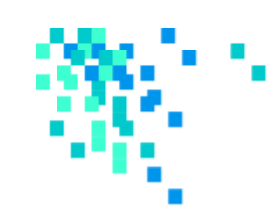


Alberta Guideline Tool Phase 2 Update



Project Funders and Partners

Project Funders

- AUPRF
- InnoTech Alberta

Technical Steering Committee

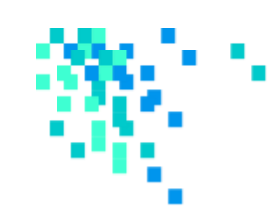
- InnoTech Alberta
- PTAC members
- The Alberta Energy Regulator
- Alberta Environment and Protected Areas



Project Description & Objectives

Web-based tool with a dual function:

1. Assist environmental professionals in selecting applicable Tier 1 guidelines.
2. Facilitate development of Tier 2 in a way that is transparent and streamlined.

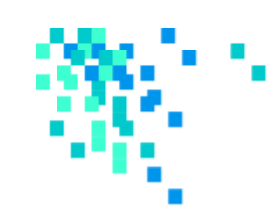


Tier 1 Module Workflow

Determines which regulatory documents the user should review to supplement the Tier 1 document.

Printable output provides:

- List of questions and the responses provided
- Relevant regulatory documents
- Hyperlinks to the location of each document



Tier 1 and 2 Guideline Tool Landing Page



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Tier 1 Guidelines

Tier 2 Guidelines

User Manual

FAQ

SETTINGS

My Account

Logout

Contact Us

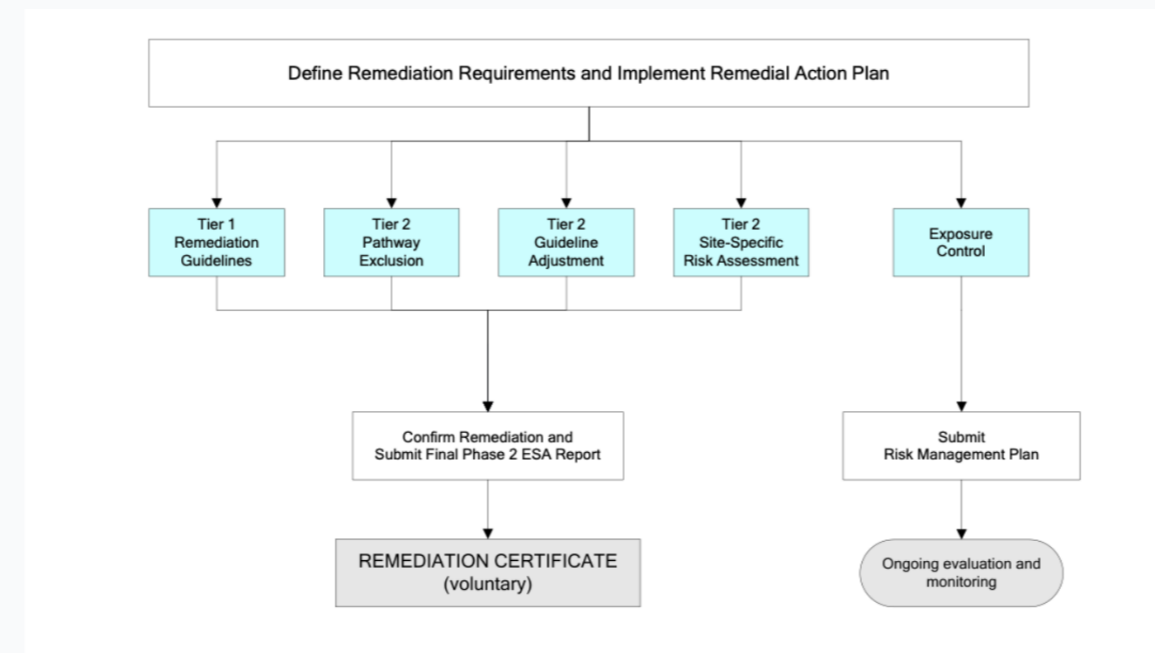
Tier 1 & 2 Guideline Calculator

Tier 1 Guidelines Module

Module 1 will highlight generic numeric guidelines that potentially apply at your site.

You will be asked a series of questions that trigger the applicability of various guideline documents.

The output will provide links to the relevant documents so you can confirm if they are, or are not, relevant based on your site knowledge.



Remediation Process Flow Chart from the Contaminated Sites Policy Framework

(Alberta Environment and Sustainable Resource Development (ESRD). 2014. Contaminated Sites Policy Framework. Land and Forestry Policy Branch, Policy Division, 25pp.) [\(Source\)](#)

Get Started



Tier 1 – Workflow

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Tier 1 & 2 Guideline Calculator

STEP 1 1/4

Tier 1 Guidelines
Tier 2 Guidelines
User Manual
FAQ

SETTINGS
My Account
Logout
Contact Us

General Site Information

Address/Legal Location/Site Name:

Land Use Classification:

Soil Type - Grain Size:

Next

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Tier 1 Guidelines
Tier 2 Guidelines
User Manual
FAQ

SETTINGS
My Account
Logout
Contact Us

Tier 1 & 2 Guideline Calculator

STEP 2 2/4

Site Details

Is this a wellsite? Yes No

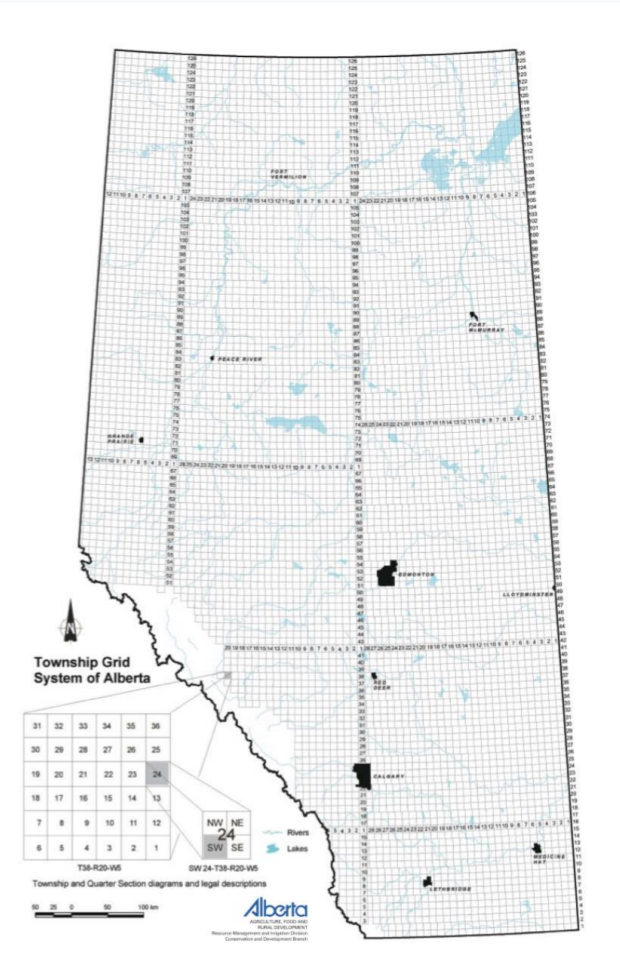
Does the site cross Provincial boundaries (e.g., pipelines or powerlines)? Yes No

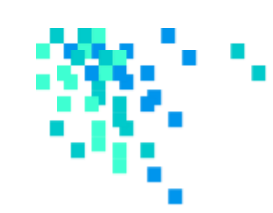
Is peat present at the site? Yes No

Is there a more sensitive land use within 30m? Yes No


Back

Next





Tier 1 – Output



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- [Tier 1 Guidelines](#)
- [Tier 2 Guidelines](#)
- [User Manual](#)
- [FAQ](#)

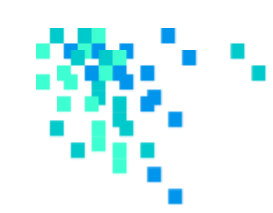
SETTINGS

- [My Account](#)
- [Logout](#)
- [Contact Us](#)

Tier One Guidelines Output

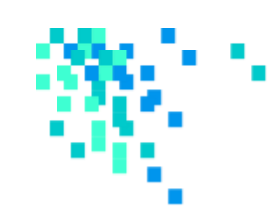
SITE INFORMATION	
Address/Legal Location/Site Name:	Wellsite 01-01
Land Use Classification:	Natural Areas
Soil Type - Grain Size:	Fine Grain

ALL QUESTIONS AND RESPONSES	
References, hyperlinks, and notes as applicable	
Alberta Environment and Protected Areas, 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines . Land Policy Branch, Policy and Planning Division. Edmonton, Alberta. Effective January 1, 2023.	
Alberta Environment and Sustainable Resource Development (ESRD). 2014. Contaminated Sites Policy Framework . Land and Forestry Policy Branch, Policy Division. Edmonton, Alberta.	
Alberta Environment and Parks (AEP), 2016. Alberta Environmental Site Assessment Standard .	
NOTE: Where specific portions of any document are referenced, the sole purpose is to bring additional focus to these sections. It is assumed and implied that the user has reviewed the entire document being referenced and understands the requirements the document(s) imposes.	
QUESTION: Is this a wellsite?	
Response	References, hyperlinks, and notes as applicable
Yes	Yes Alberta Environment and Protected Areas, 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines . Land Policy Branch, Policy and Planning Division. Edmonton, Alberta. Effective January 1, 2023.
	NOTE: Additional focus on Sections 2.1.4 and 5.2.3.
	Alberta Energy Regulator, 2014. Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification . Effective March 29, 2014.
	NOTE: Section A.6. discusses compliance options available based on conditions surrounding onsite drilling waste disposal.
QUESTION: Does the site cross Provincial boundaries?	
Response	References, hyperlinks, and notes as applicable
No	See general references and notes in table titled "ALL QUESTIONS AND RESPONSES".
QUESTION: Is peat present at the site?	



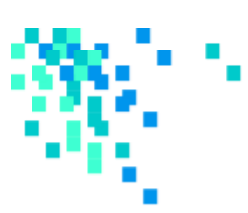
Tier 1 – Linked Documents

The screenshot shows the Alberta Government website interface. At the top left is the Alberta Government logo. To its right is a search bar labeled 'Search all Resources'. Below the logo and search bar is a navigation bar with 'Resources' and 'Interact' links. Underneath is a secondary navigation bar with 'Open Data', 'Publications', and 'Documentation' links. A breadcrumb trail reads 'HOME / OPEN GOVERNMENT / PUBLICATIONS /'. To the right of the breadcrumb are social media icons for Facebook, Twitter, LinkedIn, Email, and RSS. The main content area is titled 'PUBLICATIONS' and features the document title 'Alberta Tier 1 soil and groundwater remediation guidelines'. Below the title are two tabs: 'Summary' (selected) and 'Detailed Information'. The 'Summary' tab contains a 'DESCRIPTION' section with text about the document's focus on Tier 1 soil and groundwater remediation guidelines, the process used to develop them, and the manner in which they should be applied. It also mentions Alberta's framework for the management of contaminated sites and three management options: Tier 1, Tier 2, and Exposure Control. Below the description is an 'UPDATED' section with the date 'August 29, 2022'. Underneath is a 'TAGS' section with three tags: 'Environment', 'Groundwater', and 'Remediation'. At the bottom of the summary is a 'RESOURCES' section with a link to the document: 'Alberta Tier 1 soil and groundwater remediation guidelines [January 2023]'. Below the link is the ISBN number 'ISBN 9781460155011'. At the very bottom of the summary are two buttons: 'MORE INFORMATION' and 'DOWNLOAD'. Below the buttons is the text 'DOWNLOADS: 15770'. In the bottom right corner of the page, there is a blue circular icon with a white upward-pointing arrow.




Tier 2 Guideline Modification

- Ability to switch out default values for site-specific information
- Preview recalculated site-specific guidelines
- Output applied site-specific parameters, and the resulting calculated guidelines



Add Site-Specific Values



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- Tier 1 Guidelines
- Tier 2 Guidelines
- User Manual
- FAQ

SETTINGS

- My Account
- Logout
- Contact Us

1 General Input Parameters **2 AB Tier 2 Adjustable Parameters** 3 Results

Alberta Tier 2 Adjustable Parameters

Parameter	Symbol	Unit	Select Guideline	Default	Adjusted
Source Length - Parallel to GW Flow	X	m	Default v	10	
Source Width - Perpendicular to GW Flow	Y	m	Default v	10	
Distance From Source to Foundation - Surface Soil	L _T	cm	Default v	10	
Distance From Source to Foundation - Subsoil	L _T	cm	Default v	30	
Thickness of Contamination	Z	m	Default v	3	
Depth to Groundwater	d	m	Default v	3	
Distance to Surface Water - Parallel to GW Flow	d	x	Site Specific v	10	125
Hydraulic Gradient	i	m/m	Default v	0.028	
Saturated Hydraulic Conductivity	K	m/yr	Default v	32	
Fraction of Organic Carbon	f _{oc}	mass/mass	Default v	0.005	
Soil Bulk Density	ρ _B	gr/cm ³	Default v	1.4	
Soil Moisture-Filled Porosity	θ _w	cm ³ /cm ³	Default v	0.168	
Soil Vapour-Filled Porosity	θ _a	cm ³ /cm ³	Default v	0.302	
Depth from Surface to Bottom of Contamination	Z _T	m	Default v	3	

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Output Calculated Guidelines

Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s	F3s	F4s
Direct Soil Contact	mg/kg	360	690	1900	510	14000	6800	15000	21000
Vapour Inhalation (Slab-on-Grade)	mg/kg	0.34	1200	1900	140	630	3300	-	-
Vapour Inhalation (Basement)	mg/kg	0.36	1300	2100	150	710	3600	-	-
Protection of Domestic Use Aquifer	mg/kg	0.046	0.52	0.073	0.99	1100	1500	NGR	NGR
Offsite Migration	mg/kg	-	-	-	-	-	-	-	-

Ecological									
Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s	F3s	F4s
Direct Soil Contact	mg/kg	120	220	240	130	420	300	2600	11000
Nutrient/Energy Cycling Check	mg/kg	-	-	-	-	-	-	-	-
Livestock Soil and Food Ingestion	mg/kg	44	2500	1600	6600	27000	25000	30000	21000
Wildlife Soil and Food Ingestion	mg/kg	18	980	640	2600	11000	9800	16000	8400
Protection of Freshwater Aquatic Life	mg/kg	NGR	NGR	NGR	NGR	30000	30000	-	-
Protection of Livestock Water	mg/kg	0.19	26	36	160	6700	16000	30000	30000
Protection of Wildlife Water	mg/kg	NGR	NGR	NGR	NGR	30000	30000	NGR	NGR
Protection of Irrigation Water	mg/kg	-	-	-	-	-	-	-	-
Off-Site Migration	mg/kg	-	-	-	-	-	-	-	-

Other									
Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s	F3s	F4s
Management Limit	mg/kg	-	-	-	-	800	1000	3500	10000

Overall									
Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s	F3s	F4s
Overall	mg/kg	0.046	0.52	0.073	0.99	420	300	2600	8400

Groundwater Guidelines for Agricultural Land Use and Fine Grain Soil

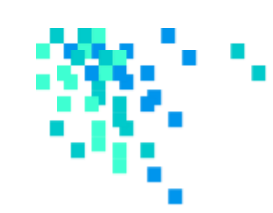
Human							
Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s
Inhalation	mg/L	0.57	NGR	NGR	44	19	NGR
Protection of Domestic Use Aquifer	mg/L	0.005	0.024	0.0016	0.02	2.2	1.1

Ecological							
Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s
Direct Soil Contact	mg/L	100	82	42	21	6.5	1.8
Protection of Freshwater Aquatic Life	mg/L	NGR	NGR	NGR	NGR	NGR	NGR
Protection of Irrigation Water	mg/L	-	-	-	-	-	-
Protection of Livestock Water	mg/L	0.088	4.9	3.2	1.3	53	NGR
Protection of Wildlife Water	mg/L	NGR	NGR	NGR	NGR	NGR	NGR

Overall							
Pathway	Unit	Benzene	Toluene	Ethylbenzene	Xylenes	F1s	F2s
Overall	mg/L	0.005	0.024	0.0016	0.02	2.2	1.1

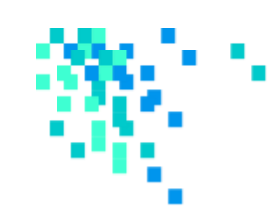
Back

Print

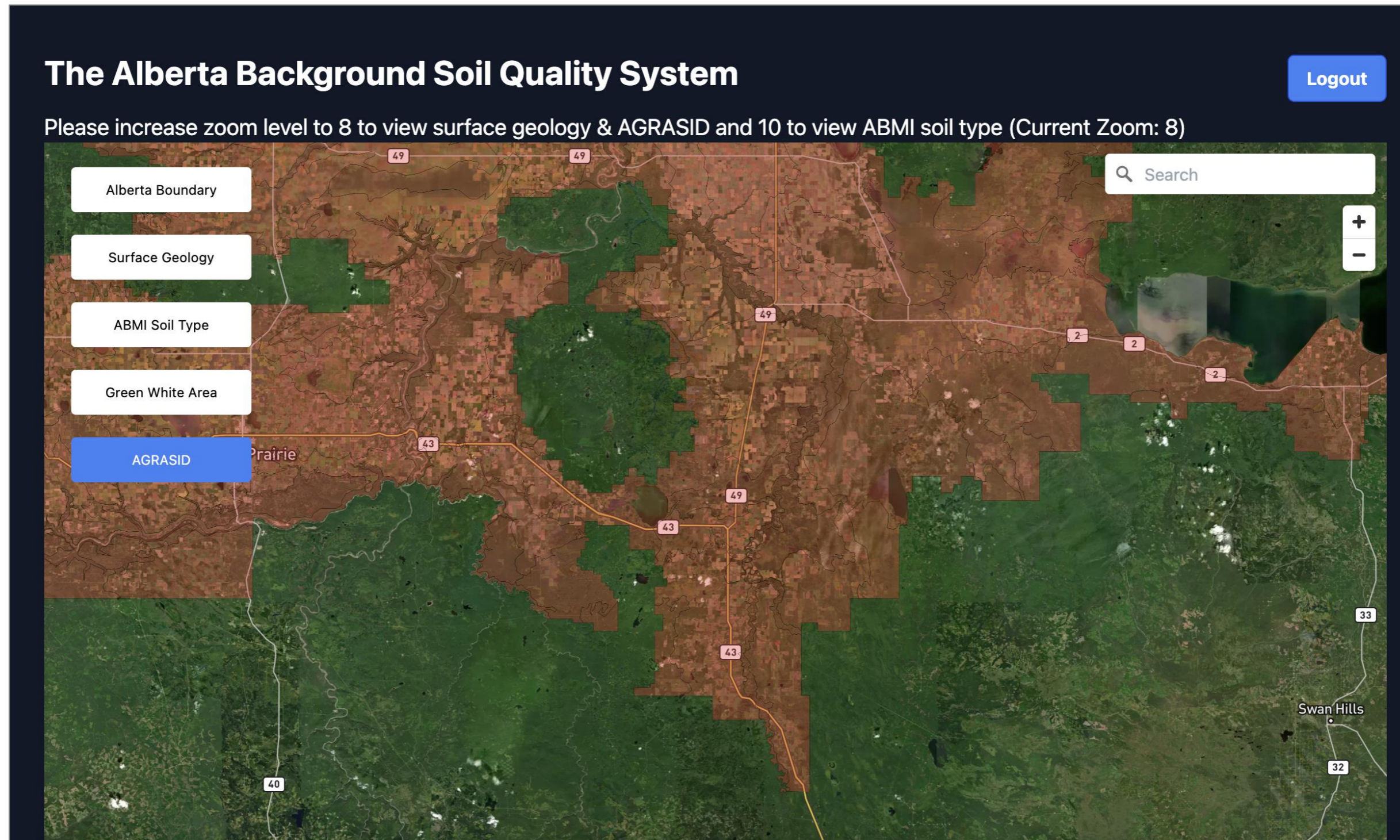


June 2023 – March 2024 Scope

- Determine pathways eligible for exclusion.
- Add geospatial elements.
- Printable output.



Geospatial – Building on the Success of ABSQS





Output – Mix of Tier 1 and Forensic Report Card

Response	References, hyperlinks, and notes as applicable
No	See general references and notes in table titled "ALL QUESTIONS AND RESPONSES".
QUESTION: CONTAMINANTS OF CONCERN WHERE ADDITIONAL REGULATORY DOCUMENTS APPLY – pH.	
Response	References, hyperlinks, and notes as applicable
Yes	Howat, D.R., 2000. Acceptable Salinity, Sodicity and pH Values for Boreal Forest Reclamation . Alberta Environment, Environmental Sciences Division, Edmonton, Alberta.
QUESTION: CONTAMINANTS OF CONCERN WHERE ADDITIONAL REGULATORY DOCUMENTS APPLY – SALINITY	
Response	References, hyperlinks, and notes as applicable
Yes	Alberta Environment, 2001. Salt Contamination Assessment & Remediation Guidelines . Environmental Sciences Division, Edmonton, Alberta Equilibrium Environmental Inc., 2020. Subsoil Salinity Tool Version 3.0 User Manual .
QUESTION: CONTAMINANTS OF CONCERN WHERE ADDITIONAL REGULATORY DOCUMENTS APPLY – METALS	
Response	References, hyperlinks, and notes as applicable
Yes	Alberta Environment, 2009. Soil Remediation Guidelines for Barite: Environmental Health and Human Health . Climate Change, Air, and Land Policy Branch, Edmonton, Alberta. Alberta Environment, 2009. Technical Appendices for Barite Soil Remediation Guidelines . Climate Change, Air, and Land Policy Branch, Edmonton, Alberta. Alberta Environment and Parks, 2015. Soil Remediation Guidelines for Boron: Environmental Health and Human Health . Land Policy Branch, Policy and Planning Division, Edmonton, Alberta. Alberta Environment and Parks, 2015. Soil Remediation Guidelines for Boron: Supplemental Data Appendices . Land Policy Branch, Policy and Planning Division, Edmonton, Alberta.
QUESTION: CONTAMINANTS OF CONCERN WHERE ADDITIONAL REGULATORY DOCUMENTS APPLY – AMINES OR GLYCOLS	
Response	References, hyperlinks, and notes as applicable
Yes	Alberta Environment, 2010. Soil and Groundwater Remediation Guidelines for Monoethanolamine and Diethanolamine . Edmonton, Alberta. Alberta Environment, 2010. Soil and Groundwater Remediation Guidelines for Diethylene Glycol and Triethylene Glycol . Edmonton, Alberta.

Print Output

SAMPLE REPORT CARD PREVIEW

17-BR 14

Diagnostic Ratios (Non-detect)

PAH Ratio	Result	Notes
Fluoranthene/Pyrene	0.85	Indeterminate
Phenanthrene/Anthracene	105.44	Pyrogenic
Benz[a]anthracene/Chrysene	0.23	Petrogenic
Indeno[1,2,3-cd]pyrene/Benzo[ghi]perylene	0.57	Petrogenic

Ratios indicate that the sample is Indeterminate in origin

Sample Summary	
Sample Date	-
Sample Location	2017-BR 14
Dataset	Publication Data
Station Number	-
Parent ND%	0.00
Alkylated ND%	0.00

Parent PAH Similarities		Alkylated PAH Similarities	
West Texas Intermediate	98.47%	Grand Banks Light Crude	79.60%
31.7% Weathered		Firebag Background	77.25%
Grand Banks Light Crude	97.34%	Alberta Sweet Mixed Blend 0% Weathered	96.65%
Alberta Sweet Mixed Blend 0% Weathered	96.65%	Midale Light Crude	72.09%

PARENT PAH CHARTS

Contribution: 2017-BR 14

Contribution: West Texas Intermediate 31.7% Weathered

Contribution: Grand Banks Light Crude

Contribution: Alberta Sweet Mixed Blend 0% Weathered

No Background Sample

No Source Sample

Questions?

Want access to the current Guideline Tool
(or the Alberta Background Soil Quality System)?

email: hello@statvis.com

LinkedIn: ca.linkedin.com/company/Statvis