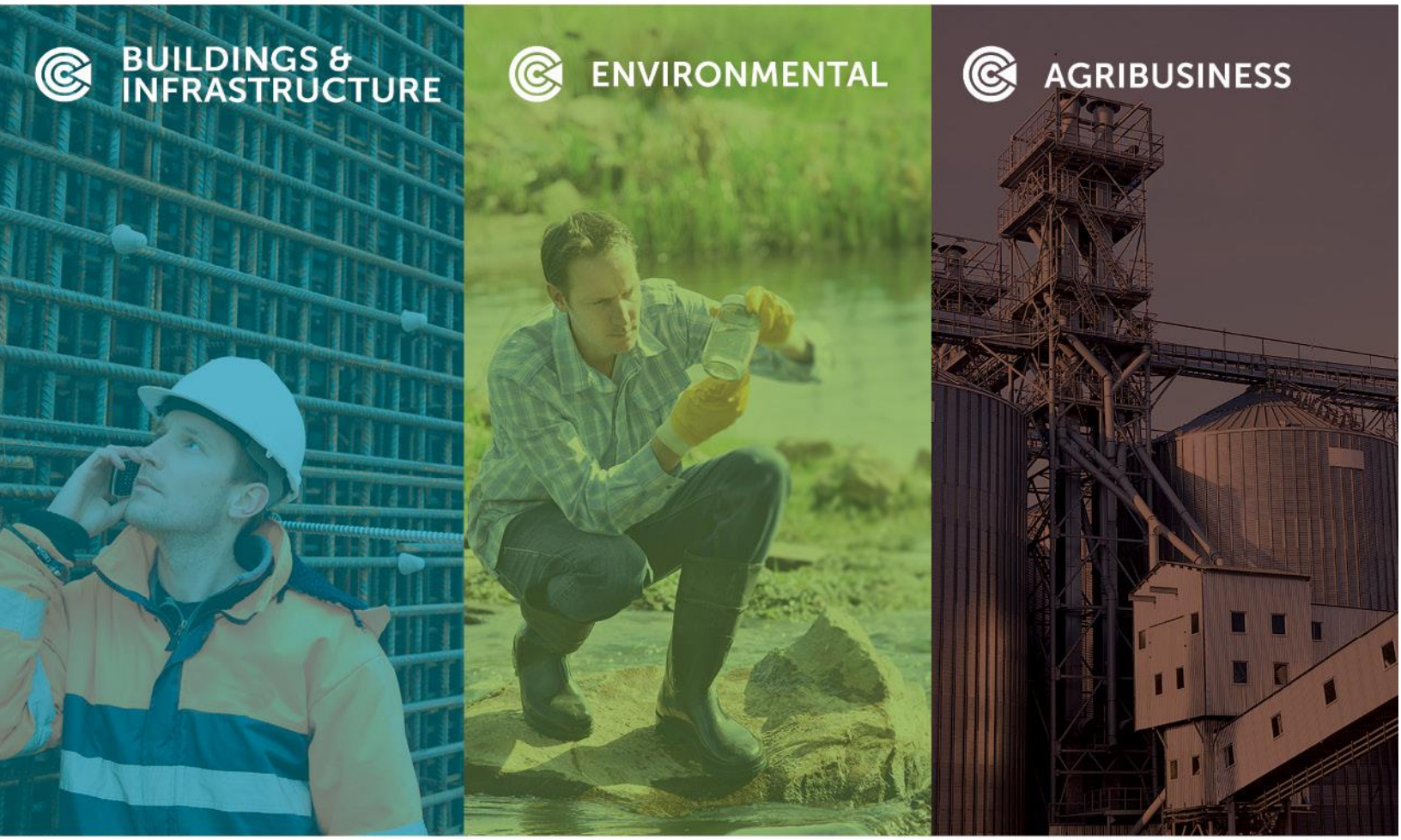
CONCENTRIC
CLIENT-CENTRIC. CHALLENGE DRIVEN.

concentriceng.com



LAKE GERALDINE DAM
DAM SAFETY INSPECTION 2023 #2
IQALUIT, NUNAVUT

PRODUCED FOR: THE CITY OF IQALUIT
C/O COLLIERS PROJECT LEADERS

PRODUCED BY: CONCENTRIC ASSOCIATES INTERNATIONAL INCORPORATED

CONCENTRIC REFERENCE NUMBER: 21-9162

DATE: JULY 24TH, 2023

TABLE OF CONTENTS

LIST OF APPENDICES

1. INTRODUCTION AND SCOPE OF WORK

This Dam Safety Inspection (DSI) of the Lake Geraldine Dam (LG Dam) has been prepared for the City of Iqaluit (City). As the owner and operator of the LG Dam, the City of Iqaluit is responsible for its safe management and operation. The intent of this DSI is to assist the City by identifying any visual changes in the condition of the LG Dam, identifying any new concerns, and making recommendations on maintenance, repairs, or further investigations.

1.1 Dam Safety Guidelines

The most recent Dam Safety Guidelines (DSG), published by the Canadian Dam Association, were first released in 2007 and further revised in 2013. The DSG applies, in general, to those structures that are at least 2.5 meters in height, and which have at least 30,000 cubic meters of storage capacity. The LG Dam exceeds these minimum requirements and therefore requires annual DSI's. The DSI is considered to be an Engineering Inspection which is recommended by the DSG to be performed annually or semi-annually by a professional engineer. A Dam Safety Review (DSR) is required, at a minimum, every 5 years. The most recent DSR was performed in April 2022.

This DSI forms part of the dam's permanent record documentation along with other documentation that make up the historical record of the dam (and berms). Section 3.6 "Surveillance" of the DSG recommends more frequent visual inspections be performed. Routine inspections performed by City staff trained in dam surveillance are recommended on a weekly basis to identify any conditions that might indicate a change in the dam's performance.

1.2 Description of Structure

The LG Dam is comprised of a concrete section with an integral concrete spillway, and three earthen berms: the north, center, and south berms. See below for a reference site plan and Appendix A for site photographs.

The 15.3 m wide spillway has an upper elevation of 111.3 m (representing the current maximum operating level of the reservoir), while the concrete dam sections on either side of the spillway have an elevation of 112.3 m. At the maximum operating level of the reservoir, the concrete dam has approximately 0.95 m of freeboard.

The southern section of the concrete dam extends approximately 39.1 m to the south rock abutment. The northern section of the concrete dam extends 13.3 m to the north of the spillway section, where it joins the center earth berm.

The center earth berm extends north approximately 75 m where it meets the access ramp and north access road. The north earth berm is located to the north of the access road ramp and extends 60m to the north rock abutment.

The south earth berm is a separate structure that is located in a valley to the south of the main concrete dam. The south berm is approximately 68.5 m long. The north and center berms incorporate a concrete cutoff wall which is reportedly founded in rock at the base of the berms.

Site Plan

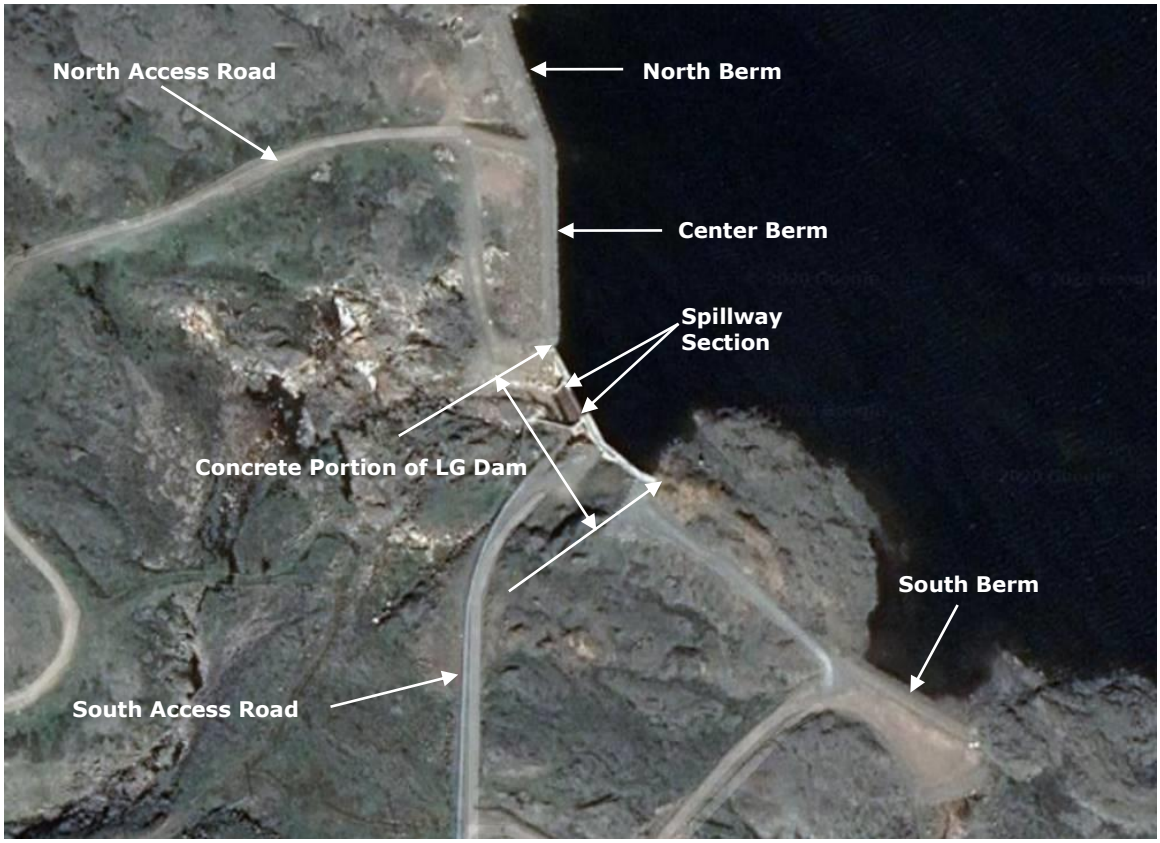


Table 1.1: Lake Geraldine Dam Summary*

Dam/Berm Segment	Length (m)	Crest Elevation	Base Elevation	Bedrock Elevation	Height of Dam/Berm (m)
North Berm	55.5	112.5	108.3	105.0	4.3
Center Berm	78.0	112.5	108.3	97.5	4.5
North Dam	13.3	112.3	102.6	97.5	11.0
Spillway	15.3	111.3	101.6	96	10.0
South Dam	39.1	112.3	102.6	97.5	11.0
South Berm	68.5	112.5	111.5	110.0	1.0

*Tabular data based upon Meco "Dam Safety Management Plan", July 2020

1.3 Scope of Work

As per the requirements of the Dam Safety Guide, the primary task of this DSI is to help identify any significant visual changes in the condition of the concrete dam and earthen berms based on a comparison with the previous inspections and reviews. A visual inspection can identify issues related to dam safety and provides the City of Iqaluit with the opportunity to mitigate any observed concerns or issues. This DSI report is the

primary deliverable and has been prepared in accordance with the Dam Safety Guide document.

The following is a summary of the scope of work for this assignment:

- Conduct a visual on-site assessment of the dam and berms above the water line;
- Prepare a photographic record documenting general and representative conditions;
- Identify, characterize, and risk-assess any significant visual changes in condition;
- Prepare a written report summarizing our observations, items of concern, and recommendations;
- Indicate any recommended repairs and outstanding recommendations from previous inspections and reviews;
- Develop a prioritized list of recommended repairs, upgrades, and improvements with Class D cost estimates;
- Submit final documents in electronic format.

2. HISTORY & BACKGROUND

2.1 Reservoir

The City of Iqaluit derives its water supply from Lake Geraldine, which is retained by a structure consisting of a cast in place concrete section incorporating an integral spillway, and three earthen berms. All concrete structures are reported to be founded on bedrock and engage the rock abutment at the south end of the concrete structure.

Lake Geraldine is a natural body of water in an irregularly shaped basin. It is fed by rainfall and snow/ice melt from a watershed with an area of approximately 385 hectares.

2.2 History

In the late 1950's, the demand for a reliable year-round source of water resulted in the construction of a cast in place concrete gravity dam and a section of earth berm with a central cast in place concrete cut off wall. The project was designed and built by the Department of National Defense. According to the documentation available, the original construction took place circa 1958.

Since that time, as the City has grown and water demands have risen, the dam has been raised four times to increase the storage capacity. In recent years, the City of Iqaluit has been pumping additional water into the reservoir in the summer and fall of the year from a river located east of the reservoir.

The first height increase (0.3m) of the concrete dam and berms reportedly took place in 1979. This involved a concrete extension, which was dowelled into the existing structure.

The second height increase of the concrete dam and berms took place in 1985 and increased the height of the spillway structure by approximately 1.15m. The berm portion was widened and heightened as well to accommodate the increased storage capacity of the reservoir. The extension of the concrete dam was constructed with concrete and steel

reinforcement, dowelled into the existing structure and incorporated a steel formwork frame over the spillway section.

The third extension was undertaken in 1995 and increased the height of the concrete structures by a further 1.5m, with a corresponding increase in berm geometry. Based on analysis done prior to the extension, it was determined that the concrete structures would not have an adequate factor of safety against overturning if the extension was simply "dowelled-in" as before. The 1995 alteration therefore included an extensive rock-anchoring program for the concrete portions to provide the required stability to the structure.

The latest extension was completed in two phases over 2005/06. Additional rock anchors were installed thought the concrete structures in 2005 in preparation for a further height extension of 2 m in 2006. The existing berms were enlarged and the existing cut-of-walls within the north and center berms were extended in height. A new berm (south berm) and cut off wall were installed to the south of the main dam structure. A subsequent technical analysis of the dam and earth berms completed in 2020 indicated that the spillway structure is marginally compliant for stability with relying on rock anchors to resist overturning. CDA guidelines indicate that it is not recommended that passive rock anchors are relied on for stability. The geotechnical investigation completed in 2019 concluded that the bedrock below the concrete dam appeared to be fractured and that the loading capacity of the rock bolts (installed in 2006) would not meet the design expectations. Additional information on this investigation is available within the report produced by Meco and titled, "Technical Analysis & Risk Assessment, Lake Geraldine DSMP", dated 16 July 2020.

In August 2019 various repairs were undertaken to repair the upstream face (below the water line) of the dam. These repairs included:

- Repair of the expansion joint.
- Polyurethane crack injection.
- Localized concrete repairs.

The last major repair program undertaken was completed in the summer of 2021, various repairs were undertaken to maintain the concrete structures, berms, and access roads. These repairs included:

- Placement of additional aggregate material and regrading of the north and south access roads.
- Installation of additional riprap/armor stone on the upstream face of the center and north berms.
- Installation of additional aggregate and regrading of the top of the center and north berms.
- Crack repair and sealing on the downstream face of the concrete structures.
- Concrete repair on the downstream face of the dam.

Replacement of the expansion joint sealant material on the downstream face of the concrete structures was started in 2021; however, the work could not be completed due to local weather and site conditions. This work was completed in July 2022.

Additional improvements were undertaken in the summer of 2022. These repairs included:

- Installation of eight survey monuments (incomplete at this time).
- Installation of water pressure (piezometer) and temperature data monitoring stations.
- Re-establishment of aggregate stock piles on site.

Installation of the additional aggregate material is complete; however, installation of the sensor instrumentation and survey monuments remains partially incomplete at the time this report was prepared.

3. DAM SAFETY INSPECTION

3.1 Site Inspections and Staff Interviews

A visual site inspection of the LG Dam was performed on July 24, 2023 by C.E. McDonald, of Concentric. The inspection was non-invasive in nature and did not include an underwater survey or assessment. For general overview photographs see the photograph in Appendix A.

A summary of observed conditions is as follows:

- Ice and snow were present in the drainage corridor downstream of the dam. No other ice and snow was observed in the area.
- The level of the reservoir by visual observation was at capacity. Water was spilling over the spillway due to light wind.
- The concrete barriers on the South access road were in place. The North and South gate were left open, presumably since the previous inspection.
- The power pole that had previously supplied power to the temporary water treatment facility at the South berm has been removed. It does not appear as though the VOC contaminated soil observed at the base of the pole and noted in DSI no. 4, dated September 29, 2022 had been removed from site.
- No significant changes were noted in the general condition of the visible portions of the concrete structures.
- No change in condition to the small rut identified in the previous report at the north end of the south berm (presumably from a vehicle).
- Seepage / leakage could was observed at the base of the concrete dam at the interface between the bedrock and the concrete dam.
- The rip rap at the base of the concrete dam, within the spillway, needs to be adjusted. The rip rap has been displaced and is no longer covering all portions of the base of the dam. Water was spilling over the spillway at a rate that could cause undermining at the toe of the spillway. The rip rap at the base of the concrete dam needs to be adjusted immediately to prevent further scouring of aggregate from the base of the dam. Miscellaneous materials were observed in the spillway.
- The aggregate stockpiles located on the downstream side of the North berm were observed and it appears there is adequate material on site for emergency repairs.

- The hydraulic fluid observed atop the center and north berms in the report dated June 8, 2023, has not yet been removed and replaced. The Contractor has been advised to correct this item by Concentric.
- Portions of the earthen berm have been disturbed at the base of the piles at several locations, the contractor has been directed to correct this item at all affected locations.
- The rip rap lip at the upstream face of the South Berm has a depression from the GNs mobile water treatment plant. Rip rap should be adjusted to meet the profile of the upstream face of the earthen berm.
- A small section of the sealant material within the top of the concrete dam is missing at the south end of the dam. This material should be replaced in the immediate future.
- Members of the public continue to access the Dam structures and Lake Geraldine.
- Several depressions within the upstream face of the dam were noted when the water level was low in June 2022, these depressions were not corrected when the water level was low in the spring of 2023. It is recommended these depressions be corrected at the earliest possible opportunity.
- The survey monuments and the data logger enclosures are in place, some minor work is required to complete these installations. This work includes adjustments to the pile casing opening at the base of the piles and re-instatement of the (granular fill) berm adjacent to the piles. The Contractor has been advised by Concentric to address these items.
- Installation of five of the ten, temperature data loggers was completed on Thursday June 8, 2023. The data loggers are now operational and recording temperature data at these locations every 30 minutes. Installation of the remaining temperature data loggers will be completed in the immediate future (August 2023).
- Erosion of the North access road was noted during our review. Basic grading and maintenance is required along the access road. Periodic repairs to the road from erosion is necessary however, installation of additional culverts would reduce the frequency and severity of repairs required.
- The steel cover for the piezometer at the South end of the spillway was not attached to the mounting brackets. Nunavut excavating will need to repair the steel cap.
- Signage at the North end of the North berm is falling over.
- With the exception of the above noted, no significant changes, such as sloughing, slides, bulging or displacement, were noted in the earthen berms. No active seepage/leakage was observed within the visible portions of the berms.

3.2 Dam Safety Analysis

A dam safety analysis was not completed as part of this inspection; however, there were no obvious indicators that the concrete structures have had significant changes since the last DSI.

3.3 Operation, Maintenance, and Surveillance

This DSI falls under the requirements of a visual inspection by an engineer as stated in Section 3.6 "Surveillance" of the Dam Safety Guide. The lack of a centralized repository of operational and maintenance records has been an ongoing issue. This, along with other issues regarding the operation and maintenance of the dam and reservoir, is noted within both the "Dam Safety Management Plan" dated July 16, 2020 prepared by MECO and the 2021 Dam Safety Review dated May 31, 2022 prepared by Concentric.

3.4 Recommendations and Required Action

Based on our inspection and review, we recommend the following:

1. Items deemed to be of an immediate need include:
    a. Removal of the contaminated soil around the base of the hydro pole adjacent to the south berm.
    b. Removal and replacement of the contaminated soil atop the center and north berms. The contractor undertaking the 2022 dam repairs has been directed to complete this work.
    c. Installation of new rip-rap material should be installed within the upstream face of the north and center berms prior to the reservoir being re-filled. This work should be scheduled for the spring of 2024.
    d. Minor work will be required to repair erosion damage within the north access road, we recommend that the City consider the installation of new steel culverts at the two locations where erosion is most active.
    e. Reinstate the cap on the piezometer at the South end of the spillway.
2. Updating of the permanent record file and its storage in a central location with an index that documents the date and contents of all records. The permanent record file needs to include:
    a) As-built drawings and specification for work undertaken at the dam.
    b) Weekly/monthly inspections completed by City staff.
    c) Dam Safety Inspections and Dam Safety Reviews generated by third parties on behalf of the City of Iqaluit.
    d) All maintenance records.
    e) Correspondence with regulatory agencies.
    f) Dam operation, maintenance, and surveillance documents.
    g) Reports and documentation generated by third parties on behalf of the City of Iqaluit.
3. Implement a public awareness program to educate and inform the public that:
    a) The dam and earthen berms are a *no trespass* area.
    b) Dog walkers should not allow their pets to travel atop and across the earthen berms due to the risk of (dog) fecal matter contamination of the potable water supply.

c) ATV and skidoos should not be traveling atop the berms and across Lake Geraldine.

4. The installation of video surveillance should be considered in the future.
5. Exercising and testing of the valves within the valve chamber is required as part of preventative measures. The condition of the valves within the valve chamber at the base of the dam was previously identified as being in an advanced state of corrosion. To our knowledge no maintenance or testing has been completed on the controls valve in the last 10+ years. There is a significant potential for the valves to fail and not operate correctly when needed in an emergency. A study to address this issue is currently underway.
6. Underwater survey of the concrete dam and spillway is recommended within the next 12 months.
7. Undertake a test opening on the downstream side of the concrete dam and center berm in late January – early February 2024 to ascertain the source of the water that forms large ice sheets within the valley in the winter months.
8. Repair of cracks within the concrete dam, this work is tentatively scheduled for summer 2024.
9. Repair of spalled concrete within the concrete dam, this work is tentatively scheduled for summer 2024.

4. LIMITATIONS

This report was prepared for the sole use of the City of Iqaluit.

This report was prepared exclusively for the purpose, project, and site locations outlined in this report. The report is based on information provided to, or obtained by Concentric as indicated in the report, and applies solely to site conditions existing at the time of the site investigations.

The conditions of the site may change over time or may have already changed due to natural forces or human intervention, and Concentric takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report.

The report does not extend to any latent defect or other deficiency which could not have been reasonably discoverable or discovered within the scope of the report. Information supplied by the City of Iqaluit or third parties for use in this report has not been verified by Concentric unless stated otherwise.

Concentric's report represents a review of available information with an established work scope, schedule, and budget. The material in the report reflects Concentric's judgement in light of the information available to it at the time of preparation. Any uses that a third party makes of this report, or any reliance on decisions made based on it, are the responsibilities of such third parties.

Concentric accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made based on this report.

Should there be any questions, please contact the undersigned.

Yours sincerely,

CONCENTRIC

Cameron McDonald
Project Manager

Steve Parker, P.Eng.
Lead Project Manager

APPENDIX A
Site Photographs

Photograph 1 – Overview of concrete dam structure.

Photograph 2 – Overview of concrete dam structure.

Photograph 3 – Downstream face of the North berm.

Photograph 4 – Top of the North berm.

Photograph 5 – Top of Centre berm.

Photograph 6 – South berm, note the electrical pole adjacent to the berm has been removed.

Photograph 7 - Depression in rip rap lip on South berm.

Photograph 8 – Hydro pole removed from pile braces at the downstream face of the South Berm. Note creosote contamination in the soil.

Photograph 9 – Rip Rap disrupted at the downstream face of the South Berm.

Photograph 10 – Oil residue (hydraulic fluid) atop the center berm from drill rig.

Photograph 11 – Deteriorated section of the expansion joint sealant (top of dam).

Photograph 12 – Typical temperature data logger installation.

Photograph 13 – Piezometer cap is knocked off of its base at the South end of the spillway.

Photograph 14 – Seepage adjacent to buttress along Gridline I.

Photograph 15 – Water level spilling over the spillway.

Photograph 16 – Ponding at the North side of the access ramp to the North and Centre berms.

Photograph 17 – Erosion on the North access road due to spring melt.

Photograph 18 – Signage at the North end of the North berm is falling over.

APPENDIX B

Lake Geraldine Dam Inspection Checklist

Lake Geraldine Dam
Inspection Check List

Inspector Name:	Cameron McDonald	Reviewer:	
Inspection Date:	July 24, 2023	Review Date:	
Weather:	10°C, Sunny	Action Required:	

Sketch the deficiency, and note its important characteristics.
Measure the deficiency.
Photograph the deficiency or describe its characteristics in writing.
Locate the deficiency relative to a recognizable reference point.
https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=10UH013

General Observations

Description	Yes	No	Observations	Action Required
Snow and ice present on dam & berms		X	Some snow and ice present down the spillway 100-200m from toe of dam.	
Snow and ice present on the lake		X		
North access road, gate secured (Any visible damage)		X	Gate was not locked, no visible damage. The North access road needs to be graded.	
South access road, gate secured (Any visible damage)		X	Gate was not locked, no visible damage	
Gates on the concrete dam locked (north and south ends on top of dam)	X			
Gates and fencing on top of dam intact or damaged			Intact	

Lake Geraldine Dam
Inspection Check List

Description	Yes	No	Observations	Action Required
Vandalism		X		
Debris on site or in the lake		X		
Dam signage intact or damaged			Signage at the North end of the North berm is displaced/falling over.	X
Valve chamber condition and damage (Indicate if there is any cracking, displacement, physical damage, cover is in place, etc)		X		
Uncontrolled breach in the concrete dam or earthen berms (embankments)		X		
Animal Activity:		X		
Additional Comments, Sketches or Observations				

Concrete Dam and Spillway				
Description	Yes	No	Observations	Action Required
Water level relative to sill of spillway (measure from top of the concrete dam) Is there flow over the spillway			The water was overflowing at the spillway. The reservoir was at the maximum capacity.	
Cracking / spalling present on top (surface) of the concrete dam (Indicate if new, existing, expanded, length, width, depth)		X		
Cracking / spalling present on upstream face (surface) of the concrete dam (Indicate if new, existing, expanded, length, width, depth)		X		
Cracking / Spalling present on Downstream face (surface) of the concrete dam (Indicate if new, existing, expanded, length, width, depth)		X		
Active seepage / leakage through dam Is there silt / sand within the leaking water (Indicate location and rate of leakage in liters per minute)		X		
Sealant Condition – Top of Dam			Sealant has been displaced (possibly due to ravens) in some locations.	
Sealant Condition – Up stream face of Dam			Could not be visually verified.	
Sealant Condition – Downstream face of Dam			Fair	
Active seepage / leakage at: - Interface between concrete and ground (bedrock) - Sealant joints	X		Seepage occurring at the interface of the dam and the bedrock on the South portion of the concrete dam.	

Description	Yes	No	Observations	Action Required
Displacement, settlement or misalignment of sections of the dam		X		
Debris / blockage within the spillway and or drainage channel at base of dam		X		X
Erosion at the base of the spillway	X		Rip Rap in the spillway is displaced. Potential for undermining to occur with the water spilling over the spillway.	
Monitoring stations (condition, damage, other)	X		The steel cover for the piezometer at the base of the dam has been dislodged and needs to be replaced.	X

Additional Comments, Sketches or Observations

North Berm				
Description	Yes	No	Observations	Action Required
Sloughing, slides, bulging, collapse or displacement within the earthen berm – Top of Berm		X		
Sloughing, slides, bulging, collapse or displacement within the earthen berm - Upstream Face		X		
Sloughing, slides, bulging, collapse or displacement within the earthen berm - Downstream Face		X		
Depressions or sink holes within the top (crest) of the berm		X		
Depressions or sink holes within the upstream face of the berm		X		
Depressions or sink holes within the downstream face of the berm		X		
Rock, gravel or aggregate displacement or washout (erosion) with the top of the berm		X		
Rock, gravel or aggregate displacement or washout (erosion) within the upstream face of berm		X		
Rock, gravel or aggregate displacement or washout (erosion) within the downstream face of berm		X		

Description	Yes	No	Observations	Action Required
Displaced rip-rap /armor stone on the upstream face of berm		X		
Displaced rip-rap /armor stone on the downstream face of berm		X		
Transverse / longitudinal cracking, within the Top / crest of the berm (Indicate if new, existing, expanded, length, width)		X		
Transverse / longitudinal cracking, within the Upstream face of the berm (Indicate if new, existing, expanded, length, width)		X		
Transverse / longitudinal cracking, within the Downstream face of the berm (Indicate if new, existing, expanded, length, width)		X		
Wet area or active leakage / seepage within the downstream side face of berm Is there silt / sand within the leaking water		X		
Ponding water at base of the berm (downstream), is there sand or silt suspended within the water		X		

Additional Comments, Sketches or Observations

Hydraulic fluid stain on top of the North berm not yet removed.

Center Berm				
Description	Yes	No	Observations	Action Required
Sloughing, slides, bulging, collapse or displacement within the earthen berm – Top of Berm		X		
Sloughing, slides, bulging, collapse or displacement within the earthen berm - Upstream Face		X		
Sloughing, slides, bulging, collapse or displacement within the earthen berm - Downstream Face		X		
Depressions or sink holes within the top (crest) of the berm		X		
Depressions or sink holes within the upstream face of the berm		X		
Depressions or sink holes within the downstream face of the berm		X		
Rock, gravel or aggregate displacement or washout (erosion) with the top of the berm		X		
Rock, gravel or aggregate displacement or washout (erosion) within the upstream face of berm		X		
Rock, gravel or aggregate displacement or washout (erosion) within the downstream face of berm		X		

Description	Yes	No	Observations	Action Required
Displaced rip-rap /armor stone on the upstream face of berm		X		
Displaced rip-rap /armor stone on the downstream face of berm		X		
Transverse / longitudinal cracking, within the Top / crest of the berm (Indicate if new, existing, expanded, length, width)		X		
Transverse / longitudinal cracking, within the Upstream face of the berm (Indicate if new, existing, expanded, length, width)		X		
Transverse / longitudinal cracking, within the Downstream face of the berm (Indicate if new, existing, expanded, length, width)		X		
Wet area or active leakage / seepage within the downstream side face of berm Is there silt / sand within the leaking water		X		
Ponding water at base of the berm (downstream), is there sand or silt suspended within the water		X		

Additional Comments, Sketches or Observations

Hydraulic fluid not yet cleaned up.

South Berm				
Description	Yes	No	Observations	Action Required
Sloughing, slides, bulging, collapse or displacement within the earthen berm – Top of Berm		X		
Sloughing, slides, bulging, collapse or displacement within the earthen berm - Upstream Face		X		
Sloughing, slides, bulging, collapse or displacement within the earthen berm - Downstream Face		X		
Depressions or sink holes within the top (crest) of the berm		X		
Depressions or sink holes within the upstream face of the berm		X		
Depressions or sink holes within the downstream face of the berm		X		
Rock, gravel or aggregate displacement or washout (erosion) with the top of the berm		X		
Rock, gravel or aggregate displacement or washout (erosion) within the upstream face of berm		X		
Rock, gravel or aggregate displacement or washout (erosion) within the downstream face of berm		X		

Description	Yes	No	Observations	Action Required
Displaced rip-rap /armor stone on the upstream face of berm	X		GN treatment plant displaced rip rap lip on upstream face of berm.	X
Displaced rip-rap /armor stone on the downstream face of berm	X		When the monitoring station was installed, backfill was not adequately placed. There is a pit around the base of the monitoring station that needs to be filled in.	X
Transverse / longitudinal cracking, within the Top / crest of the berm (Indicate if new, existing, expanded, length, width)		X		
Transverse / longitudinal cracking, within the Upstream face of the berm (Indicate if new, existing, expanded, length, width)		X		
Transverse / longitudinal cracking, within the Downstream face of the berm (Indicate if new, existing, expanded, length, width)		X		
Wet area or active leakage / seepage within the downstream side face of berm Is there silt / sand within the leaking water		X		
Ponding water at base of the berm (downstream), is there sand or silt suspended within the water		X		

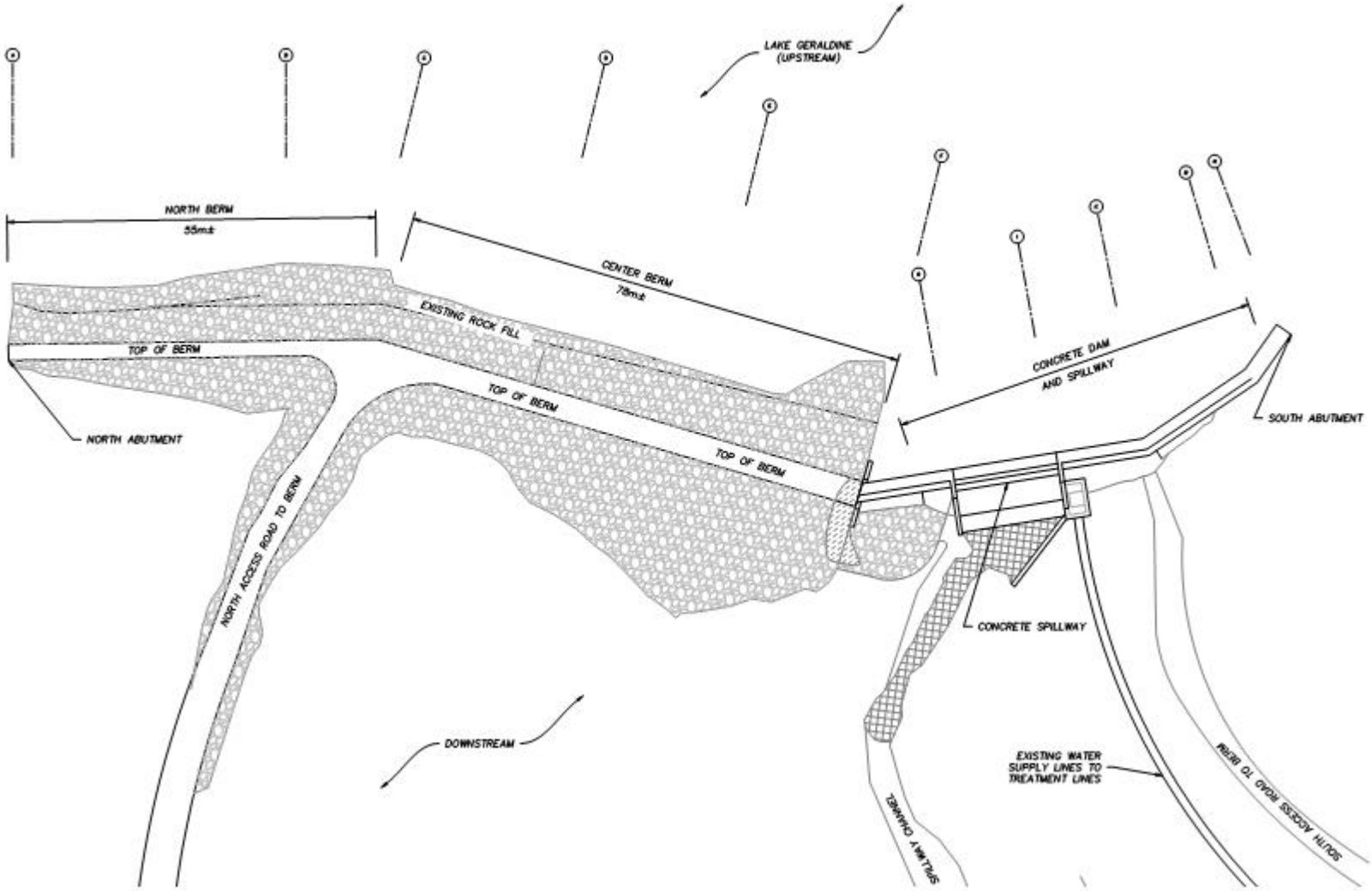
Additional Comments, Sketches or Observations

Tire mark noted at the North end of the South berm. Not repaired since previous inspection.

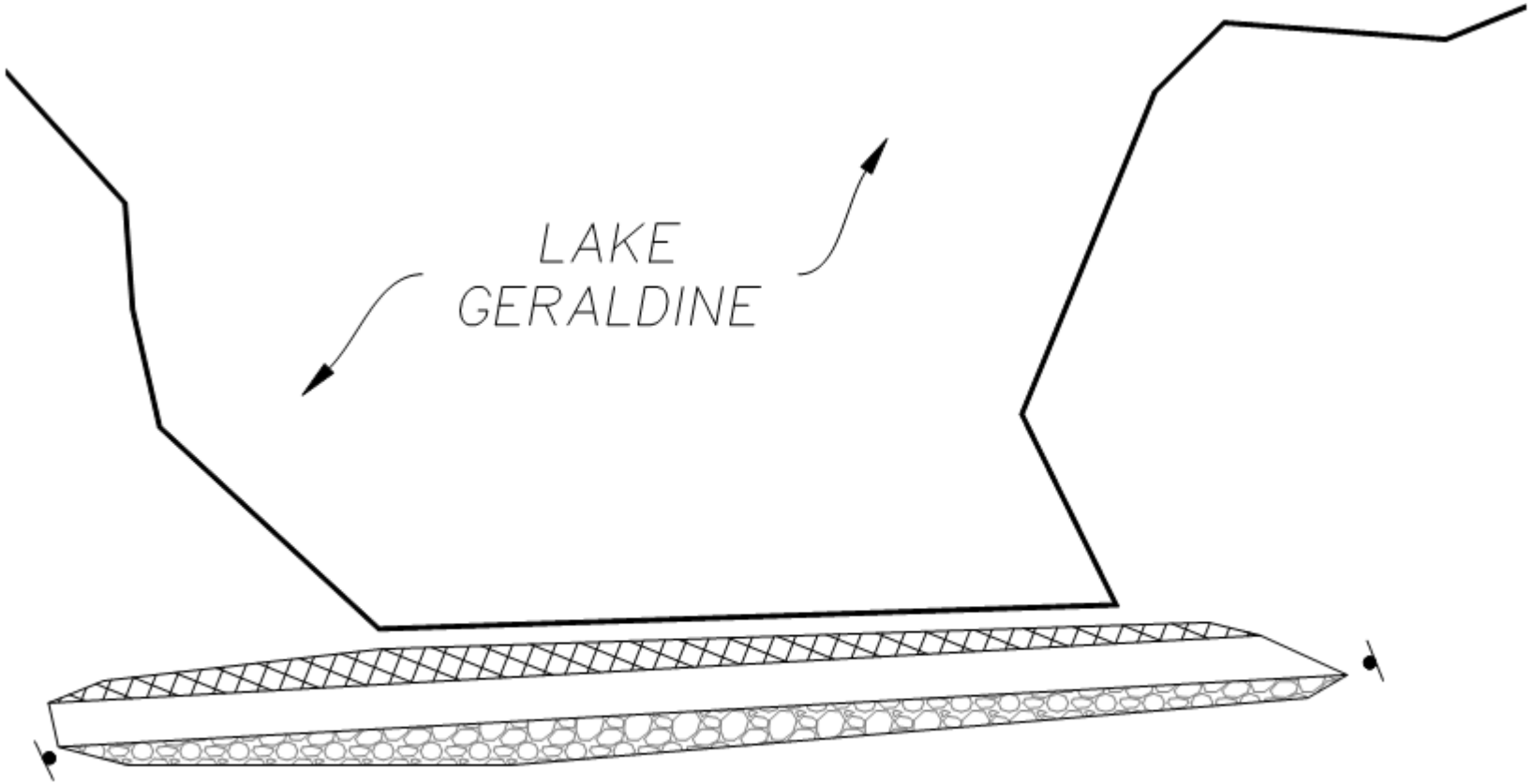
The power pole that had been leaking creosote into the soil near the South berm had been removed, however, the soil that was heavily contaminated with creosote has not yet been remediated.

Lake Geraldine Dam Location Plan

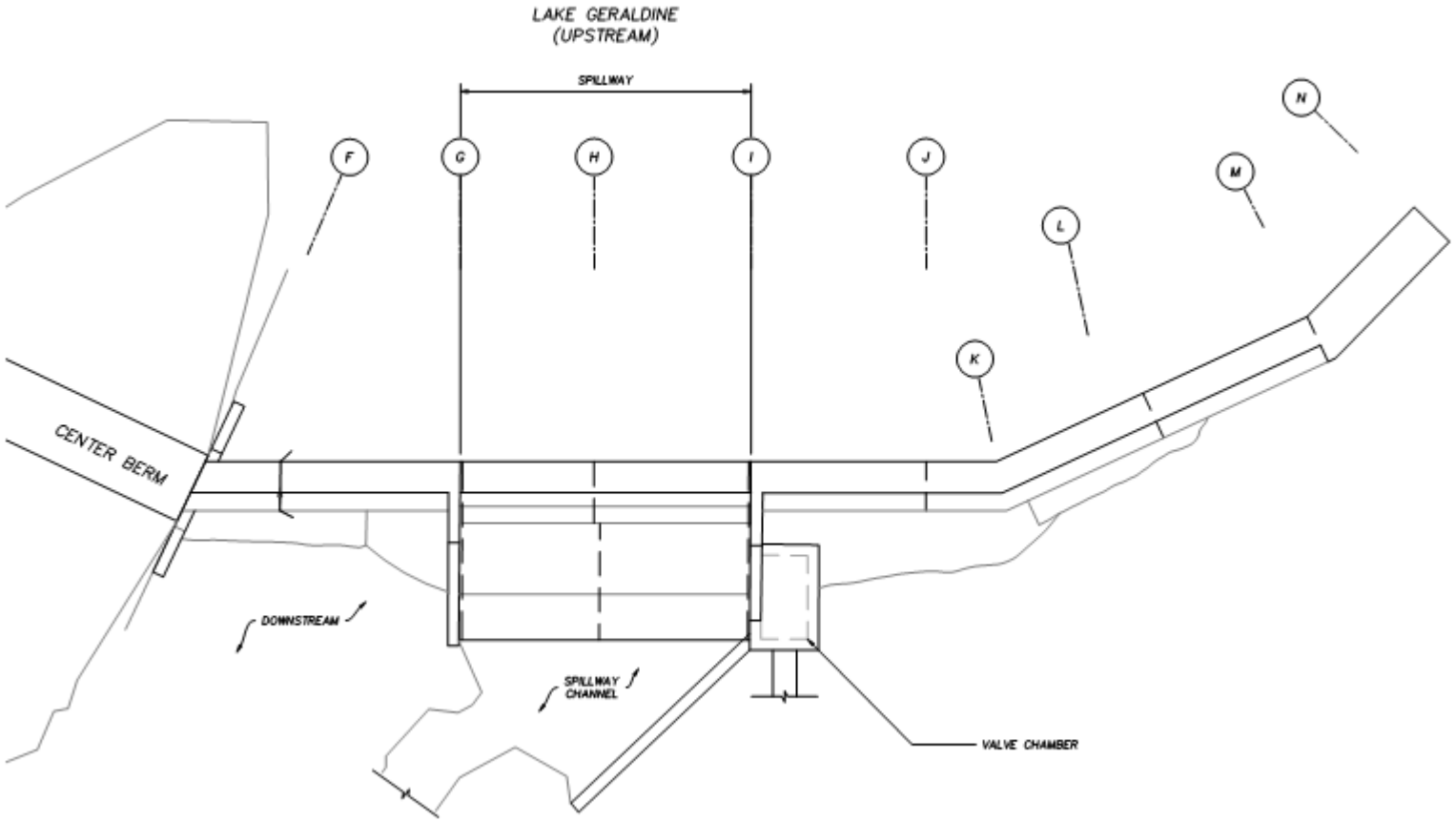
Site Plan – Concrete Dam, Center and North Berms



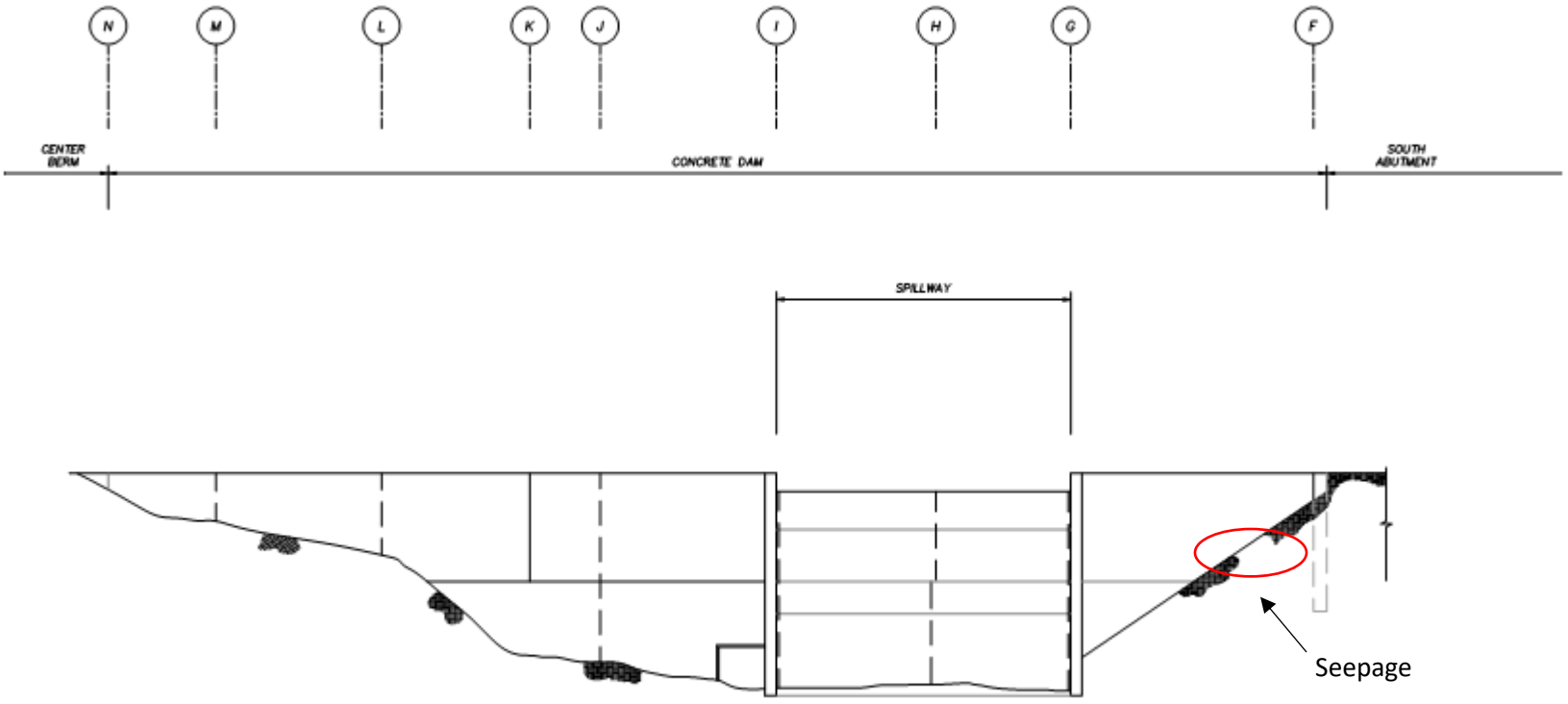
Site Plan – South Berm



Plan View – Concrete Dam and Spillway



Elevation – Upstream Face, Concrete Dam and Spillway



Elevation – Downstream Face, Concrete Dam and Spillway