June 18, 2007
Ms. Violet Camsell-Blondin
Chair
Wek’èezhii Land and Water Board
Box 32
Wekweeti, NT X0E 1W0

Re: A21 Dike

Over the last few months DDMI has discussed plans for the construction of the A21 dike with Board Staff. The A21 dike alignment has been optimized and as a result, the dike footprint and area of the lake to be dewatered will be significantly smaller. The attached drawing (Figure 1) shows the original A21 dike plan and the current design.

The A21 dike will be constructed from the island just south of the East Island (now called South Island). There will be two phases of construction. The first site preparation phase will begin during the summer of 2007 and will involve the construction of a road access to the dike construction area. To access the South Island a short causeway will be required as shown in Figure 1.

The attached Construction Environmental Management Plan – A21 Causeway describes:

- the causeway design (including engineering drawings) and schedule,
- the planned construction methods,
- the environmental management measures,
- the environmental monitoring programs.

The second phase of construction will be for the A21 dike itself and is planned for the summer of 2008. Later this summer DDMI will submit the required engineering designs and plans for the A21 dike and mine. As discussed with Board Staff we intend to submit a single package of materials for review. This was the approach taken with the A418 dike. This package will include:

- A21 Dike Design and drawings – Part C Items 2 and 9.
- A21 Dike QA/QC Plan – Part C Item 18.
• Dike Review Board Report – Part C Item 10.
• Final A21 Mine Design – Part C Item 11.

A hydrogeological characterization plan for the A21 area (Part D, Item 6b) was submitted June 15, 2007.

If the Board or Board Staff have any questions on this causeway submission or our planned A21 dike submissions, please let us know.

Regards,

Gord Macdonald

Attachments: Figure 1 – Current vs Predicted Dike Alignment

A21 Causeway Environmental Construction Management Plan

cc: Patty Ewaschuk (WLWB)
A21 CAUSEWAY:

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Prepared for:

Diavik Diamond Mines Inc.
Yellowknife, Northwest Territories

Attention: Mr. Scott Wytrychowski

Prepared by:

AMEC Earth & Environmental

015803-9000-40RA-I-0001-PA
# TABLE OF CONTENTS

## INTRODUCTION

1. Objective .................................................................................................................. 1-1
1.2 Definition of Best Management Practices .......................................................... 1-1

## BACKGROUND AND ASSUMPTIONS

2.1 Physical Setting ...................................................................................................... 2-1
2.1.1 Location and Terrain ....................................................................................... 2-1
2.1.2 Climate ............................................................................................................ 2-1
2.1.3 Shoreline and Lakebed .................................................................................... 2-1
2.1.4 Sediment Settling Implications ....................................................................... 2-2
2.1.5 Constraints ...................................................................................................... 2-2

## OVERVIEW OF CONSTRUCTION SCOPE AND SCHEDULE


## CONSTRUCTION PHASE ORGANIZATION AND RESPONSIBILITIES

4.1 Introduction ............................................................................................................. 4-1
4.2 Overall Project organization ................................................................................. 4-1
4.3 Responsibilities ....................................................................................................... 4-1

## TURBIDITY BARRIERS

5.1 Overview ................................................................................................................ 5-1
5.1.1 Design and installation ................................................................................... 5-1
5.1.2 Installation of End Anchors on Islands, Bottom Anchors and Buoys ............. 5-2
5.1.3 Silt Curtain Installation and Removal ............................................................. 5-2
5.1.4 Control ............................................................................................................. 5-3
5.1.5 Contingencies .................................................................................................. 5-3

## A-21 CAUSEWAY EMBANKMENT PLACEMENT

6.1 Overview ................................................................................................................. 6-1
6.2 Controls ................................................................................................................... 6-5
6.3 Environmental Issues ........................................................................................... 6-5
6.3.1 Management Measures ................................................................................... 6-6
6.3.2 Monitoring and Controls ............................................................................... 6-7
6.4 A21 – Regulatory Sampling – Dike Construction ................................................. 6-8
6.4.1 Daily Sampling ............................................................................................... 6-8
6.5 Spill response on land ........................................................................................... 6-10
6.6 SPILL REPORT FORM ......................................................................................... 6-14
6.7 Spill response in Lac de Gras by LDGC ............................................................... 6-15
TABLE OF CONTENTS (Cont'd)

LIST OF FIGURES

Figure 1.1: Site Plan.................................................................................................................... 1-3
Figure 1.2: Access Road and Causeway Plan................................................................. 1-4
Figure 4.1: Overall Project Orgsanisation ................................................................. 4-2
Figure 4.2: LDGC Organisation .................................................................................. 4-3
Figure 4.3: Embankment Activities Responsibilities.................................................... 4-4
Figure 5.1: Silt Curtain Plan ......................................................................................... 5-4
Figure 5.2: Turbidity Barrier Typical Section and Details ............................................. 5-5
Figure 6.1: A21 Access Causeway Section and Crest Detail ........................................ 6-3
Figure 6.2: Access Road and Causeway Profile ............................................................ 6-4
Figure 6.4: Spill Reporting Procedure Charts – Construction Phase............................. 6-17

LIST OF TABLES

Table 6.1: Fixed Sampling Locations ........................................................................... 6-8
Table 6.2: Sample Format for Daily Reporting – Fisheries Authorization....................... 6-10
Table 6.3: Sample Format for Daily Reporting – Water License .................................. 6-10
1 INTRODUCTION

1.1 Objective

The Diavik Diamond Project deals with the development of the Kimberlitic pipes A154, A418 and A21, which are located beneath Lac de Gras.

The initial construction included a large array of structures, including the construction of the A154 dike in Lac de Gras and all other facilities which made possible the mining operations of the diamond bearing A154 North and South kimberlite pipes. Other structures included temporary and permanent accommodations, several on-land processed kimberlite containment structures, a sedimentation pond, a rock quarry, linear developments such as access roads, pipelines, power lines, a runoff water treatment plant, and a sewage treatment and outfall.

Construction of the A21 water retention dike will be carried out to permit the exploitation of the A21 kimberlite pipe. It will be constructed in Lac de Gras using the same design and the same construction techniques as were used for the construction of the A154 and A418 dikes. Ancillary facilities will be limited to the construction of small stretches of new access roads, and a causeway between East Island and South Island. The general overall site development is presented in Figure 1.1 and the location of the proposed A21 dike, along with the access road and causeway to the island forming the dike abutments, is presented in Figure 1.2.

This document outlines the construction environmental management plans (CEMP) to be implemented, to minimize environmental effects during the construction of the A21 Causeway that will be required to provide access from East Island to the South Island where the A21 dike construction activities are to take place in 2008. Diavik Diamond Mines Inc. (DDMI) will be submitting a separate CEMP for the A21 Dike construction. DDMI is committed to implementing Best Management Practices (BMP) for both of these activities. A description of in-lake construction activity including turbidity curtain deployment, and embankment placement is provided. Environmental management controls available to the constructors are described. Finally monitoring and inspection programs are described which are compatible with the described BMP and which would provide relevant performance measurement.

1.2 Definition of Best Management Practices

The Best Management Practice (BMP) comprises the selection of construction methods and management controls which will be used to minimize, to the extent practical, the environmental impact of the construction activities
The criteria for establishing the BMP include the following construction methods:

- Use proven technology;
- Be consistent with recommendations made by qualified experts;
- Have limited impact on schedule;
- Be practical given the site conditions;
2 BACKGROUND AND ASSUMPTIONS

2.1 Physical Setting

2.1.1 Location and Terrain

The mine site lies just north of the tree line, approximately 200 km south of the Arctic Circle. Classified as a polar desert, this area is located in the zone of continuous permafrost. East Island (the project site) lies within a group of islands located near the east end of Lac de Gras. The northern half of the island is mostly covered by till deposits while the southern half is mostly exposed granitic bedrock with minor till occurrences. The kimberlite pipes which will be mined by open pit and underground mining methods lie just off shore of the east and southeast parts of the island.

2.1.2 Climate

East Island lies within the Arctic Climatic Region. The mean annual precipitation is about 375 mm, about 40% of which falls as rain. Snow cover exists for about six months of the year, with a maximum thickness of 500 to 650 mm. Most of the snowfall is blown into hollows and depressions, leaving much of the higher ground exposed during the winter. The mean annual air temperature is about -12°C, with a maximum monthly temperature of about 10°C in July and a minimum monthly temperature of -35°C in January. The mean annual ground temperatures vary between -3°C to -7°C, depending upon the ground surface cover, topography and the location with respect to larger water bodies. The construction season for in-lake activities will be limited to the ice free period.

2.1.3 Shoreline and Lakebed

The shoreline of Lac de Gras is dominated by boulders (>25cm in diameter) which descend to a maximum depth of 6 m.

The lakebed sediment consists of a veneer of very soft sandy silt that covers a competent till followed by bedrock. Its thickness varies generally between 0 and 3 meters with a maximum observed thickness of about 6 meters. The majority of the lakebed sediments are derived from the erosion of till and exposed bedrock located along the lakeshore.

The first 0.5 meters of the sediment layer is near fluid. Thereafter it becomes denser with depth. The fluid-like layer is sufficiently soft that these sediments are either fully displaced by rockfill placement, or are incorporated into the rockfill.
Sediment settling rates and index properties of lake bottom sediments were previously described in both the A154 Dike Construction Document and the A418 CEMP. These rates still apply to the A21 causeway.

2.1.4 Sediment Settling Implications

The primary uncertainty with respect to turbidity during dike construction relates to the amount of sediment that could be re-suspended during embankment placement. To account for the uncertainty, Diavik has developed a plan to use silt curtains and numerous other management practices to reduce sediment release during causeway construction. (see section 7, turbidity barrier)

2.1.5 Constraints

The construction work to be undertaken at the Diavik Diamond Mine must be carried out in such a manner as to minimize environmental impact. However, the overall project schedule, climatic conditions and the obvious need to use large scale construction equipment places constraints on: the methods used; the rates of embankment placement, both minimum and maximum; the layout of the installations; and the positioning of turbidity barriers.

The embankment fill placement for the causeway will be completed in the year 2007.

From the outset, the engineers and contractors have worked together to develop a design for the causeway which best suits the site conditions.

It is from this background that the Best Management Practice has been developed.
3 OVERVIEW OF CONSTRUCTION SCOPE AND SCHEDULE

The 2007 work includes the following activities. The schedule is indicated for each respective activity.

- Site preparation: crushing, hauling, temporary stockpile, spreading and compacting of rock fill and crushed stone materials for access road on East Island to north limit of causeway – August 2007.
- Deployment of turbidity barriers (on both sides of causeway alignment) – beginning of September, 2007
- Embankment placement of A21 causeway embankment materials once turbidity barriers are installed – September/October 2007, causeway completed by October 15.
- Removal of Turbidity Curtain - late fall 2007 or July 2008.
CONSTRUCTION PHASE ORGANIZATION AND RESPONSIBILITIES

4.1 Introduction

The overall project organization is illustrated in Figures 4.1 and 4.2. To ensure timely response to environmental incidents and adequate reporting, the experience of the A154 & A418 dikes will be put in application to implement a communication system if any environmental incidents occur.

4.2 Overall Project organization

As per Figure 4.1, the overall project organization consists of the following parties:

- Diavik Diamond Mines (DDMI): Owner
- AMEC providing the design and engineering of the A21 causeway. AMEC working in concert with DDMI will ensure that all aspects of the terms of the contract, environment, contractual and technical are met. The quality assurance (QA) will be based on the continuous involvement of AMEC and DDMI staff during the execution of all works included in the contract. A detailed organization is presented in Figure 4.1
- Lac de Gras Constructors (LDGC) acting as the Contractor. LDGC is responsible for mobilizing the required manpower, equipment and material to successfully execute the work included in the contract documents. LDGC is responsible to carry out the quality control (QC) pertaining to sampling and laboratory testing of all construction materials. A detailed LDGC organization is presented in Figure 4.2.
- The Overall organization is carried out in a partnership relation between the 3 parties.

The Parties interact on a daily basis to ensure that Standards are met regarding Safety, Environment, Technical and Contractual aspects of the work.

All parties participate on a weekly meeting to discuss of the various construction aspects and work progress.

4.3 Responsibilities

The responsibilities of LDGC and AMEC for the main activities for causeway and dike construction are presented in Figure 4.3.
Figure 4.1: Overall Project Organisation
Figure 4.2: LDGC Organisation
Figure 4.3: Embankment Activities Responsibilities

<table>
<thead>
<tr>
<th></th>
<th>Turbidity Barrier</th>
<th>On-land Survey</th>
<th>Causeway Alignment</th>
<th>Crushing</th>
<th>Fill Placement</th>
<th>Compaction in the Dry</th>
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<td>Execution</td>
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<td>Quality Control</td>
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<tr>
<td>Quality Assurance</td>
<td>AMEC</td>
<td>QA Survey</td>
<td>QA Survey</td>
<td>AMEC</td>
<td>AMEC</td>
<td>AMEC</td>
</tr>
</tbody>
</table>
5 TURBIDITY BARRIERS

5.1 Overview

Silt curtains will be used to limit the transport of sediments outside the work areas. A large body of water such as Lac de Gras, with islands, shoals and other topographic features develops current patterns according the wind conditions. These are obviously highly variable and current velocities and direction vary accordingly. It would obviously be impossible to stop the currents prior to the construction of the causeway. Turbidity barriers have been employed on numerous dredging and in-water construction projects. Their efficiency is rarely, if ever, 100%. The barrier can be pervious (silt screen) or impervious (silt curtain) according to whether the strategy is to filter the water or divert the sediment plume to the lower velocity areas at depth. The latter approach has to be adopted where currents are expected. The depth of the curtain has been chosen with regard to the intended mechanism and to the constraints inherent to the site. The curtain can only be deployed in ice free water.

Two primary turbidity barriers using the silt curtain described below will straddle the A21 causeway area and additional lengths of silt curtain will be available for local deployment to deal with specific problem areas.

The alignment of the silt curtains is shown in plan on Figure 5.1.

5.1.1 Design and installation

In still water, silt curtains are most effective when installed down to 0.5 m to 1 m from bottom. Practical consideration may limit the depth in very deep water, but deep water conditions do not exist within the causeway work area.

In the spirit of the BMP, in order to place the most effective tools at the disposal of the project construction team and based upon the A154 & A418 dikes construction experience, it has been decided to deploy curtains on both sides of the A21 causeway. The curtains are to be 20 m from the toe of the causeway and the DDMI proposed fixed monitoring stations are to be 5 m behind the curtain. Field adjustment to the curtain and sampling locations maybe made, as the dike toe may be slightly wider due to the bathymetry being completely accurate, which could see the curtain and sampling station be moved up to 2-5 m. The distance of each of each of the two turbidity barriers from the toe of the causeway would remain the same at 20 m with the sampling locations 5 m behind them. The curtains will be anchored into rock on either side of the causeway and will be suspended from floats and the steel anchor cables from the surface to the bottom of the lake.
The silt curtain will be made of Low Temperature Arctic, Coated PVC 22 oz LTA. It will come in 15 m sections that will be attached together at the work site. It has a top load line and special stress plates that can handle tough projects where wind and current exposure are more severe. Two anchors (inside and outside of curtain alignment) will be installed at 30 m intervals in order to properly stabilize the sections of curtains.

The silt curtains will be deployed to the bottom to limit the re-suspension of lake bottom sediment (Fig.5.2) to ~20 meter distance from the toe of the on either side of the causeway. The silt curtains sections near the shore (+/- 3 meter deep) resting on the bottom of the lake, will prevent the suspended solids from going underneath the curtains.

Figure 5.1 illustrates the desirable alignment and also shows the DDMI proposed fixed monitoring stations, 11-A and 12-A.

5.1.2 Installation of End Anchors on Islands, Bottom Anchors and Buoys

End anchors and the bottom anchors will be installed approximately at the start of September 2007 on the water, using a boat to install the various anchors out in the lake and boom truck for island mooring, and preliminary curtain layout.

The end anchors which will be located on the either side of the causeway will be installed using drilling equipment such as plugers or hand held air driven drilling tools depending on the size and depth of anchors. The preliminary determination of the rock quality on either side of the causeway suggests that the end anchors will not need to be grouted into place.

The bottom anchors will be lowered by hand from the boat and placed slowly on the lake bed. Buoys will be attached to the anchors and will be left floating on the surface.

Installation of the silt curtain will follow.

5.1.3 Silt Curtain Installation and Removal

During the 2007 construction season the causeway construction required for access to the future A 21 embankment dike via access to South Island will be completed.
Following are the silt curtain installation activities:

**Platforms** - During the deployment of the A21 turbidity curtains, DDMI construction will utilize the current docking facility used by DDMI Environment. When a section of curtain needs to be repaired, the damaged piece will be removed and replaced by a new one. The damaged one will be taken back to storage for repairs.

**Progressive Removal** - Due to the short length across the area between East Island and South Island, progressive removal will be limited. If water quality between the newly constructed causeway and the turbidity curtain does not meet the license criteria the curtain may have to be left in longer. Ambient temperatures may also reduce DDMI’s ability to remove the curtain in 2007, therefore, the curtain maybe frozen in over the winter. From experience from the A418 dike construction, sufficient open water leads are created in early spring which prevents the curtain from being ripped way by moving ice. If the curtain is left in over the winter, it will be removed during the open water season in 2008.

5.1.4 **Control**

The installation procedure will be carried out under the supervision of the LDG quality control and DDMI/AMEC quality assurance teams. The position of the barrier will be checked by differential GPS. Figure 5.1 illustrates the desirable alignment and also shows the DDMI proposed fixed monitoring stations 11-A and 12-A. DDMI Environment will conduct daily visual inspections during regulatory monitoring.

Monitoring of the TSS and turbidity will be used to judge the effectiveness of the turbidity barrier and to determine the necessary adjustments and/or additions.

5.1.5 **Contingencies**

Additional lengths of silt curtain will be available for deployment to address local problems or to install a parallel barrier in certain areas if necessary.
1. **NOTES:**
   - **DRAWING SHOWS STRAIGHT LINE SEGMENTS. ADEQUATE SLACK TO BE ALLOWED BETWEEN ANCHOR POINTS TO ALLOW FOR WATER CURRENTS.**
   - **THE CURTAIN BOTTOM IS INTENDED TO FOLLOW THE LAKEBED TO PROVIDE MAXIMUM EFFICIENCY. THE MAXIMUM DEPTH OF CURTAIN IS 8 m AND THE BOTTOM CLEARANCE AT LEAST 1 m. THE 1 m MIN. CLEARANCE IS NOT REQUIRED WHEN THE WATER DEPTH IS LESS THAN 2 m.**
   - **ADDITIONAL TURBIDITY BARRIERS MAY BE REQUIRED TO MEET WATER QUALITY REQUIREMENTS.**
   - **SHORE AND BASE ANCHORAGE TO BE DESIGNED BY INSTALLER.**

**Shore Anchor Detail**

**Typical Plan View**

**Typical Profile View**

**Typical Section**
6 A-21 CAUSEWAY EMBANKMENT PLACEMENT

6.1 Overview

The A-21 Causeway will be constructed from Type I run of mine rock run and crushed rock. This will imply generally a lower fines content than that which would be expected from naturally occurring deposits. Rock material used for the construction of the causeway will be pushed into the water from the advancing face. Refer to Figure 6.1 for a general cross section. Figure 6.2 shows an alignment profile of the causeway along with the access road to either end of it.

There are many precedents for construction by placing fill into water, The A-154 & A418 dikes construction experience illustrates that fines attached to the ROM rock used for construction may subsequently be washed by currents and waves and add to the suspended sediment load. However, these fine particles settle out rapidly within the enclosed working area. The causeway footprint will not be dredged of fine lakebed sediments prior to rockfill placement, as such some turbidity will be generated through disturbance of those sediments by the rockfill placement. However, water depths along the causeway are such that the depth of lakebed sediments is expected to be minimal, and the silt curtains will adequately contain turbidity produced via this mechanism.

The causeway construction will progress from East Island to South Island as large mine trucks deliver materials to the embankment and bulldozers advance the fill face. The initial lift will be constructed, via ramping down from the north approach, such that it is about 2 m above lake level, commensurate with experience with the A154 and A418 dikes construction. This will minimize the height of the initial lift relative to lake level which will help reduce turbidity. The causeway would be constructed to its final width with the first lift, so that the second lift does not involve additional in-the-wet placement of rockfill.

An estimated 215,000 m³ of rockfill (and fine crush road topping) are required for the causeway construction. This does not include the on-land roads extending from either end of the causeway itself.

The sides of the causeway will be shaped by backhoes; which upon reaching the final grade will also shape the berms and pipe benches. The final road bed will be graded to the west with the entire road surface sloped slightly to the north to maintain adequate drainage.

The pipe bench and power line systems will be located on the western side of the causeway. Although the design currently allows for two-10” pipes on the berm it may be
that upon final design only a single pipeline will be required. The current planning is for
one pipe to carry the seepage collection water from the Dike Pumping Stations to be
constructed downstream of the A21 dike, and the second pipe to be carrying the water
collected from within the A21 Open Pit.
A21 ACCESS CAUSEWAY

SECTION AND CREST DETAIL

PROJECT NO: VM00467-B

FIGURE 6.1

DATE: JUNE 2007

REV. NO: A

A21 DIKE - CAUSEWAY
ENVIRONMENTAL CONSTRUCTION
MANAGEMENT PLAN

SECTION - CAUSEWAY

DETAILED - CAUSEWAY

DIAMONDMINE INC.

AMEC Earth & Environmental
2227 Douglas Road, Burnaby, B.C., V5C 5A9
Tel. 604-294-3811  Fax 604-294-4664
DIAVIK A21 DIKE - CAUSEWAY
ENVIRONMENTAL CONSTRUCTION
MANAGEMENT PLAN

ACCESS ROAD AND CAUSEWAY

CENTRELINE PROFILE

PROPOSED A21 ACCESS ROAD EL 424.7m

APPROXIMATE EXISTING GROUND SURFACE

LATE LILY EL 415.8m

TILL

BEDROCK

SCALE: 1 : 1000 (VERTICAL SCALE)

SCALE: 1 : 5000 (HORIZONTAL SCALE)

0

0m 10 20 30 40 50

0

0m 10 20 30 40
The following table summarizes the efforts to be employed to reduce suspended solids during embankment construction.

<table>
<thead>
<tr>
<th>Operations</th>
<th>Component</th>
<th>Methods to minimize TSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate transport</td>
<td>Truck transport</td>
<td>Water roadways for dust control</td>
</tr>
<tr>
<td>ROM &amp; Road Topping</td>
<td>Aggregate transport</td>
<td>Maintain dumping area away from working face of the dike. Note that no end dumping directly into water will be permitted.</td>
</tr>
<tr>
<td></td>
<td>Aggregate placement</td>
<td>Use of slip displacement method. Construction of the causeway in two lifts rather than a single lift.</td>
</tr>
</tbody>
</table>

6.2 Controls

The LDGC quality control and DDMI Environment along with the AMEC quality assurance teams will provide testing and inspection for the control of the material quality and resulting embankment. DDMI Environment will conduct all monitoring related to water quality on the exterior of the turbidity curtain.

All operating personnel and construction foremen are authorized and required to modify field operations in order to comply with environmental project standards for the Diavik project. This will either be initiated by direct observation of the field personnel, or as test results are reported to them by Project Quality Control personnel.

A log of all reported incidents and responses will be maintained by the project Quality Control manager. After an incident is reported, follow-up observations will be performed to verify the effectiveness of the response action. Subsequent action may be required until specified project compliance is met.

6.3 Environmental Issues

Construction of the causeway occurs predominantly under water and fill is pushed from the crest into water as much as 6 meters deep. As the rockfill is placed under water, turbidity is created due to dust coating on the rockfill being washed off during placement. The turbidity created can become a threat to fish and their spawning grounds if established exposure duration criteria are exceeded.
Other potential environmental impacts from the dike construction are as follows:

- Causeway construction will require the use of a fleet of heavy earthmoving equipment including front-end loaders, 100 tonne rock trucks, bulldozers, excavators, and compactors. This equipment will be diesel powered so there will be some risk of hydrocarbon spills.
- Hauling and placing operations will create fugitive dust emissions, which will have to be controlled.
- Noise and diesel fumes will result from the intense activities.
- Generation of sewage in the construction area.
- Interfacing with wildlife on haul roads or in construction areas.

6.3.1 Management Measures

Measures that will be taken to manage the issues listed above are as follows:

- The water column in the vicinity of the end-dumping operations will be monitored by the Contractor to determine the turbidity. Silt curtains will be installed to capture the suspended sediments within 20 m of the toe of the causeway.
- No garbage or refuse disposal will be allowed in the construction area. Personnel will be required to transport all wastes back to camp for incineration or disposal in the appropriate area of the waste disposal facility as stipulated in DDMI Waste Management system.
- Chemical toilets will be placed in the construction areas in accordance with the Northwest Territories Mine Health and Safety Regulations. These toilets shall be cleaned and recharged at least twice per week.
- All diesel-powered equipment shall be in sound working condition and must be equipped with mufflers to minimize disturbance to wildlife. The contractor will be able to show documented evidence that the maintenance schedules are being maintained.
- The contractor shall be responsible for maintenance of the haul roads. Dust shall be controlled by spraying with water or approved dust suppressants as warranted. The dike contractor shall be responsible for dust control and maintenance of access and service roads in their construction area.
- All personnel shall receive Environmental Awareness Training. This includes instructions on how to appropriately deal with wildlife encounters. Drivers shall be instructed to slow down or stop when wildlife advisories are in effect and to report sightings to the Manager’s Representative (See also Technical Procedure No. 10.1-1 Traffic Management Procedure in Diavik Procedures).
6.3.2 Monitoring and Controls

The process used for monitoring and control of the effects of end-dumping operations on the aquatic environment will be monitored on the exterior of the turbidity curtains at fixed sampling locations on either side of the causeway by DDMI Environment.

The water quality readings will be evaluated by the Construction Manager. Should unacceptable quality persist, the advisability of installing a second silt curtain will be examined.

DDMI & LDGC will also ensure routine inspection of the roads and construction area to ensure that no undue damage is being done to the environment. Weekly Reports will be filed documenting the progress of the work areas of concern, equipment condition, anomalous, and monitoring if required monitoring. DDMI Environmental department will perform regular inspections to ensure that the construction activities are being performed in such a manner as to meet or exceed the commitments made in this document.
6.4 A21 – Regulatory Sampling – Dike Construction

6.4.1 Daily Sampling

Total suspended solids and turbidity monitoring are required by both the Fisheries Authorization and the Water License. The sampling locations are common to both however the collection method and results analysis methods differ. Following are the methods, approved for the past dike construction by both the MVLWB and DFO, with only the sampling locations modified.

Fixed sampling locations will be marked with buoys on the exterior of the turbidity curtain or at 25 m away from the toe of the causeway. The UTM coordinates for the sample locations are shown in Table 6.1, and can be seen on Figure 6.3. Daily, weather conditions permitting, each sampling location will be inspected by boat. A depth profile of turbidity will be measured at each sampling location using a calibrated HydroLab. Results will be reviewed at each site to determine the depth at which the highest turbidity reading was obtained. One water sample will then be collected from this depth, for the Fisheries Authorization, using a Van Dorn sampler. The midpoint on the Van Dorn sampler will be located at the depth of highest turbidity. This sample will be analyzed for total suspended solids at DDMI’s on-site lab using standard methods approved under DDMI’s Water License N7L2-1645.

A second water sample will be collected from each sampling location, for the Water License using an integrated depth sampler as specified in SNP Part B Item 23. This sample will be analyzed for Total Suspended Solids (TSS) and turbidity using standard methods approved under DDMI’s Water License N7L2-1645.

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Northing</th>
<th>Easting</th>
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</thead>
<tbody>
<tr>
<td>1645-55</td>
<td>7 151 091</td>
<td>537 393</td>
</tr>
<tr>
<td>11-A</td>
<td>7 149 665</td>
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</tbody>
</table>

Each day turbidity profiles and TSS results will be entered into DDMI’s database. For the Fisheries Authorization the measured TSS value from the maximum turbidity depth at each sampling location will be used, unfortunately, due to the 30 day construction schedule for the causeway, DDMI will only be reporting daily values and will not be reporting on the 110 day moving average as the window of construction in under the 110 days used to calculate the value.. At the end of each day a data report similar in format to Table 6.2 will be prepared. The Table will be posted daily on an access-controlled Web page.
Figure 6.3: Spoke Monitoring Site Plan
Table 6.2: Sample Format for Daily Reporting – Fisheries Authorization

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Depth (m)</th>
<th>Turbidity (NTU)</th>
<th>TSS (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1645-55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the Water License, the difference between the measured TSS value from the depth integrated sample the sampling location (11-A and 12-A) and the background (1645-55) will be used to calculate a moving 30 day average value. Due to the short length of the construction which has been estimated at 30 days, DDMI will report relative TSS on a daily basis only as the 30 day moving average is within the window of data collection of 30 days or less.

At the end of each day a data report similar in format to Table 6.3 will be prepared. The Table will be posted daily on an access-controlled ftp site.

Table 6.3: Sample Format for Daily Reporting – Water License

<table>
<thead>
<tr>
<th>Sampling Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Location</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>1645-55</td>
</tr>
<tr>
<td>11-A</td>
</tr>
<tr>
<td>12-A</td>
</tr>
</tbody>
</table>

6.5 Spill response on land

This Emergency Spill Response plan provides procedures for responding to a fuel oil or hazardous chemical spill at the job site. The plan includes provisions for safety, call out procedures, physical response procedures, reporting procedures, and the necessary instructions for implementing the plan.

Response Authority

The site supervisor has the responsibility for the initiation of the Emergency Spill Response plan in the event of a hazardous material spill. The supervisor will be responsible to manage and direct the containment and cleanup procedures and contact the senior members of the management team.
Note: The site supervisor has the authority to purchase or procure any labor, contract services, materials, and/or support services required to meet the situation.

**Employee Safety**

Before responding to any spill, the safety of all personnel must be assured; therefore, take the following steps before beginning the response:

1. Notify the Safety Department.
2. Identify the spilled material and follow the appropriate procedure.
3. Fuel Oils, Diesel, Gasoline, Aviation Fuel, etc
   a) Monitor the area for Explosive gases (LEL) and Oxygen (O₂) to ensure a safe atmosphere if intensified as an area with atmospheric hazards.
   b) Determine the potential for fire, and eliminate any hazards.
   c) Ensure that all personnel are equipped with the appropriate PPE.

**Spill Reporting Procedures**

After ensuring the safety of personnel, proceed with the appropriate response to the situation.

1. Spills or releases of hazardous substances into the environment may require notification to one or more federal or provincial agencies. The release reporting requirements are dependent on the substance released, the location of the release, and the period of time when the release occurred.
2. Spills of petroleum products that cause sheen on the water must be considered a reportable spill.
3. The on-site coordinator should report the release immediately to DDMI Environment. The onsite coordinator will be responsible for submitting to DDMI a Environmental Investigation Report. DDMI’s Environment Department will utilize
this report as well as gather information that is immediately available on the release 
and report this information to the appropriate agencies. If there is doubt as to the 
volume of released material that has to be reported. The on-site coordinator will 
report the spill.

Response

1. Initiate containment of the spilled material.

   a) All spills should be intercepted and contained as close to the release point as 
      possible. Absorbent booms and other absorbent materials are located in the 
      job shop.

   b) Spills onto the ground may be contained using absorbent booms or other 
      absorbent materials; constructing earthen dams, either by hand or with the use 
      of equipment; blocking drainage culverts and inlets to drain systems, etc. 
      Emphasis should be placed on keeping spilled materials from entering any 
      water source. If the spill is in a field location, consult the job plans to 
      determine the drainage system which may be affected and the location of the 
      nearest downstream spill control pond.

   c) Spills that reach water may be contained by the use of booms, absorbent 
      booms, earthen pipe dams (with the outlet controlled to allow the water to 
      pass through the pipe subsurface), use of weirs, etc. These techniques work 
      best for spills of non-soluble materials having a specific gravity less than 
      water (less than 1), which means that the spilled material floats on the surface 
      of the water. Spills of produced water and other materials which are water 
      soluble cannot be contained with any degree of success. Again, spills should 
      be contained at the closest feasible point to the source.

2. Begin Clean-up Operations

   a) It is important to begin clean-up operations as soon as possible. The sooner 
      clean-up begins, the higher the recovered amount of spilled material. This 
      increases the recovery percentage and reduces environmental damage.

   b) Spills onto Land:

      1. Recovery of any liquid spill material is to be initiated immediately. Use a 
         vacuum truck, absorbent pads or other absorbent materials, pumps, etc. 
         The material recovered should be returned to the system, if possible, or 
         stored in sealed, leak-proof containers for subsequent handling.
2. After recovering any free liquids, flush the affected area with fresh water to increase the recovery. This technique is particularly effective for partial recovery of highly soluble materials or light oils but is not effective on heavy or insoluble materials. Take care to avoid dispersing the materials across a larger area.

3. Heavy oils and some oils contained in paraffin, may be recovered by scooping up the material with hand tools or equipment. Subsequent flushing of the affected area with hot water while recovering the spilled material may increase the recovery. Again, take care to avoid spreading the material over a larger area.

4. During winter, snow that is contaminated with spilled material may be stockpiled in a lined, contained area, to be recovered after the snow has melted.

5. Some spilled materials may be made less harmful to the environment if a chemical neutralizer is applied. The MSDS for the material may list appropriate neutralizer(s) for a substance. Consult with the Environmental Coordinator to identify the proper neutralizer to use. Other clean-up efforts may be used after consulting with the Environmental Coordinator and other appropriate Crisis team personnel, such as the Safety Department. Removal of contaminated soils without the authorization of the Crisis Team Leader is now allowed.

c) Spills into Water:

1. Spills of oil into water may be recovered by using skimmers, skimming pumps, absorbent materials, and vacuum trucks. Spills of soluble materials (such as produced water) into water, may only be recovered by damming the discharge involved and recovering all of the affected water. This technique is not effective for anything other than a small discharge.

2. Cleaning of bank areas can be done with techniques similar to those used for recovery of spills onto land. Neutralizers for chemical spills into water may be used if approved by the Environmental Coordinator and/or Operations Center Foreman. Use of dispersants for oil spills to water requires governmental approval and will not occur without approval from both the Project Superintendent and the Environmental Coordinator.

3. Other techniques for clean-up of spills into water may be identified by the Environmental Coordinator.

Notification Procedures

Upon discovery that a spill event has occurred, the highest ranking Company employee on the scene shall evaluate the size, extent, and seriousness of the spill, then contact the Environmental Coordinator (or designee) immediately for all spill incidents. The On-Scene Commander will then decide whether to call those on DDMI’s Emergency Reasons Team (ERT).
The contract shall utilize their own Emergency Response team for all spills which reach water and for all major spills onto land. If required DDMI’s ERT will be initiated to assist. The supervisor at the scene shall determine, based on the circumstances, if the Local Emergency Response team needs to be activated for medium or minor spills on land.

**Remediation/Reclamation**

Remediation and reclamation of the areas affected by a spill will be initiated after consulting with the appropriate District Office personnel and the Environmental Coordinator. The remediation and reclamation procedures used may be mandated by governmental actions or orders.

**Disposal**

Disposal of waste generated by spill-response actions is to be arranged by the contractor. The disposal process will be following DDMI’s mine site waste management system.

**Reporting**

DDMI Environment, is responsible to make all required external reports regarding the incident. The Job Superintendent and DDMI Environment representative will also make the appropriate internal reports. Government agency reports must be made as soon as possible and always within 24 hours of an identified spill. A sample spill-report form for recording required information follows.

### 6.6 SPILL REPORT FORM

**Reportable Quantities**

LDGC is required to report all chemical spills to DDMI Environment as soon as possible. DDMI Environment will notify the appropriate Federal & Provincial Department of Environmental Quality and other government agencies. The information required to report a hazardous substance is as follows but not limiting to:

1. The chemical name or identity of any substance involved in the release. Include the CAS number, if possible.
2. Indicate if the substance is on the CERCLA or SARA list, or both.

3. Estimate the quantity released. If possible, note both the hazardous constituent and, if the material is a mixture, the mixture quantities.

4. The time and duration of the release. If it is ongoing, estimate the time that it will stop and the environmental medium or media into which the release occurred.

5. Any known or anticipated health risks – acute or chronic – associated with the substance and, where appropriate, advise regarding medical attention necessary for exposed individuals. Be cautious – it is better to say you don’t know than to guess.

6. The proper precautions to take as a result of the release, including evacuation.

7. The names and telephone numbers of the Lac de Gras Constructors personnel to be contacted for further information.

8. Any clean-up, containment, or control activities in progress, and a statement whether outside help will be required.

9. The location of the release (Section, Township, Range, County, and Province (Fed. Calls).

6.7 Spill response in Lac de Gras by LDGC

Initial Action

This section outlines the initial actions to be taken by the first persons arriving/witnessing to the scene of an accidental sediment discharge into Lac de Gras.

- If possible, identify the type of material spilled.
- Locate the spill source and assess if the spill can be readily stopped or brought under control.
- If safe to do so, and if possible, try to stop the flow of materials.
- Gather information on the status of the situation.
- Report the spill without delay to your immediate supervisor (see fig. 6.4 – Spill reporting procedure chart).
• The immediate supervisor or representative (Environment / Safety Individual) will notify DDMI Environment.
• The LDGC representative will ensure the on-scene Coordinator mobilizes environmental personnel and resources.
• Record all relevant information for reporting purposes.
• Resume any effective action to stop the flow of the spilled material, to contain and clean up.

**Accidental Sediment Discharge on Water**

1. Identify the source of the leak.

2. Contain the leak at the source.

3. Stop the sediment discharge past the turbidity curtain to Lac de Gras by the following actions:

<table>
<thead>
<tr>
<th>Potential Sediment Discharge Source</th>
<th>Action to stop the discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break or tear in Turbidity Curtain</td>
<td>Stop placement of material. Repair or deploy second curtain to reduce turbid water from exciting the damaged curtain.</td>
</tr>
<tr>
<td>Overland Runoff into Lac de Gras</td>
<td>Divert run-off onto land to a sump to limit the amount of solids entering the aquatic environment.</td>
</tr>
</tbody>
</table>

4. The incident must be immediately reported as per figure 6.4 – Spill reporting procedure charts.

**Equipment and Material for Response Plan**

During the causeway construction, a container will be strategically located where required. This container will be used to store all the material required to respond to an accidental sediment discharge. The following equipment and material will be available to provide a quick response:

• Work boat fully dedicated for the emergency situations.
• Additional turbidity curtain sections.
• Hand tools required for clean up.
• Wheel loaders and trucks for cleanup on the causeway.
Spill Reporting Procedure

Figure 6.4: Spill Reporting Procedure Charts – Construction Phase
Lac De Gras Constructors

Diavik Project – Northwest Territories

Environment

EMERGENCY RESPONSE REPORT

<table>
<thead>
<tr>
<th>No.</th>
<th>Observations</th>
<th>Actions</th>
<th>Date</th>
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<tbody>
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</tbody>
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COMMENTS

By: ___________________________ Copy to: ___________________________