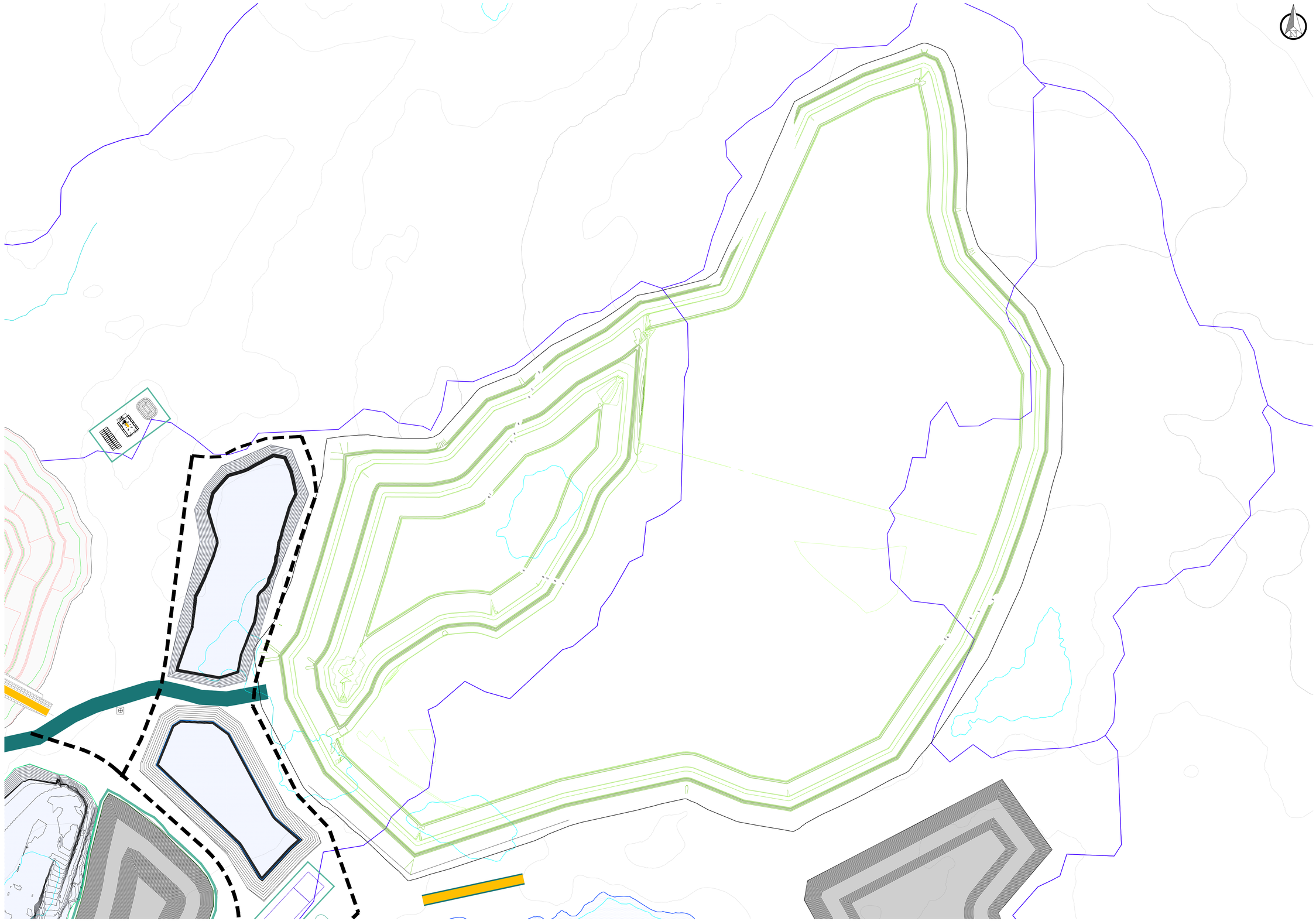

okane
Integrated Mine Waste Management and Closure Services
Specialists in Geochemistry and Unsaturated Zone Hydrology

FOR CONSTRUCTION

Legend/Notes

NOTE

1. ALL UNITS IN METRES U.N.O.
2. PRE-MINE TOPOGRAPHY PROVIDED BY AGNICO EAGLE.
3. MINE LAYOUT AND CONFIGURATION PROVIDED BY AGNICO EAGLE.
4. WASTE ROCK STORAGE FACILITY DESIGN PROVIDED BY AGNICO EAGLE.
5. REFER TO DWG. 948-011-013 FOR COVER SYSTEM DETAILS.
6. REFER TO APPENDIX A OF DOCUMENT 948-011-M-007_REV 2 FOR ALL TECHNICAL SPECIFICATIONS RELATED TO COVER SYSTEM CONSTRUCTION.
7. ALL COORDINATES ARE REFERENCED IN NAD83 ZONE 15.

TOTAL COVER SYSTEM VOLUME - 4,085,000 m³

**EXCLUDING CONTINGENCY

LEGEND

EXISTING CONTOUR
DESIGN CONTOUR
COVERED LANDFORM FOOTPRINT
PERIMETER ACCESS ROAD
MAIN ACCESS ROAD
WATERSHED DIVIDE
WATER BODY OUTLINE

CUT / FILL RANGES

NUMBER	DESCRIPTION	FILL
1		4.700
2		5.000
3		5.500
4		6.000
5		6.500
6		7.000
7		7.500
8		8.000

25 0 25 50 75 100 125m
SCALE 1:2500

Stamp

PERMIT TO PRACTICE
M. A. O'KANE CONSULTANTS INC.
Signature
Date DEC/17/2019
PERMIT NUMBER: P 768
NT/NU Association of Professional Engineers and Geoscientists

Revision	Description	Date
3		
2		
1		
0	ISSUED FOR CONSTRUCTION	2019/12/16
A	ISSUED FOR CLIENT REVIEW	2019/08/20

Client/Project

AGNICO EAGLE

AGNICO EAGLE
WHALE TAIL AND IVR
COVER SYSTEM DESIGN

Drawn by: H. COOPER
Designed by: G. ALLEN
Approved by: M. O'KANE, P. Eng

Drawing title

IVR WRSF CUT-FILL PLAN

Project no.	Drawing no.	Sheet	Revision
948-011	948-011-016	ANSI D	0

Outfile Name:948-011-016.dwg

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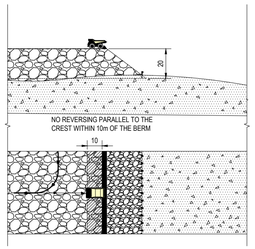
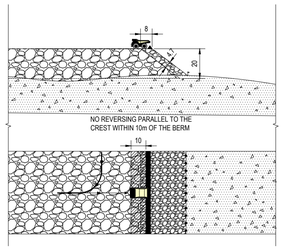


STEP 2 **-** CAP PAG LIFT SLOPE



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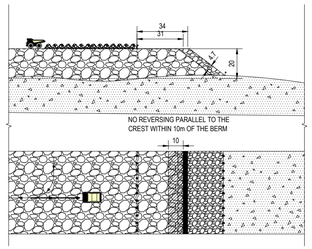
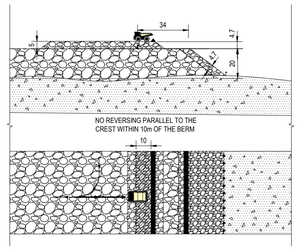


STEP 4 **- BEGIN CAP 20m x 4m BY ADDING NPAG MATERIAL**



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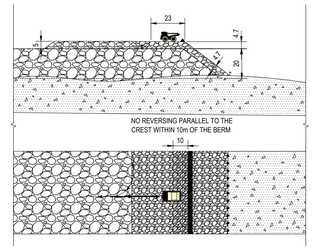

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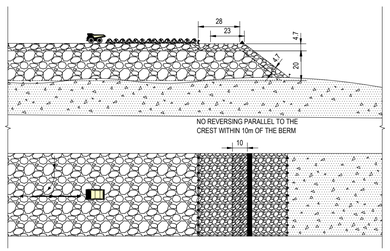

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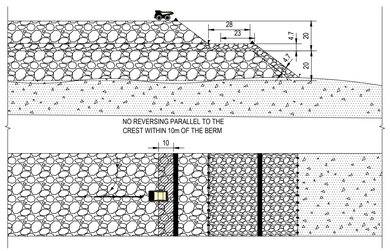
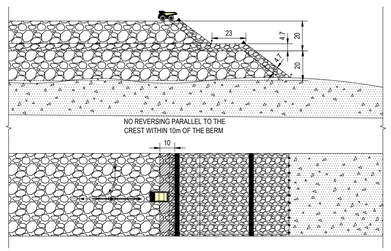


STEP 8 **- CAP PAG LIFT SLOPE**



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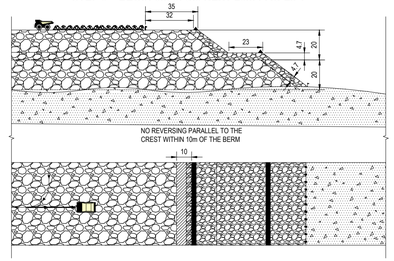
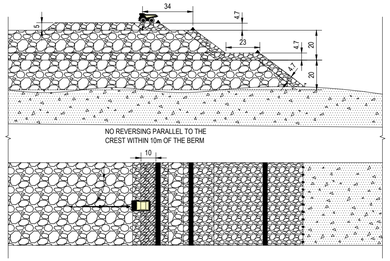
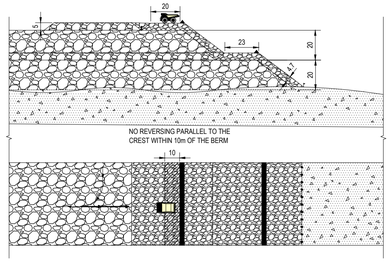


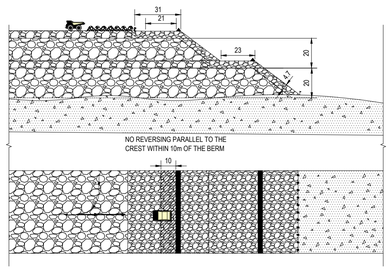
STEP 10 **- BEGIN CAP 20m x 4m BY ADDING NPAG MATERIAL**



STEP 11 **- CREATE 20m x 4m NPAG CAP**



STEP 12 **- BEGIN NEXT 20m PAG LIFT**



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Cadfile Name 948-011-017.dwg

okane

Integrated Mine Waste Management and Closure Services
Specialists In Geochemistry and Unsaturated Zone Hydrology

FOR CONSTRUCTION

Legend/Notes

NOTE

1. ALL UNITS IN METRES U.N.O.
2. CONSTRUCTION METHODOLOGY SOURCED FROM AGNICO EAGLE MBK-ENG-PRD-0001 WASTE DUMP CAPPING PROCEDURE.

LEGEND

EXISTING GROUND

WASTE ROCK

COVER SYSTEM

20 10 0 20 40 60 80 100m
SCALE 1:2000

Stamp

PERMIT TO PRACTICE
M. A. O'KANE CONSULTANTS INC.
Signature
Date 04/12/2019
PERMIT NUMBER: P 768
NT/NU Association of Professional Engineers and Geoscientists

Revision	Description	Date
3		
2		
1		
0	ISSUED FOR CONSTRUCTION	2019/12/16
A	ISSUED FOR CLIENT REVIEW	2019/08/20

Client/Project

AGNICO EAGLE

AGNICO EAGLE
WHALE TAIL AND IVR
COVER SYSTEM DESIGN

Drawn by: H. COOPER

Designed by: G. ALLEN

Approved by: M. O'KANE, P. Eng

Drawing title

WRSF AND COVER DEPOSITION METHODOLOGY

Project no.	Drawing no.	Sheet	Revision
948-011	948-011-017	ANSI D	0

Appendix B

Technical Specifications

Introduction

Background

The intent of the WRSF design is to demonstrate the physical and chemical stability of the Whale Tail and IVR WRSFs while optimizing risk and cost for AEM. The objective of the final cover system is to ensure that the overarching closure objective, specifically that water quality in the receiving environment be protected within permitted conditions, is met.

This document, together with the design basis and referenced drawings, defines the Technical Specifications for construction of the Whale Tail and IVR cover systems. Table 1 provides a revision history of the Technical Specifications:

Table 1: Revision history of technical specifications.

Revision	Status	Date	Major Changes
0	Issued for Discussion	October 2019	-
1	Issued for Submission	December 2019	-

Definitions

'Owner' is defined as Agnico Eagle Mines (AEM) or its authorized representative.

'Engineer' refers to the designated engineer responsible for technical oversight of all reclamation activities, or their appointees.

'Contractor' is defined as the party who has executed a contract agreement for the Work with the Owner.

'Others' are defined as any person, firm, or corporation having a contract in relation to the project directly or indirectly with the Owner otherwise than through the Contractor.

'Site' is defined as the land and other places on, under, in or through which the Work is to be carried out and any other land and places provided by the Owner or Others for the purposes of the Contract.

'Work' is defined as the entire completed construction or the various separately identifiable parts thereof, as defined in the Technical Specifications, on the Drawings, or as required by the Owner or Engineer.

'The Technical Specifications' is defined as this document in its entirety or other addenda prepared for the Work.

'Drawings' refers to the project drawings presented in conjunction with the Technical Specifications prepared for the Work.

'Clean' in reference to a soil or soil-like material is defined as a material that does not contain hydrocarbons or any other environmental contaminants.

Inspections and Testing

The Contractor shall at all times provide the Engineer access to the Work. The Engineer may intermittently perform inspections, tests, surveying and sampling throughout the course of the Work. The Contractor shall ensure that area of Work is safe during any inspections.

Environmental Protection

The Contractor shall comply with all Federal, Provincial and Municipal Laws and Regulations with respect to treatment and disposal of pollutants, and all additional requirements required by the Owner, specified herein or directed by the Engineer. The Contractor shall ensure that all reasonable precautions are taken to protect any water course, fauna, and flora in the immediate area.

General Site Preparation

General

This section specifies requirements for the preparation of the waste rock surface prior to placement of the cover system.

The surface of the waste rock storage facility must be free from deleterious materials such as hydrocarbons and other debris prior to construction of the cover system. Large voids (approximately 150mm or greater) are to be backfilled with waste rock prior to cover placement.

Drawings pertinent to construction of the cover system at Whale Tail and IVR Waste Rock Storage Facilities include:

Dwg. #948-011-010

Dwg. #948-011-011

Dwg. #948-011-012

Cover System Construction

General

This section specifies requirements for the construction of the cover system for the Whale Tail and IVR waste rock storage facilities (WRSFs) located north-west and north-east of the Whale Tail open pit, respectively. This work includes loading, haul, and placement (LHP) of waste rock cover material within the work area, and grading cover material within tolerances of the design elevations. Reclamation of the Whale Tail WRSF and IVR WRSF will occur progressively throughout the ongoing cover placement using the stockpiled non-potentially acid generating (NPAG) and non-metal leaching (NML) waste rock segregated during mining operations[1].

Waste rock lithologies from the Whale Tail pit that have been identified as NPAG include komatiite, iron formation, basalt, southern greywacke, and diorite units. Together, these lithologies comprise approximately 68% of the waste rock (41.8 Mt). However, the basalt, komatiite, and iron formation units (51% of the waste rock, 31.3 Mt), have potential for metal leaching. The south greywacke and the diorite within the open pit have low leachability in addition to being NPAG and represent approximately 17% of the waste rock (10.5 Mt).[1]

Drawings pertinent to construction of the cover system at Whale Tail and IVR include:

Dwg. #948-011-010

Dwg. #948-011-011

Dwg. #948-011-012

Dwg. #948-011-013

Dwg. #948-011-014

Dwg. #948-011-015

Dwg. #948-011-016

Dwg. #948-011-017

Materials

Cover system material is to be sourced from NPAG/NML waste rock. NPAG/NML material should be segregated from the ore and/or PAG/ML waste rock during mining operations. Cover materials must be free from deleterious materials such as hydrocarbons, trees, and other debris.

[1] Agnico Eagle, 2018. Whale Tail Pit – Waste Rock Management Plan. September 2018. Version 3.

During placement, cover material must be well-graded to minimize both void space and the fines limit to avoid high erosion potential[2]. Cover system material shall not exceed concentrations of arsenic and sulphur concentration specified in Table 2.

Table 2: Arsenic and sulphur limits for cover system material.

Cut-Off Criteria	Limit
Arsenic	0.1 wt%
Sulphur	75 mg/kg

Cover system material shall meet the gradation requirements specified in Table 3 and Figure 1, unless otherwise approved by the Engineer. Estimated cover material volumes are provided in Table 4

Table 3: Gradation limits for cover material

Size (mm)	Coarse Limit % Passing	Fine Limit % Passing
1000	*100*	*100*
76.2	*40*	*100*
4.75	*5*	*95*
0.075	*0*	*30*

[2] Okane, 2019. Agnico Eagle Mines Ltd. - Amaruq Waste Rock Storage Facility Thermal Cover System Design Basis Memorandum- Rev 1. July 23, 2019.

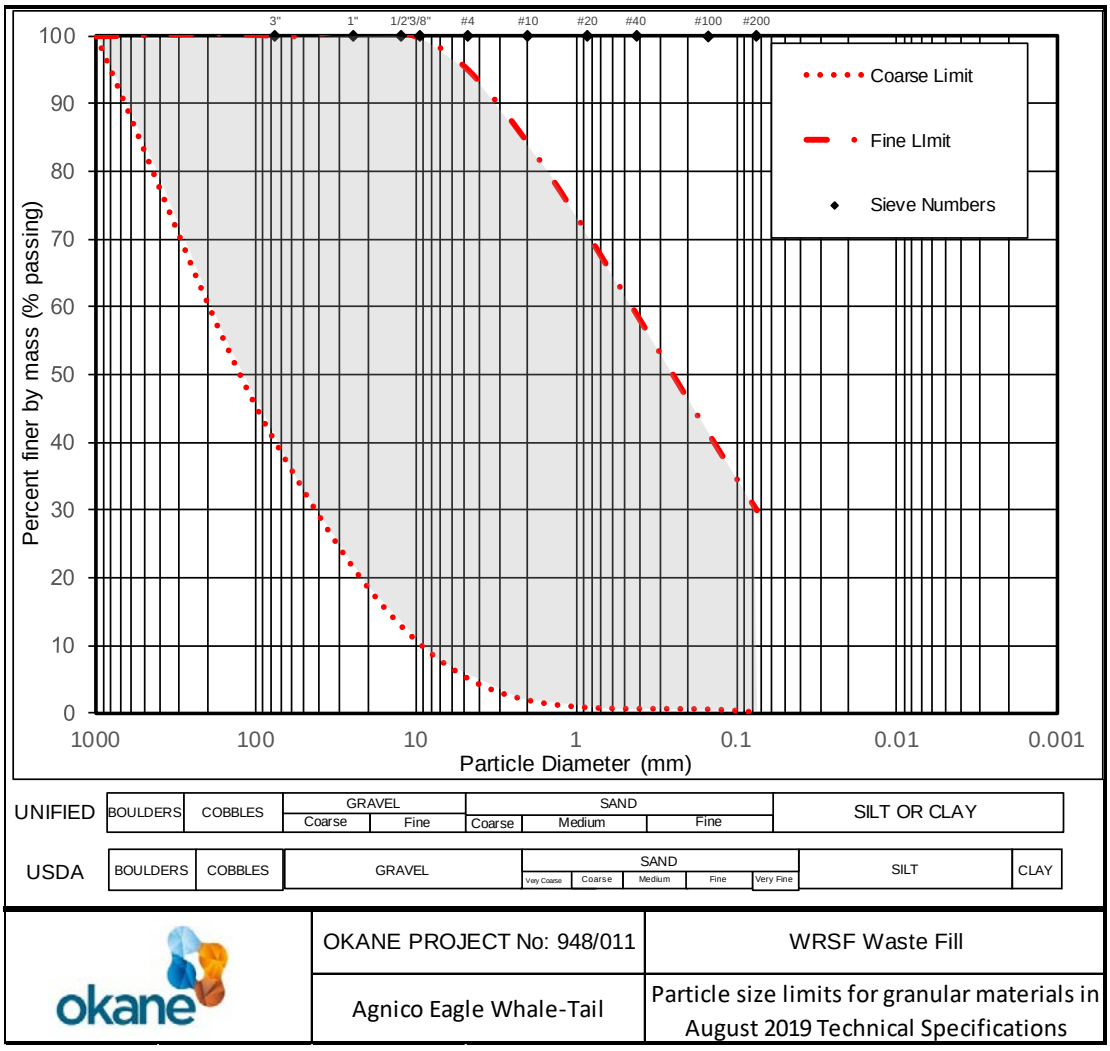

Figure 1: Particle size distribution limits for the coarse and fines cover material

Table 4: Waste rock cover material volume estimates.

Area	Minimum Cover Volume at nominal 4.7 m thickness* (m^3)
Whale Tail	6,698,800
IVR	4,085,000
Total Required	**10,783,800**

* Excluding contingency

Execution

The Contractor shall haul and place segregated NPAG and NML waste rock to the design lines and grades as indicated in the Drawings listed above or as directed by the Engineer. Elevation control for the entire cover system shall be maintained to within -0.0 m and +0.30 m of the final approved landform surface unless otherwise approved by the Engineer.

The Contractor shall keep the surface of each lift free from rejected material and shall prevent contamination of the area by traffic or other causes. The Contractor shall dispose of unsuitable and surplus material in a manner and at locations satisfactory to the Engineer. The Contractor shall also prevent surface runoff or water from any source from eroding cover system materials during construction.

To prevent soil loss due to erosion, the contractor shall avoid placing very fine material <0.005 mm in the cover system. Consistent placement of waste rock that exceeds the fines limit will promote erosion and soil loss. There is no coarse limit if the material is well-graded; however, every effort should be made to avoid placing boulder sized (>1000 mm) cover material. If boulder-sized material is observed at surface, visual inspection should be completed to ensure voids are sufficiently backfilled to avoid undue cover system material losses.

Following the placement of the cover material, the Contractor shall perform an as-built survey to ensure that the constructed surface is within the design parameters.

Surface Water Management

General

This section specifies requirements for surface water management during construction and post remediation activities.

The proposed water management design through operations, closure, and post-closure will ensure that any accumulation of runoff is constrained to the benches and plateau areas without 'overtopping' or causing erosive damage to the cover system. Accumulated runoff will be able to safely re-infiltrate into the landform.

The existing ground shall be graded towards the roads and away from the base of the WRSF at a minimum of 1%.

Benches and plateau of the cover system shall have a minimum of 1% backslope towards the WRSF to ensure that any runoff infiltrates back into the WRSF.

Drawings pertinent to management of surface water at Whale Tail and IVR landforms include:

Dwg. #948-011-010

Dwg. #948-011-011

Dwg. #948-011-012

Appendix C

Operations, Maintenance and Surveillance Manual

Whale Tail and IVR Waste Rock Storage Facilities - Operation, Maintenance, and Surveillance Manual

December 6, 2019

AGNICO EAGLE

okane

Integrated Mine Waste Management and Closure Services

Specialists in Geochemistry and Unsaturated Zone Hydrology

Whale Tail and IVR Waste Rock Storage Facilities - Operation, Maintenance, and Surveillance Manual

948-011-R-014

December 2019

Prepared for:

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Rev. #	Rev. Date	Author	Reviewer	PM Sign-off
0	09/24/2019	LS	DEC	GA
1	12/6/2019	LS	DEC	GA

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2. The scope and the period of operation of the OKC services are described in the OKC proposal and are subject to certain restrictions and limitations set out in the OKC proposal.
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1 INTRODUCTION

Agnico Eagle Mines Limited, Meadowbank Division (Agnico Eagle) is developing the Whale Tail Pit at the Amaruq site as a continuation of current mine operations and milling at the Meadowbank Mine. The Amaruq property is a 408 km^2 site located on Inuit Owned Land approximately 150 km north of the hamlet of Baker Lake and approximately 50 km northwest of Meadowbank Mine in the Kivalliq Region of Nunavut.

The Whale Tail pit, mined by truck-and-shovel operation, will produce 8.3 million tonnes (Mt) of ore, 61.3 Mt of waste rock, and 6.0 Mt of overburden waste (Agnico Eagle, 2018a). The produced waste rock will be stored in the Whale Tail Waste Rock Storage Facility (WRSF). Agnico Eagle also plans to operate the IVR pit, as well as some underground operations. The waste rock produced from the IVR pit will be stored in the IVR WRSF. All waste rock material will be sampled and tested during operations to confirm their acid rock drainage (ARD) and metal leaching (ML) potential in support of waste segregation. Non-potentially acid producing (NPAG) and non-metal leaching (NML) waste rock will be segregated to use as cover material during closure. The proposed cover system will promote freezing as a control strategy against acid generation and migration of contaminants.

An Operation, Maintenance, and Surveillance (OMS) manual has been developed for the WRSFs complimentary to the Whale Tail Pit Waste Rock Management Plan (Agnico Eagle, 2018). The OMS manual should be considered a 'living document' to be updated and improved as mine plans and associated processes and procedures are developed over the life of mine.

1.1 Report Objectives and Scope

The goal of the OMS Manual is to provide specific guidance for the operation, maintenance, and surveillance of the Whale Tail and IVR WRSFs, including the WRSF landforms, cover systems, surface water management, and monitoring elements. The objective of the OMS Manual is to implement the waste rock management plan, assist in meeting performance objectives, and manage potential risk. Specific objectives of this OMS are to define and describe the following:

- Roles and responsibilities of personnel assigned to the facility;
- The key components of the facility;
- Set out procedures required to operate, monitor the performance of, and maintain a facility to ensure that it functions in accordance to design, meets regulatory and corporate policy obligations, and links to emergency preparedness and response;
- Requirements for analysis and documentation of the performance of the facility;
- Serve as a training document for personnel that are new to the mine; and

- Identify potentially unsafe conditions or indicators and provide links to emergency response procedures; and
- Satisfy the requirements of regulatory bodies.

The OMS Manual covers operations of the WRSFs through commissioning, operations, and closure phases of the Whale Tail and IVR pits. The OMS pertains to equipment and operations beginning with waste rock hauling, dumping, grading, instrumentation, monitoring and surface water management. In addition, the OMS guides operators and staff on when to initiate the Emergency Preparedness and Response Plan (EPRP).

This document has been prepared primarily for use by the mine personnel who are responsible for the operation, maintenance and surveillance of the WRSFs. It contains information and instructions necessary to perform the above required activates. Any changes to regulatory requirements, licencing, operating policies, and procedures should be updated in this manual.

1.2 Report Organization

For convenient reference, this report has been subdivided into the following sections:

Section 1 – General overview of the purpose and scope of this document;

Section 2 – Includes the organizational structure for the Whale Tail Mine and associated roles and responsibilities, contact information, and competency training;

Section 3 – Provides information about the Whale Tail and IVR expansion site in order to provide an understanding of the facility and related performance;

Section 4 – Provides information related to the operational requirements for the facility including transport, placement, and storage of the waste rock and where applicable, water management required;

Section 5 – Provides preventative, predictive, and corrective activities conducted to provide continued proper operation of all infrastructure or to adjust infrastructure to ensure operation in conformance with performance objectives. This includes all maintenance of infrastructure as well as the facilities;

Section 6 – This section provides information on inspection and monitoring (i.e., collection of qualitative and quantitative observations and data) of activities and infrastructure related to tailings management;

Section 7 – This section provides a summary of the linkage between the WRSF and the EPRP.

2 OMS GOVERNANCE

This document was prepared using the MAC guidelines for Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (MAC, 2019) adapted for waste rock storage facilities as required. There are several Federal and Provincial environmental approvals required to construct, operate, and reclaim a mine. However, only those pursuant to the construction and maintenance of the Whale Tail and IVR WRSFs and associated water management are provided here.

2.1 Regulatory Licensing

As an expansion of the approved Whale Tail Pit Project, the Expansion Project is designed to operate as a satellite of the main Meadowbank facilities and will be accessed by the existing approved haul road. Transportation to the mine site, housing, and handling will remain the same as authorized under Project Certificate No. 004 and/or Project Certificate No. 008.

The Whale Tail WRSF will be expanded vertically and horizontally to the south east; while the IVR WRSF will accommodate waste rock generated from the IVR pit. Additional regulatory commitments that pertain to the WRSFs are found in the following:

- Part B, conditions 14 and 15 of the NWB Whale Tail Type A Water License 2AM-WTP1826
- Type A Water Licence 2AM-MEA1526 - Tailings
- Nunavut Impact Review Board (NIRB) Whale Tail Project Certificate No.008
- Waste rock will be managed in accordance with the Plan, as per Part F, condition 19 of the Water License 2AM-WTP1826.
- A Closure Plan has been filed with the Ministry of Northern Development and Mines (MNDM) under the Mining Act, which describes the planned development and operation of the Whale Tail Expansion, the proposed approach to closure, and outlines the associated financial assurance related to closure aspects.
    - This Closure Plan will be amended from time to time as required, such as any changes to the proposed operation of the WRSFs, or other changes to the Whale Tail Expansion which are deemed material.
    - The Closure Plan primarily focuses on the physical and chemical stability of the site post-closure or during a temporary shutdown scenario.
    - The Whale Tail Pit Expansion closure strategies are consistent with the approved Whale Tail Pit Project. Securities for the expansion will be arranged with Crown-

Indigenous Relations and Northern Affairs Canada and Kivalliq Inuit Association, posted in accordance with Type A 2AM-WTP1826.

2.2 Community of Interest (COI) Perspectives

The Whale Tail and IVR expansion project will provide economic benefits to the territory beyond the end of the Approved Project. The Expansion is expected to generate 99 new employment opportunities for Nunavummiut and extend employment and incomes for the Approved Project workforce until 2026 (Golder, 2018). Positive effects in the community in addition to Inuit Impact and Benefit Agreement royalties and commitments include increased household incomes, access to nutritious food, recreation, education, and other resources needed to conduct traditional activities.

Agnico Eagle continues to engage public consultation by meeting annually with the community and local stakeholders in the Kivalliq Region, regulatory agencies, and local employees. These meetings provide a better understanding of the rights, interests, values, aspirations, and concerns of potentially affected stakeholders and have fostered an operational culture that recognized and respects these relevant interests in the planning and operations process (Golder, 2018).

2.3 Organizational Structure

The organizational structure for the Whale Tail Mine, relative to the OMS is illustrated in Figure 2.1. The personnel and contact information associated with the positions referenced within each organizational flow chart can be found in Table 2.1.

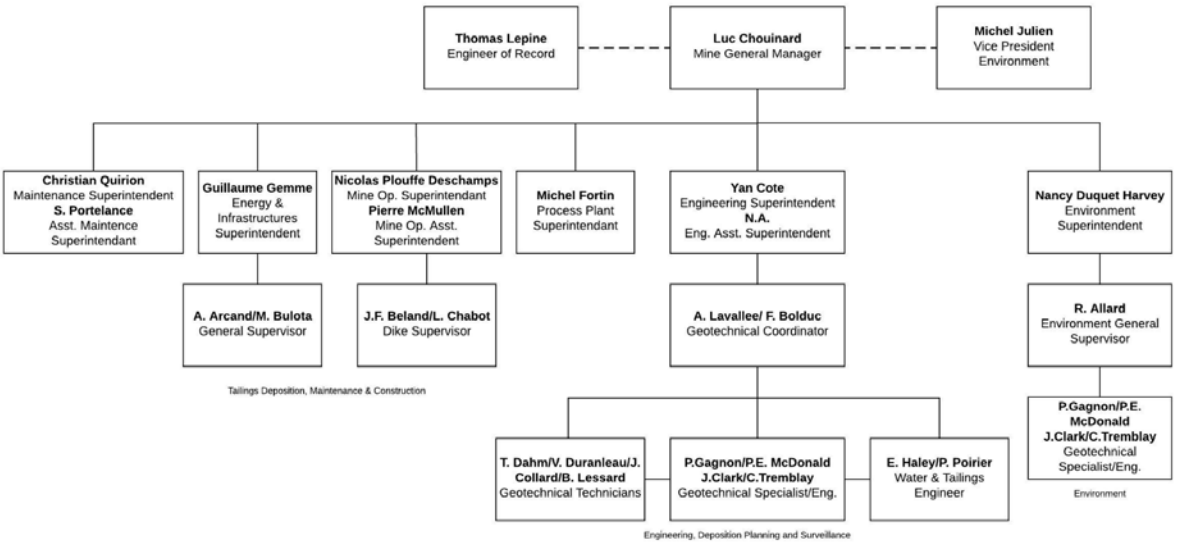

Figure 2.1: Organizational structure for Whale Tail mining operation.

2.4 Roles and Responsibilities

Vice President Environment: An executive level person (e.g. CEO, COO, Vice President) designated by the Board of Directors or Governance Level who is ultimately accountable for WRSF management, and the development and implementation of the systems needed for responsible tailings management.

Responsibilities include:

- Being aware of key outcomes of the WRSF risk assessments and how these risks are being managed;
- Accountable and responsible for putting in place an appropriate management structure;
- Delegation of responsibility and authority for WRSF management and defines the personnel responsibilities, authority, and reporting relationships to implement the systems needed for responsible tailings management through all phases of the facility life cycle; and
- Demonstrates to the Board of Directors/Governance and AEM's Community of Interest level whether waste rock is managed responsibly.

Mine General Manager: Provides leadership in mining operations.

Responsibilities include:

- Identifies the scope of work and budget requirements for all aspects of the Waste Rock Storage Facility;
- Approves budget for OMS related activities; and
- Delegates specific tasks and responsibilities for WRSF management to qualified personnel.

Engineer of Record: Provides technical direction on behalf of the Owner. The EoR verifies whether the WRSF (or components thereof) has been:

- Designed in accordance with performance objectives and indicators, applicable guidelines, standards and legal requirement; and
- Constructed, and is performing, throughout the life cycle, in accordance with the design intent, performance objectives and indicators, applicable guidelines, standards and legal requirements.

Mine Operations Superintendent and Asst.: Responsibilities include:

- Maintain access to the WRSF and seepage collection systems, including making road repairs, controlling dust and removing snow;
- Carry out field maintenance as required; and
- Supervise Mine Contractors for aspects related to earthwork construction and maintenance.

Engineering Superintendent: The Engineering superintendent's responsibilities include:

- Revise and update and redistribute the OMS Manual to reflect as-built conditions and any other changes;
- Establish a formal relationship with the EoR to ensure operations are compliant with design intent; and
- Identify where and when the contemplated operational changes are a potential deviation from the design intent and engage the EoR and Designer as part of processes to manage change.

Geotechnical Coordinator: Supervises the work of the geotechnical engineers, geotechnical technicians and water and tailings engineers

Geotechnical Technicians: Responsibilities include:

- Carry out inspections of the structures as required in the OMS Manual;
- Monitor instrumentation as required in the OMS Manual;
- Maintain instrumentation, readout units, and data acquisition systems;
- Responsible for data acquisition; and
- Prepare reports on instrumentation readings, WRSF performance, visual observations, etc.

Geotechnical Engineer: Responsibilities include:

- Carry out inspections of the structures as required in the OMS Manual;
- Carry out instrument monitoring as required in the OMS Manual;

- Review and analyse surveillance data to evaluate WRSF and thermal cover performance with respect to design parameters;
- Review and distribute surveillance reporting; and
- Analyse geotechnical instrumentation monitoring data to evaluate WRSF performance with respect to design parameters.

Water & Tailings Engineer: Responsibilities include:

- Coordinate equipment, labour, materials and maintenance activities required for the water collection systems and any runoff diversions;
- Prepare reports on instrumentation readings and water collection systems performance.

Environment Coordinator: Responsibilities include:

- Ensure monitoring of water quality in the water collection systems and attenuation ponds; and
- Ensure contact water, seepage and runoff from the WRSF corresponds to predictions.

Table 2.1: Contact Information for Whale Tail mining operation.

Position	Name	Phone Number	Ext.	Email
Vice President Environment	Michel Julien	416-947-1212	x4013738	michel.julien@agnicoeagle.com
Mine General Manager	Luc Chouinard	819-759-3555	x4606896	luc.chouinard@agnicoeagle.com
Engineer of Record	Thomas Lepine	416-947-1212	x4013722	thomas.lepine@agnicoeagle.com
Maintenance Superintendent	Christian Quirion	819-759-3555	x4606722	christian.quirion@agnicoeagle.com
Asst. Maintenance Superintendent	S. Portelance	819-759-3555	x4606722	sylvain.portelance@agnicoeagle.com
Energy & Infrastructures Superintendent	Guillaume Gemme	819-759-3555	x4606632	guillaume.gemme@agnicoeagle.com
Mine Operations Superintendent	Nicolas Plouffe Deschamps	819-759-3555	x4606832	nicolas.plouffe-deschamps@agnicoeagle.com
Mine Operations Asst. Superintendent	Pierre McMullen	819-759-3555	x4606832	pierre.mcmullen@agnicoeagle.com
Process Plant Superintendent	Michel Fortin	819-759-3555	x4606814	michel.fortin@agnicoeagle.com
Engineering Superintendent	Yan Cote	819-759-3555	x4606832	yan.cote@agnicoeagle.com
Environment Superintendent	Nancy Duquet Harvey	819-759-3555	x4606980	nancy.harvey@agnicoeagle.com
Geotechnical Coordinator	F. Bolduc J. Clark	819-759-3555	x4606837	frederick.bolduc@agnicoeagle.com jesse.clark@agnicoeagle.com
General Supervisor	A. Archand M. Bulota	819-759-3555	x4606822	alexandre.arcand@agnicoeagle.com marius.bulota@agnicoeagle.com
Dike Supervisor	J.F. Beland L. Chabot	819-759-3555	x4606807	jean-francois.beland@agnicoeagle.com larry.chabot@agnicoeagle.com
Environment General Supervisor	R. Allard	819-759-3555	x4606836	robin.allard@agnicoeagle.com
Geotechnical Technicians	T. Dahm V. Duranleau J. Collard B. Lessard	819-759-3555	x4606818 x4606818 x4606851 x4606851	thomas.dahm@agnicoeagle.com vincent.duranleau@agnicoeagle.com jerome.collard@agnicoeagle.com bruno.lessard@agnicoeagle.com
Geotechnical Specialist/Eng.	P. Gagnon P.E. McDonald C. Tremblay	819-759-3555	x4606726 x4606726 x4606933	patrice.gagnon@agnicoeagle.com pier-eric.mcdonald@agnicoeagle.com christian.tremblay@agnicoeagle.com
Water & Tailings Engineer	E. Haley P. Poirier	819-759-3555	x4606752	eric.haley@agnicoeagle.com pascal.poirier@agnicoeagle.com
Environment Coordinator	M. Archambault T. Thomson	819-759-3555	x4606744 x4606759	martin.archambault@agnicoeagle.com tom.thomson@agnicoeagle.com

2.5 Health and Safety

2.5.1 Competency and Training

Agnico Eagle will ensure that all personnel receive the proper level of training required to ensure they are competent in their roles. Training programs or opportunities will be provided as required. A training matrix for operation and management of the WRSFs is provided in Table 2.2.

Table 2.2: Training matrix for Whale Tail mining personnel.

Training	Contractors	Maintenance and Construction	Engineering, deposition planning and surveillance	Environment	Management
Site Orientation	X	X	X	X	X
Daily Inspection		X			
Quarterly Inspection				X	
EPRP Training	X	X	X	X	X
Construction	X	X	X		
Instrument Installation	x	x	X	X	
Instrument Data Collection			X	X	

3 WASTE ROCK FACILITY DESCRIPTION

The section provides information about the Amaruq Project to provide an understanding of the WRSFs and related performance objectives which management procedures and requirements are based on. The following sections were developed based on previous work for Agnico Eagle towards the Whale Tail Pit expansion.

3.1 Location

The Amaruq property is a 408 km^2 site located on Inuit Owned Land approximately 150 km north of the hamlet of Baker Lake and approximately 50 km northwest of Meadowbank Mine in the Kivalliq Region of Nunavut. The Project mining facilities include accommodation buildings, ore stockpiles, overburden stockpiles, two WRSFs, a water management system that includes collection ponds, water diversion channels, and retention dikes/berms, and a Water Treatment Plant. For the purposes of this OMS manual, only the WRSFs and associated water management will be addressed.

Waste rock from the Whale Tail and IVR Pits characterized for storage as per Agnico Eagle (2018a) in the WRSFs will be trucked to the designated locations until the end of mine operations. The Whale Tail WRSF is located northwest of the Whale Tail open pit, and the IVR WRSF is located East of the IVR open pit (Figure 3.1). Placement of the Whale Tail and IVR WRSFs took into consideration the following environmental, social, economic, and technical aspects of waste rock management (Agnico Eagle, 2018a):

- Minimize the overall footprint while maintaining short- and long-term stability of the facilities;
- Minimize impact to adjacent fish bearing lakes;
- Minimize haul distances from the open pit;
- Minimize the number of water catchment areas potentially affected by drainage from the WRSFs;
- If possible, divert clean, natural water away from the WRSFs; and
- Collect and manage contact water from the WRSFs during mine operations.

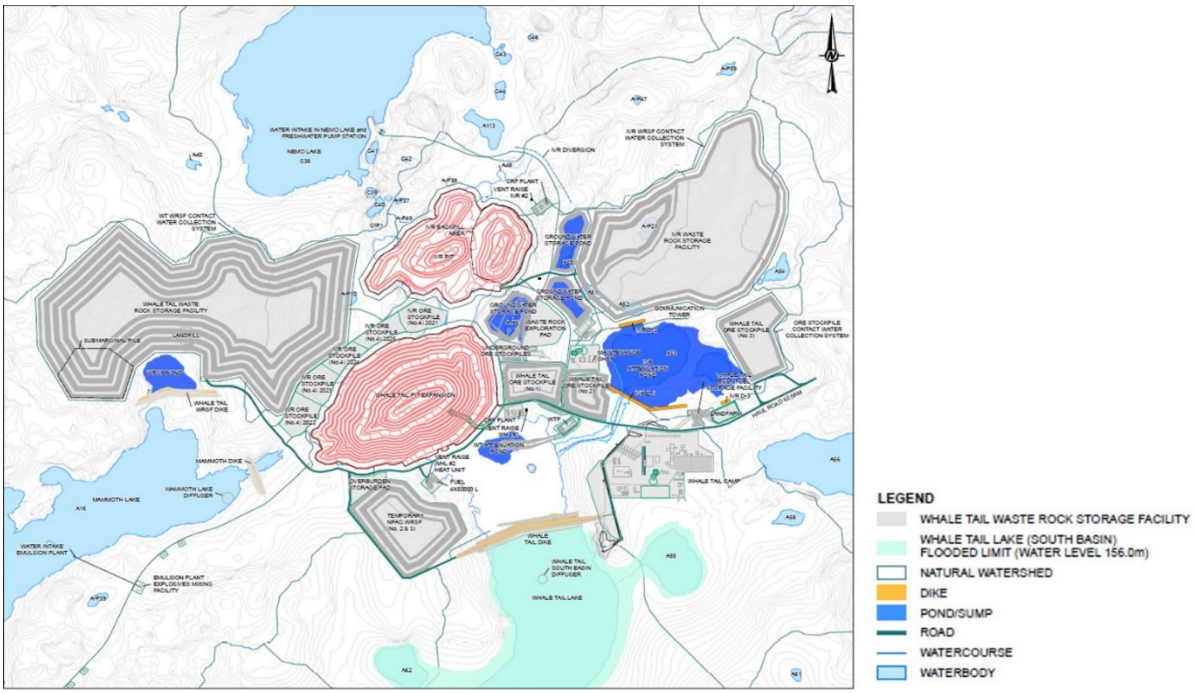

Figure 3.1: Amaruq project site layout (modified from Golder, 2018).

3.2 Climate

The Project is located in an arid arctic environment that experiences extreme winter conditions, with an annual mean temperature of -11.3 °C. The monthly mean temperature ranges from -31.5 °C in January to 11.5 °C in July, with above-freezing mean temperatures from June to September. The Site falls nearly at the intersection of ET (polar tundra) and Dfc (subarctic climate) classification of the Köppen-Geiger climate classification system where:

- E – 'polar' where average temperature of the warmest month is < 10°C;
- T – 'tundra' where the average temperature of the warmest month is <10°C, but > 0°C
- D – 'continental' where average temperature of coolest month is < -3°C, and average temperature of warmest month > 10°C;
- f – 'without a dry season' where precipitation is relatively evenly distributed throughout the year; and
- c – 'cold summer' where one to three months average temperature reach < 22°C but> 10°C.

Although the Project is located in an area of continuous permafrost, the depth of the permafrost and active layer will vary based on proximity to waterbodies, overburden thickness, vegetation, climate conditions, and slope aspect. Based on measurements of ground

temperatures, the depth of permafrost at the site is estimated to approximately 425 m outside the influence of water bodies (Golder, 2018).

Annual precipitation at the site is 262 mm, with 59% falling as rain, and 41% falling as snow. Mean annual temperatures and precipitation are provided in Table 3.1. Short-duration rainfall events representative of the project are presented in Table 3.2 and based on intensity-duration-frequency curves available from the Baker Lake A meteorological station operated by the Government of Canada (2015).

Table 3.1: Estimated site monthly climate characteristics.

Month	Temperature (°C)		Relative Humidity (%)		Wind (m/s)	Net Radiation[1] (MJ/m²/day)	Precipitation	
	Maximum	Minimum	Maximum	Minimum			(mm)	(days)
January	-28.0	-35.0	71.9	60.7	6.4	-2.0	8	27
February	-27.8	-35.0	70.8	60.2	6.3	-1.6	7	25
March	-22.6	-31.2	73.2	61.1	5.9	-0.6	11	22
April	-12.6	-22.0	81.2	67.9	5.9	4.1	16	20
May	-2.6	-9.8	89.7	75.5	5.5	7.1	15	21
June	9.0	0.5	89.8	61.8	4.8	8.9	22	14
July	16.8	6.2	88.6	52.3	4.6	8.9	37	13
August	14.3	5.4	91.8	58.6	5.0	5.6	42	18
September	6.2	-0.4	92.9	67.8	5.5	2.2	44	22
October	-3.7	-10.0	91.1	77.3	6.0	-0.4	30	24
November	-15.8	-23.2	81.0	68.2	6.1	-2.0	19	24
December	-23.5	-30.7	74.5	62.7	6.2	-2.2	11	25
Annual	**-7.4**	**-15.3**	**83.1**	**64.6**	**5.7**	**2.4**	**262**	**255**

Table 3.2: Estimated Mine Site Extreme 24-Hour Rainfall Events

Return Period (Years)	24-hour Precipitation
2	27
5	40
10	48
25	57
50	67
100	75
1000	101

SNC (2015)

3.3 Geology

The regional landscape around the Amaruq property includes many waterbodies surrounded by vegetated uplands. The topography is generally flat with gentle rolling hills, ranging in elevation between 150 and 200 masl.

Overburden (till) thickness ranges up to 10 m and overlies undulating bedrock with scattered outcrops and eskers. The till is characterized as a silty sand matrix supporting clasts that vary in size from granule gravel to large boulders. The underlying bedrock is Archean supra crustal rocks of the Woodburn Lake Group, believed to have been deposited in a continental rift setting. The metamorphosed Woodburn Lake Group includes mafic to ultramafic and volcaniclastic rocks interlayered with clastic sedimentary units including greywacke, siltstone, mudstone, banded iron formation, and chert. Both granitoid rocks and lamprophyres intruded the rock sequence and underwent multiple deformation events and metamorphism (Golder, 2018).

Gold is associated with pyrrhotite and arsenopyrite present as three different mineralization styles hosted in the iron formation (as layers, lenses, or disseminations), chert (as silica flooding), and throughout the Woodburn Lake Group (as veins) (Golder, 2018).

3.4 General Hydrogeology and Hydrology

Two groundwater flow regimes exist at the Project site: deep groundwater flow beneath the permafrost (425 to 495 m below ground), and shallow groundwater flow located in the active layer near the ground surface (1 to 4 m below ground). The two groundwater flow systems are believed to be hydraulically isolated by the permafrost; however, the deep groundwater flow regime is connected to ground surface by open taliks underlying the larger lakes. The water table closely parallels the surface topography, flowing to local depressions and ponds that drain to larger lakes. Flow velocities range from 0.004 to 0.080 m/day (Golder, 2018).

The Whale Tail mine site is located in the A watershed, and includes both Whale Tail Lake and Mammoth Lake, while water management activities are planned in both the A and the C watershed, where Nemo Lake is located. Both the A and C watersheds drain north to the Meadowbank River. Discharges from the watercourses at the Project site generally peak in late-May to mid-June due to snowmelt, followed by a rapid decline in July, a secondary peak in September due to rainfall events, and frozen conditions through the winter (Agnico Eagle, 2018d).

Baseline surface water quality sampling conducted in 2014 and 2015 indicate that the lake waters and tributaries were characteristic of headwater lakes in the Arctic: soft water with low alkalinity, turbidity, and total suspended solids (Agnico Eagle 2018d). Most water chemistry parameter concentrations were below the analytical detection limit and below the Canadian

Council of Ministers of the Environment water quality guidelines for the protection of aquatic life (CCME, 1999) and the Canadian drinking water guidelines (Health Canada, 2014).

3.5 Waste Rock Lithologies and ARD/ML Potential

The waste rock lithologies found at the Whale Tail and IVR WRSF are a combination of NPAG, NML, PAG, and ML (Table 3.3). The ARD and ML potential for each lithology was evaluated through static and kinetic testing (Golder, 2018); however, geochemical data collection is on-going and will continue throughout operations (see Section 6.4).

The komatiite, iron formation, basalt, southern greywacke and diorite units are primarily NPAG and expected to make up 68% of the waste rock (approximately 41.8 Mt). These formations do not require ARD mitigation measures; however, of these formations, the basalt, Komatiite, and iron formation units have a moderate to high potential for leaching arsenic (51%, or 31.3 Mt of the NPAG waste rock). The south grey wacke and the diorite are NPAG as well as NML (17%, 10.5 Mt). The north greywacke has variable ARD and ML potential, representing 11% (6.8 Mt) of the produced waste rock. The central greywacke and chert units are PAG/ML and represent 21% of the waste rock (19.1 Mt).

All waste material will be sampled and tested during operations to confirm their ARD and ML potential in support of waste segregation. The NPAG/NML waste rock (diorite and south greywacke) will be segregated and used for infrastructure construction and cover material for the Whale Tail and IVR WRSF. All other material will require long-term management and stored in the WRSFs.

Table 3.3: Anticipated ARD/ML Potential of Waste Rock Types at Whale Tail.

Waste Type	Rock Unit Code	ARD Potential	ML Potential
Komatiite North	V4a – 0a	No	High
Komatiite South	V4a – 0b	No	Moderate
Greywacke Central	S3C – 3b	Yes	Variable
Greywacke South	S3S – 3b	No	Low
Greywacke North	S3N – 3b	Variable	Variable
Chert	S10-3b	Yes	Variable
Iron Formation	S9E – 3b	No	High
Basalt	V3 – 1b	No	Moderate
Diorite	I2 – 8b	No	Low
Overburden	N/A	No	Low
Lake sediment	N/A	Yes	High

Golder (2018)

3.6 Facility Descriptions

Although various infrastructures are integral to the operations of the Whale Tail Expansion, only the WRSFs and associated water management system will be addressed in this document.

3.6.1 Life of Mine (LOM)

There are four phases to the Whale Tail and IVR expansion: construction, operations, closure, and post- closure. Construction during the first year (expected 2018-2019) will consist of site preparation and the construction of infrastructure using the start of the Whale Tail Pit development to produce construction material. Operations will continue for approximately 7 years with a target rate of extraction between 9,000 and 12,000 tonnes of ore per day. Mining activities will end in Year 7 (2025) with ore processing of stockpiled material to end in Year 8 (2026). During operations of the expansion, approximately 167.8 Mt of waste rock, and 11.3 Mt of overburden will be generated (Table 3.4). Post-closure and monitoring phases will commence after closure is completed in Year 33 (2051) and continue until it is shown that the site and water quality meet regulatory closure objectives.

Table 3.4: Projected waste rock and overburden tonnages (2017-2025)

Year	Waste Rock Excavated (t)	Overburden Excavated (t)
2017	461,625	199,454
2018	1,087,633	1,236,488
2019	17,238,276	4,111,005
2020	29,701,313	2,947,150
2021	31,461,155	1,342,271
2022	31,707,096	281,150
2023	31,075,034	1,226,057
2024	24,002,432	0
2025	1,090,886	0
Total	**167,825,450**	**11,343,574**

Agnico Eagle (2018a)

3.6.2 Whale Tail and IVR WRSFs

Any waste rock and overburden excavated from the Whale Tail expansion or the IVR that is not designated for mine infrastructure construction will be trucked to either the Whale Tail WRSF located north west of the Whale Tail open pit, or the IVR WRSF located east of the IVR open pit. Waste rock and overburden will be co-disposed together.

Construction of the Whale Tail WRSF will incorporate 20-m high benches composed of four 5-m thick layers. Each bench toe will start at a setback distance of 20 m from the crest of the previous bench to form an overall side slope of 2.5H:1V. Construction of the IVR WRSF will follow a similar design. The total area of the Whale Tail WRSF and IVR WRSF will be approximately 119 ha and 78 ha respectively.

Closure of the Whale Tail WRSF and IVR WRSF will begin when practical as part of the progressive reclamation program. Both WRSFs will be covered with a NPAG/NML waste rock to promote freezing as a control strategy against acid generation and migration of contaminants.

3.7 WRSF Water Management

The information provided here is derived from the Water Management Plan for the approved Whale Tail Pit Project (Agnico Eagle, 2018d) and the project description as part of the FEIS (Golder, 2018).

Contact water (seepage and runoff) from the WRSFs will be managed by water retention dikes and water collection ponds. If the water quality does not meet the discharge criteria provided by the Whale Tail Water License requirements (Section 2.1), water from the collection ponds will be pumped to and treated at the Whale Tail Water Treatment Plant (WTP) prior to discharge to the receiving environment. The water management infrastructure will be decommissioned during closure when the monitoring results demonstrate that the contact water quality from the WRSFs meet discharge criteria.

3.7.1 Whale Tail

A topographic low near Mammoth Lake (south of the WRSF) will serve as a contact water collection pond. A low point, north of the WRSF is the only topographic low where potential runoff could escape from the Whale Tail WRSF footprint. As part of the surrounding road, a saddle dam will be constructed at this location to avoid contamination of the sub-watershed located northward of the Whale Tail WRSF.

The construction of Whale Tail WRSF Pond (Whale Tail WRSF Dike) and Whale Tail Attenuation Pond (Whale Tail Dike) are among the most important water management infrastructures for the Project. Construction of the Whale Tail WRSF Dike will start in 2019. During the construction, berms and sumps will be built inside the footprint of the Whale Tail WRSF area if required to limit seepage and runoff from overburden and waste rock. As soon as waste rock material will be available from the open pit, the overburden will be surrounded with waste rock material to control the stability of the pile. If deemed necessary, turbidity barriers in Mammoth Lake will also be installed.

During the operations of the mine, seepage and runoff from the Whale Tail WRSF will be captured by the Whale Tail WRSF Collection Pond and pumped to the Whale Tail Attenuation Pond where the contact water will be treated in the Whale Tail WTP prior to discharge to the outside environment. Contact water collected in the Whale Tail WRSF Collection Pond Following the development of the IVR Attenuation Pond (exp. 2022), contact water from the Whale Tail Collection Pond will be directed to the IVR Attenuation Pond.

3.7.2 IVR

Perimeter ditches around the IVR WRSF will be used to collect seepage and runoff from the IVR WRSF. Any contact waters will be transported to the IVR WRSF Contact Water Collection System prior to being pumped to the active attenuation pond. The IVR Attenuation Pond will discharge to the water treatment plant during the summer. Treated effluent will be discharged to Whale Tail Lake. At closure, the conveyance system will be decommissioned, and the natural drainage patterns will be re-established towards Whale Tail Lake via the IVR pit.

3.8 Facility Performance

The overarching design objectives for the Whale Tail WRSFs is to minimize the impact on the environment and to consider geotechnical and geochemical stability. The intent of the WRSF design is to demonstrate the physical and chemical stability of the Whale Tail and IVR WRSFs while optimizing risk and cost for Agnico Eagle. The objective of the final cover system is to ensure that the overarching closure objective, specifically that water quality in the receiving environment be protected within permitted conditions, is met. The design basis of cover system design is to control mechanisms which result in the potential for poor water quality from the WRSF. Progressive reclamation will occur when practically achievable as part of the overall closure strategy. To achieve this the WRSFs will be covered with NPAG material to promote freezing as a control for acid generation and contaminant migration (Okane, 2019).

Performance of the facility will be evaluated by:

- Ensuring water quality collected through water management strategies meets discharge criteria; and
- Monitoring permafrost development.

4 OPERATIONS

Operation of the Whale Tail and IVR WRSFs, as defined for the purpose of this manual, includes all operating procedures related to phases of the WRSF life including active placement, progressive reclamation, and post-closure activities. The intent of this section is to outline plans and procedures for implementing critical controls that enable the WRSF to be operated with the design intent, achieve performance objectives, and manage risk through the life of the facility.

Operation of the WRSFs aligns with the Waste Rock Management Plan that is updated annually with current production quantities and actual LOM, dictating the production and mining schedule. Planning of the placement of waste rock material is reviewed for each LOM exercise, considering the different waste rock facility locations and capacity, as well as the closure NPAG/NML cover system requirements.

4.1 Performance Objectives

Operational performance objectives align with facility performance objectives in Section 3.8. Key operational processes and procedures to meet the overarching objectives are provided below.

4.2 Waste Rock Segregation, Transport, and Placement

Segregation of waste rock as PAG, NPAG, ML, or NML is based on operational testing during mining activity to differentiate waste rock types and determine final placement. Sampling and testing of waste materials for acid rock drainage and metal leaching will be conducted during mine operation to segregate PAG/ML waste rock from NPAG/NML waste rock and assigned to specific locations for use (Section 6.4). This practice is ongoing and will continue throughout operations. Once characterized and segregated, the waste rock material will be transported and placed at preselected locations according to the following standard operating procedures (SOPs):

- Haul Truck Driving Procedure: MBK-MO-2009-0027;
- Dumping Operating Procedure for the Construction of a Road or Ramp: MBK-MO-2009-0031; and
- Waste Dump Capping Procedure: MBK-ENG-PRD-0001.

Ensuring that the mine dispatch database is current (including tracking and location of all waste rock material at all locations) will provide clear direction to the operators regarding tracking and location of all waste rock materials at all locations. Clear signage and marking

of all PAG/ML zones, NPAG/NML zones, and NPAG/NML cover material zones at the site will provide visible guidance for operators during transportation and dumping.

4.2.1 QA/QC

QA/QC laboratory analysis program at the mine assay lab following the protocol in the waste rock management plan (Agnico Eagle, 2018c) continually tests the produced waste rock for characterization and segregation. Samples are routinely sent to an accredited commercial laboratory to validate the mine laboratory characterization with full acid-base accounting analysis.

4.3 Instrumentation Installation

During construction of the piles, thermistors will be installed in completed benches and on top of the waste rock piles to monitor the evolution of temperature with time, and specifically, the development of permafrost throughout the WRSFs. Thermistors installed in the NPAG cover system will be used to assess whether the defined cover system thickness of 4.7 m is effective in separating the PAG waste rock from seasonal freezing and thawing (i.e. the active zone).

The thermistor strings will be connected to dataloggers for automatic data collection and storage to be downloaded and reviewed periodically or as needed. The monitoring plan will be used to assess the development of permafrost as the primary ARD mitigation technique and help determine if further mitigation measures are required (Agnico Eagle, 2018e).

Several other near-surface sensors will be installed in the WRSF cover to confirm the modeling assumptions (thermal regime, water balance, etc). Data collection will occur periodically or as needed.

4.4 Water Management

All contact water with the WRSFs will be directed to Attenuation Ponds, treated, and released to the receiving environment. Water quality will be monitored as per the Whale Tail Water License requirements. If water quality does not meet discharge criteria, contact water in the water collection ponds will be treated at the Whale Tail water treatment plant (WTP) prior to discharge to the receiving environment. If water quality parameters outlined in the water license requirements are not met, further mitigation methods will be implemented.

The contact water management system for the Whale Tail and IVR WRSFs will remain in place until mine closure activities are completed, and monitoring results demonstrate that water quality conditions from the Whale Tail WRSF are acceptable for discharge with no further treatment required (Agnico Eagle, 2018).

4.5 Reporting Requirements

The Mine General Manager (or designate) should provide an operations report summarizing the information collected as part of normal operation. Information should include:

- Total monthly waste rock production and deposition;
- Total monthly overburden production and deposition;
- Water quality results;
- Thermistor data;
- Near-surface sensors data; and
- Collection and Attenuation Pond data.

Regulatory approval requirements of the Site have specific compliance reporting requirements with defined deadlines or reporting periodicity. The reports should include:

- Operation, Maintenance and Surveillance Plan(s) for dams, water management (water quality) and air/noise emissions;
- Emergency Preparedness Plan(s);
- As-Built Drawings and related Construction Reports;
- Dam Safety Inspection and Review Reports;
- Environmental Monitoring Plans; and
- Environmental Monitoring and Performance Reports.

The environmental approvals and permits received from the government that are maintained by Agnico Eagle should be referred to for details of monitoring, inspection, and reporting requirements.

5 MAINTENANCE

Maintenance activities for the Whale Tail Site includes preventative, predictive, and corrective activities to ensure continued proper performance of the facility and operation of all infrastructure, or to modify infrastructure to ensure operation in conformance with performance objectives.

The following periodic maintenance is anticipated to be required for the Whale Tail and IVR WRSFs:

1) Clear debris, snow, and ice which may block water from flowing away from the WRSFs;
2) Maintain equipment and instrumentation;
3) Repair any deficiencies as noted in WRSF inspections.

5.1 Routine and Predictive Maintenance

Routine and predictive maintenance includes removal of ice blockage or sediment accumulation that would otherwise affect the performance of the water management for the WRSFs when required.

5.1.1 Ditches and Spillways

Ditch maintenance includes repair, replacement, or improvement of erosion protection to prevent sloughing of slopes and clearing sediment build-up as required.

5.1.2 Diversions

Any diversions associated with the Whale Tail/IVR WRSF water management require the following maintenance activities:

- Repair erosion and bank stability particularly in areas of concentration flow;
- Remove debris; and
- Remove any ice build-up or blockages preventing water flow.

5.1.3 Dikes

Any dikes related to water management of the WRSFs require regular maintenance that includes inspections and repairs for:

- Seepage flow, especially during high water periods;
- Cracks, slumping, or erosional damage;

- Presence of animal burrows.

5.1.4 Thermal Monitoring Instrumentation

Instrumentation is calibrated by the manufacturer prior to shipment and certificates should be preserved by the maintenance department. Following instrument installation, initial reading procedures should be followed along with any subsequent calibration following the manufacturers recommendations. Malfunctioning or damaged instruments may require repair or replacement per manufacturer guidelines.

5.1.5 Pumping Systems

Pumping systems that transport water from the WRSF Collection Ponds to the Attenuation Ponds, and eventually to the receiving environment must be maintained regularly by:

- Performing regular performance tests and calibration as required by manufacturers;
- Removing debris/blockages;
- Performing annual calibration and maintenance as required on flow meters;
- Replace bends, or fitting components as required.

5.1.6 Mobile Equipment

Mobile equipment is maintained based on operational manuals and scheduled accordingly for the following:

- Dozers;
- Haul trucks;
- Excavators;
- Pickup trucks.

5.2 Event-Driven Maintenance

If an unusual even causes unexpected conditions that require immediate maintenance but are not considered an emergency, repairs and replacement of facility components should be made as required and documented. Maintenance should follow safety and performance procedures and normal documentation applies. Unusual conditions that require maintenance must be communicated to maintenance staff as soon as possible.

5.2.1 Earthquake Occurrence

The mine site is situated in an area of low seismic risk. However, following an earthquake, the following should be conducted:

- Inspect WRSFs for signs of distress due to deformation;
- Inspect diversions, ditches, and spillways for signs of slumping or changes in geometry;
- Inspect seepage collection areas;
- Collect instrumentation data.

5.2.2 Flood Event

Following a flooding or large snowmelt event, the following should be undertaken:

- Inspect dam, diversion, ditches, and spillways for signs of excessive erosion;
- Inspect WRSFs for signs of distress including cracks, slumping, erosion;
- Measure water level in Collection and Attenuation ponds for compliance with design requirements;
- Collect instrument data;
- Implement appropriate response based on observations/measurements as defined in this manual.

5.3 Reporting Requirements

Maintenance information should be communicated through formal and informal communications between various levels of the organization as well as using information posted at the Site and through this OMS Manual. Daily and weekly communication with contractors involved in WRSF management should be conducted as appropriate. Operational conditions requiring maintenance should be communicated to site management immediately. All equipment logs, manuals, and maintenance reports should be made available for all staff.

6 SURVEILLANCE

The Whale Tail and IVR WRSF surveillance activities involve inspection and monitoring to ensure structural integrity and safety of the WRSFs. Regular review of surveillance information can provide early indications that although within specifications, further evaluation or maintenance is required. The objectives of the surveillance program include:

- Monitoring the operation, safety, and environmental performance of the WRSF and water management procedures;
- Identifying and evaluating deviations from expected behaviour that could affect operational safety, structural integrity, and environmental performance of the facility; and
- Reporting significant observations for response.

Surveillance is conducted either by visual inspection or instrumentation monitoring. Whether qualitative or quantitative, the results are compared to expected performance of the WRSF and surrounding area. If the observations are within the projected or anticipated range, the results are recorded. If the observations are outside the anticipated range, further evaluation is warranted to determine if remedial action is required. Depending on the nature and severity of the deviation, remedial action could range from a minor adjustment to operational procedures to the initiation of emergency response. An example of the surveillance process is shown in Figure 6.1.