Technical Challenges of Large Scale Spill Response and Remediation Projects

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Presentation Overview

1. What makes a large spill?
2. Sampling requirements that can be overlooked.
3. Determining the appropriate remediation strategy.

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What makes a large spill?

Volume Released?

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What makes a large spill?

Product?

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What makes a large spill?

Ecosystem?

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What makes a large spill?

Unknowns and project development?

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What makes a large spill?

Stakeholders?

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What makes a large spill?

Experience and resources?

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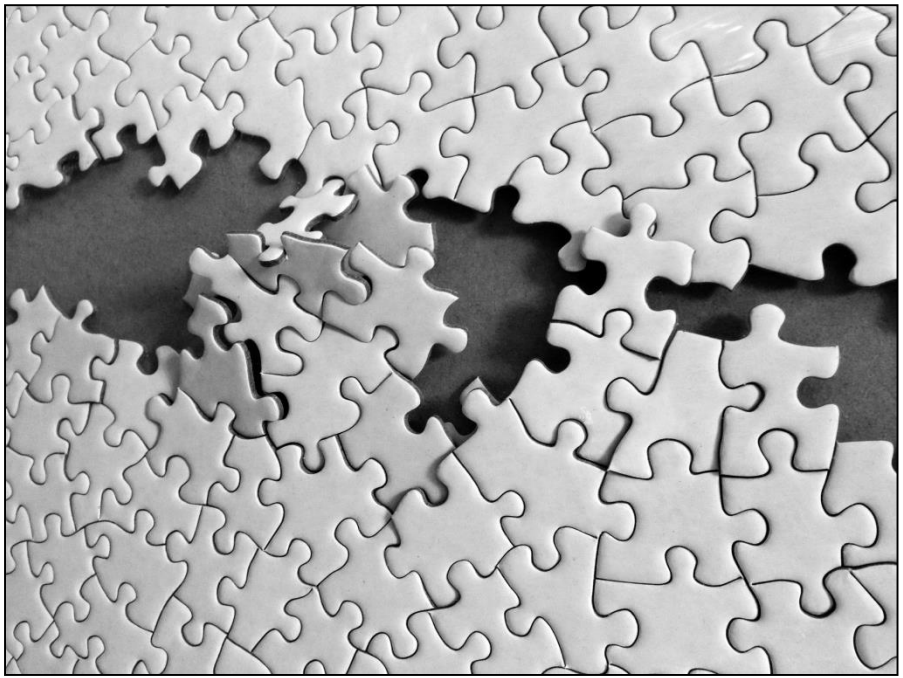
What makes a large spill?

COMPLEXITY



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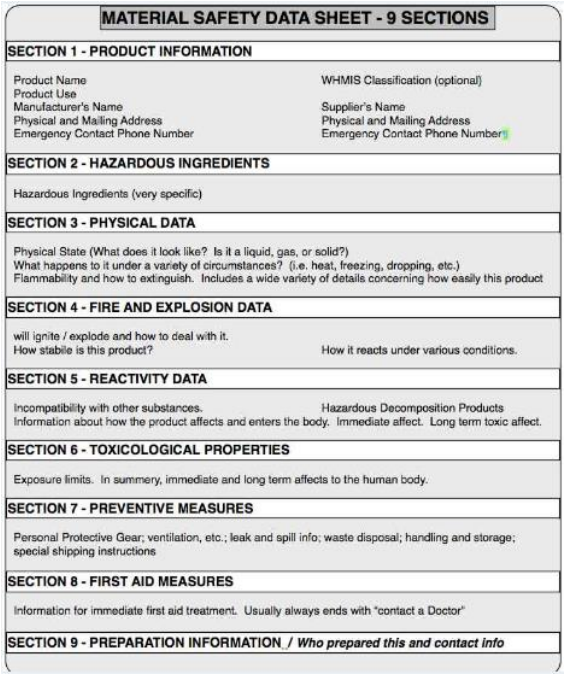
Product Characterization

- MSDS
- Laboratory Samples
- Discussion with producer and carrier



MATERIAL SAFETY DATA SHEET - 9 SECTIONS

SECTION 1 - PRODUCT INFORMATION

Product Name
Product Use
Manufacturer's Name
Physical and Mailing Address
Emergency Contact Phone Number

WHMIS Classification (optional)

Supplier's Name
Physical and Mailing Address
Emergency Contact Phone Number

SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Ingredients (very specific)

SECTION 3 - PHYSICAL DATA

Physical State (What does it look like? Is it a liquid, gas, or solid?)
What happens to it under a variety of circumstances? (i.e. heat, freezing, dropping, etc.)
Flammability and how to extinguish. Includes a wide variety of details concerning how easily this product

SECTION 4 - FIRE AND EXPLOSION DATA

will ignite / explode and how to deal with it.
How stabile is this product?

How it reacts under various conditions.

SECTION 5 - REACTIVITY DATA

Incompatibility with other substances.

Hazardous Decomposition Products

Information about how the product affects and enters the body. Immediate affect. Long term toxic affect.

SECTION 6 - TOXICOLOGICAL PROPERTIES

Exposure limits. In summery, immediate and long term affects to the human body.

SECTION 7 - PREVENTIVE MEASURES

Personal Protective Gear; ventilation, etc.; leak and spill info; waste disposal; handling and storage; special shipping instructions

SECTION 8 - FIRST AID MEASURES

Information for immediate first aid treatment. Usually always ends with "contact a Doctor"

SECTION 9 - PREPARATION INFORMATION / *Who prepared this and contact info*

Control or Background Sampling

- Timing
- Sample locations
- Analytical suite
- Reviewing the data

Sample ID	Sample Depth (mbgl)	Sample Date (dd-mm-yy)	Lab pH (6.0-8.5)[1]	Lab EC (dS/m)	SAR	Saturation %	Soluble Ions						Soil Horizon	Salinity (EC) Rating	Sodicity (SAR) Rating	Guideline
							Sodium (Na) mg/kg	Calcium (Ca) mg/kg	Magnesium (Mg) mg/kg	Potassium (K) mg/kg	Chloride (Cl) mg/kg	Sulphate (SO4) mg/kg				
Topsoil - SCAR Guideline Applied				<2	<4								Topsoil	Good	Good	1
Subsoil - SCAR Guideline Applied				<3	<4								Subsoil	Good	Good	1
BACKGROUND CONTROL																
16C01	0.0-0.1	26-Aug-16	6.0	0.17	0.2	65	2	14.6	3.6	3	7	8.5	Topsoil	Good	Good	1
16C01	0.1-0.5	26-Aug-16	5.4	0.10	0.2	60	1	8.6	1.8	1	5	4.8	Subsoil	Good	Good	1
16C02	0.0-0.1	26-Aug-16	3.8	0.16	0.1	59	2	12.9	2.3	6	7	13	Topsoil	Good	Good	1
16C02	0.1-0.5	26-Aug-16	4.4	0.13	0.2	47	2	5.9	1.4	4	6	8.1	Subsoil	Good	Good	1
CHARACTERIZATION																
16Characterization01	-	25-Aug-16	8.3	4.76	0.5	44	13	96.2	14	<4	719	69	Subsoil	Fair	Good	1
EXCAVATION NORTH WALL																
16N03	0.0-0.1	27-Aug-16	7.8	0.38	0.4	39	5	21.4	3.5	2	8	27.1	Topsoil	Good	Good	1
EXCAVATION EAST WALL																
16E01	0.1-0.2	26-Aug-16	5.4	0.08	0.3	42	2	5.9	1.4	1	4	3.7	Subsoil	Good	Good	1
EXCAVATION SOUTH WALL																
16S03	0.0-0.1	27-Aug-16	7.5	0.38	0.3	48	4	23.8	4.8	2	5	47.6	Topsoil	Good	Good	1
EXCAVATION WEST WALL																
16W01	0.0-0.1	27-Aug-16	7.6	0.32	0.4	45	5	19.1	3.9	2	10	24.6	Topsoil	Good	Good	1
EXCAVATION BASE																
16B03	0.1	27-Aug-16	7.5	0.51	0.3	47	5	33.7	6.3	3	6	79.6	Subsoil	Good	Good	1

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Sample Matrix

- Soil, water, or sediment?
- Contaminants of concern?

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Sample Matrix

- Organic or coarse textured soil

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Delineation Sampling

- Spatial coverage
- Vertical extent
- Soil stratigraphy
- Timing

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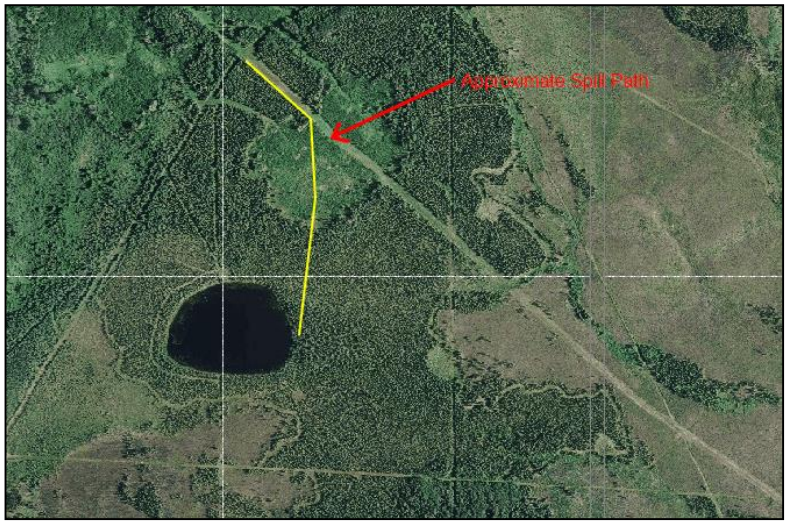
Project Representation

- Photos
- Figures



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Sample Locations

Contaminants of concern

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Sample Locations

Topography

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Sample Locations

Ecosystems

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Sample Locations

Watercourses

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Sample Locations

Wetlands

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Remediation

Transitions from response to remediation

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Remediation

Multiple Remediation Projects

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Remediation

Project goals and targets

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Take Home Message

- Don’t get lost in the initial chaos
- Build the data set early and use it to determine the remediation strategy
- Correct technical resources for the project
- Small industry work together

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Thanks!

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