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Assessing Drilling Waste Disposal Areas

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Discussion Summary

1. Assessing Drilling Waste Disposal Areas – Compliance Options

2. Feedback and Guideline Review

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Assessing Drilling Waste Disposal Areas – Compliance Options

Reclamation Program Requirements

- **Phase 1 and/or Phase 2 environmental site assessments required at all sites**
  - Sites must meet Alberta Environment's remediation requirements
- **Phase I ESA must include drilling waste disposal areas**
  - Mix-bury-cover, landspreading, land treatment and alternative methods
  - On-site or remote

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Guiding Principles

- Soil quality must be consistent with “Equivalent Land Capability” and “no adverse effect”
- Reclamation Certificate can be obtained with sufficient Phase I information
- Phase II ESA required if Phase I ESA finds insufficient information or identifies specific concerns

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Compliance Options

- **Three options for drilling waste site compliance**
  1. Detailed and accurate disposal records, including *Guide 50 Drilling Waste Notification Form (1996 or equivalent)*
  2. Records review demonstrating low likelihood of site problems
  3. Phase II ESA – assessment, sampling, and analytical confirmation of soil:waste mix

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Soil Quality Objectives

- ***Guide 50 Equivalent Salinity Requirements***
  - Optional alternative to *AENV Salt Contamination Assessment and Remediation Guidelines*
- **AENV and CCME soil quality guidelines for metals and hydrocarbons**
  - *CCME Canadian Environmental Quality Guidelines*
  - *Alberta Soil and Water Quality Guidelines for Hydrocarbons at Upstream O&G Facilities*
  - *Soil Quality Guidelines for Barite*
  - *Alberta Tier I Criteria*

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Compliance Option 1

- Records available and comply with 1996 G-50
  - G-50 Notification form or equivalent must be submitted
- Mud additives are recorded and known
- Barite, zinc carbonate and chrome thinners require additional review
- Chloride limit for mix-bury-cover is 800mg/kg
- Not suitable for advanced systems such as K_2S0_4, Pot. Formate, Pot. Silicate, Sodium Silicate… unless specific EUB approval was issued

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Compliance Option 2

- **Used if G-50 records incomplete or unavailable**
- **Review of drilling records to confirm the following:**
  - Freshwater gel/chem, salt load consistent with post-disposal salinity targets
  - Records indicate no issues with salt formations, hydrocarbon contamination, DST fluids.
  - No metals issues

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Compliance Option 2

- **Fill-in calculation tables are provided for salinity, barite, zinc carbonate, and chrome thinners**
  - If calculated value exceeds target, a Phase II ESA is required.
- **Salinity and hydrocarbons from the formation are assessed by specific questions**

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Compliance Option 3

- **This compliance option is used when:**
  - No information or insufficient information is available to allow completion of either a Option 1 or Option 2 checklist,
  - The disposal fails to meet Guide 50 disposal requirements or those requirements as outlined in the Option 1 or Option 2 checklists

In either case a Phase 2 ESA environmental site assessment (ESA) must be completed

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Compliance Option 3

- **Sampling requirements for disposal area**
  - Number of samples based on well depth
  - Samples from different locations may not be combined
  - Sample must be representative of waste or soil-waste mix (e.g. not mixed with cap or base material)

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Guideline Review

What have we heard!?

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Drill Stem Test Returns

- **Definition**
  - Brines and hydrocarbons released to surface from the formation during a drill stem test
- **Guide 50 does not allow disposal of DST returns with drilling waste**
  - Typically disposed of off-site or in drilling flare pit
- **Before Guide 50, disposal with drilling waste was common**

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Drill Stem Test Returns

- **Chemistry and volume data is frequently available, disposal location often unknown**
  - Developing calculations to allow assessment of DST returns (pre-G50) in drilling waste
- **Phase II ESA for post-G50 DST returns should focus on drilling flare pit**

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Salt Calculation

- Lime and gypsum have limited solubility
- Current salt calculation addresses this by capping the number of bags included in the calculation
- CAPP is funding an assessment of lime and gyp muds that will help refine how these materials are addressed

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Barite

- Some assessors are finding that barium concentrations found during Phase II ESAs are consistently lower than predicted by the barite calculation
- CAPP is funding a study of barite-soil blends to evaluate whether revisions to the calculation are needed.

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Mix Ratio Assumptions

- **Calculations assume a mix ratio of 3:1 for post-1996 and 1:1 for pre-1996**
- **If actual mix ratio is available, will provide a more accurate estimate**
- **Evaluating ways to incorporate actual mix ratio into the calculations**
  - Need to strike a balance between need for simplicity and ability to use all available information

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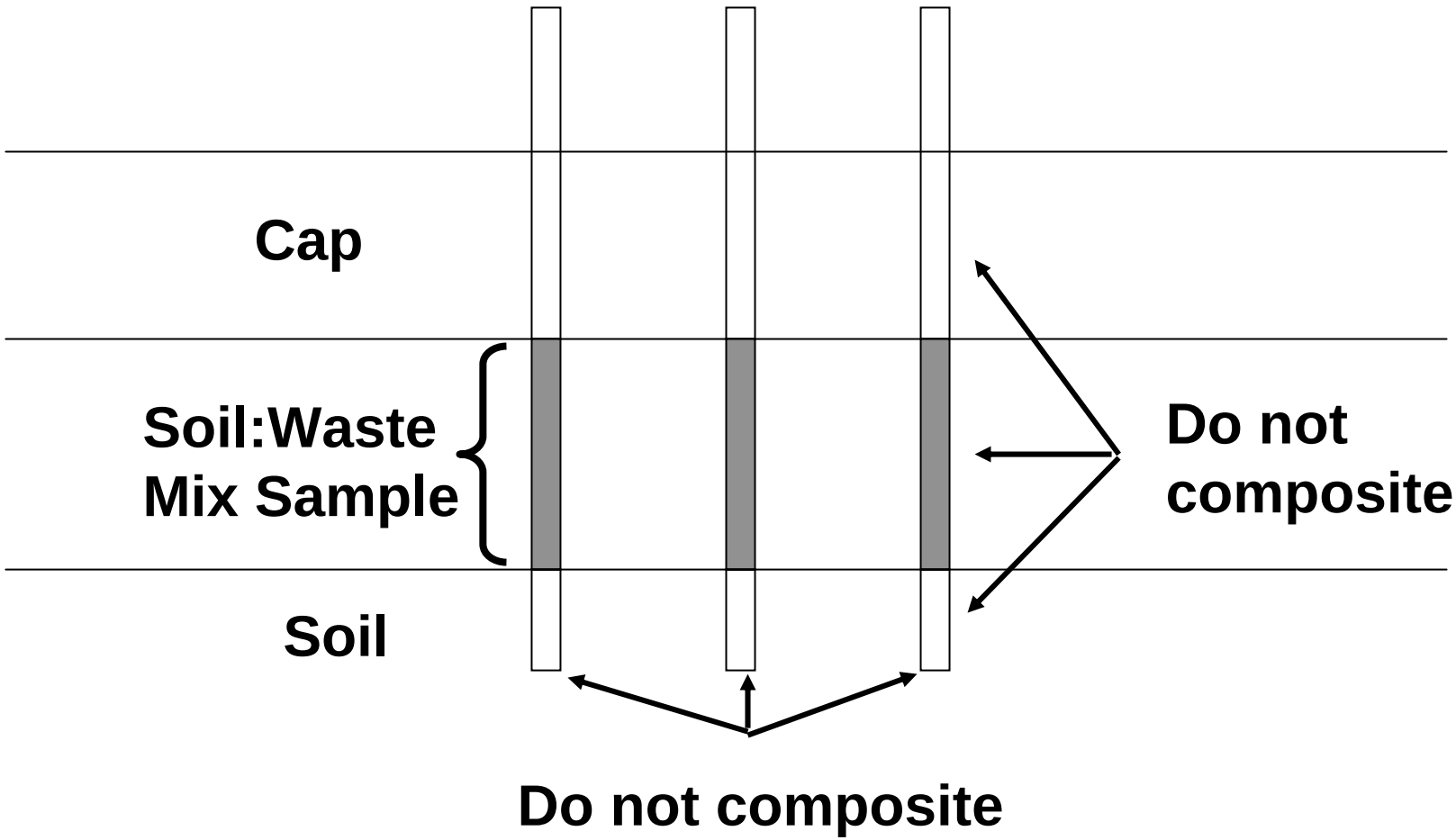
Drill Cuttings

- Drill cuttings are often disposed on-site during LWD programs
- If more than 50 m^3 of cuttings disposed on-site without G50 Notification Form, need a Phase II ESA
- Volume of cuttings disposed on-site is calculated by subtracting volume of cuttings (not total waste) disposed off-site from total volume of cuttings

Phase II ESA Sampling



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Drilling Fluid Additives

- Drilling fluid additives must be identified
- Many changes to products and trade names over time
- PSAC historic additive list available at:

  http://www.psac.ca/

- Requests to identify unknown additives can be made at same website

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Summary

- ***Assessing Drilling Waste Disposal Areas*** **provides a defined process for conducting Phase I and II ESAs**
- **Since its release in February 2005, users have identified some aspects that need more definition and clarification**
- **Work is proceeding on revisions to address these areas**

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Thank You