

The Waste Management Guidelines for the Saskatchewan Upstream Oil and Gas Industry

**Revisiting the waste management
guidelines and what are the drivers
for the change**

History Behind the Guidelines

- **SEM & SERM 1994 meeting identified that there was a lack of a coordinated approach to deal with waste management practice in the upstream petroleum industry**
- **SEM & SERM requested SPIGEC to develop a comprehensive waste management guidelines for the upstream petroleum industry**

Who is SPIGEC?

- ❁ **Saskatchewan Petroleum Industry/Government Environmental Committee**
- ❁ **joint committee made up of environmental specialists from industry and government**
- ❁ **participating organizations include SEM, SERM, SAF, SMG, CAPP, CAODC, PSAC, SEPAC and individual petroleum companies**

How was it developed?

- ❁ **waste management specialists from SEM, SERM and the upstream industry developed the framework and technical information for the guideline**
- ❁ **consultant was hired to consolidate the information into a guideline format**
- ❁ **guideline was released on February 1996**

Mandate for the Guidelines

- **promote & improve the management of solids, liquids and slurry waste generated by the upstream industry**
- **clarify & present the current regulatory requirements for waste management within Saskatchewan**
- **encourage & enhance the performance of waste management on behalf of industry operators and service companies**

What does it cover?

- **waste definition and roles of regulators**
- **waste management principles**
- **waste characterization and classification**
- **waste storage**
- **waste transportation**
- **waste treatment and disposal**
- **record keeping**
- **appendices**

Waste definitions

- ❁ **Waste: unwanted substances or mixture of substances and includes refuse and garbage, as defined by *OGCAS.2(p)* and *EMPAS. 2(cc)***
- ❁ **Waste Dangerous Goods (WDG): dangerous goods no longer used for their original purpose or are intended for reuse, recovery, recycling, treatment or disposal as defined by *HS&WDGR* and *TDGR***
- ❁ **Hazardous Waste = Waste Dangerous Goods**

SEM regulated waste

- ***The Oil and Gas Conservation Act S.2(p)***
 - **physical waste as that term is ordinarily understood in the oil and gas industry**
- **waste materials contaminated with crude oil or produced water generated from exploration, drilling or production activities, except hazardous wastes, waste dangerous goods or wastes intended for disposal at a waste disposal ground**

SERM regulated waste

- ❁ **hazardous wastes or waste dangerous goods included in *The Hazardous Substances and Waste Dangerous Goods Regulations and The Transportation of Dangerous Goods Regulations***
- ❁ **waste intended for disposal at a waste disposal ground**

Waste Management Principles

• **Pollution Prevention and Waste Minimization**

- **eliminate the production of waste through process changes**

• **4R's:**

- **Reduce, Reuse, Recycle and Recover**

Waste Characterization

- **Waste characterization is based on physical, chemical and toxicological properties:**
 - **based on TDGR classification scheme**
 - **pH, vapour pressure, flammability, ignitability, combustibility, toxicity (LD_{50}/LC_{50}), radioactivity, state (solid, liquids, gas) and quantity**

Waste Storage

◉ SEM:

- **OGCA&R: berm, tanks separation distances, earthen pits**
- **guidelines: ecology pits, buried saltwater blowdown and dehydrator and scrubber water tanks**

◉ SERM:

- **Hazardous Substances and Waste Dangerous Goods Regulations for storage of refined substances and wastes.**

Waste Transportation

- **SERM - waste dangerous goods only:**
 - **issues consignor, carrier and consignee license and waste manifests - TDGR**
 - **enforces all WDG related matters - EMPA**
- **Transport Canada - dangerous goods (DG)**
 - **issues equivalent level safety permits**
 - **power to inspect consignor/consignee**
- **Saskatchewan Highways and Transportation (DG)**
 - **inspect and enforce carriers on the highways**

Treatment and Disposal Methods

- **provides detail listing of pretreatment, treatment and disposal based on waste types**
- **list covers methods, process and regulatory requirements**

Company Records

• **Company Waste Records are required to demonstrate due diligence:**

- **waste production records**
- **waste audit reports**
- **disposal well reports**
- **correspondence**
- **way bills and invoice**
- **waste manifest - must be kept for 2 years**

Appendices

- **comprehensive list detailing waste management requirements for production, drilling and seismic wastes based on:**
 - **waste type**
 - **waste classification - TDGR**
 - **transportation requirements - TDGR**
 - **testing requirements (characterization) - TDGR**
 - **preferred waste mgmt practice Provides**

Where can I get a copy?

- **Saskatchewan Energy and Mines,
Communication Branch, Publication
Orders, Phone Number (306) 787-2528**

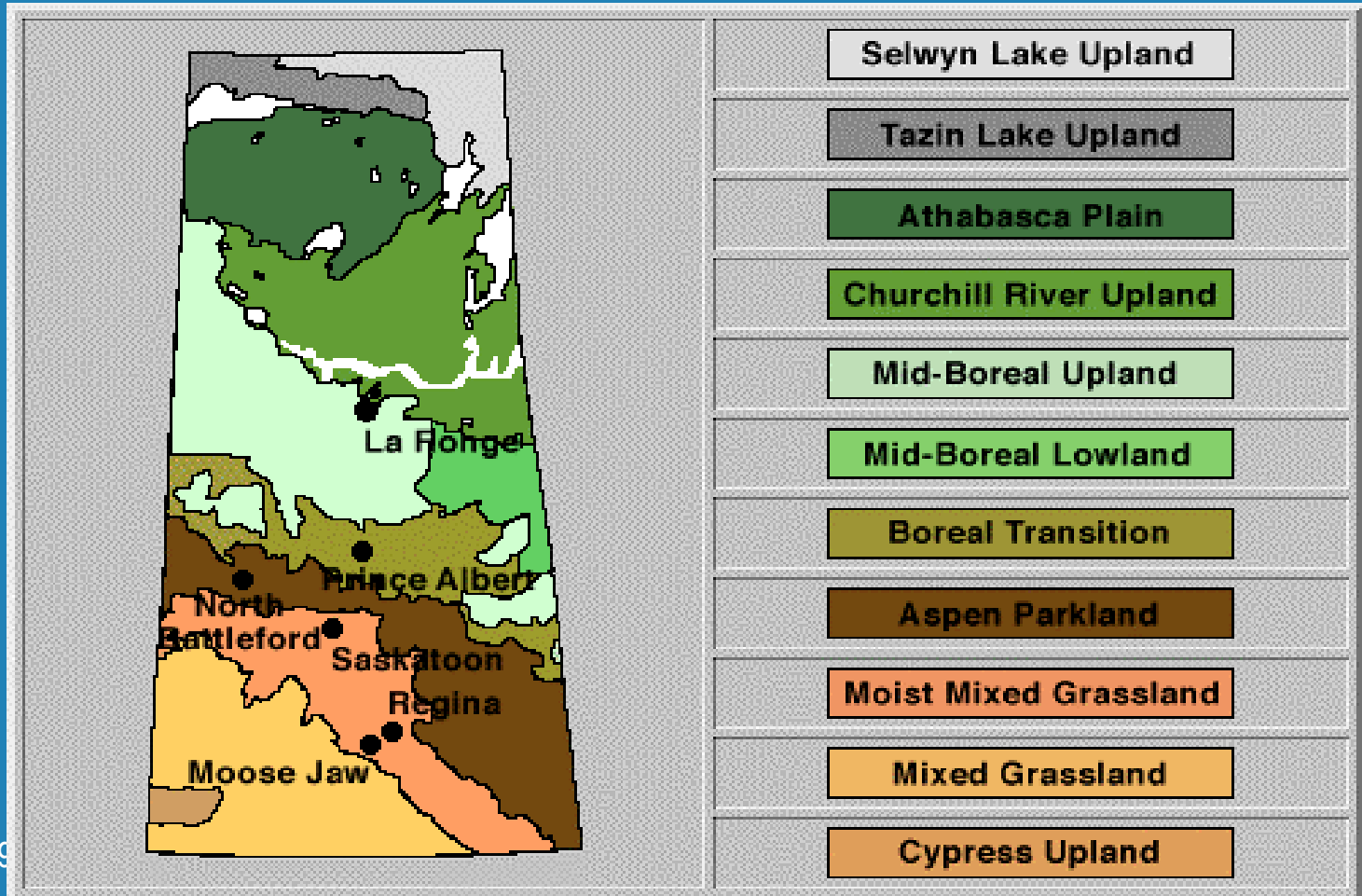
Past Shortfalls

- **a number of issues were outstanding when the guideline was published, including:**
 - **above and underground storage tanks specification for upstream products & wastes**
 - **drilling waste disposal**
 - **transportation of WDG for the in-field movement of wastes**

Present Shortfalls

- **since the publication of the guideline major changes have taken place, including:**
 - **Major Reorganization of SERM:**
 - **elimination of commercial branch**
 - **creation of environmental protection branch**
 - **creation of regions office based on ecoregions**
 - **TDGR and HS&WDGR program delivery from the regional offices - grassland, parkland, east boreal forest, west boreal forest and shield ecoregions**

Saskatchewan Ecoregions



Present Shortfalls continued...

- **Introduction of new guidelines from SEM, including:**
 - **GL 97-01 Guidelines for the Construction and Monitoring of Oily Byproducts Storage Structures (replaces ecology pits guidelines)**
 - **GL 97-02 Guidelines for the Application of Oily Byproducts to Municipal Roads in Saskatchewan -spreading & encapsulation**

Future Shortfalls

• SERM's initiatives:

- **SERM is in process of carrying out stakeholder consultation regarding policy changes with WDG movement in Saskatchewan, which will also resolve the problem with the in-field WDG transportation**
- **SERM has passed Used Oil Collection Regulations requiring collection depots to be setup by first sellers**

Future Shortfalls

• SEM's initiatives:

- **Drilling Waste Management Guidelines**
 - practical & simplified version of AEUB Guide G-50
- **Storage Requirements for the Upstream Petroleum Industry**
 - Saskatchewan's answer to AEUB Guide G-55
- **Applications for Waste Processing Facility**
- **Waste De-listing Procedures Waste Processing Facilities**

Present Shortfalls

● CCME Hazardous Waste Task Group

- **The Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussions and joint action on environmental issues.**
- **CCME is currently reviewing harmonization of definitions and criteria for hazardous waste/recyclable materials making them more consistent across the federal, provincial, and territorial jurisdictions. The CCME Hazardous Waste Task Group (HWTG) is directing this activity.**

HWTG proposes new waste definition

- **Waste** would be defined as any material that is disposed, intended to be disposed, or is required to be disposed, and does not include any material used for its original purpose.
- **Recyclable material** would be defined as any material that is recycled, intended to be recycled or is required to be recycled, and does not include any material used for its original purpose.
- For those wastes and recyclables that exhibit a hazardous characteristic the word “**hazardous**” would be added as a prefix.

HWTG - primary raw material

- ❁ **A primary raw material is a material obtained from natural sources for use in industrial, manufacturing or production processes (e.g., crude oil). It does not include materials which may arise or be displaced (e.g., produced water) from obtaining the primary raw material.**
- ❁ **A primary raw material is not regarded as being a waste/recyclable material. Primary raw material during its processing is not waste/recyclable material.**
- ❁ **Any residual materials or by-products arising from processing the raw material or its intermediates may be wastes/recyclable materials.**

HWTG proposes new criteria for TDGR

- **Class 9.2 Environmentally Hazardous Waste currently includes approximately 400 substances which were originally taken from a report from the International Joint Commission on the Great Lakes on the basis of their toxicity to aquatic life, potential to bioaccumulate and/or potential to persist in the environment for extended periods of time.**
- **A 100ppm (or 0.01% by mass) cut-off level is used as an across the board cut-off for all Class 9.2 wastes. This figure was deemed at the time as appropriate to protect human health and the environment for a broad range of substances.**

Problem with Class 9.2

• For example:

- **NaOH solution is currently classified as subsidiary Class 9.2 and regulated if concentration exceeds 100 ppm**
- **“In discussions with provincial, territorial, and federal authorities, a number of jurisdictions requested that the list of substances and wastes in Class 9.2 needed to be updated. It was determined that some materials currently on the list did not need to be controlled as environmentally hazardous wastes.”**

HWTG new criteria for TDGR continued...

• Class 9.3 Leachable Toxic Waste:

- The class 9.3 is used to ensure that materials do not exhibit hazard characteristics described in Classes 2 to 9.2 but if disposed or stored under uncontrolled conditions, can result in the discharge of toxic contaminants to the environment..**
- The leachate extraction procedures (LEP) currently referenced in Canadian regulations was modeled on a scenario where hazardous waste is disposed of in an uncontrolled manner in or on land, e.g., Landfills.**

Problem with Class 9.3

- ❁ **The LEP currently applies to all hazardous waste regardless of whether it is destined for recycling or disposal. It was felt that since the test is designed to simulate leaching action in a landfill, it is not appropriate for recyclable materials that are not landfilled.**
- ❁ **The CGSB (Canadian General Standards Board) standard was based on the U.S. EPA Extraction Procedure (EP) which has since been replaced by the Toxicity Characteristic Leachate Procedure (TCLP). The U.S. EPA list of contaminants and their corresponding concentration limits have also been modified several times since 1987.**


Problem with Class 9.3 continued...

- ➊ **Additionally, the CGSB contaminant concentrations were based on Canadian Drinking Water Quality Guidelines, which have also been modified since 1987.**
- ➋ **The use of the SIT (structural integrity test) as an effective method of assessing the behavior of solidified wastes in landfills has long been questioned. Critics contend that it does not adequately account for the effects of natural weathering forces.**

Solution to Class 9.2 and 9.3

- **combine class 9.2 and 9.3 -
Environmentally Hazardous Waste**
- **replace CGSB LEP with US EPA TCLP**
- **replace Class 9.2 100ppm cutoff criteria
with Canadian Drinking Water Quality
Criteria multiplied by 100 (dilution
attenuation factor)**

Contact

 **If you have any questions on this presentation please contact:**

Todd Han

Petroleum Development Branch

Saskatchewan Energy and Mines

(306) 787-2221