

RAINY RIVER MINE

**OPERATION, MAINTENANCE AND SURVEILLANCE
MANUAL**

PART V – SEDIMENT CONTROLS

**New Gold Inc.
Rainy River Project
5967 Highway 11/71, P.O. Box 5
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Version 2022-1

REVIEW AND REVISION HISTORY

The OMS Manual shall be reviewed annually and following any significant changes at the site to assess if the document is representative of the current condition and operation of the dam at the time of the review. Revisions to the manual should be undertaken within six months of changes. It is the responsibility of the Tailings Dam Engineer to initiate the OMS review.

The review team and approval record are given in **Error! Reference source not found.** The version history of the OMS Manual is shown in **Error! Reference source not found.**

Table 1 - Review Team

	Name	Company /Department	Position	Signature	Date
Prepared by	Winston Ding	NG Capital Projects	Tailings Dam Engineer		Oct 14, 2022
Reviewed by	Travis Pastachak	NG Capital Projects	Capital Projects Manager	 Travis Pastachak (Oct 14, 2022 11:42 CDT)	Oct 14, 2022
	Gord Simms	NG Mine Operations	Mining Manager	 Gord Simms (Oct 17, 2022 12:15 CDT)	Oct 17, 2022
	Garnet Cornell	NG Environment	Environmental Superintendent		Oct 25, 2022
	Derek McKinnon	NG Maintenance	Maintenance Superintendent	 Derek McKinnon (Oct 25, 2022 16:50 CDT)	Oct 25, 2022
	Michael Dabiri	SRK	Interim EOR	 <small>This signature has been scanned. The original signature is held on file.</small>	Oct 31, 2022
Approved by	Mohammad Taghimohammadi	NG Mill	Mill Manager		Oct 31, 2022

Table 2 - Revision Summary

Revision Number	Details of Revision	Date of Issue	Comment
Rev. A	Issued for EOR review	August 15, 2022	Review received on Sept. 2, 2022
Rev. B	Addressed review comments		
Rev. 0	Issued for use	Sept. 30, 2022	

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1.0 OBJECTIVE

The operation, maintenance, and surveillance manual (OMS Manual, the Manual) provides procedures and reference for the safe operation of the structures related to tailings, and water management structures at the New Gold Inc. (NGI) Rainy River Mine (RRM), located near Emo, Ontario. For readability, the OMS Manual has been separated into “Parts” as listed below. This is Part 4 for Sediment Ponds (1, 2 and 3), Water Discharge Pond, South Runoff Pond, and their dams.

- Part 1: General
- Part 2: TMA
- Part 3: WMP
- Part 4: MRP
- **Part 5: SEDIMENT CONTROLS**
- Part 6: FRESHWATER DIVERSIONS
- Part 7: WATER DISCHARGE
- Part 8: EPRP

To simplify and condense the OMS Manual, the overall site conditions were removed from the individual structure parts and covered in Part 1 of the OMS Manual. This part is only about the operation, maintenance, and surveillance of the sediment ponds and their dams.

2.0 FACILITIES DESCRIPTION

2.1 Overview

Except for MRP, the structures for the contacted water, or sediment controls including the following: Sediment Ponds, Water Discharge Pond (WDP), and South Runoff Pond (SRP).

2.1.1 Sediment Ponds

Three sediment ponds have been constructed on the RRM site. Sediment Pond #1, #2, and #3 receive runoff and seepage from the West Mine Rock Stockpile (WMRS). Sediment Pond #1 is located to the north of the WMRS, Sediment Pond #2 to the west, and Sediment Pond #3 to the south.

Sediment Ponds #1 and #2 have been designed to provide a 12-day hydraulic retention time during sustained wet conditions (wettest month of a 100-year wet year) and during the 25-year, 24-hour storm event. Sediment Pond #1 will also receive overflow water from the West Creek Box Culvert Spillway during large storm events exceeding the 10-year return period event. Critical to the function of the sediment ponds is progressive reclamation.

Sediment Pond #3 consists of collection ditches, a sump located in the Marr Creek valley, the WMRS temporary Sump 1, Sump 2, and a containment berm with an emergency overflow spillway. Sediment Pond #3 was designed to collect shallow seepage from the remnant Marr Creek, otherwise maintained in dry condition. Sediment Pond 3 sump was designed to accommodate an EDF of 25-year, 24-hour and the 25-year, 30-day storm events. The emergency spillway was designed to pass the 24-hour, 100-year return period IDF. The contributing watershed is 1.12 square kilometres. Construction of Sediment Pond 3 occurred between July 14, 2019, and January 26, 2020. Sediment Pond 3 does not discharge to the environment. Water is pumped to Sediment Pond 2, and the pond level in Sediment Pond 3 is maintained as low as possible.

Seepage collection ditches have been constructed around the Overburden Stockpile and WMRS to convey runoff to the sediment ponds. The ditches were constructed to minimize erosion protection requirements where practically possible. Flows may also be directed to the ponds using roadside ditches.

2.1.2 Water Discharge Pond

The Water Discharge Pond (WDP) collect runoff from natural ground catchment south of the TMA, seepage from the seepage collection ditch, and bleed flow from the WMP for discharge to the constructed wetland. The WDP will also provide sediment and seepage control south of the TMA.

2.1.3 South Runoff Pond

South Runoff Pond (SRP) was originally designed to store mine site runoff water but later becomes a temporary storage facility for open pit water before it is pumped to Mill. Because of

the limited storage capacity, overspill occurred a few times in its operation history. A seepage collection and pump back system is located downstream of the SRP to prevent seepage and overflow, as well as flows from the surrounding catchments, from reporting to the open pit.

2.2 Design and Construction Documents

Details on design and construction are available in documents summarized in Table 2-1. In many cases, As-Built drawing packages are available, but original design drawings are not.

Table 2-1: Document Summary

Document Title	Reference
LRIA Work Permit Application Support Document - Sediment Ponds	RRP-GEO-LRIA012 R1
As-Built Report – Sediment Pond #1	RRP-GEO-REP-040 R1
As-Built Report – Sediment Pond #2	RRP-GEO-REP-038 R1
As-Built Report – Sediment Pond #3	BGC-4460-DT00-RPT-0011
Sediment Pond 3 Detailed Design	BGC-4460-DT00-RPT-0002
LRIA Work Permit Application Support Document – Water Discharge Pond and Constructed Wet land	RRP-GEO-LRIA-004D R2
Drawing Title	New Gold Document Number
Temporary Sedimentation and Plan and Details	3098004004430-A1D70-0002
Sediment Pond #2 – Plan, Cross Sections, and Details	3098004-004440-A1-D70-0002
South Runoff Pond Grading Plan	100126-2510-DD10-GRD-0003.001.08.IFC
South Runoff Pond Section and Details	100126-2510-DD10-GRD-0004.001.07.IFC
Water Discharge Pond Dam – As-Built Plan and Typical Cross Sections	3098004-004410-A1-D70-0002

2.3 Review of Dam Consequence Classification

Sediment pond dams were not classified prior to 2021 Dam Safety Review (DSR). During the 2021 DSR completed by SRK, the sediment pond dams were assigned a hazard classification according to CDA guidelines. Sediment Ponds #1 Dam and #3 Dam were classified as LOW. Sediment Pond #2 Dam was classified as SIGNIFICANT. However, Sediment Pond #3 Dam may be reclassified as sump in the future because it does not meet the CDA dam definition.

The functionality of SRP is under SRK’s review. Its HIGH classification maybe changed if it stops functioning as a temporary storage facility for the open pit water and pending a detailed assessment of dam failure consequences.

2.4 Pumps and Pipelines

The pumps and pipelines are owned by Mill and operated by Site Service.

The Sediment Pond pipelines include:

- Wastewater line links Sediment Pond #3, #2 and #1 to WMP
- Dewater lines
 - from C15 (WMRS/Overburden Stockpile) toe to Sediment Pond #1
 - Sediment Pond #1 to Sediment Pond #2.
 - Sediment Pond #3 to Sediment Pond #2.
- A discharge line from Sediment Pond # 2 to Splash Pad (off-site discharge).
- A wastewater line connecting sediment ponds can direct water and discharge to TMA at Y Junction by turning the T joint north of the SD Sump.

An electrical pump is located at Sediment Pond #1 Dam, and diesel pumps at Sediment Pond #2 and #3.

The WDP pipelines include:

- WP (WMP Water) line from WMP through WDP to Outflow Basin
- TW (Treated water) line from Outflow Basin through WDP to WMP.

A pump station sits on the WDP Dam.

The SRP pipelines includes:

- Three DT (Dewatering) lines from Open Pit to SRP
- One ML (Mill Water) line from SRP to Mill

This section will be better delineated after SRK completes its side-wide management review.

2.5 Closure

Sediment Ponds will be maintained until the site is recognized as a closed mine and monitoring associated with the Metal Mining Effluent Regulation is no longer required. At such time, all Sediment Ponds will be breached, and residual pond sites will be stabilized by infilling with overburden and revegetated.

The Water Discharge Pond dam will be breached once it no longer has a water management function.

SRP closure plan is undefined.

3.0 OPERATIONS

3.1 Pond Storage Capacity

The stage storage relationship of the three sediment ponds, WDP and SRP is provided in Table 3-1.

Table 3-1 - Stage Storage Relationship

Sediment Pond 1		Sediment Pond 2		Sediment Pond 3		WDP		SRP	
Elev. (m)	Storage Volume (m ³)	Elev. (m)	Storage Volume (m ³)	Elev. (m)	Storage Volume (m ³)	Elev. (m)	Storage Volume (m ³)	Elev. (m)	Storage Volume (m ³)
350.0	6,306	340.5	-	339.2	-	349.5	94	358.0	13
350.5	32,599	341.0	90	339.5	76	350.0	371	358.5	59
351.0	60,145	341.5	192	340.0	2,787	350.5	804	359.0	310
351.5	88,966	342.0	329	340.5	7,733	351.0	1,755	359.5	1,655
352.0	119,937	342.5	516	341.0	14,073	351.5	4,971	360.0	4,121
352.5	153,181	343.0	13,124	341.5	21,754	352.0	11,991	360.5	8,046
353.0	184,992	343.5	36,359	342.0	30,942	352.5	23,611	361.0	19,343
		344.0	60,756	342.5	41,770	353.0	40,704	361.5	32,005
		344.5	86,316	343.0	56,363	353.5	65,885	362.0	45,991
		345.0	113,318	343.5	74,091	354.0	99,512	362.5	61,292
		345.5	143,756	344.0	93,357	354.3	105,512	363.0	77,862
		346.0	177,153	344.5	113,765				
		346.5	218,692	344.6	117,993				
		347.0	269,319						
		347.5	323,362						
		348.0	350,775						

3.2 Flood, Pond and Dam Operation Criteria

See Section 3.1 of Part 2 for TMA of this Manual for definition of ENL, EIL, DSN and DSI.

- ENL (Environment Notice Level) is assigned to be the same as NOWL. If reached and the water quality doesn't meet discharge criteria, RRM need to initiate Environment Contingency Plan to bring down the pond level.
- EIL (Environment Incident Level) is assigned to be the same as the MOWL (EDF event), i.e., the invert of spillway. If reached and the water quality doesn't meet discharge criteria, RRM need to continue the Environment Contingency Plan to bring down the pond level and report to the regulator.
- DSN (Dam Safety Notice Level) for sediment control dams is assigned to be the same as EIL. If reached, RRM needs to initiate Enhanced Surveillance.
- DSI (Dam Safety Incident Level) for sediment control dams corresponds to the IDF level. If reached, RRM need to report to the regulator and initiate EPRP.

Summary of sediment pond dam operation elevation data is shown in **Table 3- 1**.

Table 3- 1: Sediment Controls Operation Criteria

Description	Elevation (m)				
	Pond 1	Pond 2	Pond 3	WDP	SRP
Dam Crest	354.0	348.2	345.7	355.2	363.5
IDF (Inflow Design Flood, Maximum Flood Level)	353.99	N/A	345.5	N/A	N/A
DSI (Dam Safety Incident Level)		TBD		TBD	TBD
Sill / Invert of Emergency Spillway	353.7	348.0	345.0	354.2	362.9
DSN (Dam Safety Notice Level)					
EIL (Environment Incident Level)					
MOWL (Max. Operation Water Level)					
NOWL (Normal Operation Water Level)	352.7	347.2	344.6	354.0	362.8
Pond Level for the Increased Surveillance (High Pond)					
ENL (Environment Notice Level)					
Min. Operation Water Level	TBD	TBD	TBD	TBD	TBD

3.3 Environmental Protection

Environmental operation of sediment control ponds has been carried out by RRM Environment according to Amended Environmental Compliance Approval (ECA 2290, Doc. #: MECP-IFI-0000.001), dated April 14, 2022.

3.3.1 Effluent Discharge

Treated effluent shall only be discharged to the Pinewood River via EDL1 (Effluent Discharge Line 1) and/or EDL2 seasonally. No water shall be discharged after December 1st of each year until spring melt when the Pinewood River is largely ice free and meets the minimum flow threshold (Section 4 (8), ECA 2290).

EDL1 is the first effluent discharge pipeline approximately 500 meters long and ties into the WMP Water Discharge Pipeline which is equipped with a diffuser and discharges to the Pinewood River downstream of the McCallum Creek confluence. EDL2 discharge pipeline is approximately 2,000 m long and is equipped with a diffuser and discharge to the Pinewood at the Loslo Creek confluence.

The WDP transfers effluent from the WMP and seepage from the TMA for treatment at BCR #2, and eventually discharge to EDL2 if meeting discharge criteria. The WDP will eventually be overprinted by the TMA dam and BCR (biochemical reactor) #2 will then receive water directly from the WMP or from TMA seepage.

Sediment Pond 1 water may be reused within the Rainy River Mine site for dust suppression and other industrial uses such as drilling. Sediment Pond 1 can also discharge to the environment, via a splash pad, at a ratio of 5:1 with the West Creek Diversion should water meet discharge criteria. However, current operation finds out that it is more efficient to send Sediment Pond 1 water to Sediment Pond 2, and discharge to the environment via a splash pad (same for Sediment Pond 2 discharge) is more efficient.

Sediment Pond 2 water may be reused for dust suppression and other industrial uses such as drilling. Sediment Pond 2 may be discharged to the environment, via a splash pad, at a ratio of 10:1 with the Pinewood River should water meet discharge criteria as listed in Table 4 of this Approval. If water discharged from Sediment Pond #2 meets all applicable provincial and federal water quality criteria (i.e., Provincial Water Quality Objectives and Canadian Water Quality Guidelines for the Protection of Aquatic Life) for all parameters sampled in accordance with Table 6 of the Approval, Sediment Pond 2 may be discharged to the environment, via a splash pad, at a ratio of 1:1 with the Pinewood River.

Sediment Pond 3 does not discharge to the environment, rather water is pumped directly to Sediment Pond 2. The pond level in Sediment Pond 3 is maintained as low as possible.

Sediment pond water will be discharged to WMP on following criteria (according to NG Environment):

- 1) Discharge to Pinewood River is not allowed,
- 2) Water level in the sediment pond is high (< 0.25 m below NOWL), and
- 3) Water quality meets ECA (2290) limits.

If Criteria 3 does not meet, sediment pond water will be discharged to TMA at the Y junction.

3.3.2 Discharge Criteria

See Section 4 of ECA (2290) for the operation and maintenance requirements of the Works and related equipment and appurtenances which are installed or used to achieve compliance with the Approval (ECA 2290) are properly designed, constructed, operated, and maintained.

Table 1 in Section 5 (ECA 2290) presents the respective monthly average concentration objective for effluent discharges from EDL1, EDL2, Sediment Pond 1, and Sediment Pond 2.

Table 2 in Section 6 (ECA 2290) presents respective daily maximum concentration limit, and the respective monthly average concentration limit for effluent discharges from EDL1 and EDL 2.

Table 3 and 4 in Section 6 (ECA 2290) presents respective daily maximum concentration limit, and the respective monthly average concentration limit for effluent discharges from Sediment Pond 1 and 2.

3.3.3 Monitoring and Recording

Table 5 in Section 8 (ECA, 2290) presents the samples shall be collected and analyzed at EDL1 and EDL2 during the active discharge period, at the sampling frequencies and using the sample type(s) specified for each effluent parameter listed.

Similarly, Table 6 for Sediment Pond 1 and 2.

3.3.4 Reporting

See Section 12 of ECA (2290) for the reporting requirements for the environment purposes.

3.4 Contingency Plan

The operations are sensitive to water balance and water quality in discharges. The following are contingencies based on water management and functioning of the diversions.

If water from sediment ponds cannot be discharged to the environment, sediment ponds will be continuously pumped to the TMA or WMP (or Sediment Pond #2) and water level will be kept at 1.5 m from the bottom. The contingency triggers and action plans are described as following.

1. Sediment pond water level has exceeded the MOWL.
2. Dam performance conditions deemed unsafe by the EOR.
3. In the event the water quality nears discharge exceedance values.

Should criteria 1 or 2 be triggered:

- Notify the authorities
- If insufficient, pump water to the TMA
- If insufficient, pump water to the MRP
- If insufficient, pump to the Pit

Should criteria 3 be triggered:

- Notify the authorities
- Add pumping capacity to the TMA
- If insufficient, pump water to the MRP
- If insufficient, pump to the Pit

If the dewatering is required, the regulator will be informed immediately of the planned emergency procedures. Dam safety is of primary importance and the EOR should be contacted immediately.

The contingency plan is detailed for sediment ponds because the EIL and DSI level are close to each other.

4.0 MAINTENANCE

4.1 Type and Procedure

Refer to Section 4.1 of Part 2 for TMA of the Manual.

4.2 Preventative and Predictive Maintenance

4.2.1 Roads and Gates

Roads and gates are maintained by Site Service Department as required.

4.2.2 Pipelines and Pumps

Refer to Section 4.2.2 of Part 2 for TMA of the Manual.

4.2.3 Mobile Equipment

Refer to Section 4.2.3 of Part 2 for TMA of the Manual.

4.2.4 Geotechnical Instruments and Water Monitoring Instruments

Refer to Section 4.2.4 of Part 2 for TMA of the Manual.

Real time water level monitoring system was installed for all sediment control ponds in Summer 2022. After calibration, the system will be online before the winter 2022.

4.2.5 Dam Inspection and Predictive Maintenance

Refer to Section 4.2.5 of Part 2 for TMA of the Manual.

Accumulation of sediments in the sediment control ponds over time reduces their storage capacity. NG is to develop a maintenance plan together with EOR to properly maintain the pond performance.

4.3 Event-Driven Maintenance

Refer to Section 4.3 of Part 2 for TMA of the Manual.

4.3.1 Pipeline Leaks or Breaks

Refer to Section 4.3.1 of Part 2 for TMA of the Manual.

4.3.2 Earthquake Occurrence

Refer to Section 4.3.2 of Part 2 for TMA of the Manual.

4.3.3 Flood Event

Refer to Section 4.3.3 of Part 2 for TMA of the Manual.

4.4 Reporting Requirements

Refer to Section 4.4 of Part 2 for TMA of the Manual.

5.0 SURVEILLANCE

5.1 General

The objective of the surveillance program is to provide confirmation of the adequate performance of the facility, including containment, stability, and operational function by observing, measuring, and recording data relative to potential failure modes and specific operational controls.

The surveillance at sediment pond dams involves:

- Visual Inspections
 - Daily pipeline inspection
 - Monthly dam inspection
 - Drone inspection when needed
- Annual Dam Safety Inspections
- ITRB
- Dam Safety Reviews
- Special Inspections and Increased Levels of Surveillance

5.2 Visual Inspection

5.2.1 Pipeline Inspection

Part of site-wide pipeline inspection conducted twice per 12-hour shift by the Mill. Refer to Section 5.2.1, Part 2 for TMA of this Manual.

5.2.2 Dam Inspection

Part of site-wide monthly inspections. See Appendix A: Dam Monthly Site Inspection Checklists. Refer to Section 5.2.2, Part 2 for TMA of this Manual.

5.3 Dam Safety Inspections

Part of annual site-wide dam safety inspections carried out by the EOR. Refer to Section 5.3, Part 2 for TMA of this Manual.

5.4 ITRB

Part of site-wide water management review in ITRB meeting. Refer to Section 5.4, Part 2 for TMA of this Manual.

5.5 Dam Safety Reviews

Part of site-wide dam safety review. Refer to Section 5.5, Part 2 for TMA of this Manual.

5.6 Special Inspections and Increased Levels of Surveillance

5.6.1 Pond Surcharge

High Pond is defined as NOWL and higher. When the pond exceeds NOWL, special surveillance and increased surveillance is required for every other day. When the pond exceeds MOWL, special surveillance and increased surveillance is required for every day.

See Appendix B – Site Inspection Checklist for Sediment Pond High Pond.

5.6.2 Earthquakes

The TDE in conjunction with the Capital Project Manager and other teams will confirm the significance of the seismic event and level of response required. If the seismic event is significant, an inspection of the facilities must be conducted.

See Appendix B – Site Inspection Checklist for Sediment Pond Post-Earthquake Evaluation.

5.6.3 Increased Seepage through the Dams

Unusual leakage from the dam which may indicate damage to the perimeter dams. TDE will determine a specific surveillance for the increase seepage through the dams is required.

See Appendix B – Site Inspection Checklist for the Increased Seepage at Sediment Pond Dams.

5.6.4 Observed Dam Deformation

Settlement, sinkhole formation, cracking, offsets, leaking or other signs of substantial distress of the perimeter dams. TDE together with the Capital Project Manager will determine a specific surveillance for the observed dam deformation is required.

See Appendix B – Site Inspection Checklist for Observation of Deformation of Sediment Pond Dams.

5.6.5 Other Unusual Conditions

Other conditions that may require increased surveillance, such as rapid snowmelt, heavy rainstorm, or wind, or snowpack is same as for TMA in Part 2 of the Manual.

Accumulation of sediments in the sediment control ponds over time reduces their storage capacity. Visual inspection of the ponds would be carried out during the pond pump down for winter operation to observe the sediment accumulation.

5.7 Instrumentation

No instrumentation for Sediment Pond Dams, WDP and SRP.

5.8 Other Surveillances

5.8.1 Pond Level

Part of site-wide pond level survey. Refer to Section 5.8.1, Part 2 for TMA of this Manual.

5.8.2 Water License Sampling and Testing

Part of site-wide Water License Sampling and Testing program by Environment Department. Section 3.3 provides the sampling, testing, and reporting requirement specific to sediment control ponds according to ECA (2290).

Refer to Section 5.8.2, Part 2 for TMA of this Manual for general information.

5.8.3 Other Survey

All dam crest elevations and spillway/diversion channel invert elevations will be surveyed annually to check the dam settlement threshold.

5.9 Summary of Surveillance Frequency

Refer to Section 5.9 of Part 2 for TMA of the Manual.

5.10 Reporting

Refer to Section 5.10 of Part 2 for TMA of the Manual.

6.0 EMERGENCY PREPAREDNESS AND RESPONSE PLAN

Emergency preparedness aims to ensure that the strategic direction and required building blocks for an eventual response are in place. A detailed Emergency Response and Preparedness Plan (ERPP) is outlined in Part 8 of the OMS.

APPENDIX A

INSPECTION CHECKLISTS

The following inspection checklists are prepared and issued by the Tailings Dam Engineer.

- Monthly Site Inspection Checklist

Sediment Pond #1 DAM – MONTHLY INSPECTION CHECKLIST

Inspector: _____ Date: __

Weather: _____

Reservoir Water Level (m): _____

Inspect the following items for safety, general appearance, and evidence of damage or potential instability.

Legend: ✓ = No change since previous inspection or normal

 D = Defect or deterioration since previous inspection. (Add details under
 “Remarks”)

 - = Not inspected (explanation)

ITEM	Check	REMARKS
1. ACCESS AND SECURITY		
1.1 Access Road		
2. Sediment Pond #1 DAM		
2.1 Dam Crest		
2.1.1 Cracking		
2.1.2 Settlement		
2.1.3 Erosion		
2.1.4 Other Movement, such as Alignment		
2.2 Upstream Slope		
2.2.1 Angles		
2.2.2 Bulging/Cracking		
2.2.3 Erosion		
2.2.4 Non-Uniform Slope		
2.2.5 Settlement		
2.2.6 Sloughing		
2.3 Downstream Slope		
2.3.1 Angles		
2.3.2 Bulging/Cracking		
2.3.3 Erosion		
2.3.4 Non-Uniform Slope		
2.3.5 Settlement		
2.3.6 Sloughing		
2.4 Downstream Toe		
2.4.1 Vegetation		
2.4.2 Wet Spot/ Ice		
2.4.3 Bulging		
2.4.4 Piping		
2.5 Spillway		
2.5.1 Erosion		
2.5.2 Sill		
2.5.3 Toe		

Sediment Pond #2 DAM – MONTHLY INSPECTION CHECKLIST

Inspector: _____ Date: _____

Weather: _____

Reservoir Water Level (m): _____

Inspect the following items for safety, general appearance, and evidence of damage or potential instability.

Legend: ✓ = No change since previous inspection or normal

 D = Defect or deterioration since previous inspection. (Add details under
 “Remarks”)

 - = Not inspected (explanation)

ITEM	Check	REMARKS
1. ACCESS AND SECURITY		
1.1 Access Road		
2. Sediment Pond #2 DAM		
2.1 Dam Crest		
2.1.1 Cracking		
2.1.2 Settlement		
2.1.3 Erosion		
2.1.4 Other Movement, such as Alignment		
2.2 Upstream Slope		
2.2.1 Angles		
2.2.2 Bulging/Cracking		
2.2.3 Erosion		
2.2.4 Non-Uniform Slope		
2.2.5 Settlement		
2.2.6 Sloughing		
2.3 Downstream Slope		
2.3.1 Angles		
2.3.2 Bulging/Cracking		
2.3.3 Erosion		
2.3.4 Non-Uniform Slope		
2.3.5 Settlement		
2.3.6 Sloughing		
2.4 Downstream Toe		
2.4.1 Vegetation		
2.4.2 Wet Spot/ Ice		
2.4.3 Bulging		
2.4.4 Piping		
2.5 Spillway		
2.5.1 Erosion		
2.5.2 Sill		
2.5.3 Toe		

Sediment Pond #3 DAM – MONTHLY INSPECTION CHECKLIST

Inspector: _____ Date: _____

Weather: _____

Reservoir Water Level (m): _____

Inspect the following items for safety, general appearance, and evidence of damage or potential instability.

Legend: ✓ = No change since previous inspection or normal

 D = Defect or deterioration since previous inspection. (Add details under
 “Remarks”)

 - = Not inspected (explanation)

ITEM	Check	REMARKS
1. ACCESS AND SECURITY		
1.1 Access Road		
1. Sediment Pond #1 DAM		
2.1 Dam Crest		
2.1.1 Cracking		
2.1.2 Settlement		
2.1.3 Erosion		
2.1.4 Other Movement, such as Alignment		
2.2 Upstream Slope		
2.2.1 Angles		
2.2.2 Bulging/Cracking		
2.2.3 Erosion		
2.2.4 Non-Uniform Slope		
2.2.5 Settlement		
2.2.6 Sloughing		
2.3 Downstream Slope		
2.3.1 Angles		
2.3.2 Bulging/Cracking		
2.3.3 Erosion		
2.3.4 Non-Uniform Slope		
2.3.5 Settlement		
2.3.6 Sloughing		
2.4 Downstream Toe		
2.4.1 Vegetation		
2.4.2 Wet Spot/ Ice		
2.4.3 Bulging		
2.4.4 Piping		
2.5 Spillway		
2.5.1 Erosion		
2.5.2 Sill		
2.5.3 Toe		

WDP DAM – MONTHLY INSPECTION CHECKLIST

Inspector: _____ Date: _____

Weather: _____

Reservoir Water Level (m): _____

Inspect the following items for safety, general appearance, and evidence of damage or potential instability.

Legend: ✓ = No change since previous inspection or normal

D = Defect or deterioration since previous inspection. (Add details under
 “Remarks”)

- = Not inspected (explanation)

ITEM	Check	REMARKS
1. ACCESS AND SECURITY		
1.1 Access Road		
2. WDP DAM		
2.1 Dam Crest		
2.1.1 Cracking		
2.1.2 Settlement		
2.1.3 Erosion		
2.1.4 Other Movement, such as Alignment		
2.2 Upstream Slope		
2.2.1 Angles		
2.2.2 Bulging/Cracking		
2.2.3 Erosion		
2.2.4 Non-Uniform Slope		
2.2.5 Settlement		
2.2.6 Sloughing		
2.3 Downstream Slope		
2.3.1 Angles		
2.3.2 Bulging/Cracking		
2.3.3 Erosion		
2.3.4 Non-Uniform Slope		
2.3.5 Settlement		
2.3.6 Sloughing		
2.4 Downstream Toe		
2.4.1 Vegetation		
2.4.2 Wet Spot/ Ice		
2.4.3 Bulging		
2.4.4 Piping		
2.5 Spillway		
2.5.1 Erosion		
2.5.2 Sill		
2.5.3 Toe		

SRP DAM – MONTHLY INSPECTION CHECKLIST

Inspector: _____ Date: _____

Weather: _____

Reservoir Water Level (m): _____

Inspect the following items for safety, general appearance, and evidence of damage or potential instability.

Legend: ✓ = No change since previous inspection or normal

 D = Defect or deterioration since previous inspection. (Add details under
 “Remarks”)

 - = Not inspected (explanation)

ITEM	Check	REMARKS
1. ACCESS AND SECURITY		
1.1 Access Road		
2. SRP DAM		
2.1 Dam Crest		
2.1.1 Cracking		
2.1.2 Settlement		
2.1.3 Erosion		
2.1.4 Other Movement, such as Alignment		
2.2 Upstream Slope		
2.2.1 Angles		
2.2.2 Bulging/Cracking		
2.2.3 Erosion		
2.2.4 Non-Uniform Slope		
2.2.5 Settlement		
2.2.6 Sloughing		
2.3 Downstream Slope		
2.3.1 Angles		
2.3.2 Bulging/Cracking		
2.3.3 Erosion		
2.3.4 Non-Uniform Slope		
2.3.5 Settlement		
2.3.6 Sloughing		
2.4 Downstream Toe		
2.4.1 Vegetation		
2.4.2 Wet Spot/ Ice		
2.4.3 Bulging		
2.4.4 Piping		
2.5 Spillway		
2.5.1 Erosion		
2.5.2 Sill		
2.5.3 Toe		

APPENDIX B

SURVEILLANCE RESPONSE PLANS

The Surveillance response Plans (SRP) are intended to provide initial guidance to the first on-site inspector until the extent of the situation has been identified and further surveillance plans and/or remedial options developed.

Surveillance Response Plans for the following scenarios are included in this Appendix:

- High Pond
- Post-Earthquake
- Increased Seepage through the Earth Dam
- Observation of Dam Deformation

The failure mode, duties, and actions are like those developed for TMA dams. Only site inspection checklist has been developed specific for sediment control dams.

SITE INSPECTOR CHECKLIST for Sediment Pond High Pond

Name: _____

Date: _____ Time of arrival: _____

Pond # 1, 2, 3: _____

Inspect the condition of the dams and Spillway

1. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
2. Record weather conditions: _____
3. Record Pond level _____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
 - a. If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
 - a. If yes use seepage checklist to record the details of the observations.
6. Is there damage to the spillway? YES NO
 - a. If yes use seepage checklist to record the details of the observations



Fig 1. Plan View of Sediment Ponds

SITE INSPECTOR CHECKLIST For Sediment Pond Dam Post-EQ Evaluation

Name: _____

Date: _____ Time of arrival: _____

Pond # 1, 2, 3: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level _____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
 • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
 • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damaged to the toe? YES NO
8. Is there damaged to the side walls? YES NO



Fig 1. Plan View of Sediment Pond Dams

**SITE INSPECTOR CHECKLIST
For Increased Seepage at Sediment Pond Dams**

Name: _____

Date: _____ Time of arrival: _____

Pond # 1, 2, 3: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level _____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
 - Depressions
 - Cracking
 - Sinkholes
 - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)



Fig 1. Plan View of Sediment Pond Dams

**SITE INSPECTOR CHECKLIST
for Deformation of Sediment Pond Dams**

Name: _____

Date: _____ Time of arrival: _____

Pond # 1, 2, 3: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level _____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type

a. Cracking or Offset

- i. Along the crest or across the crest
- ii. Length _____ Width _____ of crack
- iii. Vertical offset _____
- iv. Depth of crack _____

b. Slumping or Slide

- i. Length _____ Width _____ of slumped area
- ii. Vertical offset at top of slump _____
- iii. Estimated Volume

c. Sinkhole

- i. Length _____ Width _____
- ii. Depth _____

d. Other types of deformations describe below:

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection

Checklist. Look for signs of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.
11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.
12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
13. Do not leave site until manager instructs you to do so.



Fig 1. Plan View of Sediment Pond Dams

SITE INSPECTOR CHECKLIST for WDP High Pond

Name: _____

Date: _____ Time of arrival: _____

Inspect the condition of the dams and Spillway

1. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
2. Record weather conditions: _____
3. Record Pond level _____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
 - a. If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
 - a. If yes use seepage checklist to record the details of the observations.
6. Is there damage to the spillway? YES NO
 - a. If yes use seepage checklist to record the details of the observations



Fig 1. Plan View of WDP

SITE INSPECTOR CHECKLIST For WDP Dam Post-EQ Evaluation

Name: _____

Date: _____ Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level _____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
• If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
• If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damaged to the toe? YES NO
8. Is there damaged to the side walls? YES NO



Fig 1. Plan View of WDP Dam

**SITE INSPECTOR CHECKLIST
For Increased Seepage at WDP Dam**

Name: _____

Date: _____ Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level _____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
 - Depressions
 - Cracking
 - Sinkholes
 - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)



Fig 1. Plan View of WDP Dams

SITE INSPECTOR CHECKLIST for Deformation of WDP Dam

Name: _____

Date: _____ Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level _____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
 - a. Cracking or Offset
 - i. Along the crest or across the crest
 - ii. Length _____ Width _____ of crack
 - iii. Vertical offset _____
 - iv. Depth of crack _____
 - b. Slumping or Slide
 - i. Length _____ Width _____ of slumped area
 - ii. Vertical offset at top of slump _____
 - iii. Estimated Volume
 - c. Sinkhole
 - i. Length _____ Width _____
 - ii. Depth _____
 - d. Other types of deformations describe below:

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
 - Other areas of deformation
- 10.** If anything looks unusual report back to Capital Project Manager immediately.
 - 11.** Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.
 - 12.** Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
 - 13.** Do not leave site until manger instructs you to do so.



Fig 1. Plan View of WDP Dam

SITE INSPECTOR CHECKLIST for SRP High Pond

Name: _____

Date: _____ Time of arrival: _____

Inspect the condition of the dams and Spillway

7. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
8. Record weather conditions: _____
9. Record Pond level _____
10. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
 - a. If yes use deformation checklist to record details of the observations.
11. Is there any sign of new or increased seepage? YES NO
 - a. If yes use seepage checklist to record the details of the observations.
12. Is there damage to the spillway? YES NO
 - a. If yes use seepage checklist to record the details of the observations



Fig 1. Plan View of SRP

SITE INSPECTOR CHECKLIST For SRP Dam Post-EQ Evaluation

Name: _____

Date: _____ Time of arrival: _____

Inspect the condition of the dam:

- 9. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
- 10. Record weather conditions: _____
- 11. Record Pond level _____
- 12. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
 - If yes use deformation checklist to record details of the observations.
- 13. Is there any sign of new or increased seepage? YES NO
 - If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

- 14. Is there damage to the Sill? YES NO
- 15. Is there damaged to the toe? YES NO
- 16. Is there damaged to the side walls? YES NO



Fig 1. Plan View of SRP Dam

**SITE INSPECTOR CHECKLIST
For Increased Seepage at WDP Dam**

Name: _____

Date: _____ Time of arrival: _____

17. Check that it is safe to approach the seepage area.
18. Record location of seepage below and mark on attached plan drawing.
19. Measure / estimate rate of seepage.
20. Check to see if the seepage water is “dirty”.
21. Stake out and measure area where seepage is exiting the dam.
22. Dimensions of Seepage Zone
23. Check for any erosion or sloughing in area where seepage is exiting the dam.
24. Record weather conditions: _____
25. Record pond level _____
26. Photograph seepage area
27. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

28. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
 - Depressions
 - Cracking
 - Sinkholes
 - Changes in the alignment along the crest
29. If anything looks unusual report back to Capital Project Manager immediately.
30. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
31. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
32. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)



Fig 1. Plan View of SRP Dams

**SITE INSPECTOR CHECKLIST
for Deformation of SRP Dam**

Name: _____

Date: _____ Time of arrival: _____

- 14.** Check that it is safe to approach the deformed area.
- 15.** Record Pond level _____
- 16.** Estimate Freeboard _____
- 17.** Record location of deformed area below and mark on attached plan drawing.
- 18.** Deformation Type

- a. Cracking or Offset
 - i. Along the crest or across the crest
 - ii. Length _____ Width _____ of crack
 - iii. Vertical offset _____
 - iv. Depth of crack _____
- b. Slumping or Slide
 - i. Length _____ Width _____ of slumped area
 - ii. Vertical offset at top of slump _____
 - iii. Estimated Volume
- c. Sinkhole
 - i. Length _____ Width _____
 - ii. Depth _____
- d. Other types of deformations describe below:

- 19.** Photograph deformed area.
 - 20.** Call details back to Capital Project Manager.
 - 21.** Once measurements are completed stake area and monitor for further movements.
- If no further direction given by Capital Project Manager continue with the following:
- 22.** Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
 - Other areas of deformation
23. If anything looks unusual report back to Capital Project Manager immediately.
 24. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.
 25. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
 26. Do not leave site until manger instructs you to do so.



Fig 1. Plan View of SRP Dam