,383 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 12,236 | 12,236 | 12,236 | 0 | 12,430 | 12,430 | 12,430 | 0 | 5,827 | 5,827 | 5,827 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **116,584** | | **116,584** | | **118,830** | | **118,830** | | **57,000** | | **57,000** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 25

# Flows Associated with Runoff from Precipitation

**Example**

## Subwatersheds: Reclaimed Area Watershed

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | **Factored Precipitation** (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

| | **Runoff Flow ($m^3$ / month)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** → | **R17 - Natural ground** | | | | **R18 - Reclaimed ground** | | | | **R19 - Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 17) → | **45,000** | | | | **45,000** | | | | **10,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R17** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R18** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R19** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 3,392 | 3,392 | 3,392 | 0 | 3,634 | 3,634 | 3,634 | 0 | 1,077 | 1,077 | 1,077 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 2,926 | 2,926 | 1,463 | 1,463 | 3,135 | 3,135 | 1,568 | 1,568 | 929 | 929 | 464 | 464 | 0 | 0 | 0 | 0 |
| **Dec** | 2,461 | 3,924 | 0 | 3,924 | 2,636 | 4,204 | 0 | 4,204 | 781 | 1,246 | 0 | 1,246 | 0 | 0 | 0 | 0 |
| **Jan** | 1,962 | 5,885 | 0 | 5,885 | 2,102 | 6,306 | 0 | 6,306 | 623 | 1,868 | 0 | 1,868 | 0 | 0 | 0 | 0 |
| **Feb** | 1,254 | 7,139 | 0 | 7,139 | 1,568 | 7,873 | 0 | 7,873 | 464 | 2,333 | 0 | 2,333 | 0 | 0 | 0 | 0 |
| **Mar** | 1,653 | 8,792 | 4,396 | 4,396 | 2,066 | 9,939 | 4,970 | 4,970 | 612 | 2,945 | 1,473 | 1,473 | 0 | 0 | 0 | 0 |
| **April** | 1,767 | 6,163 | 6,163 | 0 | 2,209 | 7,178 | 7,178 | 0 | 654 | 2,127 | 2,127 | 0 | 0 | 0 | 0 | 0 |
| **May** | 2,693 | 2,693 | 2,693 | 0 | 2,886 | 2,886 | 2,886 | 0 | 855 | 855 | 855 | 0 | 0 | 0 | 0 | 0 |
| **June** | 2,594 | 2,594 | 2,594 | 0 | 2,779 | 2,779 | 2,779 | 0 | 823 | 823 | 823 | 0 | 0 | 0 | 0 | 0 |
| **July** | 2,560 | 2,560 | 2,560 | 0 | 2,743 | 2,743 | 2,743 | 0 | 813 | 813 | 813 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 2,826 | 2,826 | 2,826 | 0 | 3,028 | 3,028 | 3,028 | 0 | 897 | 897 | 897 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 3,059 | 3,059 | 3,059 | 0 | 3,278 | 3,278 | 3,278 | 0 | 971 | 971 | 971 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **29,146** | | **29,146** | | **32,063** | | **32,063** | | **9,500** | | **9,500** | | **0** | | **0** | |

| | | |
|---|---|---|
| **Notes:** | 1 | Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet. |
| | 2 | The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows". |
| | 3 | The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff. |

# Sheet 26

# Flows Associated with Runoff from Precipitation

Example

## Subwatersheds: Construction Area Watershed

| | | | | |
|---|---|---|---|---|
| From cover sheet | Mine: | Enter mine name here | Product: | Enter ore mined here |
| | Project #: | Enter project number here | Revision #: | Enter revision number here (e.g., Rev. 1) |
| | Date: | Enter date here | Model year: | Enter the modelled mine year here |

| | Factored Precipitation (from Sheet 10) (mm) | | | | | | | Monthly runoff expressed as % of the total accumu-lation (If less than 100% it is because of freeze-up) |
|---|---|---|---|---|---|---|---|---|
| **Month** | **From natural ground** | **From prepared ground** | **From Ponds** | **From Waste Rock and Overburden Piles** | **From walls of open pit** | **From reclaimed area** | **From construction area** | |
| **Oct** | 75.4 | 86.1 | 107.7 | 75.4 | 86.1 | 80.8 | 64.1 | 100 |
| **Nov** | 65.0 | 74.3 | 92.9 | 65.0 | 74.3 | 69.7 | 55.3 | 50 |
| **Dec** | 54.7 | 62.5 | 78.1 | 54.7 | 62.5 | 58.6 | 46.5 | 0 |
| **Jan** | 43.6 | 49.8 | 62.3 | 43.6 | 49.8 | 46.7 | 37.1 | 0 |
| **Feb** | 27.9 | 32.5 | 46.4 | 32.5 | 37.2 | 34.8 | 23.7 | 0 |
| **Mar** | 36.7 | 42.9 | 61.2 | 42.9 | 49.0 | 45.9 | 31.2 | 50 |
| **April** | 39.3 | 45.8 | 65.4 | 45.8 | 52.4 | 49.1 | 33.4 | 100 |
| **May** | 59.9 | 68.4 | 85.5 | 59.9 | 68.4 | 64.1 | 50.9 | 100 |
| **June** | 57.6 | 65.9 | 82.3 | 57.6 | 65.9 | 61.8 | 49.0 | 100 |
| **July** | 56.9 | 65.0 | 81.3 | 56.9 | 65.0 | 61.0 | 48.4 | 100 |
| **Aug** | 62.8 | 71.8 | 89.7 | 62.8 | 71.8 | 67.3 | 53.4 | 100 |
| **Sept** | 68.0 | 77.7 | 97.1 | 68.0 | 77.7 | 72.8 | 57.8 | 100 |
| **TOTAL** | **647.7** | **742.7** | **950.0** | **665.0** | **760.0** | **712.5** | **550.5** | |

| | Runoff Flow ($m^3$ / month) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Runoff #** → | **R20 - Natural ground** | | | | **R21 - Construction ground** | | | | **R22 - Pond** | | | | | | | |
| **Area ($m^2$)** (from Sheet 17) → | **90,000** | | | | **90,000** | | | | **20,000** | | | | | | | |
| **Month** | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R20** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R21** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | **R22** Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) | Available runoff (area x factored runoff) | Total available runoff (available plus runoff not discharged the previous month) | Actual monthly runoff (total available x % runoff) | Left over each month (total available - actual runoff) |
| **Oct** | 6,783 | 6,783 | 6,783 | 0 | 5,766 | 5,766 | 5,766 | 0 | 2,153 | 2,153 | 2,153 | 0 | 0 | 0 | 0 | 0 |
| **Nov** | 5,852 | 5,852 | 2,926 | 2,926 | 4,974 | 4,974 | 2,487 | 2,487 | 1,858 | 1,858 | 929 | 929 | 0 | 0 | 0 | 0 |
| **Dec** | 4,921 | 7,847 | 0 | 7,847 | 4,183 | 6,670 | 0 | 6,670 | 1,562 | 2,491 | 0 | 2,491 | 0 | 0 | 0 | 0 |
| **Jan** | 3,924 | 11,771 | 0 | 11,771 | 3,335 | 10,005 | 0 | 10,005 | 1,246 | 3,737 | 0 | 3,737 | 0 | 0 | 0 | 0 |
| **Feb** | 2,508 | 14,279 | 0 | 14,279 | 2,132 | 12,137 | 0 | 12,137 | 929 | 4,666 | 0 | 4,666 | 0 | 0 | 0 | 0 |
| **Mar** | 3,306 | 17,585 | 8,792 | 8,792 | 2,810 | 14,947 | 7,473 | 7,473 | 1,224 | 5,890 | 2,945 | 2,945 | 0 | 0 | 0 | 0 |
| **April** | 3,534 | 12,326 | 12,326 | 0 | 3,004 | 10,477 | 10,477 | 0 | 1,309 | 4,254 | 4,254 | 0 | 0 | 0 | 0 | 0 |
| **May** | 5,387 | 5,387 | 5,387 | 0 | 4,579 | 4,579 | 4,579 | 0 | 1,710 | 1,710 | 1,710 | 0 | 0 | 0 | 0 | 0 |
| **June** | 5,187 | 5,187 | 5,187 | 0 | 4,409 | 4,409 | 4,409 | 0 | 1,647 | 1,647 | 1,647 | 0 | 0 | 0 | 0 | 0 |
| **July** | 5,121 | 5,121 | 5,121 | 0 | 4,352 | 4,352 | 4,352 | 0 | 1,626 | 1,626 | 1,626 | 0 | 0 | 0 | 0 | 0 |
| **Aug** | 5,653 | 5,653 | 5,653 | 0 | 4,805 | 4,805 | 4,805 | 0 | 1,794 | 1,794 | 1,794 | 0 | 0 | 0 | 0 | 0 |
| **Sept** | 6,118 | 6,118 | 6,118 | 0 | 5,200 | 5,200 | 5,200 | 0 | 1,942 | 1,942 | 1,942 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **58,292** | | **58,292** | | **49,548** | | **49,548** | | **19,000** | | **19,000** | | **0** | | **0** | |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The blue shaded cells are the calculated monthly runoff flows that are summarized on Sheet 41 "Summary of Flows".

3 The table must start in a month with 100 % runoff - not a month when freezing results in partial or zero runoff.

# Sheet 27
# Evaporation Losses

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Lake Evaporation** (from Sheet 10) (mm) | **Evaporation Losses ($m^3$ / month)** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Location** → | **PLS Pond** | **Heap Leach Facility** | **Mine Workings pond** | **Waste rock and Overburden Piles pond** | **Water Treatment Collection pond** | **Reclaimed Area Pond** | **Construction Area Pond** | **Barren Pond** | **Spent Ore Stockpiles** | | **Total** |
| | **Flow #** → | **E1** | **E2** | **E3** | **E4** | **E5** | **E6** | **E7** | **E8** | **E9** | | |
| | **Area ($m^2$)** (from Sheet 17) → | 20,000 | 50,000 | 200,000 | 50,000 | 60,000 | 10,000 | 20,000 | 20,000 | 150,000 | | |
| 31.5 | **Oct** | 630 | 1,575 | 6,300 | 1,575 | 1,890 | 315 | 630 | 630 | 4,725 | | 18,270 |
| 0.0 | **Nov** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 0.0 | **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 0.0 | **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 0.0 | **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 0.0 | **Mar** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 17.5 | **April** | 350 | 875 | 3,500 | 875 | 1,050 | 175 | 350 | 350 | 2,625 | | 10,150 |
| 91.0 | **May** | 1,820 | 4,550 | 18,200 | 4,550 | 5,460 | 910 | 1,820 | 1,820 | 13,650 | | 52,780 |
| 108.5 | **June** | 2,170 | 5,425 | 21,700 | 5,425 | 6,510 | 1,085 | 2,170 | 2,170 | 16,275 | | 62,930 |
| 126.0 | **July** | 2,520 | 6,300 | 25,200 | 6,300 | 7,560 | 1,260 | 2,520 | 2,520 | 18,900 | | 73,080 |
| 94.5 | **Aug** | 1,890 | 4,725 | 18,900 | 4,725 | 5,670 | 945 | 1,890 | 1,890 | 14,175 | | 54,810 |
| 56.0 | **Sept** | 1,120 | 2,800 | 11,200 | 2,800 | 3,360 | 560 | 1,120 | 1,120 | 8,400 | | 32,480 |
| **525.0** | **TOTAL** | **10,500** | **26,250** | **105,000** | **26,250** | **31,500** | **5,250** | **10,500** | **10,500** | **78,750** | | **304,500** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The columns are the calculated monthly evaporation that are summarized on Sheet 41 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

# Sheet 28

# Seepage Flows

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Location** → | | **From PLS Pond** | **From Heap Leach Facility** | **Seepage into the Mine Workings pond** | **From Waste Rock and Overburden Piles pond** | **From Water Treatment collection pond** | **From Reclaimed area pond** | **From Construction Area pond** | **From Barren Pond** | **From Spent Ore Stockpile** | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Seepage #** → | | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | | |
| **Seepage estimate (m3/day)** → | | 10 | 10 | 1,000 | 100 | 100 | 10 | 10 | 10 | 1,000 | 0 | |
| **Days/ month** | **Month** | **Seepage ($m^3$ / month)** | | | | | | | | | | |
| 31 | **Oct** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 30 | **Nov** | 300 | 300 | 30,000 | 3,000 | 3,000 | 300 | 300 | 300 | 30,000 | 0 | 67,500 |
| 31 | **Dec** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 31 | **Jan** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 28 | **Feb** | 280 | 280 | 28,000 | 2,800 | 2,800 | 280 | 280 | 280 | 28,000 | 0 | 63,000 |
| 31 | **Mar** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 30 | **April** | 300 | 300 | 30,000 | 3,000 | 3,000 | 300 | 300 | 300 | 30,000 | 0 | 67,500 |
| 31 | **May** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 30 | **June** | 300 | 300 | 30,000 | 3,000 | 3,000 | 300 | 300 | 300 | 30,000 | 0 | 67,500 |
| 31 | **July** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 31 | **Aug** | 310 | 310 | 31,000 | 3,100 | 3,100 | 310 | 310 | 310 | 31,000 | 0 | 69,750 |
| 30 | **Sept** | 300 | 300 | 30,000 | 3,000 | 3,000 | 300 | 300 | 300 | 30,000 | 0 | 67,500 |
| 365 | TOTAL | **3,650** | **3,650** | **365,000** | **36,500** | **36,500** | **3,650** | **3,650** | **3,650** | **365,000** | **0** | **821,250** |

**Notes:**

1 Seepage estimates are user-input data. Data are input in the orange shaded cells. The calculations are carried out in the other cells and the relevant data is automatically transferred to other sheets.

2 The information is automatically transferred from other sheets or is calculated on this sheet, except for seepage estimates.

3 The table should start with the same month as the runoff sheets.

4 Seepage released directly to the environment is considered an effluent under MMER and is subject to monitoring requirements.

# Sheet 29

# Miscellaneous Flows

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | **Enter revision number here (e.g., Rev. 1)** |
| | **Date:** | Enter date here | **Model year:** | **Enter the modelled mine year here** |

| **Flow** → | **Water for dust control** | | | **Potable Water** | **Treated Sewage** | | | |
|---|---|---|---|---|---|---|---|---|
| **Flow Number** → | **M1** | | | | **M2** | | | |
| **From Sheet 12** ($m^3$/day) → | Maximum Possible Water for dust control ($m^3$/day) | Percentage used each month ↓ | Volume ↓ | ($m^3$/day) | % of potable water that becomes sewage | | | |
| | 500 | (%) | ($m^3$) | 150 | 85 | | | |

| **days/ month** | **Month** | **Flow ($m^3$ / month)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 31 | **Oct** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 30 | **Nov** | 15,000 | 50 | 7,500 | 4500 | 3,825 | | | |
| 31 | **Dec** | 15,500 | 0 | 0 | 4650 | 3,953 | | | |
| 31 | **Jan** | 15,500 | 0 | 0 | 4650 | 3,953 | | | |
| 28 | **Feb** | 14,000 | 0 | 0 | 4200 | 3,570 | | | |
| 31 | **Mar** | 15,500 | 0 | 0 | 4650 | 3,953 | | | |
| 30 | **April** | 15,000 | 50 | 7,500 | 4500 | 3,825 | | | |
| 31 | **May** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 30 | **June** | 15,000 | 100 | 15,000 | 4500 | 3,825 | | | |
| 31 | **July** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 31 | **Aug** | 15,500 | 100 | 15,500 | 4650 | 3,953 | | | |
| 30 | **Sept** | 15,000 | 100 | 15,000 | 4500 | 3,825 | | | |
| 365 | **TOTAL** | **182,500** | | **107,000** | **54,750** | **46,538** | | | |

**Notes:**

1 Input data are only required in the orange shaded cells. Other information is extracted from other sheets or is calculated on this sheet.

2 The columns are the calculated monthly miscellaneous flows that are summarized on Sheet 41 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

# Sheet 30

# Irrigation Flows

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | **Enter revision number here (e.g., Rev. 1)** |
| | **Date:** | Enter date here | **Model year:** | **Enter the modelled mine year here** |

| **Flow** → | **Total Leach Solution to Heap** | **Agglomeration water retained in Ore** | **Required Makeup (Water Lost to the Ore during Saturation) (For** | **ROM Ore Moisture** | **Water Loss to Heap at Saturation** | **Ore Drain Down to Spent Ore Stockpile (from saturation to residual moisture content)** | **Ore Drain Down to Heap (from saturation to residual moisture content)** | **Rinse Water to Heap Leach Facility** |
|---|---|---|---|---|---|---|---|---|
| **Flow Number** → | **P2** | **-** | **-** | **P5** | **P4** | **P14** | **P15** | **P16** |
| **Ore Moisture (From Sheet 12)** → | - | 4.0% | 8.0% | 3.0% | 15.0% | 4.0% | 4.0% | - |
| | **m$^3$/mo** | **(%)** | **(%)** | **(%)** | **(%)** | **(%)** | **(%)** | **m$^3$/mo** |

| **days/ month** | **Month** | **Flow (m$^3$ / month)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 31 | **Oct** | 372,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | **Nov** | 360,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | **Jan** | 372,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | **Feb** | 336,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | **Mar** | 372,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | **April** | 360,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | **May** | 0 | 35,904 | 71,808 | 26,928 | 134,640 | 35,904 | 0 | 0 |
| 30 | **June** | 360,000 | 0 | 0 | 0 | 0 | 0 | 0 | 15,840,000 |
| 31 | **July** | 372,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | **Aug** | 372,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | **Sept** | 360,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 365 | **TOTAL** | **3,636,000** | **35,904** | **71,808** | **26,928** | **134,640** | **35,904** | **0** | **15,840,000** |

**Notes:**

1 Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 The columns are the calculated monthly miscellaneous flows that are summarized on Sheet 41 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

# Sheet 31
# Accumulated Flow
## PLS Pond Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | **Total flow P3 to Process Plant** ($m^3$/month) |
|---|---|---|---|---|---|---|---|---|
| | +R1 | +R2 | +R3 | -E1 | -S1 | +P11 | | |
| | Runoff from natural ground (from Sheet 18) | Runoff from prepared ground (from Sheet 18) | Precipitation on the pond (from Sheet 18) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | PLS Solution from the Heap Leach Facility (from Sheet 34) | | |
| **Oct** | 6,029 | 8,613 | 2,153 | -630 | -310 | 447,097 | | 462,953 |
| **Nov** | 2,601 | 3,716 | 929 | 0 | -300 | 392,908 | | 399,853 |
| **Dec** | 0 | 0 | 0 | 0 | -310 | 0 | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -310 | 371,690 | | 371,380 |
| **Feb** | 0 | 0 | 0 | 0 | -280 | 335,720 | | 335,440 |
| **Mar** | 7,815 | 11,242 | 2,945 | 0 | -310 | 474,551 | | 496,243 |
| **April** | 10,957 | 15,823 | 4,254 | -350 | -300 | 505,534 | | 535,917 |
| **May** | 4,788 | 6,840 | 1,710 | -1,820 | -310 | 0 | | 11,208 |
| **June** | 4,611 | 6,587 | 1,647 | -2,170 | -300 | 16,253,143 | | 16,263,517 |
| **July** | 4,552 | 6,502 | 1,626 | -2,520 | -310 | 423,504 | | 433,353 |
| **Aug** | 5,024 | 7,178 | 1,794 | -1,890 | -310 | 431,116 | | 442,913 |
| **Sept** | 5,438 | 7,769 | 1,942 | -1,120 | -300 | 426,334 | | 440,064 |
| **TOTAL** | **51,815** | **74,269** | **19,000** | **-9,870** | **-3,650** | **20,061,598** | | **20,192,842** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table should start with the same month as the runoff sheets.

4 The total flow F1 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 32
# Accumulated Flow
## Process Plant

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows (m$^3$/month)** | | | | | | | | | **Total flow P1 to Barren** |
|---|---|---|---|---|---|---|---|---|---|---|
| | +P3 | +P5 | +P7 | -P8 | | | | | | |
| | PLS Recycle from PLS Pond (from Sheet31) | Ore Moisture Going to the Process Plant (from Sheet 30) | Freshwater Makeup (from Sheet 13) | Water Losses from the Process Plant due to Evaporation and Spillage (from Sheet 13) | | | | | | (m$^3$/month) |
| **Oct** | 462,953 | 0 | 1,515 | -6,060 | | | | | | 458,408 |
| **Nov** | 399,853 | 0 | 1,515 | -6,060 | | | | | | 395,308 |
| **Dec** | 0 | 0 | 1,515 | -6,060 | | | | | | 0 |
| **Jan** | 371,380 | 0 | 1,515 | -6,060 | | | | | | 366,835 |
| **Feb** | 335,440 | 0 | 1,515 | -6,060 | | | | | | 330,895 |
| **Mar** | 496,243 | 0 | 1,515 | -6,060 | | | | | | 491,698 |
| **April** | 535,917 | 0 | 1,515 | -6,060 | | | | | | 531,372 |
| **May** | 11,208 | 26,928 | 1,515 | -6,060 | | | | | | 33,591 |
| **June** | 16,263,517 | 0 | 1,515 | -6,060 | | | | | | 16,258,972 |
| **July** | 433,353 | 0 | 1,515 | -6,060 | | | | | | 428,808 |
| **Aug** | 442,913 | 0 | 1,515 | -6,060 | | | | | | 438,368 |
| **Sept** | 440,064 | 0 | 1,515 | -6,060 | | | | | | 435,519 |
| **TOTAL** | **20,192,842** | **26,928** | **18,180** | **-72,720** | | | | | | **20,169,775** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F2 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 33
# Accumulated Flow
## Barren Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows (m$^3$/month)** | | | | | | | | | | **Total flow** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | +R23 | +R24 | +R25 | -E8 | -S8 | +P10 | +P12 | +P13 | +P1 | -P2 | **F1 to collection pond** | **P9 from Water Treatment** |
| | Runoff from natural ground (from Sheet 19) | Runoff from dumped waste rock (from Sheet 19) | Precipitation on the pond (from Sheet 19) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | Makeup Water from Mine Workings (from Sheet 12) | Makeup Water from Waste Rock Piles (from Sheet 12) | Makeup Water from Spent Ore Stockpile (from Sheet 12) | Water From Process Plant (from Sheet 32) | Heap water for Irrigation (from Sheet 30) | (m$^3$/month) | (m$^3$/month) |
| **Oct** | 6,029 | 8,613 | 2,153 | -630 | -310 | 10 | 20 | 30 | 458,408 | -372,000 | 102,324 | 0 |
| **Nov** | 2,601 | 3,716 | 929 | 0 | -300 | 10 | 20 | 30 | 395,308 | -360,000 | 42,313 | 0 |
| **Dec** | 0 | 0 | 0 | 0 | -310 | 10 | 20 | 30 | 0 | 0 | 0 | 250 |
| **Jan** | 0 | 0 | 0 | 0 | -310 | 10 | 20 | 30 | 366,835 | -372,000 | 0 | 5,415 |
| **Feb** | 0 | 0 | 0 | 0 | -280 | 10 | 20 | 30 | 330,895 | -336,000 | 0 | 5,325 |
| **Mar** | 7,815 | 11,242 | 2,945 | 0 | -310 | 10 | 20 | 30 | 491,698 | -372,000 | 141,450 | 0 |
| **April** | 10,957 | 15,823 | 4,254 | -350 | -300 | 10 | 20 | 30 | 531,372 | -360,000 | 201,816 | 0 |
| **May** | 4,788 | 6,840 | 1,710 | -1,820 | -310 | 10 | 20 | 30 | 33,591 | 0 | 44,859 | 0 |
| **June** | 4,611 | 6,587 | 1,647 | -2,170 | -300 | 10 | 20 | 30 | 16,258,972 | -360,000 | 15,909,406 | 0 |
| **July** | 4,552 | 6,502 | 1,626 | -2,520 | -310 | 10 | 20 | 30 | 428,808 | -372,000 | 66,717 | 0 |
| **Aug** | 5,024 | 7,178 | 1,794 | -1,890 | -310 | 10 | 20 | 30 | 438,368 | -372,000 | 78,225 | 0 |
| **Sept** | 5,438 | 7,769 | 1,942 | -1,120 | -300 | 10 | 20 | 30 | 435,519 | -360,000 | 89,308 | 0 |
| **TOTAL** | **51,815** | **74,269** | **19,000** | **-10,500** | **-3,650** | **120** | **240** | **360** | **20,169,775** | **-3,636,000** | **16,676,419** | **10,990** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F4 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 34
# Accumulated Flow
## Heap Leach Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows (m$^3$/month)** | | | | | | | | | | **P11 to PLS pond** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | +R4 | +R5 | +R6 | -E2 | -S2 | +P2 | +P15 | -P4 | +P16 | | |
| | Runoff from natural ground (from Sheet 20) | Runoff from prepared ground (from Sheet 20) | Precipitation on the Pond (from Sheet 20) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | Irrigation to the Heap Leach Facility (from Sheet 30) | Ore Draindown (from Sheet 30) | Water tied up in the Heap (from Sheet 30) | Rinse Water (from Sheet 30) | | (m$^3$/month) |
| **Oct** | 33,915 | 37,683 | 5,383 | -1,575 | -310 | 372,000 | 0 | 0 | 0 | | 447,097 |
| **Nov** | 14,630 | 16,256 | 2,322 | 0 | -300 | 360,000 | 0 | 0 | 0 | | 392,908 |
| **Dec** | 0 | 0 | 0 | 0 | -310 | 0 | 0 | 0 | 0 | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -310 | 372,000 | 0 | 0 | 0 | | 371,690 |
| **Feb** | 0 | 0 | 0 | 0 | -280 | 336,000 | 0 | 0 | 0 | | 335,720 |
| **Mar** | 43,961 | 51,538 | 7,363 | 0 | -310 | 372,000 | 0 | 0 | 0 | | 474,551 |
| **April** | 61,631 | 74,443 | 10,635 | -875 | -300 | 360,000 | 0 | 0 | 0 | | 505,534 |
| **May** | 26,933 | 29,925 | 4,275 | -4,550 | -310 | 0 | 0 | -134,640 | 0 | | 0 |
| **June** | 25,935 | 28,817 | 4,117 | -5,425 | -300 | 360,000 | 0 | 0 | 15,840,000 | | 16,253,143 |
| **July** | 25,603 | 28,447 | 4,064 | -6,300 | -310 | 372,000 | 0 | 0 | 0 | | 423,504 |
| **Aug** | 28,263 | 31,403 | 4,486 | -4,725 | -310 | 372,000 | 0 | 0 | 0 | | 431,116 |
| **Sept** | 30,590 | 33,989 | 4,856 | -2,800 | -300 | 360,000 | 0 | 0 | 0 | | 426,334 |
| **TOTAL** | **291,460** | **332,500** | **47,500** | **-26,250** | **-3,650** | **3,636,000** | **0** | **-134,640** | **15,840,000** | | **20,061,598** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F2 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 35
# Accumulated Flow
## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow F3 to collection pond** ($m^3$/month) |
|---|---|---|---|---|---|---|---|---|---|
| | +R8 | +R9 | +R10 | -E3 | +S3 | -P10 | | | |
| | Runoff from natural ground (from Sheet 21) | Runoff from pit walls (from Sheet 21) | Precipitation on the pond (from Sheet 21) | Evaporation from the pond (from Sheet 27) | Seepage into the open pit (from Sheet 28) | Makeup water to Barron Pond (from Sheet 12) | | | |
| **Oct** | 113,050 | 25,840 | 21,533 | -6,300 | 31,000 | -10 | | | 185,113 |
| **Nov** | 48,767 | 11,147 | 9,289 | 0 | 30,000 | -10 | | | 99,192 |
| **Dec** | 0 | 0 | 0 | 0 | 31,000 | -10 | | | 30,990 |
| **Jan** | 0 | 0 | 0 | 0 | 31,000 | -10 | | | 30,990 |
| **Feb** | 0 | 0 | 0 | 0 | 28,000 | -10 | | | 27,990 |
| **Mar** | 146,538 | 35,340 | 29,450 | 0 | 31,000 | -10 | | | 242,318 |
| **April** | 205,438 | 51,047 | 42,539 | -3,500 | 30,000 | -10 | | | 325,513 |
| **May** | 89,775 | 20,520 | 17,100 | -18,200 | 31,000 | -10 | | | 140,185 |
| **June** | 86,450 | 19,760 | 16,467 | -21,700 | 30,000 | -10 | | | 130,967 |
| **July** | 85,342 | 19,507 | 16,256 | -25,200 | 31,000 | -10 | | | 126,894 |
| **Aug** | 94,208 | 21,533 | 17,944 | -18,900 | 31,000 | -10 | | | 145,776 |
| **Sept** | 101,967 | 23,307 | 19,422 | -11,200 | 30,000 | -10 | | | 163,486 |
| **TOTAL** | **971,533** | **228,000** | **190,000** | **-105,000** | **365,000** | **-120** | **0** | **0** | **1,649,413** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F3 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 36
# Accumulated Flow
## Waste Rock Dump and Overburden Piles Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow F4 to collection pond** ($m^3$/month) |
|---|---|---|---|---|---|---|---|---|---|
| | +R11 | +R12 | +R13 | -E4 | -S4 | -P12 | | | |
| | Runoff from natural ground (from Sheet 22) | Runoff from dumped waste rock (from Sheet 22) | Precipitation on the pond (from Sheet 22) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | Makeup Water to Barren Pond (from Sheet 12) | | | |
| **Oct** | 30,147 | 41,452 | 5,383 | -1,575 | -3,100 | -20 | | | 72,287 |
| **Nov** | 13,004 | 17,881 | 2,322 | 0 | -3,000 | -20 | | | 30,188 |
| **Dec** | 0 | 0 | 0 | 0 | -3,100 | -20 | | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -3,100 | -20 | | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -2,800 | -20 | | | 0 |
| **Mar** | 39,077 | 56,691 | 7,363 | 0 | -3,100 | -20 | | | 100,010 |
| **April** | 54,783 | 81,887 | 10,635 | -875 | -3,000 | -20 | | | 143,410 |
| **May** | 23,940 | 32,918 | 4,275 | -4,550 | -3,100 | -20 | | | 53,463 |
| **June** | 23,053 | 31,698 | 4,117 | -5,425 | -3,000 | -20 | | | 50,423 |
| **July** | 22,758 | 31,292 | 4,064 | -6,300 | -3,100 | -20 | | | 48,694 |
| **Aug** | 25,122 | 34,543 | 4,486 | -4,725 | -3,100 | -20 | | | 56,306 |
| **Sept** | 27,191 | 37,388 | 4,856 | -2,800 | -3,000 | -20 | | | 63,614 |
| **TOTAL** | **259,076** | **365,750** | **47,500** | **-26,250** | **-36,500** | **-240** | | | **618,396** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F4 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 37
# Accumulated Flow
## Spent Ore Stockpile Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow** **F2** **to collection pond** ($m^3$/month) |
|---|---|---|---|---|---|---|---|---|---|
| | +R26 | +R27 | +R28 | -E9 | -S9 | -P13 | +P14 | | |
| | Runoff from natural ground (from Sheet 23) | Runoff from dumped waste rock (from Sheet 23) | Precipitation on the pond (from Sheet 23) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | Makeup Water to Barren Pond (from Sheet 12) | Ore Draindown (from Sheet 30) | | |
| **Oct** | 90,440 | 124,355 | 16,150 | -4,725 | -31,000 | -30 | 0 | | 195,190 |
| **Nov** | 39,013 | 53,643 | 6,967 | 0 | -30,000 | -30 | 0 | | 69,593 |
| **Dec** | 0 | 0 | 0 | 0 | -31,000 | -30 | 0 | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -31,000 | -30 | 0 | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -28,000 | -30 | 0 | | 0 |
| **Mar** | 117,230 | 170,074 | 22,088 | 0 | -31,000 | -30 | 0 | | 278,361 |
| **April** | 164,350 | 245,662 | 31,904 | -2,625 | -30,000 | -30 | 0 | | 409,261 |
| **May** | 71,820 | 98,753 | 12,825 | -13,650 | -31,000 | -30 | 35,904 | | 174,622 |
| **June** | 69,160 | 95,095 | 12,350 | -16,275 | -30,000 | -30 | 0 | | 130,300 |
| **July** | 68,273 | 93,876 | 12,192 | -18,900 | -31,000 | -30 | 0 | | 124,411 |
| **Aug** | 75,367 | 103,629 | 13,458 | -14,175 | -31,000 | -30 | 0 | | 147,249 |
| **Sept** | 81,573 | 112,163 | 14,567 | -8,400 | -30,000 | -30 | 0 | | 169,873 |
| **TOTAL** | **777,227** | **1,097,250** | **142,500** | **-78,750** | **-365,000** | **-360** | **35,904** | | **1,698,861** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow F4 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 38
# Accumulated Flow
## Water Treatment Plant Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | | | | | | **Total flow** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | +R14 | +R15 | +R16 | -E5 | -S5 | -M1 | +M2 | +F1 | +F2 | +F3 | +F4 | -P9 | -P16 | **D1 to Environment** |
| | Runoff from natural ground (from Sheet 24) | Runoff from prepared ground (from Sheet 24) | Precipitation on the pond (from Sheet 24) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | Water for dust control (from Sheet 29) | Sewage (from Sheet 29) | Flow from Barren Pond watershed (from Sheet 33) | Flow from stent Ore Stockpile watershed (from Sheet 37) | Flow from mine workings (from Sheet 35) | Flow from waste rock and overburden piles (from Sheet 36) | Make-up water demand to the Barren Pond (from Sheet 33) | Rinse Water to Heap (from Sheet 30) | ($m^3$/month) |
| **Oct** | 13,566 | 13,781 | 6,460 | -1,890 | -3,100 | -15,500 | 3,953 | 102,324 | 195,190 | 185,113 | 72,287 | 0 | 0 | 572,184 |
| **Nov** | 5,852 | 5,945 | 2,787 | 0 | -3,000 | -7,500 | 3,825 | 42,313 | 69,593 | 99,192 | 30,188 | 0 | 0 | 249,195 |
| **Dec** | 0 | 0 | 0 | 0 | -3,100 | 0 | 3,953 | 0 | 0 | 30,990 | 0 | -250 | 0 | 31,593 |
| **Jan** | 0 | 0 | 0 | 0 | -3,100 | 0 | 3,953 | 0 | 0 | 30,990 | 0 | -5,415 | 0 | 26,428 |
| **Feb** | 0 | 0 | 0 | 0 | -2,800 | 0 | 3,570 | 0 | 0 | 27,990 | 0 | -5,325 | 0 | 23,435 |
| **Mar** | 17,585 | 17,987 | 8,835 | 0 | -3,100 | 0 | 3,953 | 141,450 | 278,361 | 242,318 | 100,010 | 0 | 0 | 807,398 |
| **April** | 24,653 | 25,316 | 12,762 | -1,050 | -3,000 | -7,500 | 3,825 | 201,816 | 409,261 | 325,513 | 143,410 | 0 | 0 | 1,135,006 |
| **May** | 10,773 | 10,944 | 5,130 | -5,460 | -3,100 | -15,500 | 3,953 | 44,859 | 174,622 | 140,185 | 53,463 | 0 | 0 | 419,868 |
| **June** | 10,374 | 10,539 | 4,940 | -6,510 | -3,000 | -15,000 | 3,825 | 15,909,406 | 130,300 | 130,967 | 50,423 | 0 | -15,840,000 | 386,264 |
| **July** | 10,241 | 10,404 | 4,877 | -7,560 | -3,100 | -15,500 | 3,953 | 66,717 | 124,411 | 126,894 | 48,694 | 0 | 0 | 370,029 |
| **Aug** | 11,305 | 11,484 | 5,383 | -5,670 | -3,100 | -15,500 | 3,953 | 78,225 | 147,249 | 145,776 | 56,306 | 0 | 0 | 435,412 |
| **Sept** | 12,236 | 12,430 | 5,827 | -3,360 | -3,000 | -15,000 | 3,825 | 89,308 | 169,873 | 163,486 | 63,614 | 0 | 0 | 499,239 |
| **TOTAL** | **116,584** | **118,830** | **57,000** | **-31,500** | **-36,500** | **-107,000** | **46,538** | **16,676,419** | **1,698,861** | **1,649,413** | **618,396** | **10,990** | **-15,840,000** | **4,956,050** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow D1 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

5 The user should be aware that make-up flows satisfied from the collection pond (flow P9 &P16 ) are not actual flows but represent make-up demand. The user must verify in Sheet 33 that make-up demands are satisfied (no cells should be shaded pink). The user must find alternative make-up source if flow P9, P16 is not sufficient.

# Sheet 39
# Accumulated Flow
## Reclaimed Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow** |
|---|---|---|---|---|---|---|---|---|---|
| | +R17 | +R18 | +R19 | -E6 | -S6 | | | | **D2 to environment** |
| | Runoff from natural ground (from Sheet 25) | Runoff from Reclaimed ground (from Sheet 25) | Precipitation on the pond (from Sheet 25) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | | | | ($m^3$/month) |
| **Oct** | 3,392 | 3,634 | 1,077 | -315 | -310 | | | | 7,477 |
| **Nov** | 1,463 | 1,568 | 464 | 0 | -300 | | | | 3,195 |
| **Dec** | 0 | 0 | 0 | 0 | -310 | | | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -310 | | | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -280 | | | | 0 |
| **Mar** | 4,396 | 4,970 | 1,473 | 0 | -310 | | | | 10,528 |
| **April** | 6,163 | 7,178 | 2,127 | -175 | -300 | | | | 14,994 |
| **May** | 2,693 | 2,886 | 855 | -910 | -310 | | | | 5,214 |
| **June** | 2,594 | 2,779 | 823 | -1,085 | -300 | | | | 4,811 |
| **July** | 2,560 | 2,743 | 813 | -1,260 | -310 | | | | 4,546 |
| **Aug** | 2,826 | 3,028 | 897 | -945 | -310 | | | | 5,497 |
| **Sept** | 3,059 | 3,278 | 971 | -560 | -300 | | | | 6,448 |
| **TOTAL** | **29,146** | **32,063** | **9,500** | **-5,250** | **-3,650** | **0** | **0** | **0** | **62,709** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41 "Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow D2 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 40
# Accumulated Flow
## Construction Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

| **Month** | **Flows ($m^3$/month)** | | | | | | | | **Total flow D3 to environment ($m^3$/month)** |
|---|---|---|---|---|---|---|---|---|---|
| | +R20 | +R21 | +R22 | -E7 | -S7 | | | | |
| | Runoff from natural ground (from Sheet 26) | Runoff from construction ground (from Sheet 26) | Precipitation on the pond (from Sheet 26) | Evaporation from the pond (from Sheet 27) | Seepage (from Sheet 28) | | | | |
| **Oct** | 6,783 | 5,766 | 2,153 | -630 | -310 | | | | 13,762 |
| **Nov** | 2,926 | 2,487 | 929 | 0 | -300 | | | | 6,042 |
| **Dec** | 0 | 0 | 0 | 0 | -310 | | | | 0 |
| **Jan** | 0 | 0 | 0 | 0 | -310 | | | | 0 |
| **Feb** | 0 | 0 | 0 | 0 | -280 | | | | 0 |
| **Mar** | 8,792 | 7,473 | 2,945 | 0 | -310 | | | | 18,901 |
| **April** | 12,326 | 10,477 | 4,254 | -350 | -300 | | | | 26,407 |
| **May** | 5,387 | 4,579 | 1,710 | -1,820 | -310 | | | | 9,545 |
| **June** | 5,187 | 4,409 | 1,647 | -2,170 | -300 | | | | 8,773 |
| **July** | 5,121 | 4,352 | 1,626 | -2,520 | -310 | | | | 8,268 |
| **Aug** | 5,653 | 4,805 | 1,794 | -1,890 | -310 | | | | 10,052 |
| **Sept** | 6,118 | 5,200 | 1,942 | -1,120 | -300 | | | | 11,841 |
| **TOTAL** | **58,292** | **49,548** | **19,000** | **-10,500** | **-3,650** | **0** | **0** | **0** | **113,590** |

**Notes:**

1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

2 All the flows are summarized on Sheet 41"Summary of Flows".

3 The table must start with the same month as the runoff sheets.

4 The total flow D3 is assumed to be positive or null. As a result, the calculations force negative values to zero. During the QA/QC process, the user must confirm the validity of this assumption.

# Sheet 41
# Water Balance Summary of Flows

**Example**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Mine:** | Enter mine name here | **Project #:** | Enter project number here | **Date:** | Enter date here | **Revision #** | Enter revision number here (e.g., Rev. 1) | **Model year:** | modelled mine year here |

| | | | Flow ($m^3$) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **April** | **May** | **June** | **July** | **Aug** | **Sept** | **TOTAL** |
| **Flows associated with processing the ore** | | | | | | | | | | | | | | | |
| P1 | Discharge from the Process Plant to the Barren Pond | | 458,408 | 395,308 | 0 | 366,835 | 330,895 | 491,698 | 531,372 | 33,591 | 16,258,972 | 428,808 | 438,368 | 435,519 | 20,169,775 |
| P2 | Discharge from Barren Pond to Heap Leach facility | | 372,000 | 360,000 | 0 | 372,000 | 336,000 | 372,000 | 360,000 | 0 | 360,000 | 372,000 | 372,000 | 360,000 | 3,636,000 |
| P3 | Discharge from the PLS to the Process Plant | | 462,953 | 399,853 | 0 | 371,380 | 335,440 | 496,243 | 535,917 | 11,208 | 16,263,517 | 433,353 | 442,913 | 440,064 | 20,192,842 |
| P4 | Water retained in the Heap Leach Facility | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 134,640 | 0 | 0 | 0 | 0 | 134,640 |
| P5 | Moisture going into the Process Plant with the ore | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26,928 | 0 | 0 | 0 | 0 | 26,928 |
| P7 | Fresh make-up water required in the Process Plant | | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 1,515 | 18,180 |
| P8 | Losses in the Process Plant to evaporation and spillage etc | | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 6,060 | 72,720 |
| P9 | Makeup Water from the Water Treatment Plant to the Barren Pond | | 0 | 0 | -250 | -5,415 | -5,325 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -10,990 |
| P10 | Make-up water from the Mine Workings | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 120 |
| P11 | PLS from the Heap Leach Facility to the PLS Pond | | 447,097 | 392,908 | 0 | 371,690 | 335,720 | 474,551 | 505,534 | 0 | 16,253,143 | 423,504 | 431,116 | 426,334 | 20,061,598 |
| P12 | Make-up water from the Waste Rock and Overburden Piles | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 240 |
| P13 | Make-up water from the Spent Ore Stockpile | | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 360 |
| P14 | Draindown from the Spent Ore Stockpile | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35,904 | 0 | 0 | 0 | 0 | 35,904 |
| P15 | Draindown from the Heap Leach Facility | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P16 | Rinse Water from the Water Treatment Plant to Heap Leach Facility | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15,840,000 | 0 | 0 | 0 | 15,840,000 |
| **Flows associated with runoff from precipitation** | | | | | | | | | | | | | | | |
| R1 | PLS Pond | Runoff from natural ground | 6,029 | 2,601 | 0 | 0 | 0 | 7,815 | 10,957 | 4,788 | 4,611 | 4,552 | 5,024 | 5,438 | 51,815 |
| R2 | | Runoff from prepared ground | 8,613 | 3,716 | 0 | 0 | 0 | 11,242 | 15,823 | 6,840 | 6,587 | 6,502 | 7,178 | 7,769 | 74,269 |
| R3 | | Precipitation direct to the pond | 2,153 | 929 | 0 | 0 | 0 | 2,945 | 4,254 | 1,710 | 1,647 | 1,626 | 1,794 | 1,942 | 19,000 |
| R4 | Heap Leach Facility | Runoff from natural ground | 33,915 | 14,630 | 0 | 0 | 0 | 43,961 | 61,631 | 26,933 | 25,935 | 25,603 | 28,263 | 30,590 | 291,460 |
| R5 | | Runoff from prepared ground | 37,683 | 16,256 | 0 | 0 | 0 | 51,538 | 74,443 | 29,925 | 28,817 | 28,447 | 31,403 | 33,989 | 332,500 |
| R6 | | Precipitation direct to the pond | 5,383 | 2,322 | 0 | 0 | 0 | 7,363 | 10,635 | 4,275 | 4,117 | 4,064 | 4,486 | 4,856 | 47,500 |
| R8 | Mine Workings | Runoff from natural ground | 113,050 | 48,767 | 0 | 0 | 0 | 146,538 | 205,438 | 89,775 | 86,450 | 85,342 | 94,208 | 101,967 | 971,533 |
| R9 | | Runoff from the pit walls | 25,840 | 11,147 | 0 | 0 | 0 | 35,340 | 51,047 | 20,520 | 19,760 | 19,507 | 21,533 | 23,307 | 228,000 |
| R10 | | Precipitation direct to the pond | 21,533 | 9,289 | 0 | 0 | 0 | 29,450 | 42,539 | 17,100 | 16,467 | 16,256 | 17,944 | 19,422 | 190,000 |
| R11 | Waste rock and Overburden | Runoff from natural ground | 30,147 | 13,004 | 0 | 0 | 0 | 39,077 | 54,783 | 23,940 | 23,053 | 22,758 | 25,122 | 27,191 | 259,076 |
| R12 | | Runoff from the waste rock and overburden piles | 41,452 | 17,881 | 0 | 0 | 0 | 56,691 | 81,887 | 32,918 | 31,698 | 31,292 | 34,543 | 37,388 | 365,750 |
| R13 | | Precipitation direct to the pond | 5,383 | 2,322 | 0 | 0 | 0 | 7,363 | 10,635 | 4,275 | 4,117 | 4,064 | 4,486 | 4,856 | 47,500 |
| R14 | Water Treatment | Runoff from natural ground | 13,566 | 5,852 | 0 | 0 | 0 | 17,585 | 24,653 | 10,773 | 10,374 | 10,241 | 11,305 | 12,236 | 116,584 |
| R15 | | Runoff from prepared ground | 13,781 | 5,945 | 0 | 0 | 0 | 17,987 | 25,316 | 10,944 | 10,539 | 10,404 | 11,484 | 12,430 | 118,830 |
| R16 | | Precipitation direct to the pond | 6,460 | 2,787 | 0 | 0 | 0 | 8,835 | 12,762 | 5,130 | 4,940 | 4,877 | 5,383 | 5,827 | 57,000 |
| R17 | Reclaimed Area | Runoff from natural ground | 3,392 | 1,463 | 0 | 0 | 0 | 4,396 | 6,163 | 2,693 | 2,594 | 2,560 | 2,826 | 3,059 | 29,146 |
| R18 | | Runoff from reclaimed ground | 3,634 | 1,568 | 0 | 0 | 0 | 4,970 | 7,178 | 2,886 | 2,779 | 2,743 | 3,028 | 3,278 | 32,063 |
| R19 | | Precipitation direct to the pond | 1,077 | 464 | 0 | 0 | 0 | 1,473 | 2,127 | 855 | 823 | 813 | 897 | 971 | 9,500 |
| R20 | Construction Area | Runoff from natural ground | 6,783 | 2,926 | 0 | 0 | 0 | 8,792 | 12,326 | 5,387 | 5,187 | 5,121 | 5,653 | 6,118 | 58,292 |
| R21 | | Runoff from construction ground | 5,766 | 2,487 | 0 | 0 | 0 | 7,473 | 10,477 | 4,579 | 4,409 | 4,352 | 4,805 | 5,200 | 49,548 |
| R22 | | Precipitation direct to the pond | 2,153 | 929 | 0 | 0 | 0 | 2,945 | 4,254 | 1,710 | 1,647 | 1,626 | 1,794 | 1,942 | 19,000 |
| R23 | Barren Pond | Runoff from natural ground | 6,029 | 2,601 | 0 | 0 | 0 | 7,815 | 10,957 | 4,788 | 4,611 | 4,552 | 5,024 | 5,438 | 51,815 |
| R24 | | Runoff from construction ground | 8,613 | 3,716 | 0 | 0 | 0 | 11,242 | 15,823 | 6,840 | 6,587 | 6,502 | 7,178 | 7,769 | 74,269 |
| R25 | | Precipitation direct to the pond | 2,153 | 929 | 0 | 0 | 0 | 2,945 | 4,254 | 1,710 | 1,647 | 1,626 | 1,794 | 1,942 | 19,000 |
| R26 | Spent Ore Stockpile | Runoff from natural ground | 90,440 | 39,013 | 0 | 0 | 0 | 117,230 | 164,350 | 71,820 | 69,160 | 68,273 | 75,367 | 81,573 | 777,227 |
| R27 | | Runoff from construction ground | 124,355 | 53,643 | 0 | 0 | 0 | 170,074 | 245,662 | 98,753 | 95,095 | 93,876 | 103,629 | 112,163 | 1,097,250 |
| R28 | | Precipitation direct to the pond | 16,150 | 6,967 | 0 | 0 | 0 | 22,088 | 31,904 | 12,825 | 12,350 | 12,192 | 13,458 | 14,567 | 142,500 |
| **Evaporation** | | | | | | | | | | | | | | | |
| E1 | From the PLS Pond | | -630 | 0 | 0 | 0 | 0 | 0 | -350 | -1,820 | -2,170 | -2,520 | -1,890 | -1,120 | -9,870 |
| E2 | From the collection pond at the Heap Leach Facility | | -1,575 | 0 | 0 | 0 | 0 | 0 | -875 | -4,550 | -5,425 | -6,300 | -4,725 | -2,800 | -26,250 |
| E3 | From the collection pond at the Mine Workings | | -6300 | 0 | 0 | 0 | 0 | 0 | -3,500 | -18,200 | -21,700 | -25,200 | -18,900 | -11,200 | -105,000 |
| E4 | From the collection pond at the Waste Rock and Overburden Piles | | -1,575 | 0 | 0 | 0 | 0 | 0 | -875 | -4,550 | -5,425 | -6,300 | -4,725 | -2,800 | -26,250 |
| E5 | From the collection pond at the Water Treatment Plant | | -1,890 | 0 | 0 | 0 | 0 | 0 | -1,050 | -5,460 | -6,510 | -7,560 | -5,670 | -3,360 | -31,500 |
| E6 | From the Reclaimed Area Pond | | -315 | 0 | 0 | 0 | 0 | 0 | -175 | -910 | -1,085 | -1,260 | -945 | -560 | -5,250 |
| E7 | From the Construction Area Pond | | -630 | 0 | 0 | 0 | 0 | 0 | -350 | -1,820 | -2,170 | -2,520 | -1,890 | -1,120 | -10,500 |
| E8 | From the collection pond at the Barren Pond | | -630 | 0 | 0 | 0 | 0 | 0 | -350 | -1,820 | -2,170 | -2,520 | -1,890 | -1,120 | -10,500 |
| E9 | From the collection pond at the Spent Ore Stockpiles | | -4,725 | 0 | 0 | 0 | 0 | 0 | -2,625 | -13,650 | -16,275 | -18,900 | -14,175 | -8,400 | -78,750 |
| **Seepage** | | | | | | | | | | | | | | | |
| S1 | From the PLS Pond | | -310 | -300 | -310 | -310 | -280 | -310 | -300 | -310 | -300 | -310 | -310 | -300 | -3,650 |
| S2 | From the Heap Leach Facility | | -310 | -300 | -310 | -310 | -280 | -310 | -300 | -310 | -300 | -310 | -310 | -300 | -3,650 |
| S3 | From the Mine Workings | | 31,000 | 30,000 | 31,000 | 31,000 | 28,000 | 31,000 | 30,000 | 31,000 | 30,000 | 31,000 | 31,000 | 30,000 | 365,000 |
| S4 | From the Waste Rock and Overburden Piles | | -3,100 | -3,000 | -3,100 | -3,100 | -2,800 | -3,100 | -3,000 | -3,100 | -3,000 | -3,100 | -3,100 | -3,000 | -36,500 |
| S5 | From the collection pond at the Water Treatment Plant | | -3,100 | -3,000 | -3,100 | -3,100 | -2,800 | -3,100 | -3,000 | -3,100 | -3,000 | -3,100 | -3,100 | -3,000 | -36,500 |
| S6 | From the Reclaimed Area Pond | | -310 | -300 | -310 | -310 | -280 | -310 | -300 | -310 | -300 | -310 | -310 | -300 | -3,650 |
| S7 | From the Construction Area Pond | | -310 | -300 | -310 | -310 | -280 | -310 | -300 | -310 | -300 | -310 | -310 | -300 | -3,650 |
| S8 | From the Barren Pond | | -310 | -300 | -310 | -310 | -280 | -310 | -300 | -310 | -300 | -310 | -310 | -300 | -3,650 |
| S9 | From the Spent Ore Stockpiles | | -31,000 | -30,000 | -31,000 | -31,000 | -28,000 | -31,000 | -30,000 | -31,000 | -30,000 | -31,000 | -31,000 | -30,000 | -365,000 |
| **Miscellaneous flows** | | | | | | | | | | | | | | | |
| M1 | Water for dust control (from the collection pond at the Water Treatment Plant) | | 15,500 | 7,500 | 0 | 0 | 0 | 0 | 7,500 | 15,500 | 15,000 | 15,500 | 15,500 | 15,000 | 107,000 |
| M2 | Treated sewage water discharged to the Water Treatment Plant | | 3,953 | 3,825 | 3,953 | 3,953 | 3,570 | 3,953 | 3,825 | 3,953 | 3,825 | 3,953 | 3,953 | 3,825 | 46,538 |
| **Surface** | Construction Area | | | | | | | | | | | | | | |
| F1 | From Barren pond to collection pond at the Water Treatment Plant | | 102,324 | 42,313 | 0 | 0 | 0 | 141,450 | 201,816 | 44,859 | 15,909,406 | 66,717 | 78,225 | 89,308 | 16,676,419 |
| F2 | From Spent Ore Stockpiles pond to collection pond at the Water Treatment Plant | | 195,190 | 69,593 | 0 | 0 | 0 | 278,361 | 409,261 | 174,622 | 130,300 | 124,411 | 147,249 | 169,873 | 1,698,861 |
| F3 | From Mine Workings pond to collection pond at the Water Treatment Plant | | 185,113 | 99,192 | 30,990 | 30,990 | 27,990 | 242,318 | 325,513 | 140,185 | 130,967 | 126,894 | 145,776 | 163,486 | 1,649,413 |
| F4 | From Waste Rock and Overburden Piles pond to collection pond at the Water Treatment Plant | | 72,287 | 30,188 | 0 | 0 | 0 | 100,010 | 143,410 | 53,463 | 50,423 | 48,694 | 56,306 | 63,614 | 618,396 |
| **Discharge to the environment** | | | | | | | | | | | | | | | |
| D1 | From the Water Treatment Plant polishing pond to the environment | | 572,184 | 249,195 | 31,593 | 26,428 | 23,435 | 807,398 | 1,135,006 | 419,868 | 386,264 | 370,029 | 435,412 | 499,239 | 4,956,050 |
| D2 | From the Reclaimed Area pond to the environment | | 7,477 | 3,195 | 0 | 0 | 0 | 10,528 | 14,994 | 5,214 | 4,811 | 4,546 | 5,497 | 6,448 | 62,709 |
| D3 | From the Construction Area pond to the environment | | 13,762 | 6,042 | 0 | 0 | 0 | 18,901 | 26,407 | 9,545 | 8,773 | 8,268 | 10,052 | 11,841 | 113,590 |

**Note:** Input of data is not required on this sheet, The information is automatically transferred from the other sheets.

The user should be aware that make-up flows satisfied from the collection pond (flow P9 and P16) are not actual flows but represent make-up demand. The user must verify in Sheet 38 that make-up demands are satisfied (no cells should be shaded pink). The user must find alternative make-up source if flow P9 and P16 is not sufficient.

# Sheet 42

**Example**

# Summary of Key Input Data Used in this Model Run

| Background information (from Cover Sheet) | |
|---|---|
| Mine | Enter mine name here |
| Product | Enter ore mined here |
| Revision # | Enter revision number here (e.g., Rev. 1) |
| Date | Enter date here |
| Level of study | Enter level of study here (e.g., feasibility, detail design) |
| Model year | Enter the modelled mine year here |
| Project # | Enter project number here |

| Operating data (from Sheet 12) | | |
|---|---|---|
| Ore reserve | 100.00 | Mt |
| Production rate | 5,000,000 | t/y |
| Process Plant availability | 90 | % |
| Factor of safety | 1 | - |

| Water inputs (from Sheet 12) | | |
|---|---|---|
| Saturated Moisture Content | 15% | % of total dry mass of ore |
| Residual Moisture Content (after draindown) | 11% | % of total dry mass of ore |
| Ore Moisture Content | 3% | % of total dry mass of ore |
| Moisture Addition for Agglomeration | 4% | % of total dry mass of ore |
| Minimum clean water required in the Process Pla | 0.50% | % of total water in Irrigation |
| Water lost in Process Plant to evaporation & spill | 2.00% | % of total water in Irrigation |
| Water required for dust control | 500 | $m^3$/d |
| Potable water required | 150 | $m^3$/d |
| Portion of potable water to sewage | 85 | % |

| Precipitation & evaporation (from Sheet 10) | | |
|---|---|---|
| 100 year dry return precipitation | 625 | mm/y |
| Mean precipitation | 900 | mm/y |
| 100 year wet return precipitation | 1,200 | mm/y |
| Precipitation used | 950 | mm/y |
| Runoff factor - natural ground | 68 | % |
| Runoff factor - prepared ground | 78 | % |
| Runoff factor - ponds | 100 | % |
| Runoff factor - waste rock and overburden piles | 70 | % |
| Runoff factor - walls of open pit | 80 | % |
| Runoff factor - reclaim areas | 75 | % |
| Runoff factor - construction areas | 85 | % |
| 100 year dry return pan evaporation | 900 | mm/y |
| Mean pan evaporation | 750 | mm/y |
| 100 year wet return pan evaporation | 500 | mm/y |
| Pan evaporation used | 750 | mm/y |
| Factor - pan to lake evaporation | 0.70 | % |

| Collecting watershed areas (from Sheet 17) | | |
|---|---|---|
| Process Plant and camp site | 200,000 | $m^2$ |
| Heap Leach Facility | 1,000,000 | $m^2$ |
| Open pit mine | 2,000,000 | $m^2$ |
| Waste rock and Overburden Piles | 1,000,000 | $m^2$ |
| Water Treatment Collection pond | 400,000 | $m^2$ |
| Reclaimed areas | 90,000 | $m^2$ |
| Construction areas | 180,000 | $m^2$ |
| Barren Pond | 200,000 | $m^2$ |
| Spent Ore Stockpile | 3,000,000 | $m^2$ |
| TOTAL | 8,070,000 | $m^2$ |

**Notes:** 1 Input data are not required on this sheet. The information is automatically linked from the cover and Sheets 10, 12, and 17.

# Sheet 43 (1 of 6)
# Mass Balance Module
## Input Concentrations

Example

| From cover sheet | **Mine:** | Enter mine name here | | |
|---|---|---|---|---|
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from Natural Ground These concentration will be assigned to Flows: R1, R4, R8, R11, R14, R17, R20,R23,R26

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Nov | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Dec | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Jan | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Feb | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Mar | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| April | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| May | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| June | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| July | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Aug | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Sept | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |

**Description** Concentration associated with runoff from prepared ground These concentration will be assigned to Flows: R2, R5, R15, R24

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Nov | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Dec | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Jan | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Feb | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Mar | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| April | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| May | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| June | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| July | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Aug | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Sept | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |

**Description** Concentration associated with direct precipitation on ponds These concentration will be assigned to Flows: R3, R6, R10, R13, R16, R19, R22,R25,R28

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Nov | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Dec | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Jan | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Feb | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Mar | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| April | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| May | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| June | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| July | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Aug | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Sept | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |

**Description** Concentration associated with runoff from pit walls These concentration will be assigned to Flows: R9

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Nov | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Dec | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Jan | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Feb | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Mar | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| April | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| May | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| June | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| July | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Aug | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Sept | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 43 (2 of 6)
# Mass Balance Module
## Input Concentrations

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from the waste rock and overburden piles These concentration will be assigned to Flows: R12

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Nov | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Dec | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Jan | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Feb | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Mar | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| April | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| May | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| June | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| July | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Aug | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Sept | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |

**Description** Concentration associated with seepage into the Mine Workings These concentration will be assigned to Flows: S3

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Nov | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Dec | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Jan | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Feb | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Mar | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| April | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| May | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| June | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| July | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Aug | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Sept | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |

**Description** Concentration associated with runoff from reclaimed ground These concentration will be assigned to Flows: R18

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Nov | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Dec | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Jan | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Feb | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Mar | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| April | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| May | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| June | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| July | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Aug | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Sept | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |

**Description** Concentration associated with runoff from construction ground These concentration will be assigned to Flows: R21

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Nov | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Dec | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Jan | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Feb | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Mar | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| April | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| May | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| June | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| July | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Aug | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Sept | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations. In subsequent sheets for mass loading calculations.

# Sheet 43 (3 of 6)
# Mass Balance Module
## Input Concentrations

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with treated sewage water from the mine camp These concentration will be assigned to Flows: M2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | otal Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Nov | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Dec | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Jan | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Feb | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Mar | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| April | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| May | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| June | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| July | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Aug | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Sept | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |

**Description** Concentration associated with discharge from Process Plant to Barren Pond These concentration will be assigned to Flows: P1

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | otal Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Nov | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Dec | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Jan | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Feb | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Mar | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| April | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| May | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| June | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| July | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Aug | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Sept | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

**Description** Concentration associated with runoff from the spent ore stockpiles These concentration will be assigned to Flows: R27

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Sol | tal Suspended Sol | lved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | otal Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Nov | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Dec | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Jan | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Feb | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Mar | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| April | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| May | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| June | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| July | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Aug | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Sept | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations. In subsequent sheets for mass loading calculations.

# Sheet 43 (4 of 6)
# Mass Balance Module
## Input Concentrations

**Example**

oncen

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** \` These concentration will be assigned to Flows: R1, R4, R8, R11, R14, R17, R20,R23,R26

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Nov | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Dec | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Jan | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Feb | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Mar | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| April | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| May | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| June | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| July | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Aug | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| Sept | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |

**Description** Concentration associated with runoff from prepared ground These concentration will be assigned to Flows: R2, R5, R15, R24

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Nov | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Dec | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Jan | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Feb | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Mar | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| April | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| May | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| June | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| July | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Aug | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Sept | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |

**Description** Concentration associated with direct precipitation on ponds These concentration will be assigned to Flows: R3, R6, R10, R13, R16, R19, R22,R25,R28

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Nov | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Dec | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Jan | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Feb | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Mar | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| April | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| May | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| June | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| July | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Aug | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Sept | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |

**Description** Concentration associated with runoff from pit walls These concentration will be assigned to Flows: R9

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Nov | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Dec | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Jan | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Feb | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Mar | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| April | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| May | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| June | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| July | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Aug | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| Sept | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 43 (5 of 6)
# Mass Balance Module
## Input Concentrations

Example

| From cover sheet | | | |
|---|---|---|---|
| **Mine:** | Enter mine name here | | |
| **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with runoff from the waste rock and overburden piles These concentration will be assigned to Flows: R12

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Nov | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Dec | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Jan | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Feb | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Mar | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| April | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| May | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| June | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| July | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Aug | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Sept | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |

**Description** Concentration associated with seepage into the Mine Workings These concentration will be assigned to Flows: S3

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Nov | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Dec | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Jan | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Feb | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Mar | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| April | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| May | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| June | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| July | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Aug | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |
| Sept | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |

**Description** Concentration associated with runoff from reclaimed ground These concentration will be assigned to Flows: R18

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Nov | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Dec | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Jan | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Feb | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Mar | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| April | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| May | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| June | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| July | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Aug | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| Sept | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |

**Description** Concentration associated with runoff from construction ground These concentration will be assigned to Flows: R21

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Nov | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Dec | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Jan | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Feb | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Mar | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| April | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| May | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| June | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| July | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Aug | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Sept | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 43 (6 of 6)
# Mass Balance Module
## Input Concentrations

**Example**

| From cover sheet | | | | |
|---|---|---|---|---|
| | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Concentration associated with treated sewage water from the mine camp These concentration will be assigned to Flows: M2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Nov | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Dec | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Jan | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Feb | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Mar | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| April | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| May | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| June | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| July | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Aug | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |
| Sept | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 |

**Description** Concentration associated with discharge from Process Plant to Barren Pond These concentration will be assigned to Flows: P1

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Nov | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Dec | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Jan | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Feb | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Mar | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| April | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| May | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| June | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| July | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Aug | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| Sept | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

**Description** Concentration associated with runoff from the spent ore stockpiles These concentration will be assigned to Flows: R27

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Nov | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Dec | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Jan | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Feb | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Mar | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| April | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| May | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| June | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| July | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Aug | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| Sept | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |

**Note:** The concentration tables require a positive numerical input. Text inputs such as "NaN, N/A, -, <, etc." will generate errors in Excel. The concentration values entered in this sheet are used in subsequent sheets for mass loading calculations.

# Sheet 44 (1 of 2)
# Mass Balance Module

Example

## Input Concentrations and Flows from Receiving Environment, Upstream from the Compliance Point

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Flow and Concentration associated to the receiving environment at compliance point 1

| Month | RE1 Flow (m³/month) | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | tal Dissolved Sol | tal Suspended Sol | olved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 2

| Month | RE2 Flow (m³/month) | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | tal Dissolved Sol | tal Suspended Sol | olved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 3

| Month | RE3 Flow (m³/month) | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | tal Dissolved Sol | tal Suspended Sol | olved Organic Ca | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitrogen | Phosphate | Total Phosphorus | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| Oct | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |

# Sheet 44 (2 of 2)
# Mass Balance Module

**Example**

## Input Concentrations and Flows from Receiving Environment, Upstream from the Compliance Point

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Description** Flow and Concentration associated to the receiving environment at compliance point 1

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 2

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

**Description** Flow and Concentration associated to the receiving environment at compliance point 3

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| Oct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | | | | | | | | | | | | | | | | | | | | | | | | | |
| April | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | | | | | | | | | | | | | | | | | | | | | | | | | |

# Sheet 45 (1 of 4)
# Computed Loads
## PLS Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R1 (flow from sheet 31* Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Soli | uspended | ed Organic | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 6029.333333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 |
| **Nov** | 2600.888889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 7815.333333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 |
| **April** | 10956.66667 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 |
| **May** | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 |
| **June** | 4610.666667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 |
| **July** | 4551.555556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 |
| **Aug** | 5024.444444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 |
| **Sept** | 5438.222222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 |

**Computed Loads at R2 (flow from sheet 31 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Soli | uspended | ed Organic | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 17226.66667 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 |
| **Nov** | 7431.111111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22483.33333 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 |
| **April** | 31645.55556 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 |
| **May** | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 |
| **June** | 13173.33333 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 |
| **July** | 13004.44444 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 |
| **Aug** | 14355.55556 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 |
| **Sept** | 15537.77778 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 |

**Computed Loads at R3 (flow from sheet 31 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tal Dissolved Soli | uspended | ed Organic | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 |
| **Nov** | 2786.666667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 |
| **April** | 12761.66667 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 |
| **May** | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 |
| **June** | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 |
| **July** | 4876.666667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 |
| **Aug** | 5383.333333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 |
| **Sept** | 5826.666667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 45 (2 of 4)
# Computed Loads
## PLS Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Load for P11 (from sheet 47)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | Suspended | ed Organic | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 179627.5715 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 |
| **Nov** | 98460.29805 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 226705.8926 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 |
| **April** | 303777.5909 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 |
| **May** | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 |
| **June** | 132288.8689 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 |
| **July** | 145938.7049 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 |
| **Aug** | 156763.9785 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 |
| **Sept** | 164840.9083 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 |

**Computed Load for P3**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | Suspended | ed Organic | Cyanide | Calcium | Chloride | Magnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 209343.5715 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 |
| **Nov** | 111278.9647 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 265839.5593 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 |
| **April** | 359141.4798 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 |
| **May** | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 |
| **June** | 155012.8689 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 |
| **July** | 168371.3716 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 |
| **Aug** | 181527.3118 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 |
| **Sept** | 191643.575 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 45 (3 of 4)
# Computed Loads
## PLS Pond Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R1 (flow from sheet 31* Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | olybdenun | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 6029.333333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 | 6029.333 |
| **Nov** | 2600.888889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 | 2600.889 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 7815.333333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 | 7815.333 |
| **April** | 10956.66667 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 | 10956.67 |
| **May** | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 |
| **June** | 4610.666667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 | 4610.667 |
| **July** | 4551.555556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 | 4551.556 |
| **Aug** | 5024.444444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 | 5024.444 |
| **Sept** | 5438.222222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 | 5438.222 |

**Computed Loads at R2 (flow from sheet 31 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | olybdenun | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 17226.66667 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 | 17226.67 |
| **Nov** | 7431.111111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 | 7431.111 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22483.33333 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 | 22483.33 |
| **April** | 31645.55556 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 | 31645.56 |
| **May** | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 |
| **June** | 13173.33333 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 | 13173.33 |
| **July** | 13004.44444 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 | 13004.44 |
| **Aug** | 14355.55556 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 | 14355.56 |
| **Sept** | 15537.77778 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 | 15537.78 |

**Computed Loads at R3 (flow from sheet 31 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | olybdenun | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 |
| **Nov** | 2786.666667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 | 2786.667 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 |
| **April** | 12761.66667 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 | 12761.67 |
| **May** | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 |
| **June** | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 |
| **July** | 4876.666667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 | 4876.667 |
| **Aug** | 5383.333333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 | 5383.333 |
| **Sept** | 5826.666667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 | 5826.667 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 45 (4 of 4)
# Computed Loads
## PLS Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Load for P11 (from sheet 47)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 179627.5715 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 | 179627.6 |
| **Nov** | 98460.29805 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 226705.8926 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 | 226705.9 |
| **April** | 303777.5909 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 | 303777.6 |
| **May** | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 |
| **June** | 132288.8689 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 | 132288.9 |
| **July** | 145938.7049 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 | 145938.7 |
| **Aug** | 156763.9785 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 |
| **Sept** | 164840.9083 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 | 164840.9 |

**Computed Load for P3**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 209343.5715 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 | 209343.6 |
| **Nov** | 111278.9647 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 | 111279 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 265839.5593 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 | 265839.6 |
| **April** | 359141.4798 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 | 359141.5 |
| **May** | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 | 123205.5 |
| **June** | 155012.8689 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 | 155012.9 |
| **July** | 168371.3716 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 | 168371.4 |
| **Aug** | 181527.3118 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 | 181527.3 |
| **Sept** | 191643.575 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 | 191643.6 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 46 (1 of 4)
# Computed Loads
## Barren Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R23 (flow from sheet 33 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitrog | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 6029.333333 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 |
| **Nov** | 2600.888889 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 7815.333333 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 |
| **April** | 10956.66667 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 |
| **May** | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 |
| **June** | 4610.666667 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 |
| **July** | 4551.555556 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 |
| **Aug** | 5024.444444 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 |
| **Sept** | 5438.222222 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 |

**Computed Loads at R24 (flow from sheet 33 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitrog | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 17226.66667 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 |
| **Nov** | 7431.111111 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22483.33333 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 |
| **April** | 31645.55556 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 |
| **May** | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 |
| **June** | 13173.33333 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 |
| **July** | 13004.44444 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 |
| **Aug** | 14355.55556 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 |
| **Sept** | 15537.77778 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 |

**Computed Loads at R25 (flow from sheet 33 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitrog | Phosphate | al Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 |
| **Nov** | 2.786666667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 |
| **April** | 12.76166667 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 |
| **May** | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 |
| **June** | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| **July** | 4.876666667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 |
| **Aug** | 5.383333333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 |
| **Sept** | 5.826666667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 |

**Notes:** Input of data is not required on this sheet.  The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 46 (2 of 4)
# Computed Loads
## Barren Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at P1  (flow from sheet 33 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 45840.76667 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 |
| **Nov** | 39530.81111 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 49169.825 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 |
| **April** | 53137.23611 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 |
| **May** | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 |
| **June** | 1625897.233 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 |
| **July** | 42880.79444 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 |
| **Aug** | 43836.80556 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 |
| **Sept** | 43551.87778 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 |

**Computed Load for P2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 54195.90488 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 |
| **Nov** | 44352.52027 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 57582.14261 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 |
| **April** | 61356.0631 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 36370.53561 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 |
| **July** | 51250.09384 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 |
| **Aug** | 52237.5896 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 |
| **Sept** | 51706.46384 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 |

**Computed Load for F1**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | otal Dissolved Soli | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 14907.32179 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 |
| **Nov** | 5213.077507 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 21895.18405 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 |
| **April** | 34396.1569 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 |
| **May** | 21832.23 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 |
| **June** | 1607315.638 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 |
| **July** | 9191.577276 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 |
| **Aug** | 10984.59929 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 |
| **Sept** | 12827.2406 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 |

**Notes:** Input of data is not required on this sheet.  The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 46 (3 of 4)
# Computed Loads
## Barren Pond Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R23 (flow from sheet 33 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 6029.333333 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 | 6029.33 |
| **Nov** | 2600.888889 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 | 2600.89 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 7815.333333 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 | 7815.33 |
| **April** | 10956.66667 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 | 10956.7 |
| **May** | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 | 4788 |
| **June** | 4610.666667 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 | 4610.67 |
| **July** | 4551.555556 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 | 4551.56 |
| **Aug** | 5024.444444 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 | 5024.44 |
| **Sept** | 5438.222222 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 | 5438.22 |

**Computed Loads at R24 (flow from sheet 33 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 17226.66667 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 | 17226.7 |
| **Nov** | 7431.111111 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 | 7431.11 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22483.33333 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 | 22483.3 |
| **April** | 31645.55556 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 | 31645.6 |
| **May** | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 | 13680 |
| **June** | 13173.33333 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 | 13173.3 |
| **July** | 13004.44444 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 |
| **Aug** | 14355.55556 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 | 14355.6 |
| **Sept** | 15537.77778 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 | 15537.8 |

**Computed Loads at R25 (flow from sheet 33 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 | 6.46 |
| **Nov** | 2.786666667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 | 2.78667 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 | 8.835 |
| **April** | 12.76166667 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 | 12.7617 |
| **May** | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 | 5.13 |
| **June** | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 | 4.94 |
| **July** | 4.876666667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 | 4.87667 |
| **Aug** | 5.383333333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 | 5.38333 |
| **Sept** | 5.826666667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 | 5.82667 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

For Discussion Purposes Only

# Sheet 46 (4 of 4)
# Computed Loads
## Barren Pond Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at P1 (flow from sheet 33 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 45840.76667 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 | 45840.8 |
| **Nov** | 39530.81111 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 | 39530.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 49169.825 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 | 49169.8 |
| **April** | 53137.23611 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 | 53137.2 |
| **May** | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 | 3359.1 |
| **June** | 1625897.233 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 | 1625897 |
| **July** | 42880.79444 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 | 42880.8 |
| **Aug** | 43836.80556 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 | 43836.8 |
| **Sept** | 43551.87778 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 | 43551.9 |

**Computed Load for P2**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 54195.90488 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 |
| **Nov** | 44352.52027 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 57582.14261 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 |
| **April** | 61356.0631 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 36370.53561 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 |
| **July** | 51250.09384 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 |
| **Aug** | 52237.5896 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 |
| **Sept** | 51706.46384 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 |

**Computed Load for F1**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 14907.32179 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 |
| **Nov** | 5213.077507 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 21895.18405 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 |
| **April** | 34396.1569 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 |
| **May** | 21832.23 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 |
| **June** | 1607315.638 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 |
| **July** | 9191.577276 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 |
| **Aug** | 10984.59929 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 |
| **Sept** | 12827.2406 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 47 (1 of 4)
# Computed Loads
## Heap Leach Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R4 (flow from sheet 34 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | d Organic | Cyanide | Calcium | Chloride | lagnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 |
| **Nov** | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 43961.25 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 |
| **April** | 61631.25 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 |
| **May** | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 |
| **June** | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 |
| **July** | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 |
| **Aug** | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 |
| **Sept** | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 |

**Computed Loads at R5 (flow from sheet 34 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | d Organic | Cyanide | Calcium | Chloride | lagnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 75366.667 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 |
| **Nov** | 32511.111 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 |
| **April** | 148886.11 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 |
| **May** | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 |
| **June** | 57633.333 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 |
| **July** | 56894.444 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 |
| **Aug** | 62805.556 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 |
| **Sept** | 67977.778 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 |

**Computed Loads at R6 (flow from sheet 34 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | d Organic | Cyanide | Calcium | Chloride | lagnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 |
| **Nov** | 6966.6667 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 |
| **April** | 31904.167 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 |
| **May** | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 |
| **June** | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 |
| **July** | 12191.667 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 |
| **Aug** | 13458.333 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 |
| **Sept** | 14566.667 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 47 (2 of 4)
# Computed Loads
## Heap Leach Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at P2 (from sheet 46)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 54195.905 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 |
| **Nov** | 44352.52 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 57582.143 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 |
| **April** | 61356.063 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 36370.536 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 |
| **July** | 51250.094 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 |
| **Aug** | 52237.59 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 |
| **Sept** | 51706.464 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 |

**Computed Load for P11**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | d Organic | Cyanide | Calcium | Chloride | lagnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 179627.57 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 |
| **Nov** | 98460.298 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 |
| **Mar** | 226705.89 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 |
| **April** | 303777.59 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 |
| **May** | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 |
| **June** | 132288.87 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 |
| **July** | 145938.7 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 |
| **Aug** | 156763.98 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 |
| **Sept** | 164840.91 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 47 (3 of 4)
# Computed Loads
## Heap Leach Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R4 (flow from sheet 34 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 | 33915 |
| **Nov** | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 43961.25 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961.3 | 43961 |
| **April** | 61631.25 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631.3 | 61631 |
| **May** | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26932.5 | 26933 |
| **June** | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 | 25935 |
| **July** | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25602.5 | 25603 |
| **Aug** | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28262.5 | 28263 |
| **Sept** | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 | 30590 |

**Computed Loads at R5 (flow from sheet 34 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 75366.66667 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75367 |
| **Nov** | 32511.11111 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511.1 | 32511 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 | 103075 |
| **April** | 148886.1111 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 | 148886 |
| **May** | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 | 59850 |
| **June** | 57633.33333 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633.3 | 57633 |
| **July** | 56894.44444 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894.4 | 56894 |
| **Aug** | 62805.55556 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62805.6 | 62806 |
| **Sept** | 67977.77778 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67977.8 | 67978 |

**Computed Loads at R6 (flow from sheet 34 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 |
| **Nov** | 6966.666667 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.7 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22088 |
| **April** | 31904.16667 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904 |
| **May** | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 |
| **June** | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 |
| **July** | 12191.66667 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12192 |
| **Aug** | 13458.33333 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458 |
| **Sept** | 14566.66667 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14567 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 47 (4 of 4)
# Computed Loads
## Heap Leach Facility Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at P2  (from sheet 46)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 54195.90488 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54195.9 | 54196 |
| **Nov** | 44352.52027 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44352.5 | 44353 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36684 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33090 |
| **Mar** | 57582.14261 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582.1 | 57582 |
| **April** | 61356.0631 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356.1 | 61356 |
| **May** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **June** | 36370.53561 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36370.5 | 36371 |
| **July** | 51250.09384 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250.1 | 51250 |
| **Aug** | 52237.5896 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52237.6 | 52238 |
| **Sept** | 51706.46384 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706.5 | 51706 |

**Computed Load for P11**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 179627.5715 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 | 179628 |
| **Nov** | 98460.29805 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460.3 | 98460 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36683.5 | 36684 |
| **Feb** | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33089.5 | 33090 |
| **Mar** | 226705.8926 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 | 226706 |
| **April** | 303777.5909 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 | 303778 |
| **May** | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99607.5 | 99608 |
| **June** | 132288.8689 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 | 132289 |
| **July** | 145938.7049 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 | 145939 |
| **Aug** | 156763.9785 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 | 156764 |
| **Sept** | 164840.9083 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 | 164841 |

**Notes:** Input of data is not required on this sheet.  The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 48 (1 of 2)
# Computed Loads
## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R8 (flow from sheet 35* Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | ed Organic | Cyanide | Calcium | Chloride | agnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 |
| **Nov** | 48766.67 | 48766.67 | 48766.67 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 146537.5 | 146537.5 | 146537.5 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 |
| **April** | 205437.5 | 205437.5 | 205437.5 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 |
| **May** | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 |
| **June** | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 |
| **July** | 85341.67 | 85341.67 | 85341.67 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 |
| **Aug** | 94208.33 | 94208.33 | 94208.33 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 |
| **Sept** | 101966.7 | 101966.7 | 101966.7 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 |

**Computed Loads at R9 (flow from sheet 35 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | ed Organic | Cyanide | Calcium | Chloride | agnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 |
| **Nov** | 44586.67 | 44586.67 | 44586.67 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 |
| **April** | 204186.7 | 204186.7 | 204186.7 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 |
| **May** | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 |
| **June** | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 |
| **July** | 78026.67 | 78026.67 | 78026.67 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 |
| **Aug** | 86133.33 | 86133.33 | 86133.33 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 |
| **Sept** | 93226.67 | 93226.67 | 93226.67 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 |

**Computed Loads at R10 (flow from sheet 35 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved | Suspended | ed Organic | Cyanide | Calcium | Chloride | agnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 |
| **Nov** | 27866.67 | 27866.67 | 27866.67 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 |
| **April** | 127616.7 | 127616.7 | 127616.7 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 |
| **May** | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 |
| **June** | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 |
| **July** | 48766.67 | 48766.67 | 48766.67 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 |
| **Aug** | 53833.33 | 53833.33 | 53833.33 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 |
| **Sept** | 58266.67 | 58266.67 | 58266.67 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 |

**Computed Loads at S3 (flow from sheet 28 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Dissolv | Total Suspe | Dissolved O | Cyanide | Calcium | Chloride | Magnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitro | Phosphate | Total Phos | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Nov** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |
| **Dec** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Jan** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Feb** | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 |
| **Mar** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **April** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |
| **May** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **June** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |
| **July** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Aug** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Sept** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |

**Computed Load for F3**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Dissolv | Total Suspe | Dissolved O | Cyanide | Calcium | Chloride | Magnesiur | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | Total Nitro | Phosphate | Total Phos | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 |
| **Nov** | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 |
| **Dec** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Jan** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Feb** | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 |
| **Mar** | 562247.5 | 562247.5 | 562247.5 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 |
| **April** | 717240.8 | 717240.8 | 717240.8 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 |
| **May** | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 |
| **June** | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 |
| **July** | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 |
| **Aug** | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 |
| **Sept** | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 48 (2 of 2)
# Computed Loads
## Mine Workings Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R8 (flow from sheet 35* Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 | 113050 |
| **Nov** | 48766.66667 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48767 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 146537.5 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 | 146538 |
| **April** | 205437.5 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 | 205438 |
| **May** | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 | 89775 |
| **June** | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 | 86450 |
| **July** | 85341.66667 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85341.7 | 85342 |
| **Aug** | 94208.33333 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208.3 | 94208 |
| **Sept** | 101966.6667 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 | 101967 |

**Computed Loads at R9 (flow from sheet 35 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 | 103360 |
| **Nov** | 44586.66667 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44586.7 | 44587 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 | 141360 |
| **April** | 204186.6667 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 | 204187 |
| **May** | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 | 82080 |
| **June** | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 | 79040 |
| **July** | 78026.66667 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78026.7 | 78027 |
| **Aug** | 86133.33333 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133.3 | 86133 |
| **Sept** | 93226.66667 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93226.7 | 93227 |

**Computed Loads at R10 (flow from sheet 35 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganes | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 | 64600 |
| **Nov** | 27866.66667 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27866.7 | 27867 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 | 88350 |
| **April** | 127616.6667 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 | 127617 |
| **May** | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 | 51300 |
| **June** | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 | 49400 |
| **July** | 48766.66667 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48766.7 | 48767 |
| **Aug** | 53833.33333 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833.3 | 53833 |
| **Sept** | 58266.66667 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58266.7 | 58267 |

**Computed Loads at S3 (flow from sheet 28 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **0** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **0** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |
| **0** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **0** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Oct** | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 |
| **Nov** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Dec** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |
| **Jan** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Feb** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |
| **Mar** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **April** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **May** | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 | 180000 |

**Computed Load for F3**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 |
| **Nov** | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 |
| **Dec** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Jan** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Feb** | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 |
| **Mar** | 562247.5 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 |
| **April** | 717240.8333 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 |
| **May** | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 |
| **June** | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 |
| **July** | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 |
| **Aug** | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 |
| **Sept** | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 49 (1 of 2)
# Computed Loads
## Waste Rock Dump and Stockpiles Watersheds

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R11 (flow from sheet 36 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 30146.667 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 |
| **Nov** | 13004.444 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 39076.667 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 |
| **April** | 54783.333 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 |
| **May** | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 |
| **June** | 23053.333 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 |
| **July** | 22757.778 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 |
| **Aug** | 25122.222 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 |
| **Sept** | 27191.111 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 |

**Computed Loads at R12 (flow from sheet 36 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 207258.33 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 |
| **Nov** | 89405.556 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 283456.25 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 |
| **April** | 409436.81 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 |
| **May** | 164587.5 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 |
| **June** | 158491.67 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 |
| **July** | 156459.72 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 |
| **Aug** | 172715.28 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 |
| **Sept** | 186938.89 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 |

**Computed Loads at R13 (flow from sheet 36 * Concentrations from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 |
| **Nov** | 6966.6667 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 |
| **April** | 31904.167 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 |
| **May** | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 |
| **June** | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 |
| **July** | 12191.667 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 |
| **Aug** | 13458.333 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 |
| **Sept** | 14566.667 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 |

**Computed Loads at F4**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | lagnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 |
| **Nov** | 109376.67 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 344620.42 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 |
| **April** | 496124.31 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 |
| **May** | 201352.5 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 |
| **June** | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 |
| **July** | 191409.17 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 |
| **Aug** | 211295.83 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 |
| **Sept** | 228696.67 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 49 (2 of 2)
# Computed Loads
## Waste Rock Dump and Stockpiles Watersheds

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R11 (flow from sheet 36 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 30146.66667 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30146.7 | 30147 |
| **Nov** | 13004.44444 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004.4 | 13004 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 39076.66667 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39076.7 | 39077 |
| **April** | 54783.33333 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783.3 | 54783 |
| **May** | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 | 23940 |
| **June** | 23053.33333 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053.3 | 23053 |
| **July** | 22757.77778 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22757.8 | 22758 |
| **Aug** | 25122.22222 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122.2 | 25122 |
| **Sept** | 27191.11111 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191.1 | 27191 |

**Computed Loads at R12 (flow from sheet 36 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 207258.3333 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 | 207258 |
| **Nov** | 89405.55556 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89405.6 | 89406 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 283456.25 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 | 283456 |
| **April** | 409436.8056 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 | 409437 |
| **May** | 164587.5 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 | 164588 |
| **June** | 158491.6667 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 | 158492 |
| **July** | 156459.7222 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 | 156460 |
| **Aug** | 172715.2778 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 | 172715 |
| **Sept** | 186938.8889 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 | 186939 |

**Computed Loads at R13 (flow from sheet 36 * Concentrations from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 |
| **Nov** | 6966.666667 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.67 | 6966.7 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22087.5 | 22088 |
| **April** | 31904.16667 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904.2 | 31904 |
| **May** | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 | 12825 |
| **June** | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 | 12350 |
| **July** | 12191.66667 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12191.7 | 12192 |
| **Aug** | 13458.33333 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458.3 | 13458 |
| **Sept** | 14566.66667 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14566.7 | 14567 |

**Computed Loads at F4**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 |
| **Nov** | 109376.6667 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 344620.4167 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 |
| **April** | 496124.3056 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 |
| **May** | 201352.5 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 |
| **June** | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 |
| **July** | 191409.1667 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 |
| **Aug** | 211295.8333 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 |
| **Sept** | 228696.6667 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 50(1 of 2)
# Computed Loads
## Spent Ore Stock Pile Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R26 (flow from sheet 37, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 |
| **Nov** | 39013.333 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 |
| **April** | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 |
| **May** | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 |
| **June** | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 |
| **July** | 68273.333 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 |
| **Aug** | 75366.667 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 |
| **Sept** | 81573.333 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 |

**Computed Loads at R27 (flow from sheet 37, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 |
| **Nov** | 536.43333 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 1700.7375 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 |
| **April** | 2456.6208 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 |
| **May** | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 |
| **June** | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 |
| **July** | 938.75833 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 |
| **Aug** | 1036.2917 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 |
| **Sept** | 1121.6333 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 |

**Computed Loads at R28 (flow from sheet 37, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 |
| **Nov** | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 |
| **April** | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 |
| **May** | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 |
| **June** | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 |
| **July** | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 |
| **Aug** | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 |
| **Sept** | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 |

**Computed Loads at F2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 140133.55 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 |
| **Nov** | 60449.767 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 185193.24 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 |
| **April** | 262519.12 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 |
| **May** | 111282.53 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 |
| **June** | 107160.95 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 |
| **July** | 105787.09 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 |
| **Aug** | 116777.96 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 |
| **Sept** | 126394.97 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 |

**Notes:** 1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 50 (2of 2)
# Computed Loads
## Spent Ore Stock Pile Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R26 (flow from sheet 37, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 | 90440 |
| **Nov** | 39013.33333 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 | 39013.3 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 | 117230 |
| **April** | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 | 164350 |
| **May** | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 | 71820 |
| **June** | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 | 69160 |
| **July** | 68273.33333 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 | 68273.3 |
| **Aug** | 75366.66667 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 | 75366.7 |
| **Sept** | 81573.33333 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 | 81573.3 |

**Computed Loads at R27 (flow from sheet 37, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 | 1243.55 |
| **Nov** | 536.4333333 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 | 536.433 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 1700.7375 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 | 1700.74 |
| **April** | 2456.620833 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 | 2456.62 |
| **May** | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 | 987.525 |
| **June** | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 | 950.95 |
| **July** | 938.7583333 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 | 938.758 |
| **Aug** | 1036.291667 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 | 1036.29 |
| **Sept** | 1121.633333 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 | 1121.63 |

**Computed Loads at R28 (flow from sheet 37, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 | 48450 |
| **Nov** | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 | 20900 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 | 66262.5 |
| **April** | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 | 95712.5 |
| **May** | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 | 38475 |
| **June** | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 | 37050 |
| **July** | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 | 36575 |
| **Aug** | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 | 40375 |
| **Sept** | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 | 43700 |

**Computed Loads at F2**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 140133.55 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 |
| **Nov** | 60449.76667 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 185193.2375 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 |
| **April** | 262519.1208 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 |
| **May** | 111282.525 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 |
| **June** | 107160.95 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 |
| **July** | 105787.0917 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 |
| **Aug** | 116777.9583 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 |
| **Sept** | 126394.9667 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 |

**Notes:** 1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 51 (1 of 4)
# Computed Loads
## Water Treatment Plant Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** : | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R14 (flow from sheet 38, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 |
| **Nov** | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 |
| **April** | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 |
| **May** | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 |
| **June** | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 |
| **July** | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 |
| **Aug** | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 |
| **Sept** | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 |

**Computed Loads at R15 (flow from sheet 38, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 27562.667 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 |
| **Nov** | 11889.778 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 35973.333 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 |
| **April** | 50632.889 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 |
| **May** | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 |
| **June** | 21077.333 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 |
| **July** | 20807.111 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 |
| **Aug** | 22968.889 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 |
| **Sept** | 24860.444 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 |

**Computed Loads at R16 (flow from sheet 38, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 |
| **Nov** | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 |
| **April** | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 |
| **May** | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 |
| **June** | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 |
| **July** | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 |
| **Aug** | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 |
| **Sept** | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 |

**Computed Loads at F1 (from sheet 46)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 14907.322 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 |
| **Nov** | 5213.0775 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 21895.184 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 |
| **April** | 34396.157 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 |
| **May** | 21832.23 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 |
| **June** | 1607315.6 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 |
| **July** | 9191.5773 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 |
| **Aug** | 10984.599 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 |
| **Sept** | 12827.241 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 |

**Computed Loads at F2 (from sheet 50)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 140133.55 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 |
| **Nov** | 60449.767 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 185193.24 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 |
| **April** | 262519.12 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 |
| **May** | 111282.53 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 |
| **June** | 107160.95 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 |
| **July** | 105787.09 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 |
| **Aug** | 116777.96 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 |
| **Sept** | 126394.97 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 |

**Notes:** 1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 51 (2 of 4)
# Computed Loads
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** : | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at F3 (from sheet 48)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 |
| **Nov** | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 |
| **Dec** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Jan** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Feb** | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 |
| **Mar** | 562247.5 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 |
| **April** | 717240.83 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 |
| **May** | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 |
| **June** | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 |
| **July** | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 |
| **Aug** | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 |
| **Sept** | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 |

**Computed Loads at F4 (from sheet 49)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 |
| **Nov** | 109376.67 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 344620.42 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 |
| **April** | 496124.31 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 |
| **May** | 201352.5 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 |
| **June** | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 |
| **July** | 191409.17 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 |
| **Aug** | 211295.83 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 |
| **Sept** | 228696.67 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 |

**Computed Loads at M2 (flow from sheet 29, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Nov** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |
| **Dec** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Jan** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Feb** | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 |
| **Mar** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **April** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |
| **May** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **June** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |
| **July** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Aug** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Sept** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |

**Computed Loads for D1**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitrog | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 971687.04 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 |
| **Nov** | 536786.29 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 |
| **Dec** | 221572.5 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 |
| **Jan** | 221572.5 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 |
| **Feb** | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 |
| **Mar** | 1229591.7 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 |
| **April** | 1658275.8 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 |
| **May** | 827245.76 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 |
| **June** | 2383957.9 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 |
| **July** | 785773.45 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 |
| **Aug** | 845229.78 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 |
| **Sept** | 890380.32 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 51 (3 of 4)
# Computed Loads
## Water Treatment Plant Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R14 (flow from sheet 38, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 | 13566 |
| **Nov** | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 | 5852 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 | 17584.5 |
| **April** | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 | 24652.5 |
| **May** | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 | 10773 |
| **June** | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 | 10374 |
| **July** | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 | 10241 |
| **Aug** | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 | 11305 |
| **Sept** | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 | 12236 |

**Computed Loads at R15 (flow from sheet 38, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 27562.66667 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 | 27562.7 |
| **Nov** | 11889.77778 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 | 11889.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 35973.33333 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 | 35973.3 |
| **April** | 50632.88889 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 | 50632.9 |
| **May** | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 | 21888 |
| **June** | 21077.33333 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 | 21077.3 |
| **July** | 20807.11111 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 | 20807.1 |
| **Aug** | 22968.88889 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 | 22968.9 |
| **Sept** | 24860.44444 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 | 24860.4 |

**Computed Loads at R16 (flow from sheet 38, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 | 19380 |
| **Nov** | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 | 8360 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 | 26505 |
| **April** | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 | 38285 |
| **May** | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 | 15390 |
| **June** | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 | 14820 |
| **July** | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 | 14630 |
| **Aug** | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 | 16150 |
| **Sept** | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 | 17480 |

**Computed Loads at F1 (from sheet 46)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 14907.32179 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 | 14907.3 |
| **Nov** | 5213.077507 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 | 5213.08 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 21895.18405 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 | 21895.2 |
| **April** | 34396.1569 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 | 34396.2 |
| **May** | 21832.23 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 | 21832.2 |
| **June** | 1607315.638 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 | 1607316 |
| **July** | 9191.577276 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 | 9191.58 |
| **Aug** | 10984.59929 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 | 10984.6 |
| **Sept** | 12827.2406 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 | 12827.2 |

**Computed Loads at F2 (from sheet 50)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganes | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 140133.55 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 | 140134 |
| **Nov** | 60449.76667 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 | 60449.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 185193.2375 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 | 185193 |
| **April** | 262519.1208 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 | 262519 |
| **May** | 111282.525 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 | 111283 |
| **June** | 107160.95 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 | 107161 |
| **July** | 105787.0917 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 | 105787 |
| **Aug** | 116777.9583 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 | 116778 |
| **Sept** | 126394.9667 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 | 126395 |

**Notes:** 1 Input data are not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 51 (4 of 4)
# Computed Loads
## Water Treatment Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at F3 (from sheet 48)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 | 467010 |
| **Nov** | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 | 301220 |
| **Dec** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Jan** | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 | 186000 |
| **Feb** | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 | 168000 |
| **Mar** | 562247.5 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 | 562248 |
| **April** | 717240.8333 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 | 717241 |
| **May** | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 | 409155 |
| **June** | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 | 394890 |
| **July** | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 | 398135 |
| **Aug** | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 | 420175 |
| **Sept** | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 | 433460 |

**Computed Loads at F4 (from sheet 49)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 | 253555 |
| **Nov** | 109376.6667 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 | 109377 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 344620.4167 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 | 344620 |
| **April** | 496124.3056 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 | 496124 |
| **May** | 201352.5 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 | 201353 |
| **June** | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 | 193895 |
| **July** | 191409.1667 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 | 191409 |
| **Aug** | 211295.8333 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 | 211296 |
| **Sept** | 228696.6667 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 | 228697 |

**Computed Loads at M2 (flow from sheet 29, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Nov** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |
| **Dec** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Jan** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Feb** | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 | 32130 |
| **Mar** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **April** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |
| **May** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **June** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |
| **July** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Aug** | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 | 35572.5 |
| **Sept** | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 | 34425 |

**Computed Loads for D1**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 971687.0385 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 | 971687 |
| **Nov** | 536786.2886 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 | 536786 |
| **Dec** | 221572.5 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 |
| **Jan** | 221572.5 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 | 221573 |
| **Feb** | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 | 200130 |
| **Mar** | 1229591.672 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 | 1229592 |
| **April** | 1658275.806 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 | 1658276 |
| **May** | 827245.755 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 | 827246 |
| **June** | 2383957.921 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 | 2383958 |
| **July** | 785773.4467 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 | 785773 |
| **Aug** | 845229.7798 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 | 845230 |
| **Sept** | 890380.3184 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 | 890380 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 52 (1 of 2)
# Computed Loads
## Reclaimed Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R17 (flow from sheet 39, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 |
| **Nov** | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 4396.125 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 |
| **April** | 6163.125 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 |
| **May** | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 |
| **June** | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 |
| **July** | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 |
| **Aug** | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 |
| **Sept** | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 |

**Computed Loads at R18 (flow from sheet 39, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 25436.25 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 |
| **Nov** | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 34787.813 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 |
| **April** | 50249.063 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 |
| **May** | 20199.375 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 |
| **June** | 19451.25 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 |
| **July** | 19201.875 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 |
| **Aug** | 21196.875 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 |
| **Sept** | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 |

**Computed Loads at R19 (flow from sheet 39, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 |
| **Nov** | 1393.3333 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 |
| **April** | 6380.8333 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 |
| **May** | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 |
| **June** | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 |
| **July** | 2438.3333 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 |
| **Aug** | 2691.6667 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 |
| **Sept** | 2913.3333 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 |

**Computed Loads for D2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 32057.75 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 |
| **Nov** | 13828.833 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 43601.438 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 |
| **April** | 62793.021 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 |
| **May** | 25457.625 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 |
| **June** | 24514.75 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 |
| **July** | 24200.458 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 |
| **Aug** | 26714.792 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 |
| **Sept** | 28914.833 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 52 (2 of 2)
# Computed Loads
## Reclaimed Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R17 (flow from sheet 39, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 | 3391.5 |
| **Nov** | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 | 1463 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 4396.125 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.13 | 4396.1 |
| **April** | 6163.125 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.13 | 6163.1 |
| **May** | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.25 | 2693.3 |
| **June** | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 | 2593.5 |
| **July** | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.25 | 2560.3 |
| **Aug** | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.25 | 2826.3 |
| **Sept** | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 | 3059 |

**Computed Loads at R18 (flow from sheet 39, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 25436.25 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436.3 | 25436 |
| **Nov** | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10972.5 | 10973 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 34787.8125 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34787.8 | 34788 |
| **April** | 50249.0625 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249.1 | 50249 |
| **May** | 20199.375 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199.4 | 20199 |
| **June** | 19451.25 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451.3 | 19451 |
| **July** | 19201.875 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19201.9 | 19202 |
| **Aug** | 21196.875 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21196.9 | 21197 |
| **Sept** | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22942.5 | 22943 |

**Computed Loads at R19 (flow from sheet 39, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 | 3230 |
| **Nov** | 1393.333333 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.33 | 1393.3 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 | 4417.5 |
| **April** | 6380.833333 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.83 | 6380.8 |
| **May** | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 | 2565 |
| **June** | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 | 2470 |
| **July** | 2438.333333 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.33 | 2438.3 |
| **Aug** | 2691.666667 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.67 | 2691.7 |
| **Sept** | 2913.333333 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.33 | 2913.3 |

**Computed Loads for D2**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanese | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 32057.75 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32057.8 | 32058 |
| **Nov** | 13828.83333 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13828.8 | 13829 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 43601.4375 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601.4 | 43601 |
| **April** | 62793.02083 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 | 62793 |
| **May** | 25457.625 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25457.6 | 25458 |
| **June** | 24514.75 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24514.8 | 24515 |
| **July** | 24200.45833 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200.5 | 24200 |
| **Aug** | 26714.79167 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26714.8 | 26715 |
| **Sept** | 28914.83333 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28914.8 | 28915 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 53 (1 of 2)
# Computed Loads
## Construction Area Watershed

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R20 (flow from sheet 40, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 |
| **Nov** | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 |
| **April** | 12326.25 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 |
| **May** | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 |
| **June** | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 |
| **July** | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 |
| **Aug** | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 |
| **Sept** | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 |

**Computed Loads at R21 (flow from sheet 40, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 |
| **Nov** | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 |
| **April** | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 |
| **May** | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 |
| **June** | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 |
| **July** | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 |
| **Aug** | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 |
| **Sept** | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 |

**Computed Loads at R22 (flow from sheet 40, parameters from sheet 43)**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | tal Nitroge | Phosphate | l Phosph | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 |
| **Nov** | 2786.6667 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 |
| **April** | 12761.667 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 |
| **May** | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 |
| **June** | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 |
| **July** | 4876.6667 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 |
| **Aug** | 5383.3333 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 |
| **Sept** | 5826.6667 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 |

**Computed Loads for D3**

| **Month** | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 |
| **Oct** | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 |
| **Nov** | 25609.467 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 77414.55 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 |
| **April** | 108906.42 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 |
| **May** | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 |
| **June** | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 |
| **July** | 44816.567 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 |
| **Aug** | 49472.833 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 |
| **Sept** | 53547.067 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 53 (2 of 2)
# Computed Loads
## Construction Area Watershed

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Computed Loads at R20 (flow from sheet 40, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 | 6783 |
| **Nov** | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 | 2926 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.25 | 8792.3 |
| **April** | 12326.25 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326.3 | 12326 |
| **May** | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 | 5386.5 |
| **June** | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 | 5187 |
| **July** | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 | 5120.5 |
| **Aug** | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 | 5652.5 |
| **Sept** | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 | 6118 |

**Computed Loads at R21 (flow from sheet 40, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124.4 | 46124 |
| **Nov** | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19896.8 | 19897 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787.3 | 59787 |
| **April** | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83818.5 | 83819 |
| **May** | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628.2 | 36628 |
| **June** | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35271.6 | 35272 |
| **July** | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819.4 | 34819 |
| **Aug** | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 | 38437 |
| **Sept** | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602.4 | 41602 |

**Computed Loads at R22 (flow from sheet 40, parameters from sheet 43)**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | anganese | Mercury | olybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 |
| **Nov** | 2786.666667 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.67 | 2786.7 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 | 8835 |
| **April** | 12761.66667 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12761.7 | 12762 |
| **May** | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 | 5130 |
| **June** | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 | 4940 |
| **July** | 4876.666667 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.67 | 4876.7 |
| **Aug** | 5383.333333 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.33 | 5383.3 |
| **Sept** | 5826.666667 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.67 | 5826.7 |

**Computed Loads for D3**

| Month | Load (mg/month) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 | 6460 |
| **Oct** | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367.4 | 59367 |
| **Nov** | 25609.46667 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609.5 | 25609 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 77414.55 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77414.6 | 77415 |
| **April** | 108906.4167 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 | 108906 |
| **May** | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47144.7 | 47145 |
| **June** | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45398.6 | 45399 |
| **July** | 44816.56667 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44816.6 | 44817 |
| **Aug** | 49472.83333 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49472.8 | 49473 |
| **Sept** | 53547.06667 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547.1 | 53547 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.

# Sheet 54 (1 of 2)
# Concentrations at Discharge Point

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Concentrations at D1**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0.0016982 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 |
| **Nov** | 0.0021541 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 |
| **Dec** | 0.0070135 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 |
| **Jan** | 0.0083842 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 |
| **Feb** | 0.0085398 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 |
| **Mar** | 0.0015229 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 |
| **April** | 0.001461 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 |
| **May** | 0.0019703 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 |
| **June** | 0.0061718 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 |
| **July** | 0.0021235 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 |
| **Aug** | 0.0019412 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 |
| **Sept** | 0.0017835 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 |

**Concentrations at D2**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0.0042876 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 |
| **Nov** | 0.0043283 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | 0.0041414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 |
| **April** | 0.004188 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 |
| **May** | 0.0048827 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 |
| **June** | 0.005096 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 |
| **July** | 0.0053233 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 |
| **Aug** | 0.0048602 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 |
| **Sept** | 0.0044846 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 |

**Concentrations at D3**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesium | Potassium | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **Oct** | 0.0043139 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 |
| **Nov** | 0.0042386 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | 0.0040959 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 |
| **April** | 0.0041241 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 |
| **May** | 0.0049392 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 |
| **June** | 0.005175 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 |
| **July** | 0.0054202 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 |
| **Aug** | 0.0049219 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 |
| **Sept** | 0.0045224 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

# Sheet 54 (2 of 2)
# Concentrations at Discharge Point

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Concentrations at D1**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0.001698209 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 |
| **Nov** | 0.002154078 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 |
| **Dec** | 0.007013453 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 |
| **Jan** | 0.008384164 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 |
| **Feb** | 0.008539791 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 |
| **Mar** | 0.001522906 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 |
| **April** | 0.001461028 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 |
| **May** | 0.001970254 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 |
| **June** | 0.006171836 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 |
| **July** | 0.002123544 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 |
| **Aug** | 0.00194122 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 |
| **Sept** | 0.001783474 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 |

**Concentrations at D2**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0.004287563 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 | 0.00429 |
| **Nov** | 0.004328349 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 | 0.00433 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | 0.004141351 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 |
| **April** | 0.004188014 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 |
| **May** | 0.004882669 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 | 0.00488 |
| **June** | 0.005096004 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 | 0.0051 |
| **July** | 0.005323283 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 | 0.00532 |
| **Aug** | 0.004860242 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 | 0.00486 |
| **Sept** | 0.004484581 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 |

**Concentrations at D3**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | Manganese | Mercury | Molybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **Oct** | 0.004313901 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 |
| **Nov** | 0.004238582 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 | 0.00424 |
| **Dec** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Jan** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Feb** | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 | -9999 |
| **Mar** | 0.004095864 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 | 0.0041 |
| **April** | 0.004124079 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 |
| **May** | 0.004939191 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 | 0.00494 |
| **June** | 0.005175035 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 | 0.00518 |
| **July** | 0.00542017 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 | 0.00542 |
| **Aug** | 0.004921901 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 |
| **Sept** | 0.004522357 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

# Sheet 55
# Water Quality Criteria - Reference

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**The water quality criteria presented here are provided for reference purposes and do not constitute a comprehensive list of water quality criteria for a mine site. This list must be updated based on mine operations.**
**If a parameter of concern is not listed here, the reference documents should be consulted and this table should be updated accordingly.**

| Parameters | | | Sulphate | Chloride | Cyanide | Total Ammonia | Nitrate | Nitrite | Sodium | Aluminium | Antimony | Arsenic | Barium | Boron | Cadmium | Chromium | Copper | Iron | Lead | Magnesium | Manganese | Mercury | Molybdenum | Nickel | Selenium | Silver | Thallium | Tin | Uranium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit | | | mg/L | mg/L | mg/L | mg/L | mg nitrate /L | mg nitrite nitrogen/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| MMER(1) | | MAX Monthly mean(2) | | | 1 | | | | | | | 0.5 | | | | | 0.3 | | 0.2 | | | | | 0.5 | | | | | | 0.5 |
| | | MAX Grab(3) | | | 2 | | | | | | | 1 | | | | | 0.6 | | 0.4 | | | | | 1 | | | | | | 1 |
| CCME Water Guidelines | Drinking Water Community Guidelines(10) | MAC | | | 0.2 | | 45(12) | 3.2(12) | | | 0.006 | 0.01 | 1 | 5 | 0.005 | 0.05 | | | 0.01 | | | 0.001 | | | 0.01 | | | | 0.02 | |
| | | AO/OG | ≤500 | ≤250 | | | | | ≤200 | 0.1/0.2(11) | | | | | | | ≤1 | <0.3 | | | ≤0.05 | | | | | | | | | ≤5 |
| | Canadian Water Quality Guidelines for the Protection of Aquatic Life(4) | Freshwater | | | 0.005 (as free cyanide) | 0.019 (in-ionized) | 13(8) | 0.06(9) | | 0.005 - 0.1(5) | | 0.005 | | | 0.000017(6) | 0.0089 (Cr(III))<br>0.001 (Cr(VI)) | 0.002 - 0.004(6) | 0.3 | 0.001 - 0.007(6) | | | 0.000026 (Inorganic)<br>0.000004 (Methylmercury) | 0.073 | 0.025 - 0.150(6) | 0.001 | 0.0001 | 0.0008 | | | 0.03 |

**Notes:**

1 All concentrations are for total values (MMER, 2002)
2 Maximum Monthly Mean Authorized Concentration in a Composite Sample
3 Maximum Authorized Concentration in a Grab Sample
4 Guideline values apply to the total element or substance in an unfiltered sample, unless otherwise specified (CCME, 2006)
5 pH dependant parameter
6 Hardness dependant parameter
7 Valence dependant parameter
8 Guidelines are expressed in mg nitrate/L. This value is equivalent to 2.9 mg nitrate-nitrogen/L for freshwater aquatic life
9 Guidelines are expressed in mg/ nitrite nitrogen/L. This value is equivalent to 0.197 mg nitrite/L
10 Guidelines for Canadian Drinking Water Quality (Health Canada, 2008)
11 This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance values of 0.1 mg/L applies to conventional treatment plants and 0.2 mg/L applies to other types of treatment systems
12 Guidelines are expressed as mg/L and are equivalent to 10 mg/L as nitrate-nitrogen. Where nitrate and nitrite are determined separately, levels of nitrite should not exceed 3.2 mg/L
MAC Maximum Acceptable Concentration
AO Aesthetic Objective
OG Operational Guidance Values

# Sheet 56 (1 of 2)
# Water Quality at the Compliance Points

Example

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Water Quality (concentration) at Compliance Point 1**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassiu | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **WQ Criteria** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Oct** | 0.0016982 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 |
| **Nov** | 0.002154 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 |
| **Dec** | 0.0070112 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 |
| **Jan** | 0.008381 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 |
| **Feb** | 0.0085361 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 |
| **Mar** | 0.0015229 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 |
| **April** | 0.001461 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 |
| **May** | 0.0019702 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 |
| **June** | 0.0061717 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 |
| **July** | 0.0021235 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 |
| **Aug** | 0.0019412 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 |
| **Sept** | 0.0017834 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 |

**Water Quality (concentration) at Compliance Point 2**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassiu | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **WQ Criteria** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Oct** | 0.0042818 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 |
| **Nov** | 0.0043148 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0.0041374 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 |
| **April** | 0.0041852 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 |
| **May** | 0.0048733 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 |
| **June** | 0.0050854 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 |
| **July** | 0.0053116 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 |
| **Aug** | 0.0048514 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 |
| **Sept** | 0.0044776 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 |

**Water Quality (concentration) at Compliance Point 3**

| Month | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | l Dissolved S | uspended | d Organic | Cyanide | Calcium | Chloride | agnesiu | Potassiu | Sodium | Sulphate | Sulphide | Ammonia | Nitrate | Nitrite | otal Nitroge | Phosphate | l Phospho | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium |
| **WQ Criteria** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Oct** | 0.0043108 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 |
| **Nov** | 0.0042316 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0.0040937 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 |
| **April** | 0.0041225 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 |
| **May** | 0.004934 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 |
| **June** | 0.0051691 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 |
| **July** | 0.0054136 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 |
| **Aug** | 0.004917 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 |
| **Sept** | 0.0045185 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

🟪 Purple shaded cells indicate that the water quality at the compliance point is above the Selected Criteria

# Sheet 56 (2 of 2)
# Water Quality at the Compliance Points

**Example**

| | | | | |
|---|---|---|---|---|
| From cover sheet | **Mine:** | Enter mine name here | | |
| | **Project #:** | Enter project number here | **Revision #:** | Enter revision number here (e.g., Rev. 1) |
| | **Date:** | Enter date here | **Model year:** | Enter the modelled mine year here |

**Water Quality (concentration) at Compliance Point 1**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **WQ Criteria** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Oct** | 0.001698179 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 | 0.0017 |
| **Nov** | 0.002153992 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 | 0.00215 |
| **Dec** | 0.007011233 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 | 0.00701 |
| **Jan** | 0.008380993 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 | 0.00838 |
| **Feb** | 0.008536148 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 | 0.00854 |
| **Mar** | 0.001522887 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 | 0.00152 |
| **April** | 0.001461015 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 | 0.00146 |
| **May** | 0.001970207 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 | 0.00197 |
| **June** | 0.006171676 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 | 0.00617 |
| **July** | 0.002123486 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 | 0.00212 |
| **Aug** | 0.001941175 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 | 0.00194 |
| **Sept** | 0.001783438 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 | 0.00178 |

**Water Quality (concentration) at Compliance Point 2**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **WQ Criteria** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Oct** | 0.004281836 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 | 0.00428 |
| **Nov** | 0.004314843 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0.004137421 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 | 0.00414 |
| **April** | 0.004185223 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 | 0.00419 |
| **May** | 0.004873322 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 | 0.00487 |
| **June** | 0.005085432 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 | 0.00509 |
| **July** | 0.005311599 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 | 0.00531 |
| **Aug** | 0.004851416 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 | 0.00485 |
| **Sept** | 0.004477636 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 | 0.00448 |

**Water Quality (concentration) at Compliance Point 3**

| **Month** | Concentration (mg/l) | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cobalt | Copper | Iron | Lead | langanes | Mercury | lolybdenu | Nickel | Selenium | Silver | Strontium | Vanadium | Zinc | Pmtr_39 | Pmtr_40 | Pmtr_41 | Pmtr_42 | Pmtr_43 | Pmtr_44 | Pmtr_45 | Pmtr_46 | Pmtr_47 | Pmtr_48 | Pmtr_49 | Pmtr_50 |
| **WQ Criteria** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Oct** | 0.004310768 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 | 0.00431 |
| **Nov** | 0.004231579 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 | 0.00423 |
| **Dec** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Jan** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Feb** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Mar** | 0.004093698 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 | 0.00409 |
| **April** | 0.004122518 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 | 0.00412 |
| **May** | 0.004934022 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 | 0.00493 |
| **June** | 0.005169143 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 | 0.00517 |
| **July** | 0.005413622 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 | 0.00541 |
| **Aug** | 0.00491701 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 | 0.00492 |
| **Sept** | 0.004518541 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 | 0.00452 |

**Notes:** Input of data is not required on this sheet. The information is automatically transferred from other sheets or is calculated on this sheet.
Cells with -9999 indicate an error in the values used for the calculation of concentrations. Typically, the error is caused by a division by 0, indicating a flow value of 0. This error can be fixed by assigning a 0 mg/L concentration to the parameter. The user should be cautious when replacing existing formulas with hardcoding values as these "fixes" have a tendency of being forgotten and carried forward.

🟪 Purple shaded cells indicate that the water quality at the compliance point is above the Selected Criteria

# APPENDIX D

## Advice on Assessing Potential Impacts of Future Climate Change on PMF and PMP in Yukon Territory, Canada

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Environment Canada
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Benoit Godin
Environmental Protection,
91782 Alaska Highway
Whitehorse, Yukon , Y1A 5B7

8 March 2006

Subject: **Advice on Assessing Potential Impacts of Future Climate Change on PMF and PMP in Yukon Territory, Canada**

Dear Benoit,

Some time ago you asked how we might evaluate the impacts of future climate changes might affect predicted floods. With the help of Jon Wang, we have prepared the following advice:

Summary:

Probable maximum precipitation (PMP), the greatest depth of precipitation that could physically occur at the location of interest for a given storm duration, is often used for calculating the probable maximum flood (PMF). PMP can be estimated based on annual maximum series combined with a frequency factor. Methods for estimating PMP are usually estimated based on the present available historical data; however, by definition, any possible factors that may influence PMP should be taken into account. In this study, we focus on how future climate change (temperature and precipitation) might be accounted for in determining future PMP and PMF. Using the Coupled Global Climate Models (CGCM) with grid boxes centering at locations of hydrometric stations in Yukon, we found that, by the end of this century, maximum increases of temperature may vary from 4.4°C to 6.8°C and maximum increases of precipitation from 5% to nearly 20% depending on the locations of the watersheds in the territory, compared to the 1961-1990 baseline. Maximum increases of precipitation and temperature show a clear spatial pattern in Yukon with

greatest increases in the north and smallest in the south. These findings may have important implications to determining PMP and PMF in Yukon.

## 1. Introduction

Studies of potential future climate change have suggested that changes in precipitation and temperature may have significant impacts on hydrologic regimes and changes in streamflows (Coulson, 1997, Whitfield and Taylor, 1998). Increased rainfall directly contributes to streamflows whereas increased snowfall increases potential water available from snowmelt. Impacts of temperature change on hydrologic attributes have received much attention. Frederick and Gleick (1999) concluded that higher temperature will accelerate the rate of snowmelt, increase the ratio of rain to snow, and reduce the duration of snowpack on the ground. By studying of the effect of $CO_2$ and climate change on snowpack and streamflow, Cooley (1990) stressed that a small change in temperature near the threshold that delineates rain from snow could have a significant impact on snow accumulation and snowmelt rate. Comparing increases in precipitation at two watersheds in the province of British Columbia, Whitfield *et al*. (2003a) showed that an increase in temperature and a change in the form of precipitation from snow to rain account for the majority of the increase and timing of the runoff.

Climate change is also another important factor in the process of estimating the probable maximum precipitation (PMP) and the probable maximum flood (PMF). Koutsoyiannis (1999) developed a method for assigning a return period to PMP values estimated based on the frequency factor method by Hershfield (1961): $h_m = \overline{h}_n + k_m s_n$, in which $h_m$ is the maximum observed rainfall depth at the site of interest; $\overline{h}_n$ and $s_n$ the mean and standard deviation of the annual maximum precipitation series for site $m$; and $k_m$ the frequency factor. Hershfield (1961) recommended $k_m = 15$ for estimating the PMP because it was the largest factor taken from an analysis of 2645 stations. Therefore, future precipitation change is one of the most important concerns in PMP estimation. However, in mountainous areas such as the Yukon Territory, a flood may not be exclusively caused by intensive precipitation but rather by other triggering factors (e.g., snowmelt and ice-jams). Thus, future temperature change near the threshold delineating rain from snow is of a significant impact on snow accumulation and snowmelt rate, and consequently it may play a key role in determining the PMF.

Future climate change is often modelled using Global Climate Models (also known as the General Circulation Models, abbreviated as GCM). GCMs provide quantitative analysis of potential climate changes over the entire Earth by modelling the physical climate systems. They are based on mathematical equations representing physical laws on a three-dimensional grid of points over the globe encompassing the atmosphere, ocean, and land surface. Values of winds, clouds, temperature, precipitation, ocean currents and many other climate variables are calculated and the averages of these quantities give the three dimensional climate simulated by the model. The simulation can be done with changing greenhouse gas concentrations and aerosol loadings in the atmosphere to simulate potential climate change to the end of the current century to estimate changes under different scenarios.

Commonly used GCM models include UK Hadley Centre's GCM version 2 (HADCM2) and version 3 (HADCM3), Coupled Global Climate Models (CGCM1 and CGCM2) developed by Canadian Centre for Climate Modelling and Analysis in Canada, and many others. HADCM2 examines climate changes due to enhanced greenhouse effect whereas HADCM3 represents effects of greenhouse gases, $CO_2$, water vapour, ozone, and aerosols. Both models were originally developed for predicting changes in precipitation and temperature for the Mediterranean region (Viner and Hulme, 1997).

The first version CGCM1 used heat and water flux adjustments from coupled ocean and atmosphere model runs, followed by a procedure in which the flux adjustments are modified by an integration of the coupled model. A multi-century control simulation with the coupled model is then performed using the present day $CO_2$ concentration to evaluate the stability of the coupled model climate and to compare the variability of modelled climate to its observed counterpart. Details of CGCM1 and discussions of the primary results can be found in Climate Change Digest (Henry, 2000). The second version CGCM2 is based on CGCM1 with some improvements. Details of CGCM2 can be found in Flato and Boer (2001). Forcing scenarios in CGCM2 mainly include greenhouse gas (GG), greenhouse gas plus aerosol (GA), and Special Report on Emissions Scenarios (SRES) with different families (A or B) and focuses (1 or 2). The “A” families have more economic concerns than “B” families which are more environmental, whereas the focus of “1” is more global compared to “2” which is more regional. Full details of SRES are cited as follows (Nakicenovic et al., 2000):

> ***A1***
>
> *The A1 storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies. Major underlying themes are convergence among regions, capacity-building, and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income. The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil intensive (A1FI), non-fossil energy sources (A1T), or a balance across all sources (A1B; where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end use technologies).*
>
> ***A2***
>
> *The A2 storyline and scenario family describes a very heterogeneous world. The underlying theme is self-reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing population. Economic development is primarily regionally oriented and per capita economic growth and technological change more fragmented and slower than other storylines.*
>
> ***B1***
>
> *The B1 storyline and scenario family describes a convergent world with the same global population that peaks in mid-century and declines thereafter, as in the A1 storyline, but with rapid change in economic structures toward a service and*

> *information economy, with reductions in material intensity and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without additional climate initiatives.*
>
> ***B2***
>
> *The B2 storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social and environmental sustainability. It is a world with continuously increasing global population, at a rate lower than A2, intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1 storylines. While the scenario is also oriented towards environmental protection and social equity, it focuses on local and regional levels.*

CGCM2 has been widely used to produce ensemble climate change projections using GG and GA scenarios as well as SRES A2 and B2 scenarios. Results from CGCM2 have been applied to the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report and the ongoing Arctic Climate Impact Assessment (http://www.cccma.bc.ec.gc.ca/models/cgcm2.shtml). Studies have showed that CGCM2 performs “better” than other models in some areas; for example, Allamano *et al.* (2005) showed that CGCM2 produced the smallest bias compared to other four models including HADCM3 and CGCM1, when analyzing modelled present streamflows in rivers in British Columbia.

In developing this advice, we adopted CGCM2 with forcing scenarios of GA and SRES A2 and B2 and used locations of hydrometric stations in Yukon as the grid centres for downloading climate data (temperature and precipitation) to examine the modelled future climate in 2010-2030, 2040-2060, and 2070-2090. The purposes of the study are to estimate the future maximum temperature and precipitation changes in this century and to assess the temporal and spatial changes of temperature and precipitation in the Yukon Territory. Both the magnitudes and the temporal and spatial trends may have significant implications to updating the existing PMP and PMF estimates or to re-estimating PMP and PMF in the future in this territory.

## 2. Study Area and Method

Yukon is one of Canada's three territories in the North. It is a triangle-shaped territory characterized by mountainous terrains and glaciers and ice fields, located at north-west of Canada with an area of 478,970 km². Yukon has Canada’s highest peak at 5,959m above sea level (Mount Logan). It has a range of latitudes from $60^{o}$N to about $70^{o}$N and longitudes from $124^{o}$W to $141^{o}$W, experiencing a large range of annual temperature with long cold winters and short mild summers.

The grid box centres that are used as inputs to CGCM2 model are based on the locations of hydrometric stations in Yukon. The stations are managed by Environment Canada and Indian and Northern Affairs. A total of 68 hydrometric stations were obtained from the HYDAT published by Environment Canada, 2002. Their latitudes and longitudes were used for downloading temperature and precipitation data from the CGCM2 model (Figure 1). We defined small (<1000 $km^2$) and large (>1000$km^2$) watersheds in the study based on the drainage area, because the impact of climate change on determining PMP and PMF may be more significant to small watersheds than to large ones. For each grid box, mean temperature change and precipitation change illustrate the distribution of scenario changes for that grid box on a monthly, seasonal, or annual basis. We used annual basis in the study.

Data of mean annual temperature change and precipitation change with different emission scenarios in 2010-2030, 2040-2060, and 2070-2090 were obtained from Canadian Institute for Climate Studies. Three scenarios of climate change were used in the study, which described a range of possible future climate rather than subjectively using a single best-guess scenario. Three scenarios are (1) more economical and regional development scenario A2, (2) more environmentally friendly and regional development scenario B2, and (3) greenhouse gas and aerosol scenario GA. All outputs from the CGCM2 model are with respect to 1961-1990 global climate model baseline. For each hydrometric station we determine the model output for that location for 3 time periods and 3 scenarios. This means that the results from the closest grid point are attributed to that station.

We used three time slices (2010-2030, 2040-2060, and 2070-2090) in the study. This allows us to examine the pattern of temperature and precipitation changes in Yukon in this century. From the three selected scenarios, it is possible to identify the one that indicates the most extreme increases for a given time slice because extreme increases in temperature and precipitation are useful for updating or re-estimating PMP and PMF.

Figure 1 Locations of hydrometric stations for smaller (<1000km$^2$, triangles) and larger (>1000km$^2$, squares) watersheds. These stations were used to derive CGCM2 data.

## 3. Results and discussions

Modelled results from CGCM2 experiments at selected locations in Yukon for 2010-2030, 2040-2060, and 2070-2090 of the century are listed in Appendix I and Appendix II.

Because of lower resolutions that CGCM2 can handle, CGCM2 may generate the same values of temperature and precipitation for some adjacent hydrometric stations if the stations are not considerably located apart. This is especially common in southern Yukon due to the fact that hydrometric stations are unevenly distributed with the majority concentrated in the south of the territory. The precipitation change versus temperature change figures (Figures 2, 3, and 4) show extensive overlaps, i.e., one point in the figure may present climate change for one or more hydrometric stations. The scatter of the same symbol (from the same scenario) in the figure indicates the variation of the changes of temperature and precipitation due to different geographic locations. The spread of the three groups of symbols (from three different scenarios) in the figure shows the discrepancy of the model outputs that different scenarios may generate. Figures 2, 3, and 4 also show the increase of the range of temperature and precipitation varies from 2010-2030 to 2040-2060 then to 2070-2090, which may indicate that there are fewer uncertainties from the CGCM models in the near future and more uncertainties by the end of the century. For example, the range for precipitation from CGCM2-ga is from 3.48% to 8.55% in 2010-2030; it becomes from 4.98% to 12.24% in 2040-2060 and then from 5.00% to 19.59% in 2070-2090. Similar results of the increase of the range for temperature can be seen from Figures 2, 3, and 4 as well.

Results from CGCM2 show that, in 2010-2030, the B2 scenario may cause the biggest increase for precipitation (10.49%) and the GA scenario may cause the biggest increase for temperature (2.34°C) compared to the 1961-1990 baseline (Figure 2). In 2040-2060, the A2 scenario has the biggest precipitation increase (13.04%) and the GA scenario has the biggest temperature increase (4.15°C). In 2070-2090, the GA scenario shows the biggest increases for both precipitation and temperature with the values of 19.59% and 6.77°C, respectively. It was shown that the extreme increase of precipitation could be caused by B2 scenario (2010-2030), or A2 scenario (2040-2060), or GA scenario (2070-2090). However, greenhouse gases and aerosol (GA) are likely the only forcing scenario that causes the largest temperature increase in all time slices (Figures 2, 3, and 4).

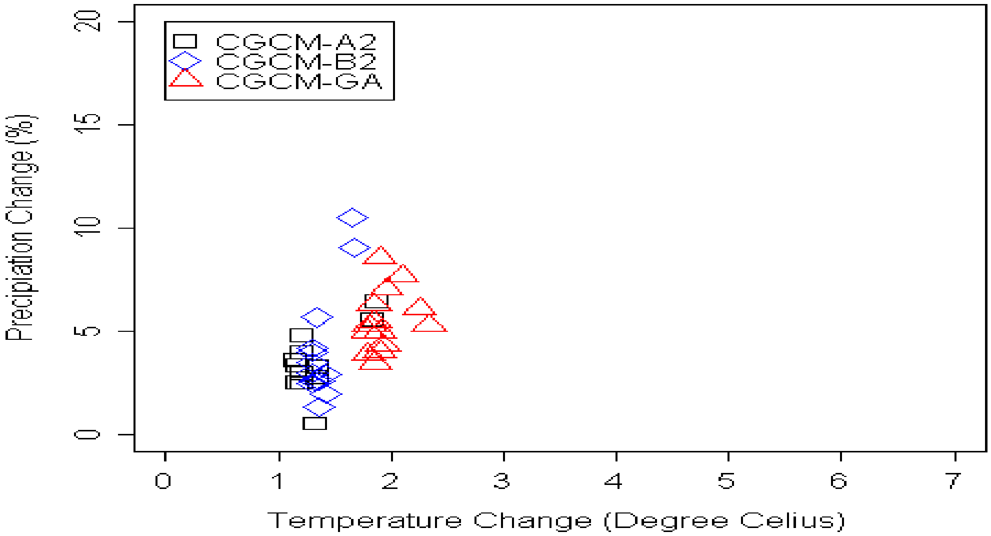

Figure 2 Predicted climate change in 2010-2030 using CGCM2 and the scenarios A2, B2, and GA. Since many stations are close to each other the modelled changes overlap and reduce the number of symbols shown.

Jasper *et al*. (2004) concluded that GA scenario is usually characterized by larger temperature changes and more substantial precipitation changes than the A2 and B2 scenarios. The smallest temperature and precipitation changes in 2040-2060 and 2070-2090 are projected by B2 scenario (Figures 3 and 4). This may indicate that increases of greenhouse gases and aerosol will eventually have significant impacts on climate change in a long run although the impacts may not be evident in a shorter time period in the future. This is not surprising because B2 assumes a more environmentally friendly economic development. Similar conclusions have been made in other studies (e.g. Jasper *et al*., 2004). However, it is interesting to note that B2 scenario may produce a wider range of precipitation changes in the near future in 2010-2030, showing more variability in precipitation at different locations.

All climate change scenarios showed consistent increases in precipitation and temperature from 2010-2030 to 2040-2060 then to 2070-2090. Plots of the average of annual precipitation change (%) versus annual temperature change (°C) from the three different

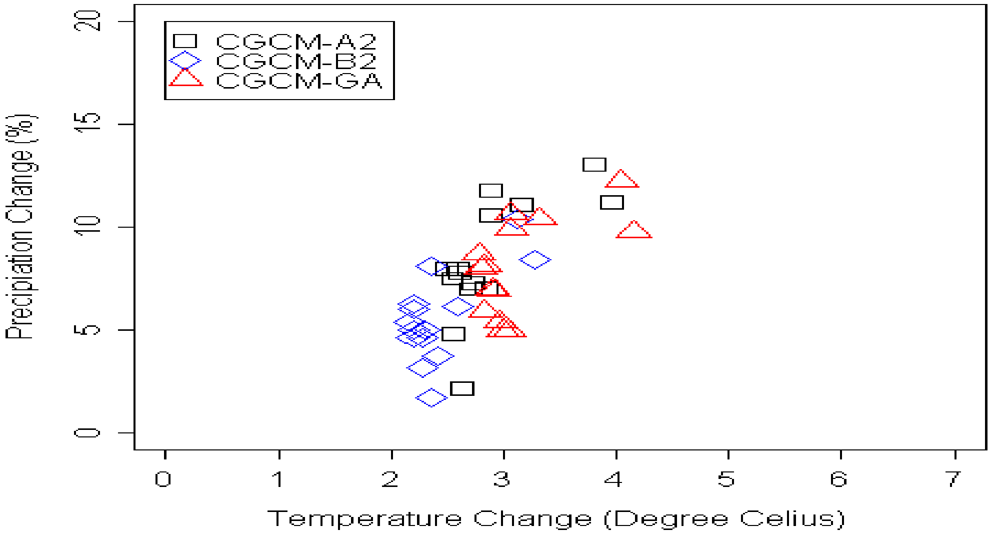

Figure 3 Predicted climate change in 2040-2060 using CGCM2 and the scenarios A2, B2, and GA. Since many stations are close to each other the modelled changes overlap and reduce the number of symbols shown.

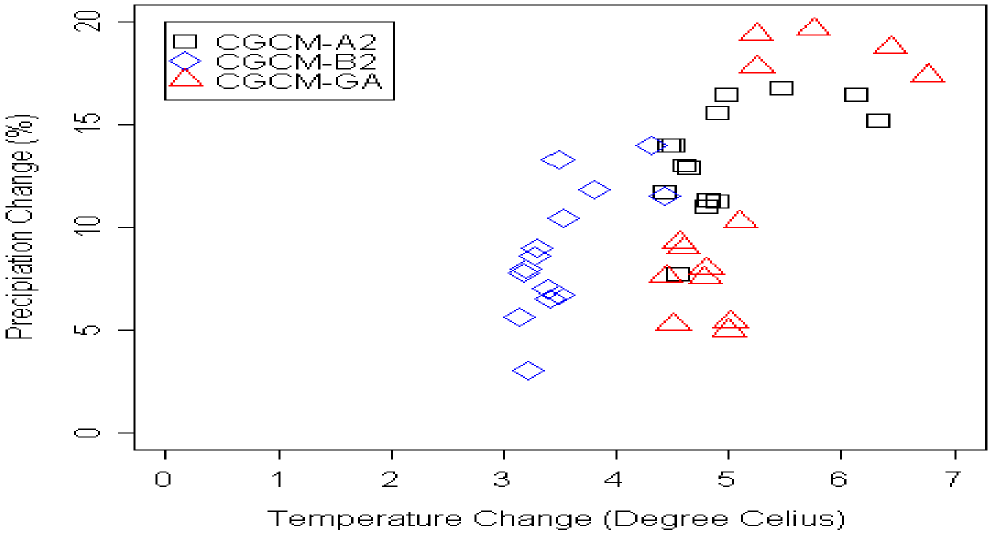

Figure 4 Predicted climate change in 2070-2090 using CGCM2 and the scenarios A2, B2, and GA. Since many stations are close to each other the modelled changes overlap and reduce the number of symbols shown.

scenarios (A2, B2, and GA) are illustrated in Figures 5 for time slices of 2010-2030, 2040-2060, and 2070-2090. In 2010-2030, increases of temperature may vary from 1.42°C to 1.95°C with an average of 1.53°C, increases of precipitation from 2.66% to 7.69% with an average of 4.24% compared to the 1961-1990 baseline. Those numbers become from 2.50°C to 3.79°C with an average of 2.77°C for temperature and from 3.77% to 11.89% with an average of 7.36% for precipitation in 2040-2060. Temperature and precipitation will further increase to a new level from 4.00°C to 5.84°C with an average of 4.52°C and from 5.36% to 16.39% with an average of 11.27% in 2070-2090. This steady increasing trend is in agreement with some previous studies. For example, results from the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) indicate a global mean temperature increase ranging from 1.4°C to 5.8°C and an increase of mean precipitation by about 2.4% per 1°C increase in temperature for the end of the century (Houghton *et al*., 2001). However, a recent study showed a reduction in precipitation with increased temperature for Alaska and assumed these changes to continue from Alaska's interior to northeastern Canada (Goetz *et al*., 2005). These “unexpected” results may be due to other factors.

Similar results were also found in other studies. For example, Whitfield *et al*. (2003b) showed a continuing increase in temperature in the future and concluded that, by 2073-2093, modelled temperature increases are statistically significant with magnitudes on the order around 5°C at watersheds in British Columbia. Whitfield *et al.* (2003b) also showed that precipitation increased for the modelled future periods in the century at the same watersheds but changes in precipitation were less important. In Yukon, this study showed dramatic and steady increases in both temperature and precipitation in the future three modelled periods of 2010-2030, 2040-2060, and 2070-2090 (Figure 5).

B2, A2, and GA scenarios produced the biggest increases of precipitation in Yukon for time slices 2010-2030, 2040-2060, and 2070-2090, respectively. Increases of precipitation showed a general spatial pattern with the highest increase in the north and less increase in the south. This spatial pattern applies to all time slices with some variations (Figures 6, 7, and 8). For example, increases of precipitation in 2010-2030 are less homogeneously distributed than in 2040-2060 and 2070-2090. Increases of precipitation in 2010-2030 almost remain unchanged in most part (southern Yukon) of the territory and gradually increase in the north. Increases of precipitation in 2070-2090 show a stable trend increasing from the south to the north, reaching the highest level (extrapolation using a Spline function shows a value of over 20%) in the area of latitudes 65$^{o}$N-67$^{o}$N and longitudes 137$^{o}$W-141$^{o}$W in Yukon (Figure 8).

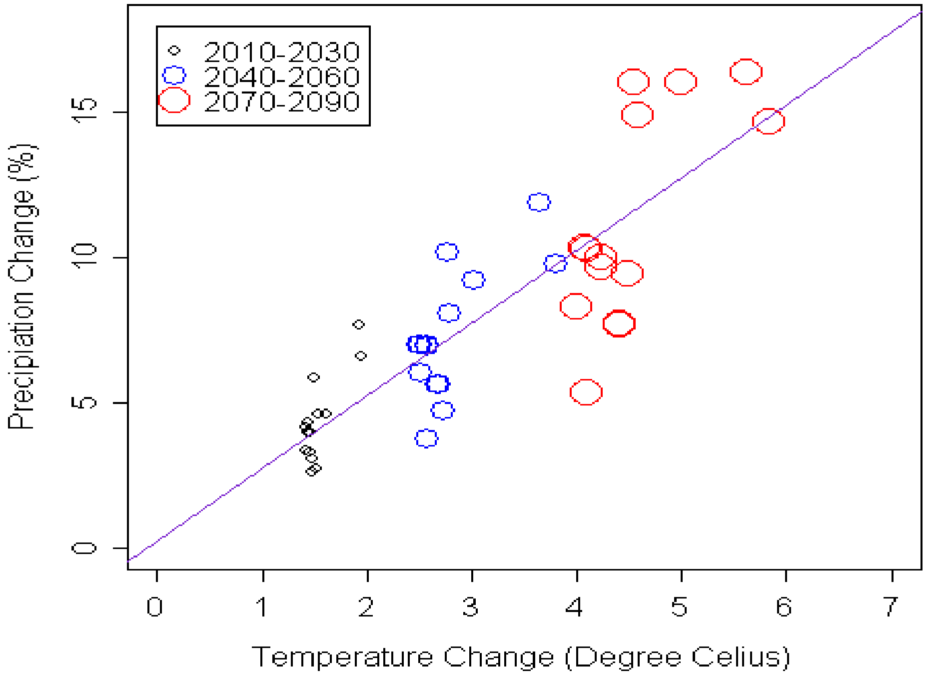

Figure 5 Temporal trend of climate change in Yukon. Each symbol presents the average for a hydrometric station over three scenarios A2, B2, and GA.

GA scenario generated the biggest increases of temperature for all selected slices in Yukon. Temperature changes showed a simple and steady spatial pattern with all big temperature increases in the north and small temperature increases in the south (Figures 9, 10, and 11). This spatial trend is very similar to the trend of precipitation change, increasing the magnitude with the increase of latitude in the territory. This may indicate that the precipitation change would be closely correlated to temperature change in the future of this century in the area.

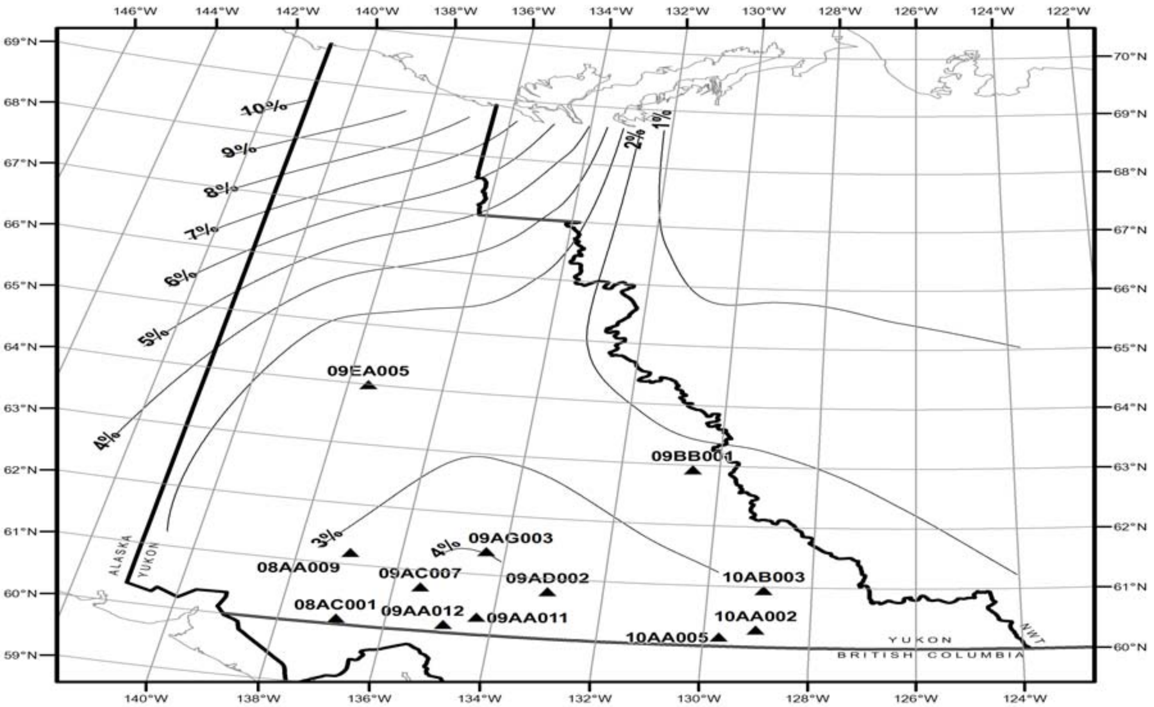

Figure 6 Maximum increases of precipitation (1% - 10%) in 2010-2030 generated by CGCM2-B2 compared to the 1961-1990 baseline. Isobar interval is 1% and only small watersheds (<1000km$^2$) are shown.

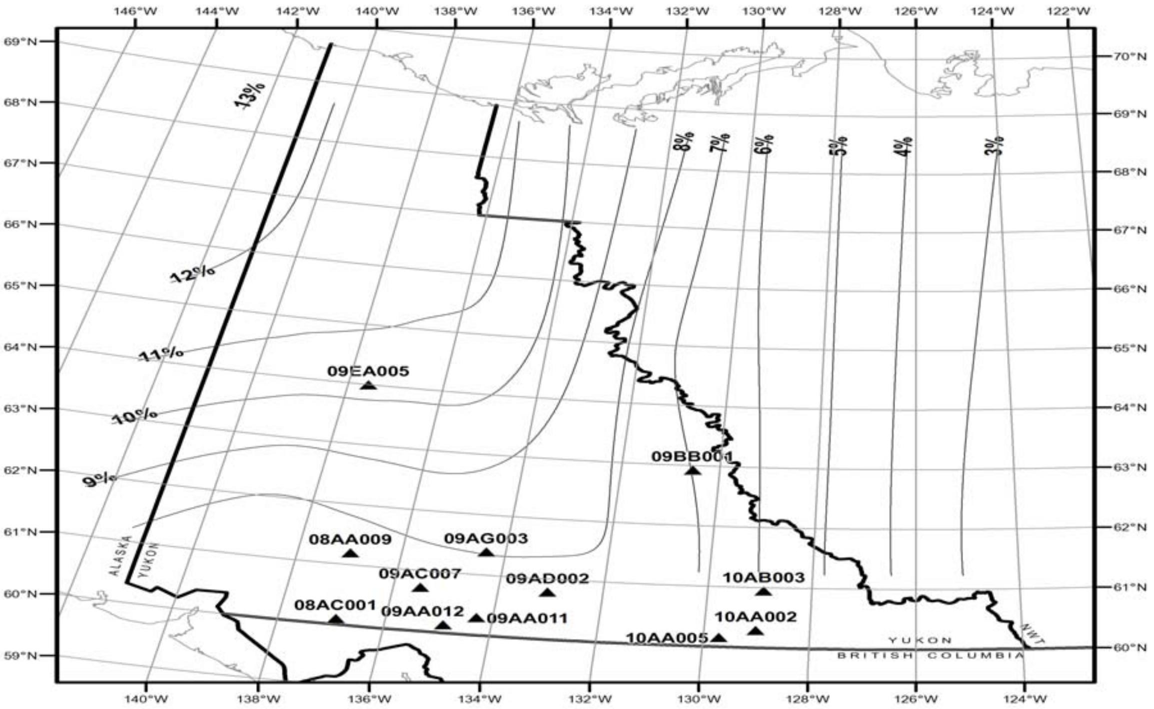

Figure 7 Maximum increases of precipitation (3% - 13%) in 2040-2060 generated by CGCM2-A2 compared to the 1961-1990 baseline. Isobar interval is 1% and only small watersheds (<1000km$^2$) are shown.

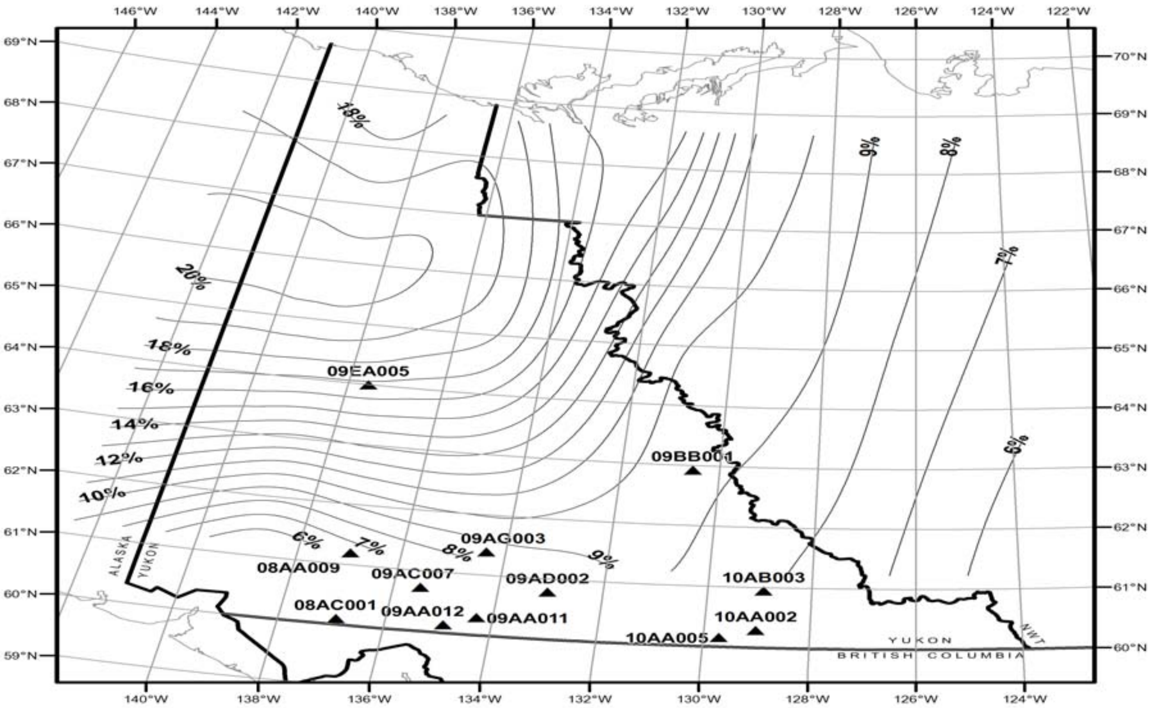

Figure 8 Maximum increases of precipitation (5% - 20%) in 2070-2090 generated by CGCM2-GA compared to the 1961-1990 baseline. Isobar interval is 1% and only small watersheds (<1000km$^2$) are shown.

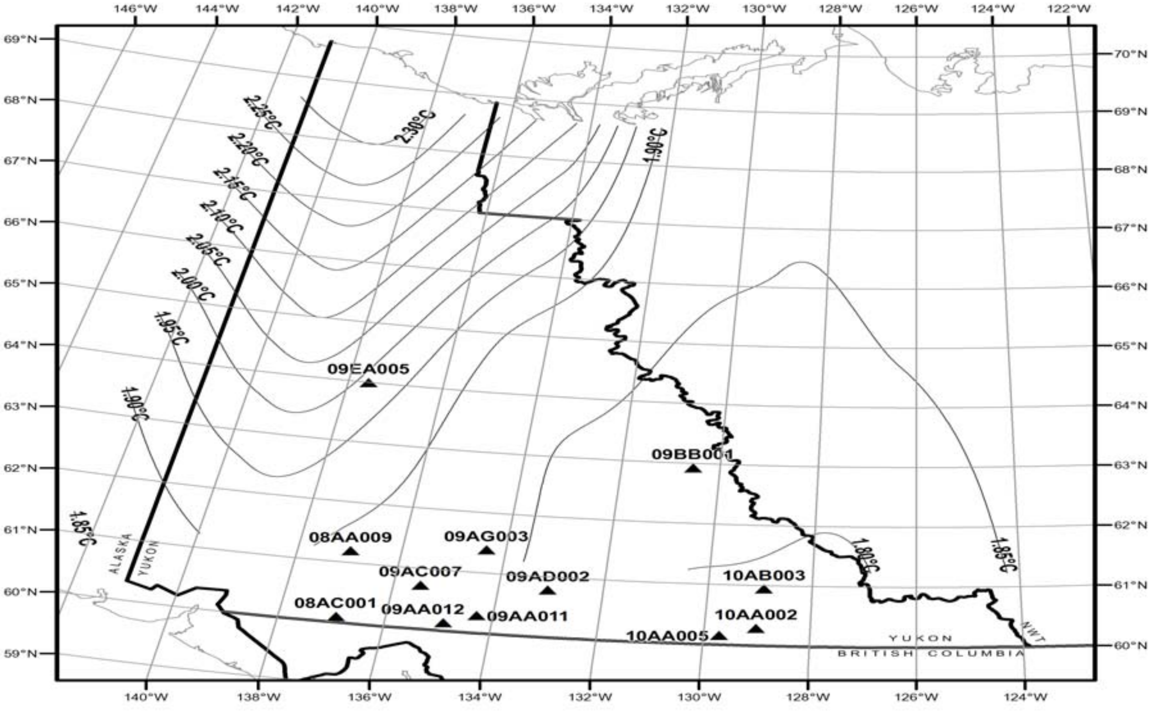

Figure 9 Maximum increases of temperature (1.8°C – 2.3°C) in 2010-2030 generated by CGCM2-GA compared to the 1961-1990 baseline. Isobar interval is 0.05°C and only small watersheds (<1000km$^2$) are shown.

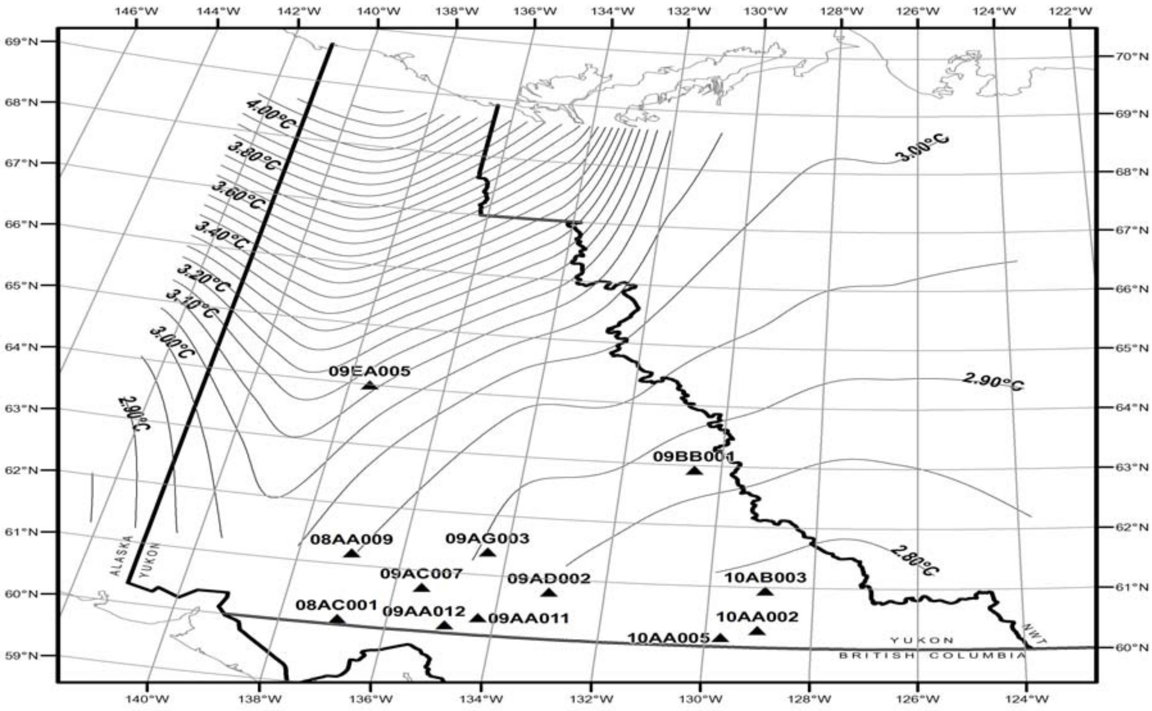

Figure 10 Maximum increases of temperature (2.8°C – 4.1°C) in 2040-2060 generated by CGCM2-GA compared to the 1961-1990 baseline. Isobar interval is 0.05°C and only small watersheds (<1000km$^2$) are shown.

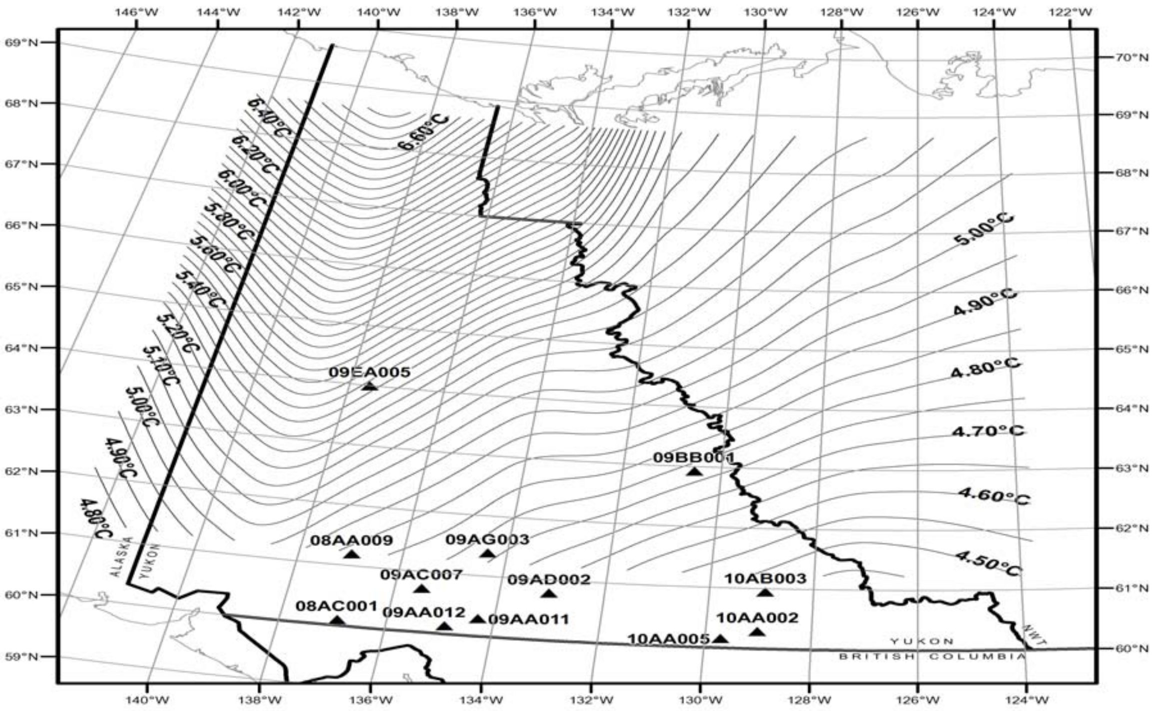

Figure 11 Maximum increases of temperature (4.5°C – 6.7°C) in 2070-2090 generated by CGCM2-GA compared to the 1961-1990 baseline. Isobar interval is 0.05°C and only small watersheds (<1000km$^2$) are shown.

There is no doubt that hydrological responses are strongly linked to climate change. Many studies have found that climate change could strongly affect water balance and frequency distribution of floods and low flows (Schulla, 1997, Schaper and Seidel, 2001, Kleinn, 2002). Jasper *et al*. (2004) concluded that the increase on temperature and precipitation would lead to significant changes in streamflows and snow resources could be reduced by 74% to 90% (depending on different climate scenarios) in the end of this century compared with current snow amount based on simulation studies for alpine rivers in Switzerland. Whitfield *et al.* (2003b) showed climate change had major regional effects on hydrological characteristics in various (rainfall-driven, snow-melt driven, and hybrid) rivers in the province of British Columbia, when using a hydrologic model for assessing relative changes in the frequency, timing, and magnitude of floods and low flows between the present and future climate scenarios of the 2020s, 2050s, and 2080s. In particular, they found that, in snow-melt driven watersheds, the magnitudes of annual peak flows increase and low flow events occur less often due to an overall increase of streamflows in a warmer climate. Being driven by the same physical mechanisms, it is understandable that the increases of temperature and precipitation would have extensive impacts on hydrological attributes in Yukon although the geographical locations of rivers between Yukon and British Columbia are different.

Steady increases of temperature and precipitation in the future may have great impact on streamflows in Yukon because the most common causes of streamflows in this region are spring snowmelt or a combination of snowmelt and rainfall (Watt *et al*., 1989). Watt *et al*. (1989) summarized that in Yukon the annual snowmelt runoff generally occurs in late May or June. In the northern area of Yukon (north of Ogilvie Mountains), streamflow regimes are not greatly different with peak flows in spring due to snowmelt and secondary peak flows later due to rainfall. In the southern area of Yukon (south of Ogilvie Mountains), streamflows increase rapidly during the early summer due to snowmelt at lower elevations and then reach the peak in later summer due to snow and glacial melt at higher elevations. It is obvious that temperature and precipitation, if not the only forcing factors, would be the most important dominating causes that govern streamflow regimes and their changes in Yukon.

PMF is a function of numerous factors and its accurate estimation requires finding the optimum combination of the factors. The most causative factor of PMF is the PMP which is the theoretically greatest depth of precipitation for a given duration that is physically possible at a particular geographical location at a certain time of the year (Hansen et al., 1982). In reality, it is impossible to determine the exact value of the PMP and the estimated PMP value is heavily influenced by the available data, knowledge, and estimation technique. Douglas and Barros (2003) summarized that PMP estimation methods may fall into categories of: the storm model approach, the maximization and transposition of individual observed storms, generalized (regionalized) methods, theoretical or empirical methods derived from maximum depth, duration, and area observations, and statistical methods. By definition, PMP and PMF take into account the most severe combination of meteorological and hydrological conditions that are physically possible in a region. In other words, any physically possible affecting factor should be a concern to PMP and PMF. As mentioned before, PMP can also be estimated based only on annual maximum precipitation series. The maximum increases of precipitation in Yukon could be concerns when determining PMP and PMF, although their quantitative computation is out of the scope of the study.

Attention should also be paid to the maximum increases of temperature in cases where extreme floods or PMF may be triggered by factors such as extreme snowmelt and ice-jams in the mountainous areas in the territory. Ice-jam induced floods are often with extremely large magnitude with discharges being easily two or three times greater than those under open-water condition, although their durations are usually short (Prowse and Culp, 2003). An increase of temperature to a level close to the threshold (long-term air temperature at 0°C) that melts ice-jams could be of importance to an extreme flood occurrence. Prowse and Culp (2003) pointed out that the rate of water level rise in the order of 1m/min is not uncommon at northern rivers in Canada. It is important to note that intensive and long-duration rainfall would dramatically accelerate the rate of ice-jam breakup and consequently produce an extreme flood or PMF. In such a case, combination of rainfall and temperature should be taken into consideration for a PMF estimate at a given watershed.

Due to the facts that (1) extreme factors are concerned with regard to determining PMP and PMF and (2) results of the study showed that maximum increases of precipitation and temperature are in 2070-2090, outputs from CGCM2 for 2070-2090 are of importance. Therefore, contour maps for the time slice 2070-2090 (Figures 8 and 11) should be considered in terms of PMP and PMF. It is important to note that the modelled values of temperature and precipitation are site specific with the ranges of maximum increases of temperature from 4.4°C to 6.8°C and maximum increases of precipitation from 5% to 19.6% (Figures 8 and 11) compared to the 1961-1990 baseline depending on the locations of the hydrometric stations and the scenarios. This implies that, at different watersheds, different values of the maximum increases of precipitation and temperature could be considered in the PMP and PMF issue. As an example, in a previous report by Wang and Whitfield (2004), we concluded that a maximum increase of precipitation of 15% and a maximum increase of temperature of 6.2°C at Faro Mine Site area in Yukon be used for re-assessing the PMF estimate.

Increase of precipitation to PMP could be considered in different ways. Assume annual maximum 24-hour precipitation is governed by the Generalized Logistic distribution (GLOG), the modelled precipitation increase could have impact on each of the location, scale, and shape parameter of the distribution or any combination of the three parameters. Taken Yukon River at Whitehorse as an example, the maximum increase of precipitation of 11% was analyzed in relationship of PMP. Based on precipitation records (1942-2005) at Whitehorse Airport and synthetic data analysis using GLOG, changes of extreme precipitation due to different options are compared in Figure 12. Extreme 24-hour precipitation from the records is 449mm which results in an increase shift of 498mm caused by the 11% increase (Figure 12). However, it could reach as high as 568mm, 572mm, and 626mm because of 11% variation of the location, scale, and shape parameter of GLOG, respectively. The reach of right-hand tail in the probability density distribution (Figure 12) shows the highest extreme precipitation for each of the settings. For a conservative consideration, the overall largest value (626mm) should be taken into account in terms of the PMP estimate in this case.

Climate change that affects PMP and PMF may also be influenced by Pacific climate patterns, the short-term El Niño/Southern Oscillation (ENSO) and longer-term Pacific Decadal Oscillation (PDO). It is unknown that whether extreme meteorological and/or hydrological conditions, such as extreme high precipitation and extreme floods, would be affected by ENSO or PDO, although Wang et al. (2005) showed that there is no significant correlation between ENSO/PDO and low-flows in the southern Yukon. It would be valuable to assess if extreme precipitation and extreme floods are related to Pacific climate patterns to estimate PMP and PMF.

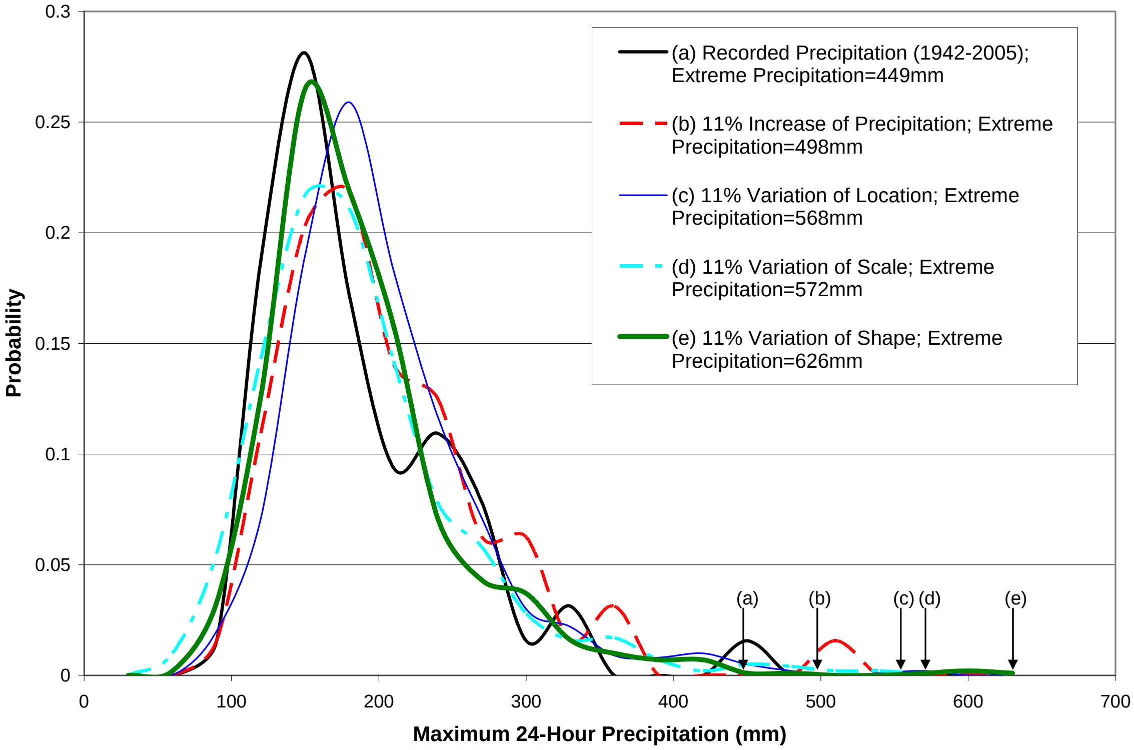

Figure 12 Probability density distribution of maximum 24-hour precipitation at Whitehorse Airport. Data simulation was based on the GLOG distribution with GLOG parameters of 158.8 (location), 31.5 (scale), and -0.231 (shape) from the records.

## 4. Conclusions

Using CGCM2 with scenarios A2, B2, and GA, precipitation and temperature data in 2010-2030, 2040-2060, and 2070-2090 were downloaded for assessing future climate change in

Yukon, which may have significant impacts on estimates of PMP and PMF. A continuing and steady temporal increasing trend for both temperature and precipitation was found. Extreme increases of precipitation will be caused by B2, A2, and GA in 2010-2030, 2040-2060, and 2070-2090, respectively. Due to the temporal trend, maximum increases of temperature and precipitation in 2070-2090 are of importance to determining PMP and PMF.

Quantitative analysis of the relationship between future climate change and PMP and PMF is out of the scope of the study. However, we found that the maximum temperature would increase from 4.4°C to 6.8°C and maximum precipitation from 5% to 20% in the century in Yukon compared to the 1961-1990 baseline. This may have tremendous impacts on the estimates of PMP and PMF because temperature and precipitation are two important factors in determining PMP and PMF. Maximum increase of precipitation can be interpreted in different ways, for example the increase may have impact on each of the parameters of location, scale, and shape or a combination of the precipitation distribution for a given site. A conservative estimate of the influence of maximum precipitation increase should be used for the PMP calculation. Maximum change of temperature would be meaningful only when increasing temperature causes extreme snowmelt or ice-jam flood that could generate the PMF in a watershed.

Maximum increases of temperature and precipitation show a clear spatial pattern with greatest increases in the north and smallest in the south of Yukon. This may indicate a correlation between climate change and latitude over the territory. Because of the spatial distribution of the maximum increases of temperature and precipitation, different values of the maximum changes could be taken into account in determining PMP and PMF, depending on the locations of the watersheds.

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Yours sincerely,

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a/Chief, Science Division

## Appendix I Modelled temperature change (°C) in Yukon

| | 2010-2030 | | | 2040-2060 | | | 2070-2090 | | |
|---|---|---|---|---|---|---|---|---|---|
| Location | A2 | B2 | GA | A2 | B2 | GA | A2 | B2 | GA |
| 08AA001 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 08AA003 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 08AA008 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 08AA009 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 08AB001 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 08AC001 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 08AC002 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 09AA007 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AA009 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AA011 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AA012 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AB001 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AB008 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AB009 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AC001 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AC004 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AC007 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AD001 | 1.20 | 1.30 | 1.80 | 2.50 | 2.20 | 2.80 | 4.50 | 3.20 | 4.60 |
| 09AD002 | 1.20 | 1.30 | 1.80 | 2.50 | 2.20 | 2.80 | 4.50 | 3.20 | 4.60 |
| 09AE001 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AF001 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AG001 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AG003 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AH001 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09AH003 | 1.20 | 1.30 | 1.90 | 2.70 | 2.30 | 3.00 | 4.80 | 3.40 | 5.00 |
| 09AH004 | 1.20 | 1.30 | 1.90 | 2.60 | 2.20 | 2.90 | 4.60 | 3.30 | 4.80 |
| 09BA001 | 1.20 | 1.30 | 1.80 | 2.50 | 2.20 | 2.80 | 4.50 | 3.20 | 4.60 |
| 09BB001 | 1.20 | 1.30 | 1.80 | 2.50 | 2.20 | 2.80 | 4.50 | 3.20 | 4.60 |
| 09BB002 | 1.17 | 1.30 | 1.86 | 2.61 | 2.21 | 2.92 | 4.64 | 3.27 | 4.79 |
| 09BC001 | 1.17 | 1.30 | 1.86 | 2.61 | 2.21 | 2.92 | 4.64 | 3.27 | 4.79 |
| 09BC002 | 1.15 | 1.31 | 1.81 | 2.54 | 2.16 | 2.83 | 4.48 | 3.17 | 4.56 |
| 09BC004 | 1.17 | 1.30 | 1.86 | 2.61 | 2.21 | 2.92 | 4.64 | 3.27 | 4.79 |
| 09CA002 | 1.20 | 1.30 | 1.93 | 2.73 | 2.28 | 3.05 | 4.81 | 3.40 | 5.01 |
| 09CA003 | 1.20 | 1.30 | 1.93 | 2.73 | 2.28 | 3.05 | 4.81 | 3.40 | 5.01 |
| 09CB001 | 1.20 | 1.30 | 1.93 | 2.73 | 2.28 | 3.05 | 4.81 | 3.40 | 5.01 |
| 09CD001 | 1.20 | 1.30 | 1.93 | 2.73 | 2.28 | 3.05 | 4.81 | 3.40 | 5.01 |
| 09DA001 | 1.32 | 1.36 | 1.85 | 2.84 | 2.36 | 2.96 | 4.89 | 3.49 | 5.09 |
| 09DC002 | 1.33 | 1.37 | 1.90 | 2.88 | 2.41 | 3.07 | 4.98 | 3.53 | 5.25 |
| 09DC003 | 1.33 | 1.37 | 1.90 | 2.88 | 2.41 | 3.07 | 4.98 | 3.53 | 5.25 |
| 09DD002 | 1.33 | 1.37 | 1.90 | 2.88 | 2.41 | 3.07 | 4.98 | 3.53 | 5.25 |

| Location | 2010-2030 | | | 2040-2060 | | | 2070-2090 | | |
|---|---|---|---|---|---|---|---|---|---|
| | A2 | B2 | GA | A2 | B2 | GA | A2 | B2 | GA |
| 09DD003 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09DD004 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09EA003 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09EA004 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09EA005 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09EB001 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09EB003 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09EC002 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09ED001 | 1.21 | 1.34 | 1.96 | 2.89 | 2.36 | 3.06 | 4.89 | 3.48 | 5.24 |
| 09FA001 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 09FB001 | 1.83 | 1.67 | 2.34 | 3.96 | 3.27 | 4.15 | 6.32 | 4.43 | 6.77 |
| 09FB002 | 1.33 | 1.37 | 1.90 | 2.88 | 2.41 | 3.07 | 4.98 | 3.53 | 5.25 |
| 09FC001 | 1.83 | 1.67 | 2.34 | 3.96 | 3.27 | 4.15 | 6.32 | 4.43 | 6.77 |
| 09FD001 | 1.83 | 1.67 | 2.34 | 3.96 | 3.27 | 4.15 | 6.32 | 4.43 | 6.77 |
| 09FD002 | 1.86 | 1.66 | 2.26 | 3.81 | 3.12 | 4.04 | 6.12 | 4.30 | 6.43 |
| 10AA001 | 1.15 | 1.33 | 1.79 | 2.54 | 2.19 | 2.78 | 4.42 | 3.14 | 4.44 |
| 10AA002 | 1.15 | 1.33 | 1.79 | 2.54 | 2.19 | 2.78 | 4.42 | 3.14 | 4.44 |
| 10AA004 | 1.15 | 1.31 | 1.81 | 2.54 | 2.16 | 2.83 | 4.48 | 3.17 | 4.56 |
| 10AA005 | 1.15 | 1.31 | 1.81 | 2.54 | 2.16 | 2.83 | 4.48 | 3.17 | 4.56 |
| 10AB001 | 1.15 | 1.33 | 1.79 | 2.54 | 2.19 | 2.78 | 4.42 | 3.14 | 4.44 |
| 10AB003 | 1.15 | 1.33 | 1.79 | 2.54 | 2.19 | 2.78 | 4.42 | 3.14 | 4.44 |
| 10AD002 | 1.15 | 1.33 | 1.79 | 2.54 | 2.19 | 2.78 | 4.42 | 3.14 | 4.44 |
| 10BD001 | 1.17 | 1.42 | 1.86 | 2.63 | 2.28 | 2.83 | 4.54 | 3.21 | 4.51 |
| 10MA001 | 1.33 | 1.37 | 1.90 | 2.88 | 2.41 | 3.07 | 4.98 | 3.53 | 5.25 |
| 10MA002 | 1.34 | 1.43 | 2.09 | 3.15 | 2.58 | 3.32 | 5.46 | 3.80 | 5.75 |
| 10MB004 | 1.33 | 1.37 | 1.90 | 2.88 | 2.41 | 3.07 | 4.98 | 3.53 | 5.25 |
| 10MD001 | 1.83 | 1.67 | 2.34 | 3.96 | 3.27 | 4.15 | 6.32 | 4.43 | 6.77 |
| 10MD002 | 1.83 | 1.67 | 2.34 | 3.96 | 3.27 | 4.15 | 6.32 | 4.43 | 6.77 |

### Appendix II Modelled precipitation change (%) in Yukon

| | 2010-2030 | | | 2040-2060 | | | 2070-2090 | | |
|---|---|---|---|---|---|---|---|---|---|
| Location | A2 | B2 | GA | A2 | B2 | GA | A2 | B2 | GA |
| 08AA001 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 08AA003 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 08AA008 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 08AA009 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 08AB001 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 08AC001 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 08AC002 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 09AA007 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AA009 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AA011 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AA012 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AB001 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AB008 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AB009 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AC001 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AC004 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AC007 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AD001 | 4.00 | 3.00 | 5.00 | 8.00 | 5.00 | 8.00 | 14.00 | 8.00 | 9.00 |
| 09AD002 | 4.00 | 3.00 | 5.00 | 8.00 | 5.00 | 8.00 | 14.00 | 8.00 | 9.00 |
| 09AE001 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AF001 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AG001 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AG003 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AH001 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09AH003 | 3.00 | 3.00 | 4.00 | 7.00 | 5.00 | 5.00 | 11.00 | 7.00 | 5.00 |
| 09AH004 | 3.00 | 4.00 | 5.00 | 8.00 | 6.00 | 7.00 | 13.00 | 9.00 | 8.00 |
| 09BA001 | 4.00 | 3.00 | 5.00 | 8.00 | 5.00 | 8.00 | 14.00 | 8.00 | 9.00 |
| 09BB001 | 4.00 | 3.00 | 5.00 | 8.00 | 5.00 | 8.00 | 14.00 | 8.00 | 9.00 |
| 09BB002 | 3.39 | 4.17 | 5.49 | 7.76 | 6.27 | 6.91 | 12.90 | 8.61 | 7.57 |
| 09BC001 | 3.39 | 4.17 | 5.49 | 7.76 | 6.27 | 6.91 | 12.90 | 8.61 | 7.57 |
| 09BC002 | 3.64 | 3.49 | 5.30 | 7.50 | 5.39 | 8.11 | 13.98 | 7.81 | 9.27 |
| 09BC004 | 3.39 | 4.17 | 5.49 | 7.76 | 6.27 | 6.91 | 12.90 | 8.61 | 7.57 |
| 09CA002 | 2.52 | 2.50 | 4.32 | 7.27 | 4.66 | 4.98 | 11.33 | 6.53 | 5.41 |
| 09CA003 | 2.52 | 2.50 | 4.32 | 7.27 | 4.66 | 4.98 | 11.33 | 6.53 | 5.41 |
| 09CB001 | 2.52 | 2.50 | 4.32 | 7.27 | 4.66 | 4.98 | 11.33 | 6.53 | 5.41 |
| 09CD001 | 2.52 | 2.50 | 4.32 | 7.27 | 4.66 | 4.98 | 11.33 | 6.53 | 5.41 |
| 09DA001 | 0.56 | 1.35 | 6.30 | 7.03 | 1.70 | 5.41 | 11.28 | 6.71 | 10.29 |
| 09DC002 | 2.79 | 2.60 | 8.55 | 10.57 | 3.76 | 9.92 | 16.44 | 10.46 | 17.78 |
| 09DC003 | 2.79 | 2.60 | 8.55 | 10.57 | 3.76 | 9.92 | 16.44 | 10.46 | 17.78 |
| 09DD002 | 2.79 | 2.60 | 8.55 | 10.57 | 3.76 | 9.92 | 16.44 | 10.46 | 17.78 |

| Location | 2010-2030 | | | 2040-2060 | | | 2070-2090 | | |
|---|---|---|---|---|---|---|---|---|---|
| | A2 | B2 | GA | A2 | B2 | GA | A2 | B2 | GA |
| 09DD003 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09DD004 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09EA003 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09EA004 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09EA005 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09EB001 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09EB003 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09EC002 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09ED001 | 4.80 | 5.67 | 7.07 | 11.77 | 8.12 | 10.67 | 15.54 | 13.27 | 19.39 |
| 09FA001 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 09FB001 | 5.58 | 9.08 | 5.26 | 11.22 | 8.41 | 9.78 | 15.20 | 11.49 | 17.38 |
| 09FB002 | 2.79 | 2.60 | 8.55 | 10.57 | 3.76 | 9.92 | 16.44 | 10.46 | 17.78 |
| 09FC001 | 5.58 | 9.08 | 5.26 | 11.22 | 8.41 | 9.78 | 15.20 | 11.49 | 17.38 |
| 09FD001 | 5.58 | 9.08 | 5.26 | 11.22 | 8.41 | 9.78 | 15.20 | 11.49 | 17.38 |
| 09FD002 | 6.46 | 10.49 | 6.12 | 13.04 | 10.40 | 12.24 | 16.43 | 13.97 | 18.75 |
| 10AA001 | 3.65 | 2.58 | 3.90 | 4.80 | 4.61 | 8.68 | 11.68 | 5.65 | 7.61 |
| 10AA002 | 3.65 | 2.58 | 3.90 | 4.80 | 4.61 | 8.68 | 11.68 | 5.65 | 7.61 |
| 10AA004 | 3.64 | 3.49 | 5.30 | 7.50 | 5.39 | 8.11 | 13.98 | 7.81 | 9.27 |
| 10AA005 | 3.64 | 3.49 | 5.30 | 7.50 | 5.39 | 8.11 | 13.98 | 7.81 | 9.27 |
| 10AB001 | 3.65 | 2.58 | 3.90 | 4.80 | 4.61 | 8.68 | 11.68 | 5.65 | 7.61 |
| 10AB003 | 3.65 | 2.58 | 3.90 | 4.80 | 4.61 | 8.68 | 11.68 | 5.65 | 7.61 |
| 10AD002 | 3.65 | 2.58 | 3.90 | 4.80 | 4.61 | 8.68 | 11.68 | 5.65 | 7.61 |
| 10BD001 | 2.53 | 1.96 | 3.48 | 2.18 | 3.18 | 5.94 | 7.74 | 3.08 | 5.27 |
| 10MA001 | 2.79 | 2.60 | 8.55 | 10.57 | 3.76 | 9.92 | 16.44 | 10.46 | 17.78 |
| 10MA002 | 3.33 | 2.95 | 7.67 | 11.09 | 6.17 | 10.40 | 16.78 | 11.84 | 19.59 |
| 10MB004 | 2.79 | 2.60 | 8.55 | 10.57 | 3.76 | 9.92 | 16.44 | 10.46 | 17.78 |
| 10MD001 | 5.58 | 9.08 | 5.26 | 11.22 | 8.41 | 9.78 | 15.20 | 11.49 | 17.38 |
| 10MD002 | 5.58 | 9.08 | 5.26 | 11.22 | 8.41 | 9.78 | 15.20 | 11.49 | 17.38 |

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

| | |
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