Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

Nunavut Regional Office
P.O. Box 2200
Iqaluit, NU, X0A 0H0

Your file - Votre référence

Our file - Notre référence

February 18, 2005

Philippe di Pizzo
Executive Director
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0E 1J0
tel.: (867) 360-6338
fax.: (867) 360-6369

RE: NWB Permit No. NWB5RES0308 Annual Report

Mr di Pizzo:

Please find enclosed three (3) copies of the annual report prepared in accordance to the General Conditions of the waters licences for the Resolution Island project. A copy of *Summary of Technical Activities 2004 - Resolution Island Project* prepared by QC/Sinanni, supporting the annual report, is also provided. Also as a supporting document, a copy of *Scientific Investigations - Resolution Island 2004* prepared by Queen's University ASU, not yet published, will be provided in the next few weeks.

Should you have any questions regarding the submitted documents, please contact us.

Sincerely,

Lou Spagnuolo
Contaminated Site Project Officer
Tel: 867-979-7936
Fax: 867-975-4939
E-mail: spagnuolol@inac.gc.ca

cc. Harry Flaherty, Qikiqtaaluk Corporation
Philippe Simon, Qikiqtaaluk Environmental

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Canada

Annual Report

Water Licence No. NWB5RES0308

Resolution Island Project

Resolution Island, Nunavut

Report submitted to:

NUNAVUT WATER BOARD

by:

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Qikiqtaaluk Corporation

Sinanni Inc.

February 2005

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ᐃᓕᑭᒪᒪᔪ ᑐᐅᓂ ᐱᔾᓇᖏᐊᓂᐅᐳᓕ ᐱᓕᓗᐊᓗᐅᐳᐅᔪᓕ, ᖃᑭᖏᑦᑕᓗᒃ ᑯᐊᖏᑦᐳᓗᓴ ᑎᒍᒥᐊᖏᖅᓯᓂ ᐅᓪᓚᖏᖏᑦᑐᖅᓯᓂ ᐃᓄᓕᓗᐊᔾᑐᖅᓂᓂ ᑲᓇᑕᒥ, ᐃᒥᖏᒧᓂ ᓕᐃᓴ (NWB0305) ᐅᓪᓚᖏᖏᑦᔨᒪᔪᖅ ᓄᓇᕐᓂ ᐃᒥᓕᓗᐊᔾᑐᓂ ᑲᑎᒪᔨᖏᑦᓂᓂ. ᐊᖏᔪᓕᒪᖏᑦᐅᒪᓂᓂ ᐅᓂᑲᓕᐊᓗᒥᒪᔪᖅ, ᒪᓕᒥᒪᐅᖅ ᓕᐃᓴᒥᑲ, ᖁᖃᑎᖏᑦᑎᓕᓂ ᐊᐅᑭᖏᑦᑐᓂᑲᓂ ᑐᖃᒥᒋᐊᖏᑎᓴᓂᑲ ᐃᒪᐃᑦᑐᓂᑲᓂ ᐅᖃᓕᑦᑐᓂᑲᓂ:

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3. ᑭᓱᓕᓐᓂᑲ ᐊᖏᑕᑯᖃᖏᓂᖅ
4. ᓄᐃᓇᐃᔾᔨᒪᓕᒃᑐᑎᒃ ᓴᓇᔾᐅᐅᖃᖏᑕᒪᐅᖏᑦᑐᑦ
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7. ᐃᓗᒪᑕᐅᐅᓪᓚ ᐱᓕᓓᐊᖕᒪᔾᔪᑎᑦᑐᑦ
8. ᐱᔾᐅᐅᔨᒪᓪᓚ ᖃᐅᔨᓴᖏᓴᐅᓓᑎᒃ
9. ᐊᖕᖏᖏᑕᐅᓗᒪᓕᓂᓂ ᐊᖏᑕᑯᖃᖏᓂᖅ
10. ᑐᓴᐅᒪᖃᖏᑕᐅᑎᓂᖏᓐᓇᔭᓐ ᐊᑐᖏᑕᐅᓪᓚᑦᑐᑦ
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14. ᐱᔾᓇᖏᓴᐃᓂᖏᓐᓇᔭᓐ ᐊᑐᖏᑕᐅᓪᓚᑦᑐᑦ
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16. ᐃᓗᒋᓗᑕᐅᔪᑦ ᓴᖅᖏᑕᐅᓂᖕᖏᑦ
17. ᐊᓗᖕᖏᑦ ᓄᑐᓇᐃᔾᔨᒪᓕᒃᑐᑎᒃ ᓄᑐᓇᐃᔾᔨᑭᔾᔨᒪᔪᓕ
18. ᐃᓄᖏᑎᑐᖏᑦᑐᑦ ᓄᐃᓇᐃᔾᔨᒪᓕᒃᑐᑎᒃ ᓄᑐᓇᐃᔾᔨᑭᔾᔨᒪᔪᓕ

ᐱᔪᑎᑭᓕᑐᒍ ᐅᑯᐊ ᐊᖏᔪᑕᒪᒋᒥ ᐅᓂᑲᓕᐊᓗᒥᒪᔪᖅ, ᐊᒥᓗᒃᑕᓪᓚᑦ ᑎᑎᖏᓗᒪᔪᖅ ᐃᓕᑭᑕᐅᑎᓗᒪᑭᐅᖏᑦ. ᓄᐃᓇᐃᔾᔨᒪᔪᓂ, 2004ᖓᔪᑎᑭᓕᓓᑐᒍ ᖃᓄᐃᑕᐅᓗᐊᖏᖅᑐᑎᒋᓐ ᐃᒥᐅᐸ ᓕᐃᓴᓴᓂᒃ ᒪᑕᖏᐊᔪᐃᓐᓇᔭᐅᓕᐅᖏᑦᑐᖅ.

EXECUTIVE SUMMARY

As part of the Resolution Island clean up Project, Qikiqtaaluk Corporation (QC) holds, on behalf of Indian and Northern Affairs Canada (INAC), a Water Licence (NWB5RES0308) from the Nunavut Water Board. The annual report, in compliance with the licence, presents various information in the following sections:

a. Fresh Water Quantities
b. Sewage Water Quantities
c. Waste Discharge
d. Summary of Construction Work
e. Surveillance Network Program
f. Environmental Monitoring Program
g. Anticipated Work
h. Studies Requested
i. Unauthorized Discharges
j. Communication Exercises
k. Operation and Maintenance Plan
l. Contingency Plan Revisions
m. Trenches and Sumps
n. Clean Up Procedures
o. Public Consultation
p. Concerns Addressed
q. Other Details
r. Inuktitut Executive Summary

In reference to this annual report, several documents are appended. In summary, during the 2004 season all conditions of the Water Licence were complied with.

GENERAL CONDITIONS

As licensees, Qikiqtaaluk Corporation (QC) and Indian and Northern Affairs Canada (INAC) have implemented various procedures to comply with conditions described in the Water Licence (issued on August 29, 2003) related to the Resolution Island Project. The following document summarizes water use data and describes various activities conducted on-site as required by the General Conditions of the Permit.

a. Fresh Water Quantities

Lower Lake, used as the water supply, is located in a relatively undisturbed area (Lower Lake borrow pit nearby was last used in 2001) at approximately 3.2 km (in a straight line) from camp and 1.6 km from the nearest traffic and construction activities. During the work season fresh water was pumped from the supply lake into an 11 m^3 water truck and delivered to 3 (5,265-litre) polyethylene tanks located in the core camp. Fresh water was mainly used for sanitary and kitchen uses and for fire drills. The following table presents the monthly and annual quantities of fresh water used for the project. Estimates are based on the average number of truck loads per week.

Period	June	July	August	September
Water volume used (m^3)	140	565	530	190
Total volume (m^3)	1425			

The permit stipulates that no more than 600 m^3 of fresh water per month be used (*i.e.*, approximately 20 m^3/day). This requirement was met.

b. Sewage Water Quantities

Sewage water was discharged from the core camp through a single pipe into the sewage lagoon. Monthly and annual estimates are presented in the following table.

Period	June	July	August	September
Sewage volume generated (m^3)	115	455	425	155
Total volume (m^3)	1150			

c. Waste Discharge

Solid waste produced during on-site activities was transferred to a covered metal vault outside the core camp on a daily basis and incinerated using a double chamber forced-air Westland incinerator. Solid waste mainly originated from the kitchen operations and from discarded packaging of materials and supplies. The following table presents the monthly and annual quantities of solid waste managed during the 2004 field season at Resolution Island. Estimates are based on the assumption that every person in the camp generated, on average, approximately 2.5 kg of solid waste per day.

Period	June	July	August	September
Waste generated (M.T.)	2.14	4.44	4.22	1.88
Total (M.T.)	12.68			

d. Summary of Construction Work

Construction activities conducted at Resolution Island during the 2004 season are summarized in a report submitted to Indian and Northern Affairs Canada (INAC) in February 2005 by Qikiqtaaluk Corporation and Sinanni Inc. (see appended document: *Summary of Technical Activities - 2004 - Resolution Island Project*).

e. Surveillance Network Program

Field activities that could generate environmental impacts have been evaluated and are presented in the document entitled *Environmental Screening Report* submitted with the permit application. As part of the Surveillance Network Program (SNP), water from the new supply lake (sampling station # RES-1) was sampled and analyzed. Runoff water from both active solid waste disposal sites (sampling stations # RES-4 and # RES-5) could not be sampled and analyzed because no water was found to discharge from these sites.

The SNP analytical results are presented in Table I at the end of this document. These results can also be found in the document entitled *Resolution Island 2004 - Scientific Investigations* prepared by Queen's University Analytical Services Unit (ASU) (see appended document). Furthermore, the Quality Assurance and Quality Control (QA/QC) program used for the SNP is also included in this appended document.

Because of low pH values in the drinking water, pH adjustment was carried out throughout the season by adding sodium carbonate to the camp water storage tanks thereby increasing the pH value to within the required range of 6.5 - 8.5.

f. Environmental Monitoring Program

Details of the Environmental Monitoring Program conducted during the 2004 season are described in the document entitled *Resolution Island 2004 - Scientific Investigations* prepared by Queen's University ASU (see appended document). The long-term post-construction monitoring program, submitted to NWB, will be implemented in 2006.

g. Anticipated Work

The tasks anticipated for the 2005 field season are listed below:

Logistics

- Mobilization and demobilization: mobilize mid-June, demobilize mid-September.
- Purchasing / acquisition: additional supplies, tools and equipment as required.
- Sea lifts: return approximately 100 empty containers, rolls of geotextile and geomembrane to site as soon as possible – remove filled containers (approx. 330 containers of soils - 5 seacans and 30 containers of PCB waste other than soil) in September or earlier.
- Fuel re-supply: add fuel to the tanks as required such that there is an adequate amount for completion of the project.

PCB Soil Excavation

- S1/S4 Beach: complete PCB contaminated soil excavation – all levels of PCB contamination can be excavated as convenient – CEPA soil to screener and to containers, Tier II to Tier II landfill, Tier I to beach non-hazardous (NH) landfill and/or Tier II landfill.
- S1/S4 Valley and Buildings Area: complete excavation of Tier II soil and debris and begin hauling to Tier II landfill, excavate Tier I material and transport to camp non-hazardous (NH) landfill and/or Tier II Landfill.
- PCL dump: excavate Tier II soil and begin hauling to Tier II landfill, excavate Tier I material and transport to camp non-hazardous (NH) landfill and/or Tier II Landfill.

Approximate Volume (m^3) of PCB contaminated soil to be excavated and/or managed in 2005			
Location	**CEPA**	**Tier II**	**Tier I (estimate)**
S1/S4 beach	250	1500[1]	1500[2]
S1/S4 valley	---	6600[3]	2000[4]
PCL dump[5]	---	125	20
DND Helipad[5]	---	95	200
TOTAL	250	8320	3720

1 Estimates recently provided by Queen's ASU included 650 m^3 in-situ plus about 850 m^3 of reject rocks from CEPA screening operations stockpiled near B2.

2 Estimates provided in Queen's ASU 3-year remediation plan was 4000 m^3. After the 2004

season, the Tier I in-situ volume is likely to be lower.

[3] Includes soil stockpiled in 2004, piles of soil and debris from the furniture dump, reject rocks and other shredded debris from demolition.

[4] Estimates provided in Queen's ASU 3-year remediation plan was 5000 m^3. After the 2004 season, the Tier I in-situ volume is likely to be lower.

[5] Estimates provided in Queen's ASU 3-year remediation plan.

Waste Containerization and Disposal

- Containerization of remaining CEPA soil from S1/S4 Beach.
- Excavation of heavy oil contaminated soil at the barrel cache valley and containerization (approximately 100 m^3 -i.e. 40 units if steel containers are used)
- Reorganise Hazardous Material seacans to remove Tier I/Tier II debris misplaced in 2004
- Manage surface contamination and residual contaminated debris/mud inside empty red vault and implement disposal strategy based on test results.
- Characterise B2 building concrete floor (to be done by ASU) and manage as per test results.
- Ship CEPA soil and debris south for disposal.

Clean Fill

- Production of approximately 20,000 m^3 of granular materials as gravel from borrow sources around the site and/or as shot rock from blasting.
  - √ About 5000 m^3 of Type 4 material (fine sand) will be required for the Tier II landfill (i.e. about 2200 m^3 is already stockpiled, 2800 m^3 will need to be produced likely from Radio Hill borrow pit)
  - √ Type 2 & Type 1 material will be required for the final cover of the Tier II landfill. Volume estimates for both type should be provided with the modified design to be provided by UMA/EBA required due to a lack of type 1 available on site. Likely, type 2 material will be quarried from the old water lake borrow area.
  - √ Gravel will also be required for road maintenance, covering of non-hazardous landfills, backfilling/recontouring of excavated areas, covering of S4 building concrete slab, etc.
- Construction of an access road to the old water lake borrow area and set up of a grizzli.

Old Landfill Remediation

- Beach dumps: excavate Tier II soil and transport to Tier II landfill – excavate Tier I soil and haul to beach non-hazardous landfill and/or Tier II landfill – close dump by adding some fill and recontouring.
- Maintenance dump: excavate and haul cobalt contaminated soil to Tier II landfill – close dump by adding some fill and recontouring.
- North slope dump: excavate and haul copper contaminated soil to Tier II landfill – close dump by adding some fill and recontouring.

Approximate Volume (m^3) of heavy metal contaminated soil to be excavated and/or managed in 2005

Location	Tier II	Tier I
Beach dump	500	300
Maintenance dump	50	---
North slope dump	35	---
TOTAL	585	300

Hydrocarbon contaminated soil

- Excavate TPH contaminated soil at the beach (i.e. approximately 25 m^3) and haul to the landfarming platform.

Non-Hazardous Landfills

- Core camp non-hazardous landfill: add Tier I soil and debris from camp and maintenance areas – cover and compact at end of season.
- Beach non-hazardous landfill: add Tier I soil and debris from beach area – cover and compact at end of season.
- Empty red vault containing Tier I PCB contaminated soil and dispose soil in the non-hazardous waste landfill.

Tier II landfill

- Use the ground heater to melt all ice/snow present within the landfill cell
- Pump out all water outside the cell.
- Drill and install 2 thermistors inside the berm
- Place a layer of Type 4 material (i.e. 20 cm) on top of the geotextile surface in compliance with Specifications.
- Fill with Tier II contaminated soil (approx. 8900 m^3) and other Tier II waste (approx. 200 m^3: boxes of metal contaminated soils, shredded wood, insulation, etc.)
- Fill some of the remaining available volume with Tier I contaminated soil.
- Place a layer of Type 4 material (i.e. 20 cm) on top of contaminated soil and materials.
- Drill and install 4 thermistors within the landfill as per Specifications.
- Install and heat weld the geomembrane between layers of geotextile.
- Place a layer of Type 4 material (i.e. 20 cm) on top of the geotextile surface in compliance with Specifications.
- Place and compact the layers of Type 2 and Type 1 as per revised Specifications in lifts of 25 cm.

Physical Debris

- Drums and their contents: consolidate contents of any new drums found; shred and landfill empty drums (remaining empty drums are mainly found beneath Radio Hill, on the north side of the old water lake).
- Collect steel beams and frames from the maintenance building demolition and dispose in a non-hazardous waste landfill.
- Complete the cutting of the old water line, remove and dispose debris in non-hazardous waste landfill.

- Remove all wires from cut telephone poles and dispose in non-hazardous waste landfill.
- Dismantle the POL pipe line from the beach to the camp and dispose in non-hazardous waste landfill.
- Remove collapsed antenna past the furniture dump and dispose in non-hazardous waste landfill.
- Manage (dispose/burn and/or recycle) unused wooden boxes initially purchased (i.e. 1998) for CEPA soil on-site storage (pending INAC decision on the management strategy).
- Dismantle the 3 old POL tanks (2 beach POL, imploded tanks) using the crane truck and welders(if decided by INAC to proceed with this activity).
- Management of other materials.

Waste POL Incineration

- Complete incineration of waste POL products.
- Prepare all incineration equipment for demobilisation.

Demolition

- Demolish the officers mess building near the camp area and landfill debris in the non-hazardous landfill (to be included in the workplan pending INAC's approval)

Other Tasks

- On-the-job training.
- Initiate packaging of some equipment and supplies to be demobilised.
- Initiate modifications to the training centre to convert it into a small (<10 persons) camp.
- Move the Caterpillar gen set from the beach to replace the one installed at the training centre.
- ASU work: carry out analyses and mapping as required plus usual annual tasks – conduct research and prototype testing to support permanent barrier installation.
- Carry out "as convenient" tasks as time and equipment permit.
- Continue to implement pH control of drinking water, if necessary.
- Continue Surveillance Network Program (SNP).

h. Studies Requested

No studies related to waste disposal, water use or reclamation were requested by the Board.

I. Unauthorized Discharges

No unauthorized discharges of liquid or solid waste were observed and/or recorded during the 2004 field season at Resolution Island. However, an accidental discharge (*i.e.,* spill) of fuel occurred on snow underneath a building. Approximately 60 m^2 of surface area was affected. The incident was immediately reported to the Government of Nunavut Environmental Protection Service. The entire volume of spilled fuel were recovered.

j. Communication Exercises

All site workers (including sub-contractors) were instructed on camp rules and safety requirements. Drills were conducted for fire emergency and spill prevention events. Fire safety and spill contingency plans were implemented.

k. Operation and Maintenance Plan

Details of the operation and maintenance (O&M) plan were initially presented in the project Specifications and Environmental Protection Plan submitted with the first permit application in 1998. No major revisions to the initial plan have been implemented.

l. Contingency Plan Revisions

Details of the contingency plan were initially presented in the project Specifications and Environmental Protection Plan and submitted with the permit application. A Spill Contingency plan was submitted to NWB in September 1998 and was revised at the end of the 1999 field season and resubmitted. Further revisions were added during the 2001 season and an improved version was submitted to the NWB in October 2001.

m. Trenches and Sumps

No new trenches or sumps were excavated during the 2004 season.

n. Clean Up Procedures

During the 2004 season, remedial activities included:

- PCB Clean Up: Excavation and removal of most CEPA PCB soil from the S1/S4 beach; excavation and temporary stockpiling of PCB Tier II soil from the S1/S4 valley.

- PCB Containerization and Storage: Thawing of the CEPA soil stockpile inside the B2 storage building; screening of CEPA soil from the S1/S4 beach behind the B2 building; containerization of PCB CEPA soil from the B2 storage building and from the screening pad behind B2, repackaging and containerization of various CEPA waste materials in compliance with TDG Regulations

- Tier II Landfill: Gravel production at Radio Hill and Airstrip borrow pits; completed construction of landfill berm core (Type 3), berm core exterior (Type 2), and protective bottom sand layer (Type 4); installation of bottom geotextile and geomembrane liners; backfilling and sloping of depression along exterior east side; installation of monitoring

wells.

- Other Activities: Additional cover material added over Airstrip dump; excavation of hydrocarbon contaminated soils from Tier II landfill area and imploded tank; landfarm platform set up; demolition of S4 building and landfilling of debris; incineration of waste POL products; shred drums and debris at beach non-hazardous landfill.

- PCB Off-Site Shipment and Disposal: Shipment of 516 containers (*i.e.*, 2,709 M.T.) of PCB contaminated soil to the Bennett disposal facility in Québec.

Otherwise, details on these activities are summarized in a report submitted to Indian and Northern Affairs Canada in February 2005 by Qikiqtaaluk Corporation and Sinanni Inc. (see appended document: *Summary of Technical Activities - 2004 - Resolution Island Project*).

o. Public Consultation

No public consultations or meetings were held with local organizations or residents of nearby communities this past year.

p. Concerns Addressed

No concerns or deficiencies related to the project were addressed during this past year.

q. Other Details

No other details on water use or waste disposal were requested by the Board.

r. Inuktitut Executive Summary

The executive summary in Inuktitut of *Resolution Island Water Licence Annual Report 2004*, INAC/QC/Sinanni, is presented at the beginning of this report. The executive summary in Inuktitut of *Summary of Technical Activities - 2004 - Resolution Island Project*, QC/Sinanni, is presented as part of that report and attached to the current document. The executive summary of *Resolution Island 2004 - Scientific Investigations*, Queen's University ASU is being translated in Inuktitut and will be forwarded to NWB within the next few weeks.

TABLE I: SNP Sampling Results

Parameter	Units	CCME Water Quality Guidelines	Station Numbers (top) / Sample ID (bottom)				
			RES-1	RES-2[1]	RES-3[1]	RES-4[2]	RES-5[2]
			RI04-W003	-	-	-	-
Copper	mg/L	1	0.017	-	-	-	-
Iron	mg/L	0.3	< 0.05	-	-	-	-
Lead	mg/L	0.01	< 0.005	-	-	-	-
Manganese	mg/L	0.05	0.13	-	-	-	-
Mercury	mg/L	0.001	< 0.0005	-	-	-	-
Cadmium	mg/L	0.005	< 0.001	-	-	-	-
Nickel	mg/L	-	0.086	-	-	-	-
Chromium	mg/L	0.05	< 0.005	-	-	-	-
Cobalt	mg/L	-	0.021	-	-	-	-
Zinc	mg/L	5	0.045	-	-	-	-
Phenols	µg/L	-	< 1.0	-	-	-	-
pH	-	6.5-8.5	4.5	-	-	-	-
TSS	mg/L	< 500	< 4.0	-	-	-	-
Nitrate	mg/L	< 10[3]	0.07	-	-	-	-
Nitrite	mg/L	< 1.0[3]	< 0.05	-	-	-	-
Oil and Grease	mg/L	-	2.0	-	-	-	-
BOD	mg/L	-	< 3	-	-	-	-
Fecal Coliforms	Cts/100	0[3]	0	-	-	-	-

TSS: Total Suspended Solids
BOD: Biological Oxygen Demand

Notes: Certificate of analysis presented on following page
[1] Sampling and analysis not required
[2] No sampling and analysis carried out because of absence of runoff water at these sampling locations
[3] Ontario Ministry of the Environment (MOE) criteria

Analytical Services Unit
School of Environmental Studies
Biosciences Complex
Queen's University, Kingston, Ontario, Canada K7L 3N6
Tel 613 533-2642 Fax 613 533-2897

ASU #: 7358
Client: DIAND

Method: Standard Methods

Report I.D. RI Lake Water ASU7358
Date Submitted: 18-Aug-04
Date Analysis Initiated: 18-Aug-04
Date Reported: 20 Sept 04
Matrix: Water

Parameter	Units	RI04-W003	BLANK	QC	QC TARGET
Copper	mg/L	0.017	<0.005	2.20	2.20
Iron	mg/L	<0.05	<0.05	14.8	16.0
Lead	mg/L	<0.005	<0.005	2.25	2.20
Manganese	mg/L	0.13	<0.05	2.26	2.20
Mercury	mg/L	<0.0005	<0.0005	0.0022	0.0020
Cadmium	mg/L	<0.001	<0.001	0.42	0.40
Nickel	mg/L	0.086	<0.005	2.21	2.20
Chromium	mg/L	<0.005	<0.005	0.42	0.40
Cobalt	mg/L	0.021	<0.005	2.22	2.20
Zinc	mg/L	0.045	<0.010	1.24	1.20
Phenols	ug/L	<1.0	<1.0	10.0	10.0
pH	-	4.5	-	-	-
TSS	mg/L	<4.0	<2.0	-	-
Nitrate	mg/L	0.07	<0.05	1.03	1.00
Nitrite	mg/L	<0.05	<0.05	0.97	1.00
Oil and Grease	mg/L	2.0	<1.0	14.8	15.6
BOD	mg/L	<3	<3	166	200
Faecal Coliforms	Cts/100 mL	0	0	41	50

Prepared by: P. Whidey

Authorization: A. Rutter

Allison Rutter, PhD
Assistant Director