



Register of Tailings Storage Facilities and Dams

Excel File User Guide

Version 1.0

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Revision History

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1.0 Background

Under section 10.4.3 of the Health Safety and Reclamation Code for Mines in BC (Code):

- (1) *The manager of a mine with one or more tailings storage facilities shall maintain a Register of Tailings Storage Facilities and Dams*
- (2) *The register shall be reviewed and updated at least annually*

To assist mines in complying with this Code requirement the BC Ministry of Energy, Mines and Petroleum Resources (EMPR) has developed an Excel template titled *Register of Tailings Storage Facilities and Dams (Register)*. The information provided in the *Register* will be stored in a provincial database of tailings storage facilities (TSF) and dams at BC mine sites.

1.1 Purpose of Register of Tailings Storage Facilities and Dams

The purpose of the *Register* is to collect accurate information regarding tailings storage facilities and dams located on mine sites in British Columbia.

1.2 Who should fill out the Register?

EMPR expects the *Register* to be completed in full by each mine that **produces tailings** and/or **has any type of water management pond or dam**. This includes sites that store water or tailings underground, including as backfill.

1.3 When is the Register due?

Annual submission of the completed *Register* to EMPR by March 31 is required under part 10.4.3 and 10.4.4 of the Code.

1.4 How do I submit the Register?

The *Register* should be submitted to EMPR through the “MineSpace” document upload portal, located at <https://minespace.gov.bc.ca/>. To use this service, the mine will need to obtain a BCeID (for more information visit <https://www.bceid.ca/>). Once obtained, the BCeID can be used to log in to the “MineSpace” document portal. The *Register* can then be uploaded under the “Register of Tailings Storage Facilities and Dams” section (see Figure 1).

If a mine is unable to obtain a BCeID, the *Register* should be submitted to the EMPR Permitting and Reclamation group mailbox at PERMRECL@gov.bc.ca.

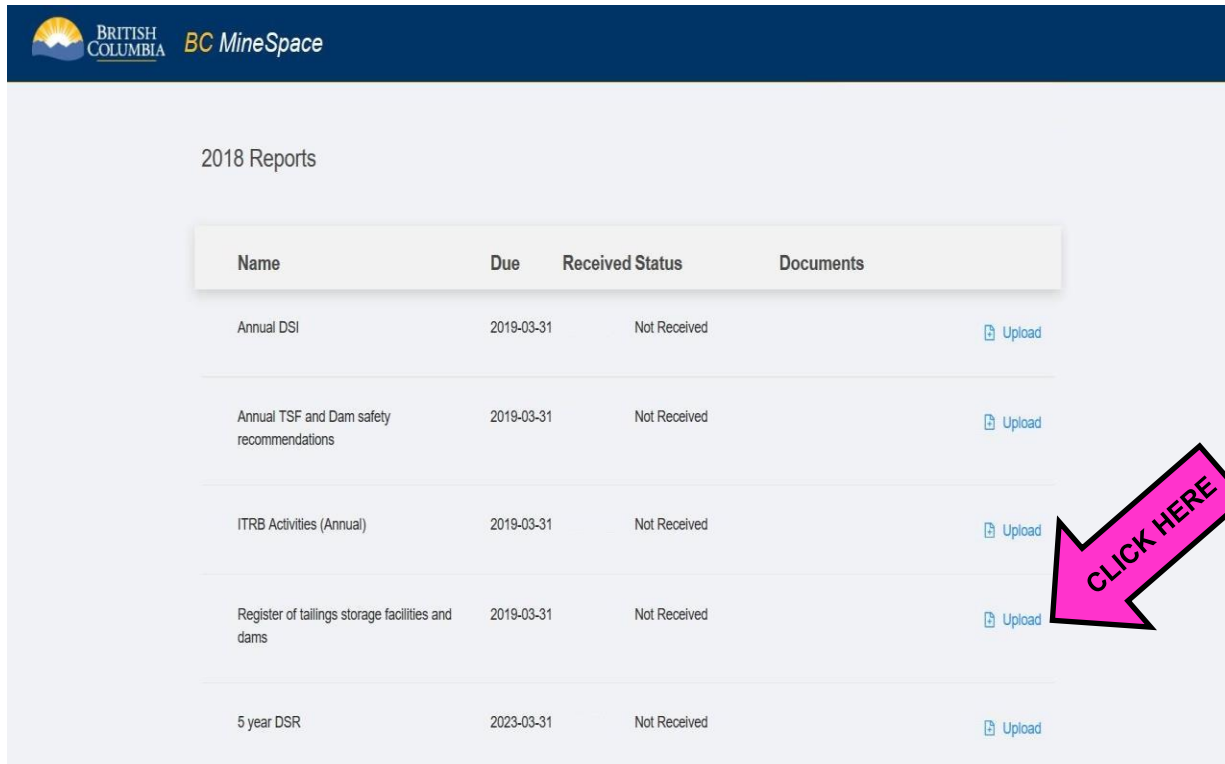


Figure 1: Upload page on MineSpace.

2.0 Register (Excel Template) User Guide

2.1 Basic Information

The Excel template entitled “*Register of Tailings Storage Facilities and Dams*” allows the user to input the requested information about tailings storage facilities and water management infrastructure on their mine site.

The Excel template file contains automation – **as a user enters information, additional relevant information requirements are generated**. In this way, only information requirements which are relevant to each mine’s infrastructure will be visible. **All visible information requirements should be filled out.**

2.2 Opening the *Register* Excel File

When opening the *Register* excel file, there may be a yellow status bar across the top warning the user that “Macros have been disabled” and prompting the user to “Enable Content” (see Figure 1). For this document to function properly **macros must be enabled**; this can be done by clicking the ‘Enable Content’ button in the warning label (see Figure 2).

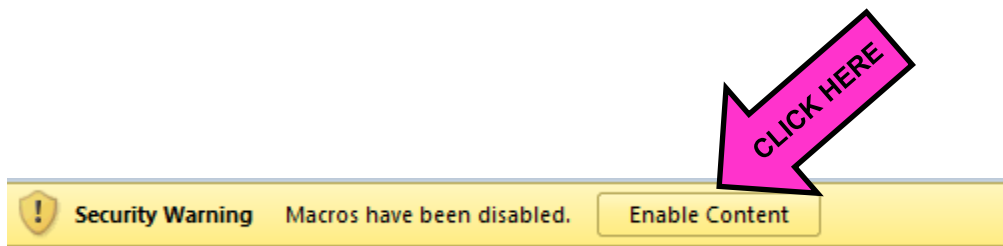


Figure 2: Status bar prompting the user to Enable Content

Alternatively, macros can be enabled by going into the ‘File’ menu, selecting the ‘Info’ section, and selecting the ‘Enable Content’ button.

2.3 Using the Register Excel File

When the *Register* excel file is opened for the first time, the “**Mine Information**” tab will be displayed, and the “**Site Water Management**” tab is accessible to the right (see Figure 3). The sections below guide the user through the sequence of inputting information into the *Register*.

i. Mine Information Tab

The “**Mine Information**” tab captures overall information about the mine site. The user should first enter all information listed in the “**Mine Information**” tab. Entering information is described below:

As information is entered into the “Mine Information” tab, corresponding new tabs and tables will be automatically generated for the following circumstances:

- If a mine has underground workings (“Yes” input in cell G17), the “**Underground Water Management**” tab will become visible.
- If a mine stores tailings (any non-zero number is input into the “Tailings Inventory” section, cells G18 – G22).
 - Two types of tabs may be generated – “TSF” tabs, corresponding to the number and type of surface tailings storage TSFs and “**Underground Tailings**” tabs, for underground tailings storage.
- When specifying the number of Independent Tailings Review Board Members (Cell G26), a corresponding number of fields for the name and company affiliation of each board member will appear.
- If a mine reports that they have variances, granted by the Chief Inspector, fields will appear to input the date and description of the variance.

This is illustrated for an example scenario in Figure 4. **All visible tabs and fields should be filled out.** If generated in error, extra tabs will be removed by correcting the associated section of the “**Mine Information**” tab.

*****Do not manually delete tabs by clicking on the tab and selecting delete (this will cause the program to stop functioning correctly).*****

Register of Tailings Storage Facilities and Dams
Mine Information

Date of Record (YYYY-MM-DD)

HSRC Part

Mine Information	Name of Mine:	
	Mines Act Permit number:	
	Mine number (as indicated on Mines Act Permit):	
	Owner/company:	
	Mine Manager name:	
	Mine Manager email address:	
	Mine Manager phone number:	
	Region:	
	Nearest community to site:	
	Mine status (self assessment from mine):	
Tailings Inventory	Ore(s) mined, select all that apply:	
	Does the mine have underground workings?	
	Number of conventional tailings facilities (impounded by dams):	
	Number of dry stack or filtered tailings facilities:	
	Number of in-pit tailings facilities:	
Tailings Management	Number of in-lake tailings facilities:	
	Are tailings placed underground?	
	10.4.2 (1)(a) Has a tailings management system has been developed for the mine?	
Independent Tailings Review	10.4.2 (1)(a) Date of last tailings management system audit: (YYYY-MM-DD)	
	What guidance or standard was used to develop the tailings management system?	
	10.4.2 (1) (c) Has an Independent Tailings Review Board (ITRB) been established?	
HSRC Variations	10.4.2 (3) Have the ITRB terms of reference, including qualifications of the board members, been approved by the Chief Inspector?	
	10.4.2 (2) Number of members on the ITRB:	
	1.2.1, 10.6.11 Has the mine been granted a variance by the Chief Inspector related to tailings storage facilities or dams?	

TABS

Mine Information Site Water Management

Figure 3: Register excel file with “Mine Information” and “Site Water Management” tabs shown at bottom

Tailings Inventory	Does the mine have underground workings?	
	Number of conventional tailings facilities (impounded by dams):	1
	Number of dry stack or filtered tailings facilities:	1
	Number of in-pit tailings facilities:	
	Number of in-lake tailings facilities:	
Tailings Management	Are tailings placed underground?	
	10.4.2 (1)(a) Has a tailings management system has been developed for the mine?	
	10.4.2 (1)(a) Date of last tailings management system audit: (YYYY-MM-DD)	
Independent Tailings Review	What guidance or standard was used to develop the tailings management system?	
	10.4.2 (1) (c) Has an Independent Tailings Review Board (ITRB) been established?	
	10.4.2 (3) Have the ITRB terms of reference, including qualifications of the board members, been approved by the Chief Inspector?	
HSRC Variations	10.4.2 (2) Number of members on the ITRB:	
	1.2.1, 10.6.11 Has the mine been granted a variance by the Chief Inspector related to tailings storage facilities or dams?	

TSF TABS GENERATED

Mine Information Conventional - Template(1) Drystack - Template(1) Site Water Management

Figure 4: Example of new tabs generated based on information inputs. One “Conventional – Template (1)” tab and one “Drystack – Template(1)” tab were created in the file based on inputs.

ii. Entering Information

Three types of information entries are permitted:

- Text (white cells) – the user should type the requested information into the cell.
 - In some cases only specific text formats are allowed (e.g. dates). Where this is the case the required format is specified and an error message saying “The value you entered is not valid” will pop up if the correct format is not used.
- Drop-down menus (greyed cells) – the user should select one value from the drop-down menu.
- Multi-value lists (light blue cells) – the user may select one or more values from the drop-down menu.
 - To select an item, open the drop-down menu and click on it.
 - To unselect an item, reopen the drop-down menu and click on it.
 - To remove all selections, hit the delete key and all the selected values will be removed.

iii. Underground Water Management Tab

If a mine reports that they do not have any underground workings, this tab will not be generated – user may skip ahead to the next section of this user guide).

This tab will be generated automatically if a mine reports that they have underground workings (i.e. “Yes” in cell G17 of the “Mine Information” tab). **All available fields should be filled out.**

iv. TSF Tabs

If a mine reports that they do not have any surface tailings storage facilities (TSF), no TSF tabs will be generated – user may skip ahead to the next section of this user guide.

Based on the information provided in the “Tailings Inventory” section of the “**Mine Information**” tab (cells G18-G22), a unique tab for each TSF on the mine site will be generated (as illustrated in Figure 4). **One TSF tab will be generated and must be filled out for each TSF on the mine site.**

If generated in error, the extra TSF tabs will be removed by correcting the TSF inventory on the “**Mine Information**” tab.

*****Do not manually delete tabs by clicking on the tab and selecting delete (this will cause the program to stop functioning correctly).*****

Once a user enters the TSF name (cell E10), the tab name will be automatically changed to match the initials of the TSF, allowing for easier identification of various tabs (e.g. ‘North Pit Tailings Facility No. 1’ would be abbreviated to ‘NPTF1’ on the tab name).

The specific content of the TSF tab depends on the type of TSF, however all are structured following a similar general layout. At the top of each TSF tab are general questions, followed by questions specific to the type of TSF.

Once a user enters the number of dams associated with a TSF (cell E21), **tables of additional information requirements (one table for each associated dam) are added to the bottom of the tab. These tables will be titled “Dam Specific Information” and should also be filled out.**

v. *Underground Tailings Tab:*

If a mine reports that they do not store tailings underground, this tab will not be generated – user may skip ahead to the next section of this user guide).

This tab will be generated automatically if a mine reports that they place tailings (i.e. “Yes” in cell G22 of the “Mine Information” tab). **All available fields should be filled out.**

vi. *Site Water Management Tab:*

The “**Site Water Management**” tab is designed to compile an inventory of the mine site water management ponds and their associated dams. At the top of the tab will be an inventory table, with ponds categorized according to purpose (i.e. non-contact water, seepage collection, sediment control, contact water, or sludge ponds). The user should **fill in the number of each type of pond on the mine site.** A breakdown of each major pond type and some of its main sub-types has been provided below (see Figure 5).

Based on the information provided in the “Water Management Pond Inventory” section (cells E10-E14) of the “**Site Water Management**” tab, one table of additional information requirements describing each pond will be added to the tab, beneath the inventory table (see Figure 6). **One pond description table will be generated for each site water management pond and each table must be filled out.**

For each pond, the user will enter the number of dams associated with the pond. Based on the number of dams entered, a corresponding number of tables for dam-specific information will be added below the associated pond description table (see Figure 7). **One dam table will be generated for each dam associated with each site water management pond – all tables must be filled out.**

For the purposes of the Site Water Management register, include all dams/ponds that meet one or more of the following criteria:

- Greater than 2.5 m high and capable of impounding at least 30,000 m³ of liquid or liquefiable material
- “Significant” or greater consequence classification
- Designated a “dam” by the Chief Inspector

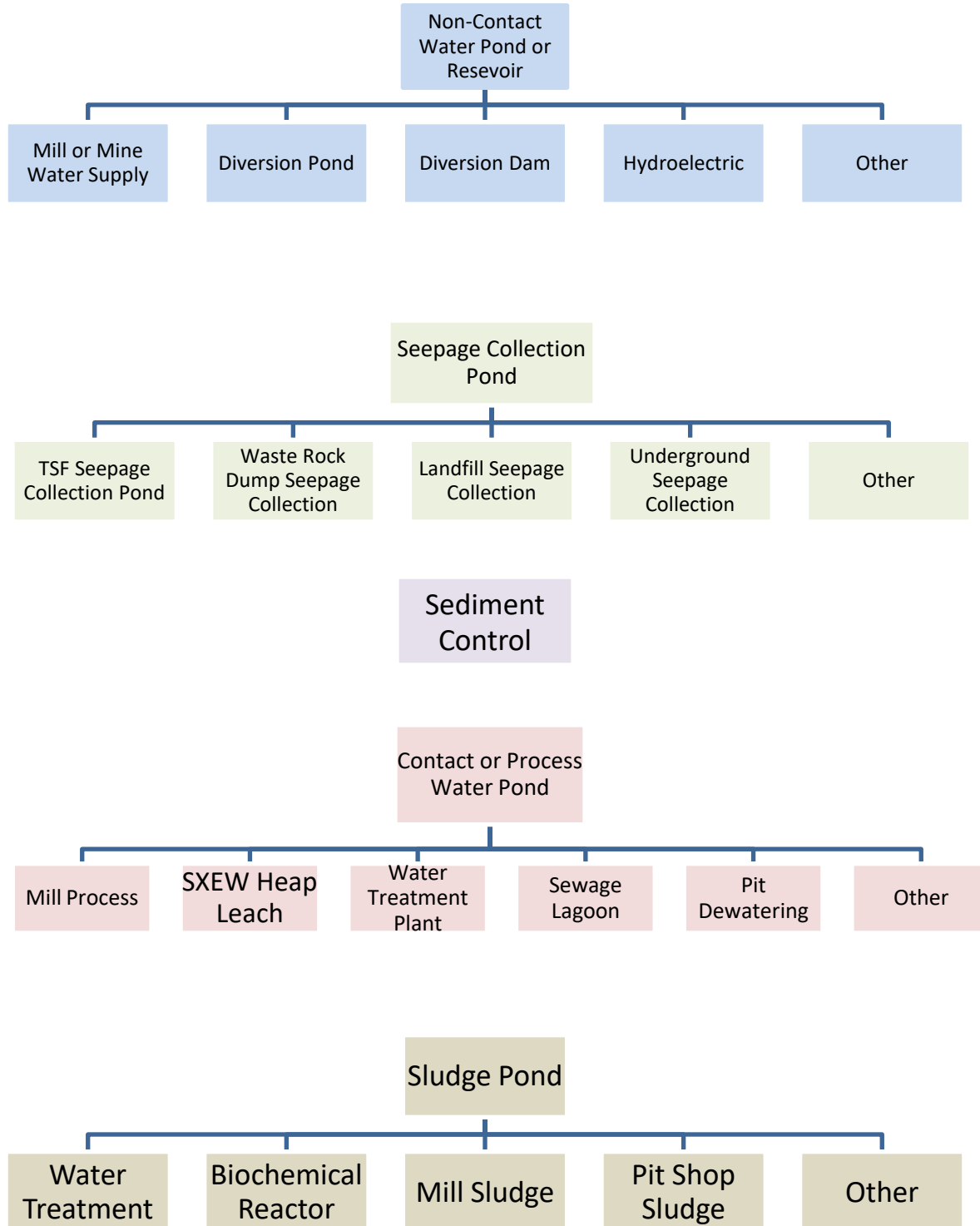


Figure 5: A breakdown of each pond type into its subcategories

Site Water Management Pond Inventory	Name of Mine		0
	Number of non-contact water ponds or reservoirs:		1
	Number of seepage collection ponds:		1
	Number of sediment control ponds:		1
	Number of contact, process water and/or water treatment ponds (not TSF):		1
	Number of sludge ponds:		1
Total number of water management ponds at the Mine:			5

Non-contact Water Pond Description	Name of non-contact water pond or reservoir (regulated by FLNRORD)	
	Type of pond or reservoir	
	Does the mine have an EMA Permit for water collected at this pond to be discharged to the environment?	
	Number of dams associated with the pond or reservoir (as defined by FLNRORD dam criteria in the Dam Safety Regulations)	

Seepage Collection Pond Description	Name of seepage collection pond	
	Type of pond	
	Does the mine have an EMA Permit for water collected at this pond to be discharged to the environment?	
	Number of dams associated with the pond that meet one or more of the following criteria: -greater than 2.5 m high and capable of impounding at least 30,000 m3 of liquid or liquefiable material; -"Significant" or greater consequence classification; or -designated a "dam" by the Chief Inspector.	

Sediment Control Pond Description	Name of sediment control pond	
	Does the mine have an EMA Permit for water collected at this pond to be discharged to the environment?	
	Number of dams associated with the pond that meet one or more of the following criteria: -greater than 2.5 m high and capable of impounding at least 30,000 m3 of liquid or liquefiable material; -"Significant" or greater consequence classification; or -designated a "dam" by the Chief Inspector.	

Contact or Process Water Pond Description	Name of contact or process water pond (non-TSF)	
	Type of pond	
	Does the mine have an EMA Permit for water collected at this pond to be discharged to the environment?	
	Number of dams associated with the pond that meet one or more of the following criteria: -greater than 2.5 m high and capable of impounding at least 30,000 m3 of liquid or liquefiable material; -"Significant" or greater consequence classification; or -designated a "dam" by the Chief Inspector.	

Sludge Pond Description	Name of sludge pond	
	Type of pond	
	Does the mine have an EMA Permit for water collected at this pond to be discharged to the environment?	
	Number of dams associated with the pond that meet one or more of the following criteria: -greater than 2.5 m high and capable of impounding at least 30,000 m3 of liquid or liquefiable material; -"Significant" or greater consequence classification; or -designated a "dam" by the Chief Inspector.	

POND DESCRIPTION TABLES GENERATED

Figure 6: Example of "Site Water Management" tab for a mine with one of each type of pond. Pond description tables for each type of site water management pond are generated as shown.

Site Water Management Pond Inventory	Name of Mine		Example Mine
	Number of non-contact water ponds or reservoirs:		1
	Number of seepage collection ponds:		0
	Number of sediment control ponds:		0
	Number of contact, process water and/or water treatment ponds (TSF):		0
	Number of sludge ponds:		0
	Total number of water management ponds at the Mine:		1

Non-contact Water Pond Description	Name of non-contact water pond or reservoir (regulated by)		
	Type of pond or reservoir		
	Does the mine have an EMA Permit for water collected at this pond to be discharged to the environment?		
	Number of dams associated with the pond or reservoir (as defined by FLNRORD dam definition in the Dam Safety Regulations)		1

Description	Name of Dam:		
	Location of Dam (UTM)	Zone:	
		Northing:	
		Easting:	
	FLNRORD Dam File Number		
	Dam crest elevation (metres above sea level):		
	Current dam height (downstream toe to crest) (metres):		
	Maximum pond elevation recorded in previous 12 months (metres above sea level):		
	Type of spillway: (Select all that apply)		
	Spillway design flood event return period:		
Performance and Monitoring	Spillway design flood event duration (days):		
	Inflow Design Flood (IDF) return period:		
	IDF duration (hours):		
	Monitoring methods currently in place for the dam: (Select all that apply)		
	Date of most recent Dam Safety Inspection (DSI) report: (YYYY-MM-DD)		
	Date of most recent Dam Safety Review (DSR) report: (YYYY-MM-DD)		
Date of most recent OMS manual review and/or update: (YYYY-MM-DD)			

Figure 7: Example of “Site Water Management” tab for a mine with one ‘non-contact water pond or reservoir’. Note that the non-contact water pond has one dam, resulting in a dam information table being added below.

3.0 Glossary of Terms

Term	Description
As-Built Report	Mechanism by which the Engineer of Record (EOR) confirms that a constructed facility meets the intent of the design and certifies the facility as suitable for operation. It also compiles valuable documentation of the construction methodology, quality control and quality assurance results, and survey details of the final structure. See section 10.5.1 of the Code and the HSRC Guidance Document for further requirements (available online at: https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
BCeID	A BCeID is an account that provides secure electronic access to online government services. For more information about obtaining a BCeID or answers to questions about the BCeID, visit https://www.bceid.ca/ .
Consequence Classification	Details of Consequence Classification can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Dam	<p>As defined in the HSRC “means a barrier on the surface preventing uncontrolled release of either water, slurry or solids or a barrier underground to prevent the uncontrolled flow of water, slurry or solids.”</p> <p>For the purposes of competing this <i>Register</i>, any infrastructure that meets one or more of the following criteria needs to have a Register completed:</p> <ul style="list-style-type: none"> • Greater than 2.5 m high <u>and</u> capable of impounding at least 30,000 m³ of liquid or liquefiable material • “Significant” or greater consequence classification • Contains tailings • Designated a “dam” by the Chief Inspector
Dam Safety Inspection (DSI)	Required annually per part 10.5.3 of the Code, a review and evaluation of the adequacy of performance and operation of the overall facility, with specific attention on short-term physical condition and surveillance results. The report shall be prepared by the EOR. Further information and requirements can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Dam Safety Review (DSR)	Required at least every 5 years per part 10.5.4 of the Code, a detailed review and evaluation of the performance and operation of the facility relative to dam safety standard of practice. Performed by an independent

	third party consulting firm not previously involved as the EOR for the facility. Further information and requirements can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Dangerous Occurrences	See part 1.7.3 of the Code (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
EGBC	Engineers and Geoscientists of BC (formerly APEGBC).
EGBC Guidance	“Site Characterization for Dam Foundations in BC”, an APEGBC Professional Practice Guideline (available online at https://www.egbc.ca/Practice-Resources/Professional-Practice-Guidelines).
EMA permit	<i>Environmental Management Act</i> (EMA) permit from the Ministry of Environment & Climate Change Strategy
Emergency Preparedness and Response Plan (EPRP)	<p>Details of EPRP requirements can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).</p> <p>The TSF EPRP must be integrated with the MERP, per part 10.4.2 of the Code.</p>
Engineer of Record (EOR)	As defined in the HSRC “means the Professional Engineer who is retained under section 10.1.5.(1) of this code”. Part 10.1.5.(1) states that the Engineer of Record “has professional responsibility for assuring that a TSF or dam has been designed and constructed in accordance with the applicable guidelines, standards, and regulations.” Further information can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Environmental Design Flood (EDF)	As defined in the HSRC “means the hydrological event that is to be managed without release of untreated water to the environment.” Further details can be found in part 10.1.8 of the Code and the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
FLNRORD	Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

Geotechnical Incident	A dangerous occurrence that is geotechnical in nature or any geotechnical incident that requires changes to an existing standard operating procedure or the creation of a site-specific safe work plan as well as any multi-bench pit slope failures, spoil failure resulting in full loss of the crest berm or dam embankment instability (regardless of size). See https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/permitting/geotechnical-information .
HSRC (the Code)	Health Safety and Reclamation Code for Mines in BC (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
IFC	Issued for Construction.
Independent Tailings Review Board (ITRB)	Details of ITRB role can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Inflow Design Flood (IDF)	As defined in the HSRC “means the flood into the impoundment resulting from the design hydrologic event.” Further details can be found in part 10.1.8 of the Code and the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
ISO	International Organization for Standardization.
MAC (TSM – Tailings Protocol)	Mining Association of Canada (MAC) Towards Sustainable Mining (TSM) Tailings Management Protocol (see http://mining.ca/towards-sustainable-mining/protocols-frameworks/tailings-management-protocol).
Mine Emergency Response Plan (MERP)	<p>Details of MERP requirements can be found in part 3.7.1 of the Code (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).</p> <p>The TSF EPRP must be integrated with the MERP, per part 10.4.2 of the Code.</p>

Operations Maintenance and Surveillance Manual (OMS)	Formal documentation of operational procedures, maintenance procedures and a surveillance and monitoring program to safely operate and monitor the condition and performance of TSFs, dams, structures and associated facilities in order to avoid or detect and address any changes, deterioration or hazardous conditions. Further information and requirements can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Quantifiable Performance Objective (QPO)	As defined in the HSRC “means measurable monitoring parameters that are identified and required to be maintained within predetermined limits for tailings storage facility safety.” Per part 10.1.13 of the Code, QPOs shall be determined and reviewed by the EOR and the TSF qualified person.
Seismic Design Criteria	The acceptance criteria used by the EOR to assess that the design will have acceptable performance through the design seismic event. See part 10.1.8 of the Code and the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Seismic Design Event	Annual exceedance probability (return period) associated with the design earthquake. See part 10.1.8 of the Code and the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Tailings Management System (TMS)	A system that defines how the mine will manage the tailings storage facility and which includes regular system audits. Further information can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Tailings Storage Facility (TSF)	As defined in the HSRC “means a facility that stores tailings”.
TSF Risk Assessment	Details of risk assessment requirements can be found in the HSRC Guidance Document (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).
Variance	See Section 13 of the <i>Mines Act</i> (available online at https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/health-safety/health-safety-and-reclamation-code-for-mines-in-british-columbia).