12.0 Reference Documents

INDEX OF REFERENCE DOCUMENTS

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1. AMEC – Attitude Surveys, 2005 and 2006

2. AMEC – Copper, October 2006

3. Conestoga Rovers & Associates – Domestic Well Survey, November 2006

4. Conestoga Rovers & Associates – Surface Water Information Summary February 2007

5. Conestoga Rovers & Associates – Groundwater Monitoring and Aquifer Testing February 2007

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2005 and 2006
Attitude Surveys

WHITES POINT QUARRY AND MARINE TERMINAL

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Data comparison of 2005 and 2006 attitude surveys

Summary of Key Findings;

The 2006 attitude survey for the White's Point Quarry Project was conducted in late November and early December with a sample size of 200 respondents.

- Results indicate clearly that there is a much higher awareness and greater understanding of the project than in 2005; incidents of "don't know' is much lower in the vast number of questions;
- People's knowledge of the project in terms of knowing the proponent, the nature of the project, where it will be located, the end market for the product, job creation and project impacts is more accurate;
- The number of respondents who support the project has increased to 42.5% compared to just 28.9% in 2005. The no. of respondents who do not support the project has declined from 40.3% to 31.8%;
- Over 62% of respondents believe the project will create jobs which are up 8 points over 2005. Job creation is also the primary reason for project support;
- The primary reasons why some respondents do not support the project is still the potential impact on the fishery and lobster fishery with increases from 22.3% and 9.5% (2005) respectively to 43.7% and 34.4% (2006);
- Concerns regarding the impact of the project on the environment, people's lives, tourism, impacts on the coastline have all declined, albeit marginally;
- Concerns have increased regarding the impact of the project on traditional activities (up 2 points) and the lobster fishery (7 points);
- The number of respondents who feel that project concerns can be addressed such that the project can proceed is 47% compared to 43% in 2005;
- The people who feel they have had ample opportunity to participate in discussions have increased to 60% compared to 50% in 2005;
- The primary reason for project support is job creation;

Over 70% of people thought that the project would affect the area's economy with job creation being the top reason given compared to 65.9% in 2005;

ATTITUDE SURVEY: WHITES POINT QUARRY

The following statistical report is based on a survey conducted for the Whites Point Quarry Project October 12 – October 21, 2005 with a total sample size of 546, of which 461 were in the employment catchment area.

The responses were broken out by telephone exchange with the communities closest to the Quarry listed in Table 1 and all other communities within the employment catchment area listed in Table 2.

Table 1: Surveyed Communities closest to the Whites Point Quarry by Telephone Exchange

Exchange	Community	Area Sample	As a % of Total Sample
245	Barton	3	1.2%
	Church Point	6	2.4%
	Digby	132	53.9%
	Sandy Cove	1	0.4%
	Smiths Cove	13	5.3%
	Weymouth	3	1.2%
	Total	**158**	**64.5%**
834	Centreville	6	2.4%
	Sandy Cove	30	12.2%
	Total	**36**	**14.7%**
839	Freeport	30	12.2%
	Tiverton	10	4.1%
	Westport	11	4.5%
	Total	**51**	**20.8%**
Totals		**245**	**100.0%**

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Table 2: All Other Surveyed Communities within the Whites Point Quarry Employment Catchment Area by Telephone Exchange

Exchange	Community	Area Sample	As a % of Total Sample
467	Bear River	22	10.2%
	Clementsvale	5	2.3%
	Total	**27**	**12.5%**
532	Annapolis Royal	51	23.6%
	Grandville Ferry	9	4.7%
	Total	**60**	**27.8%**
638	Annapolis Royal	3	1.4%
	Clementsport	6	2.8%
	Cornwallis	17	7.9%
	Deep Brook	6	2.8%
	Total	**32**	**14.8%**
769	Church Point	7	3.2%
	Little Brook	10	4.6%
	Total	**17**	**7.9%**
837	Belliveau Cove	8	3.7%
	Church Point	1	0.5%
	Plympton	6	2.8%
	Weymouth	65	30.1%
	Total	**80**	**37.0%**
Totals		**216**	**100.0%**

Table 1 and 2 are broken down by exchange as requested by the Whites Point Quarry and Marine Terminal Project Joint Review Panel (i.e. 8.2 Public Consultation, Section 8.2.4). However, due to the smallness in size of many of the communities within the three Digby Neck and Digby area exchanges (i.e. 834, 839 and 245), confidentially can be lost if the questions are broken out by individual exchanges. Therefore, the three exchanges on and/or near the Neck have been combined in order to protect confidentiality. The total number of respondents within the three exchanges represents approximately 53% of the total number of respondents.

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Note that responses are provided in Frequency, i.e. percent of total
Frequencies will > 100% in some questions where multiple options were selected

Question	Responses	245 Exch.	467 Exch.	532 Exch.	638 Exch.	769 Exch.	834 Exch.	837 Exch.	839 Exch.
Have you heard of the White's Point Quarry project?	a) Yes	96.2	92.6	95.0	93.8	100.0	100.0	93.8	100.0
	b) No	3.8	7.4	5.0	6.3	0.0	0.0	6.3	0.0
From which of the following sources have you received MOST of your information about the White's Point project?	a) Local newspaper	59.9	56.6	59.6	70.0	36.3	58.3	46.7	62.7
	b) Word of mouth	58.6	40.0	49.1	36.7	41.2	63.9	60.0	60.8
	c) Radio	21.1	12.0	26.3	23.3	23.5	27.8	20.0	15.7
	d) Environmental Group	13.2	16.0	14.0	13.3	5.9	22.2	14.7	23.5
	e) Community group	14.5	4.0	10.5	20.0	0.0	41.7	6.7	25.5
	f) Bill boards/protest signs	2.0	0.0	0.0	13.3	5.9	0.0	6.7	0.0
	g) Newsletters / flyers	2.6	4.0	0.0	0.0	0.0	2.8	0.0	0.0
	h) Media	0.0	0.0	1.8	3.3	5.9	0.0	0.0	0.0
	i) TV	0.7	0.0	1.8	0.0	0.0	0.0	0.0	0.0
	j) MHA / Gov't member	0.7	0.0	0.0	0.0	0.0	2.8	0.0	0.0
	k) Other	2.0	0.0	0.0	0.0	5.9	0.0	0.0	3.9
	l) Don't Know / No Answer / No Answer	0.7	0.0	0.0	0.0	0.0	0.0	1.3	
What kind of project is it?	a) Basalt / Rock Quarry	63.8	64.0	49.1	56.7	41.2	80.6	56.0	78.4
	b) Quarry limestone for US Roads	9.9	12.0	10.5	10.0	17.6	0.0	9.3	5.9
	c) Quarry Rock to be shipped away / shipped to US	7.2	4.0	8.8	13.4	0.0	11.1	4.0	5.9
	d) Mining Project	2.6	0.0	3.5	3.3	5.9	5.6	5.3	5.9
	e) Other	5.9	4.0	5.3	3.3	17.6	11.1	2.7	2.0
	f) Don't Know / No Answer	13.8	16.0	26.3	16.7	23.5	2.8	25.3	3.9

Question	Responses	245	467	532	638	769	834	837	839
Where will it be located?	a) Digby Neck	57.9	76.0	63.2	40.0	64.7	16.7	69.3	19.6
	b) Little River	19.1	4.0	5.3	6.7	0.0	25.0	6.7	54.9
	c) White's Cove	6.6	0.0	1.8	3.3	0.0	27.8	1.3	9.8
	d) White's Point on Digby						1		
	Neck	2.6	4.0	0.0	3.3	5.9	3.9	0.0	5.9
	e) Sandy Cove	3.3	4.0	1.8	6.7	5.9	0.0	2.7	2.0
	f) Whale Cove	2.6	0.0	0.0	6.7	0.0	0.0	0.0	0.0
	g) Digby County	0.7	0.0	3.5	3.3	0.0	0.0	0.0	0.0
	h) Other	2.0	12.0	5.3	6.7	0.0	11.1	5.3	2.0
	i) Don't Know / No Answer	5.9	0.0	19.3	23.3	23.5	8.3	14.7	5.9
How many jobs will be created?	a) Very few	9.2	4.0	5.3	10.0	5.9	16.7	2.7	3.9
	b) 10-20	7.2	4.0	7.0	16.7	0.0	2.8	0.0	9.8
	c) 21-50	15.1	8.0	5.3	6.7	0.0	36.1	12.0	19.6
	d) 51-100	2.6	4.0	1.8	3.3	0.0	0.0	4.0	5.9
	e) 101-200	0.7	0.0	0.0	0.0	0.0	0.0	6.7	2.0
	f) 201-300	0.7	8.0	0.0	0.0	0.0	0.0	1.3	0.0
	g) Other	1.3	0.0	1.8	0.0	0.0	0.0	2.7	5.9
	h) Don't Know / No Answer	63.2	72.0	78.9	63.3	94.1	44.4	70.7	52.9
How long will the project last?	a) Forever/ very long time	8.6	12.0	3.5	3.3	0.0	11.1	10.7	9.8
	b) Until the resources run out	3.9	0.0	1.8	0.0	0.0	5.6	4.0	7.8
	c) 1-3 years	2.6	4.0	1.8	0.0	0.0	0.0	1.3	0.0
	d) 4-5 years	3.9	0.0	3.5	0.0	0.0	0.0	2.7	2.0
	e) 6-10 years	2.6	0.0	1.8	3.3	11.8	0.0	1.3	3.9
	f) 11-20 years	2.0	8.0	1.8	6.7	0.0	22.2	1.3	0.0
	g) 21-50 years	5.9	0.0	1.8	6.7	0.0	11.1	0.0	15.7
	h) 51-100 years	0.7	0.0	0.0	0.0	0.0	2.8	0.0	0.0
	i) Other	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	j) Don't Know / No Answer	69.1	76.0	84.2	80.0	88.2	47.2	78.7	60.8

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Question	Responses	245	467	532	638	769	834	837	839
What will happen to the quarry mined?	a) Sent to New Jersey	3.3	0.0	1.8	3.3	0.0	0.0	1.3	0.0
	b) Shipped away	7.9	0.0	8.8	10.0	5.9	11.1	1.3	3.9
	c) Shipped to US	27.6	36.0	24.6	13.3	23.5	41.7	26.7	49.0
	d) Shipped to US for road construction	6.6	0.0	3.5	6.7	0.0	16.7	4.0	23.5
	e) For roads / waste land	4.6	0.0	1.8	0.0	11.8	5.6	5.3	2.0
	f) Other	9.2	16.0	12.3	16.7	0.0	8.3	5.3	7.8
	g) Don't Know / No Answer	40.8	48.0	47.4	50.0	58.8	16.7	56.0	13.7
Do you know if Digby County will receive any financial or other benefits from the project?	a) Yes:								
	• Jobs	19.1	8.0	15.8	10.0	17.6	11.1	13.3	13.7
	• Tax revenue	9.2	12.0	8.8	10.0	5.9	2.8	6.7	3.9
	• Good for economy	2.6	4.0	3.5	0.0	0.0	2.8	4.0	0.0
	• Other	2.0	16.0	5.3	6.7	0.0	8.3	5.3	2.0
	b) No	26.3	20.0	21.1	33.3	11.8	55.6	16.0	37.3
	c) Don't Know / No Answer	40.8	40.0	45.6	40.0	64.7	19.4	54.7	43.1
Have you heard any opinions expressed about the project?	a) Yes	87.5	84.0	84.2	83.3	88.2	91.7	85.3	92.2
	• Some people are for it and some people are against it	30.8	38.1	29.2	32.0	33.3	15.2	51.6	21.3
	• Environment/ecosystem	36.1	19.0	43.8	16.0	46.7	15.2	23.4	27.7
	• Impact on fishery	29.3	14.3	14.6	16.0	26.7	45.5	15.6	40.0
	• Noise, dust	20.3	9.5	8.3	16.0	13.3	18.2	4.7	31.9
	• It will create jobs	12.0	4.8	10.4	8.0	6.7	9.1	14.0	10.6
	• Impact on whales	13.5	9.5	8.3	12.0	6.7	0.0	4.7	12.8
	• Impact on lobster fishery	15.0	0.0	4.2	8.0	0.0	24.2	4.7	12.8
	• Disturb the natural landscape / beauty of area	8.3	19.0	8.3	8.0	6.7	6.1	7.8	12.8
	• Water/air pollution	7.5	9.5	2.1	8.0	0.0	6.1	6.3	6.4
	• Impact on tourism	7.5	4.8	2.1	8.0	0.0	9.1	7.8	8.5
	• The project generally is								

	not good for the area	3.8	9.5	2.1	8.0	0.0	3.0	0.0	0.0
	• Impact on water quality	3.8	4.8	2.1	0.0	0.0	15.2	0.0	4.3
	• Increased marine traffic	4.5	4.8	2.1	8.0	0.0	6.1	0.0	12.8
	• Ballast water	4.5	0.0	0.0	0.0	6.7	0.0	4.7	12.8
	• Deterioration of roads	3.8	0.0	2.1	0.0	2.0.	0.0	0.0	0.0
	• Drop in the water table	3.8	0.0	2.1	0.0	0.0	0.0	3.1	0.0
	• Losing our resources	2.3	4.8	0.0	4.0	0.0	3.0	1.6	8.5
	• Other	15.8	9.5	14.6	16.0	13.3	27.3	6.3	36.2
	• Don't Know / No Answer	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0
	b) No	9.9	16.0	15.8	16.7	11.8	8.3	10.7	7.8
	c) Don't Know / No Answer	2.6	0.0	0.0	0.0	0.0	0.0	4.0	0.0

Question	Responses	245	467	532	638	769	834	837	839
Overall, do YOU think the White's Point is a good project for Digby County?	a) Yes → Why?	32.2	32.0	28.1	26.7	11.8	22.2	38.7	15.7
	• Job creation	85.7	75.0	62.5	75.0	100.0	50.0	72.4	87.5
	• Good for economy	12.2	12.5	12.5	12.5	0.0	25.0	27.6	0.0
	• Higher paying jobs	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0
	• Other	18.4	25.0	25.0	25.0	0.0	37.5	13.8	12.5
	• Don't Know / No Answer	2.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0
	b) No → Why Not?	41.4	36.0	28.1	46.7	52.9	63.9	26.7	54.9
	• Environment/ecosystem	34.9	66.7	31.3	35.7	22.2	13.0	30.0	25.0
	• Destroying the fishery	19.0	11.1	31.3	14.3	0.0	30.4	5.0	39.3
	• Destroying the area	20.6	0.0	12.5	14.3	0.0	17.4	5.0	14.3
	• No benefits	15.9	11.1	12.5	7.1	0.0	8.7	5.0	3.6
	• Air/water pollution	7.9	0.0	0.0	7.1	0.0	13.0	5.0	1.07
	• Destroying the whale habitat	3.2	0.0	6.3	14.3	0.0	4.3	0.0	7.1
	• Noise Levels	4.8	0.0	0.0	7.1	0.0	8.7	0.0	3.6
	• Losing our resources	4.8	0.0	6.3	0.0	0.0	8.7	0.0	0.0
	• Destroying marine life	3.2	0.0	0.0	0.0	0.0	4.3	0.0	0.0
	• Other	34.9	22.2	37.5	35.7	77.8	43.5	55.0	60.7
	• Don't Know /No Answer	1.6	0.0	6.3	7.1	0.0	0.0	0.0	0.0
	(c) Don't Know / No Answer	26.3	32.0	43.9	26.7	35.3	13.9	34.7	29.4

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Question	Responses	245	467	532	638	769	834	837	839
Do YOU believe the jobs created by the project will be important to Digby County?	a) Yes → Why?	55.9	80.0	57.9	56.7	52.9	27.8	61.3	35.3
	• Jobs are important to the area	51.8	40.0	45.5	47.1	77.8	60.0	71.7	61.1
	• Hiring of local people	21.2	15.0	27.3	11.8	0.0	10.0	8.7	22.2
	• Improve the economy	14.1	15.0	3.0	0.0	0.0	0.0	10.9	5.6
	• Take people off welfare	1.2	0.0	0.0	11.8	0.0	0.0	0.0	0.0
	• Other	15.3	30.0	21.2	17.6	11.1	20.0	4.3	11.1
	• Don't Know / No Answer	7.1	10.0	6.1	11.8	11.1	10.0	8.7	5.6
	b) No → Why Not?	34.9	8.0	26.3	33.3	41.2	58.3	21.3	39.2
	• Hiring of outsiders	35.8	0.0	6.7	20.0	0.0	52.4	31.3	45.0
	• Not sustainable	5.7	50.0	20.0	50.0	42.9	9.5	18.8	10.0
	• Not that many jobs available	13.2	50.0	20.0	10.0	14.3	19.0	12.5	15.0
	• Not enough jobs to have an impact	7.5	50.0	20.0	10.0	0.0	9.5	18.8	10.0
	• Unskilled people in the area	7.5	0.0	0.0	0.0	0.0	0.0	6.3	10.0
	• Only low paying jobs	3.8	0.0	13.3	0.0	0.0	4.8	6.3	10.0
	• Other	39.6	0.0	20.0	40.0	42.9	19.0	25.0	25.0
	• Don't Know / No Answer	3.8	0.0	13.3	10.0	0.0	4.8	12.5	0.0
	c) Don't Know / No Answer	9.2	12.0	15.8	10.0	5.9	13.9	17.3	25.5

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Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the White's Point project affect the natural environment of Digby County?	a) Yes → How?	66.4	72.0	71.9	76.7	82.4	77.8	56.0	80.4
	• Destroying the landscape/loss of tree line	54.5	55.6	51.2	39.1	35.7	28.6	35.7	48.8
	• Killing fish / destroying habitat	18.8	0.0	9.8	8.7	14.3	28.6	16.7	19.5
	• Air / water pollution	9.9	27.8	9.8	17.4	0.0	21.4	16.7	36.6
	• Silt in the bay / run-offs / chemicals in ocean	4.0	11.1	9.8	8.7	0.0	17.9	9.5	0.0
	• Endanger wildlife	9.9	0.0	12.2	13.0	21.4	14.3	9.5	12.2
	• Change in the water tables	8.9	5.6	14.6	0.0	0.0	7.1	9.5	4.9
	• Decline in whale population	6.9	5.6	7.3	8.7	7.1	7.1	7.1	14.6
	• Disturbing the natural sea	9.9	11.1	2.4	8.7	0.0	14.3	9.5	9.8
	• Too many boats in water	6.9	0.0	0.0	8.7	7.1	14.3	4.8	14.6
	• Detrimental to lobster fishery	4.0	0.0	4.9	0.0	0.0	21.4	0.0	9.8
	• Health problems	2.0	0.0	0.0	8.7	7.1	0.0	2.4	0.0
	• Plant life will die	2.0	0.0	2.4	0.0	0.0	3.6	0.0	4.9
	• Other	19.8	22.2	19.5	13.0	21.4	14.3	16.7	12.2
	• Don't Know / No Answer	2.0	0.0	12.2	8.7	7.1	0.0	9.5	4.9
	b) No	13.2	8.0	12.3	0.0	11.8	19.4	25.3	15.7
	c) Don't Know / No Answer	20.4	20.0	15.8	23.3	5.9	2.8	18.7	3.9

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Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the project affect the overall well-being and quality of people's lives in Digby County?	a) Yes → How?	57.9	48.0	45.6	50.0	41.2	63.9	46.7	54.9
	Positive								
	better jobs	25.0	16.7	15.4	20.0	28.6	13.0	22.9	21.4
	• Increases in the economy	13.6	8.3	7.7	6.7	28.6	4.3	0.0	0.0
	• More homes will be built	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Negative								
	• Destroy livelihood of people in fishery and tourism	18.2	16.7	7.7	20.0	28.6	26.1	17.1	14.3
	• Too much noise	10.2	0.0	23.1	20.0	0.0	17.4	20.0	17.9
	• Air / water pollution	6.8	16.7	19.2	20.0	0.0	21.7	5.7	10.7
	• Silt run off/more pollution	14.8	8.3	15.4	20.0	0.0	8.7	2.9	7.1
	• Bad impact on tourism	4.5	0.0	3.8	0.0	0.0	4.3	2.9	0.0
	• Too much traffic on land and water	1.1	0.0	0.0	6.7	0.0	8.7	8.6	10.7
	• Destroying habitats	4.5	8.3	0.0	0.0	0.0	0.0	0.0	3.6
	• Roads will be destroyed	3.4	0.0	3.8	0.0	0.0	8.7	2.9	0.0
	• Trouble with water tables	2.3	0.0	11.5	0.0	0.0	0.0	0.0	0.0
	• Negative impact on eco-system	1.1	8.3	0.0	0.0	0.0	0.0	0.0	0.0
	• Other	34.1	33.3	26.9	40.0	42.9	39.1	45.7	53.6
	• Don't Know / No Answer	4.5	16.7	0.0	0.0	0.0	0.0	2.9	3.6
	b) No	24.3	20.0	28.1	23.3	41.2	22.2	25.3	29.4
	c) Don't Know / No Answer	17.8	32.0	26.3	26.7	17.6	13.9	28.0	15.7

Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the project affect tourism opportunities in Digby County?	a) Yes → Why?)	39.5	40.0	36.8	33.3	47.1	52.8	30.7	52.9
	Positive:								
	• It will bring more tourists to the area	5.0	10.0	9.5	0.0	0.0	5.3	13.0	0.0
	Negative:								
	• Will drive tourists away	56.7	40.0	47.6	20.0	37.5	52.6	39.1	55.6
	• Will spoil beauty of the landscape	18.3	0.0	42.9	50.0	12.5	21.1	17.4	29.6
	• Will drive away the whales	20.0	10.0	9.5	10.0	0.0	26.3	13.0	33.3
	• Too much noise	15.0	0.0	4.8	10.0	0.0	0.0	8.7	11.1
	• Will be an ugly site	5.0	10.0	4.8	0.0	12.5	15.8	4.3	7.4
	• Will kill the fishery / deep sea fishery	8.3	0.0	0.0	10.0	0.0	5.3	0.0	0.0
	• Bad for campgrounds	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	• Other	20.0	30.0	4.8	30.0	37.5	52.6	39.1	55.6
	• Don't Know / No Answer	1.7	10.0	4.8	10.0	12.5	0.0	4.3	3.7
	b) No	45.4	52.0	36.8	46.7	41.2	41.7	45.3	37.3
	c) Don't Know / No Answer	15.1	8.0	26.3	20.0	11.8	5.6	24.0	9.8

Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the project affect local traditional activities?	a) Yes → Why?	39.5	40.0	33.3	33.3	41.2	44.4	29.3	41.2
	• Will destroy fishing and spawning grounds	55.0	40.0	73.7	80.0	71.4	68.8	40.9	47.6
	• Will have a bad affect on people	13.3	10.0	0.0	10.0	0.0	18.8	9.1	33.3
	• Will destroy the characteristics of quiet fishing villages	11.7	0.0	5.3	0.0	14.3	0.0	18.2	4.8
	• Bad impact on tourism	10.0	10.0	0.0	10.0	28.6	0.0	0.0	0.0
	• Will hurt activities like hunting, camping, picnicking, walking trial, skidooing	11.7	0.0	5.3	10.0	0.0	6.3	9.1	0.0
	• Will affect plant life	3.3	0.0	0.0	0.0	28.6	0.0	0.0	0.0
	• Will take away from the scenic beauty	1.7	0.0	0.0	0.0	14.3	0.0	18.2	4.8
	• Will destroy farmlands	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	• Will change the culture	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
	• Other	20.0	40.0	15.8	0.0	14.3	0.0	27.3	19.0
	• Don't Know / No Answer	3.3	0.0	10.5	0.0	0.0	6.3	9.1	19.0
	b) No	36.2	44.0	33.3	36.7	35.3	50.0	45.3	43.1
	c) Don't Know / No Answer	24.3	16.0	33.3	30.0	23.5	5.6	25..3	15.7

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Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the coastline near the project be affected by the project?	a) Yes → Why?	68.4	56.0	75.4	70.0	47.1	80.6	49.3	78.4
	• Large hole will be left in side of coastline	17.3	14.3	18.6	14.3	0.0	24.1	13.5	10.0
	• Building a wharf / huge wharf / eyesore terminal	14.4	14.3	4.7	14.3	12.5	17.2	13.5	17.5
	• Marine traffic	9.6	0.0	11.6	9.5	25.0	3.4	0.0	5.0
	• Pollution of water	10.6	0.0	16.3	19.0	0.0	6.9	5.4	2.5
	• Environmental issues	8.7	14.3	11.6	0.0	12.5	10.3	5.4	10.0
	• Visually it will not be good	6.7	0.0	4.7	4.8	12.5	10.3	8.1	7.5
	• Erosion	5.8	7.1	9.3	0.0	0.0	3.4	5.4	15.0
	• Spills along the coastline	5.8	0.0	4.7	4.8	0.0	3.4	0.0	0.0
	• Will affect the mountain range	5.8	0.0	7.0	4.8	0.0	13.8	2.7	0.0
	• Water levels	1.0	7.1	0.0	0.0	0.0	0.0	0.0	2.5
	• Other	35.6	35.7	27.9	38.1	50.0	31.0	37.8	45.0
	• Don't Know / No Answer	1.0	7.1	9.3	9.5	0.0	3.4	16.2	2.5
	b) No	12.5	28.0	5.3	10.0	17.6	16.7	17.3	19.6
	c) Don't Know / No Answer	19.1	16.0	19.3	20.0	35.3	2.8	33.3	2.0

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Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the project have an affect on the local lobster fishery?	a) Yes → Why?	50.0	28.0	40.4	43.3	41.2	77.8	38.7	68.6
	• Silt run-off and/or ballast water will destroy habitats	15.8	0.0	8.7	7.7	0.0	32.1	27.6	28.6
	• Ships will destroy lobster pots	6.6	0.0	8.7	23.1	0.0	25.0	3.4	14.3
	• Blasting, construction and dredging will cause environmental damage	11.8	14.3	8.7	0.0	0.0	10.7	3.4	8.6
	• High volume of shipping traffic	6.6	0.0	0.0	7.7	0.0	14.3	13.8	5.7
	• Upset balance of marine life	6.6	14.3	0.0	15.4	14.3	3.6	10.3	0.0
	• Spawning grounds in the cove will be disturbed	5.3	14.3	4.3	0.0	0.0	0.0	3.4	17.1
	• Fish will move to deeper waters	3.9	14.3	4.3	15.4	28.6	3.6	6.9	2.9
	• Floor of ocean will change	2.6	14.3	4.3	0.0	0.0	0.0	3.4	0.0
	• Land and water temperature will affect water temperature	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	• Other	34.2	28.6	34.8	30.8	42.9	10.7	13.8	20.0
	• Don't Know / No Answer	5.3	0.0	26.1	0.0	14.3	0.0	13.8	17.6
	b) No	20.4	28.0	15.8	23.3	29.4	13.9	25.3	13.7
	c) Don't Know / No Answer	29.6	44.0	43.9	33.3	29.4	8.3	36.0	2.9

Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion will the project affect Digby County's economy?	a) Yes → Why?	68.4	96.0	66.7	56.7	64.7	61.1	65.3	60.8
	Positive:								
	• Will create growth in the economy	33.7	33.3	60.5	23.5	63.6	27.3	49.0	32.3
	• There will be more jobs in the area	30.8	37.5	18.4	41.2	18.2	9.1	22.4	9.7
	• There will be more spending in the area	11.5	4.2	0.0	11.8	18.2	4.5	6.1	12.9
	Negative:								
	• It will destroy people's livelihoods	9.6	4.2	2.6	5.9	0.0	50.0	6.1	16.1
	• Less tourists	1.0	0.0	0.0	5.9	0.0	4.5	4.1	6.5
	• Other	10.6	12.5	5.3	11.8	0.0	4.5	10.2	22.6
	• Don't Know / No Answer	2.9	8.3	13.2	0.0	0.0	0.0	2.0	0.0
	b) No	21.1	0.0	15.8	26.7	17.6	27.8	16.0	17.6
	c) Don't Know / No Answer	10.5	4.0	17.5	16.7	17.6	11.1	18.7	21.6
Of the issues raised respecting the project, which concerns you the most?	a) Environmental issues	17.1	32.0	17.5	10.0	29.4	8.3	14.7	3.9
	b) Fishery	12.5	16.0	12.3	13.3	0.0	16.7	9.3	17.6
	c) Landscape	7.2	16.0	10.5	10.0	0.0	8.3	10.7	3.9
	d) Economic Impacts	7.2	0.0	7.0	6.7	5.9	8.3	5.3	3.9
	e) Lobster Fishery	5..3	0.0	0.0	3.3	0.0	11.1	1.3	11.8
	f) Water Quality	2.6	4.0	1.8	3.3	11.8	2.8	4.0	0.0
	g) Whales	3.9	0.0	1.8	3.3	0.0	0.0	1.3	0.0
	h) Noise / dust	2.0	0.0	3.5	3.3	11.8	0.0	1.3	11.8
	i) Ecological impact	1.3	0.0	3.5	3.3	5.9	0.0	0.0	0.0
	j) Ballast Water	2.6	4.0	0.0	0.0	0.0	0.0	2.7	0.0
	k) Resources being taken away	1.3	0.0	1.8	0.0	5.9	2.8	0.0	0.0
	l) Affect people's lifestyle	0.7	4.0	0.0	0.0	0.0	2.8	1.3	2.0

	m) Marine traffic	2.0	0.0	1.8	0.0	0.0	0.0	1.3	0.0
	n) The results once the								0
	developer is gone	0.0	0.0	1.8	3.3	0.0	0.0	2.7	0.0
	o) Lack of information	0.7	4.0	1.8	0.0	0.0	0.0	0.0	0.0
	p) Infrastructure / traffic	1.3	4.0	1.8	0.0	0.0	0.0	1.3	0.0
	q) All the issues	2.0	0.0	0.0	0.0	0..0	0.0	0.0	0.0
	r) Oil and chemical spills	1.3	0.0	0.0	0.0	0.0	1.3	0.0	0.0
	s) Health of residents	0.0	0.0	0.0	0.0	5.9	2.8	5.3	0.0
	t) Other	7.9	4.0	7.0	10.0	5.9	16.7	5.3	27.5
	u) Don't Know / No Answer	17.8	12.0	24.6	26.7	5.9	11.1	34.7	9.8

Question	Responses	245	467	532	638	769	834	837	839
In YOUR opinion can concerns that people have expressed about the project be addressed so that the project can proceed?	a) Yes	44.7	52.0	40.4	43.3	23.5	38.9	44.0	37.3
	b) No → Why Not?	27.6	32.0	22.8	23.3	35.3	33.3	22.7	41.2
	• Project will proceed regardless	19.0	25.0	7.7	42.9	66.7	16.7	29.4	23.8
	• People do not want the project to proceed	19.2	0.0	0.0	0.0	16.7	8.3	11.8	9.5
	• Too many environmental issues	4.8	12..5	15.4	28.6	16.7	16.7	5.9	9.5
	• Too many unanswered questions	11.9	12.5	0.0	0.0	0.0	8.3	5.9	4.8
	• Just not a good idea for the area	4.8	0.0	7.7	0.0	0.0	8.3	0.0	0.0
	• No compensation for fishermen	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	• Big companies have no concern for project impacts	4.8	0.0	0.0	0.0	0.0	0.0	5.9	4.8
	• Need to protect the fishery / lobster fishery	2.4	0.0	0.0	0.0	0.0	0.0	0.0	4.8
	• Because of impacts on people	2.4	0.0	0.0	0.0	0.0	0.0	0.0	4.8
	• Don't trust the companies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
	• Other	21.4	50.0	53.8	14.3	0.0	50.0	29.4	38.1
	• Don't Know / No Answer	4.8	0.0	15.4	14.3	0.0	0.0	17.6	0.0
	c) Don't Know / No Ans	27.6	16.0	36.8	33.3	41.2	27.8	33.3	21.6

Question	Responses	245	467	532	638	769	834	837	839
Based on what you know about the White's Point Project, do you support the project?	a) Yes	34.2	24.0	26.3	26.7	5.9	25.0	38.7	19.6
	b) No	47.4	52.0	50.9	60.0	47.1	61.1	32.0	70.6
	c) Don't Know / No Answer	18.4	24.0	22.8	13.3	47.1	13.9	29.3	9.8
Do you feel that you have had sufficient opportunity to participate in discussions regarding the project?	a) Yes	51.3	60.0	33.3	40.0	23.5	69.4	49.3	70.6
	b) No → Why Not?	38.8	36.0	47.4	50.0	76.5	25.0	37.9	19.6
	• Does not concern them / Not interested	30.5	33.3	25.9	26.7	30.8	11.1	21.4	30.0
	• Have not heard too much about it	13.6	11.1	14.8	26.7	0.0	22.2	25.0	10.0
	• Need more information	18.6	11.1	3.7	6.7	7.7	11.1	14.3	20.0
	• Doesn't live in the area	10.2	0.0	18.5	20.0	15.4	0.0	14.3	0.0
	• Would like more public meetings / information	6.8	0.0	14.8	13.3	7.7	22.2	7.1	20.0
	• Need more promotion / advertising	8.5	11.1	0.0	0.0	7.7	0.0	7.1	0.0
	• Meetings are held too far away	1..7	22.2	3.7	0.0	7.7	0.0	0.0	0.0
	• Other	8.5	0.0	3.7	0.0	0..0	33.3	25.0	10.0
	• Don't Know / No Answer	3.4	11.1	14.8	6.7	23.1	0.0	3.6	0.0
	c) Don't Know / No Ans	9.9	4.0	19.3	6.7	0.0	5.6	13.3	9.8
	d) Refused	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0

Question	Responses	245	467	532	638	769	834	837	839
Do you have any other comments?	a) Yes	25.0	28.0	19.3	23.3	17.6	38.9	21.3	31.4
	Positive:								
	• Hope it goes ahead and boosts economy	3.3	0.0	1.8	0.0	0.0	0.0	2.7	0.0
	• The project will bring lots of jobs to the area	2.0	0.0	1.8	0.0	0.0	2.8	2.7	0.0
	• Government looks long and hard before proceeding	2.0	0.0	0.0	0.0	00	5.6	1.3	0.0
	• Things should be fine	0.7	0.0	0.0	0.0	0.0	2.8	1.3	0.0
	• Digby should get benefits promised	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.0
	• Other	3.9	12.0	5.3	6.7	0.0	8.3	5.3	13.7
	Negative:								
	• Hope it does not proceed	7.2	12.0	0.0	3.3	0.0	8.3	2.7	7.8
	• Would like / needs more information/ updates more often	2.0	0.0	3.5	3.3	11.8	2.8	2.7	0.0
	• People in the area are very opposed	2.0	0.0	1.8	0.0	0.0	8.3	2.7	0.0
	• Should not let our resources to be taken away	2.6	0.0	0.0	0.0	0.0	0.0	0.0	5.9
	• Have not heard enough to form an opinion	0.0	4.0	1.8	10.0	5.9	0.0	0.0	0.0
	• Will affect the environment								

	• What will happen to site once developer goes • Property values will decrease b) No	0.0 0.0 0.7 75.0	0.0 0.0 0.0 72.0	3.5 0.0 0.0 80.7	0.0 0.0 0.0 76.7	0.0 0.0 0.0 82.4	0.0 2.8 0.0 61.1	0.0 0.0 0.0 78.7	0.0 0.0 0.0 68.6

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Question	Responses	245	467	532	638	769	834	837	839
Can you name the company that is developing the White's Point Quarry?	a) Bilcon b) No c) Other	5.9 92.1 2.0	12.0 84.0 4.0	0.0 91.2 8.8	3.3 93.3 3.3	0.0 100.0 0.0	22.2 72.2 5.6	0.0 100.0 0.0	11.8 84.3 3.9
Where does the company come from?	a) United States b) Canada c) Other d) Don't Know / No Answer	69.1 2.0 1.3 27.6	68.0 0.0 4.0 28.0	45.6 1.8 0.0 52.6	63.3 0.0 1.0 26.7	52.9 5.9 0.0 41.2	88.9 0.0 2.8 8.3	54.7 0.0 0.0 45.3	90.2 0.0 2.0 7.8
What do you think is the best way to inform the community about development projects in the Digby area?	a) Local newspaper b) Public Information sessions c) Radio / TV d) Mail out surveys e) Community group f) Government g) General media h) Internet i) Other / community newspapers j) Door to door k) Other l) Don't Know / No Answer	60.1 39.9 28.5 16.5 16.5 9.5 0.0 1.3 1.3 1.3 4.4 1.9	55.6 33.3 25.9 29.6 7.4 7.4 3.7 3.7 0.0 0.0 0.0 0.0	63.3 31.7 50.0 18.3 8.3 0.0 3.3 1.7 1.7 1.7 0.0 3.3	50.0 43.8 31.3 21.9 9.4 3.1 3.1 0.0 0.0 0.0 3.1 9.4	58.8 35.3 35.3 11.8 17.6 0.0 0.0 0.0 0.0 0.0 5.9 0.0	41.7 36.1 25.0 25.0 30.6 11.1 2.8 0.0 0.0 2.8 2.8 11.1	65.0 26.3 33.8 20.0 13.8 7.5 1.3 0.0 1.3 0.0 2.5 7.5	62.7 52.9 25.5 23.5 37.3 7.8 2.0 3.9 2.0 0.0 0.0 5.9

Demographics

Question	Responses	245	467	532	638	769	834	837	839
Gender:	a) Male	46.2	51.9	36.7	43.8	52.9	47.1	47.2	52.8
	b) Female	53.8	48.1	63.6	56.3	47.1	52.8	51.3	54.9
Is your permanent residence in Digby County?	a) Yes	98.7	48.1	5.0	12.5	88.2	100.0	96.3	98.0
	b) No	0.6	51.9	95.0	84.4	11.8	0.0	3.8	2.0
	c) Refused	0.6	0.0	0.0	3.1	0.0	0.0	0.0	0.0
What brings you to Digby County at this time?	a) Visiting relatives	0.0	25.0	12.5	0.0	0.0	0.0	33.3	0.0
	b) Summer home	0.0	25.0	12.5	0.0	50.0	0.0	0.0	0.0
	c) Shopping	0.0	25.0	12.5	42.9	0.0	0.0	0.0	0.0
	d) Other	50.0	0.0	12.5	0.0	0.0	0.0	33.3	0.0
	e) Don't Know / No	50.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0
	Answer / refused	0.0	25.0	50.0	42.9	50.0	0.0	33.3	1.0
How often do you visit Digby County?	a) Twice per year	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0
	b) More than 4 times per year	100.0	50.0	62.5	71.4	100.0	0.0	66.7	100.0
	c) Refused	0.0	25.0	37.5	28.6	0.0	0.0	33.3	0.0
How long do you usually stay in the area when you visit?	a) Less than a month	0.0	25.0	0.0	28.6	0.0	0.0	33.3	0.0
	b) 1-2 months	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0
	c) 5-6 months	0.0	0.0	12.5	0.0	50.0	0.0	0.0	100.0
	d) more than 6 months	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	e) Day trip	50.0	25.0	50.0	42.9	50.0	0.0	33.3	0.0
	f) Refused	00.0	25.0	37.5	28.6	0.0	0.0	33.3	0.0
Age	a) 18-30	10.0	7.4	6.7	3.1	11.8	13.9	10.0	9.8
	b) 31-40	15.8	7.4	6.7	12.5	11.8	19.4	22.5	7.8
	c) 41-50	24.7	37.0	30.0	6.3	11.8	11.1	18.5	25.5
	d) 51-60	23.4	37.0	26.7	37.5	35.3	16.7	26.3	25.5
	e) 61-70	18.4	0.0	20.0	21.9	23.5	22.2	13.8	15.7
	f) over 70	70.0	11.1	10.0	15.6	5.9	16.7	8.8	15.7
	g) Refused	0.6	0.0	0.0	3.1	0.0	0.0	0.0	0.0

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Question	Responses	245	467	532	638	769	834	837	839
Are you currently working?	a) Yes	57.0	63.0	51.7	34.4	52.9	44.4	60.0	35.3
	• Full time	87.8	70.6	77.4	72.7	77.8	68.8	83.3	66.7
	• Part Time	12.2	29.4	22.6	27.3	22.2	31.3	16.7	33.3
	b) No	43.0	37.0	48.3	62.5	47.1	55.6	40.0	62.7
	c) Refused	0.0	0.0	0.0	3.1	0.0	0.0	0.0	2.0
What is your occupation?	a) Management Occupations	5.7	14.8	8.3	3.1	11.8	2.8	3.8	3.9
	b) Business, Finance and Administrative Occupations	8.2	11.1	10.0	12.5	5.9	13.9	5.0	0.0
	c) Natural and Applied Sciences and Related Occupations	0.6	3.7	5.0	0.0	0.0	2.8	1.3	2.0
	d) Health Occupations	6.3	0.0	1.7	3.1	0.0	5.6	10.0	0.0
	e) Occupations in Social Sci., Education, Govt. service and Rel	7.6	7.4	6.7	0.0	11.8	2.8	8.8	3.9
	f) Occupations in Art, Culture, Recreation and Sport	1.3	0.0	1.7	0.0	0.0	0.0	1.3	3.9
	g) Sales and Service Occupations	10.8	11.1	6.7	9.4	11.8	2.8	3.8	7.8
	h) Trades, Transport and Equipment Operators and Related Occupations	10.1	11.1	6.7	6.3	0.0	2.8	10.0	2.0
	i) Occupations Unique to Primary Industry	5.1	0.0	10.0	0.0	5.9	19.4	12.5	17.6
	j) Occupations Unique to Processing, Manufacturing and	1.3	3.7	0.0	3.1	0.0	2.8	3.8	0.0

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	Utilities								
	k) Retired	28.5	18.5	26.7	46.9	41.2	30.6	21.3	35.3
	l) Unemployed/home-maker / stay at home mother	5.7	7.4	10.0	6.3	0.0	11.1	11.3	15.7
	m) Laborer	0.6	0.0	1.7	0.0	0.0	0.0	2.5	2.0
	n) Disabled	0.6	3.7	1.7	3.1	0.0	0.0	1.3	0.0
	o) Student	2.5	3.7	1.7	0.0	5.9	0.0	0.0	0.0
	p) Other Mentions	3.8	0.0	0.0	3.1	5.9	2.8	3.8	3.9
	q) Refused	1.3	3.7	1.7	3.1	0.0	0.0	0.0	2.0
What is your highest level of education?	a) Less than grade 9	3.2	3.7	6.7	3.1	5.9	13.9	6.3	9.8
	b) Grade 9	13.3	18.5	11.7	6.3	5.9	5.6	13.8	5.9
	c) High School	31.0	33.3	20.0	31.3	5.9	41.7	36.3	43.1
	d) College Diploma	25.3	14.8	30.0	18.8	23.5	16.7	16.3	17.6
	e) Some University	5.1	7.4	13.3	6.3	17.6	2.8	7.5	0.0
	f) University graduate	15.2	14.8	10.0	31.3	17.6	11.1	13.8	19.6
	g) Masters or PHD	7.0	7.4	8.3	0.0	23.5	5.6	6.3	2.0
	h) Refused	0.0	0.0	0.0	3.0	0.0	2.8	0.0	2.0

ATTITUDE SURVEY:
WHITE'S POINT QUARRY, DEC 2006

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WHITE'S POINT QUARRY, DEC 2006

Sample Size: **200 (unless otherwise stated)**
Reliability: **+ 5.0% at 95% confidence** level

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
1.	**Have you heard of the White's Point Quarry project?**	Yes:	100	96.0
		No:	0	4.0
2.	**From which of the following sources have you received MOST of your information about the White's Point project? (Multiple responses allowed)**	a) Local newspaper	59.6	55.4
		b) Environmental Lobby Group	22.1	13.5
		c) Radio	18.4	20.3
		d) Word of Mouth	52.0	55.4
		e) Community group	27.3	14.5
		f) Protest/Lawn/Bill board signs	2.3	4.0
		g) Newsletters /flyers/magazines	3.8	1.0
		h) TV	0.3	0.5
		i) Mail	2.8	NA
		j) Company/Developer information (EIS, brochures, meetings)	4.0	NA
		k) Other	1.9	1.2
		l) Don't Know / No Answer / No Answer	0.6	0.6
3.	**What kind of project is it? (Multiple responses allowed)**	a)Basalt/Rock quarry	41.6	61.3
		b) Mining Project	3.5	4.8
		c) Quarry to refine rock to be shipped away	4.7	7.0
		d) Shipping rock to the U.S.	11.0	NA
		e) Quarry Project	21.1	NA
		f) Exporting rock to New Jersey	3.4	NA
		g) Using rock for road construction/concrete products	8.0	7.7
		h) Has to do with exporting/shipping rocks	3.9	NA
		i) It has to do with gravel/rocks/crushed stone	5.9	NA
		j) Other	12.4	5.2
		k) Don't know/No Answer	11.6	17.1
3b	**Where will it be located? (Multiple responses allowed)**	a)Digby Neck	28.2	51.3
		b) White's Point/White's Point on Digby Neck	12.8	3.0
		c) White's Cove/White's Cove on Digby Neck	12.7	6.1
		d) Little River/Little River on Digby Neck	35.6	27.2
		e) Sandy Cove/Sandy Cove Area	3.2	2.8
		f) Other	5.5	5.0
		g) Don't know/No Answer	2.9	11.9
3c	**How many jobs will be created?**	a)Few jobs/Not a lot/Not many	3.3	6.4
		b) 10-20	2.5	5.7
		c) 21-50	40.8	13.6
		d) 51-100	6.8	2.6
		e) 101-200	1.4	1.3
		f) 201-300	0.7	0.9
		g) 401-500	0.3	NA
		h) Other	5.3	2.0
		i) Don't know/No Answer	39.0	67.5
3d	**How long will the project last?**	a)Lengthy/Forever/Longtime	6.8	7.2
		b) Until resources run out	3.9	2.9
		c) 1-3 yrs	0.7	1.5
		d) 6-10 yrs	2.3	2.0
		e) 11-20 yrs	1.8	3.3
		f) 21-50 yrs	5.2	5.3
		g) 51-100 yrs	2.9	0.4
		h) 50 years	18.1	NA
		i) 20 years	4.3	NA

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
		j) Other	3.2	0.4
		k) Don't know/No Answer	50.8	74.3
3e	**What will happen to the quarry mined? (Multiple responses allowed)**	a)Sent to New Jersey	8.4	1.8
		b) Shipped away	2.7	6.6
		c) Exported to the US	33.4	27.9
		d) Material for roads, asphalt	6.8	8.1
		e) Leave large hole/Waste land	0.6	3.7
		f) Used to make concrete	3.0	NA
		g) Other	19.9	9.0
		h) Don't know/No Answer	37.2	43.6
4	**Do you know if Digby County will receive any financial or other benefits from the project? Specify. (Multiple responses allowed)**	a)Yes - More employment/Jobs	22.9	15.8
		b) No	24.7	27.4
		c) Yes - Tax Revenue	8.5	6.3
		d) Yes - good for the economy	10.5	2.4
		e) Yes - Other	9.5	3.9
		f) Don't Know/No Answer	37.0	44.2
5	**Have you heard any opinions expressed about the project?**	a) Yes	93.5	83.0
		b) No	5.8	12.0
		c) Don't know/No answer	0.7	2.0
5b	**Could you please tell us what issues you have heard about? (Multiple responses allowed) Sample: 187**	a)Impact on fishery	43.7	22.3
		b) Impact on lobster fishery	34.4	9.5
		c) Impact on water quality	18.3	3.3
		d) Impact on tourism	11.7	6.1
		e) Impact on whales	23.4	9.5
		f) Ballast water	7.8	3.0
		g) Noise, dust	27.2	15.7
		h) Increased marine traffic	11.1	4.8
		i) Disturb the natural landscape and beauty of area	37.3	8.4
		j) It will create jobs	25.3	10.4
		k) Drop in water tables	1.0	2.0
		l) Environmental/Ecosystem	8.1	28.9
		m) Deterioration of roads	0.7	1.9
		n) Water/Air pollution	0.8	5.7
		o) Losing our resources	4.8	2.7
		p) Some for the project and some against	1.0	32.3
		q) Not good for the area	0.7	3.2
		r) Increased truck traffic	1.4	NA
		s) Decrease value of homes	2.3	NA
		t) People opposed to it	5.3	NA
		u) Other	12.3	16.6
		v) Don't Know/No Answer	4.9	2.0
6	**Overall, do YOU think the White's Point is a good project for Digby County?**	a) Yes	42.5	28.9
		b) No	31.8	40.3
		c) Don't Know/No Answer	25.7	30.9
6b	**Why? (Multiple responses allowed) Sample: 85**	a) Job creation/Create jobs	79.4	76.9
		b) Good for the economy	17.6	15.5
		c) Doesn't think that project will be harmful	23.5	NA
		d) Other	11.5	18.3
6c	**Why not? (Multiple responses allowed) Sample: 64**	a) No benefits	13.9	8.5
		b) Losing our resources	4.8	2.7
		c) Destroying the area	18.0	15.3
		d) Destroying the fishery	30.2	22.3
		e) Destroying the whale habitat	6.3	4.2
		f) Environmental/Ecosystem damage	12.2	30.0
		g) Noise level	4.0	4.1
		h) Destroying marine life	1.1	1.6
		i) Air and water pollution	13.7	7.3
		j) Not enough jobs	6.0	NA
		k) Will hurt/destroy the lobster fishery	12.6	NA
		l) Will destroy the economy/No economic benefits	6.1	NA

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
		m) Will hurt peoples livelihoods/Quality of life n) Project is too big for this small strip of land o) Tourism will be affected p) Doesn't trust/believe people operating it q) Other r) Don't Know/No Answer	10.0 4.6 5.4 5.4 27.7 1.0	NA NA NA NA 44.6 2.0
7	**Do YOU believe the project will create jobs that will be important to Digby County?**	a) Yes b) No c) Don't Know/No Answer	62.4 28.3 9.3	54.7 30.0 15.3
7b	**Why? (Multiple responses allowed) Sample: 125**	a) Take people off welfare b) Improve the economy c) Any job is important to the area d) Hiring of local people e) There is a lot of unemployment/No work f) They will need people to work there, provide training g) People won't have to move away to find work h) Fishing industry is not what it used to be i) Other j) Don't Know/No Answer	1.7 10.6 45.6 4.7 22.5 6.8 6.8 7.8 18.6 2.5	1.0 9.3 55.2 18.4 NA NA NA NA 15.1 7.0
7c	**Why not? (Multiple responses allowed) Sample: 56**	a) Not that many jobs available b) Not enough jobs for impact c) Not sustainable/Short term d) Hiring of outsiders e) Top jobs will go to their people/Bring in their own people f) Quarry will destroy jobs in the fishery and tourism areas g) Only jobs available for locals will be low paying jobs h) Jobs are going to need special training (eg. heavy equipment) i) Other	22.0 4.9 8.4 9.6 25.1 17.8 17.4 8.6 11.5	12.9 12.3 13.5 33.8 NA NA 4.4 NA 31.0
8	**In YOUR opinion will the White's Point project affect the area's natural environment?**	a) Yes b) No c) Don't Know/No Answer	62.5 23.7 13.9	66.7 15.1 18.2
8b	**How? (Multiple responses allowed) Sample: 125**	a) Too many boats in area/Water b) Killing fish/Destroying fishery c) Detrimental to lobster fishery d) Destroying the environment/land/landscape/loss of treelings e) Decline in whale population f) Silt in bay/The run-offs/Chemicals in ocean g) Disturbing the natural sea-life h) Air/water pollution i) Change in the water tables j) Endanger to the wildlife k) Plant life will die l) Noise/blasting m) Tourism n) Local way of life/quality will be affected o) Other p) Don't Know/No Answer	6.3 20.0 12.5 44.3 9.1 5.8 5.8 14.3 4.9 15.7 2.9 19.9 5.7 5.6 16.3 7.5	7.0 14.8 5.1 43.4 7.7 8.3 7.8 17.1 7.7 10.3 1.9 NA NA NA 18.4 4.6
9	**In YOUR opinion will the project affect the overall well-being and quality of people's lives in Digby County?**	a) Yes b) No c) Don't Know/No Answer	56.5 27.0 16.5	50.8 25.8 23.4

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
9b	**How? (Multiple responses allowed) Sample: 113**	a) More/better jobs	41.3	20.5
		b) Too much traffic on land and water	3.3	4.1
		c) Air/water pollution	6.5	11.0
		d) Too much noise	14.3	14.2
		e) Destroy livelihood of people (fishery/tourism)	15.9	16.2
		f) Quality of water	0.7	0.7
		g) Increase in the economy	13.8	8.4
		h) Bad effect on tourism/Drive tourists away	3.1	3.3
		i) Environmental issues/Silt run-off/More pollution	4.0	10.2
		j) Will cause health problems	4.1	NA
		k) Decrease property values	3.7	NA
		l) Other	20.5	38.6
		m) Don't Know/No Answer	5.9	4.3
10	**In YOUR opinion will the project affect tourism opportunities in Digby County?**	a) Yes	34.5	37.9
		b) No	47.5	43.3
		c) Don't Know/No Answer	18.0	18.8
10b	**How? (Multiple responses allowed) Sample: 69**	a) Spoil the landscape/beauty	23.0	24.0
		b) Driving away the whales	20.2	19.6
		c) Too much noise	10.9	8.1
		d) Quarry an ugly site	2.2	7.2
		e) It will bring more tourists to the area	19.1	5.8
		f) Bad for tourism/drive people away	48.9	49.1
		g) Other	14.3	21.0
		h) Don't Know/No Answer	3.9	3.5
11	**In YOUR opinion will the project affect local traditional activities?**	a) Yes	36.0	34.9
		b) No	48.9	41.3
		c) Don't Know/No Answer	15.2	23.7
11b	**How? (Multiple responses allowed) Sample: 72**	a) Destroy fishery/fishing grounds/spawning grounds	52.4	57.3
		b) Big effect on tourism	6.3	6.2
		c)Hiking/camping/picnicing/hunting/skidooing/walking trails	12.6	5.9
		d) Destroying the characteristic quiet fishing villages	4.5	8.0
		e) Taking away from the beautiful scenic view	1.2	1.0
		f) Effect on the people themselves	10.9	NA
		g) Other	19.5	18.8
		h) Don't Know/No Answer	3.4	7.3
12	**In YOUR opinion will the coastline near the project be affected by the project?**	a) Yes	62.9	64.3
		b) No	22.6	21.6
		c) Don't Know/No Answer	14.5	19.4
12b	**How? (Multiple responses allowed) Sample: 126**	a) Erosion	1.6	6.4
		b) Spills along the coastline	0.2	3.9
		c) Pollution of water	8.1	9.1
		d) Building a wharf/huge wharf eyesore/terminal	22.7	13.2
		e) Effect on mountain range	1.4	4.6
		f) Large hole left in side of coastline	1.2	17.2
		g) Visual aspect	6.2	6.6
		h) Marine traffic	0.4	8.4
		i) Environmental issues	2.5	7.6
		j) Blasting/mining will destroy coastline	23.6	NA
		k) Other	39.4	35.5
		l) Don't Know/No Answer	3.1	5.4
13	**In YOUR opinion will the project have an affect on the local lobster fishery?**	a) Yes	54.1	47.1
		b) No	24.8	21.5
		c) Don't Know/No Answer	21.2	31.4
13b	**How? (Multiple responses allowed) Sample: 108**	a) Blasting/construction & dredging	17.1	9.2
		b) Silt/Run-off/Destroy habitat/Ballast water	13.2	18.0
		c) Lobster pots destroyed by huge ships/Can't set traps in norm	20.9	NA

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
		d) Spawning grounds in cove disturbed	15.6	6.5
		e) Fish will move to deeper waters/another area	10.0	5.1
		f) High volume of shipping traffic	12.1	7.4
		g) Floor of ocean will change	3.4	1.8
		h) Upset balance of marine life	1.0	6.0
		i) Pollution in water will destroy lobster fishery	9.8	NA
		j) Other	10.8	26.7
		k) Don't Know/No Answer	9.9	21.5
14	**In YOUR opinion will the project affect Digby County's economy?**	a) Yes	70.6	65.9
		b) No	17.3	18.6
		c) Don't Know/No Answer	12.2	15.5
14b	**How? (Multiple responses allowed) Sample: 141**	a) Growth in the economy	24.7	37.7
		b) More spending in the area	11.3	8.6
		c) More jobs in the area	33.2	26.2
		d) Less tourists	7.7	2.0
		e) New housing	2.0	NA
		f) Destroy people's livelihood	16.4	11.6
		g) Positive/Good effect/Help some/Improve it	10.9	NA
		h) Other	6.4	9.3
		i) Don't Know/No Answer	3.6	4.6
15	**Of all the issues raised respecting the White's Point project, which concerns you the most?**	a) Fishery	18.1	12.0
		b) Water Quality	0.9	3.7
		c) Whales	1.5	2.0
		d) Noise, dust	5.9	3.5
		e) Landscape	10.3	7.6
		f) Lobster fishery	11.5	5.0
		g) Tourism	0.7	1.4
		h) Ballast water	1.5	1.3
		i) Marine traffic	1.1	1.1
		j) Economic Impacts	7.9	6.1
		k) environmental issues	8.6	14.8
		l) No Concerns	4.7	NA
		m) People's lifestyle/People living in the area	2.8	1.5
		n) Resources been taken away	0.1	1.3
		o) The end result when they are gone	0.3	1.1
		p) Infrastructure/Traffic	0.6	0.9
		q) Lack of information	2.2	0.9
		r) Other	7.6	8.9
		s) Don't Know/No Answer	13.6	20.5
15b	**Why? (Multiple responses allowed) Sample: 173**	a) Impact on fishery	33.0	NA
		b) Don't live in the area	0.4	NA
		c) Pay no attention/Doesn't concern me	0.4	NA
		d) Doesn't matter to them	0.4	NA
		e) Impact on the wildlife	2.3	NA
		f) Pollution	2.3	NA
		g) Landscape beauty destroyed	5.2	NA
		h) Hazards to health	0.8	NA
		i) Chemicals in the water	3.9	NA
		j) Erosion of shoreline/surrounding land	2.1	NA
		k) Disruption of serenity	1.2	NA
		l) Destroy small fishing villages/No concern for people living	0.1	NA
		m) Endangering the whales	1.6	NA
		n) Sound effects for the people living in the area	3.3	NA
		o) Will improve the employment rate/Good for the economy	8.5	NA
		p) Because of detrimental effect on the environment	15.0	NA
		q) Destroying the area for tourists	3.3	NA
		r) Taking away people's livelihood	10.5	NA
		s) Concern for quality of water/Water tables	0.7	NA

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
		t) Concern for future of people and children	3.7	NA
		u) Think it is a good thing	2.6	NA
		v) Doesn't think it is a good thing/Not being truthful	4.9	NA
		w) Other	8.2	NA
		x) Don't Know/No Answer	4.3	NA
16	**In YOUR opinion can the concerns that people have expressed about the project be addressed so that the project can proceed?**	a) Yes	47.0	43.0
		b) No	31.4	26.1
		c) Don't Know/No Answer	21.6	30.9
16b	**Why not? (Multiple responses allowed) Sample: 63**	a) Too many environmental issues	7.4	9.2
		b) No compensation for fishermen	0.4	3.2
		c) Big companies have no concern for impact project has on area	7.9	3.2
		d) Too many questions left unanswered	14.0	6.7
		e) Will proceed regardless	6.9	23.7
		f) How they could protect the fishery/lobster fishery	1.6	2.1
		g) Because of the different effects it will have on the people	10.0	1.4
		h) Don't want project to proceed	26.8	11.8
		i) Not a good idea for the area	8.4	NA
		j) Other	16.4	32.3
		k) Don't Know/No Answer	3.0	5.8
17	**Based on what you know about the White's Point Project, do you support the project?**	a) Yes	40.4	30.5
		b) No	37.7	48.2
		c) Don't Know/No Answer	21.9	21.3
18	**Do you feel that you have had sufficient opportunity to participate in discussions regarding the project?**	a) Yes	59.4	49.8
		b)No	34.9	39.3
		c)Don't Know/No Answer	5.7	10.7
18b	**Why not? (Multiple responses allowed) Sample: 70**	a) Would like more information/Public meetings	15.2	9.6
		b) More advertising/information made available	6.1	5.4
		c) Need more information before commenting	0.9	13.4
		d) Doesn't live in the area	1.0	11.5
		e) Meetings are held too far away	6.4	2.7
		f) No interest/Doesn't concern them/Own choice	43.0	27.8
		g) Have not heard too much about it	20.8	NA
		h) Other	4.1	5.9
		i) Don't Know/No Answer	4.5	6.2
19	**Do you have any other comments about the project? (Multiple responses allowed)**	a) People in area very opposed/upset	3.7	2.0
		b) No	65.6	75.7
		c) Hopes it doesn't go ahead	3.3	4.9
		d) Would like to know more/Updates more often	2.4	2.7
		e) Hopes it goes ahead/Boost to the economy	3.9	2.4
		f) Will effect the environment	2.9	0.4
		g) Should not let our resources to be taken away	0.5	1.6
		h) The project will bring lots of jobs to the area	5.4	1.8
		i) Concerned about quarry site when project is finished	0.5	NA
		j) That Digby gets benefits promised	0.6	0.3
		k) Gov't looks long and hard before proceeding	1.8	1.2
		l) Things should be fine	3.0	0.8
		m) Big threat to the fishery and people's livelihood	1.8	NA
		n) Other	7.5	6.0
20	**Can you name the company that is developing the White's**	a) Bilcon	41.0	5.7
		b) No	54.1	91.2
		c) Clayton of New Jersey	0.7	NA

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
	Point Quarry?	d) Other	4.3	3.0
21	**Do you know where the company comes from?**	a) Canada	0.9	1.1
		b) United States	73.5	64.6
		c) Other	1.0	1.7
		d) Don't Know/No Answer	24.5	32.5
22	**In concluding our survey I would like to ask some general questions to assist us in understanding your answers. [DO NOT ASK] Record Gender**	a) Male	39.8	44.9
		b) Female	60.2	55.1
23	**What is your occupation?**	a) Retired	28.1	29.8
		b) Other	14.3	3.4
		c) Homemaker	10.0	9.0
		d) Unemployed/disabled	6.3	1.9
		e) Fishing Vessel Skippers and Fishermen/women	5.0	NA
		f) Fish Plant Workers	2.9	NA
		g) Refused	2.5	1.5
		h) Secondary School Teachers	1.9	NA
		i) Bookkeepers	1.9	NA
		j) Food and Beverage Servers	1.7	NA
		k) Labourers in Fish Processing	1.3	NA
		l) Deck Officers, Water Transport	1.2	NA
		m) Employment Counsellors	1.1	NA
		n) Customer Service, Information and Related Clerks	1.1	NA
		o) Biologists and Related Scientists	0.9	2.1
		p) Social Workers	0.9	NA
		q) Farmers and Farm Managers	0.9	NA
		r) Manufacturing Managers	0.8	NA
		s) Other Professional Engineers, n.e.c.	0.8	NA
		t) Retail Trade Managers	0.7	NA
		u) Restaurant and Food Service Managers	0.7	NA
		v) Financial Auditors and Accountants	0.7	NA
		w) Accounting and Related Clerks	0.7	NA
		x) Registered Nurses	0.7	NA
		y) Real Estate Agents and Salespersons	0.7	NA
		z) Police Officers (Except Commissioned)	0.7	NA
		aa) Visiting Homemakers, Housekeepers and Related Occupations	0.7	NA
		bb) Elementary and Secondary School Teacher Assistants	0.7	NA
		cc) Pet Groomers and Animal Care Workers	0.7	NA
		dd) Other Attendants in Accommodation and Travel	0.7	NA
		ee) Heavy Equipment Operators (Except Crane)	0.7	NA
		ff) Mail, Postal and Related Clerks	0.6	
		gg) Authors and Writers	0.6	NA
		hh) Deck Crew, Water Transport	0.6	NA
		ii) Nurse Aides, Orderlies and Patient Service Associates	0.6	NA
		jj) University Professors	0.5	NA
		kk) Civil Engineers	0.4	NA
		ll) Ambulance Attendants and Other Paramedical Occupations	0.4	NA
		mm) Early Childhood Educators and Assistants	0.4	NA
		nn) Retail Salespersons and Sales Clerks	0.4	NA
		oo) Construction Trades Helpers and Labourers	0.4	NA
		pp) General Office Clerks	0.3	NA
		qq) Painters, Sculptors and Other Visual Artists	0.3	NA
		rr) Tour and Travel Guides	0.3	NA

	Survey Question	Responses	2006 Percent (%)	2005 Percent (%)
		ss) Cashiers	0.3	NA
		tt) Receptionists and Switchboard Operators	0.3	NA
		uu) Electrical and Electronics Engineering Technologists and Tec	0.3	NA
		vv) Construction Inspectors	0.3	NA
		ww) Ministers of Religion	0.3	NA
		xx) Librarians	0.3	NA
		yy) Insurance Agents and Brokers	0.1	NA
		zz) Funeral Directors and Embalmers	0.1	NA
24	**Are you currently working?**	a) Yes	46.5	49.8
		b) No	52.6	49.8
		c) Refused	0.9	0.4
24b	**Do you work full-time or part-time? Sample: 93**	a) Full-Time	75.3	83.1
		b) Part-Time	24.7	16.9
25	**What do you think is the best way to inform the community about new development projects in the Digby area? (Multiple responses allowed)**	a) Local newspaper	49.0	59.8
		b) Public information session	36.3	34.5
		c) Community groups	17.8	16.1
		d) Government	4.4	6.6
		e) Mail outs	23.5	21.2
		f) Radio	23.0	NA
		g) Internet	0.6	1.4
		h) Door to door	1.5	0.7
		i) Other newspapers beside local	0.1	0.8
		j) Word of mouth	1.0	NA
		k) TV	7.0	NA
		l) Posters	1.7	NA
		m) Other	5.2	2.8
		n) Don't Know/No Answer	7.1	5.4
26	**Is your permanent residence in Digby County?**	a) Yes	98.7	77.3
		b) No	1.3	22.3
26b	**Where is your permanent residence? Sample: 3**	a) Other	39.7	NA
		b) Halifax (Regional municipality)	60.3	NA
27	**What brings you to Digby County at this time? Sample: 3**	a) Summer Home	20.6	6.9
		b) Other	79.4	NA
28	**How often do you visit Digby County? Sample: 3**	a) More than 4 times per year	100.0	58.6
29	**How long do you usually stay in the area when you visit? Sample: 3**	a) 1-2 months	39.7	3.2
		b) 3-4 months	20.6	NA
		c) Other	39.7	NA
30	**Into which of the following age categories do you fall?**	a) 18-30	12.2	15.1
		b) 31-40	12.1	17.9
		c) 41-50	22.7	19.3
		d) 51-60	23.1	17.6
		e) 61-70	15.3	12.8
		f) Over 70	13.7	16.6
		g) Refused	1.0	0.6
31	**What is the highest level of education you have attained?**	a) Grade IX	11.3	11.3
		b) High School	36.6	31.2
		c) College Diploma	17.8	23.5
		d) Some University	4.4	6.9
		e) University Graduate	13.2	14.0
		f) Masters or PHD Level	3.9	6.1
		g) Less than Grade IX	11.8	6.1
		h) Refused	1.0	0.8

CONESTOGA-ROVERS
& ASSOCIATES

31 Gloster Court
Dartmouth, Nova Scotia, Canada B3B 1X9
Telephone: 902.468.1248 Facsimile: 902.468.2207
www.CRAworld.com

November 9, 2006

Reference No. 821191C

Mr. Paul Buxton, P. Eng.
Bilcon of Nova Scotia
305 Highway #303, Suite #3
Digby, Nova Scotia
B0V 1A0

Dear Mr. Buxton:

Re: Whites Point Quarry - Domestic Well Survey

Conestoga-Rovers & Associates (CRA), has recently completed a domestic water well survey on behalf of Bilcon NS in support of the proposed White's Point Quarry development. The survey involved the completion of a questionnaire and the collection of water samples from 9 willing residential properties within an 800 meter radius of the proposed quarry area. In addition, short duration (1 hour) discharge tests were completed at three of the homes. Figure 1 highlights the properties which were included in the study.

Based on the mapping completed by Bilcon NS, 19 homes were identified for inclusion in the survey. An attempt was made to contact all homeowners to include them in the survey. Table 1 indicates the participating homeowners and non participating homeowners. An additional property from outside the survey boundary was included in the survey because the well servicing that property was located within the survey boundary.

There were a total of eight wells surveyed from nine properties. Of that number, 4 were drilled wells and three were dug wells. The eighth well sampled was not accessible as it was located on a property who's owner did not wish to participate in the study, but was believed to be a dug well.

Water samples were obtained from each property and analyzed for bacteriological presence/absence, general chemistry and metals, and the results were compared to the Canadian Drinking Water Quality (CDWQ) Guidelines. The results indicated that of the nine samples taken, bacteria was present in four, total coliform only was present in one, and the remaining three had both total coliform and E. coli present. The pH was above the acceptable guideline range set in the CDWQ limits in four of the samples taken and was below the range in one sample. In two of the samples taken, iron was above the CDWQ guideline and in one sample the guideline limit for lead was exceeded. All other parameters were within CDWQ guidelines.

CONESTOGA-ROVERS
& ASSOCIATES

Short duration discharge tests were performed at three locations. The results of the discharge tests are shown in Table 3.

For your records, copies of all lab certificates of analysis are contained in Appendix A. Copies of the completed questionnaires are contained in Appendix B.

In conclusion, if you have any questions regarding the results of this survey, please contact us at your convenience.

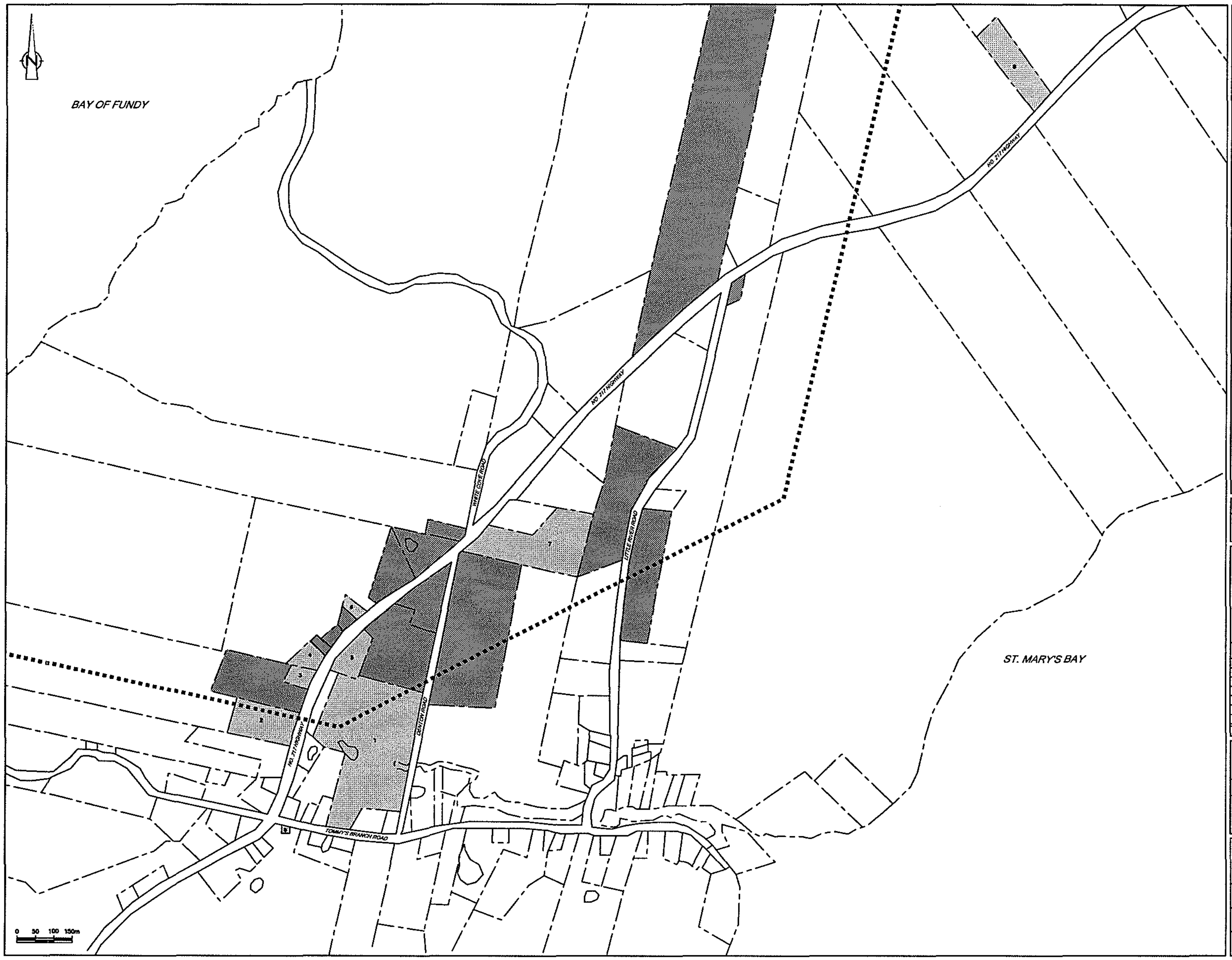
Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

H. Sutherland

Heather Sutherland, B.Sc.
Project Geoscientist



Nº	Revision	Date	Initial

LEGEND

- 800m Well Survey Boundary
- Residences Within Survey Boundary Area Which did not Participate
- Residences Within Survey Boundary Area Which did Participate

1 30160069 LAURISTON A. TIDD 33 LITTLE RIVER ROAD
2 30160964 DALE S. & RITA M. DENTON 5131 NO. 217 HWY.
3 30161004 DAVID H. GIDNEY 5163 NO. 217 HWY.
4 30264626 REX L. & BEULAH M. TRASK 5171 NO. 217 HWY.
5 30161038 NORMAN C. & LAURA K. RICE 5172 NO. 217 HWY.
6 30161152 JAMES A. & DEBORAH L. DENTON 5207 NO. 217 HWY.
7 30322630 KEVIN & RHONDA E. GIDNEY 5274 NO. 217 HWY.
8 30161327 THOMAS M. RYAN 5659 NO. 217 HWY.
9 30160022 LITTLE RIVER TRADING COMPANY 6 LITTLE RIVER ROAD

SCALE VERIFICATION

THIS BAR MEASURES 50mm ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

SITE PLAN WITH SURROUNDING PROPERTIES

WHITES POINT QUARRY – BILCON NS

DOMESTIC WELL SURVEY LITTLE RIVER, NOVA SCOTIA

CONESTOGA–ROVERS & ASSOCIATES

Source Reference:

Project Manager: DS	Reviewed By: HS	Date: NOVEMBER 2006	
Scale: 1:5000	Project Nº: 821191C	Report Nº:	Figure Nº: 1

821191-C GN-DA001 NOVEMBER 8/2006

TABLE 1 - HOMEOWNERS WITHIN WELL SURVEY AREA

Homeowner	PID#	Address	
Travis Frost	30160857	183 Denton Rd	Was not home - tried repeatedly to contact
Royce Elderkin	30160824	184 Denton Rd	Contacted and opted not to participate
Stacy Denton	30161269	300 Denton Rd	Contacted and opted to participate but was not home scheduled day
Lauriston Tidd	30160089	33 Little River Rd	participated
Dale Denton	30160980, 30160964	5131 Highway 217	participated
David Gidney	30161004	5163 Highway 217	participated
Rex Trask	30264626	5171 Highway 217	participated
Norman Rice	30161038	5172 Highway 217	participated
Brian Walker	30256275, 30161053, 30256283	5191 Highway 217	Contacted and opted not to participate
James & Deborah Denton	30161152	5207 Highway 217	participated
Arnold Nesbitt	30161061	5216 Highway 217	Contacted and opted not to participate
John & Evelyn Dickenson	30161095	5224 Highway 217	Contacted and opted not to participate
Mark Jeffrey	30161079	5239 Highway 217	No answer - 6 attempts to contact
Zora Walker	30161087	5261 Highway 217	Contacted and opted not to participate
Kevin Gidney	30322630	5274 Highway 217	participated
Curtis Addington	30161111, 30161129	5275 Highway 217	Curtis was not home when contacted - wife would not give permission
Fred Trask	30132559	5441 Highway 217	Contacted and opted not to participate
Thomas Ryan	30161327	5659 Highway 217	participated
Allen Denton	60160972	Tommys Branch Rd	Contacted and opted not to participate
Royce Elderkin Sr.		Little River Trading Co.*	Sampled water from store - well on property of Allen Denton

* this property was outside of the survey area but the well supplying the store is within the survey area

TABLE 2 - ANALYTICAL AND BACTERIOLOGICAL RESULTS

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5172 Hwy 217	5172 HWY 217 Lab-Dup	5171 Hwy 217	5274 Hwy 217	5207 Hwy 217	5163 Hwy 217	5163 HWY 217 Lab-Dup	5131 Hwy 217	5131 HWY 217 Lab-Dup	Little River Trading Co.	5659 Hwy 217	33 Little River Road	33 LITTLE RIVER RD Lab-Dup
	Sample Date				17-Oct-06	17-Oct-06	17-Oct-06	18-Oct-06	17-Oct-06	18-Oct-06	18-Oct-06	17-Oct-06	17-Oct-06	18-Oct-06	19-Oct-06	18-Oct-06	18-Oct-06
INORGANICS																	
Total Alkalinity (Total as CaCO3)	mg/L	30			37	37	38	71	28	69		50		34	23	60	
Dissolved Chloride (Cl)	mg/L	1			22	22	23	71	15	20		17		17	11	41	
Colour	TCU	5		15	ND	ND	ND	ND	ND	ND		ND		6	14	ND	
Hardness (CaCO3)	mg/L	1			40		42	57	29	25		39		38	22	12	
Nitrate + Nitrite	mg/L	0.05			0.35	0.36	0.41	0.75	0.2	0.23		0.82		0.37	0.06	0.1	
Nitrite (N)	mg/L	0.01			ND	ND	ND	ND	ND	ND		ND		ND	ND	ND	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND		ND	ND	ND	ND		ND		ND	ND	ND	
Total Organic Carbon (C)	mg/L	0.5			0.9		0.8	0.5	0.8	ND		ND	ND	1	2.2	0.6	
Orthophosphate (P)	mg/L	0.01			ND	ND	ND	0.01	ND	0.01		0.01		ND	ND	ND	
pH	pH	N/A		6.5-8.5	7.14		7.28	8.66	6.5	8.71		7.54		6.72	6.43	9.44	9.34
Reactive Silica (SiO2)	mg/L	0.5			15	15	16	22	18	18		18		17	15	20	
Dissolved Sulphate (SO4)	mg/L	2		500	9	9	8	11	5	6		7		8	5	48	
Turbidity	NTU	0.1			0.2		0.1	<0.1	0.1	0.2		0.4		0.2	2.9	0.2	
Conductivity	uS/cm	1			170		170	350	120	200		170		140	93	360	360
RCAP CALCULATIONS																	
Anion Sum	me/L	N/A			1.57		1.62	3.72	1.11	2.08		1.69		1.35	0.871	3.36	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			37		38	68	28	65		50		34	23	47	
Calculated TDS	mg/L	1		500	99		102	227	75	136		107		89	62	228	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND		ND	3	ND	3		ND		ND	ND	12	
Cation Sum	me/L	N/A			1.43		1.49	3.51	0.973	2.21		1.48		1.31	0.853	3.6	
Ion Balance (% Difference)	%	N/A			4.69		3.99	2.86	6.59	3.1		6.47		1.39	1.04	3.44	
Langelier Index (@ 20C)	N/A	N/A			-1.57		-1.38	0.419	-2.56	0.114		-1.03		-2.14	-2.76	0.383	
Langelier Index (@ 4C)	N/A	N/A			-1.82		-1.63	0.169	-2.81	-0.137		-1.28		-2.39	-3.01	0.134	
Saturation pH (@ 20C)	N/A	N/A			8.71		8.66	8.24	9.06	8.6		8.57		8.86	9.19	9.06	
Saturation pH (@ 4C)	N/A	N/A			8.96		8.91	8.49	9.31	8.85		8.82		9.11	9.44	9.31	
Elements (ICP-MS)																	
Total Aluminum (Al)	ug/L	5	200		11		14	ND	14	ND	ND	65		ND	190	12	
Total Antimony (Sb)	ug/L	2	6		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Arsenic (As)	ug/L	2	25		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Barium (Ba)	ug/L	5	1,000		ND		ND	69	ND	ND	ND	ND		ND	ND	ND	
Total Beryllium (Be)	ug/L	2			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Bismuth (Bi)	ug/L	2			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Boron (B)	ug/L	5	5,000		18		19	260	9	35	36	15		13	16	330	
Total Cadmium (Cd)	ug/L	0.017	5		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Chromium (Cr)	ug/L	2	50		ND		ND	ND	ND	ND	ND	3		ND	ND	ND	
Total Cobalt (Co)	ug/L	0.4			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Copper (Cu)	ug/L	2		1,000	10		6	ND	260	ND	ND	400		370	280	4	
Total Iron (Fe)	ug/L	50		300	ND		ND	ND	ND	ND	ND	400		ND	1000	ND	
Total Lead (Pb)	ug/L	0.5	10		ND		0.8	ND	0.7	ND	ND	23		0.6	3.8	ND	
Total Manganese (Mn)	ug/L	2		50	ND		ND	ND	ND	ND	ND	2		ND	11	ND	
Total Molybdenum (Mo)	ug/L	2			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Nickel (Ni)	ug/L	2			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Selenium (Se)	ug/L	1	10		ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Silver (Ag)	ug/L	0.1			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Strontium (Sr)	ug/L	5			41		43	58	22	18	18	21		30	21	19	
Total Thallium (Tl)	ug/L	0.1			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Tin (Sn)	ug/L	2			ND		ND	ND	ND	ND	ND	2		ND	ND	ND	
Total Titanium (Ti)	ug/L	2			ND		ND	ND	ND	ND	ND	ND		ND	7	ND	
Total Uranium (U)	ug/L	0.1	20		ND		ND	0.3	ND	0.4	0.4	ND		ND	ND	0.2	
Total Vanadium (V)	ug/L	2			10		14	10	ND	10	10	7		3	ND	ND	
Total Zinc (Zn)	ug/L	5		5,000	21		8	7	20	5	ND	1200		13	41	7	
Elements (ICP-OES)																	
Total Calcium (Ca)	mg/L	0.1			12		13	21	6.7	8.8	8.7	12		8.8	5.8	4.6	
Total Magnesium (Mg)	mg/L	0.1			2.6		2.5	1.3	2.9	0.8	0.8	2.2		3.9	1.9	ND	
Total Phosphorus (P)	mg/L	0.1			ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	
Total Potassium (K)	mg/L	0.2			0.4		0.4	0.1	0.2	0.2	0.3	0.3		0.4	0.4	0.1	
Total Sodium (Na)	mg/L	0.4		200	15		15	54	9	39	39	16		12	8.3	77	
RCAP CALCULATIONS																	
Nitrate (N)	mg/L	0.05	45		0.35		0.41	0.75	0.2	0.23		0.82		0.37	0.06	0.1	
MICROBIOLOGICAL																	
Sample ID					4517		4518	4520	4521	4522		4523		4524	4525	4526	
Total Coliforms	P-A/100mL	N/A	0 per/100 mL		Present		Present	Absent	Present	Absent		Absent		Absent	Present	Absent	
Escherichia Coli	P-A/100mL	N/A	0 per/100 mL		Absent		Present	Absent	Present	Absent		Absent		Absent	Present	Absent	

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

TABLE 3 - DISCHARGE TEST RESULTS, DOMESTIC WELL SURVEY

5131 HWY 217

Initial Water Level: 7.98 metres   Discharge Rate: 20 L/min

Well Depth: 42.67 metres

Time (minutes)	Water Level (meters below top of casing)	Cumulative volume discharged (Litres)	Estimated volume of water in well (Litres)
0	8.49	0	604
2	9.75	40	581
4	9.60	80	584
6	9.18	120	592
8	8.83	160	598
10	9.45	200	587
12	9.93	240	578
14	9.72	280	582
16	8.96	320	595
18	9.81	360	580
20	9.57	400	585

5171 HWY 217

Initial Water Level: 1.50 metres   Discharge Rate: 20 L/min

Well Depth: 1.475 metres

Time (minutes)	Water Level (meters below top of casing)	Cumulative volume discharged (Litres)	Estimated volume of water in well (Litres)
0	0.52	0	2587
5	0.53	100	2562
10	0.55	200	2512
15	0.57	300	2462
20	0.59	400	2421
25	0.60	500	2388
30	0.61	600	2346
35	0.63	700	2305
40	0.65	800	2247
45	0.67	900	2189
50	0.68	1000	2155
55	0.70	1100	2106
60	0.72	1200	2064

5659 HWY 217

Initial Water Level: 0.86m   Discharge Rate: 8L/min

Well Depth: 2.50 m

Time (minutes)	Water Level (meters below top of casing)	Cumulative volume discharged (Litres)	Estimated volume of water in well (Litres)
0	0.86	0	7528
5	0.90	40	7345
10	0.91	80	7289
15	0.93	120	7219
20	0.95	160	7135
25	0.96	200	7065
30	0.98	240	7009
35	1.00	280	6897
40	1.01	320	6827
45	1.02	360	6785
50	1.04	400	6715
55	1.05	440	6673
60	1.06	480	6603

APPENDIX A

LABORATORY CERTIFICATES

Your Project #: 821191C
Site: BILCON DWS
Your C.O.C. #: B12928

Attention: Heather Sutherland
Conestoga-Rovers and Associates Ltd
Dartmouth
31 Gloster Crt
Dartmouth , NS
B3B 1X9

Report Date: 2006/10/30

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A6B2574
Received: 2006/10/19, 16:01

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide (1)	9	N/A	2006/10/20		
Alkalinity (1)	9	N/A	2006/10/23	ATL SOP 00013	Based on EPA310.2
Chloride (1)	9	N/A	2006/10/23	ATL SOP 00014	Based on SM4500-Cl-
Colour (1)	9	N/A	2006/10/23	ATL SOP 00020	Based on EPA110.2
Conductance - water (1)	9	N/A	2006/10/23	ATL SOP 00004/00006	Based on SM2510B
Hardness (calculated as CaCO3) (1)	9	N/A	2006/10/20	Based on SM2340B	ATL SOP 00048
Total metals in water OES (1)	9	N/A	2006/10/23	ATL SOP 00025	Based on EPA200.7
Elements by ICPMS - Total (FIAS) (1)	9	N/A	2006/10/25	ATL SOP 00024	Based on EPA6020A
Ion Balance (% Difference) (1)	9	N/A	2006/10/20		
Anion and Cation Sum (1)	9	N/A	2006/10/20		
Nitrogen Ammonia - water (1)	9	N/A	2006/10/25	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	9	N/A	2006/10/23	ATL SOP 00016 R2	Based on USGS - Enz.
Nitrogen - Nitrite (1)	9	N/A	2006/10/23	ATL SOP 00017	Based on USEPA 354.1
Nitrogen - Nitrate (as N) (1)	9	N/A	2006/10/20	ATL SOP 00018	Based on ASTMD3867
pH (1)	9	N/A	2006/10/23	ATL SOP 00003/00005	Based on EPA150.1
Phosphorus - ortho (1)	9	N/A	2006/10/23	ATL SOP 00021	Based on USEPA 365.1
Sat. pH and Langelier Index (@ 20C) (1)	9	N/A	2006/10/20		
Sat. pH and Langelier Index (@ 4C) (1)	9	N/A	2006/10/20		
Reactive Silica (1)	9	N/A	2006/10/23	ATL SOP 00022	Based on EPA 366.0
Sulphate (1)	9	N/A	2006/10/23	ATL SOP 00023	Based on EPA 375.4
Total Dissolved Solids (TDS calc) (1)	9	N/A	2006/10/20		
Organic carbon - Total (TOC) (1,2)	9	N/A	2006/10/28	ATL SOP 00037	Based on SM5310C
Turbidity (1,2)	9	N/A	2006/10/27	ATL SOP 00011	based on EPA 180.1

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bedford
(2) SCC/CAEAL

../2

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Your Project #: 821191C
Site: BILCON DWS
Your C.O.C. #: B12928

Attention: Heather Sutherland
Conestoga-Rovers and Associates Ltd
Dartmouth
31 Gloster Crt
Dartmouth , NS
B3B 1X9

Report Date: 2006/10/30

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MICHELLE HILL, Project Manager
Email: Michelle.Hill.Reports@maxxamanalytics.com
Phone# (902) 420-0203

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Total cover pages: 2

Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97747	O97748	O97748		
Sampling Date		2006/10/17	2006/10/17	2006/10/17		
COC Number		B12928	B12928	B12928		
	Units	**5171 HWY 217**	**5172 HWY 217**	**5172 HWY 217 Lab-Dup**	**RDL**	**QC Batch**
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	38	37	37	5	1083044
Dissolved Chloride (Cl)	mg/L	23	22	22	1	1083046
Colour	TCU	ND	ND	ND	5	1083050
Hardness (CaCO3)	mg/L	42	40		1	1081609
Nitrate + Nitrite	mg/L	0.41	0.35	0.36	0.05	1083052
Nitrite (N)	mg/L	ND	ND	ND	0.01	1083053
Nitrogen (Ammonia Nitrogen)	mg/L	ND	ND		0.05	1085908
Total Organic Carbon (C)	mg/L	0.8	0.9		0.5	1088749
Orthophosphate (P)	mg/L	ND	ND	ND	0.01	1083051
pH	pH	7.28	7.14		N/A	1083711
Reactive Silica (SiO2)	mg/L	16	15	15	0.5	1083049
Dissolved Sulphate (SO4)	mg/L	8	9	9	2	1083047
Turbidity	NTU	0.1	0.2		0.1	1087738
Conductivity	uS/cm	170	170		1	1083699
RCAP CALCULATIONS						
Anion Sum	me/L	1.62	1.57		N/A	1081613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	38	37		1	1081607
Calculated TDS	mg/L	102	99		1	1081622
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	ND		1	1081607
Cation Sum	me/L	1.49	1.43		N/A	1081613
Ion Balance (% Difference)	%	3.99	4.69		N/A	1081611
Langelier Index (@ 20C)	N/A	-1.38	-1.57		N/A	1081618
Langelier Index (@ 4C)	N/A	-1.63	-1.82		N/A	1081620
Saturation pH (@ 20C)	N/A	8.66	8.71		N/A	1081618
Saturation pH (@ 4C)	N/A	8.91	8.96		N/A	1081620
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	14	11		10	1086034
Total Antimony (Sb)	ug/L	ND	ND		2	1086034
Total Arsenic (As)	ug/L	ND	ND		2	1086034
Total Barium (Ba)	ug/L	ND	ND		5	1086034
Total Beryllium (Be)	ug/L	ND	ND		2	1086034

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97747	O97748	O97748		
Sampling Date		2006/10/17	2006/10/17	2006/10/17		
COC Number		B12928	B12928	B12928		
	Units	**5171 HWY 217**	**5172 HWY 217**	**5172 HWY 217 Lab-Dup**	**RDL**	**QC Batch**
Total Bismuth (Bi)	ug/L	ND	ND		2	1086034
Total Boron (B)	ug/L	19	18		5	1086034
Total Cadmium (Cd)	ug/L	ND	ND		0.3	1086034
Total Chromium (Cr)	ug/L	ND	ND		2	1086034
Total Cobalt (Co)	ug/L	ND	ND		1	1086034
Total Copper (Cu)	ug/L	6	10		2	1086034
Total Iron (Fe)	ug/L	ND	ND		50	1086034
Total Lead (Pb)	ug/L	0.8	ND		0.5	1086034
Total Manganese (Mn)	ug/L	ND	ND		2	1086034
Total Molybdenum (Mo)	ug/L	ND	ND		2	1086034
Total Nickel (Ni)	ug/L	ND	ND		2	1086034
Total Selenium (Se)	ug/L	ND	ND		2	1086034
Total Silver (Ag)	ug/L	ND	ND		0.5	1086034
Total Strontium (Sr)	ug/L	43	41		5	1086034
Total Thallium (Tl)	ug/L	ND	ND		0.1	1086034
Total Tin (Sn)	ug/L	ND	ND		2	1086034
Total Titanium (Ti)	ug/L	ND	ND		2	1086034
Total Uranium (U)	ug/L	ND	ND		0.1	1086034
Total Vanadium (V)	ug/L	14	10		2	1086034
Total Zinc (Zn)	ug/L	8	21		5	1086034
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	13	12		0.2	1083530
Total Magnesium (Mg)	mg/L	2.5	2.6		0.1	1083530
Total Phosphorus (P)	mg/L	ND	ND		0.1	1083530
Total Potassium (K)	mg/L	0.4	0.4		0.1	1083530
Total Sodium (Na)	mg/L	15	15		0.2	1083530
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.41	0.35		0.05	1081615

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97749	O97749	O97750		
Sampling Date		2006/10/17	2006/10/17	2006/10/17		
COC Number		B12928	B12928	B12928		
	Units	**5131 HWY 217**	**5131 HWY 217 Lab-Dup**	**5207 HWY 217**	**RDL**	**QC Batch**
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	50		28	5	1083054
Dissolved Chloride (Cl)	mg/L	17		15	1	1083055
Colour	TCU	ND		ND	5	1083059
Hardness (CaCO3)	mg/L	39		29	1	1081609
Nitrate + Nitrite	mg/L	0.82		0.20	0.05	1083062
Nitrite (N)	mg/L	ND		ND	0.01	1083063
Nitrogen (Ammonia Nitrogen)	mg/L	ND		ND	0.05	1085908
Total Organic Carbon (C)	mg/L	ND	ND	0.8	0.5	1088743
Orthophosphate (P)	mg/L	0.01		ND	0.01	1083061
pH	pH	7.54		6.50	N/A	1083711
Reactive Silica (SiO2)	mg/L	18		18	0.5	1083058
Dissolved Sulphate (SO4)	mg/L	7		5	2	1083057
Turbidity	NTU	0.4		0.1	0.1	1087738
Conductivity	uS/cm	170		120	1	1083699
RCAP CALCULATIONS						
Anion Sum	me/L	1.69		1.11	N/A	1081613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	50		28	1	1081607
Calculated TDS	mg/L	107		75	1	1081622
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND		ND	1	1081607
Cation Sum	me/L	1.48		0.973	N/A	1081613
Ion Balance (% Difference)	%	6.47		6.59	N/A	1081611
Langelier Index (@ 20C)	N/A	-1.03		-2.56	N/A	1081618
Langelier Index (@ 4C)	N/A	-1.28		-2.81	N/A	1081620
Saturation pH (@ 20C)	N/A	8.57		9.06	N/A	1081618
Saturation pH (@ 4C)	N/A	8.82		9.31	N/A	1081620
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	65		14	10	1086034
Total Antimony (Sb)	ug/L	ND		ND	2	1086034
Total Arsenic (As)	ug/L	ND		ND	2	1086034
Total Barium (Ba)	ug/L	ND		ND	5	1086034
Total Beryllium (Be)	ug/L	ND		ND	2	1086034

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97749	O97749	O97750		
Sampling Date		2006/10/17	2006/10/17	2006/10/17		
COC Number		B12928	B12928	B12928		
	Units	**5131 HWY 217**	**5131 HWY 217 Lab-Dup**	**5207 HWY 217**	**RDL**	**QC Batch**
Total Bismuth (Bi)	ug/L	ND		ND	2	1086034
Total Boron (B)	ug/L	15		9	5	1086034
Total Cadmium (Cd)	ug/L	ND		ND	0.3	1086034
Total Chromium (Cr)	ug/L	3		ND	2	1086034
Total Cobalt (Co)	ug/L	ND		ND	1	1086034
Total Copper (Cu)	ug/L	400		260	2	1086034
Total Iron (Fe)	ug/L	400		ND	50	1086034
Total Lead (Pb)	ug/L	23		0.7	0.5	1086034
Total Manganese (Mn)	ug/L	2		ND	2	1086034
Total Molybdenum (Mo)	ug/L	ND		ND	2	1086034
Total Nickel (Ni)	ug/L	ND		ND	2	1086034
Total Selenium (Se)	ug/L	ND		ND	2	1086034
Total Silver (Ag)	ug/L	ND		ND	0.5	1086034
Total Strontium (Sr)	ug/L	21		22	5	1086034
Total Thallium (Tl)	ug/L	ND		ND	0.1	1086034
Total Tin (Sn)	ug/L	2		ND	2	1086034
Total Titanium (Ti)	ug/L	ND		ND	2	1086034
Total Uranium (U)	ug/L	ND		ND	0.1	1086034
Total Vanadium (V)	ug/L	7		ND	2	1086034
Total Zinc (Zn)	ug/L	1200		20	5	1086034
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	12		6.7	0.2	1083530
Total Magnesium (Mg)	mg/L	2.2		2.9	0.1	1083530
Total Phosphorus (P)	mg/L	ND		ND	0.1	1083530
Total Potassium (K)	mg/L	0.3		0.2	0.1	1083530
Total Sodium (Na)	mg/L	16		9.0	0.2	1083530
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.82		0.20	0.05	1081615

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97751	O97752	O97752		
Sampling Date		2006/10/18	2006/10/18	2006/10/18		
COC Number		B12928	B12928	B12928		
	Units	**5274 HWY 217**	**33 LITTLE RIVER RD**	**33 LITTLE RIVER RD Lab-Dup**	**RDL**	**QC Batch**
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	71	60		5	1083054
Dissolved Chloride (Cl)	mg/L	71	41		1	1083055
Colour	TCU	ND	ND		5	1083059
Hardness (CaCO3)	mg/L	57	12		1	1081609
Nitrate + Nitrite	mg/L	0.75	0.10		0.05	1083062
Nitrite (N)	mg/L	ND	ND		0.01	1083063
Nitrogen (Ammonia Nitrogen)	mg/L	ND	ND		0.05	1085908
Total Organic Carbon (C)	mg/L	0.5	0.6		0.5	1088743
Orthophosphate (P)	mg/L	0.01	ND		0.01	1083061
pH	pH	8.66	9.44	9.34	N/A	1083711
Reactive Silica (SiO2)	mg/L	22	20		0.5	1083058
Dissolved Sulphate (SO4)	mg/L	11	48		2	1083057
Turbidity	NTU	<0.1	0.2		0.1	1087738
Conductivity	uS/cm	350	360	360	1	1083699
RCAP CALCULATIONS						
Anion Sum	me/L	3.72	3.36		N/A	1081613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	68	47		1	1081607
Calculated TDS	mg/L	227	228		1	1081622
Carb. Alkalinity (calc. as CaCO3)	mg/L	3	12		1	1081607
Cation Sum	me/L	3.51	3.60		N/A	1081613
Ion Balance (% Difference)	%	2.86	3.44		N/A	1081611
Langelier Index (@ 20C)	N/A	0.419	0.383		N/A	1081618
Langelier Index (@ 4C)	N/A	0.169	0.134		N/A	1081620
Saturation pH (@ 20C)	N/A	8.24	9.06		N/A	1081618
Saturation pH (@ 4C)	N/A	8.49	9.31		N/A	1081620
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	ND	12		10	1086034
Total Antimony (Sb)	ug/L	ND	ND		2	1086034
Total Arsenic (As)	ug/L	ND	ND		2	1086034
Total Barium (Ba)	ug/L	69	ND		5	1086034

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97751	O97752	O97752		
Sampling Date		2006/10/18	2006/10/18	2006/10/18		
COC Number		B12928	B12928	B12928		
	Units	**5274 HWY 217**	**33 LITTLE RIVER RD**	**33 LITTLE RIVER RD Lab-Dup**	**RDL**	**QC Batch**
Total Beryllium (Be)	ug/L	ND	ND		2	1086034
Total Bismuth (Bi)	ug/L	ND	ND		2	1086034
Total Boron (B)	ug/L	260	330		5	1086034
Total Cadmium (Cd)	ug/L	ND	ND		0.3	1086034
Total Chromium (Cr)	ug/L	ND	ND		2	1086034
Total Cobalt (Co)	ug/L	ND	ND		1	1086034
Total Copper (Cu)	ug/L	ND	4		2	1086034
Total Iron (Fe)	ug/L	ND	ND		50	1086034
Total Lead (Pb)	ug/L	ND	ND		0.5	1086034
Total Manganese (Mn)	ug/L	ND	ND		2	1086034
Total Molybdenum (Mo)	ug/L	ND	ND		2	1086034
Total Nickel (Ni)	ug/L	ND	ND		2	1086034
Total Selenium (Se)	ug/L	ND	ND		2	1086034
Total Silver (Ag)	ug/L	ND	ND		0.5	1086034
Total Strontium (Sr)	ug/L	58	19		5	1086034
Total Thallium (Tl)	ug/L	ND	ND		0.1	1086034
Total Tin (Sn)	ug/L	ND	ND		2	1086034
Total Titanium (Ti)	ug/L	ND	ND		2	1086034
Total Uranium (U)	ug/L	0.3	0.2		0.1	1086034
Total Vanadium (V)	ug/L	10	ND		2	1086034
Total Zinc (Zn)	ug/L	7	7		5	1086034
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	21	4.6		0.2	1083530
Total Magnesium (Mg)	mg/L	1.3	ND		0.1	1083530
Total Phosphorus (P)	mg/L	ND	ND		0.1	1083530
Total Potassium (K)	mg/L	0.1	0.1		0.1	1083530
Total Sodium (Na)	mg/L	54	77		0.4	1087457
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.75	0.10		0.05	1081615

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97753			O97754		
Sampling Date		2006/10/18			2006/10/18		
COC Number		B12928			B12928		
	Units	**LITTLE RIVER TRADING**	**RDL**	**QC Batch**	**5163 HWY 217**	**RDL**	**QC Batch**
INORGANICS							
Total Alkalinity (Total as CaCO3)	mg/L	34	5	1083054	69	5	1083054
Dissolved Chloride (Cl)	mg/L	17	1	1083055	20	1	1083055
Colour	TCU	6	5	1083059	ND	5	1083059
Hardness (CaCO3)	mg/L	38	1	1081609	25	1	1081609
Nitrate + Nitrite	mg/L	0.37	0.05	1083062	0.23	0.05	1083062
Nitrite (N)	mg/L	ND	0.01	1083063	ND	0.01	1083063
Nitrogen (Ammonia Nitrogen)	mg/L	ND	0.05	1085908	ND	0.05	1085908
Total Organic Carbon (C)	mg/L	1.0	0.5	1088743	ND	0.5	1088743
Orthophosphate (P)	mg/L	ND	0.01	1083061	0.01	0.01	1083061
pH	pH	6.72	N/A	1083717	8.71	N/A	1083717
Reactive Silica (SiO2)	mg/L	17	0.5	1083058	18	0.5	1083058
Dissolved Sulphate (SO4)	mg/L	8	2	1083057	6	2	1083057
Turbidity	NTU	0.2	0.1	1087738	0.2	0.1	1087738
Conductivity	uS/cm	140	1	1083705	200	1	1083705
RCAP CALCULATIONS							
Anion Sum	me/L	1.35	N/A	1081613	2.08	N/A	1081613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	34	1	1081607	65	1	1081607
Calculated TDS	mg/L	89	1	1081622	136	1	1081622
Carb. Alkalinity (calc. as CaCO3)	mg/L	ND	1	1081607	3	1	1081607
Cation Sum	me/L	1.31	N/A	1081613	2.21	N/A	1081613
Ion Balance (% Difference)	%	1.39	N/A	1081611	3.10	N/A	1081611
Langelier Index (@ 20C)	N/A	-2.14	N/A	1081618	0.114	N/A	1081618
Langelier Index (@ 4C)	N/A	-2.39	N/A	1081620	-0.137	N/A	1081620
Saturation pH (@ 20C)	N/A	8.86	N/A	1081618	8.60	N/A	1081618
Saturation pH (@ 4C)	N/A	9.11	N/A	1081620	8.85	N/A	1081620
Elements (ICP-MS)							
Total Aluminum (Al)	ug/L	ND	10	1086034	ND	10	1085923
Total Antimony (Sb)	ug/L	ND	2	1086034	ND	2	1085923
Total Arsenic (As)	ug/L	ND	2	1086034	ND	2	1085923
Total Barium (Ba)	ug/L	ND	5	1086034	ND	5	1085923

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97753			O97754		
Sampling Date		2006/10/18			2006/10/18		
COC Number		B12928			B12928		
	Units	**LITTLE RIVER TRADING**	**RDL**	**QC Batch**	**5163 HWY 217**	**RDL**	**QC Batch**
Total Beryllium (Be)	ug/L	ND	2	1086034	ND	2	1085923
Total Bismuth (Bi)	ug/L	ND	2	1086034	ND	2	1085923
Total Boron (B)	ug/L	13	5	1086034	35	5	1085923
Total Cadmium (Cd)	ug/L	ND	0.3	1086034	ND	0.3	1085923
Total Chromium (Cr)	ug/L	ND	2	1086034	ND	2	1085923
Total Cobalt (Co)	ug/L	ND	1	1086034	ND	1	1085923
Total Copper (Cu)	ug/L	370	2	1086034	ND	2	1085923
Total Iron (Fe)	ug/L	ND	50	1086034	ND	50	1085923
Total Lead (Pb)	ug/L	0.6	0.5	1086034	ND	0.5	1085923
Total Manganese (Mn)	ug/L	ND	2	1086034	ND	2	1085923
Total Molybdenum (Mo)	ug/L	ND	2	1086034	ND	2	1085923
Total Nickel (Ni)	ug/L	ND	2	1086034	ND	2	1085923
Total Selenium (Se)	ug/L	ND	2	1086034	ND	2	1085923
Total Silver (Ag)	ug/L	ND	0.5	1086034	ND	0.5	1085923
Total Strontium (Sr)	ug/L	30	5	1086034	18	5	1085923
Total Thallium (Tl)	ug/L	ND	0.1	1086034	ND	0.1	1085923
Total Tin (Sn)	ug/L	ND	2	1086034	ND	2	1085923
Total Titanium (Ti)	ug/L	ND	2	1086034	ND	2	1085923
Total Uranium (U)	ug/L	ND	0.1	1086034	0.4	0.1	1085923
Total Vanadium (V)	ug/L	3	2	1086034	10	2	1085923
Total Zinc (Zn)	ug/L	13	5	1086034	5	5	1085923
Elements (ICP-OES)							
Total Calcium (Ca)	mg/L	8.8	0.2	1083530	8.8	0.2	1084012
Total Magnesium (Mg)	mg/L	3.9	0.1	1083530	0.8	0.1	1084012
Total Phosphorus (P)	mg/L	ND	0.1	1083530	ND	0.1	1084012
Total Potassium (K)	mg/L	0.4	0.1	1083530	0.2	0.1	1084012
Total Sodium (Na)	mg/L	12	0.2	1083530	39	0.4	1087457
RCAP CALCULATIONS							
Nitrate (N)	mg/L	0.37	0.05	1081615	0.23	0.05	1081615

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97754			O97755		
Sampling Date		2006/10/18			2006/10/19		
COC Number		B12928			B12928		
	Units	**5163 HWY 217 Lab-Dup**	**RDL**	**QC Batch**	**5659 HWY 217**	**RDL**	**QC Batch**
INORGANICS							
Total Alkalinity (Total as CaCO3)	mg/L		5	1083054	23	5	1083054
Dissolved Chloride (Cl)	mg/L		1	1083055	11	1	1083055
Colour	TCU		5	1083059	14	5	1083059
Hardness (CaCO3)	mg/L		1	1081609	22	1	1081609
Nitrate + Nitrite	mg/L		0.05	1083062	0.06	0.05	1083062
Nitrite (N)	mg/L		0.01	1083063	ND	0.01	1083063
Nitrogen (Ammonia Nitrogen)	mg/L		0.05	1085908	ND	0.05	1085908
Total Organic Carbon (C)	mg/L		0.5	1088743	2.2	0.5	1088743
Orthophosphate (P)	mg/L		0.01	1083061	ND	0.01	1083061
pH	pH		N/A	1083717	6.43	N/A	1083717
Reactive Silica (SiO2)	mg/L		0.5	1083058	15	0.5	1083058
Dissolved Sulphate (SO4)	mg/L		2	1083057	5	2	1083057
Turbidity	NTU		0.1	1087738	2.9	0.1	1087738
Conductivity	uS/cm		1	1083705	93	1	1083705
RCAP CALCULATIONS							
Anion Sum	me/L		N/A	1081613	0.871	N/A	1081613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L		1	1081607	23	1	1081607
Calculated TDS	mg/L		1	1081622	62	1	1081622
Carb. Alkalinity (calc. as CaCO3)	mg/L		1	1081607	ND	1	1081607
Cation Sum	me/L		N/A	1081613	0.853	N/A	1081613
Ion Balance (% Difference)	%		N/A	1081611	1.04	N/A	1081611
Langelier Index (@ 20C)	N/A		N/A	1081618	-2.76	N/A	1081618
Langelier Index (@ 4C)	N/A		N/A	1081620	-3.01	N/A	1081620
Saturation pH (@ 20C)	N/A		N/A	1081618	9.19	N/A	1081618
Saturation pH (@ 4C)	N/A		N/A	1081620	9.44	N/A	1081620
Elements (ICP-MS)							
Total Aluminum (Al)	ug/L	ND	10	1085923	190	10	1085923
Total Antimony (Sb)	ug/L	ND	2	1085923	ND	2	1085923
Total Arsenic (As)	ug/L	ND	2	1085923	ND	2	1085923
Total Barium (Ba)	ug/L	ND	5	1085923	ND	5	1085923
Total Beryllium (Be)	ug/L	ND	2	1085923	ND	2	1085923

ND = Not detected
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QC Batch = Quality Control Batch

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Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		O97754			O97755		
Sampling Date		2006/10/18			2006/10/19		
COC Number		B12928			B12928		
	Units	**5163 HWY 217 Lab-Dup**	**RDL**	**QC Batch**	**5659 HWY 217**	**RDL**	**QC Batch**
Total Bismuth (Bi)	ug/L	ND	2	1085923	ND	2	1085923
Total Boron (B)	ug/L	36	5	1085923	16	5	1085923
Total Cadmium (Cd)	ug/L	ND	0.3	1085923	ND	0.3	1085923
Total Chromium (Cr)	ug/L	ND	2	1085923	ND	2	1085923
Total Cobalt (Co)	ug/L	ND	1	1085923	ND	1	1085923
Total Copper (Cu)	ug/L	ND	2	1085923	280	2	1085923
Total Iron (Fe)	ug/L	ND	50	1085923	1000	50	1085923
Total Lead (Pb)	ug/L	ND	0.5	1085923	3.8	0.5	1085923
Total Manganese (Mn)	ug/L	ND	2	1085923	11	2	1085923
Total Molybdenum (Mo)	ug/L	ND	2	1085923	ND	2	1085923
Total Nickel (Ni)	ug/L	ND	2	1085923	ND	2	1085923
Total Selenium (Se)	ug/L	ND	2	1085923	ND	2	1085923
Total Silver (Ag)	ug/L	ND	0.5	1085923	ND	0.5	1085923
Total Strontium (Sr)	ug/L	18	5	1085923	21	5	1085923
Total Thallium (Tl)	ug/L	ND	0.1	1085923	ND	0.1	1085923
Total Tin (Sn)	ug/L	ND	2	1085923	ND	2	1085923
Total Titanium (Ti)	ug/L	ND	2	1085923	7	2	1085923
Total Uranium (U)	ug/L	0.4	0.1	1085923	ND	0.1	1085923
Total Vanadium (V)	ug/L	10	2	1085923	ND	2	1085923
Total Zinc (Zn)	ug/L	ND	5	1085923	41	5	1085923
Elements (ICP-OES)							
Total Calcium (Ca)	mg/L	8.7	0.2	1084012	5.8	0.2	1084012
Total Magnesium (Mg)	mg/L	0.8	0.1	1084012	1.9	0.1	1084012
Total Phosphorus (P)	mg/L	ND	0.1	1084012	ND	0.1	1084012
Total Potassium (K)	mg/L	0.3	0.1	1084012	0.4	0.1	1084012
Total Sodium (Na)	mg/L	39	0.4	1087457	8.3	0.1	1084012
RCAP CALCULATIONS							
Nitrate (N)	mg/L		0.05	1081615	0.06	0.05	1081615

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A6B2574
Report Date: 2006/10/30

Conestoga-Rovers and Associates Ltd
Client Project #: 821191C
Project name: BILCON DWS
Sampler Initials:

GENERAL COMMENTS

Sample O97749-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample O97750-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1083044 MCN	MATRIX SPIKE						
	[O97748-01]	Total Alkalinity (Total as CaCO3)	2006/10/23		96	%	80 - 120
	QC STANDARD	Total Alkalinity (Total as CaCO3)	2006/10/23		101	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2006/10/23		102	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2006/10/23	ND, RDL=5		mg/L	
	RPD [O97748-01]	Total Alkalinity (Total as CaCO3)	2006/10/23	0.02		%	25
1083046 MCN	MATRIX SPIKE						
	[O97748-01]	Dissolved Chloride (Cl)	2006/10/23		95	%	80 - 120
	QC STANDARD	Dissolved Chloride (Cl)	2006/10/23		100	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2006/10/23		101	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2006/10/23	ND, RDL=1		mg/L	
	RPD [O97748-01]	Dissolved Chloride (Cl)	2006/10/23	0.3		%	25
1083047 MCN	MATRIX SPIKE						
	[O97748-01]	Dissolved Sulphate (SO4)	2006/10/23		106	%	80 - 120
	QC STANDARD	Dissolved Sulphate (SO4)	2006/10/23		103	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2006/10/23		105	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2006/10/23	ND, RDL=2		mg/L	
	RPD [O97748-01]	Dissolved Sulphate (SO4)	2006/10/23	NC		%	25
1083049 MCN	MATRIX SPIKE						
	[O97748-01]	Reactive Silica (SiO2)	2006/10/23		NC	%	80 - 120
	QC STANDARD	Reactive Silica (SiO2)	2006/10/23		106	%	75 - 125
	Spiked Blank	Reactive Silica (SiO2)	2006/10/23		102	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2006/10/23	ND, RDL=0.5		mg/L	
	RPD [O97748-01]	Reactive Silica (SiO2)	2006/10/23	1.3		%	25
1083050 MCN	QC STANDARD	Colour	2006/10/23		97	%	80 - 120
	Method Blank	Colour	2006/10/23	ND, RDL=5		TCU	
	RPD [O97748-01]	Colour	2006/10/23	NC		%	25
1083051 MCN	MATRIX SPIKE						
	[O97748-01]	Orthophosphate (P)	2006/10/23		94	%	80 - 120
	QC STANDARD	Orthophosphate (P)	2006/10/23		101	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2006/10/23		99	%	80 - 120
	Method Blank	Orthophosphate (P)	2006/10/23	ND, RDL=0.01		mg/L	
	RPD [O97748-01]	Orthophosphate (P)	2006/10/23	NC		%	25
1083052 MCN	MATRIX SPIKE						
	[O97748-01]	Nitrate + Nitrite	2006/10/23		107	%	80 - 120
	QC STANDARD	Nitrate + Nitrite	2006/10/23		104	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2006/10/23		106	%	80 - 120
	Method Blank	Nitrate + Nitrite	2006/10/23	ND, RDL=0.05		mg/L	
	RPD [O97748-01]	Nitrate + Nitrite	2006/10/23	2.7		%	25
1083053 MCN	MATRIX SPIKE						
	[O97748-01]	Nitrite (N)	2006/10/23		98	%	80 - 120
	QC STANDARD	Nitrite (N)	2006/10/23		102	%	80 - 120
	Spiked Blank	Nitrite (N)	2006/10/23		100	%	80 - 120
	Method Blank	Nitrite (N)	2006/10/23	ND, RDL=0.01		mg/L	
	RPD [O97748-01]	Nitrite (N)	2006/10/23	NC		%	25
1083054 MCN	MATRIX SPIKE	Total Alkalinity (Total as CaCO3)	2006/10/23		100	%	80 - 120
	QC STANDARD	Total Alkalinity (Total as CaCO3)	2006/10/23		103	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2006/10/23		100	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2006/10/23	ND, RDL=5		mg/L	
	RPD	Total Alkalinity (Total as CaCO3)	2006/10/23	NC		%	25
1083055 MCN	MATRIX SPIKE	Dissolved Chloride (Cl)	2006/10/23		98	%	80 - 120
	QC STANDARD	Dissolved Chloride (Cl)	2006/10/23		100	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2006/10/23		100	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2006/10/23	ND, RDL=1		mg/L	
	RPD	Dissolved Chloride (Cl)	2006/10/23	0.6		%	25

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1083057 MCN	MATRIX SPIKE	Dissolved Sulphate (SO4)	2006/10/23		102	%	80 - 120
	QC STANDARD	Dissolved Sulphate (SO4)	2006/10/23		103	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2006/10/23		102	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2006/10/23	ND, RDL=2		mg/L	
	RPD	Dissolved Sulphate (SO4)	2006/10/23	NC		%	25
1083058 MCN	MATRIX SPIKE	Reactive Silica (SiO2)	2006/10/23		99	%	80 - 120
	QC STANDARD	Reactive Silica (SiO2)	2006/10/23		106	%	75 - 125
	Spiked Blank	Reactive Silica (SiO2)	2006/10/23		103	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2006/10/23	ND, RDL=0.5		mg/L	
	RPD	Reactive Silica (SiO2)	2006/10/23	0.2		%	25
1083059 MCN	QC STANDARD	Colour	2006/10/23		102	%	80 - 120
	Method Blank	Colour	2006/10/23	ND, RDL=5		TCU	
	RPD	Colour	2006/10/23	NC		%	25
1083061 MCN	MATRIX SPIKE	Orthophosphate (P)	2006/10/23		95	%	80 - 120
	QC STANDARD	Orthophosphate (P)	2006/10/23		101	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2006/10/23		97	%	80 - 120
	Method Blank	Orthophosphate (P)	2006/10/23	ND, RDL=0.01		mg/L	
	RPD	Orthophosphate (P)	2006/10/23	7.7		%	25
1083062 MCN	MATRIX SPIKE	Nitrate + Nitrite	2006/10/23		107	%	80 - 120
	QC STANDARD	Nitrate + Nitrite	2006/10/23		107	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2006/10/23		107	%	80 - 120
	Method Blank	Nitrate + Nitrite	2006/10/23	ND, RDL=0.05		mg/L	
	RPD	Nitrate + Nitrite	2006/10/23	0.6		%	25
1083063 MCN	MATRIX SPIKE	Nitrite (N)	2006/10/23		97	%	80 - 120
	QC STANDARD	Nitrite (N)	2006/10/23		106	%	80 - 120
	Spiked Blank	Nitrite (N)	2006/10/23		98	%	80 - 120
	Method Blank	Nitrite (N)	2006/10/23	ND, RDL=0.01		mg/L	
	RPD	Nitrite (N)	2006/10/23	NC		%	25
1083530 MLB	MATRIX SPIKE	Total Calcium (Ca)	2006/10/23		89	%	80 - 120
		Total Magnesium (Mg)	2006/10/23		88	%	80 - 120
		Total Phosphorus (P)	2006/10/23		90	%	80 - 120
		Total Potassium (K)	2006/10/23		87	%	80 - 120
		Total Sodium (Na)	2006/10/23		77 (1)	%	80 - 120
	QC STANDARD	Total Calcium (Ca)	2006/10/23		109	%	80 - 120
		Total Magnesium (Mg)	2006/10/23		107	%	80 - 120
		Total Phosphorus (P)	2006/10/23		93	%	80 - 120
		Total Potassium (K)	2006/10/23		102	%	80 - 120
		Total Sodium (Na)	2006/10/23		90	%	80 - 120
	Spiked Blank	Total Calcium (Ca)	2006/10/23		103	%	80 - 120
		Total Magnesium (Mg)	2006/10/23		101	%	80 - 120
		Total Phosphorus (P)	2006/10/23		102	%	80 - 120
		Total Potassium (K)	2006/10/23		104	%	80 - 120
		Total Sodium (Na)	2006/10/23		97	%	80 - 120
	Method Blank	Total Calcium (Ca)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Magnesium (Mg)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Phosphorus (P)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Potassium (K)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Sodium (Na)	2006/10/23	ND, RDL=0.1		mg/L	
	RPD	Total Calcium (Ca)	2006/10/23	3.5		%	25
		Total Magnesium (Mg)	2006/10/23	0.8		%	25
		Total Phosphorus (P)	2006/10/23	NC		%	25
		Total Potassium (K)	2006/10/23	1.4		%	25
1083699 SMT	QC STANDARD	Conductivity	2006/10/23		103	%	80 - 120
	Method Blank	Conductivity	2006/10/23	1.4		uS/cm	
	RPD [O97752-01]	Conductivity	2006/10/23	0.6		%	25

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Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1083705 SMT	QC STANDARD	Conductivity	2006/10/23		101	%	80 - 120
	Method Blank	Conductivity	2006/10/23	0.87		uS/cm	
	RPD	Conductivity	2006/10/23	1.3		%	25
1083711 SMT	QC STANDARD	pH	2006/10/23		102	%	80 - 120
	Method Blank	pH	2006/10/23	5.43		pH	
	RPD [O97752-01]	pH	2006/10/23	1.1		%	25
1083717 SMT	QC STANDARD	pH	2006/10/23		102	%	80 - 120
	Method Blank	pH	2006/10/23	6.10		pH	
	RPD	pH	2006/10/23	1.1		%	25
1084012 MLB	MATRIX SPIKE						
	[O97754-01]	Total Calcium (Ca)	2006/10/23		103	%	80 - 120
		Total Magnesium (Mg)	2006/10/23		101	%	80 - 120
		Total Phosphorus (P)	2006/10/23		103	%	80 - 120
		Total Potassium (K)	2006/10/23		101	%	80 - 120
		Total Sodium (Na)	2006/10/23		99	%	80 - 120
	QC STANDARD	Total Calcium (Ca)	2006/10/23		107	%	80 - 120
		Total Magnesium (Mg)	2006/10/23		108	%	80 - 120
		Total Phosphorus (P)	2006/10/23		94	%	80 - 120
		Total Potassium (K)	2006/10/23		102	%	80 - 120
		Total Sodium (Na)	2006/10/23		87	%	80 - 120
	Spiked Blank	Total Calcium (Ca)	2006/10/23		103	%	80 - 120
		Total Magnesium (Mg)	2006/10/23		102	%	80 - 120
		Total Phosphorus (P)	2006/10/23		102	%	80 - 120
		Total Potassium (K)	2006/10/23		105	%	80 - 120
		Total Sodium (Na)	2006/10/23		97	%	80 - 120
	Method Blank	Total Calcium (Ca)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Magnesium (Mg)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Phosphorus (P)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Potassium (K)	2006/10/23	ND, RDL=0.1		mg/L	
		Total Sodium (Na)	2006/10/23	ND, RDL=0.1		mg/L	
	RPD [O97754-01]	Total Calcium (Ca)	2006/10/23	1.5		%	25
		Total Magnesium (Mg)	2006/10/23	2.0		%	25
		Total Phosphorus (P)	2006/10/23	NC		%	25
		Total Potassium (K)	2006/10/23	NC		%	25
1085908 LMA	MATRIX SPIKE	Nitrogen (Ammonia Nitrogen)	2006/10/25		98	%	80 - 120
	QC STANDARD	Nitrogen (Ammonia Nitrogen)	2006/10/25		107	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2006/10/25		101	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2006/10/25	ND, RDL=0.05		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2006/10/25	NC		%	25
1085923 DLB	MATRIX SPIKE	Total Aluminum (Al)	2006/10/25		104	%	80 - 120
		Total Antimony (Sb)	2006/10/25		95	%	80 - 120
		Total Arsenic (As)	2006/10/25		100	%	80 - 120
		Total Barium (Ba)	2006/10/25		96	%	80 - 120
		Total Beryllium (Be)	2006/10/25		95	%	80 - 120
		Total Bismuth (Bi)	2006/10/25		85	%	80 - 120
		Total Boron (B)	2006/10/25		92	%	80 - 120
		Total Cadmium (Cd)	2006/10/25		100	%	80 - 120
		Total Chromium (Cr)	2006/10/25		96	%	80 - 120
		Total Cobalt (Co)	2006/10/25		98	%	80 - 120
		Total Copper (Cu)	2006/10/25		96	%	80 - 120
		Total Lead (Pb)	2006/10/25		96	%	80 - 120
		Total Manganese (Mn)	2006/10/25		98	%	80 - 120
		Total Molybdenum (Mo)	2006/10/25		98	%	80 - 120
		Total Nickel (Ni)	2006/10/25		99	%	80 - 120
		Total Selenium (Se)	2006/10/25		102	%	80 - 120

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1085923 DLB	MATRIX SPIKE	Total Silver (Ag)	2006/10/25		98	%	80 - 120
		Total Strontium (Sr)	2006/10/25		98	%	80 - 120
		Total Thallium (Tl)	2006/10/25		94	%	80 - 120
		Total Tin (Sn)	2006/10/25		88	%	80 - 120
		Total Titanium (Ti)	2006/10/25		97	%	80 - 120
		Total Uranium (U)	2006/10/25		98	%	80 - 120
		Total Vanadium (V)	2006/10/25		99	%	80 - 120
		Total Zinc (Zn)	2006/10/25		99	%	80 - 120
	QC STANDARD	Total Aluminum (Al)	2006/10/25		113	%	80 - 120
		Total Antimony (Sb)	2006/10/25		101	%	80 - 120
		Total Arsenic (As)	2006/10/25		101	%	80 - 120
		Total Barium (Ba)	2006/10/25		90	%	80 - 120
		Total Beryllium (Be)	2006/10/25		100	%	80 - 120
		Total Boron (B)	2006/10/25		97	%	80 - 120
		Total Cadmium (Cd)	2006/10/25		104	%	80 - 120
		Total Chromium (Cr)	2006/10/25		101	%	80 - 120
		Total Cobalt (Co)	2006/10/25		108	%	80 - 120
		Total Copper (Cu)	2006/10/25		99	%	80 - 120
		Total Iron (Fe)	2006/10/25		107	%	80 - 120
		Total Lead (Pb)	2006/10/25		103	%	80 - 120
		Total Manganese (Mn)	2006/10/25		102	%	80 - 120
		Total Molybdenum (Mo)	2006/10/25		100	%	80 - 120
		Total Nickel (Ni)	2006/10/25		101	%	80 - 120
		Total Selenium (Se)	2006/10/25		102	%	80 - 120
		Total Strontium (Sr)	2006/10/25		101	%	80 - 120
		Total Thallium (Tl)	2006/10/25		98	%	80 - 120
		Total Uranium (U)	2006/10/25		102	%	80 - 120
		Total Vanadium (V)	2006/10/25		99	%	80 - 120
		Total Zinc (Zn)	2006/10/25		97	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2006/10/25		118	%	80 - 120
		Total Antimony (Sb)	2006/10/25		98	%	80 - 120
		Total Arsenic (As)	2006/10/25		92	%	80 - 120
		Total Barium (Ba)	2006/10/25		99	%	80 - 120
		Total Beryllium (Be)	2006/10/25		96	%	80 - 120
		Total Bismuth (Bi)	2006/10/25		95	%	80 - 120
		Total Boron (B)	2006/10/25		96	%	80 - 120
		Total Cadmium (Cd)	2006/10/25		97	%	80 - 120
		Total Chromium (Cr)	2006/10/25		99	%	80 - 120
		Total Cobalt (Co)	2006/10/25		101	%	80 - 120
		Total Copper (Cu)	2006/10/25		100	%	80 - 120
		Total Lead (Pb)	2006/10/25		99	%	80 - 120
		Total Manganese (Mn)	2006/10/25		104	%	80 - 120
		Total Molybdenum (Mo)	2006/10/25		101	%	80 - 120
		Total Nickel (Ni)	2006/10/25		101	%	80 - 120
		Total Selenium (Se)	2006/10/25		94	%	80 - 120
		Total Silver (Ag)	2006/10/25		98	%	80 - 120
		Total Strontium (Sr)	2006/10/25		99	%	80 - 120
		Total Thallium (Tl)	2006/10/25		97	%	80 - 120
		Total Tin (Sn)	2006/10/25		96	%	80 - 120
		Total Titanium (Ti)	2006/10/25		98	%	80 - 120
		Total Uranium (U)	2006/10/25		101	%	80 - 120
		Total Vanadium (V)	2006/10/25		100	%	80 - 120
		Total Zinc (Zn)	2006/10/25		101	%	80 - 120
	Method Blank	Total Aluminum (Al)	2006/10/25	ND, RDL=10		ug/L	
		Total Antimony (Sb)	2006/10/25	ND, RDL=2		ug/L	

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1085923 DLB	Method Blank	Total Arsenic (As)	2006/10/25	ND, RDL=2		ug/L	
		Total Barium (Ba)	2006/10/25	ND, RDL=5		ug/L	
		Total Beryllium (Be)	2006/10/25	ND, RDL=2		ug/L	
		Total Bismuth (Bi)	2006/10/25	ND, RDL=2		ug/L	
		Total Boron (B)	2006/10/25	ND, RDL=5		ug/L	
		Total Cadmium (Cd)	2006/10/25	ND, RDL=0.3		ug/L	
		Total Chromium (Cr)	2006/10/25	ND, RDL=2		ug/L	
		Total Cobalt (Co)	2006/10/25	ND, RDL=1		ug/L	
		Total Copper (Cu)	2006/10/25	ND, RDL=2		ug/L	
		Total Iron (Fe)	2006/10/25	ND, RDL=50		ug/L	
		Total Lead (Pb)	2006/10/25	ND, RDL=0.5		ug/L	
		Total Manganese (Mn)	2006/10/25	ND, RDL=2		ug/L	
		Total Molybdenum (Mo)	2006/10/25	ND, RDL=2		ug/L	
		Total Nickel (Ni)	2006/10/25	ND, RDL=2		ug/L	
		Total Selenium (Se)	2006/10/25	ND, RDL=2		ug/L	
		Total Silver (Ag)	2006/10/25	ND, RDL=0.5		ug/L	
		Total Strontium (Sr)	2006/10/25	ND, RDL=5		ug/L	
		Total Thallium (Tl)	2006/10/25	ND, RDL=0.1		ug/L	
		Total Tin (Sn)	2006/10/25	ND, RDL=2		ug/L	
		Total Titanium (Ti)	2006/10/25	ND, RDL=2		ug/L	
		Total Uranium (U)	2006/10/25	ND, RDL=0.1		ug/L	
		Total Vanadium (V)	2006/10/25	ND, RDL=2		ug/L	
		Total Zinc (Zn)	2006/10/25	ND, RDL=5		ug/L	
	RPD [O97754-01]	Total Aluminum (Al)	2006/10/25	NC		%	25
		Total Antimony (Sb)	2006/10/25	NC		%	25
		Total Arsenic (As)	2006/10/25	NC		%	25
		Total Barium (Ba)	2006/10/25	NC		%	25
		Total Beryllium (Be)	2006/10/25	NC		%	25
		Total Bismuth (Bi)	2006/10/25	NC		%	25
		Total Boron (B)	2006/10/25	2.9		%	25
		Total Cadmium (Cd)	2006/10/25	NC		%	25
		Total Chromium (Cr)	2006/10/25	NC		%	25
		Total Cobalt (Co)	2006/10/25	NC		%	25
		Total Copper (Cu)	2006/10/25	NC		%	25
		Total Iron (Fe)	2006/10/25	NC		%	25
		Total Lead (Pb)	2006/10/25	NC		%	25
		Total Manganese (Mn)	2006/10/25	NC		%	25
		Total Molybdenum (Mo)	2006/10/25	NC		%	25
		Total Nickel (Ni)	2006/10/25	NC		%	25
		Total Selenium (Se)	2006/10/25	NC		%	25
		Total Silver (Ag)	2006/10/25	NC		%	25
		Total Strontium (Sr)	2006/10/25	NC		%	25
		Total Thallium (Tl)	2006/10/25	NC		%	25
		Total Tin (Sn)	2006/10/25	NC		%	25
		Total Titanium (Ti)	2006/10/25	NC		%	25
		Total Uranium (U)	2006/10/25	NC		%	25
		Total Vanadium (V)	2006/10/25	NC		%	25
		Total Zinc (Zn)	2006/10/25	NC		%	25
1086034 DLB	MATRIX SPIKE [O97752-01]	Total Aluminum (Al)	2006/10/25		98	%	80 - 120
		Total Antimony (Sb)	2006/10/25		98	%	80 - 120
		Total Arsenic (As)	2006/10/25		108	%	80 - 120
		Total Barium (Ba)	2006/10/25		102	%	80 - 120
		Total Beryllium (Be)	2006/10/25		98	%	80 - 120
		Total Bismuth (Bi)	2006/10/25		87	%	80 - 120

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1086034 DLB	MATRIX SPIKE [O97752-01]	Total Boron (B)	2006/10/25		NC	%	80 - 120
		Total Cadmium (Cd)	2006/10/25		102	%	80 - 120
		Total Chromium (Cr)	2006/10/25		100	%	80 - 120
		Total Cobalt (Co)	2006/10/25		101	%	80 - 120
		Total Copper (Cu)	2006/10/25		95	%	80 - 120
		Total Lead (Pb)	2006/10/25		99	%	80 - 120
		Total Manganese (Mn)	2006/10/25		93	%	80 - 120
		Total Molybdenum (Mo)	2006/10/25		105	%	80 - 120
		Total Nickel (Ni)	2006/10/25		99	%	80 - 120
		Total Selenium (Se)	2006/10/25		102	%	80 - 120
		Total Silver (Ag)	2006/10/25		95	%	80 - 120
		Total Strontium (Sr)	2006/10/25		96	%	80 - 120
		Total Thallium (Tl)	2006/10/25		98	%	80 - 120
		Total Tin (Sn)	2006/10/25		91	%	80 - 120
		Total Titanium (Ti)	2006/10/25		99	%	80 - 120
		Total Uranium (U)	2006/10/25		104	%	80 - 120
		Total Vanadium (V)	2006/10/25		104	%	80 - 120
		Total Zinc (Zn)	2006/10/25		104	%	80 - 120
	QC STANDARD	Total Aluminum (Al)	2006/10/25		110	%	80 - 120
		Total Antimony (Sb)	2006/10/25		96	%	80 - 120
		Total Arsenic (As)	2006/10/25		100	%	80 - 120
		Total Barium (Ba)	2006/10/25		86	%	80 - 120
		Total Beryllium (Be)	2006/10/25		93	%	80 - 120
		Total Boron (B)	2006/10/25		95	%	80 - 120
		Total Cadmium (Cd)	2006/10/25		101	%	80 - 120
		Total Chromium (Cr)	2006/10/25		99	%	80 - 120
		Total Cobalt (Co)	2006/10/25		104	%	80 - 120
		Total Copper (Cu)	2006/10/25		96	%	80 - 120
		Total Iron (Fe)	2006/10/25		102	%	80 - 120
		Total Lead (Pb)	2006/10/25		100	%	80 - 120
		Total Manganese (Mn)	2006/10/25		99	%	80 - 120
		Total Molybdenum (Mo)	2006/10/25		98	%	80 - 120
		Total Nickel (Ni)	2006/10/25		97	%	80 - 120
		Total Selenium (Se)	2006/10/25		97	%	80 - 120
		Total Strontium (Sr)	2006/10/25		97	%	80 - 120
		Total Thallium (Tl)	2006/10/25		92	%	80 - 120
		Total Uranium (U)	2006/10/25		97	%	80 - 120
		Total Vanadium (V)	2006/10/25		97	%	80 - 120
		Total Zinc (Zn)	2006/10/25		97	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2006/10/25		111	%	80 - 120
		Total Antimony (Sb)	2006/10/25		92	%	80 - 120
		Total Arsenic (As)	2006/10/25		90	%	80 - 120
		Total Barium (Ba)	2006/10/25		96	%	80 - 120
		Total Beryllium (Be)	2006/10/25		89	%	80 - 120
		Total Bismuth (Bi)	2006/10/25		87	%	80 - 120
		Total Boron (B)	2006/10/25		92	%	80 - 120
		Total Cadmium (Cd)	2006/10/25		92	%	80 - 120
		Total Chromium (Cr)	2006/10/25		95	%	80 - 120
		Total Cobalt (Co)	2006/10/25		97	%	80 - 120
		Total Copper (Cu)	2006/10/25		94	%	80 - 120
		Total Lead (Pb)	2006/10/25		94	%	80 - 120
		Total Manganese (Mn)	2006/10/25		98	%	80 - 120
		Total Molybdenum (Mo)	2006/10/25		97	%	80 - 120
		Total Nickel (Ni)	2006/10/25		95	%	80 - 120

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1086034 DLB	Spiked Blank	Total Selenium (Se)	2006/10/25		90	%	80 - 120
		Total Silver (Ag)	2006/10/25		95	%	80 - 120
		Total Strontium (Sr)	2006/10/25		96	%	80 - 120
		Total Thallium (Tl)	2006/10/25		93	%	80 - 120
		Total Tin (Sn)	2006/10/25		91	%	80 - 120
		Total Titanium (Ti)	2006/10/25		96	%	80 - 120
		Total Uranium (U)	2006/10/25		95	%	80 - 120
		Total Vanadium (V)	2006/10/25		96	%	80 - 120
		Total Zinc (Zn)	2006/10/25		94	%	80 - 120
	Method Blank	Total Aluminum (Al)	2006/10/25	ND, RDL=10		ug/L	
		Total Antimony (Sb)	2006/10/25	ND, RDL=2		ug/L	
		Total Arsenic (As)	2006/10/25	ND, RDL=2		ug/L	
		Total Barium (Ba)	2006/10/25	ND, RDL=5		ug/L	
		Total Beryllium (Be)	2006/10/25	ND, RDL=2		ug/L	
		Total Bismuth (Bi)	2006/10/25	ND, RDL=2		ug/L	
		Total Boron (B)	2006/10/25	ND, RDL=5		ug/L	
		Total Cadmium (Cd)	2006/10/25	ND, RDL=0.3		ug/L	
		Total Chromium (Cr)	2006/10/25	ND, RDL=2		ug/L	
		Total Cobalt (Co)	2006/10/25	ND, RDL=1		ug/L	
		Total Copper (Cu)	2006/10/25	ND, RDL=2		ug/L	
		Total Iron (Fe)	2006/10/25	ND, RDL=50		ug/L	
		Total Lead (Pb)	2006/10/25	ND, RDL=0.5		ug/L	
		Total Manganese (Mn)	2006/10/25	ND, RDL=2		ug/L	
		Total Molybdenum (Mo)	2006/10/25	ND, RDL=2		ug/L	
		Total Nickel (Ni)	2006/10/25	ND, RDL=2		ug/L	
		Total Selenium (Se)	2006/10/25	ND, RDL=2		ug/L	
		Total Silver (Ag)	2006/10/25	ND, RDL=0.5		ug/L	
		Total Strontium (Sr)	2006/10/25	ND, RDL=5		ug/L	
		Total Thallium (Tl)	2006/10/25	ND, RDL=0.1		ug/L	
		Total Tin (Sn)	2006/10/25	ND, RDL=2		ug/L	
		Total Titanium (Ti)	2006/10/25	ND, RDL=2		ug/L	
		Total Uranium (U)	2006/10/25	ND, RDL=0.1		ug/L	
		Total Vanadium (V)	2006/10/25	ND, RDL=2		ug/L	
		Total Zinc (Zn)	2006/10/25	ND, RDL=5		ug/L	
	RPD	Total Aluminum (Al)	2006/10/25	34.1 (2)		%	25
		Total Antimony (Sb)	2006/10/25	NC		%	25
		Total Arsenic (As)	2006/10/25	NC		%	25
		Total Barium (Ba)	2006/10/25	7.1		%	25
		Total Beryllium (Be)	2006/10/25	NC		%	25
		Total Bismuth (Bi)	2006/10/25	NC		%	25
		Total Boron (B)	2006/10/25	9.0		%	25
		Total Cadmium (Cd)	2006/10/25	NC		%	25
		Total Chromium (Cr)	2006/10/25	NC		%	25
		Total Cobalt (Co)	2006/10/25	NC		%	25
		Total Copper (Cu)	2006/10/25	NC		%	25
		Total Iron (Fe)	2006/10/25	NC		%	25
		Total Lead (Pb)	2006/10/25	NC		%	25
		Total Manganese (Mn)	2006/10/25	7.3		%	25
		Total Molybdenum (Mo)	2006/10/25	8.3		%	25
		Total Nickel (Ni)	2006/10/25	NC		%	25
		Total Selenium (Se)	2006/10/25	NC		%	25
		Total Silver (Ag)	2006/10/25	NC		%	25
		Total Strontium (Sr)	2006/10/25	7.9		%	25
		Total Thallium (Tl)	2006/10/25	NC		%	25
		Total Tin (Sn)	2006/10/25	NC		%	25

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191C
P.O. #:
Project name: BILCON DWS

Quality Assurance Report (Continued)

Maxxam Job Number: DA6B2574

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1086034 DLB	RPD	Total Titanium (Ti)	2006/10/25	NC		%	25
		Total Uranium (U)	2006/10/25	6.9		%	25
		Total Vanadium (V)	2006/10/25	NC		%	25
		Total Zinc (Zn)	2006/10/25	NC		%	25
1087457 MLB	RPD [O97754-01]	Total Sodium (Na)	2006/10/27	0.9		%	25
1087738 SMT	QC STANDARD	Turbidity	2006/10/27		108	%	80 - 120
	Method Blank	Turbidity	2006/10/27	<0.1		NTU	
	RPD	Turbidity	2006/10/27	1.6		%	25
1088743 CRA	MATRIX SPIKE [O97749-01]	Total Organic Carbon (C)	2006/10/28		103	%	75 - 125
	QC STANDARD	Total Organic Carbon (C)	2006/10/28		96	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2006/10/28		103	%	75 - 125
	Method Blank	Total Organic Carbon (C)	2006/10/28	ND, RDL=0.5		mg/L	
	RPD [O97749-01]	Total Organic Carbon (C)	2006/10/28	NC		%	25
1088749 CRA	MATRIX SPIKE	Total Organic Carbon (C)	2006/10/28		94	%	75 - 125
	QC STANDARD	Total Organic Carbon (C)	2006/10/28		94	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2006/10/28		100	%	75 - 125
	Method Blank	Total Organic Carbon (C)	2006/10/28	ND, RDL=0.5		mg/L	
	RPD	Total Organic Carbon (C)	2006/10/28	NC		%	25

ND = Not detected
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample
(1) Poor matrix Spike recovery due to possible matrix interference.
(2) Please refer to General Comments page for specific clarification.

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Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather** Collection Date: **17/10/2006** 2:00PM
Client ID: **1334** Reg. Water Supply #: Report Method: **Email**
Sample ID: **004517** Water Supply Address: **5171 Hwy 217 - 5172** Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Present**	Pres/Absence	Absent
E. coli P/A	**Absent**	Pres/Absence	Absent

Reported: **19/10/2006** **14:00** Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004518** Water Supply Address: **5171 Hwy 217**

Collection Date: **17/10/2006** 1:50PM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Present**	Pres/Absence	Absent
E. coli P/A	**Present**	Pres/Absence	Absent

Reported: **19/10/2006** **13:59**

Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004520** Water Supply Address: **5274 Hwy 217**

Collection Date: **18/10/2006** 2:30PM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Absent**	Pres/Absence	Absent
E. coli P/A	**Absent**	Pres/Absence	Absent

Reported: **20/10/2006** **15:16**
Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004521** Water Supply Address: **5207 Hwy 217**

Collection Date: **17/10/2006** 4:00PM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Present**	Pres/Absence	Absent
E. coli P/A	**Present**	Pres/Absence	Absent

Reported: **19/10/2006** **13:57**

Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004522** Water Supply Address: **5163 Hwy 217**

Collection Date: **18/10/2006** 10:00AM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Absent**	Pres/Absence	Absent
E. coli P/A	**Absent**	Pres/Absence	Absent

Reported: **20/10/2006** **15:15**

Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004523** Water Supply Address: **5131 Hwy 217**

Collection Date: **17/10/2006** 2:45PM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Absent**	Pres/Absence	Absent
E. coli P/A	**Absent**	Pres/Absence	Absent

Reported: **19/10/2006** **13:58**

Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004524** Water Supply Address:

Collection Date: **18/10/2006** 10:30AM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Absent**	Pres/Absence	Absent
E. coli P/A	**Absent**	Pres/Absence	Absent

Reported: **20/10/2006** **15:14**

Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Client ID: **1334** Reg. Water Supply #:
Sample ID: **004525** Water Supply Address: **5659 Hwy 217**

Collection Date: **19/10/2006** 10:30AM
Report Method: **Email**
Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Present**	Pres/Absence	Absent
E. coli P/A	**Present**	Pres/Absence	Absent

Reported: **20/10/2006** **15:17**

Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory

Verified:

Synova Diagnostics
Laboratory Report

Lawrencetown, Nova Scotia
B0S 1M0
1-902-584-3372

GST #: 86880 5979 RT

Client Name: **Sutherland,Heather**
Collection Date: **18/10/2006** 11:00AM
Client ID: **1334** Reg. Water Supply #:
Report Method: **Email**
Sample ID: **004526** Water Supply Address: **33 Little River Rd.** Source: **Well**

Mailing Address: **31 Gloster Crt.**
PO Box:
Dartmouth
Halifax County
Nova Scotia
Postal Code: **B3B 1X9**

Tel: (902) 478-4020 (H)
Tel: (902) 468-1248
Fax: **(902) 468-2207**

Comment:

Test Name	Test Result	Units	Accepted Guidelines
Total Coliform P/A	**Absent**	Pres/Absence	Absent
E. coli P/A	**Absent**	Pres/Absence	Absent

Reported: **20/10/2006** **15:13**
Reported By: Deborah Reid
Technologist

Client Name: **Sutherland,Heather**

Note: These results relate only to the sample received for testing.
Tests Flagged: 'R' = Referred to external Laboratory
Verified:

APPENDIX B

COMPLETED QUESTIONAIRES

November 7, 2006

Reference No. 821191C

Lauriston & Dorothy Tidd
33 Little River Road
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. & Mrs. Tidd:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that pH was in exceedence of the guideline limits. All other parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results of which are also included in the attached table, this indicates the absence of total coliform and E. coli and therefore the water, in terms of the parameters analyzed, is considered safe for human consumption.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	33 Little River Road	33 Little River Road Lab-Dup
	Sample Date				18-Oct-06	18-Oct-06
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	30			60	
Dissolved Chloride (Cl)	mg/L	1			41	
Colour	TCU	5		15	ND	
Hardness (CaCO3)	mg/L	1			12	
Nitrate + Nitrite	mg/L	0.05			0.1	
Nitrite (N)	mg/L	0.01			ND	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND	
Total Organic Carbon (C)	mg/L	0.5			0.6	
Orthophosphate (P)	mg/L	0.01			ND	
pH	pH	N/A		6.5-8.5	9.44	9.34
Reactive Silica (SiO2)	mg/L	0.5			20	
Dissolved Sulphate (SO4)	mg/L	2		500	48	
Turbidity	NTU	0.1			0.2	
Conductivity	uS/cm	1			360	360
RCAP CALCULATIONS						
Anion Sum	me/L	N/A			3.36	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			47	
Calculated TDS	mg/L	1		500	228	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			12	
Cation Sum	me/L	N/A			3.6	
Ion Balance (% Difference)	%	N/A			3.44	
Langelier Index (@ 20C)	N/A	N/A			0.383	
Langelier Index (@ 4C)	N/A	N/A			0.134	
Saturation pH (@ 20C)	N/A	N/A			9.06	
Saturation pH (@ 4C)	N/A	N/A			9.31	
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	5	200		12	
Total Antimony (Sb)	ug/L	2	6		ND	
Total Arsenic (As)	ug/L	2	25		ND	
Total Barium (Ba)	ug/L	5	1,000		ND	
Total Beryllium (Be)	ug/L	2			ND	
Total Bismuth (Bi)	ug/L	2			ND	
Total Boron (B)	ug/L	5	5,000		330	
Total Cadmium (Cd)	ug/L	0.017	5		ND	
Total Chromium (Cr)	ug/L	2	50		ND	
Total Cobalt (Co)	ug/L	0.4			ND	
Total Copper (Cu)	ug/L	2		1,000	4	
Total Iron (Fe)	ug/L	50		300	ND	
Total Lead (Pb)	ug/L	0.5	10		ND	
Total Manganese (Mn)	ug/L	2		50	ND	
Total Molybdenum (Mo)	ug/L	2			ND	
Total Nickel (Ni)	ug/L	2			ND	
Total Selenium (Se)	ug/L	1	10		ND	
Total Silver (Ag)	ug/L	0.1			ND	
Total Strontium (Sr)	ug/L	5			19	
Total Thallium (Tl)	ug/L	0.1			ND	
Total Tin (Sn)	ug/L	2			ND	
Total Titanium (Ti)	ug/L	2			ND	
Total Uranium (U)	ug/L	0.1	20		0.2	
Total Vanadium (V)	ug/L	2			ND	
Total Zinc (Zn)	ug/L	5		5,000	7	
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	0.1			4.6	
Total Magnesium (Mg)	mg/L	0.1			ND	
Total Phosphorus (P)	mg/L	0.1			ND	
Total Potassium (K)	mg/L	0.2			0.1	
Total Sodium (Na)	mg/L	0.4		200	77	
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.05	45		0.1	
MICROBIOLOGICAL						
Sample ID					4526	
Total Coliforms	P-A/100mL	N/A	0 per/100 mL		Absent	
Escherichia Coli	P-A/100mL	N/A	0 per/100 mL		Absent	

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

Water Sample Number: 33 Little River Rd.
Date of Survey: 18 Oct 06
Interviewed by: Heather
Project Number: 821191 C

Sampled for:
☑ RCAp MS
☑ Bacteria
☐ Other ______

004526
Sample ID
Synova Diagnostics
WEB Key: E7221 K1525 E0980
Keep This Label at Home

Full Name of Owner: Dorthy Tidd.
Address: 33 Little River Road. "Shore" rd.
Phone Number: 834-2045
Number of Persons at this residence: 2
Information from Owner or Occupant (Name): owner

WATER SUPPLY

How many wells are on site? 1

Type dug well ____ drilled well 1 spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location ______

Have water shortages been experienced? ☐ Yes ☐ No

If yes, please explain - occasionally when too much water is used.

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?
☐ Yes ☒ No

If yes, please explain ______

Has the water ever been tested for chemical quality/bacteria? ☒ Yes ☐ No

Has any maintenance ever been completed on the well? ☐ Yes ☒ No

If yes, please explain ______

Is there a water treatment system? ☐ Yes ☐ No

If yes, location of backwash discharge (if applicable) ______

Type of pump submersable deep water pump. - installed when drilled

Storage tank type and pressure setting: ______

IF DRILLED WELL

Construction date: 20-25 yrs ago

Driller: not known

For whom was well constructed: owner-present

Well depth: 120'

Well diameter: 6"

Length of casing: not known

Is the top of the well visible? ☒ Yes ☐ No

Static water level: ______

Completion of top of well: ______

Comments of Owner: ______

Interviewer Comments ______

12 gal/min

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: 2 systems 1 for bathroom 1 for kitchen/washers

Installation date: 6-10 years ago. 7-8 years ago

Has the system been properly maintained (regular pumping, etc)? once

When was the septic tank last pumped out? few years ago.

Are there any obvious signs the system may be malfunctioning?

Comments of Owner: tank changed

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? forced air wood/oil

If by oil, do you have a fuel oil tank(s) on your property? yes

Type of fuel stored: furnace oil

Capacity of tank(s): 200 gal.

Age and year tank installed: 2004.

Type of tank: steel

Location, inside or outside: basement

Is there any spill containment? ☐ Yes ☒ No

If yes, what type?

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? no

Were any chemicals (oil/grease/other) ever spilled on the property? no

November 7, 2006 Reference No. 821191C

Dale Denton
5131 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Denton:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate exceedences for iron and lead. All other parameters were within their respective guideline limits.

With respect to the bacteriological analysis, the results of which are also included in the attached table, this indicates the absence of total coliform and E. coli and therefore the water, in terms of the parameters analyzed, is considered safe for human consumption.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5131 Hwy 217	5131 HWY 217 Lab-Dup
	Sample Date				17-Oct-06	17-Oct-06
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	30			50	
Dissolved Chloride (Cl)	mg/L	1			17	
Colour	TCU	5		15	ND	
Hardness (CaCO3)	mg/L	1			39	
Nitrate + Nitrite	mg/L	0.05			0.82	
Nitrite (N)	mg/L	0.01			ND	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND	
Total Organic Carbon (C)	mg/L	0.5			ND	ND
Orthophosphate (P)	mg/L	0.01			0.01	
pH	pH	N/A		6.5-8.5	7.54	
Reactive Silica (SiO2)	mg/L	0.5			18	
Dissolved Sulphate (SO4)	mg/L	2		500	7	
Turbidity	NTU	0.1			0.4	
Conductivity	uS/cm	1			170	
RCAP CALCULATIONS						
Anion Sum	me/L	N/A			1.69	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			50	
Calculated TDS	mg/L	1		500	107	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND	
Cation Sum	me/L	N/A			1.48	
Ion Balance (% Difference)	%	N/A			6.47	
Langelier Index (@ 20C)	N/A	N/A			-1.03	
Langelier Index (@ 4C)	N/A	N/A			-1.28	
Saturation pH (@ 20C)	N/A	N/A			8.57	
Saturation pH (@ 4C)	N/A	N/A			8.82	
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	5	200		65	
Total Antimony (Sb)	ug/L	2	6		ND	
Total Arsenic (As)	ug/L	2	25		ND	
Total Barium (Ba)	ug/L	5	1,000		ND	
Total Beryllium (Be)	ug/L	2			ND	
Total Bismuth (Bi)	ug/L	2			ND	
Total Boron (B)	ug/L	5	5,000		15	
Total Cadmium (Cd)	ug/L	0.017	5		ND	
Total Chromium (Cr)	ug/L	2	50		3	
Total Cobalt (Co)	ug/L	0.4			ND	
Total Copper (Cu)	ug/L	2		1,000	400	
Total Iron (Fe)	ug/L	50		300	400	
Total Lead (Pb)	ug/L	0.5	10		25	
Total Manganese (Mn)	ug/L	2		50	2	
Total Molybdenum (Mo)	ug/L	2			ND	
Total Nickel (Ni)	ug/L	2			ND	
Total Selenium (Se)	ug/L	1	10		ND	
Total Silver (Ag)	ug/L	0.1			ND	
Total Strontium (Sr)	ug/L	5			21	
Total Thallium (Tl)	ug/L	0.1			ND	
Total Tin (Sn)	ug/L	2			2	
Total Titanium (Ti)	ug/L	2			ND	
Total Uranium (U)	ug/L	0.1	20		ND	
Total Vanadium (V)	ug/L	2			7	
Total Zinc (Zn)	ug/L	5		5,000	1200	
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	0.1			12	
Total Magnesium (Mg)	mg/L	0.1			2.2	
Total Phosphorus (P)	mg/L	0.1			ND	
Total Potassium (K)	mg/L	0.2			0.3	
Total Sodium (Na)	mg/L	0.4		200	16	
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.05	45		0.82	
MICROBIOLOGICAL						
Sample ID					4523	
Total Coliforms	P-A/100mL	N/A	0 per/100 mL		Absent	
Escherichia Coli	P-A/100mL	N/A	0 per/100 mL		Absent	

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

Water Sample Number: 5131 Hwy 217
Date of Survey: 17 Oct 06
Interviewed by: Taber
Project Number: 821191C

Sampled for:
☑ RCAp MS
☑ Bacteria
☐ Other

004523
Sample ID
Synova Diagnostics
WEB Key: I1348 N9878 W4290
Keep This Label at Home

Full Name of Owner: Dale Denton
Address: 5131 Hwy No 217
Phone Number: 834-2699
Number of Persons at this residence: 2
Information from Owner or Occupant (Name): owner.

WATER SUPPLY

How many wells are on site? 2 wells onsite → 1 well used

Type dug well ____ drilled well ✓ spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☑ No

Location Behind house. ~ 20 ft.

Have water shortages been experienced? ☐ Yes ☑ No

If yes, please explain

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?

☐ Yes ☑ No

If yes, please explain

Has the water ever been tested for chemical quality/bacteria? ☑ Yes ☐ No

Has any maintenance ever been completed on the well? ☑ Yes ☐ No

If yes, please explain New pump

Is there a water treatment system? ☐ Yes ☑ No

If yes, location of backwash discharge (if applicable)

Type of pump submersible pump ½ hp.

Storage tank type and pressure setting: bladder tank → 65

IF DRILLED WELL

Construction date: 1981

Driller: Clearwater drilling

For whom was well constructed: Dale Denton

Well depth: 140 ft

Well diameter: 6"

Length of casing: cased to bedrock.

Is the top of the well visible? ☑ Yes ☐ No

Static water level: 26.19'

Completion of top of well: steel cap.

Comments of Owner:

Interviewer Comments

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: Onsite septic system

Installation date: 1981 (tank + bed)

Has the system been properly maintained (regular pumping, etc)? Yes

When was the septic tank last pumped out? 3-4 yrs ago

Are there any obvious signs the system may be malfunctioning? NO

Comments of Owner:

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? heat pump + wood furnace.

If by oil, do you have a fuel oil tank(s) on your property? N/A

Type of fuel stored: N/A

Capacity of tank(s): N/A

Age and year tank installed: N/A

Type of tank: N/A

Location, inside or outside: N/A

Is there any spill containment? ☐ Yes ☐ No N/A

If yes, what type?

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? No

Were any chemicals (oil/grease/other) ever spilled on the property? No

DISCHARGE TEST

Initial Water Level: 26.19'

Discharge Rate: 20l/min

Well Depth: 140'

400l total

Time (minutes)	Water Level (~~meters~~ feet below top of casing)
t=0	27.85
2	32.00
4	31.49
6	30.12
8	28.96
10	31.00
12	32.58
14	31.90
16	29.40
18	32.20
20	31.40.

Comments: older pump - homeowner did not want to run it for an hour.

November 7, 2006 Reference No. 821191C

David Gidney
5163 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Gidney:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that pH was in exceedence of the guideline limits. All other parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results of which are also included in the attached table, this indicates the absence of total coliform and E. coli and therefore the water, in terms of the parameters analyzed, is considered safe for human consumption.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5163 Hwy 217	5163 HWY 217 Lab-Dup
	Sample Date				18-Oct-06	18-Oct-06
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	30			69	
Dissolved Chloride (Cl)	mg/L	1			20	
Colour	TCU	5		15	ND	
Hardness (CaCO3)	mg/L	1			25	
Nitrate + Nitrite	mg/L	0.05			0.23	
Nitrite (N)	mg/L	0.01			ND	
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND	
Total Organic Carbon (C)	mg/L	0.5			ND	
Orthophosphate (P)	mg/L	0.01			0.01	
pH	pH	N/A		6.5-8.5	8.71	
Reactive Silica (SiO2)	mg/L	0.5			18	
Dissolved Sulphate (SO4)	mg/L	2		500	6	
Turbidity	NTU	0.1			0.2	
Conductivity	uS/cm	1			200	
RCAP CALCULATIONS						
Anion Sum	me/L	N/A			2.08	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			65	
Calculated TDS	mg/L	1		500	136	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			3	
Cation Sum	me/L	N/A			2.21	
Ion Balance (% Difference)	%	N/A			3.1	
Langelier Index (@ 20C)	N/A	N/A			0.114	
Langelier Index (@ 4C)	N/A	N/A			-0.137	
Saturation pH (@ 20C)	N/A	N/A			8.6	
Saturation pH (@ 4C)	N/A	N/A			8.85	
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	5	200		ND	ND
Total Antimony (Sb)	ug/L	2	6		ND	ND
Total Arsenic (As)	ug/L	2	25		ND	ND
Total Barium (Ba)	ug/L	5	1,000		ND	ND
Total Beryllium (Be)	ug/L	2			ND	ND
Total Bismuth (Bi)	ug/L	2			ND	ND
Total Boron (B)	ug/L	5	5,000		35	36
Total Cadmium (Cd)	ug/L	0.017	5		ND	ND
Total Chromium (Cr)	ug/L	2	50		ND	ND
Total Cobalt (Co)	ug/L	0.4			ND	ND
Total Copper (Cu)	ug/L	2		1,000	ND	ND
Total Iron (Fe)	ug/L	50		300	ND	ND
Total Lead (Pb)	ug/L	0.5	10		ND	ND
Total Manganese (Mn)	ug/L	2		50	ND	ND
Total Molybdenum (Mo)	ug/L	2			ND	ND
Total Nickel (Ni)	ug/L	2			ND	ND
Total Selenium (Se)	ug/L	1	10		ND	ND
Total Silver (Ag)	ug/L	0.1			ND	ND
Total Strontium (Sr)	ug/L	5			18	18
Total Thallium (Tl)	ug/L	0.1			ND	ND
Total Tin (Sn)	ug/L	2			ND	ND
Total Titanium (Ti)	ug/L	2			ND	ND
Total Uranium (U)	ug/L	0.1	20		0.4	0.4
Total Vanadium (V)	ug/L	2			10	10
Total Zinc (Zn)	ug/L	5		5,000	5	ND
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	0.1			8.8	8.7
Total Magnesium (Mg)	mg/L	0.1			0.8	0.8
Total Phosphorus (P)	mg/L	0.1			ND	ND
Total Potassium (K)	mg/L	0.2			0.2	0.3
Total Sodium (Na)	mg/L	0.4		200	39	39
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.05	45		0.23	
MICROBIOLOGICAL						
Sample ID					4522	
Total Coliforms	P-A/100mL	N/A	0 per/100 mL		Absent	
Escherichia Coli	P-A/100mL	N/A	0 per/100 mL		Absent	

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

Water Sample Number: 5163 Hwy 217
Date of Survey: 18-Oct-06
Interviewed by: Taber Burn
Project Number: 821191C

Sampled for:
☑ RCAp MS
☑ Bacteria
☐ Other ______

004522
Sample ID
Synova Diagnostics
WEB Key: X1082 F5944 M5987
Keep This Label at Home

Full Name of Owner: David Gidney
Address: 5163 Hwy #217
Phone Number: 834-2698
Number of Persons at this residence: 2
Information from Owner or Occupant (Name): Owner

WATER SUPPLY

How many wells are on site? ONE

Type dug well ____ drilled well ✓ spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location Clearwater drilling

Have water shortages been experienced? ☐ Yes ☑ No

If yes, please explain

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?

☐ Yes ☑ No

If yes, please explain

Has the water ever been tested for chemical quality/bacteria? ☑ Yes ☐ No 4-5 years ago

Has any maintenance ever been completed on the well? ☑ Yes ☐ No

If yes, please explain New pump 5-6 years ago

Is there a water treatment system? ☐ Yes ☑ No

If yes, location of backwash discharge (if applicable)

Type of pump Submersible

Storage tank type and pressure setting:

IF DRILLED WELL

Construction date: 1980 or 1981

Driller: Clearwater

For whom was well constructed: David Gidney

Well depth: 100 ft

Well diameter: 6"

Length of casing: 20'

Is the top of the well visible? ☑ Yes ☐ No

Static water level: Overflowing 2gal/50 sec

Completion of top of well: ______

Comments of Owner: ______

Interviewer Comments ______

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: Septic tank + Bed.

Installation date: 1967

Has the system been properly maintained (regular pumping, etc)? Yes.

When was the septic tank last pumped out? 6-7 yrs.

Are there any obvious signs the system may be malfunctioning? No

Comments of Owner:

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? Forced Air (oil furnace).

If by oil, do you have a fuel oil tank(s) on your property? Yes.

Type of fuel stored: Oil

Capacity of tank(s): 200 gal

Age and year tank installed: 3 yrs old.

Type of tank: Steel

Location, inside or outside: inside Garage.

Is there any spill containment? ☐ Yes ☑ No

If yes, what type?

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? No

Were any chemicals (oil/grease/other) ever spilled on the property? No

November 7, 2006

Reference No. 821191C

Rex Trask
5171 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Trask:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that all parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results indicated the presence of total coliform and E. coli. The presence of total coliform bacteria, which is commonly present in the soil and degrading vegetation, and E. coli, which is indicative of contamination from the feces of warm blooded animals, indicate that there is an entrance point for potentially contaminated surface water into your well. The presence of either of these bacteria exceeds the Guidelines for Canadian Drinking Water Quality limit and therefore the water is considered unsuitable for drinking purposes.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5171 Hwy 217
	Sample Date				17-Oct-06
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	30			38
Dissolved Chloride (Cl)	mg/L	1			23
Colour	TCU	5		15	ND
Hardness (CaCO3)	mg/L	1			42
Nitrate + Nitrite	mg/L	0.05			0.41
Nitrite (N)	mg/L	0.01			ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND
Total Organic Carbon (C)	mg/L	0.5			0.8
Orthophosphate (P)	mg/L	0.01			ND
pH	pH	N/A		6.5-8.5	7.28
Reactive Silica (SiO2)	mg/L	0.5			16
Dissolved Sulphate (SO4)	mg/L	2		500	8
Turbidity	NTU	0.1			0.1
Conductivity	uS/cm	1			170
RCAP CALCULATIONS					
Anion Sum	me/L	N/A			1.62
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			38
Calculated TDS	mg/L	1		500	102
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND
Cation Sum	me/L	N/A			1.49
Ion Balance (% Difference)	%	N/A			3.99
Langelier Index (@ 20C)	N/A	N/A			-1.38
Langelier Index (@ 4C)	N/A	N/A			-1.63
Saturation pH (@ 20C)	N/A	N/A			8.66
Saturation pH (@ 4C)	N/A	N/A			8.91
Elements (ICP-MS)					
Total Aluminum (Al)	ug/L	5	200		14
Total Antimony (Sb)	ug/L	2	6		ND
Total Arsenic (As)	ug/L	2	25		ND
Total Barium (Ba)	ug/L	5	1,000		ND
Total Beryllium (Be)	ug/L	2			ND
Total Bismuth (Bi)	ug/L	2			ND
Total Boron (B)	ug/L	5	5,000		19
Total Cadmium (Cd)	ug/L	0.017	5		ND
Total Chromium (Cr)	ug/L	2	50		ND
Total Cobalt (Co)	ug/L	0.4			ND
Total Copper (Cu)	ug/L	2		1,000	6
Total Iron (Fe)	ug/L	50		300	ND
Total Lead (Pb)	ug/L	0.5	10		0.8
Total Manganese (Mn)	ug/L	2		50	ND
Total Molybdenum (Mo)	ug/L	2			ND
Total Nickel (Ni)	ug/L	2			ND
Total Selenium (Se)	ug/L	1	10		ND
Total Silver (Ag)	ug/L	0.1			ND
Total Strontium (Sr)	ug/L	5			43
Total Thallium (Tl)	ug/L	0.1			ND
Total Tin (Sn)	ug/L	2			ND
Total Titanium (Ti)	ug/L	2			ND
Total Uranium (U)	ug/L	0.1	20		ND
Total Vanadium (V)	ug/L	2			14
Total Zinc (Zn)	ug/L	5		5,000	8
Elements (ICP-OES)					
Total Calcium (Ca)	mg/L	0.1			13
Total Magnesium (Mg)	mg/L	0.1			2.5
Total Phosphorus (P)	mg/L	0.1			ND
Total Potassium (K)	mg/L	0.2			0.4
Total Sodium (Na)	mg/L	0.4		200	15
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.05	45		0.41
MICROBIOLOGICAL					
Sample ID					**4518**
Total Coliforms	P-A/100mL	N/A	0 per/100 mL		Present
Escherichia Coli	P-A/100mL	N/A	0 per/100 mL		Present

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

discharge test

Water Sample Number: 5171 Hwy 217
Date of Survey: 17 Oct 06
Interviewed by: Heather
Project Number: 82119 1-C

Sampled for:
☑ RCAp MS
☑ Bacteria
☐ Other

004518
Sample ID
Synova Diagnostics
WEB Key: J4293 B9126 W3299
Keep This Label at Home

Full Name of Owner: Rex Trask
Address: 5171 Hwy #217
Phone Number: 834-2953
Number of Persons at this residence: 3 (+2 at Rice residence)
Information from Owner or Occupant (Name): Owner

WATER SUPPLY

How many wells are on site? 1

Type dug well 1 drilled well ~~2~~ spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location -cleaned out 1 year ago

Have water shortages been experienced? ☐ Yes ☒ No

If yes, please explain -back 7 years -never been dry
-father 25 years

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?

☑ Yes ~~☒ No~~

If yes, please explain Pumped out well, cleaned and added Javex

Has the water ever been tested for chemical quality/bacteria? ☒ Yes ☐ No

Has any maintenance ever been completed on the well? ☒ Yes ☐ No

If yes, please explain -cleaned out 1 year ago
-used javex for it to pass.

Is there a water treatment system? ☐ Yes ☒ No -use bottled water for drinking

If yes, location of backwash discharge (if applicable) ____

Type of pump jet pump. -pressure over wood pump.

Storage tank type and pressure setting: small tank @ 40-50 psi.

IF DUG WELL

Approximate date of construction: 30yrs ago - cement tank (no bottom) installed.

Well depth: ~~7.8"~~ ~~7.8~~ 4.84' Measured from: top of cap

Well diameter: 7.3' x 4'

Water level: ~~7.5"~~ 1.65'

Height of well casing above ground: 1'

Well construction:

- ☐ Well crocks on top of rock
- ☒ Well crocks only - concrete tank
- ☐ Rocked well only
- ☐ Other (specify) ______

If crocked, are the joints sealed? ☐ Yes ☒ No

Type of well cover: wooden ☐ concrete ☒ other ____

Is ground mounded above well? ☐ Yes ☒ No

Does well have a concrete apron? ☐ Yes ☒ No

If so, is it at ground surface or below surface? ______

Comments of Owner: concrete tank w open bottom
Norman Rice (5172 Hwy 217) on same well

Interviewer Comments water at ground level - possibly spring fed.

11.84
1.65
3.19 x 7.3 x 4

C0639-096

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: tank & bed.

Installation date: tank installed 20yrs ago.

Has the system been properly maintained (regular pumping, etc)? yes. every 11 months

When was the septic tank last pumped out? July 2006

Are there any obvious signs the system may be malfunctioning? ______

Comments of Owner: ______

Interviewer Comments ______

HOME HEATING SYSTEM

How do you heat your dwelling? oil

If by oil, do you have a fuel oil tank(s) on your property? yes

Type of fuel stored: furnace oil

Capacity of tank(s): 200 gal

Age and year tank installed: 8 years ago furnace 8yrs

Type of tank: steel

Location, inside or outside: inside

Is there any spill containment? ☐ Yes ☑ No

If yes, what type? ______

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? no.

Were any chemicals (oil/grease/other) ever spilled on the property? no

DISCHARGE TEST

Initial Water Level: ______________

Discharge Rate: 20 l/min   1200 l/hr

Well Depth: ______________

	Time (minutes)	Water Level ~~(meters~~ feet below top of casing)
0	12:45	1.72
5	12:50	1.75
10	12:55	1.81
15	1:00	1.87
20	1:05	1.92
25	1:10	1.96
30	1:15	2.01
35	1:20	2.06
40	1:25	2.13
45	1:30	2.20
50	1:35	2.24
55	1:40	2.30
60	1:45	2.35

3.19
7.3
957
2233
23.287 ft³

Comments: ____

C0639-098

November 7, 2006

Reference No. 821191C

Norman Rice
5172 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Rice:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that all parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results indicated the presence of total coliform and an absence of E. coli. The presence of total coliform bacteria, which is commonly present in the soil and degrading vegetation, indicates that there may be an entrance point for potentially contaminated surface water into your well. The presence of either of this bacteria exceeds the Guidelines for Canadian Drinking Water Quality limit and therefore the water is considered unsuitable for drinking purposes.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5172 Hwy 217	5172 HWY 217 Lab-Dup
	Sample Date				17-Oct-06	17-Oct-06
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	30			37	37
Dissolved Chloride (Cl)	mg/L	1			22	22
Colour	TCU	5		15	ND	ND
Hardness (CaCO3)	mg/L	1			40	
Nitrate + Nitrite	mg/L	0.05			0.35	0.36
Nitrite (N)	mg/L	0.01			ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND	
Total Organic Carbon (C)	mg/L	0.5			0.9	
Orthophosphate (P)	mg/L	0.01			ND	ND
pH	pH	N/A		6.5-8.5	7.14	
Reactive Silica (SiO2)	mg/L	0.5			15	15
Dissolved Sulphate (SO4)	mg/L	2		500	9	9
Turbidity	NTU	0.1			0.2	
Conductivity	uS/cm	1			170	
RCAP CALCULATIONS						
Anion Sum	me/L	N/A			1.57	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			37	
Calculated TDS	mg/L	1		500	99	
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND	
Cation Sum	me/L	N/A			1.43	
Ion Balance (% Difference)	%	N/A			4.69	
Langelier Index (@ 20C)	N/A	N/A			-1.57	
Langelier Index (@ 4C)	N/A	N/A			-1.82	
Saturation pH (@ 20C)	N/A	N/A			8.71	
Saturation pH (@ 4C)	N/A	N/A			8.96	
Elements (ICP-MS)						
Total Aluminum (Al)	ug/L	5	200		11	
Total Antimony (Sb)	ug/L	2	6		ND	
Total Arsenic (As)	ug/L	2	25		ND	
Total Barium (Ba)	ug/L	5	1,000		ND	
Total Beryllium (Be)	ug/L	2			ND	
Total Bismuth (Bi)	ug/L	2			ND	
Total Boron (B)	ug/L	5	5,000		18	
Total Cadmium (Cd)	ug/L	0.017	5		ND	
Total Chromium (Cr)	ug/L	2	50		ND	
Total Cobalt (Co)	ug/L	0.4			ND	
Total Copper (Cu)	ug/L	2		1,000	10	
Total Iron (Fe)	ug/L	50		300	ND	
Total Lead (Pb)	ug/L	0.5	10		ND	
Total Manganese (Mn)	ug/L	2		50	ND	
Total Molybdenum (Mo)	ug/L	2			ND	
Total Nickel (Ni)	ug/L	2			ND	
Total Selenium (Se)	ug/L	1	10		ND	
Total Silver (Ag)	ug/L	0.1			ND	
Total Strontium (Sr)	ug/L	5			41	
Total Thallium (Tl)	ug/L	0.1			ND	
Total Tin (Sn)	ug/L	2			ND	
Total Titanium (Ti)	ug/L	2			ND	
Total Uranium (U)	ug/L	0.1	20		ND	
Total Vanadium (V)	ug/L	2			10	
Total Zinc (Zn)	ug/L	5		5,000	21	
Elements (ICP-OES)						
Total Calcium (Ca)	mg/L	0.1			12	
Total Magnesium (Mg)	mg/L	0.1			2.6	
Total Phosphorus (P)	mg/L	0.1			ND	
Total Potassium (K)	mg/L	0.2			0.4	
Total Sodium (Na)	mg/L	0.4		200	15	
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.05	45		0.35	
MICROBIOLOGICAL						
Sample ID					**4517**	
Total Coliforms	P-A/100mL	N/A	0 per 100 mL		Present	
Escherichia Coli	P-A/100mL	N/A	0 per 100 mL		Absent	

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

004517
Sample ID
Synova Diagnostics
WEB Key: W0515 D2004 R5306
Keep This Label at Home

Water Sample Number: 5172 Hwy 217
Date of Survey: 17 Oct 06
Interviewed by: Taber
Project Number: 821191-C

Sampled for :
☑ RCAp MS
☑ Bacteria
☐ Other ______

Full Name of Owner: Norman, Laura Rice.
Address: 5172 Hwy 217
Phone Number: 834-2770
Number of Persons at this residence: 2
Information from Owner or Occupant (Name): owner

* well located at 5171 Hwy 217

WATER SUPPLY

How many wells are on site? None (Same well as Rex trask)

Type dug well ✓ drilled well ____ spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location ______

Have water shortages been experienced? ☐ Yes ☑ No (since 91)

If yes, please explain ______

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?
☑ Yes ☐ No

If yes, please explain Same Rex.

Has the water ever been tested for chemical quality/bacteria? ☑ Yes ☐ No

Has any maintenance ever been completed on the well? ☑ Yes ☐ No

If yes, please explain - Cleaned out 1 year ago
- used Javex

Is there a water treatment system? ☑ Yes ☐ No (big blue inline filter (particulate))

If yes, location of backwash discharge (if applicable) For drinking Water.

Type of pump ~~[illegible]~~ NO Pump. → Gravity Fed.

Storage tank type and pressure setting: None.

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: Onsite septic field & tank.

Installation date: Not sure. (before 1991)

Has the system been properly maintained (regular pumping, etc)? Yes

When was the septic tank last pumped out? 4-5 years Ago

Are there any obvious signs the system may be malfunctioning? NO

Comments of Owner:

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? Oil

If by oil, do you have a fuel oil tank(s) on your property? Yes

Type of fuel stored: Oil

Capacity of tank(s): 200 gal

Age and year tank installed: installed 3 yrs ago

Type of tank: Steel tank - covered

Location, inside or outside: outside.

Is there any spill containment? ☐ Yes ☑ No

If yes, what type?

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? NO

Were any chemicals (oil/grease/other) ever spilled on the property? NO

November 7, 2006 Reference No. 821191C

James & Deborah Denton
5207 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. & Mrs Denton:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that all parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results indicated the presence of total coliform and E. coli. The presence of total coliform bacteria, which is commonly present in the soil and degrading vegetation, and E. coli, which is indicative of contamination from the feces of warm blooded animals, indicate that there is an entrance point for potentially contaminated surface water into your well. The presence of either of these bacteria exceeds the Guidelines for Canadian Drinking Water Quality limit and therefore the water is considered unsuitable for drinking purposes.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5207 Hwy 217
	Sample Date				17-Oct-06
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	30			28
Dissolved Chloride (Cl)	mg/L	1			15
Colour	TCU	5		15	ND
Hardness (CaCO3)	mg/L	1			29
Nitrate + Nitrite	mg/L	0.05			0.2
Nitrite (N)	mg/L	0.01			ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND
Total Organic Carbon (C)	mg/L	0.5			0.8
Orthophosphate (P)	mg/L	0.01			ND
pH	pH	N/A		6.5-8.5	6.5
Reactive Silica (SiO2)	mg/L	0.5			18
Dissolved Sulphate (SO4)	mg/L	2		500	5
Turbidity	NTU	0.1			0.1
Conductivity	uS/cm	1			120
RCAP CALCULATIONS					
Anion Sum	me/L	N/A			1.11
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			28
Calculated TDS	mg/L	1		500	75
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND
Cation Sum	me/L	N/A			0.973
Ion Balance (% Difference)	%	N/A			6.59
Langelier Index (@ 20C)	N/A	N/A			-2.56
Langelier Index (@ 4C)	N/A	N/A			-2.81
Saturation pH (@ 20C)	N/A	N/A			9.06
Saturation pH (@ 4C)	N/A	N/A			9.31
Elements (ICP-MS)					
Total Aluminum (Al)	ug/L	5	200		14
Total Antimony (Sb)	ug/L	2	6		ND
Total Arsenic (As)	ug/L	2	25		ND
Total Barium (Ba)	ug/L	5	1,000		ND
Total Beryllium (Be)	ug/L	2			ND
Total Bismuth (Bi)	ug/L	2			ND
Total Boron (B)	ug/L	5	5,000		9
Total Cadmium (Cd)	ug/L	0.017	5		ND
Total Chromium (Cr)	ug/L	2	50		ND
Total Cobalt (Co)	ug/L	0.4			ND
Total Copper (Cu)	ug/L	2		1,000	260
Total Iron (Fe)	ug/L	50		300	ND
Total Lead (Pb)	ug/L	0.5	10		0.7
Total Manganese (Mn)	ug/L	2		50	ND
Total Molybdenum (Mo)	ug/L	2			ND
Total Nickel (Ni)	ug/L	2			ND
Total Selenium (Se)	ug/L	1	10		ND
Total Silver (Ag)	ug/L	0.1			ND
Total Strontium (Sr)	ug/L	5			22
Total Thallium (Tl)	ug/L	0.1			ND
Total Tin (Sn)	ug/L	2			ND
Total Titanium (Ti)	ug/L	2			ND
Total Uranium (U)	ug/L	0.1	20		ND
Total Vanadium (V)	ug/L	2			ND
Total Zinc (Zn)	ug/L	5		5,000	20
Elements (ICP-OES)					
Total Calcium (Ca)	mg/L	0.1			6.7
Total Magnesium (Mg)	mg/L	0.1			2.9
Total Phosphorus (P)	mg/L	0.1			ND
Total Potassium (K)	mg/L	0.2			0.2
Total Sodium (Na)	mg/L	0.4		200	9
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.05	45		0.2
MICROBIOLOGICAL					
Sample ID					**4521**
Total Coliforms	P-A/100mL	N/A	0 per 100 mL		Present
Escherichia Coli	P-A/100mL	N/A	0 per 100 mL		Present

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

no discharge

Water Sample Number: 5207 Hwy 217
Date of Survey: 17 Oct 06
Interviewed by: Heather
Project Number: 821191 C

Sampled for:
☒ RCAp MS
☒ Bacteria
☐ Other ____

004521
Sample ID
Synova Diagnostics
WEB Key: H9727 I9343 F9494
Keep This Label at Home

Full Name of Owner: Deborah Denton
Address: 5207 Hwy 217
Phone Number: 834-2187.
Number of Persons at this residence: 2.
Information from Owner or Occupant (Name): Owner

WATER SUPPLY

How many wells are on site? 1

Type dug well 1 drilled well ____ spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location ____

Have water shortages been experienced? ☒ Yes ☐ No

If yes, please explain summer - when kids still lived home.

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?

☐ Yes ☐ No - don't drink water

If yes, please explain ____

Has the water ever been tested for chemical quality/bacteria? ☐ Yes ☒ No

Has any maintenance ever been completed on the well? ☐ Yes ☐ No

If yes, please explain disinfected periodically

Is there a water treatment system? ☐ Yes ☒ No

If yes, location of backwash discharge (if applicable) ____

Type of pump jet pump.

Storage tank type and pressure setting: 45 ps.

IF DUG WELL

Approximate date of construction: ~1962 36 years

Well depth: 6.73' **Measured from:** top of concrete

Well diameter: ~ 1.5 m

Water level: ~~AWM~~ 2.40'

Height of well casing above ground: 20 cm

Well construction:
- ☐ Well crocks on top of rock
- ☐ Well crocks only
- ☒ Rocked well only Concrete around top
- ☐ Other (specify) ______

If crocked, are the joints sealed? ☐ Yes ☐ No

Type of well cover: wooden ☒ concrete ☐ other ____

Is ground mounded above well? ☐ Yes ☒ No

Does well have a concrete apron? ☐ Yes ☒ No

If so, is it at ground surface or below surface? ______

Comments of Owner: ______

Interviewer Comments ______

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: cement tank & pipes @ front of house

Installation date: 1981

Has the system been properly maintained (regular pumping, etc)? 2x

When was the septic tank last pumped out? 8-10 years ago.

Are there any obvious signs the system may be malfunctioning? no

Comments of Owner:

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? *wood / electric

If by oil, do you have a fuel oil tank(s) on your property?

Type of fuel stored:

Capacity of tank(s): 45gal - not used

Age and year tank installed:

Type of tank:

Location, inside or outside: basement

Is there any spill containment? ☐ Yes ☐ No

If yes, what type?

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? no

Were any chemicals (oil/grease/other) ever spilled on the property? no

November 7, 2006

Reference No. 821191C

Kevin Gidney
5274 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Gidney:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that pH was in exceedence of the guideline limits. All other parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results of which are also included in the attached table, this indicates the absence of total coliform and E. coli and therefore the water, in terms of the parameters analyzed, is considered safe for human consumption.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5274 Hwy 217
	Sample Date				18-Oct-06
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	30			71
Dissolved Chloride (Cl)	mg/L	1			71
Colour	TCU	5		15	ND
Hardness (CaCO3)	mg/L	1			57
Nitrate + Nitrite	mg/L	0.05			0.75
Nitrite (N)	mg/L	0.01			ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND
Total Organic Carbon (C)	mg/L	0.5			0.5
Orthophosphate (P)	mg/L	0.01			0.01
pH	pH	N/A		6.5-8.5	8.66
Reactive Silica (SiO2)	mg/L	0.5			22
Dissolved Sulphate (SO4)	mg/L	2		500	11
Turbidity	NTU	0.1			<0.1
Conductivity	uS/cm	1			350
RCAP CALCULATIONS					
Anion Sum	me/L	N/A			3.72
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			68
Calculated TDS	mg/L	1		500	227
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			3
Cation Sum	me/L	N/A			3.51
Ion Balance (% Difference)	%	N/A			2.86
Langelier Index (@ 20C)	N/A	N/A			0.419
Langelier Index (@ 4C)	N/A	N/A			0.169
Saturation pH (@ 20C)	N/A	N/A			8.24
Saturation pH (@ 4C)	N/A	N/A			8.49
Elements (ICP-MS)					
Total Aluminum (Al)	ug/L	5	200		ND
Total Antimony (Sb)	ug/L	2	6		ND
Total Arsenic (As)	ug/L	2	25		ND
Total Barium (Ba)	ug/L	5	1,000		69
Total Beryllium (Be)	ug/L	2			ND
Total Bismuth (Bi)	ug/L	2			ND
Total Boron (B)	ug/L	5	5,000		260
Total Cadmium (Cd)	ug/L	0.017	5		ND
Total Chromium (Cr)	ug/L	2	50		ND
Total Cobalt (Co)	ug/L	0.4			ND
Total Copper (Cu)	ug/L	2		1,000	ND
Total Iron (Fe)	ug/L	50		300	ND
Total Lead (Pb)	ug/L	0.5	10		ND
Total Manganese (Mn)	ug/L	2		50	ND
Total Molybdenum (Mo)	ug/L	2			ND
Total Nickel (Ni)	ug/L	2			ND
Total Selenium (Se)	ug/L	1	10		ND
Total Silver (Ag)	ug/L	0.1			ND
Total Strontium (Sr)	ug/L	5			58
Total Thallium (Tl)	ug/L	0.1			ND
Total Tin (Sn)	ug/L	2			ND
Total Titanium (Ti)	ug/L	2			ND
Total Uranium (U)	ug/L	0.1	20		0.3
Total Vanadium (V)	ug/L	2			10
Total Zinc (Zn)	ug/L	5		5,000	7
Elements (ICP-OES)					
Total Calcium (Ca)	mg/L	0.1			21
Total Magnesium (Mg)	mg/L	0.1			1.3
Total Phosphorus (P)	mg/L	0.1			ND
Total Potassium (K)	mg/L	0.2			0.1
Total Sodium (Na)	mg/L	0.4		200	54
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.05	45		0.75
MICROBIOLOGICAL					
Sample ID					**4520**
Total Coliforms	P-A/100mL	N/A	0 per 100 mL		Absent
Escherichia Coli	P-A/100mL	N/A	0 per 100 mL		Absent

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

Water Sample Number: 5274 Hwy 217
Date of Survey: 18 Oct 06
Interviewed by: Heather
Project Number: 821191 C

Sampled for: ☒ RCAp MS ☒ Bacteria ☐ Other

004520
Sample ID
Synova Diagnostics
WEB Key: S6560 M0646 L5943
Keep This Label at Home

Full Name of Owner: Rhonda Sidney
Address: 5274 Hwy 217
Phone Number: 834-2574
Number of Persons at this residence: 5
Information from Owner or Occupant (Name): Owner

WATER SUPPLY

How many wells are on site? 1

Type dug well ____ drilled well 1 spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location ____________________

Have water shortages been experienced? ☐ Yes ☒ No

If yes, please explain ____________________

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?

☐ Yes ☒ No

If yes, please explain ____________________

Has the water ever been tested for chemical quality/bacteria? ☒ Yes ☐ No

Has any maintenance ever been completed on the well? ☐ Yes ☒ No

If yes, please explain ____________________

Is there a water treatment system? ☐ Yes ☒ No

If yes, location of backwash discharge (if applicable) ____________________

Type of pump submersible pump

Storage tank type and pressure setting: ____________________

IF DRILLED WELL

Construction date: 1992

Driller: Robar

For whom was well constructed: present owner

Well depth: not known

Well diameter: 6"

Length of casing: not known

Is the top of the well visible? ☒ Yes ☐ No

Static water level: not able to remove well cap

Completion of top of well: steel cap
- well located in pool area - no stickup
steel casing surrounded by concrete

Comments of Owner:

Interviewer Comments

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: concrete tank & bed.

Installation date: 1992

Has the system been properly maintained (regular pumping, etc)? no

When was the septic tank last pumped out? never.

Are there any obvious signs the system may be malfunctioning? no.

Comments of Owner:

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? oil / wood.

If by oil, do you have a fuel oil tank(s) on your property? yes

Type of fuel stored:

Capacity of tank(s): 200 gal tank

Age and year tank installed: 14 years old.

Type of tank: steel

Location, inside or outside: inside

Is there any spill containment? ☑ Yes ☐ No

If yes, what type? concrete

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? no

Were any chemicals (oil/grease/other) ever spilled on the property? no

November 7, 2006

Reference No. 821191C

Thomas Ryan
5659 Highway 217
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Ryan:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate exceedences for pH and iron. All other parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results indicated the presence of total coliform and E. coli. The presence of total coliform bacteria, which is commonly present in the soil and degrading vegetation, and E. coli, which is indicative of contamination from the feces of warm blooded animals, indicate that there is an entrance point for potentially contaminated surface water into your well. The presence of either of these bacteria exceeds the Guidelines for Canadian Drinking Water Quality limit and therefore the water is considered unsuitable for drinking purposes.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	5659 Hwy 217
	Sample Date				19-Oct-06
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	30			23
Dissolved Chloride (Cl)	mg/L	1			11
Colour	TCU	5		15	14
Hardness (CaCO3)	mg/L	1			22
Nitrate + Nitrite	mg/L	0.05			0.06
Nitrite (N)	mg/L	0.01			ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND
Total Organic Carbon (C)	mg/L	0.5			2.2
Orthophosphate (P)	mg/L	0.01			ND
pH	pH	N/A		6.5-8.5	6.43
Reactive Silica (SiO2)	mg/L	0.5			15
Dissolved Sulphate (SO4)	mg/L	2		500	5
Turbidity	NTU	0.1			2.9
Conductivity	uS/cm	1			93
RCAP CALCULATIONS					
Anion Sum	me/L	N/A			0.871
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			23
Calculated TDS	mg/L	1		500	62
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND
Cation Sum	me/L	N/A			0.853
Ion Balance (% Difference)	%	N/A			1.04
Langelier Index (@ 20C)	N/A	N/A			-2.76
Langelier Index (@ 4C)	N/A	N/A			-3.01
Saturation pH (@ 20C)	N/A	N/A			9.19
Saturation pH (@ 4C)	N/A	N/A			9.44
Elements (ICP-MS)					
Total Aluminum (Al)	ug/L	5	200		190
Total Antimony (Sb)	ug/L	2	6		ND
Total Arsenic (As)	ug/L	2	25		ND
Total Barium (Ba)	ug/L	5	1,000		ND
Total Beryllium (Be)	ug/L	2			ND
Total Bismuth (Bi)	ug/L	2			ND
Total Boron (B)	ug/L	5	5,000		16
Total Cadmium (Cd)	ug/L	0.017	5		ND
Total Chromium (Cr)	ug/L	2	50		ND
Total Cobalt (Co)	ug/L	0.4			ND
Total Copper (Cu)	ug/L	2		1,000	280
Total Iron (Fe)	ug/L	50		300	1000
Total Lead (Pb)	ug/L	0.5	10		3.8
Total Manganese (Mn)	ug/L	2		50	11
Total Molybdenum (Mo)	ug/L	2			ND
Total Nickel (Ni)	ug/L	2			ND
Total Selenium (Se)	ug/L	1	10		ND
Total Silver (Ag)	ug/L	0.1			ND
Total Strontium (Sr)	ug/L	5			21
Total Thallium (Tl)	ug/L	0.1			ND
Total Tin (Sn)	ug/L	2			ND
Total Titanium (Ti)	ug/L	2			7
Total Uranium (U)	ug/L	0.1	20		ND
Total Vanadium (V)	ug/L	2			ND
Total Zinc (Zn)	ug/L	5		5,000	41
Elements (ICP-OES)					
Total Calcium (Ca)	mg/L	0.1			5.8
Total Magnesium (Mg)	mg/L	0.1			1.9
Total Phosphorus (P)	mg/L	0.1			ND
Total Potassium (K)	mg/L	0.2			0.4
Total Sodium (Na)	mg/L	0.4		200	8.3
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.05	45		0.06
MICROBIOLOGICAL					
Sample ID					4525
Total Coliforms	P-A/100mL	N/A	0 per 100 mL		Present
Escherichia Coli	P-A/100mL	N/A	0 per 100 mL		Present

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

004525
Sample ID
Synova Diagnostics
WEB Key: P7056 V3272 X0670
Keep This Label at Home

Domestic Well Survey
Fundy Gypsum Company

Water Sample Number: 5659 Hwy 217
Date of Survey: 17-Oct-06
Interviewed by: Taber (over phone)
Project Number: 82119 F-C

Sampled for:
☑ RCAp MS
☑ Bacteria
(sampling completed 19 Oct 06)
☐ Other ____

Full Name of Owner: Thomas Ryan
Address: 5659 Highway 217, Little River.
Phone Number: 834-2627
Number of Persons at this residence: ____
Information from Owner or Occupant (Name): Owner.

WATER SUPPLY

How many wells are on site? 1 dug well & 1 drilled well

Type dug well ✓ drilled well ____ spring ____ other ____

Is a copy of the well contractors "well log" available? ☐ Yes ☐ No

Location ____

Have water shortages been experienced? ☐ Yes ☑ No

If yes, please explain maybe August after extensive use.

Have water quality problems (colour, taste, staining, odour, etc.) been experienced?

☐ Yes ☑ No

If yes, please explain ____

Has the water been tested for chemical quality/bacteria?

☑ Yes ☐ No

If yes, when? long ago By Whom? French Shore.

Is there a water treatment system? ☑ Yes ☐ No cartrige filter.

If yes, location of backwash discharge (if applicable) NA

Type of pump Jet pump.

Storage tank type and pressure setting: 20 Gal tank 45-50

Robert
Cell: 247-0620
after 7

C0639-115

IF DUG WELL

Approximate date of construction: 28 years ago

Well depth: 8.21ft. 10-12 ft Measured from: top of rock

Well diameter: 4 ft

Water level: 2.83'

Height of well casing above ground: ____

Well construction:
- ☐ Well crocks on top of rock
- ☒ Well crocks only
- ☐ Rocked well only
- ☐ Other (specify) ____

If crocked, are the joints sealed? ☐ Yes ☒ No

Type of well cover: wooden ☒ concrete ☐ other ____

Is ground mounded above well? ☐ Yes ☒ No

Does well have a concrete apron? ☐ Yes ☒ No

If so, is it at ground surface or below surface? ____

Comments of Owner: ____

Interviewer Comments ____

ON-SITE SEWAGE DISPOSAL SYSTEM

Type of system: Septic Tank & Bed.

Installation date: 28 years ago

Has the system been properly maintained (regular pumping, etc)? Yes

When was the septic tank last pumped out? 7 years.

Are there any obvious signs the system may be malfunctioning? NO

Comments of Owner:

Interviewer Comments

HOME HEATING SYSTEM

How do you heat your dwelling? wood/oil/electric

If by oil, do you have a fuel oil tank(s) on your property? Yes

Type of fuel stored:

Capacity of tank(s): 200 g

Age and year tank installed: 6-7 years ago

Type of tank: steel

Location, inside or outside: outside

Is there any spill containment? ☐ Yes ☑ No

If yes, what type?

GENERAL

Do you store or use any chemicals (oil/grease/other) on the property? NO

Were any chemicals (oil/grease/other) ever spilled on the property? NO

DISCHARGE TEST

Initial Water Level: ______________

Discharge Rate: 8 l/min

Well Depth: ______________

diameter 3' inside.

Time (minutes)		Water Level feet ~~meters~~ (feet below top of casing)
10:18	0	2.83
10:23	5	2.96
10:28	10	3.00
10:33	15	3.05
10:38	20	3.11
10:43	25	3.16
10:48	30	3.20
10:53	35	3.28
10:58	40	3.33
11:03	45	3.36
11:08	50	3.41
11:13	55	3.44
11:18	60	3.49

Comments: ______________

C0639-118

November 7, 2006 Reference No. 821191C

Royce Elderkin
Little River Trading Co
GD Little River, NS
B0V 1C0

Re: Domestic Water Well Survey

Dear Mr. Elderkin:

As you are aware, Conestoga-Rovers & Associates (CRA), on behalf of Bilcon of Nova Scotia has recently completed a domestic water well survey at your residence. The survey involved the completion of a questionnaire and the collection of water samples and subsequent analysis for RCAp MS and presence/absence for Total Coliform and E. coli bacteria. The RCAp MS analysis was performed at Maxxam Analytics located in Bedford, NS and the bacteria analysis was performed at Synova Diagnostics located in Lawrencetown, NS.

The results of chemical analysis were compared to the Guidelines for Canadian Drinking Water Quality (2006) and indicate that all parameters are within their respective guideline limits.

With respect to the bacteriological analysis, the results of which are also included in the attached table, this indicates the absence of total coliform and E. coli and therefore the water, in terms of the parameters analyzed, is considered safe for human consumption.

For your records, we have attached a copy of the chemical and bacteriological results and a copy of the completed questionnaire.

In conclusion, if you have any questions regarding the analytical results or the completed questionnaire, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

David F. Strajt, M. Eng.
Project Manager

Heather Sutherland, B.Sc.
Project Geoscientist

	Units	RDL	CDWQ GUIDELINES (health based)	CDWQ GUIDELINES (asthetic objective)	Little River Trading Co.
	Sample Date				18-Oct-06
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	30			34
Dissolved Chloride (Cl)	mg/L	1			17
Colour	TCU	5		15	6
Hardness (CaCO3)	mg/L	1			38
Nitrate + Nitrite	mg/L	0.05			0.37
Nitrite (N)	mg/L	0.01			ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05			ND
Total Organic Carbon (C)	mg/L	0.5			1
Orthophosphate (P)	mg/L	0.01			ND
pH	pH	N/A		6.5-8.5	6.72
Reactive Silica (SiO2)	mg/L	0.5			17
Dissolved Sulphate (SO4)	mg/L	2		500	8
Turbidity	NTU	0.1			0.2
Conductivity	uS/cm	1			140
RCAP CALCULATIONS					
Anion Sum	me/L	N/A			1.35
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			34
Calculated TDS	mg/L	1		500	89
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND
Cation Sum	me/L	N/A			1.31
Ion Balance (% Difference)	%	N/A			1.39
Langelier Index (@ 20C)	N/A	N/A			-2.14
Langelier Index (@ 4C)	N/A	N/A			-2.39
Saturation pH (@ 20C)	N/A	N/A			8.86
Saturation pH (@ 4C)	N/A	N/A			9.11
Elements (ICP-MS)					
Total Aluminum (Al)	ug/L	5	200		ND
Total Antimony (Sb)	ug/L	2	6		ND
Total Arsenic (As)	ug/L	2	25		ND
Total Barium (Ba)	ug/L	5	1,000		ND
Total Beryllium (Be)	ug/L	2			ND
Total Bismuth (Bi)	ug/L	2			ND
Total Boron (B)	ug/L	5	5,000		13
Total Cadmium (Cd)	ug/L	0.017	5		ND
Total Chromium (Cr)	ug/L	2	50		ND
Total Cobalt (Co)	ug/L	0.4			ND
Total Copper (Cu)	ug/L	2		1,000	370
Total Iron (Fe)	ug/L	50		300	ND
Total Lead (Pb)	ug/L	0.5	10		0.6
Total Manganese (Mn)	ug/L	2		50	ND
Total Molybdenum (Mo)	ug/L	2			ND
Total Nickel (Ni)	ug/L	2			ND
Total Selenium (Se)	ug/L	1	10		ND
Total Silver (Ag)	ug/L	0.1			ND
Total Strontium (Sr)	ug/L	5			30
Total Thallium (Tl)	ug/L	0.1			ND
Total Tin (Sn)	ug/L	2			ND
Total Titanium (Ti)	ug/L	2			ND
Total Uranium (U)	ug/L	0.1	20		ND
Total Vanadium (V)	ug/L	2			3
Total Zinc (Zn)	ug/L	5		5,000	13
Elements (ICP-OES)					
Total Calcium (Ca)	mg/L	0.1			8.8
Total Magnesium (Mg)	mg/L	0.1			3.9
Total Phosphorus (P)	mg/L	0.1			ND
Total Potassium (K)	mg/L	0.2			0.4
Total Sodium (Na)	mg/L	0.4		200	12
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.05	45		0.37
MICROBIOLOGICAL					
Sample ID					4524
Total Coliforms	P-A/100mL	N/A	0 per 100 mL		Absent
Escherichia Coli	P-A/100mL	N/A	0 per 100 mL		Absent

ND = Not detected
RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
QC Batch = Quality Control Batch
CDWQ GUIDELINES - Canadian Drinking Water Quality Guidelines
shading indicates guideline exceeded

Water Sample Number: Little River Trading Co.
Date of Survey: 18 Oct 06
Interviewed by: Heather
Project Number: 821191-C

Sampled for:
☑ RCAp MS
☑ Bacteria
☐ Other ____

004524
Sample ID
Synova Diagnostics
WEB Key: K6500 W6199 U6436
Keep This Label at Home

Full Name of Owner: Talked to Royce Alderkin @ Little River trading Co.
Address: ____
Phone Number: ____
Number of Persons at this residence: ____
Information from Owner or Occupant (Name): ____

WATER SUPPLY

Conversation with Royce.

Spoke about many homes fed from well on allen Denton's Property. Allen Denton has 2 wells on his property. One well feeds his residence (drilled well). And another well is shard by various residences/ buisnesses. Well type is unknown. Sample collected from sink of convience store.

If yes, location of backwash discharge (if applicable) ____

Type of pump ____

Storage tank type and pressure setting: ____

C0639-121

SURFACE WATER INFORMATION SUMMARY

WHITES POINT QUARRY
LITTLE RIVER, DIGBY COUNTY, NOVA SCOTIA

Prepared For:

Bilcon of Nova Scotia

Prepared by:
Conestoga-Rovers
& Associates

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FEBRUARY 2007
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1.0 INTRODUCTION

On behalf of Bilcon of Nova Scotia (Bilcon), Conestoga-Rovers and Associates (CRA) was requested to provide input and assistance with various surface water management issues for the proposed Whites Point Quarry Project. As part of this analysis, CRA completed the following:

- a water budget analysis, examining surface water availability at the quarry site, under both average and drought conditions;
- detailed water requirements were examined during both construction and operation periods;
- sediment pond volumetric capacity was assessed for normal and flood conditions; and,
- flood risk at the quarry site was examined under current conditions and considering climate change scenarios.

This report summarizes the methodology used and presents the results of the various analyses.

1.1 BACKGROUND

The proposed Whites Point Quarry site is located along the Digby Neck at Whites Point, near the community of Little River, Digby County, Nova Scotia. A location map is provided as Figure 1. The project is currently undergoing a Joint Review Panel process.

The project involves the construction and operation of a basalt quarry, processing facility and marine terminal. Year-round extraction and processing activities are expected to take place on 300 acres of land, with approximately 40,000 tonnes of aggregate produced for ship loading each week, totaling two million tonnes per year.

The intent is to ship washed aggregate from the site, utilizing only surface water runoff collected on site to make-up for losses in the washing process. The runoff would be collected in a series of sedimentation ponds.

2.0 HYDROLOGIC BUDGET ANALYSIS

A hydrologic budget analysis was completed for the proposed quarry site and contributing drainage basin. The objectives of the analysis were as follows:

- Assess surface water hydrology for the site, based on historic climate records for the area, considering both average and historic drought conditions;
- Estimate losses in the hydrologic budget such as evapotranspiration, and storage pond evaporation and seepage losses;
- Determine average expected moisture surplus available at the site (i.e. runoff) on a monthly basis; and,
- Estimate water storage volumes required to satisfy make-up demand during deficit periods.

2.1 METHODOLOGY

A hydrologic budget is essentially a climate-based accounting of the water gains and losses at a location or region. Temperature and precipitation records are used to develop the water budget, tabulating the additions, losses, and changes in water storage at a location. A simple water budget model was used for this analysis.

2.1.1 Model Description

The water budget model maintained and operated by the Meteorological Service of Canada (MSC), Environment Canada, was used for this analysis. The model is based on the Thornthwaite and Mather water balance procedure, and accounts for temperature, precipitation, snow storage and melt, evapotranspiration, and soil water holding capacity for the basin. Model input consists of mean daily temperature and precipitation data for the station and period of interest, station latitude, and site soil and vegetation cover information (used to estimate soil water holding capacity). The model generates a monthly water balance tabulation, from which total runoff is determined. Model background and additional details can be found in Johnstone and Louie (1983).

The Thornthwaite and Mather water balance procedure is commonly used for a wide variety of water resource planning applications, given its simplicity and basic data requirements. The MSC model improves on the procedure, by using daily temperature and precipitation data (as opposed to monthly), which permits better modeling of snowmelt and improves the accounting of snow storage (Johnstone and Louie, 1983).

This is particularly important for applications in colder climates such as Canada. The model was considered appropriate for the level of analysis required.

2.1.2 Hydrology

Model input consisted of daily temperature and precipitation data for the Weymouth Falls climate station, operated by the MSC (ID# 8206275), for the 35 year period from 1963 - 1997. The station is located approximately 16 km southeast of Whites Point at Weymouth Falls (44° 24'N, 65° 57'W) at an elevation of 11 m. The station was selected based on its proximity to the site and length of record. Any data gaps were filled with data from nearby stations, such as Meteghan River (ID# 8203500).

Total contributing basin area was delineated for the project, based on 1:10,000 topographic mapping obtained from Service Nova Scotia and Municipal Relations, with 5 m contour interval (Map #10444450066100). The contributing area is shown superimposed on the Concept Quarry Plan (Year 1 - 5) provided by Bilcon, which utilizes the same base mapping. The plan is reproduced here as Figure 2. Total contributing area was measured at 143 ha, and includes the entire topographic basin to the north of Whites Cove Road, and west and south of the natural topographic divide above the property line. The basin rises from sea level to an elevation of approximately 100 m at the topographic divide.

Note that the property area to the south of Whites Cove Road was not included in the main budget analysis, as it was assumed that runoff from this portion of the property would not drain across the road and would not be captured for use. This area is considered separately later in the analysis.

2.1.3 Soils/Cover Information

Basin soils information along with vegetation cover was required to estimate soil water holding capacities required for model input. Soils information was obtained from soils surveys and mapping for the Digby County area (Hilchey *et. al.*, 1962). Additional soils information was also obtained from the Canadian Soil Information System (CanSIS) website and database.

The soil for the entire basin area is the Rossway Series, which is described as a very stony, sandy loam, and well drained with medium to rapid internal drainage (Hilchey *et. al.*, 1962). Based on a site visit and communication with Bilcon, it is apparent that soil cover along the steeper portions of the basin is extremely shallow, with frequent bedrock outcrops. Existing vegetation cover is predominantly forest of spruce, maple, fir, birch and poplar. Soil water holding capacities in the range of 100 - 250 mm were used given the soil type and cover information.

2.1.4 Land Use

The contributing basin area was subdivided into varying land uses at the end of 5 or 10 year intervals over the 50 year project life, as delineated in Concept Quarry Plans provided by Bilcon (included here in Appendix A). Table 1 summarizes the varying land uses and their measured areas. Time steps of 0 (existing conditions), 5, 10, 15, 20, 30, 40 and 50 (reclaimed conditions) years were assessed in the analysis. Areas with different land use and cover characteristics were assigned different soil water holding capacities, giving slightly different model surplus water tabulations. Note that quarry areas, roads and other areas without soil were assigned a minimal water holding capacity of 25 mm.

2.2 MODELING AND ANALYSIS

Detailed monthly water budget output was obtained from the MSC water budget model for the Weymouth Falls climate data and various soil water holding capacities.

2.2.1 Runoff

Monthly runoff amounts for each land use area with a different soil water holding capacity were calculated, based on surplus water determined from the model results. Surplus water is defined as the excess moisture available after the evapotranspiration demands of the surface have been met and soil water storage has been returned to the water holding capacity level. Individual runoff amounts were then summed for the entire basin area. Following the convention of the Thornthwaite and Mather method, it is assumed that 50% of the surplus water for any given month is detained in the watershed and contributes to runoff the following month.

2.2.2 Pond Areas

For sedimentation pond areas, the total direct monthly input was calculated as the sum of rainfall and snow melt over the ponds, as determined from the model. Evaporation losses for the ponds were estimated using lake evaporation data for the Kentville CDA climate station (ID#8202800), which is the closest MSC station for which lake evaporation data exists. The station is located approximately 150 km northeast of

Whites Point, near Kentville, NS (45° 4'N, 64° 28'W). The data is based on 1971 - 2000 climate normals.

Pond seepage losses were estimated using Darcy's Law. The ponds will be excavated along the western edge of the property, in an area characterized by beach gravels and silt. Hydraulic gradient and conductivity values were estimated representative of pond location. Seepage estimates were kept constant for the analysis, however it is likely that seepage rates would decline over time as fines settle in the ponds and seal larger voids.

It is assumed that all runoff from the contributing drainage area (Figure 2) can be directed to the sedimentation ponds for collection and storage. This water plus the water collected directly by the ponds (i.e. rain plus melt above the ponds) constitutes the total available water for the basin.

2.2.3 Water Demand

Water demands during both the construction and operation phases of the project were considered in the analysis. The largest water demand will be for make-up water lost in the recycle of aggregate wash water during quarry operation. Based on information obtained from Bilcon, process demand for aggregate washing operations is estimated to be approximately 5000 igpm (0.38 m^3/s) for 16 hours per day, 264 days per year (i.e. 44 weeks x 6 days/week). It is assumed that 5 percent will be lost in the recycle process, or roughly 24,000 m^3/month. This constitutes the plant make-up demand.

Additional demands include site dust control provided by a water truck, water applied to shot rock before crushing, water to be used for dust suppression at the crushing plant, and water to be used at the sediment disposal area. These additional demands range from approximately 5,800 m^3 per month from December through March to 17,000 m^3 per month from April through November during quarry operation. Tables 2 and 3 summarize the demand estimates provided by Bilcon for both construction and operation, respectively.

2.3 AVERAGE CLIMATIC CONDITIONS ANALYSIS

The averaged model results over the 35 year period of record were used for this analysis. Figure 3 shows the mean monthly precipitation and temperature data for the 35 year record. The averaged model summary output data is included in Appendix B.

2.3.1 Construction Demand

Based on the Quarry Concept Plans provided by Bilcon, site conditions existing during the first 1-2 years of operation were used in the water budget model to represent construction conditions. During this period, only the first four of five sediment ponds proposed would be in operation (approximate pond surface area of 6.3 ha).

Figure 4 shows the distribution of surplus water from month to month, along with the construction demand estimates. Table 4 presents the detailed results for the average climatic conditions. As indicated in Figure 4 and Table 4, construction demands would be satisfied each month for average conditions, with no storage required.

2.3.2 Operation Demand

Table 5 presents a summary of the results for the analysis during operating conditions, employing the information and assumptions discussed. The table presents the average *net* monthly water surplus volume once all losses and demands have been accounted for. Values were calculated for basin conditions existing at the end of each time step, as outlined in Table 1. A negative value indicates a water deficit for that month, so that storage would be required to meet demand. The sum of consecutive deficit months indicates the total storage requirements for the time step. The results indicate that there is generally a water deficit during the period from July to October. The minimum storage requirements to satisfy demand during these months ranges from approximately 78,000 to 82,000 m^3. This equates to an average storage depth required in each of the five sediment ponds of approximately 0.9 m.

Detailed results for each time step considered are presented in Tables 6 through 13. The tables show monthly runoff volumes for the quarry and watershed areas and net water volumes collected directly by the ponds. Pond evaporation and seepage loss estimates are also shown.

Figures 5 through 12 show the distribution of surplus water from month to month and also present a simple mass diagram (Rippl plot) for each time step which indicates the cumulative supply and demand over the year and required storage during deficit periods. The mass diagram indicates excess supply when the slope of the supply curve is equal to or greater than the slope of the demand curve. Demand exceeds supply when the slope of the supply curve is less than that of the demand curve. Storage is determined by the maximum distance between the line parallel to the demand curve (drawn tangent to the supply curve) and the supply curve. The Rippl plot represents a visual indication of storage requirements, and storage values indicated in the figures correspond to those presented in Table 5 (i.e. 78,000 to 82,000 m^3).

2.4 DROUGHT CLIMATIC CONDITIONS ANALYSIS

The 35 year climate record was analyzed to determine the year with the driest conditions, particularly during the summer low flow period. Climate data and water budget model results indicated that 1965 was the driest year of the 1963 - 1997 period. Total precipitation for the year was 757.8 mm, compared to the average for the period of record of 1252.1 mm. Figure 13 summarizes the climate data used in the analysis. Total precipitation from May to September, 1965 was 220 mm, which is less than 50% of the average total of 460 mm over these months. Modeled water surpluses for 1965 were only 314 mm, compared to an average of 688 mm (values for a soil water holding capacity of 150 mm). Model results using the 1965 data indicated no water surplus during the months from May to September. Summary model output data for the year 1965 is included in Appendix C.

2.4.1 Construction Demand

Based on the Quarry Concept Plans provided by Bilcon, site conditions existing during the first 1-2 years of operation were used in the water budget model to represents construction conditions. During this period, only the first four of five sediment ponds proposed would be in operation (approximate pond surface area of 6.3 ha).

Figure 14 shows the distribution of surplus water from month to month, along with the construction demand estimates. Table 14 presents the detailed results for the drought climatic conditions. As indicated in Figure 14 and Table 14, under drought conditions as much as 28,000 m^3 of storage would be required to satisfy demand. This would require an average storage depth in each of the four ponds of approximately 0.44 m.

2.4.2 Operation Demand

Table 15 presents a summary of the results for the drought conditions analysis. The table presents the calculated net monthly water surplus volume once all losses and demands have been accounted for. Values were calculated for basin conditions existing at the end of the 5 or 10 year time steps. A negative value indicates a water deficit for that month, so that storage would be required to meet demand. The sum of consecutive deficit months indicates the total storage requirements for the time step, based on the 1965 climatic conditions. The results indicate that a water deficit would exist for the months of May through November under drought-like conditions. The minimum storage requirements to satisfy demand during these months ranges from approximately 219,000 to 226,000 m^3. This equates to an average storage depth required in each of the five sediment ponds of approximately 2.35 m.

Detailed results for each time step considered are presented in Tables 16 through 23. The tables show monthly runoff volumes for the quarry and watershed areas and net water volumes collected directly by the ponds. Pond evaporation and seepage loss estimates are also shown.

Figures 15 through 22 show the distribution of surplus water from month to month and the mass diagram (Rippl plot) for each time step. Storage values indicated in the figures correspond to those presented in Table 15 (i.e. 219,000 to 226,000 m^3).

2.5 WATER BUDGET SUMMARY

The results of the analysis indicate that little variation in the hydrologic budget exists for the various quarry phases given the abundant precipitation and size of contributing basin.

For average climatic conditions, the analysis indicates that there would be sufficient supply for construction water demands, however during operation, storage of up to 82,000 m3 would be required to satisfy demand. Given the total surface area of the five proposed sediment ponds of approximately 9.6 ha, an average depth of 0.9 m would be required in each pond for storage purposes.

For drought conditions, the analysis indicates that approximately 28,000 m3 of storage would be required to satisfy demand during construction. This equates to an average storage depth in each of the 4 ponds of approximately 0.44 m. During operation, the analysis showed that as much as 226,000 m3 of storage would be required to satisfy demand, or an approximate storage depth in each pond of 2.4 m.

3.0 SEDIMENT PONDS

The following presents overview information pertaining to the sediment ponds proposed by Bilcon.

3.1 POND/BERM DESIGN DETAILS

Outlined below are some typical design consideration required for the design of the sediment ponds, berms and conveyance channels. The level of detail required, consideration of existing information, and site specific details would be evaluated during the initial phases of the design process.

Berms

Geotechnical specifications required for the design of a berm (approximately 3 - 3.5 m high) would include the following:

- A complete geotechnical investigation of the existing soil (i.e. boreholes, test pits) would need to be carried out at each proposed general berm location, which would include items such as:
    - grain size analysis
    - consistency limits
    - water content
    - proctor testing for density
    - field testing for permeability
    - bedrock and groundwater elevations
    - shear strength analysis
    - consolidation potential
- base width and top width design considerations
- slope design and stability requirements:
    - dependant on berm height requirements, material type, cover, etc.
    - analysis of sliding, sloughing or rotation failures
    - seepage analysis and drainage requirements, seepage filter
- material specification:
    - consideration of type and quantity of native materials available on site
    - compaction requirements
    - permeability requirements for berms, seepage control
    - investigate the need for a synthetic liner, depending on available material on site
    - surface protection (i.e. rip-rap, vegetation)

- evaluation of potential for mass movements (i.e. landslides)
- settlement analysis

Sediment Detention Ponds

The design of sediment detention ponds would require the following:

- Geotechnical investigation, similar to above, at least one investigation per pond likely
- Piezometer installation to define detailed groundwater locations
    - will factor in determining how deep the ponds can be excavated versus the need for berms to obtain required pond depth/freeboard
- particle settling analysis for detention time requirements
- surface protection requirements due to wave-action, etc.
- spillway/emergency spillway considerations
- Depending on the native soil on site, it is possible that a liner system would also have to be designed

Runoff Collection Channels

The design of runoff channels should include the following:

- Geotechnical investigation along the proposed channels (similar to above, if required)
- piezometer installations along the proposed channels
- channel slope analysis (i.e. sediment transport considerations versus velocity/erosion concerns)
- consideration of channel capacity
- flow velocity analysis for bed and bank protection requirements
- assessment of need for energy dissipation measures, e.g. rock check dams

Sediment and Organics Disposal Areas

The design of disposal areas for sediment and organics will require the same information as the design of a berm. Depending on the native soil on site, it is possible that a liner system would also have to be designed.

3.2 VOLUMETRIC SIZING

Preliminary volumetric sizing requirements were investigated for the proposed sediment ponds identified in the quarry plans. The Nova Scotia Department of Environment and Labour (NSDEL) Sediment and Erosion Control Handbook gives a minimum sizing requirement of 190 m^3/ha of disturbed area. This number reflects sizing for temporary sediment ponds, but provides a lower limit estimate of size requirements. Typical urban stormwater pond sizing requirements fall around a maximum of 250 m^3/ha for water quality storage requirements (Ontario Ministry of the Environment Stormwater Management Planning and Design Manual, 2003). This is for urban settings however, and the sediment loadings from the quarry operations will be much higher. Typical pond sizing for mining applications falls in the range of 500 - 600 m^3/ha, of which approximately 140 m^3/ha should be reserved for sediment storage (Pennsylvania Department of Environmental Protection (PDEP), Engineering Manual for Mining Operations, 1999). Given the 143 ha catchment area draining to the sediment ponds (north of Whites Cove Rd.), this would suggest a total pond volume requirement of approximately 86,000 m^3, with a maximum sediment storage capacity of approximately 20,000 m^3. For the proposed pond area of 9.6 ha, this equates to an approximate pond depth of 0.9 m and sediment storage depth of 0.2 m for each pond.

Bilcon is proposing to construct each pond at a maximum depth of 4 m, consisting of a maximum of 1 m for sediment storage, 2.5 m for water storage and a 0.5 m freeboard allowance. This would provide a total pond volume of 336,000 m^3, with a sediment storage capacity of 96,000 m^3, not including the freeboard allowance. This equates to a sizing criteria of approximately 2,350 m^3/ha, with sediment storage allowance of 670 m^3/ha. Bilcon estimates a sediment loading rate of 10,300 m^3/year and proposes to schedule sediment pond cleaning every 9 years. At this rate, maximum average sediment depth in each pond would reach approximately 1 m, although sediment deposition will vary depending on final pond layout and configuration. Sediment removal may need to be more frequent in the first one or two ponds in series, and a sediment forebay could be incorporated into the first pond to trap larger particles and facilitate maintenance.

Given the information above, and the demand storage estimates, the preliminary pond sizing proposed by Bilcon should be sufficient to provide for adequate treatment, sediment storage and surface water supply purposes. Pond design and configuration details would need to be finalized during the industrial approvals stage to ensure proper pond function and treatment characteristics, including a particle settling analysis to ensure sufficient residence times.

Based on the currently defined location of the water table, it is possible that the ponds would intersect the water table if constructed to a depth of 4 m. This could result in infiltration of groundwater into the ponds, depending on pond construction and native soils in the vicinity of each pond. This could act to reduce the storage capacity of the ponds, depending on the fluctuating groundwater level in the constructed ponds, as storage volume would be lost below this level.

As outlined above, a complete geotechnical investigation would be required to assess the pond design requirements, which would include a seepage analysis to determine infiltration potential and rates. Based on this, a suitable liner system (i.e. clay material or synthetic) could be designed for the ponds to reduce groundwater infiltration if required. Alternatively, the ponds could be constructed above the groundwater table using berms. The liner system and/or construction above the water table would effectively eliminate any significant groundwater-surface water hydraulic interaction in the ponds, minimizing effects on storage capacity or on the local water table.

In order to achieve the multi-purpose use of the sediment ponds, proper management and monitoring of the ponds will be required. The ponds will be required to store sediment accumulated over time (prior to cleanout) and provide for storage of up to 2.5 m of water (over a combined pond area of 9.6 ha) to satisfy projected demand during drought conditions. However, part of the storage volume may also be required for use as emergency flood storage during a major event. Depending on pond water levels at the time, emergency drawdown may be required to ensure sufficient volume is available to handle the flood input. As a result, pumping will likely be required during these times, or additional storage capacity (i.e. increased pond depth or berm height) will need to be incorporated into the pond design.

3.3 FLOOD CAPACITY

In addition to storage considerations, a check of pond capacity for flood conditions was made. Typically in Nova Scotia, stormwater ponds are designed to handle the 100-yr storm event. Storm data was obtained from the Meteorological Service of Canada (MSC) in the form of rainfall intensity-duration frequency (IDF) information for the Yarmouth Airport climate station (MSC ID# 8206500), which is the closest station to the quarry site for which IDF data exists. The station is considered representative for storm conditions for the region in which the quarry will be located. The 25 year data record indicated that the 100-yr, 24-hr duration storm event would yield 124.6 mm of rainfall. As a first cut conservative estimate, one can assume no abstraction losses (i.e. saturated conditions), which gives a total runoff volume for the 143 ha north catchment area of approximately 178,200 m^3. This would require a depth of approximately 1.9 m for each of the 5 operating ponds for flood storage. During construction, with only 4 ponds in operation, a flood storage depth of approximately 2.85 m would be required to contain the flood volume.

Given the proposed pond design, sufficient capacity would exist to contain the 100-yr flood volume, assuming the ponds were or could be drawn down to sufficient levels to accommodate the flood flows.

Storm data for extended duration events was also obtained from the MSC, based on a combined analysis for the two MSC stations at Yarmouth, NS (MSC ID# 8206500 and 8206490). The analysis indicated that the 100 year maximum 5-day total rainfall would be 191 mm. Assuming no abstraction losses (conservative estimate), the total runoff volume for the 143 ha north catchment area would be approximately 273,000 m^3. This would require a depth of approximately 2.8 m for each of the 5 operating ponds for flood storage.

Given the proposed maximum sediment storage depth of 1 m, a total pond depth of 3.8 m would be required, leaving only 0.2 m of freeboard. Increased sediment cleanout may be warranted, say a 6 year frequency or 0.7 m sediment storage capacity. This would provide for a 0.5 m freeboard allowance. Again, this assumes that pond level would be drawn down to provide for the full flood volume capacity, as required.

Given the intended multi-purpose use of the ponds (sediment storage/demand storage/flood storage), the various uses may at times conflict in terms of available capacity (i.e. drought storage vs. sufficient capacity to handle a flood input). In order to reduce the potential conflicts and increase operational flexibility, additional storage capacity would need to be added to the ponds (e.g. deeper pond or higher berms). Having additional capacity would reduce the volume required for drawdown prior to or during a major storm event. The additional capacity would not necessarily be in regular use, but be available during the in-frequent flood events. This is particularly relevant if the pond design is required to handle the 5-day 100-yr storm.

3.4 FLOOD RISK

The 100-yr flood is defined as having a magnitude that would be exceeded once, on the average, every 100 years. However, the risk that at least one 100-yr flood would occur over a 100 year time period is approximately 63%. Over a 50 year time period the risk is approximately 40%, and over a 5 year time period approximately 5%. Thus, there is a 40% risk of a 100-yr storm occurring at least once during the project life of 50 years.

Flood risk was also evaluated based on climate change considerations, as presented in the guidance documents (Pancura, M. & Lines, G. S., 2005; Lines, G. S. *et. al.*, 2006). Based on these reports, the current 100-yr storm is projected to become the equivalent of a 10-yr storm by the 2050's (i.e. 2040 - 2069). The reports do not provide information on projected change in recurrence interval during the 2020's (i.e. 2010 - 2039), but do indicate that the maximum 5-day precipitation increases by 15% by the 2020's and remains steady in subsequent time periods.

Assuming the project life will be from 2010 - 2060, and assuming no change in the recurrence interval for the current 100-yr storm in the first 25 years (i.e. 2010 - 2035), the risk of occurrence of the 100-yr storm during this period would be approximately 22%. For the latter 25 years of the project life (i.e. 2036 - 2060), the risk of occurrence of the current 100-yr storm (i.e. a 10-yr storm during that period) would rise to approximately 93%. If we assume the current 100-yr storm will have a recurrence interval of 10 years over the full project life (i.e. 2010 - 2060), the risk of occurrence would be approximately 99%.

4.0 SOUTH DRAINAGE CATCHMENT

The majority of the quarry operations will take place to the north of Whites Cove Rd. and the water budget analyses described above have been focused on this area. It was assumed that drainage from the catchment to the south would not drain across the road and provide input to the 5 main sediment ponds. Quarrying is proposed in the south catchment after year 15. A 1 ha sediment pond has been proposed to handle runoff from the catchment area, however the pond is not intended to be used for normal water supply purposes.

The contributing drainage area of the south catchment has been estimated at 36 ha, based on the 1:10,000 topographic mapping (see Figure 2). The water budget analysis was applied to the south catchment area for both average and drought conditions, to determine additional water supply quantities available if required (i.e. backup). Summary results are presented in Tables 24 and 25 for average and drought conditions, respectively. As indicated in the tables, additional monthly supply of approximately 4,000 m^3 to 40,000 m^3 is available on average, and from 0 to 25,000 m^3 per month is available under drought conditions.

For a proposed 3.5 m deep, 1 ha pond, total storage volume would be 35,000 m^3 with a sediment storage allowance of 10,000 m^3. This translates to a pond sizing of 970 m^3/ha with sediment storage of 275 m^3/ha. This should be sufficient, based on the PDEP guidance. However, flood volume generated from the 100-yr 24-hr storm would be a maximum of approximately 45,000 m^3, requiring a storage depth of 4.5 m. Flood volume generated from the 100-yr 5 day duration storm would be 68,700 m^3, requiring a storage depth of 6.9 m. Thus additional capacity would be required to contain the 100-yr storms. Assuming worst case conditions of the pond full with sediment (to 1 m depth), would leave 2.5 m for flood storage or 25,000 m^3. If the remaining 20,000 m^3 from a 100-yr 24-hr storm was diverted to the ponds to the north, an additional storage depth of 0.21 m would be required in the 5 north ponds, raising total flood storage requirements in those ponds to approximately 2.1 m. This is still within the minimum 2.5 m of depth available in each of these ponds, without consideration of the 0.5 m freeboard allowance. For a 100-yr 5-day duration storm, the remaining 43,700 m^3 diverted to the north sediment ponds would require an additional 0.46 m of storage in those ponds, raising storage requirements during a 5-day duration event to approximately 3.3 m in the north ponds. Maximizing the sediment pond size in the south catchment area (i.e. Pond 6) to suit design conditions will reduce the reliance on the north ponds for extra flood storage.

5.0 REFERENCES

Canadian Soil Information System (CanSIS) - http://sis.agr.gc.ca/cansis/

Hilchey, J.D, Cann, D.B. and MacDougall, J.I. 1962. Soil Survey of Digby County Nova Scotia. Report No. 11, Nova Scotia Soil Survey, Truro Nova Scotia.

Johnstone, K. and Louie, P.Y.T. 1983. Water Balance Tabulations for Canadian Climate Stations. Hydrometeorology Division, Canadian Climate Centre, Atmospheric Environment Service.

Lines, G. S., Pancura, M., and Lander, C. 2006. Building Climate Change Scenarios of Temperature and Precipitation in Atlantic Canada Using the Statistical Downscaling Model (SDSM). Meteorological Service of Canada, Atlantic Region Science Report Series 2005-9.

Nova Scotia Department of the Environment, Environmental Assessment Division. 1988. Erosion and Sediment Control – Handbook for Construction Sites.

Ontario Ministry of the Environment (MOE). 2003. Stormwater Management Planning and Design Manual.

Pancura, M. and Lines, G. S. 2005. Variability and Extremes in Statistically Downscaled Climate Change Projections at Greenwood Nova Scotia. Meteorological Service of Canada, Atlantic Region Science Report Series 2005-10.

Pennsylvania Department of Environmental Protection - Bureaus of Mining and Reclamation and District Mining Operations. 1999. Engineering Manual for Mining Operations.

Thornthwaite, C.W. and J. R. Mather. 1955: The Water Balance. Publications in Climatology, Vol. 8, No. 1, Drexel Institute of Technology, Centerton, New Jersey.

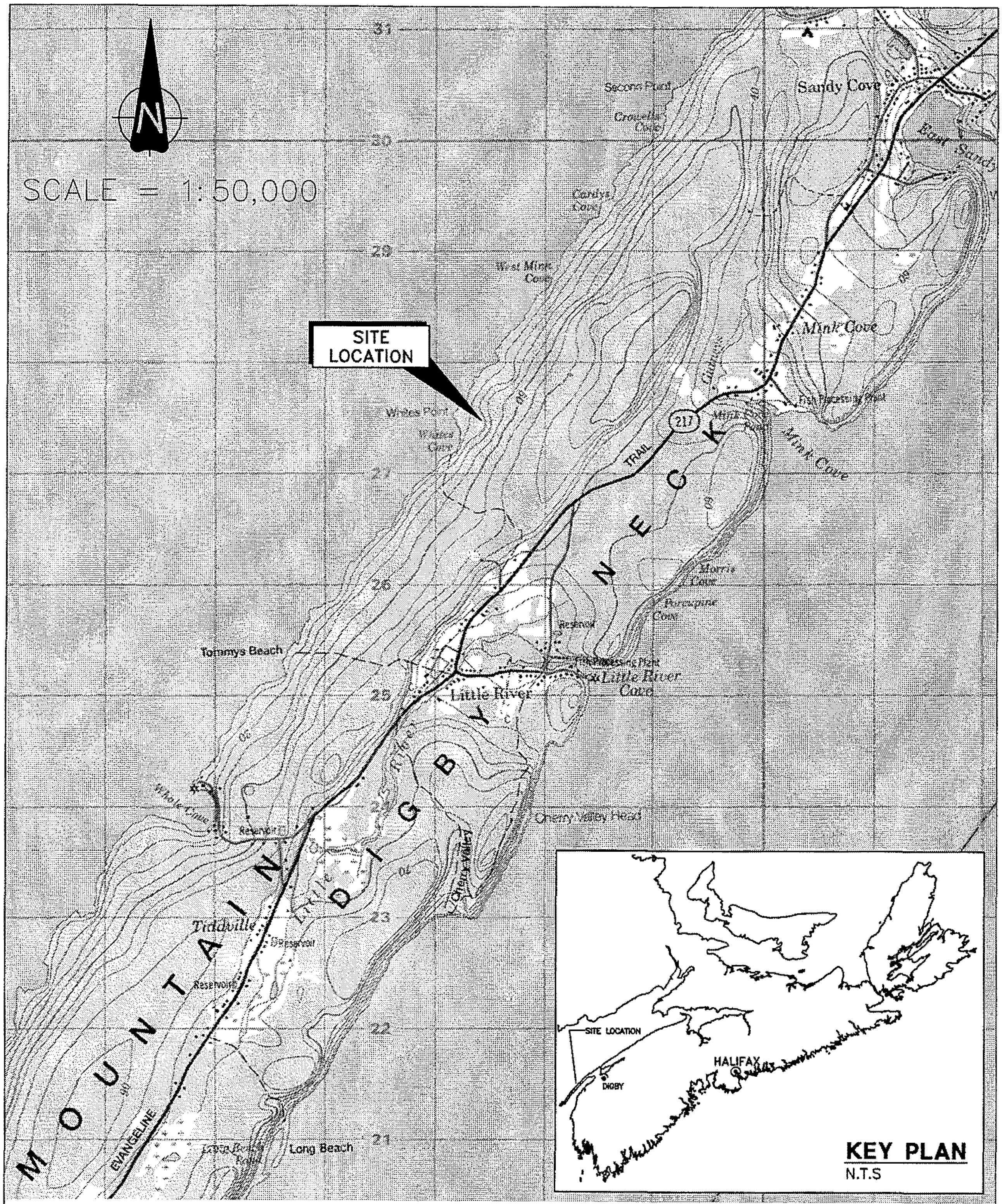
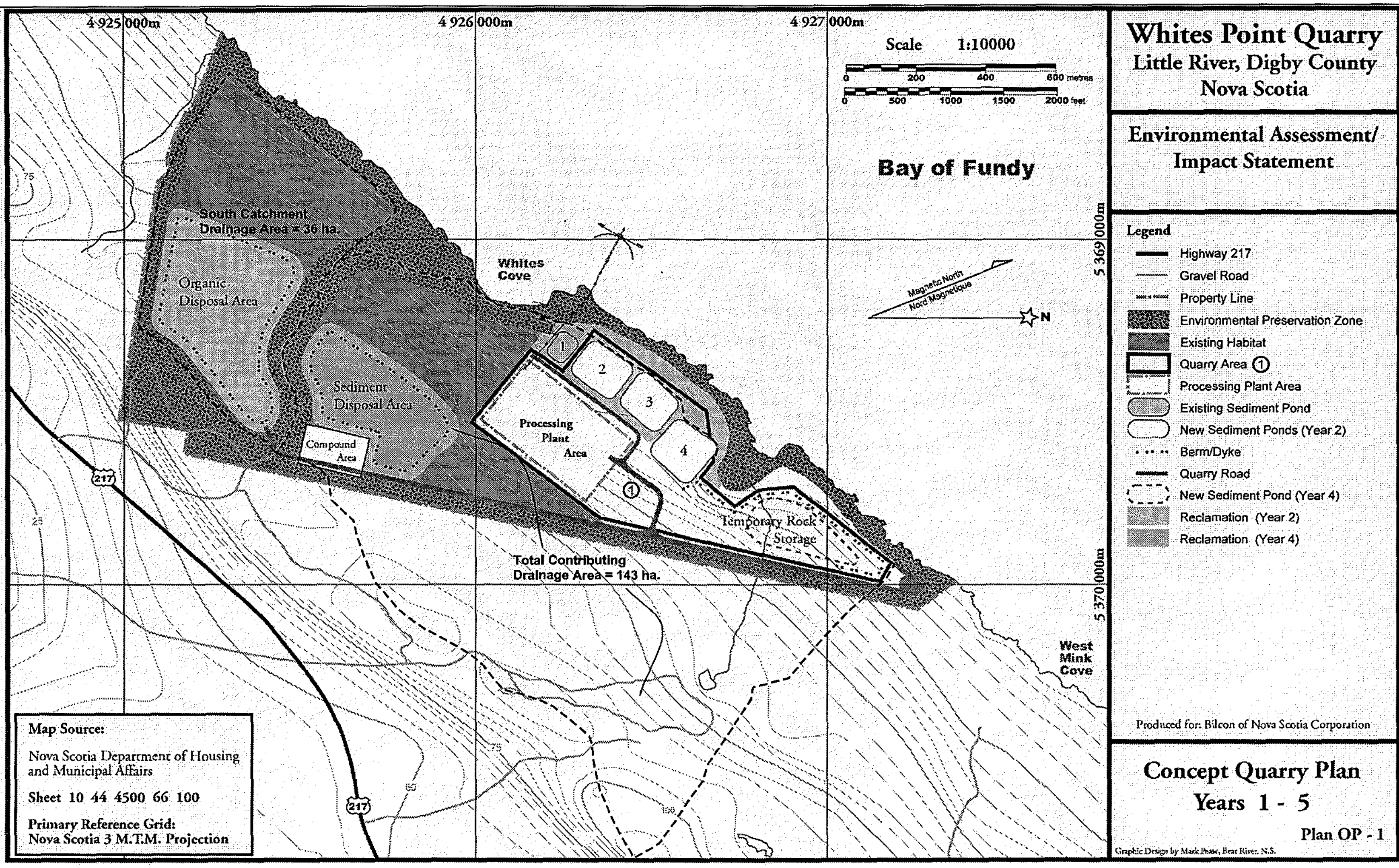


figure 1

Site Location Map
Whites Point Quarry Hydrologic Budget Analysis
Whites Point, Nova Scotia
821191B

October 2005



NOTE: Original drawing provided by Bilcon NS.

figure 2

Contributing Drainage Area
Whites Point Quarry Hydrologic Budget Analysis
Whites Point, Nova Scotia
821191B

October 2005

Figure 3
Whites Point Quarry Hydrologic Budget
Average Precipitation & Temperature
Weymouth Falls, NS

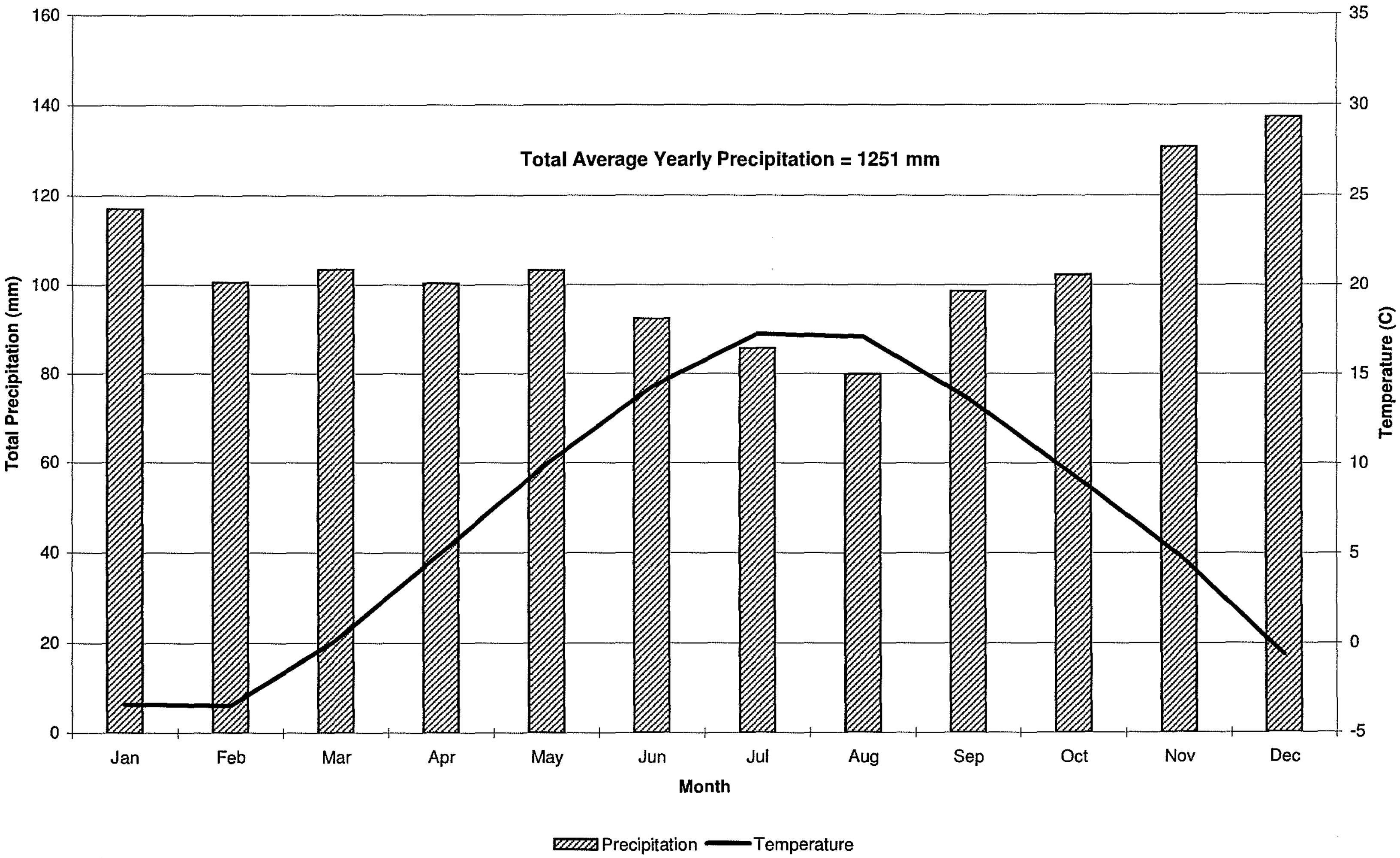
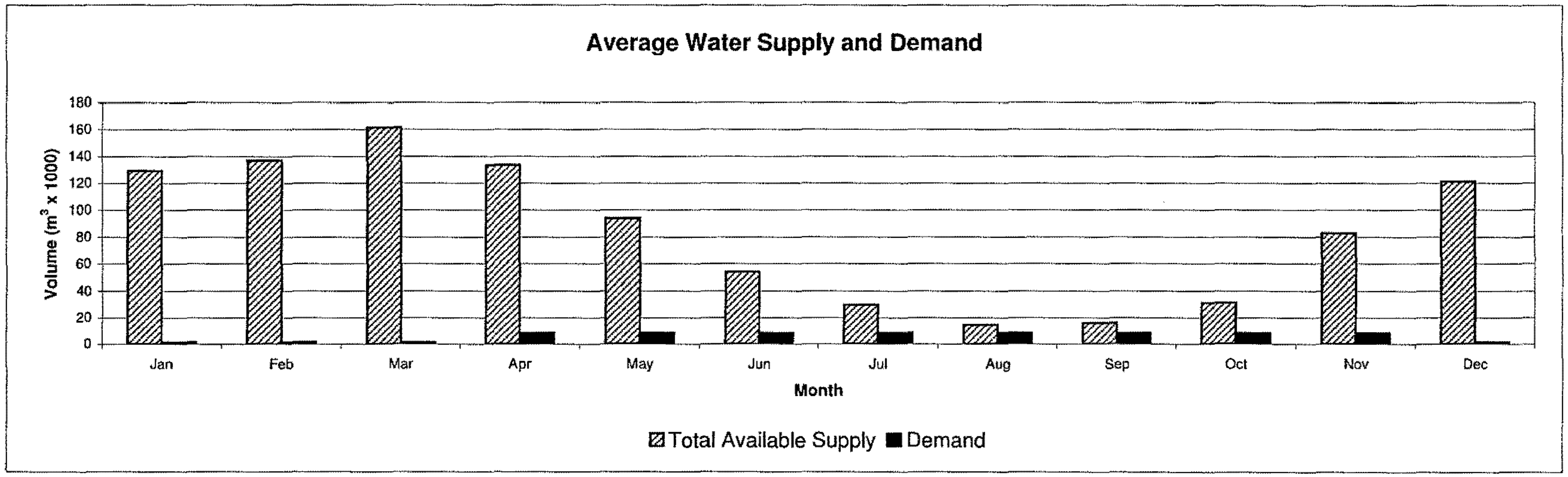


Figure 4
Whites Point Quarry Hydrologic Budget
Construction Water Budget Estimates - Average Conditions



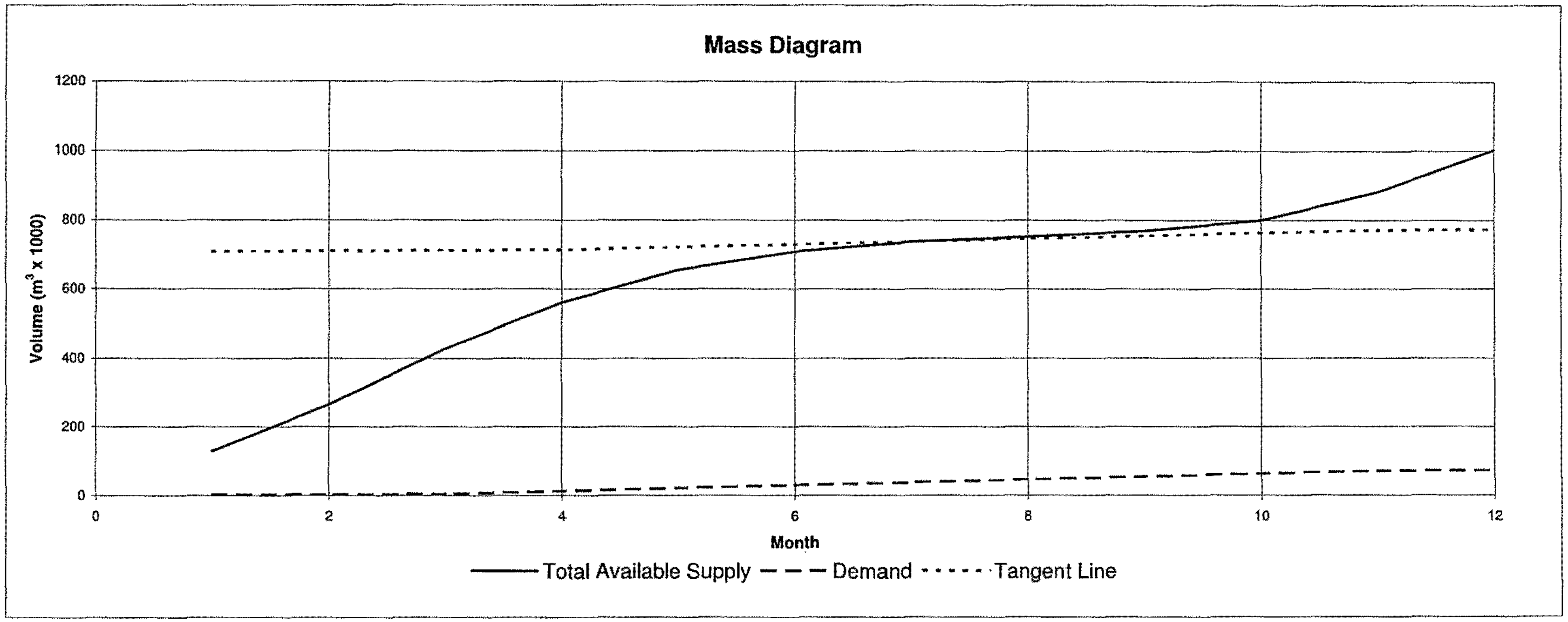


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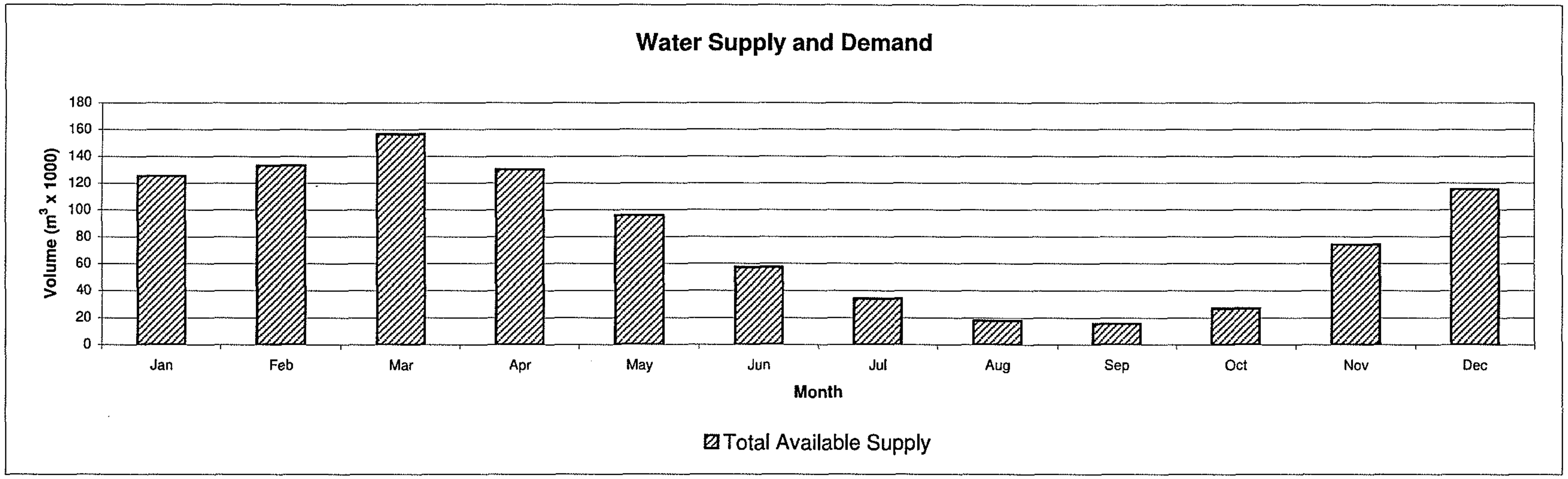
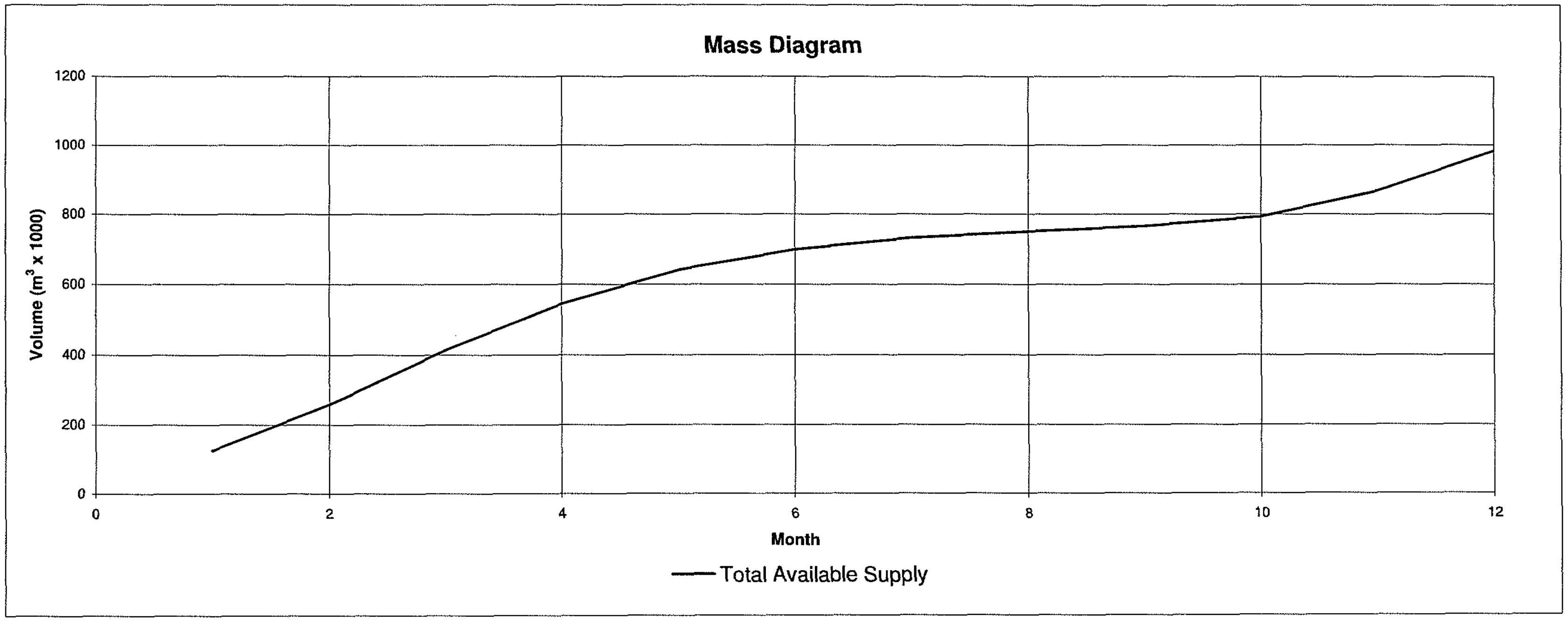
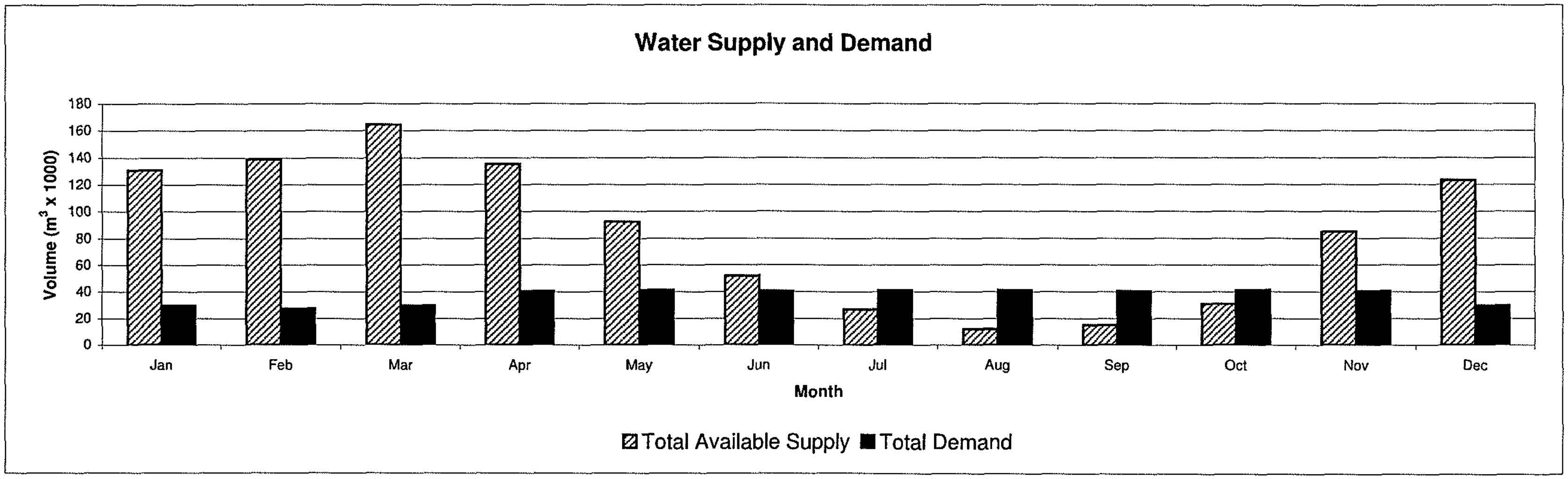
Figure 5
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 0 (Existing) - Average Conditions





CRA (821191-D) - February, 2007

Figure 6
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 5 - Average Conditions



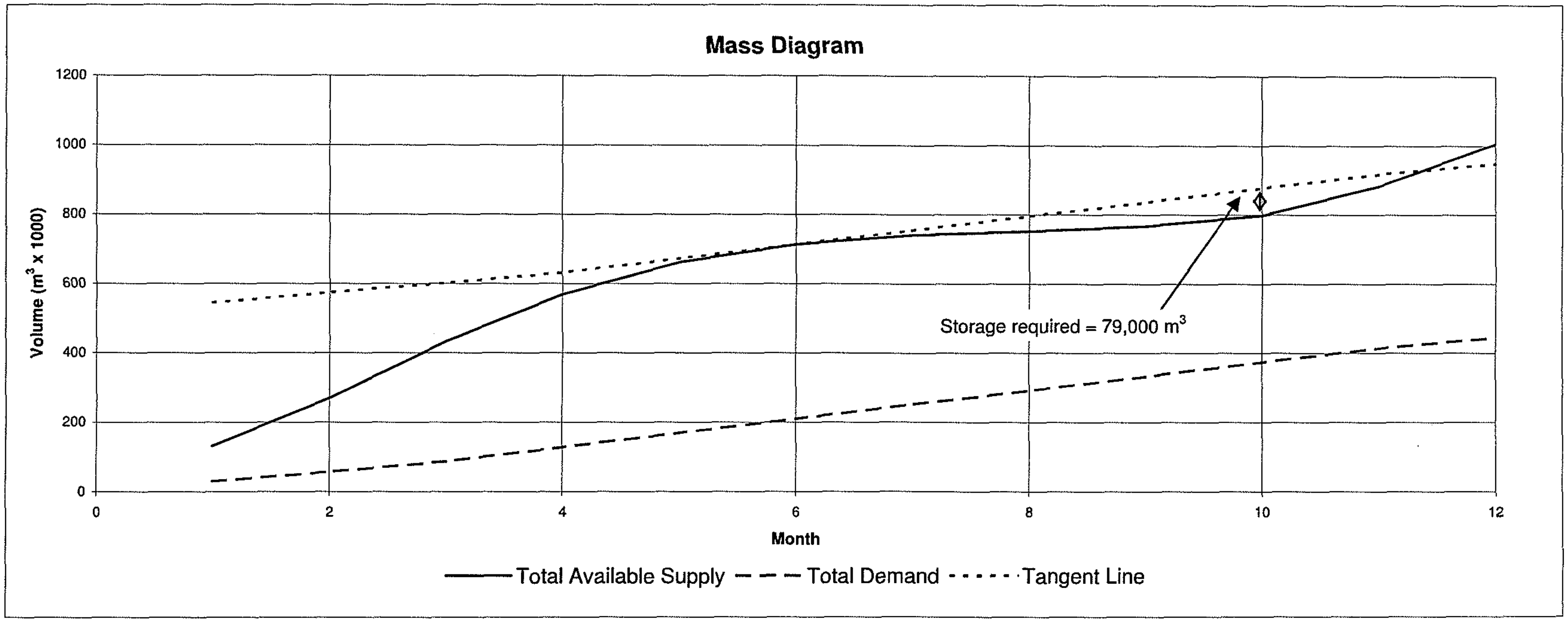


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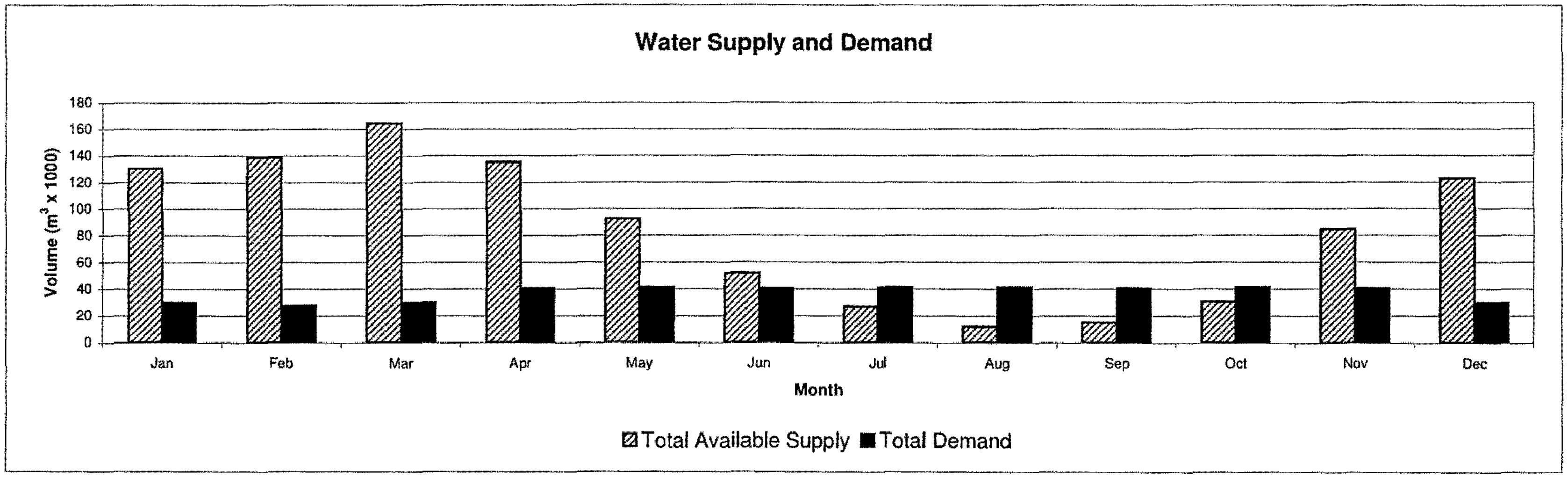
Figure 7
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 10 - Average Conditions



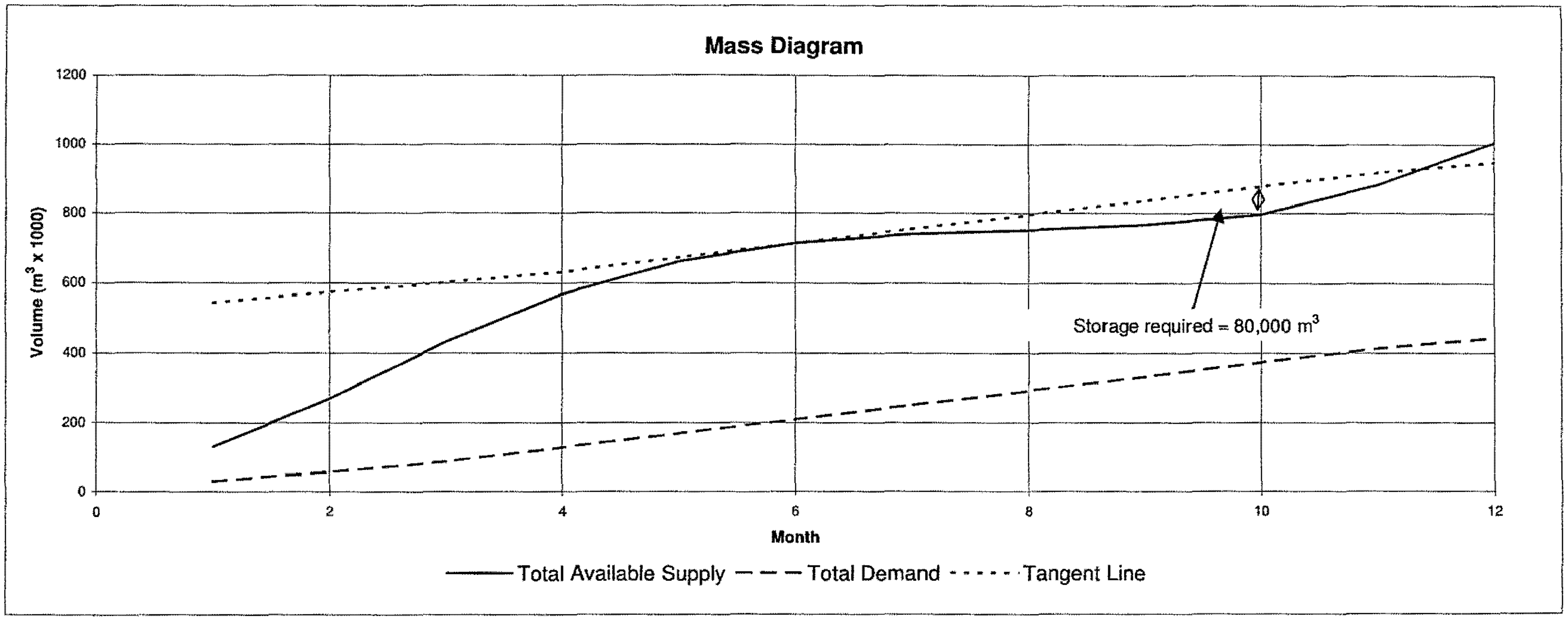


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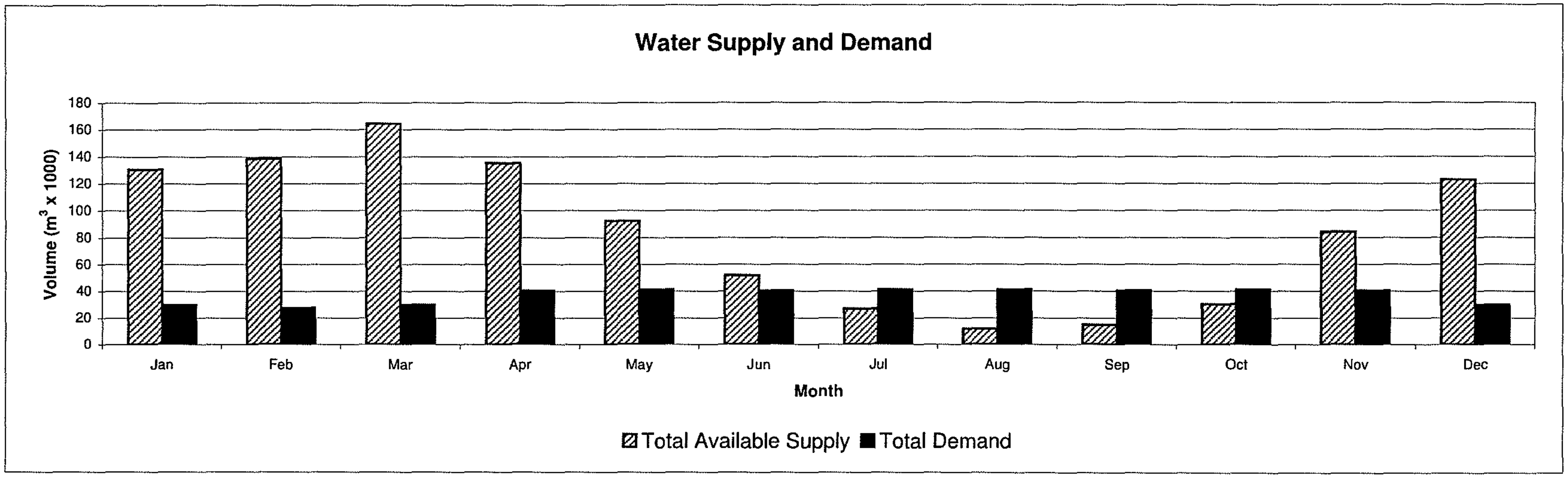
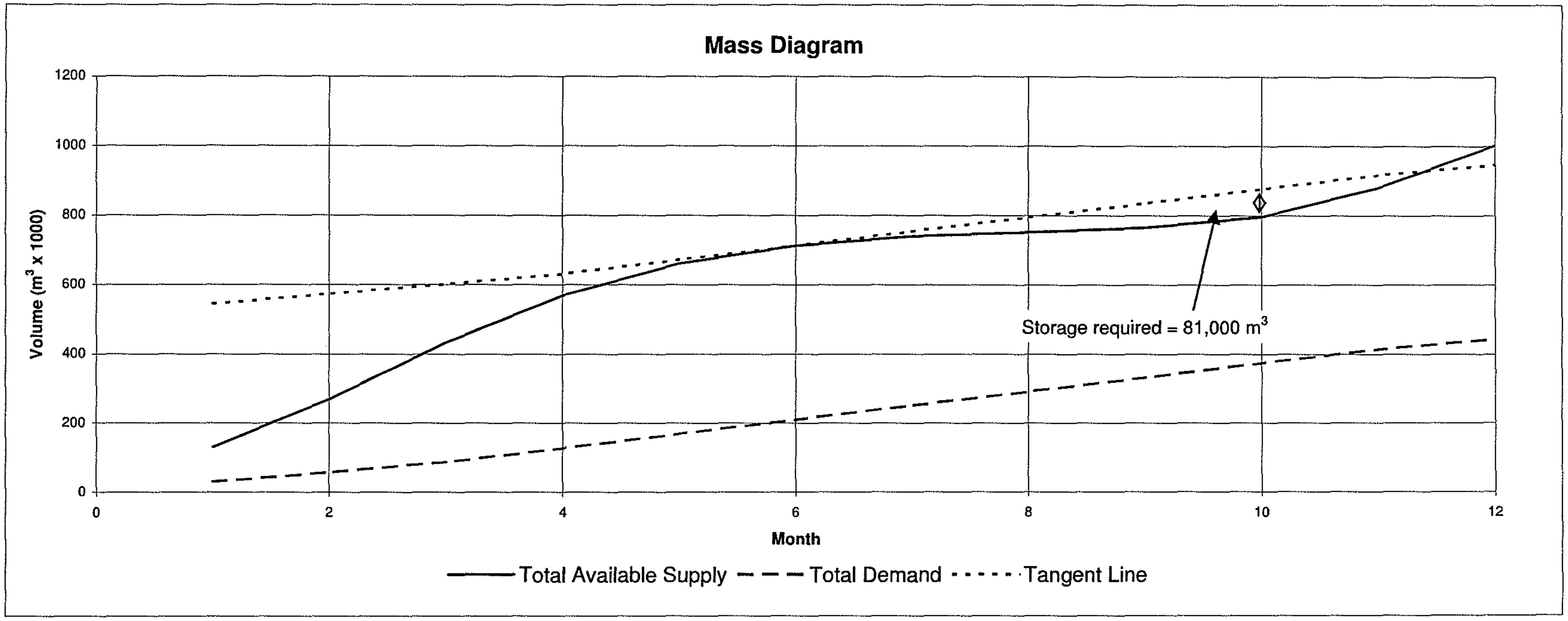
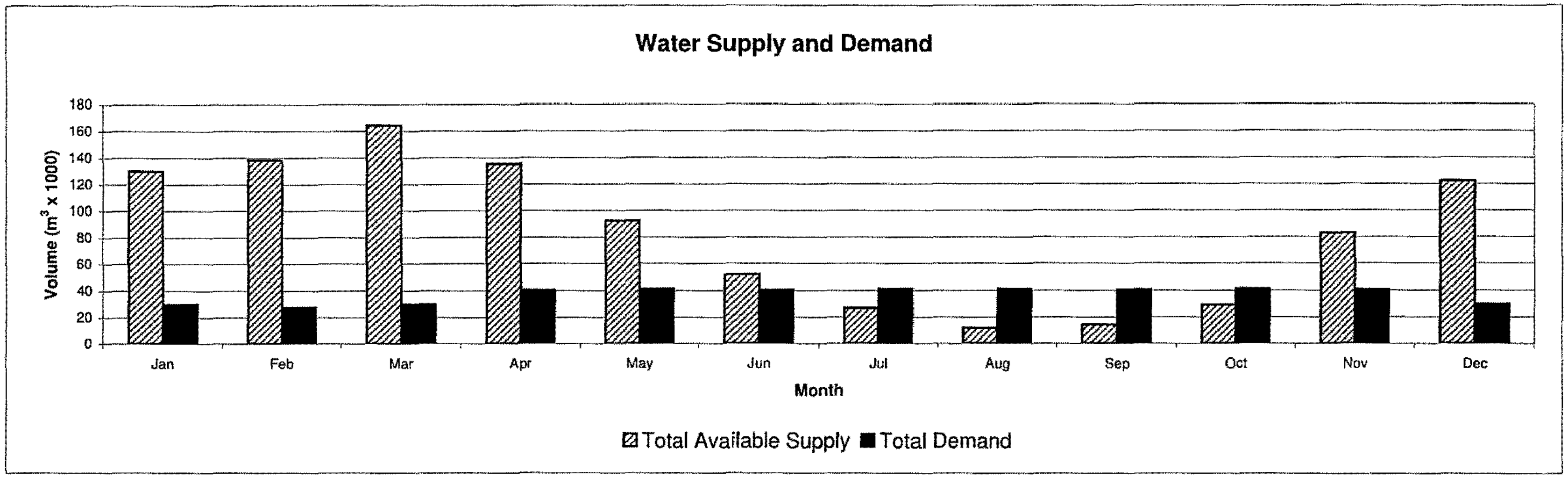
Figure 8
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 15 - Average Conditions

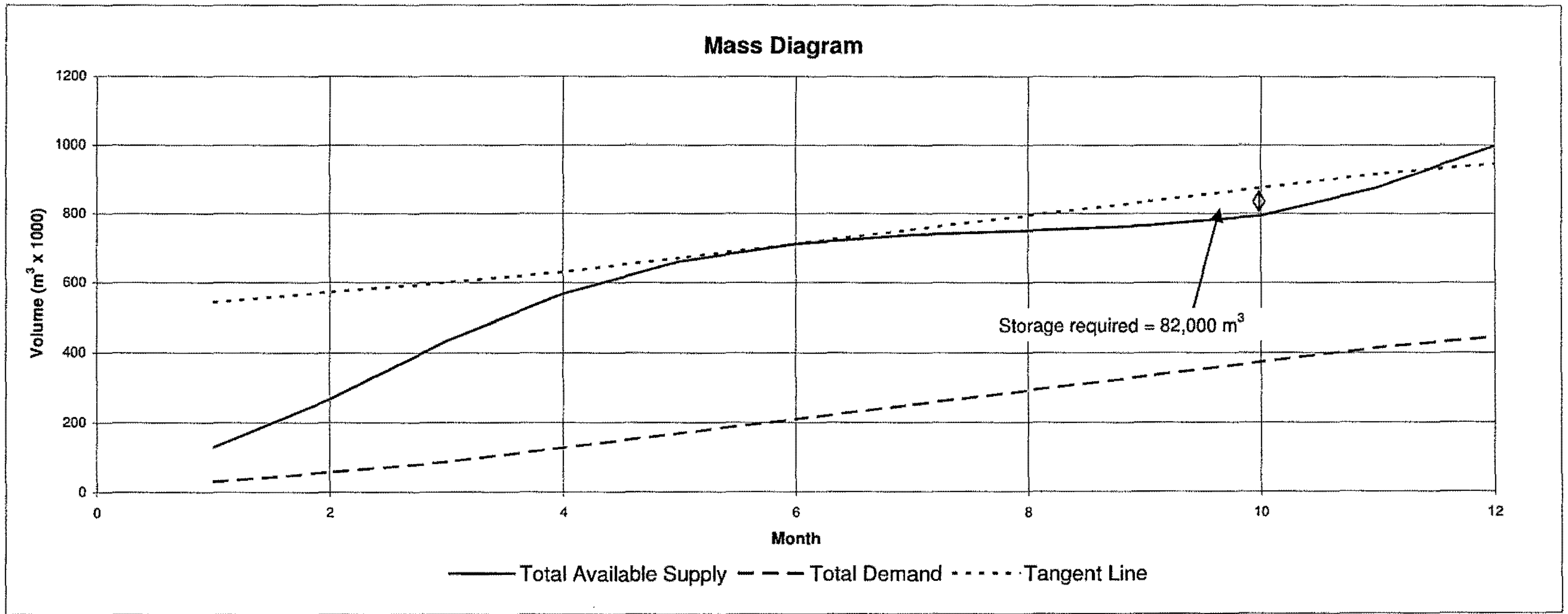




CRA (821191-D) - February, 2007

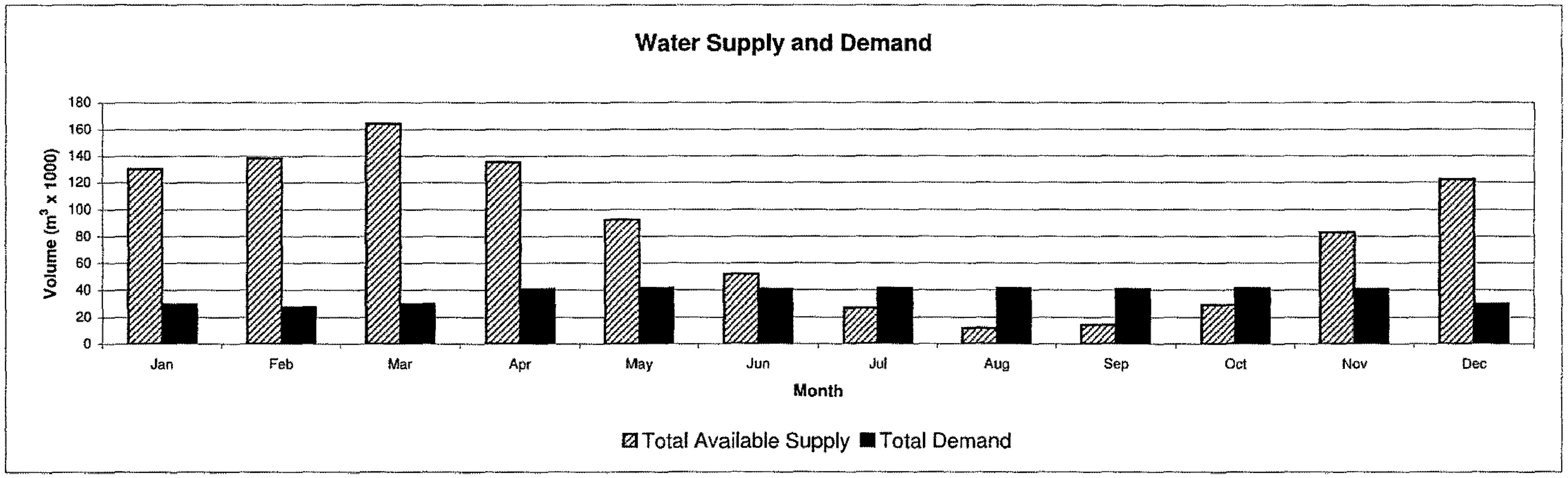
Figure 9
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 20 - Average Conditions





CRA (821191-D) - February, 2007

Figure 10
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 30 - Average Conditions



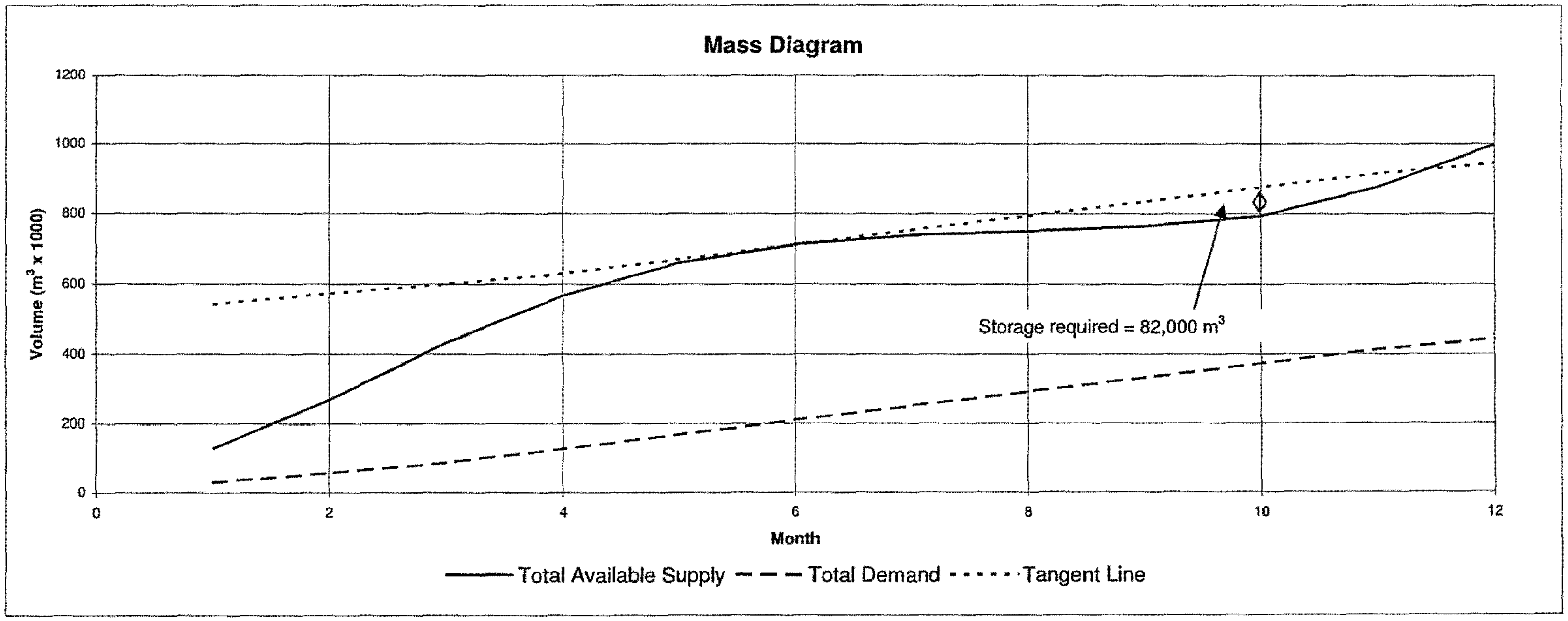


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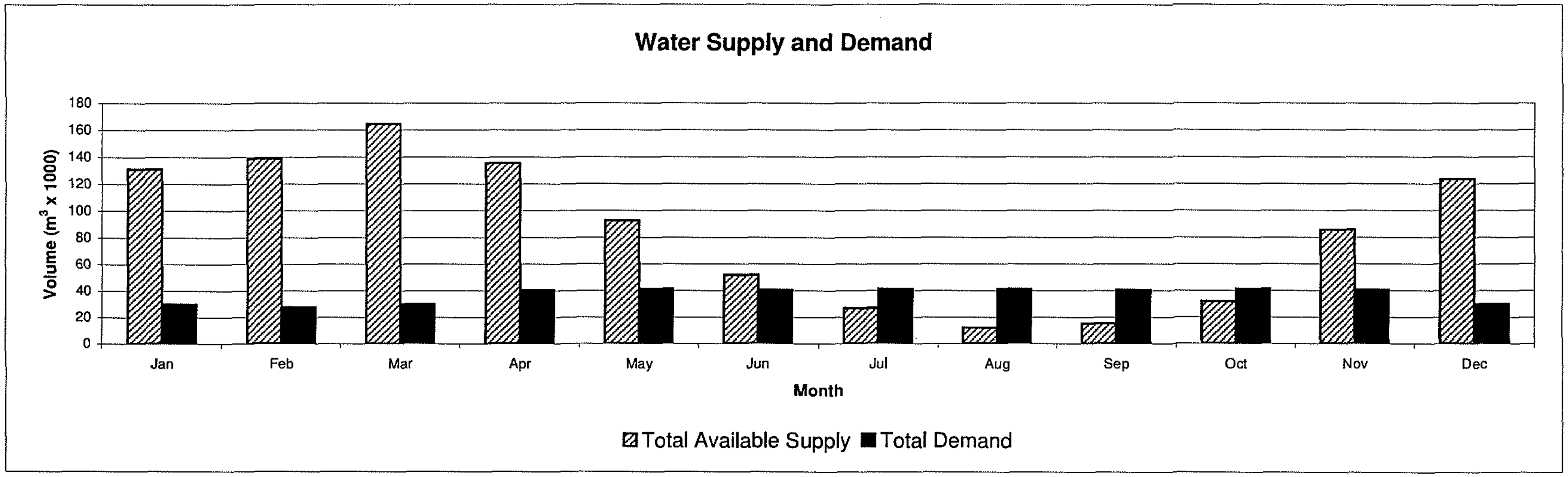
Figure 11
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 40 - Average Conditions



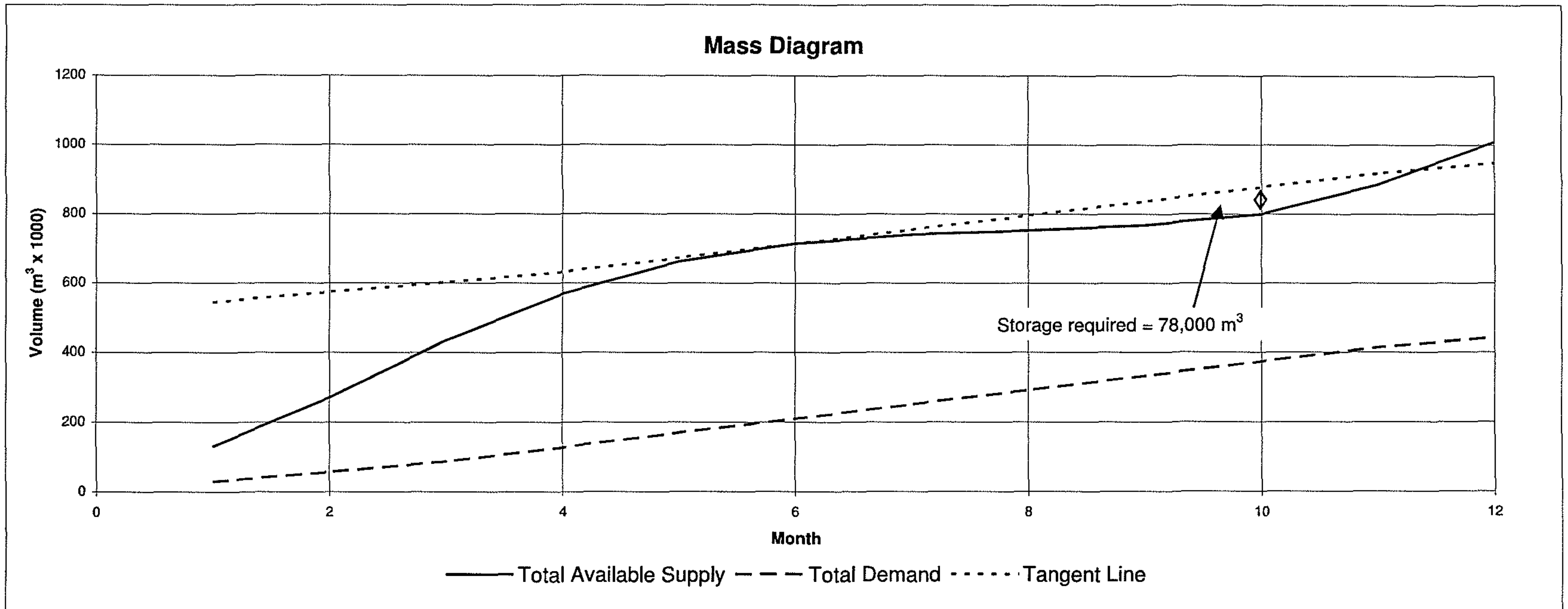


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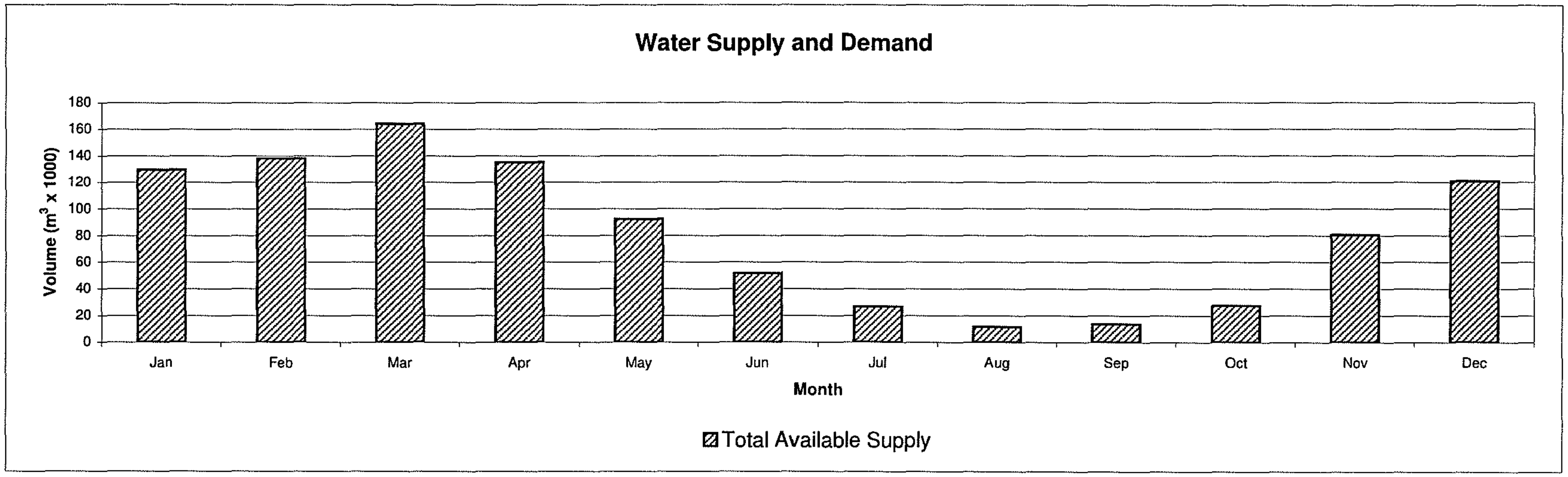
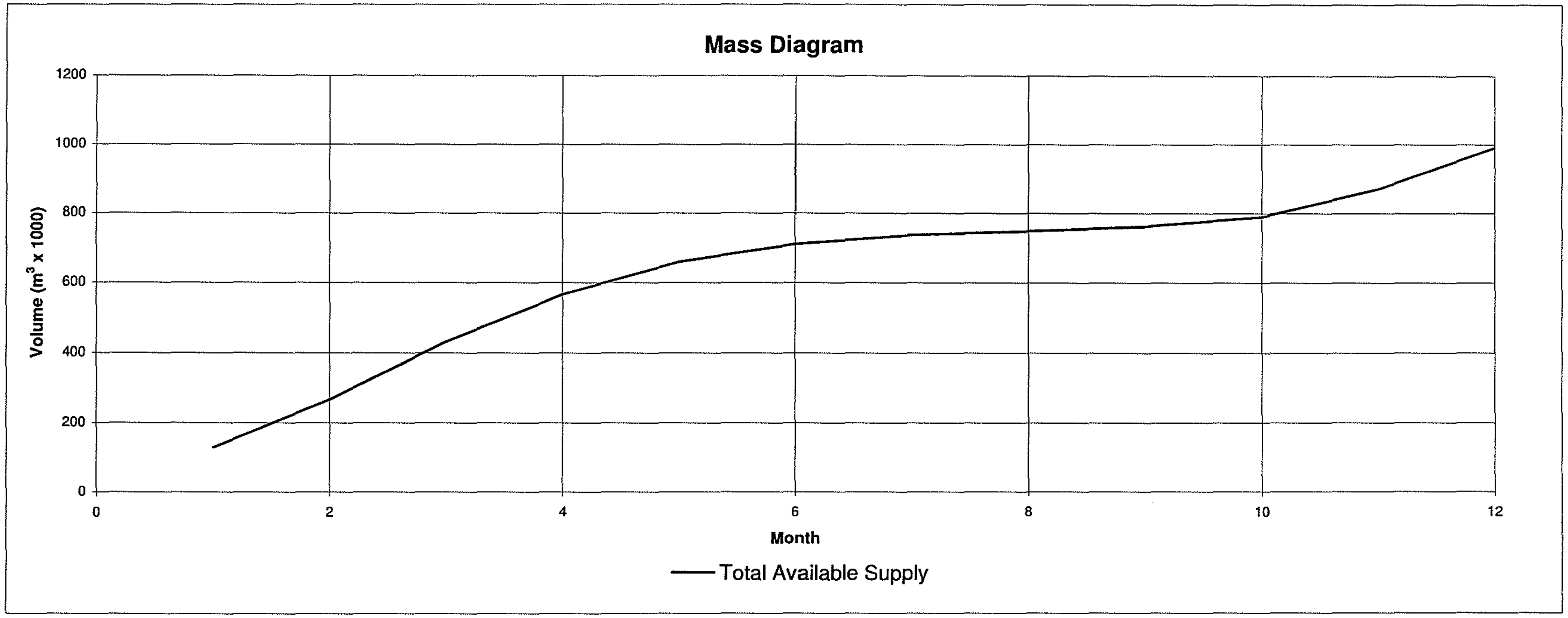
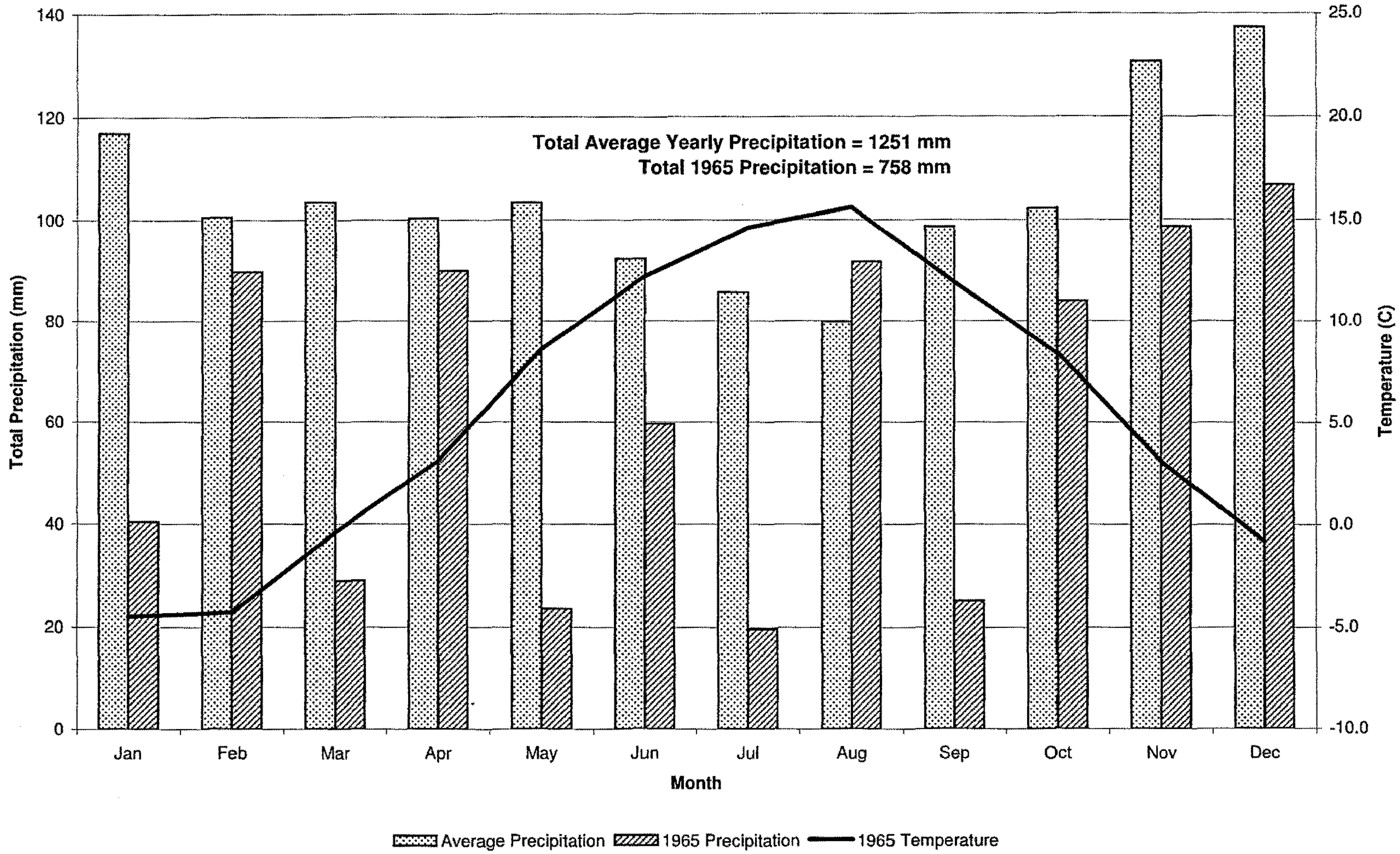
Figure 12
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 50 (Reclaimed) - Average Conditions





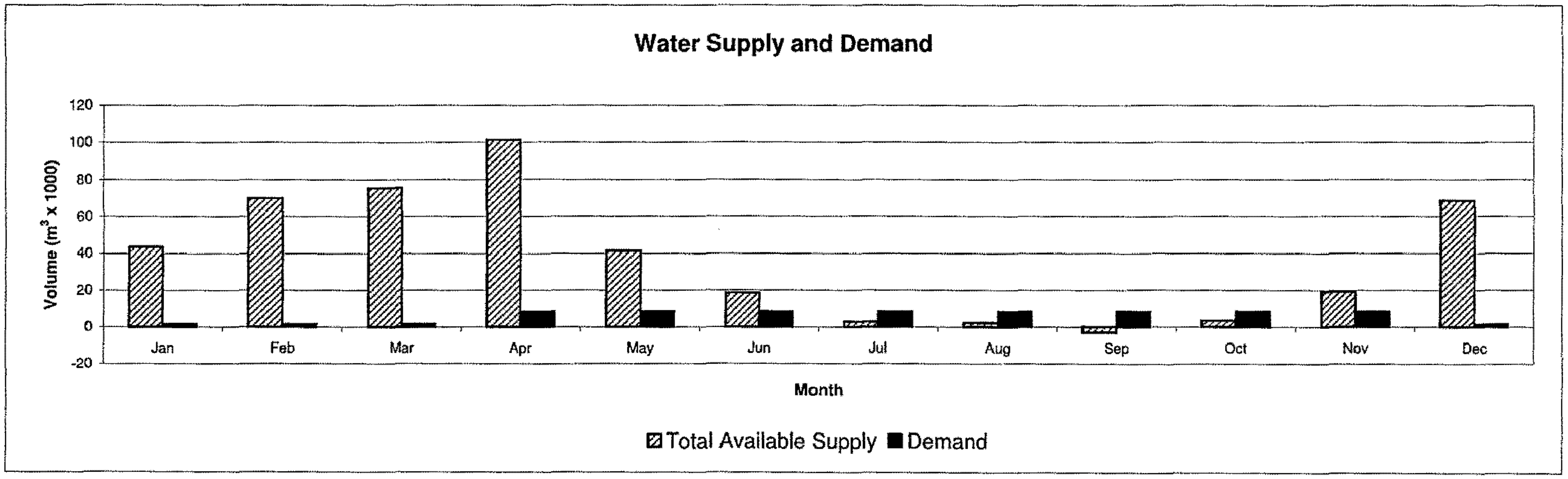
CRA (821191-D) - February, 2007

Figure 13
Whites Point Quarry Hydrologic Budget - Drought Conditions
Precipitation & Temperature
Weymouth Falls, NS



CRA (821191-D) - February, 2007

Figure 14
Whites Point Quarry Hydrologic Budget
Construction Water Budget Estimates - Drought Conditions



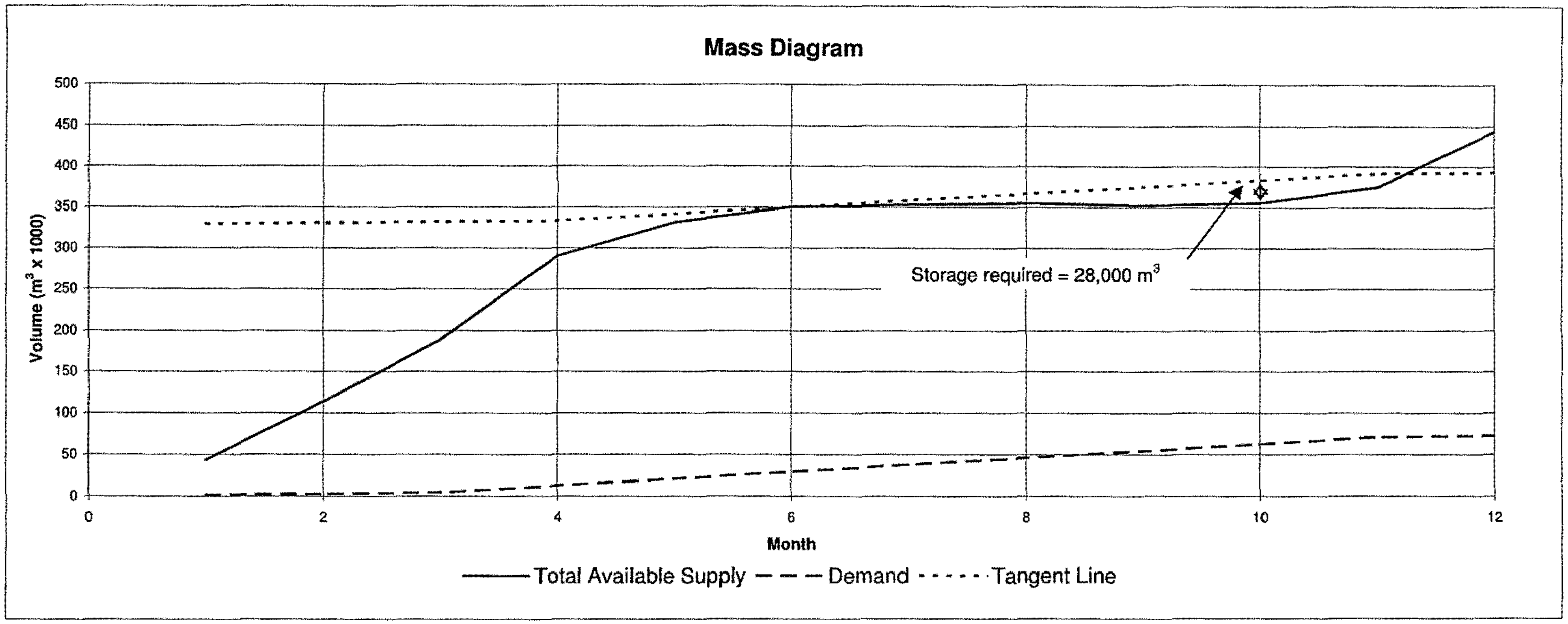
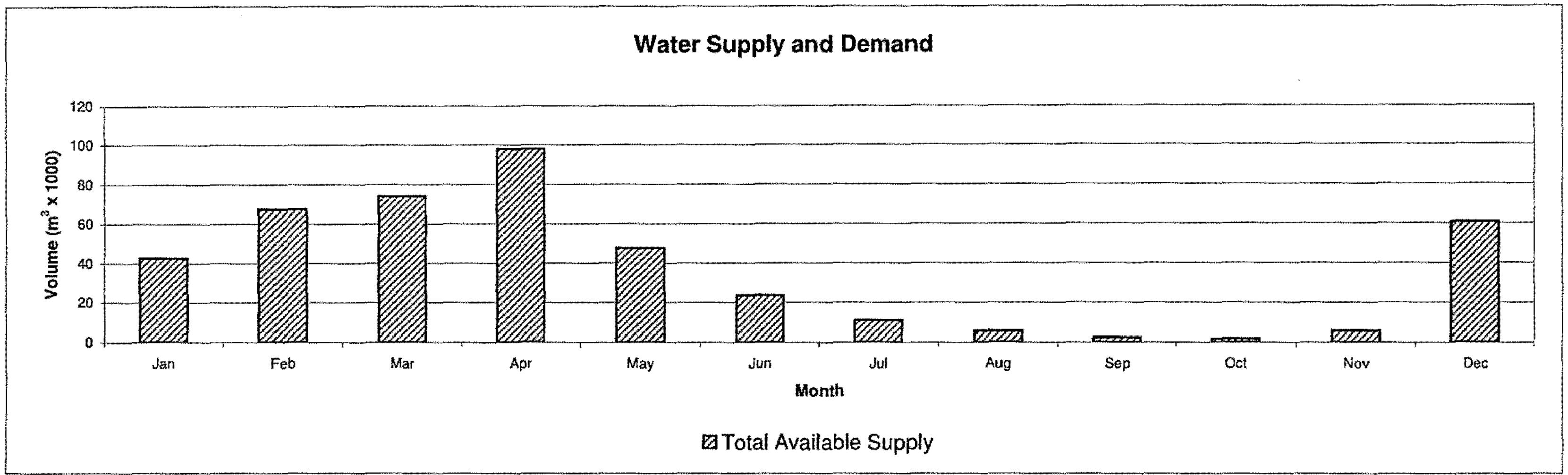


Figure 15
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 0 (Existing) - Drought Conditions



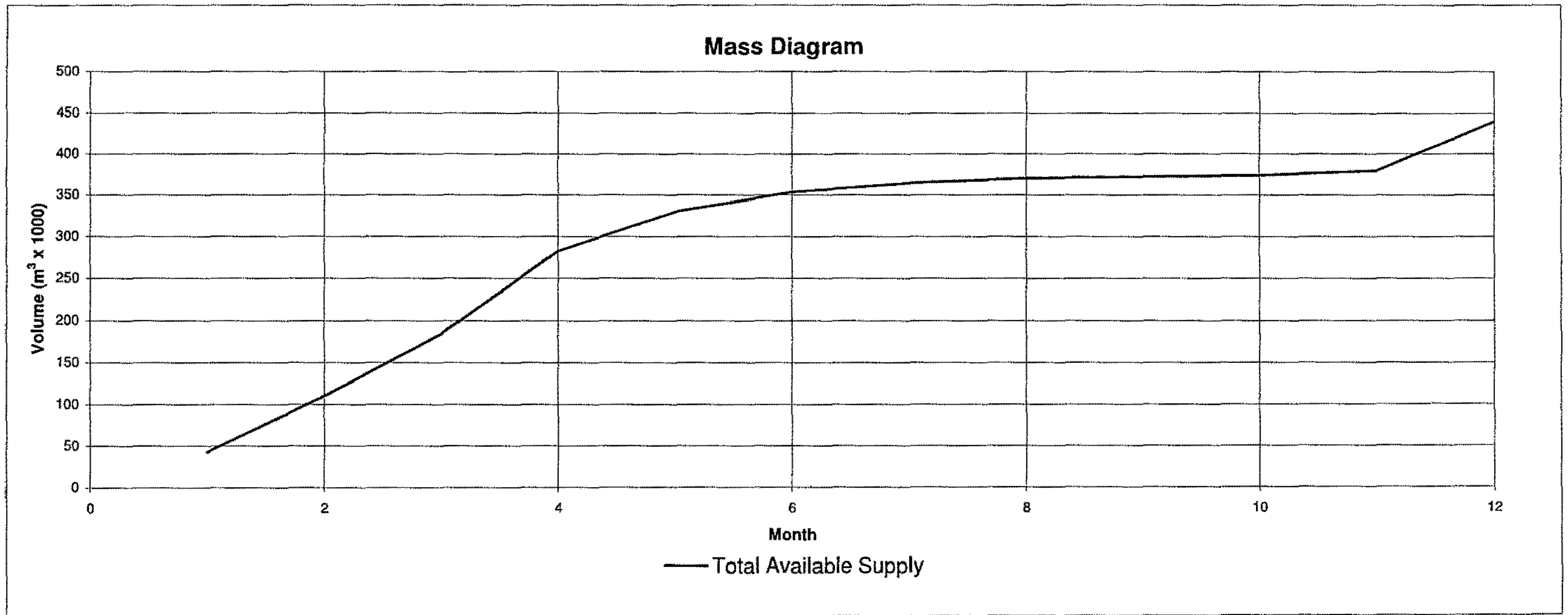
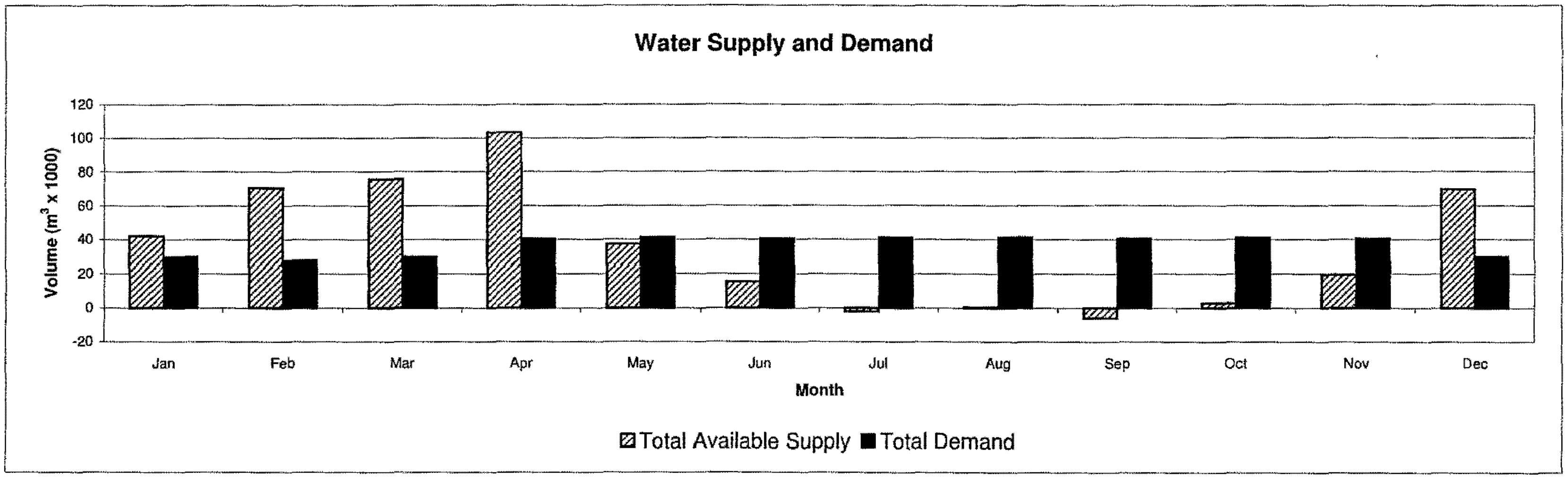


Figure 16
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 5 - Drought Conditions



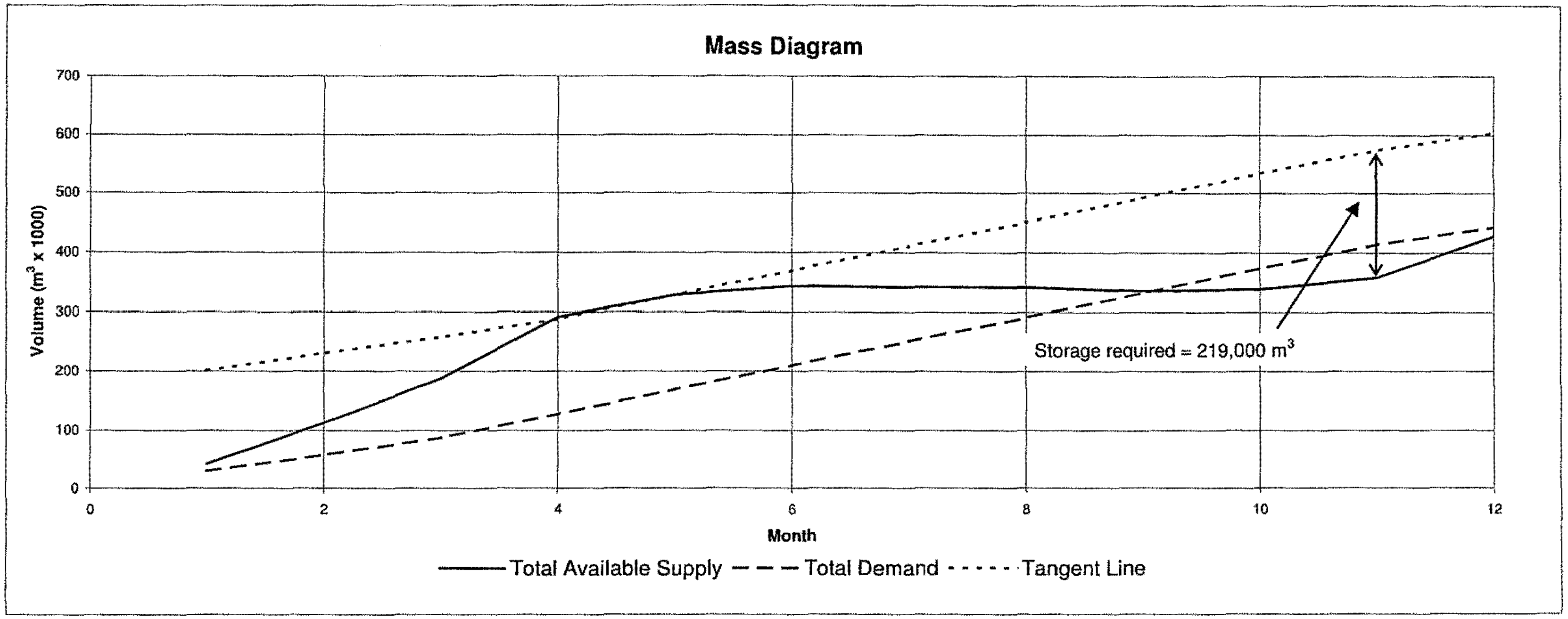


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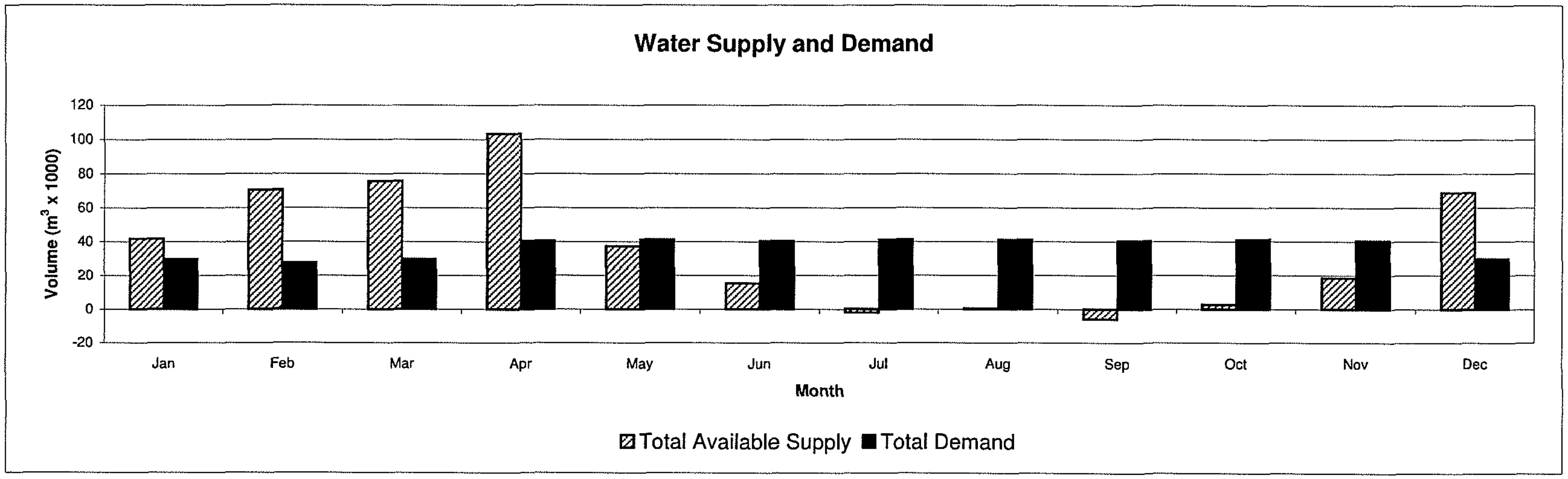
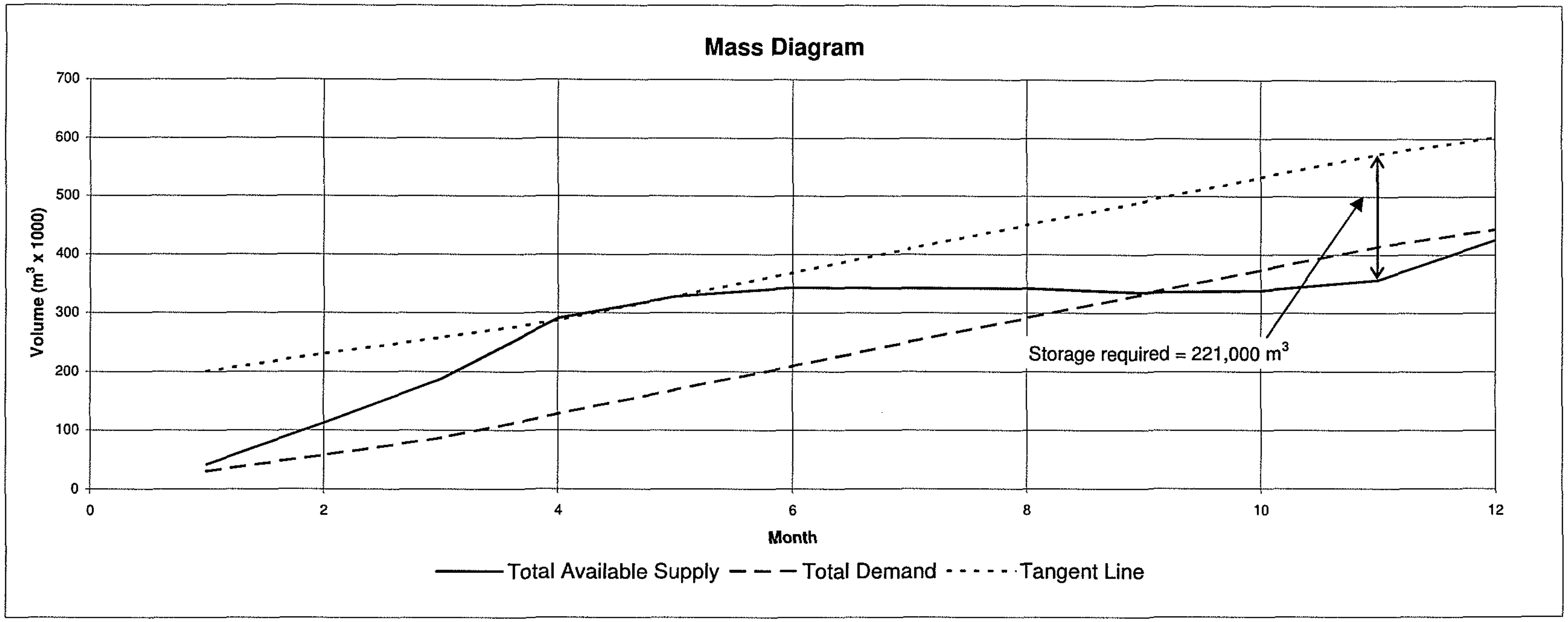
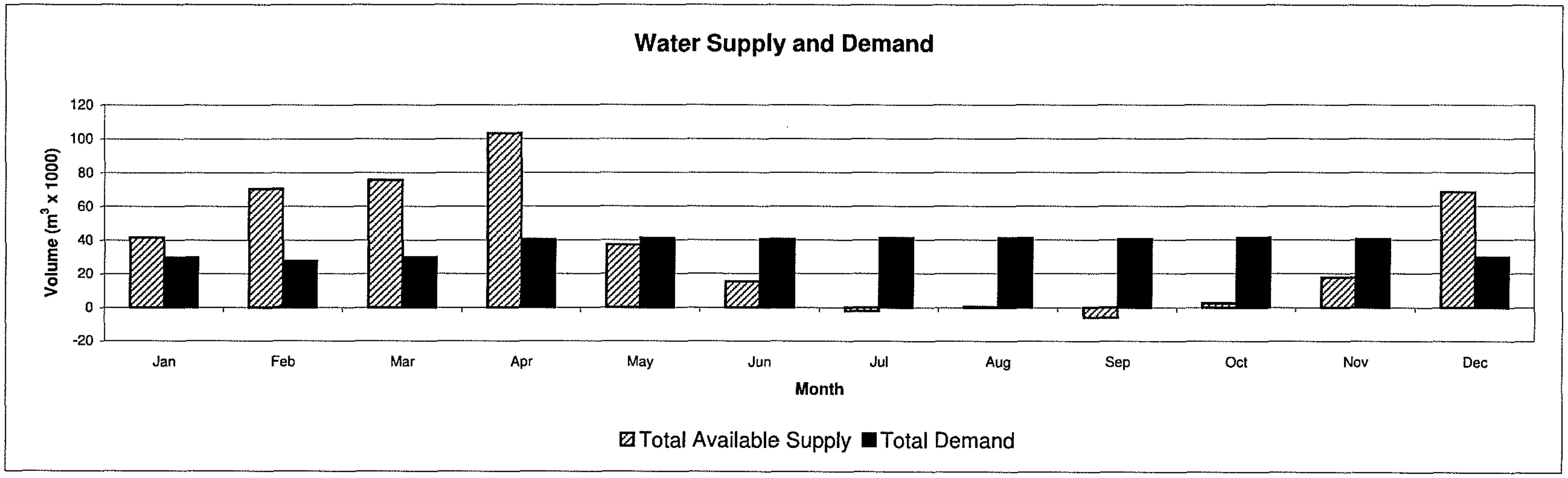
Figure 17
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 10 - Drought Conditions





CRA (821191-D) - February, 2007

Figure 18
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 15 - Drought Conditions



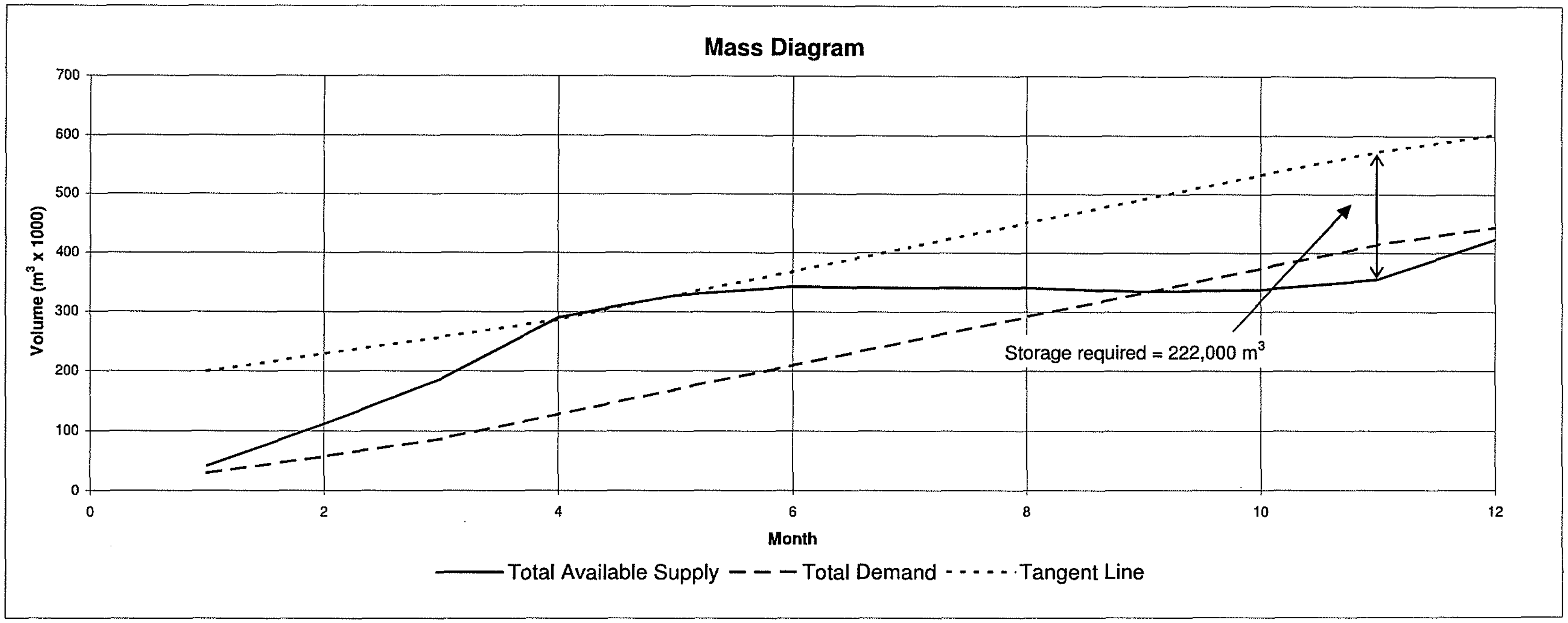
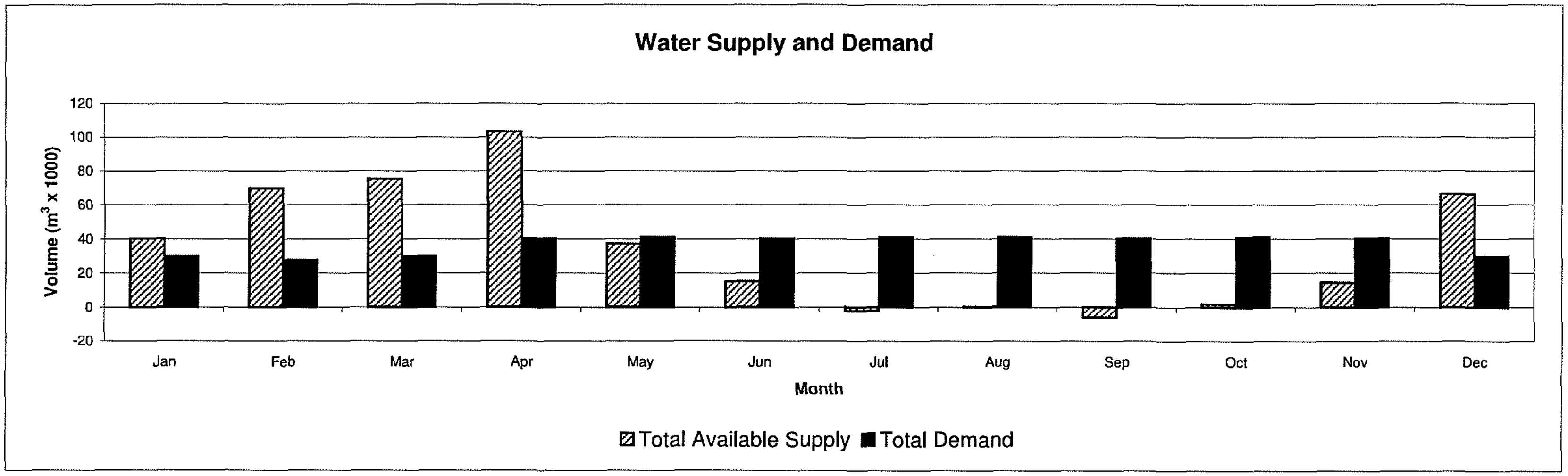


Figure 19
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 20 - Drought Conditions



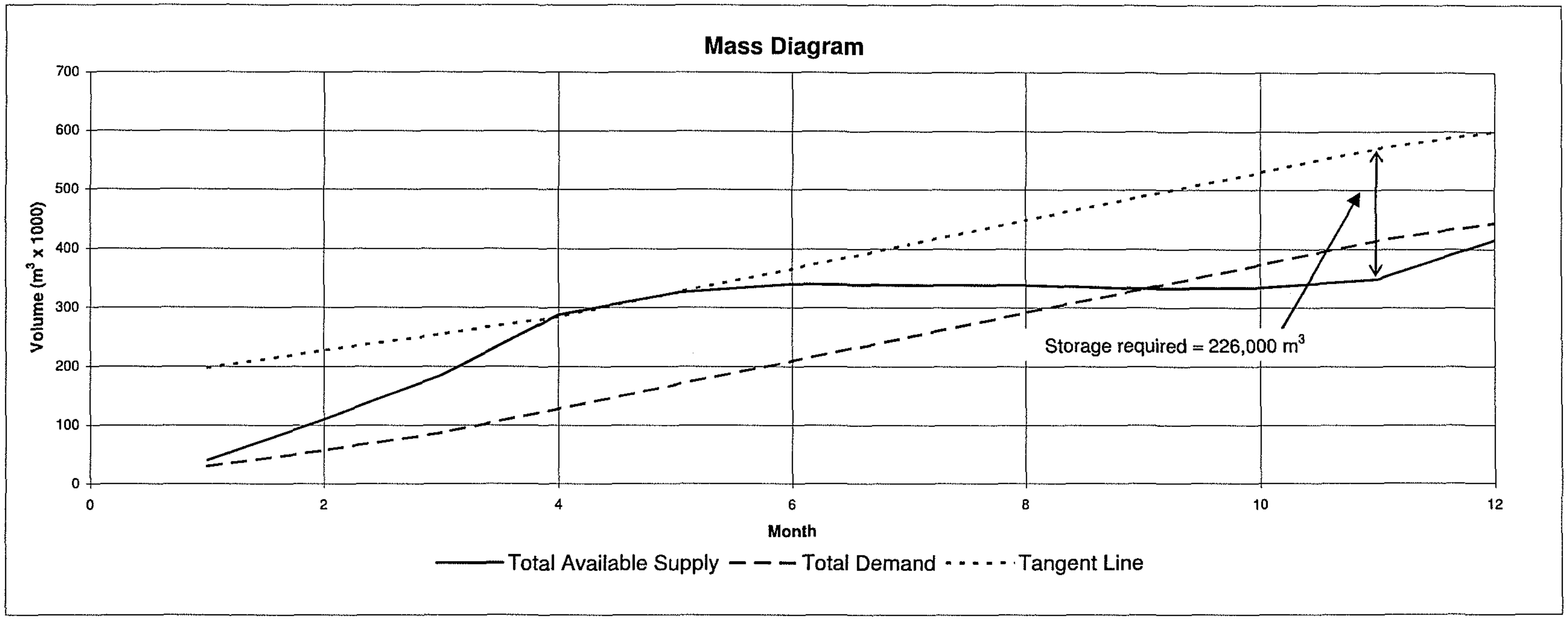
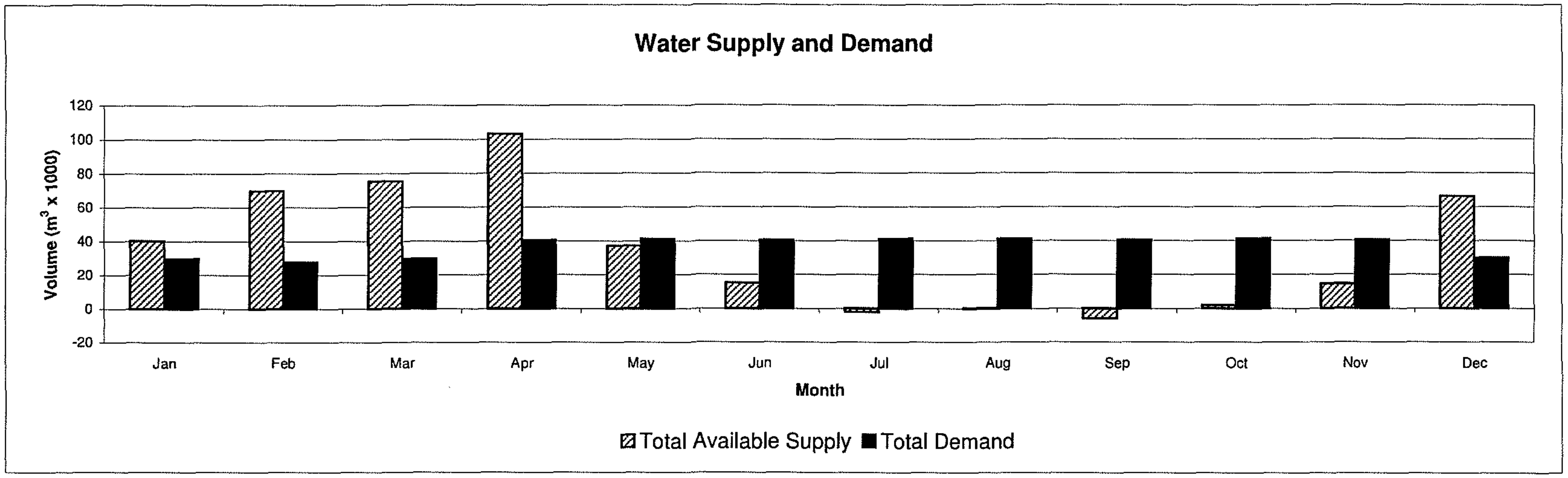


Figure 20
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 30 - Drought Conditions



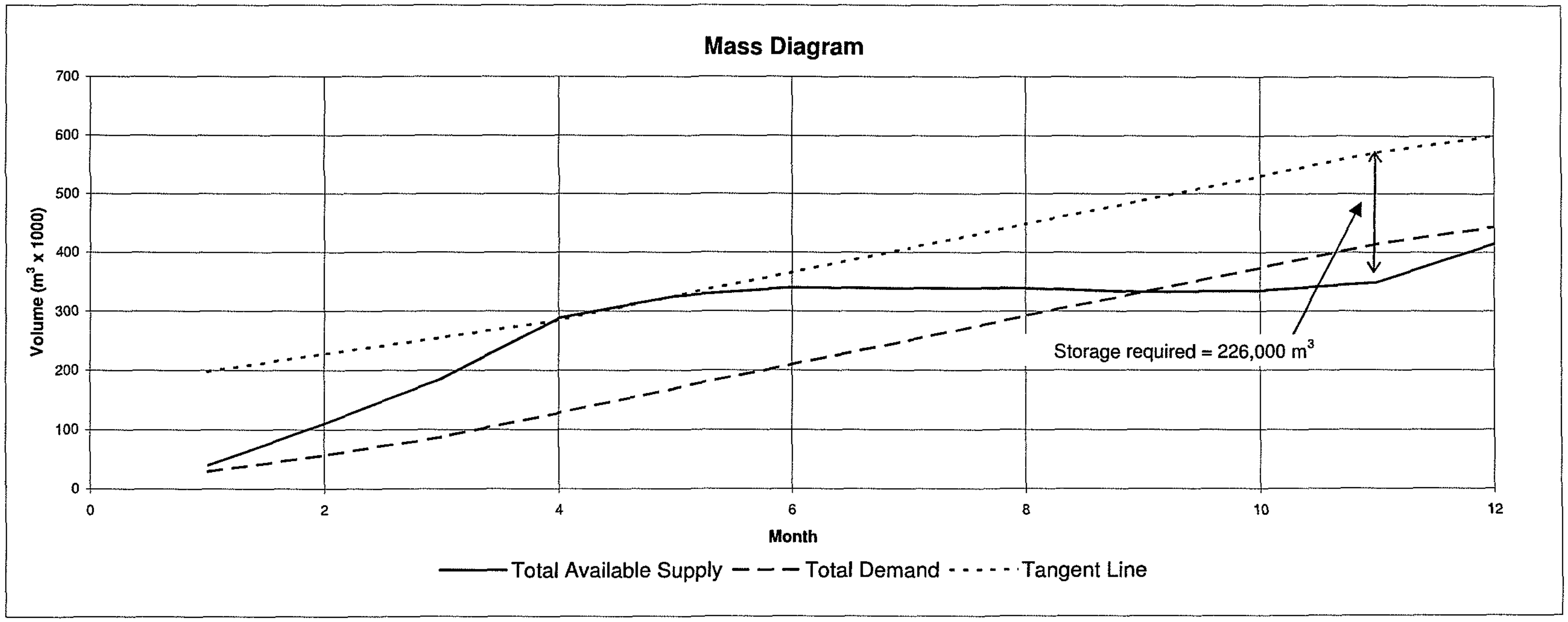
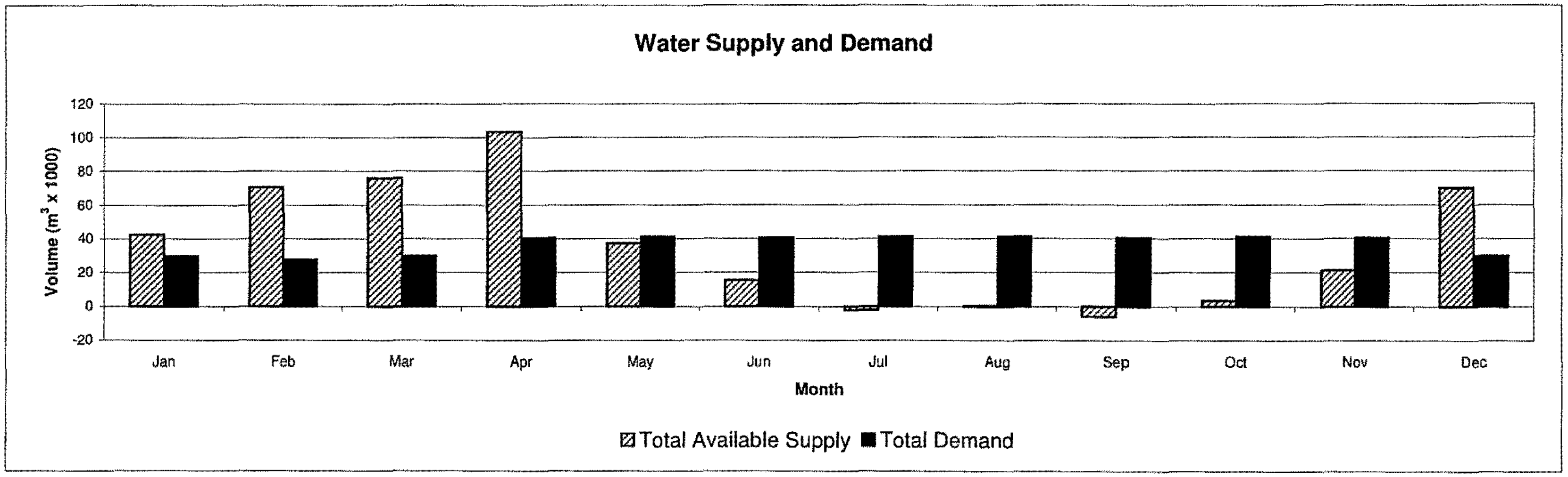
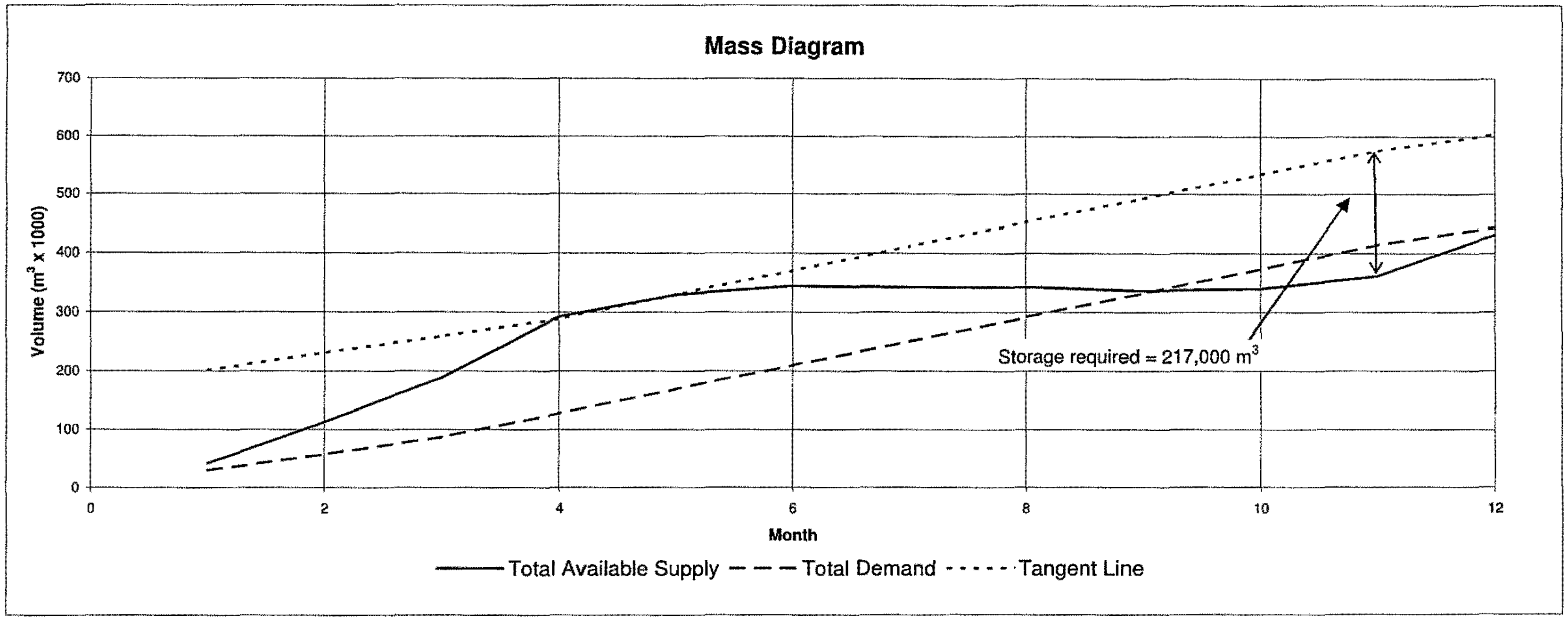


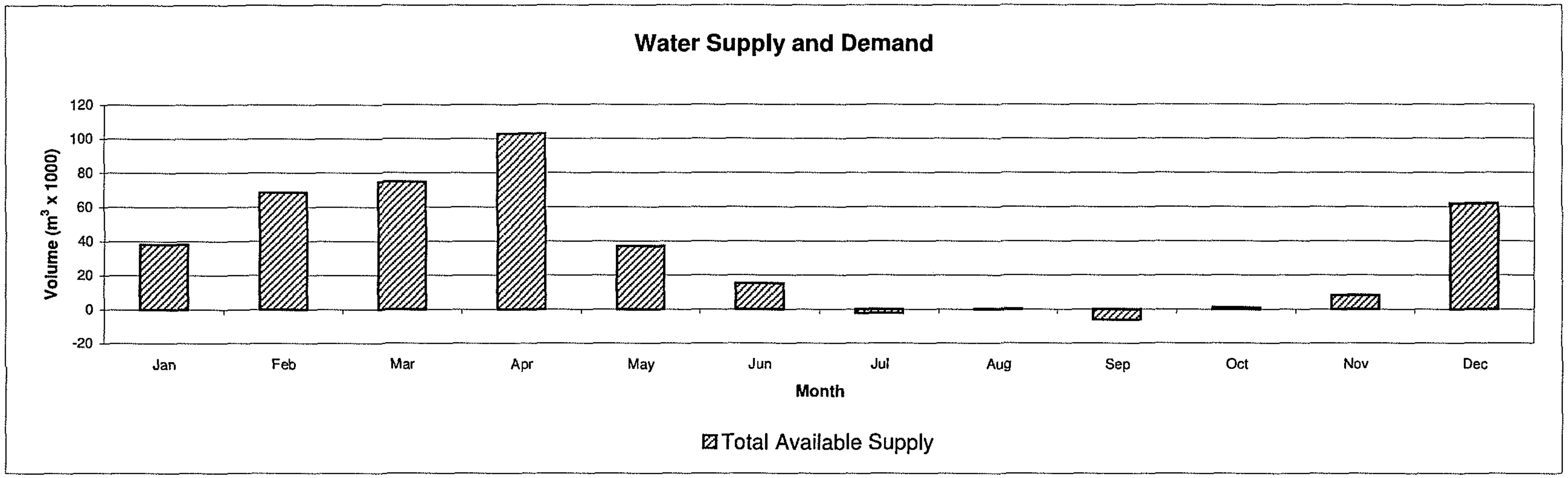
Figure 21
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 40 - Drought Conditions





CRA (821191-D) - February, 2007

Figure 22
Whites Point Quarry Hydrologic Budget
Conceptual Layout - Year 50 (Reclaimed) - Drought Conditions



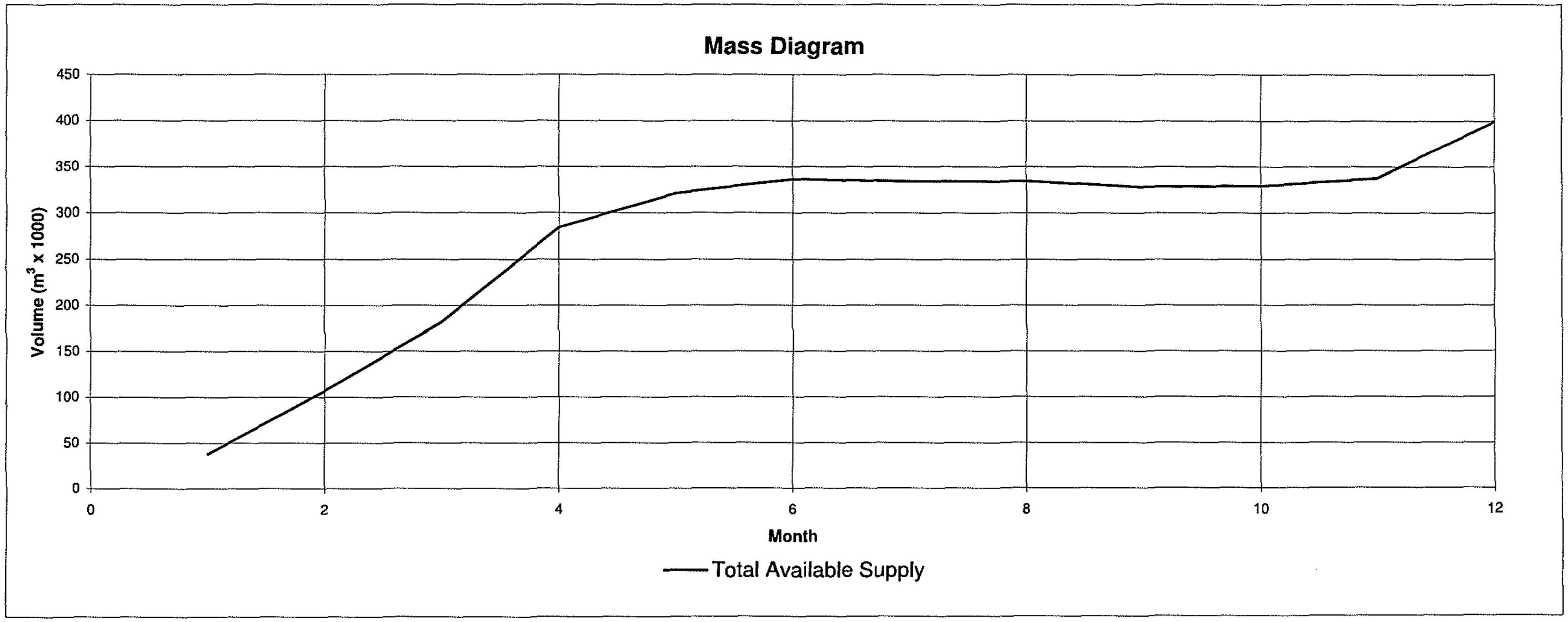


Table 1
Whites Point Quarry Hydrologic Budget
Land Use / Area Summary

Area No.	Description	Land Use	WHC[1] (mm)	Area (ha) by Year: 0	5	10	15	20	30	40	50
1	Environmental Preservation Zone	Property buffer strip (cleared or forest)	250	0.0	11.7	11.7	11.7	11.7	11.7	11.7	11.7
2	Existing/Reclaimed Habitat	Existing use or future reclaimed areas	150	63.9	23.3	25.4	27.2	33.8	33.8	27.2	53.2
3	Existing Grubbed Area	Bare bedrock	25	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Quarry Areas	Active quarrying	25	0.0	12.5	8.8	7.0	0.0[2]	0.0[2]	16.5	0.0
5	Processing Plant	Plant facilitities, aggregate piles, etc.	25	0.0	7.9	9.5	9.5	9.5	9.5	9.5	0.0
6	Sediment Ponds	Storage of runoff	-	0.8	9.6	9.6	9.6	9.6	9.6	9.6	9.6
7	Compound Area	Offices, power, fuel tanks, etc.	25	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
8	Roads	Roads	25	0.0	2.7	2.7	2.7	3.1	3.1	3.2	3.2
9	Sediment Disposal Area	Sediment from thickener tank	100	0.0	10.0	10.0	10.0	10.0	10.0	0.0	0.0
10	Clearcut Area	Cleared forest	75	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Remainder of Drainage Area East of Property	Forest	250	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2
			Total Land	**142.6**	**133.8**	**133.8**	**133.8**	**133.8**	**133.8**	**133.8**	**133.8**
			Total Pond	**0.8**	**9.6**	**9.6**	**9.6**	**9.6**	**9.6**	**9.6**	**9.6**
			Total	**143.4**	**143.4**	**143.4**	**143.4**	**143.4**	**143.4**	**143.4**	**143.4**

Notes: 1) Water holding capacity assigned based on soil type/landuse/cover.
2) Active quarrying outside of contibuting basin area during these time steps.

Table 2
Whites Point Quarry Hydrologic Budget
Water Demands - Construction

	Dust Control	Shot Rock	Dust - Plant	Total
Jan	379	114	946	1,438
Feb	379	114	946	1,438
Mar	379	114	946	1,438
Apr	5,678	757	1,893	8,328
May	5,678	757	1,893	8,328
Jun	5,678	757	1,893	8,328
Jul	5,678	757	1,893	8,328
Aug	5,678	757	1,893	8,328
Sep	5,678	757	1,893	8,328
Oct	5,678	757	1,893	8,328
Nov	5,678	757	1,893	8,328
Dec	379	114	946	1,438
Total	46,939	6,511	18,927	72,377

Table 3
Whites Point Quarry Hydrologic Budget
Water Demands - Operation

	Process (Make-up)	Dust Control	Shot Rock	Dust - Plant	Sediment Disposal	Total
Jan	24,003	3,785	946	946	114	29,795
Feb	21,821	3,785	946	946	114	27,613
Mar	24,003	3,785	946	946	114	29,795
Apr	23,458	11,356	3,785	1,893	114	40,606
May	24,003	11,356	3,785	1,893	114	41,151
Jun	23,458	11,356	3,785	1,893	114	40,606
Jul	24,003	11,356	3,785	1,893	114	41,151
Aug	24,003	11,356	3,785	1,893	114	41,151
Sep	23,458	11,356	3,785	1,893	114	40,606
Oct	24,003	11,356	3,785	1,893	114	41,151
Nov	23,458	11,356	3,785	1,893	114	40,606
Dec	24,003	3,785	946	946	114	29,795
Total	283,676	105,992	34,069	18,927	1,363	444,026

Table 4
Whites Point Quarry Hydrologic Budget
Detailed Summary Table
Construction Water Budget Estimates - Average Conditions

	Quarry and Watershed Areas			Pond Areas							
Month	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Demand[4] (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	95	88	126	100	0	48	52	3.3	129	1.4	128
Feb	98	93	133	102	0	43	59	3.7	137	1.4	135
Mar	125	109	156	135	0	48	88	5.5	161	1.4	160
Apr	73	91	130	103	0	46	56	3.5	133	8.3	125
May	44	68	96	103	96	48	-40	-2.5	94	8.3	86
Jun	13	41	58	92	108	46	-62	-3.9	54	8.3	46
Jul	8	24	35	86	121	48	-83	-5.2	30	8.3	21
Aug	2	13	19	80	105	48	-73	-4.6	14	8.3	6
Sep	11	12	17	99	75	46	-23	-1.4	16	8.3	8
Oct	31	21	31	102	47	48	8	0.5	31	8.3	23
Nov	87	54	78	130	0	46	84	5.2	83	8.3	74
Dec	109	82	117	119	0	48	71	4.4	121	1.4	120
Total	**698**	**698**	**995**	**1250**	**552**	**561**	**137**	**9**	**1004**	**72**	**931**

Storage Required: **0**

Equivalent Average Pond Storage Depth (m): **0**

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area (north catchment - 143 ha).
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas (ponds 1, 2, 3 & 4 - 6.3 ha).
4) Comprised of general site dust control, dust suppression on portable crushing plant, and wet down of shot rock.

Table 5
Whites Point Quarry Hydrologic Budget
Summary Results - Operation (Average Conditions)

Month	Net Water Surplus[1] (m³ x 1000)							
	Year 0	Year 5	Year 10	Year 15	Year 20	Year 30	Year 40	Year 50
Jan	125	101	101	101	100	100	101	129
Feb	133	111	111	111	111	111	111	138
Mar	156	135	135	135	134	134	135	164
Apr	130	95	95	95	95	95	95	135
May	96	51	51	51	51	51	51	92
Jun	57	11	11	11	11	11	11	52
Jul	34	*-14*	*-14*	*-14*	*-14*	*-14*	*-14*	27
Aug	18	*-29*	*-29*	*-29*	*-29*	*-29*	*-29*	11
Sep	16	*-26*	*-26*	*-26*	*-26*	*-26*	*-25*	13
Oct	27	*-10*	*-11*	*-11*	*-12*	*-12*	*-9*	27
Nov	74	44	44	44	42	42	45	80
Dec	115	93	93	93	92	92	94	121
Total	**982**	**562**	**561**	**559**	**555**	**555**	**565**	**990**
Storage Required (m^3 x 1000)	**N/A**	**79**	**80**	**81**	**82**	**82**	**78**	**N/A**

Notes: 1) Represents available surplus water after all losses have been considered and demand satisfied.
Negative values represent a water deficit.

Table 6
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 0 (Existing)

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[4]	Other Demand	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	95	88	125	100	0	48	52	0.4	125	n/a	n/a	125
Feb	98	93	133	102	0	43	59	0.5	133	n/a	n/a	133
Mar	125	109	156	135	0	48	88	0.7	156	n/a	n/a	156
Apr	73	91	130	103	0	46	56	0.5	130	n/a	n/a	130
May	44	68	96	103	96	48	-40	-0.3	96	n/a	n/a	96
Jun	13	40	58	92	108	46	-62	-0.5	57	n/a	n/a	57
Jul	8	24	35	86	121	48	-83	-0.7	34	n/a	n/a	34
Aug	2	13	18	80	105	48	-73	-0.6	18	n/a	n/a	18
Sep	9	11	16	99	75	46	-23	-0.2	16	n/a	n/a	16
Oct	27	19	27	102	47	48	8	0.1	27	n/a	n/a	27
Nov	84	52	73	130	0	46	84	0.7	74	n/a	n/a	74
Dec	109	80	115	119	0	48	71	0.6	115	n/a	n/a	115
Total	**688**	**688**	**980**	**1250**	**552**	**561**	**137**	**1**	**982**	**n/a**	**n/a**	**982**

Storage Required: N/A

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 7
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 5

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[4]	Other Demand	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	95	88	126	100	0	48	52	5.0	131	24	6	101
Feb	98	93	133	102	0	43	59	5.6	139	22	6	111
Mar	125	109	156	135	0	48	88	8.4	164	24	6	135
Apr	73	91	130	103	0	46	56	5.4	135	23	17	95
May	44	68	96	103	96	48	-40	-3.9	93	24	17	51
Jun	13	40	58	92	108	46	-62	-5.9	52	23	17	11
Jul	8	24	35	86	121	48	-83	-8.0	27	24	17	-14
Aug	2	13	19	80	105	48	-73	-7.0	12	24	17	-29
Sep	11	12	17	99	75	46	-23	-2.2	15	23	17	-26
Oct	30	21	30	102	47	48	8	0.8	31	24	17	-10
Nov	87	54	77	130	0	46	84	8.0	85	23	17	44
Dec	109	82	116	119	0	48	71	6.8	123	24	6	93
Total	**697**	**697**	**993**	**1250**	**552**	**561**	**137**	**13**	**1006**	**284**	**160**	**562**

Storage Required: 79
Equivalent Average Pond Depth (m): 0.83

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 8
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 10

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[4]	Other Demand	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	95	88	126	100	0	48	52	5.0	131	24	6	101
Feb	98	93	133	102	0	43	59	5.6	139	22	6	111
Mar	125	109	156	135	0	48	88	8.4	164	24	6	135
Apr	73	91	130	103	0	46	56	5.4	135	23	17	95
May	44	68	96	103	96	48	-40	-3.9	93	24	17	51
Jun	13	40	58	92	108	46	-62	-5.9	52	23	17	11
Jul	8	24	35	86	121	48	-83	-8.0	27	24	17	-14
Aug	2	13	19	80	105	48	-73	-7.0	12	24	17	-29
Sep	11	12	17	99	75	46	-23	-2.2	15	23	17	-26
Oct	30	21	30	102	47	48	8	0.8	31	24	17	-11
Nov	86	54	77	130	0	46	84	8.0	85	23	17	44
Dec	109	81	116	119	0	48	71	6.8	123	24	6	93
Total	**696**	**696**	**992**	**1250**	**552**	**561**	**137**	**13**	**1005**	**284**	**160**	**561**

Storage Required: 80
Equivalent Average Pond Depth (m): 0.83

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 9
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 15

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[4]	Other Demand	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	95	88	125	100	0	48	52	5.0	131	24	6	101
Feb	98	93	133	102	0	43	59	5.6	139	22	6	111
Mar	125	109	156	135	0	48	88	8.4	164	24	6	135
Apr	73	91	130	103	0	46	56	5.4	135	23	17	95
May	44	68	96	103	96	48	-40	-3.9	93	24	17	51
Jun	13	40	58	92	108	46	-62	-5.9	52	23	17	11
Jul	8	24	35	86	121	48	-83	-8.0	27	24	17	-14
Aug	2	13	19	80	105	48	-73	-7.0	12	24	17	-29
Sep	10	12	17	99	75	46	-23	-2.2	15	23	17	-26
Oct	30	21	30	102	47	48	8	0.8	30	24	17	-11
Nov	86	53	76	130	0	46	84	8.0	84	23	17	44
Dec	109	81	116	119	0	48	71	6.8	123	24	6	93
Total	**695**	**695**	**990**	**1250**	**552**	**561**	**137**	**13**	**1003**	**284**	**160**	**559**

Storage Required: 81
Equivalent Average Pond Depth (m): 0.84

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 10
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 20

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[4]	Other Demand	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	95	88	125	100	0	48	52	5.0	130	24	6	100
Feb	98	93	133	102	0	43	59	5.6	138	22	6	111
Mar	125	109	156	135	0	48	88	8.4	164	24	6	134
Apr	73	91	130	103	0	46	56	5.4	135	23	17	95
May	44	68	96	103	96	48	-40	-3.9	92	24	17	51
Jun	13	40	58	92	108	46	-62	-5.9	52	23	17	11
Jul	8	24	35	86	121	48	-83	-8.0	27	24	17	-14
Aug	2	13	19	80	105	48	-73	-7.0	12	24	17	-29
Sep	10	11	16	99	75	46	-23	-2.2	14	23	17	-26
Oct	28	20	28	102	47	48	8	0.8	29	24	17	-12
Nov	85	53	75	130	0	46	84	8.0	83	23	17	42
Dec	109	81	115	119	0	48	71	6.8	122	24	6	92
Total	**691**	**691**	**986**	**1250**	**552**	**561**	**137**	**13**	**999**	**284**	**160**	**555**

Storage Required: 82
Equivalent Average Pond Depth (m): 0.86

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 11
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 30

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[4]	Other Demand	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	95	88	125	100	0	48	52	5.0	130	24	6	100
Feb	98	93	133	102	0	43	59	5.6	138	22	6	111
Mar	125	109	156	135	0	48	88	8.4	164	24	6	134
Apr	73	91	130	103	0	46	56	5.4	135	23	17	95
May	44	68	96	103	96	48	-40	-3.9	92	24	17	51
Jun	13	40	58	92	108	46	-62	-5.9	52	23	17	11
Jul	8	24	35	86	121	48	-83	-8.0	27	24	17	-14
Aug	2	13	19	80	105	48	-73	-7.0	12	24	17	-29
Sep	10	11	16	99	75	46	-23	-2.2	14	23	17	-26
Oct	28	20	28	102	47	48	8	0.8	29	24	17	-12
Nov	85	53	75	130	0	46	84	8.0	83	23	17	42
Dec	109	81	115	119	0	48	71	6.8	122	24	6	92
Total	**691**	**691**	**986**	**1250**	**552**	**561**	**137**	**13**	**999**	**284**	**160**	**555**

Storage Required: 82
Equivalent Average Pond Depth (m): 0.86

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 12
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 40

Month	Quarry and Watershed Areas: Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Pond Areas: Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Make-up Demand[4] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	95	88	126	100	0	48	52	5.0	131	24	6	101
Feb	98	93	133	102	0	43	59	5.6	139	22	6	111
Mar	125	109	156	135	0	48	88	8.4	164	24	6	135
Apr	73	91	130	103	0	46	56	5.4	135	23	17	95
May	44	68	96	103	96	48	-40	-3.9	93	24	17	51
Jun	13	41	58	92	108	46	-62	-5.9	52	23	17	11
Jul	8	24	35	86	121	48	-83	-8.0	27	24	17	-14
Aug	2	13	19	80	105	48	-73	-7.0	12	24	17	-29
Sep	11	12	17	99	75	46	-23	-2.2	15	23	17	-25
Oct	31	22	31	102	47	48	8	0.8	32	24	17	-9
Nov	87	55	78	130	0	46	84	8.0	86	23	17	45
Dec	109	82	117	119	0	48	71	6.8	123	24	6	94
Total	**699**	**699**	**996**	**1250**	**552**	**561**	**137**	**13**	**1009**	**284**	**160**	**565**

Storage Required: 78
Equivalent Average Pond Depth (m): 0.81

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 13
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Average Conditions
Quarry Conceptual Layout - Year 50 (Reclaimed)

Month	Quarry and Watershed Areas: Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Pond Areas: Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Make-up Demand[4] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	95	87	124	100	0	48	52	5.0	129	n/a	n/a	129
Feb	98	93	132	102	0	43	59	5.6	138	n/a	n/a	138
Mar	125	109	156	135	0	48	88	8.4	164	n/a	n/a	164
Apr	73	91	130	103	0	46	56	5.4	135	n/a	n/a	135
May	44	68	96	103	96	48	-40	-3.9	92	n/a	n/a	92
Jun	13	40	58	92	108	46	-62	-5.9	52	n/a	n/a	52
Jul	8	24	35	86	121	48	-83	-8.0	27	n/a	n/a	27
Aug	2	13	19	80	105	48	-73	-7.0	11	n/a	n/a	11
Sep	9	11	16	99	75	46	-23	-2.2	13	n/a	n/a	13
Oct	26	19	27	102	47	48	8	0.8	27	n/a	n/a	27
Nov	83	51	72	130	0	46	84	8.0	80	n/a	n/a	80
Dec	109	80	114	119	0	48	71	6.8	121	n/a	n/a	121
Total	**686**	**686**	**977**	**1250**	**552**	**561**	**137**	**13**	**990**	**n/a**	**n/a**	**990**

Storage Required: N/A

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area.
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas.
4) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 14
Whites Point Quarry Hydrologic Budget
Detailed Summary Table
Construction Water Budget Estimates - Drought Conditions

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Demand[4]	Net Surplus
	Water Surplus[1] (mm)	Surface Runoff[2] (mm)	Runoff Volume (m^3 x 1000)	Input[3] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	18	32	45	19	0	48	-29	-1.8	44	1.4	42
Feb	64	48	69	66	0	43	22	1.4	70	1.4	69
Mar	57	52	75	61	0	48	13	0.8	75	1.4	74
Apr	85	69	98	104	0	46	58	3.6	101	8.3	93
May	0	34	49	24	96	48	-120	-7.5	41	8.3	33
Jun	0	17	24	60	108	46	-95	-5.9	19	8.3	10
Jul	0	9	12	20	121	48	-149	-9.3	3	8.3	-5
Aug	0	4	6	92	105	48	-61	-3.8	2	8.3	-6
Sep	0	2	3	25	75	46	-96	-6.0	-3	8.3	-11
Oct	4	3	4	84	47	48	-10	-0.6	3	8.3	-5
Nov	19	11	16	99	0	46	52	3.3	19	8.3	11
Dec	80	46	65	107	0	48	59	3.7	69	1.4	67
Total	**327**	**327**	**466**	**758**	**552**	**561**	**-355**	**-22**	**444**	**72**	**371**

Storage Required: **28**
Equivalent Average Pond Storage Depth (m): **0.44**

Notes: 1) Sum of water surpluses from varying land-use areas within contibuting drainage area (north catchment - 143 ha).
2) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
3) Pond input is the sum of rainfall and snowmelt over pond areas (ponds 1, 2, 3 & 4 - 6.3 ha).
4) Comprised of general site dust control, dust suppression on portable crushing plant, and wet down of shot rock.

Table 15
Whites Point Quarry Hydrologic Budget
Summary Results - Operation (Drought Conditions)

Month	Net Water Surplus[1] (m^3 x 1000)							
	Year 0	**Year 5**	**Year 10**	**Year 15**	**Year 20**	**Year 30**	**Year 40**	**Year 50**
Jan	43	12	12	12	11	11	13	38
Feb	68	43	43	43	42	42	43	69
Mar	74	46	46	46	46	46	46	75
Apr	98	63	63	63	62	62	63	103
May	48	*-4*	*-4*	*-4*	*-4*	*-4*	*-4*	37
Jun	24	*-25*	*-25*	*-25*	*-25*	*-25*	*-25*	15
Jul	11	*-43*	*-43*	*-43*	*-43*	*-43*	*-43*	*-2*
Aug	6	*-41*	*-41*	*-41*	*-41*	*-41*	*-41*	0
Sep	2	*-47*	*-47*	*-47*	*-47*	*-47*	*-47*	*-6*
Oct	2	*-38*	*-38*	*-39*	*-39*	*-39*	*-38*	1
Nov	6	*-21*	*-22*	*-23*	*-26*	*-26*	*-19*	8
Dec	60	40	39	39	36	36	40	62
Total	**440**	**-16**	**-18**	**-21**	**-29**	**-29**	**-13**	**399**
Storage Required (m^3 x 1000)	**N/A**	**219**	**221**	**222**	**226**	**226**	**217**	**N/A**

Notes: 1) Represents available surplus water after all losses have been considered and demand satisfied. Negative values represent a water deficit.

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Table 16
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 0 (Existing)

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[5]	Other Demand	Net Surplus
	Water Surplus[2] (mm)	Surface Runoff[3] (mm)	Runoff Volume (m^3 x 1000)	Input[4] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	18	30	43	19	0	48	-29	-0.2	43	n/a	n/a	43
Feb	64	47	67	66	0	43	22	0.2	68	n/a	n/a	68
Mar	57	52	74	61	0	48	13	0.1	74	n/a	n/a	74
Apr	85	68	97	104	0	46	58	0.5	98	n/a	n/a	98
May	0	34	49	24	96	48	-120	-1.0	48	n/a	n/a	48
Jun	0	17	24	60	108	46	-95	-0.8	24	n/a	n/a	24
Jul	0	9	12	20	121	48	-149	-1.3	11	n/a	n/a	11
Aug	0	4	6	92	105	48	-61	-0.5	6	n/a	n/a	6
Sep	0	2	3	25	75	46	-96	-0.8	2	n/a	n/a	2
Oct	0	1	2	84	47	48	-10	-0.1	2	n/a	n/a	2
Nov	6	4	5	99	0	46	52	0.4	6	n/a	n/a	6
Dec	80	42	60	107	0	48	59	0.5	60	n/a	n/a	60
Total	**311**	**311**	**443**	**758**	**552**	**561**	**-355**	**-3**	**440**	**n/a**	**n/a**	**440**

Storage Required: N/A

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 17
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 5

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply	Make-up Demand[5]	Other Demand	Net Surplus
	Water Surplus[2] (mm)	Surface Runoff[3] (mm)	Runoff Volume (m^3 x 1000)	Input[4] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)	(m^3 x 1000)
Jan	18	31	45	19	0	48	-29	-2.8	42	24	6	12
Feb	64	48	68	66	0	43	22	2.2	70	22	6	43
Mar	57	52	74	61	0	48	13	1.3	76	24	6	46
Apr	85	69	98	104	0	46	58	5.5	103	23	17	63
May	0	34	49	24	96	48	-120	-11.5	37	24	17	-4
Jun	0	17	24	60	108	46	-95	-9.1	15	23	17	-25
Jul	0	9	12	20	121	48	-149	-14.3	-2	24	17	-43
Aug	0	4	6	92	105	48	-61	-5.9	0	24	17	-41
Sep	0	2	3	25	75	46	-96	-9.2	-6	23	17	-47
Oct	3	3	4	84	47	48	-10	-1.0	3	24	17	-38
Nov	18	10	15	99	0	46	52	5.0	20	23	17	-21
Dec	79	45	64	107	0	48	59	5.7	70	24	6	40
Total	**324**	**324**	**462**	**758**	**552**	**561**	**-355**	**-34**	**428**	**284**	**160**	**-16**

Storage Required: 219
Equivalent Average Pond Depth (m): 2.28

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 18
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 10

Month	Quarry and Watershed Areas: Water Surplus[2] (mm)	Quarry and Watershed Areas: Surface Runoff[3] (mm)	Quarry and Watershed Areas: Runoff Volume (m^3 x 1000)	Pond Areas: Input[4] (mm)	Pond Areas: Evaporation (mm)	Pond Areas: Seepage Loss (mm)	Pond Areas: Net Input (mm)	Pond Areas: Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Make-up Demand[5] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	18	31	45	19	0	48	-29	-2.8	42	24	6	12
Feb	64	48	68	66	0	43	22	2.2	70	22	6	43
Mar	57	52	74	61	0	48	13	1.3	76	24	6	46
Apr	85	68	98	104	0	46	58	5.5	103	23	17	63
May	0	34	49	24	96	48	-120	-11.5	37	24	17	-4
Jun	0	17	24	60	108	46	-95	-9.1	15	23	17	-25
Jul	0	9	12	20	121	48	-149	-14.3	-2	24	17	-43
Aug	0	4	6	92	105	48	-61	-5.9	0	24	17	-41
Sep	0	2	3	25	75	46	-96	-9.2	-6	23	17	-47
Oct	3	3	4	84	47	48	-10	-1.0	3	24	17	-38
Nov	16	9	14	99	0	46	52	5.0	19	23	17	-22
Dec	79	44	63	107	0	48	59	5.7	69	24	6	39
Total	**322**	**322**	**460**	**758**	**552**	**561**	**-355**	**-34**	**426**	**284**	**160**	**-18**

Storage Required: 221
Equivalent Average Pond Depth (m): 2.30

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 19
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 15

Month	Quarry and Watershed Areas: Water Surplus[2] (mm)	Quarry and Watershed Areas: Surface Runoff[3] (mm)	Quarry and Watershed Areas: Runoff Volume (m^3 x 1000)	Pond Areas: Input[4] (mm)	Pond Areas: Evaporation (mm)	Pond Areas: Seepage Loss (mm)	Pond Areas: Net Input (mm)	Pond Areas: Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Make-up Demand[5] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	18	31	44	19	0	48	-29	-2.8	41	24	6	12
Feb	64	48	68	66	0	43	22	2.2	70	22	6	43
Mar	57	52	74	61	0	48	13	1.3	76	24	6	46
Apr	85	68	98	104	0	46	58	5.5	103	23	17	63
May	0	34	49	24	96	48	-120	-11.5	37	24	17	-4
Jun	0	17	24	60	108	46	-95	-9.1	15	23	17	-25
Jul	0	9	12	20	121	48	-149	-14.3	-2	24	17	-43
Aug	0	4	6	92	105	48	-61	-5.9	0	24	17	-41
Sep	0	2	3	25	75	46	-96	-9.2	-6	23	17	-47
Oct	3	2	3	84	47	48	-10	-1.0	3	24	17	-39
Nov	15	9	13	99	0	46	52	5.0	18	23	17	-23
Dec	79	44	63	107	0	48	59	5.7	68	24	6	39
Total	**321**	**321**	**457**	**758**	**552**	**561**	**-355**	**-34**	**423**	**284**	**160**	**-21**

Storage Required: 222
Equivalent Average Pond Depth (m): 2.31

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 20
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 20

Month	Quarry and Watershed Areas: Water Surplus[2] (mm)	Quarry and Watershed Areas: Surface Runoff[3] (mm)	Quarry and Watershed Areas: Runoff Volume (m^3 x 1000)	Pond Areas: Input[4] (mm)	Pond Areas: Evaporation (mm)	Pond Areas: Seepage Loss (mm)	Pond Areas: Net Input (mm)	Pond Areas: Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Make-up Demand[5] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	18	30	43	19	0	48	-29	-2.8	40	24	6	11
Feb	64	47	68	66	0	43	22	2.2	70	22	6	42
Mar	57	52	74	61	0	48	13	1.3	75	24	6	46
Apr	85	68	97	104	0	46	58	5.5	103	23	17	62
May	0	34	49	24	96	48	-120	-11.5	37	24	17	-4
Jun	0	17	24	60	108	46	-95	-9.1	15	23	17	-25
Jul	0	9	12	20	121	48	-149	-14.3	-2	24	17	-43
Aug	0	4	6	92	105	48	-61	-5.9	0	24	17	-41
Sep	0	2	3	25	75	46	-96	-9.2	-6	23	17	-47
Oct	2	2	3	84	47	48	-10	-1.0	2	24	17	-39
Nov	11	7	9	99	0	46	52	5.0	14	23	17	-26
Dec	78	42	61	107	0	48	59	5.7	66	24	6	36
Total	**315**	**315**	**449**	**758**	**552**	**561**	**-355**	**-34**	**415**	**284**	**160**	**-29**

Storage Required: 226
Equivalent Average Pond Depth (m): 2.35

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 21
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 30

Month	Quarry and Watershed Areas: Water Surplus[2] (mm)	Quarry and Watershed Areas: Surface Runoff[3] (mm)	Quarry and Watershed Areas: Runoff Volume (m^3 x 1000)	Pond Areas: Input[4] (mm)	Pond Areas: Evaporation (mm)	Pond Areas: Seepage Loss (mm)	Pond Areas: Net Input (mm)	Pond Areas: Volume (m^3 x 1000)	Total Available Water Supply (m^3 x 1000)	Make-up Demand[5] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
Jan	18	30	43	19	0	48	-29	-2.8	40	24	6	11
Feb	64	47	68	66	0	43	22	2.2	70	22	6	42
Mar	57	52	74	61	0	48	13	1.3	75	24	6	46
Apr	85	68	97	104	0	46	58	5.5	103	23	17	62
May	0	34	49	24	96	48	-120	-11.5	37	24	17	-4
Jun	0	17	24	60	108	46	-95	-9.1	15	23	17	-25
Jul	0	9	12	20	121	48	-149	-14.3	-2	24	17	-43
Aug	0	4	6	92	105	48	-61	-5.9	0	24	17	-41
Sep	0	2	3	25	75	46	-96	-9.2	-6	23	17	-47
Oct	2	2	3	84	47	48	-10	-1.0	2	24	17	-39
Nov	11	7	9	99	0	46	52	5.0	14	23	17	-26
Dec	78	42	61	107	0	48	59	5.7	66	24	6	36
Total	**315**	**315**	**449**	**758**	**552**	**561**	**-355**	**-34**	**415**	**284**	**160**	**-29**

Storage Required: 226
Equivalent Average Pond Depth (m): 2.35

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 22
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 40

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply (m^3 x 1000)	Make-up Demand[5] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
	Water Surplus[2] (mm)	Surface Runoff[3] (mm)	Runoff Volume (m^3 x 1000)	Input[4] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)				
Jan	18	32	45	19	0	48	-29	-2.8	42	24	6	13
Feb	64	48	68	66	0	43	22	2.2	71	22	6	43
Mar	57	52	75	61	0	48	13	1.3	76	24	6	46
Apr	85	69	98	104	0	46	58	5.5	103	23	17	63
May	0	34	49	24	96	48	-120	-11.5	37	24	17	-4
Jun	0	17	24	60	108	46	-95	-9.1	15	23	17	-25
Jul	0	9	12	20	121	48	-149	-14.3	-2	24	17	-43
Aug	0	4	6	92	105	48	-61	-5.9	0	24	17	-41
Sep	0	2	3	25	75	46	-96	-9.2	-6	23	17	-47
Oct	4	3	4	84	47	48	-10	-1.0	3	24	17	-38
Nov	20	11	16	99	0	46	52	5.0	21	23	17	-19
Dec	79	45	64	107	0	48	59	5.7	70	24	6	40
Total	**326**	**326**	**465**	**758**	**552**	**561**	**-355**	**-34**	**431**	**284**	**160**	**-13**

Storage Required: 217
Equivalent Average Pond Depth (m): 2.26

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 23
Whites Point Quarry Hydrologic Budget
Detailed Summary Table - Drought Conditions[1]
Quarry Conceptual Layout - Year 50

Month	Quarry and Watershed Areas			Pond Areas					Total Available Water Supply (m^3 x 1000)	Make-up Demand[5] (m^3 x 1000)	Other Demand (m^3 x 1000)	Net Surplus (m^3 x 1000)
	Water Surplus[2] (mm)	Surface Runoff[3] (mm)	Runoff Volume (m^3 x 1000)	Input[4] (mm)	Evaporation (mm)	Seepage Loss (mm)	Net Input (mm)	Volume (m^3 x 1000)				
Jan	18	29	41	19	0	48	-29	-2.8	38	n/a	n/a	38
Feb	64	47	66	66	0	43	22	2.2	69	n/a	n/a	69
Mar	57	52	73	61	0	48	13	1.3	75	n/a	n/a	75
Apr	85	68	97	104	0	46	58	5.5	103	n/a	n/a	103
May	0	34	49	24	96	48	-120	-11.5	37	n/a	n/a	37
Jun	0	17	24	60	108	46	-95	-9.1	15	n/a	n/a	15
Jul	0	9	12	20	121	48	-149	-14.3	-2	n/a	n/a	-2
Aug	0	4	6	92	105	48	-61	-5.9	0	n/a	n/a	0
Sep	0	2	3	25	75	46	-96	-9.2	-6	n/a	n/a	-6
Oct	1	1	2	84	47	48	-10	-1.0	1	n/a	n/a	1
Nov	3	2	3	99	0	46	52	5.0	8	n/a	n/a	8
Dec	77	39	56	107	0	48	59	5.7	62	n/a	n/a	62
Total	**304**	**304**	**434**	**758**	**552**	**561**	**-355**	**-34**	**399**	**n/a**	**n/a**	**399**

Storage Required: N/A

Notes: 1) Based on historic climate data for 1965.
2) Sum of water surpluses from varying land-use areas within contibuting drainage area.
3) Runoff calculated as 50% of surplus for current month plus 50% of runoff from previous month.
4) Pond input is the sum of rainfall and snowmelt over pond areas.
5) Based on 5% process loss and 16 hr/day operation, 264 days/yr.

Table 24
Whites Point Quarry Hydrologic Budget
Summary Results - South Catchment (Average Conditions)

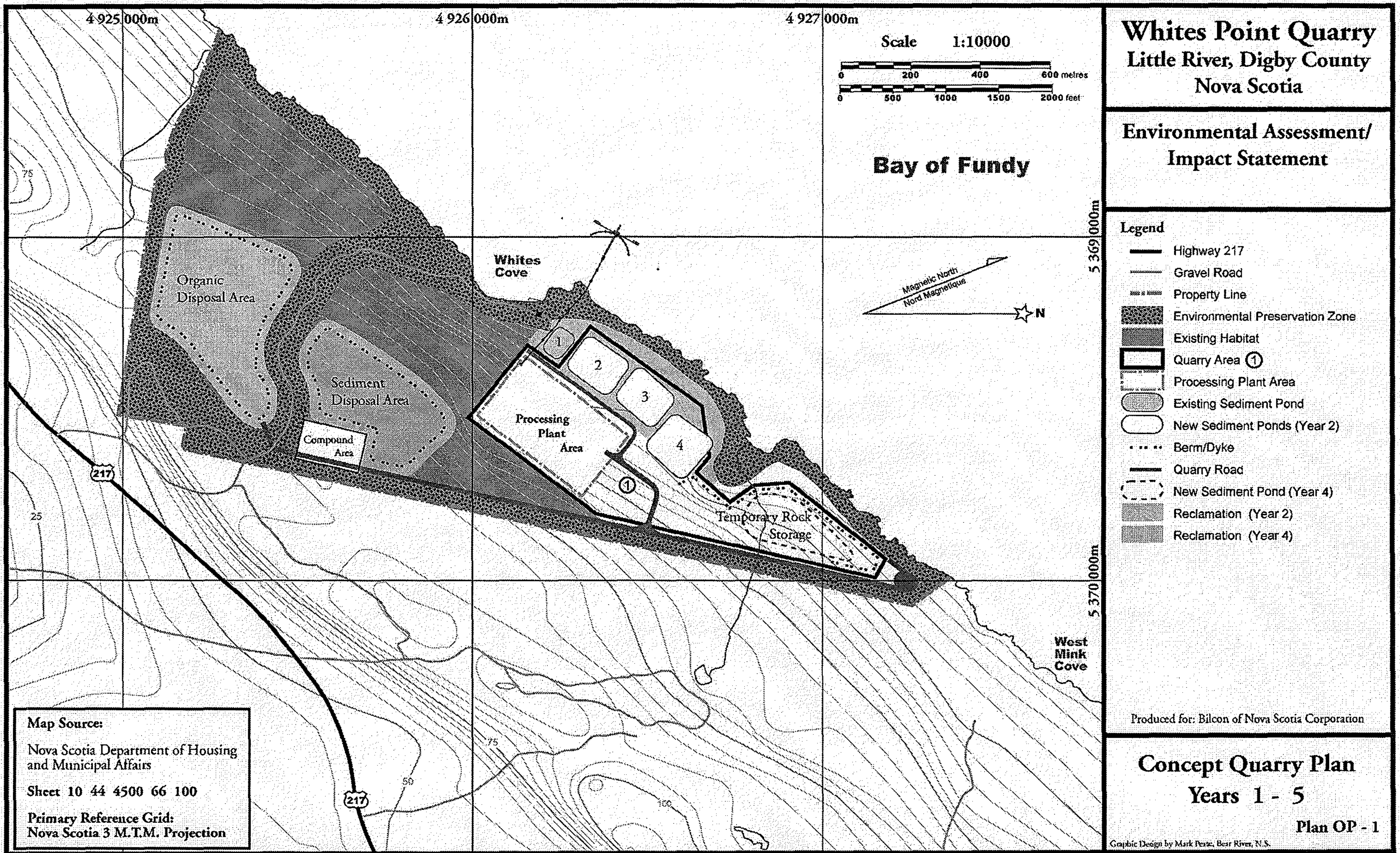
Month	Net Water Surplus[1] (m^3 x 1000)			
	Year 20	**Year 30**	**Year 40**	**Year 50**
Jan	32	32	31	32
Feb	34	34	33	33
Mar	40	40	39	39
Apr	33	33	33	33
May	23	23	23	23
Jun	14	14	14	14
Jul	8	8	8	8
Aug	4	4	4	4
Sep	4	4	4	4
Oct	9	9	7	6
Nov	21	21	19	19
Dec	30	30	29	29
Total	**252**	**252**	**244**	**244**
Storage Required (m^3 x 1000)	**N/A**	**N/A**	**N/A**	**N/A**

Notes:

1) Represents available surplus water after all losses have been considered and demand satisfied.
Negative values represent a water deficit.

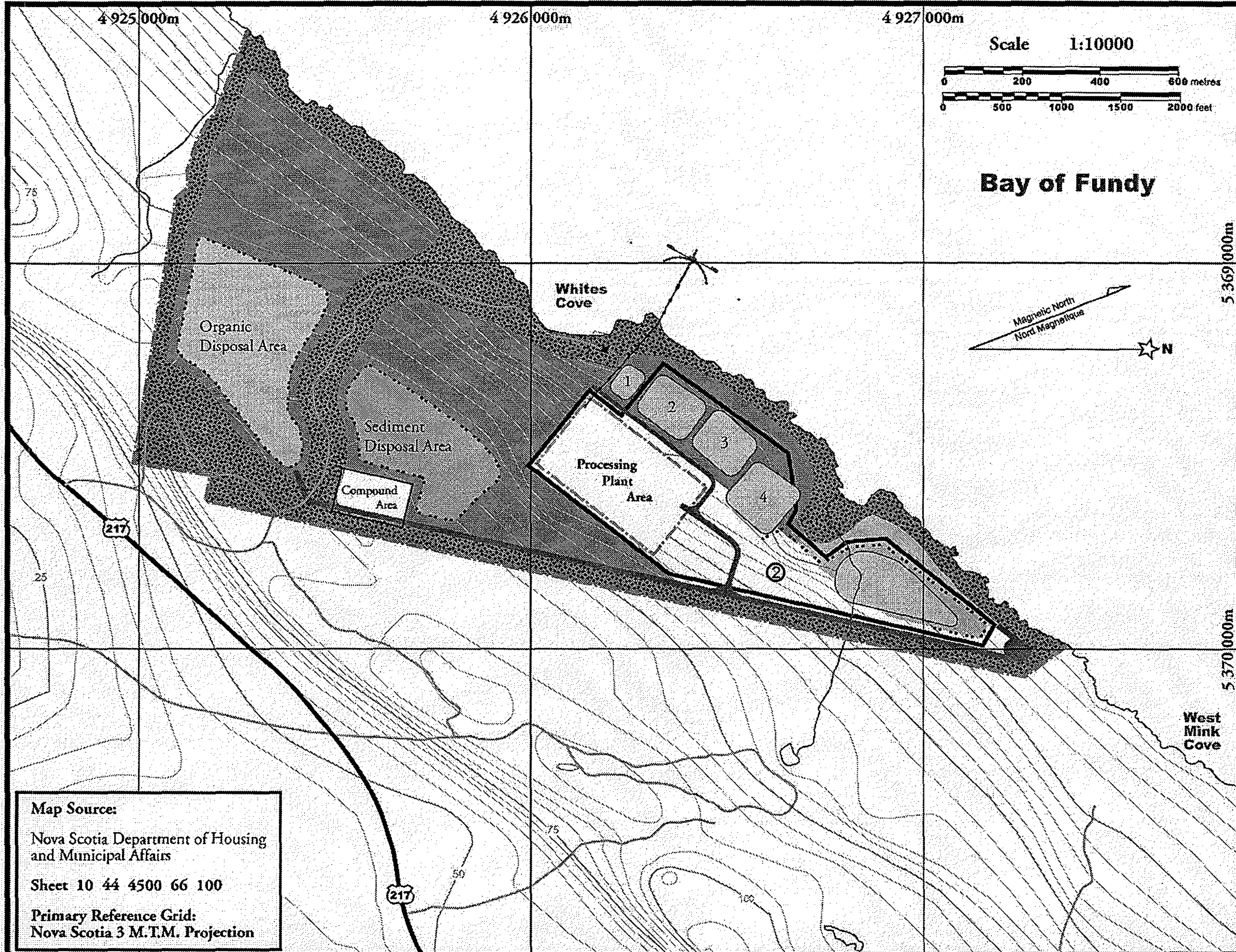
APPENDIX A

QUARRY CONCEPT PLANS



Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing Habitat
Quarry Area 1
Processing Plant Area
Existing Sediment Pond
New Sediment Ponds (Year 2)
Berm/Dyke
Quarry Road
New Sediment Pond (Year 4)
Reclamation (Year 2)
Reclamation (Year 4)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 1 - 5
Plan OP - 1
Graphic Design by Mark Peare, Bear River, N.S.
Scale 1:10000
0 200 400 600 metres
0 500 1000 1500 2000 feet
Bay of Fundy
Whites Cove
West Mink Cove
Magnetic North
Nord Magnétique
N
4 925 000m
4 926 000m
4 927 000m
5 369 000m
5 370 000m
Organic Disposal Area
Sediment Disposal Area
Compound Area
Processing Plant Area
Temporary Rock Storage
1
2
3
4
217
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

Buxton & Kern



Map Source:

Nova Scotia Department of Housing and Municipal Affairs

Sheet 10 44 4500 66 100

Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

Whites Point Quarry

Little River, Digby County
Nova Scotia

Environmental Assessment/ Impact Statement

Legend

- Highway 217
- Gravel Road
- Property Line
- Environmental Preservation Zone
- Existing and Reclaimed Habitat
- Quarry Area ②
- Processing Plant Area
- Existing Sediment Pond
- Berm/Dyke
- Quarry Road
- Reclamation (Year 6)
- Reclamation (Year 10)

Produced for: Bilcon of Nova Scotia Corporation

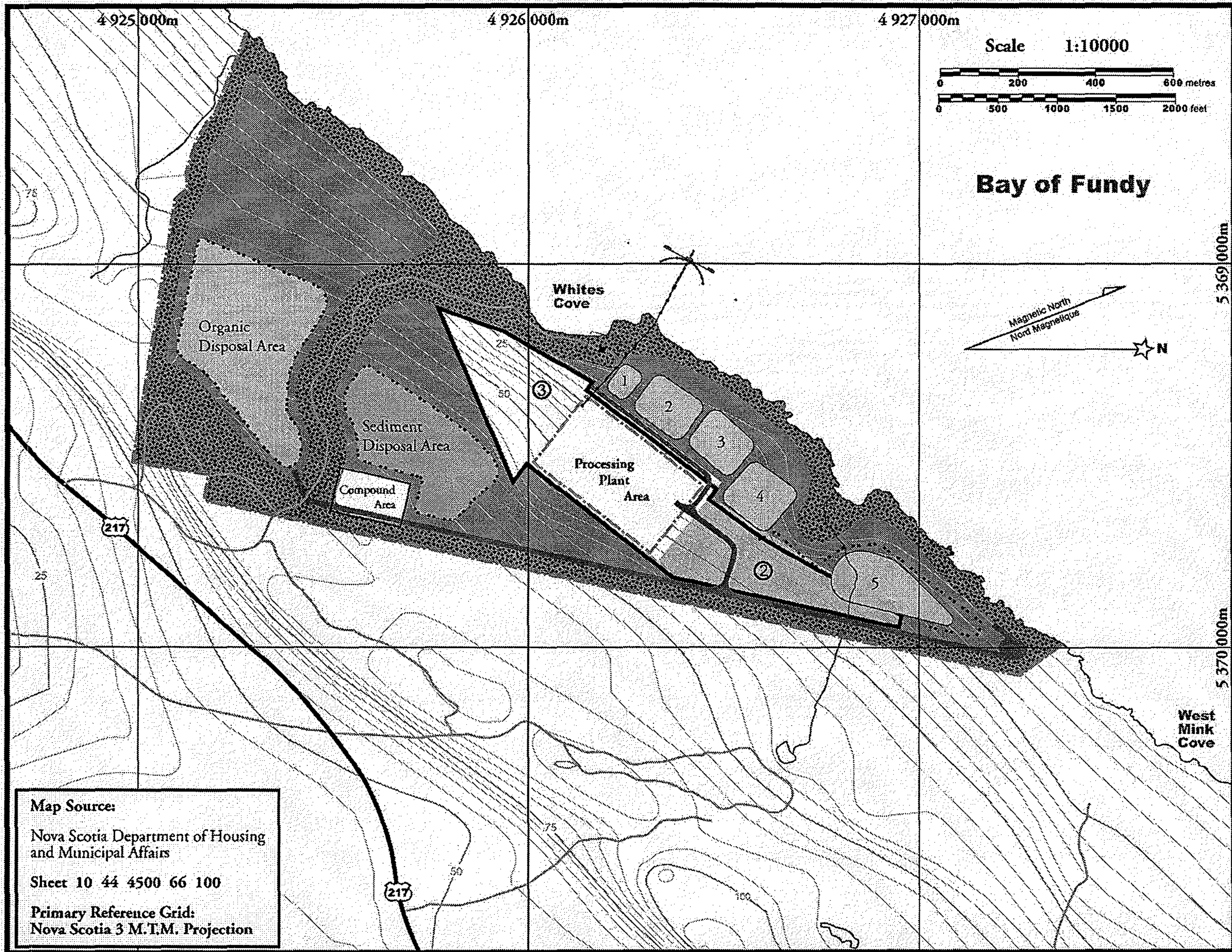
Concept Quarry Plan
Years 6 - 10

Plan OP - 2

Graphic Design by Mark Pease, Bear River, N.S.

Buxton & Kern

C0639-182



Whites Point Quarry

Little River, Digby County
Nova Scotia

Environmental Assessment/ Impact Statement

Legend

- Highway 217
- Gravel Road
- Property Line
- Environmental Preservation Zone
- Existing and Reclaimed Habitat
- Quarry Area ② and ③
- Processing Plant Area
- Existing Sediment Pond
- Berm/Dyke
- Quarry Road
- Reclamation (Year 14)

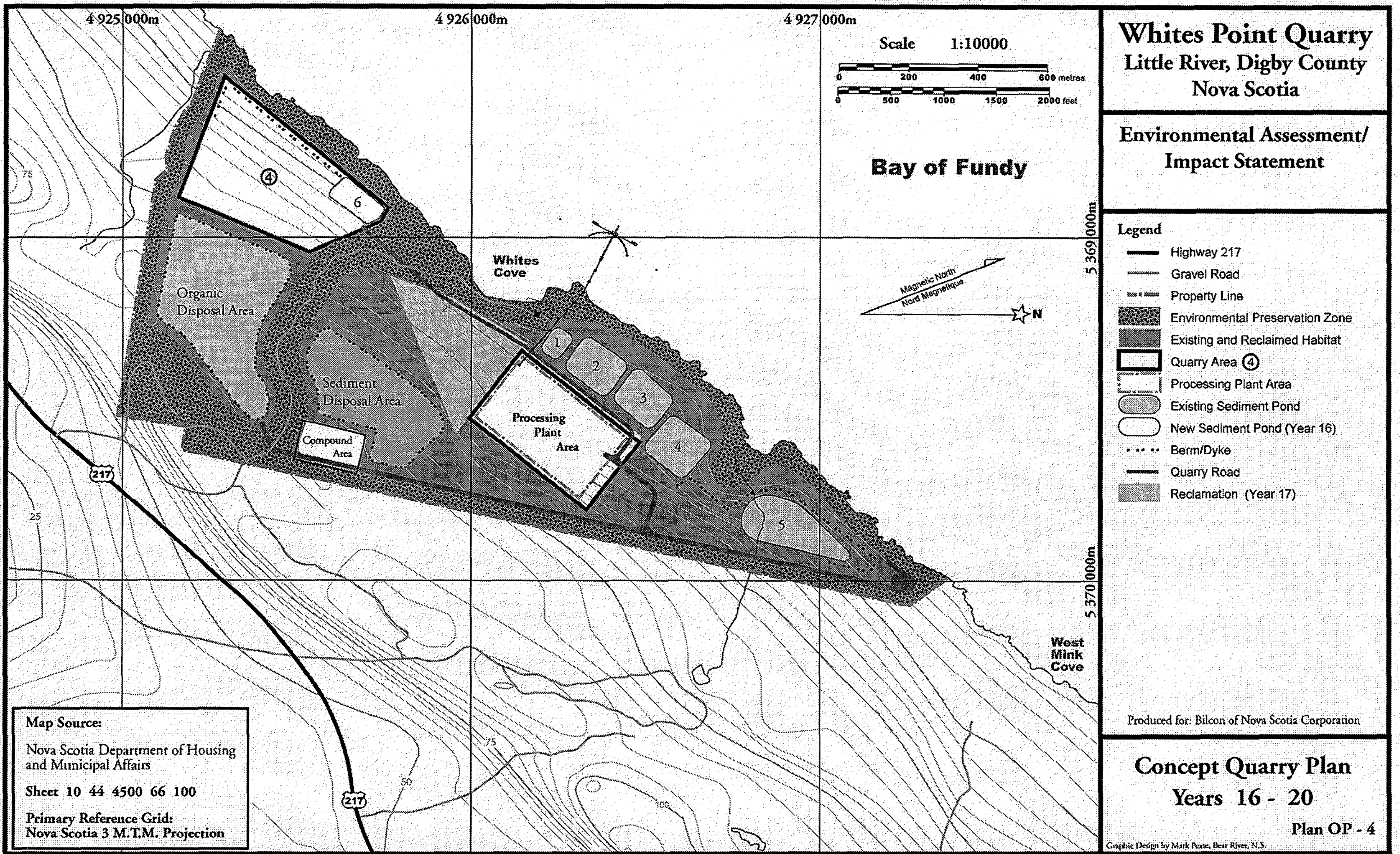
Produced for: Bilcon of Nova Scotia Corporation

Concept Quarry Plan
Years 11 - 15

Plan OP - 3

Graphic Design by Mark Peare, Bear River, N.S.

Buxton & Kern



4 925 000m
4 926 000m
4 927 000m
5 369 000m
5 370 000m
Scale 1:10000
0 200 400 600 metres
0 500 1000 1500 2000 feet
Bay of Fundy
Whites Cove
West Mink Cove
Magnetic North
Nord Magnetique
N
Organic Disposal Area
Sediment Disposal Area
Compound Area
Processing Plant Area
217
Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area ④
Processing Plant Area
Existing Sediment Pond
New Sediment Pond (Year 16)
Berm/Dyke
Quarry Road
Reclamation (Year 17)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 16 - 20
Plan OP - 4
Graphic Design by Mark Pease, Bear River, N.S.
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

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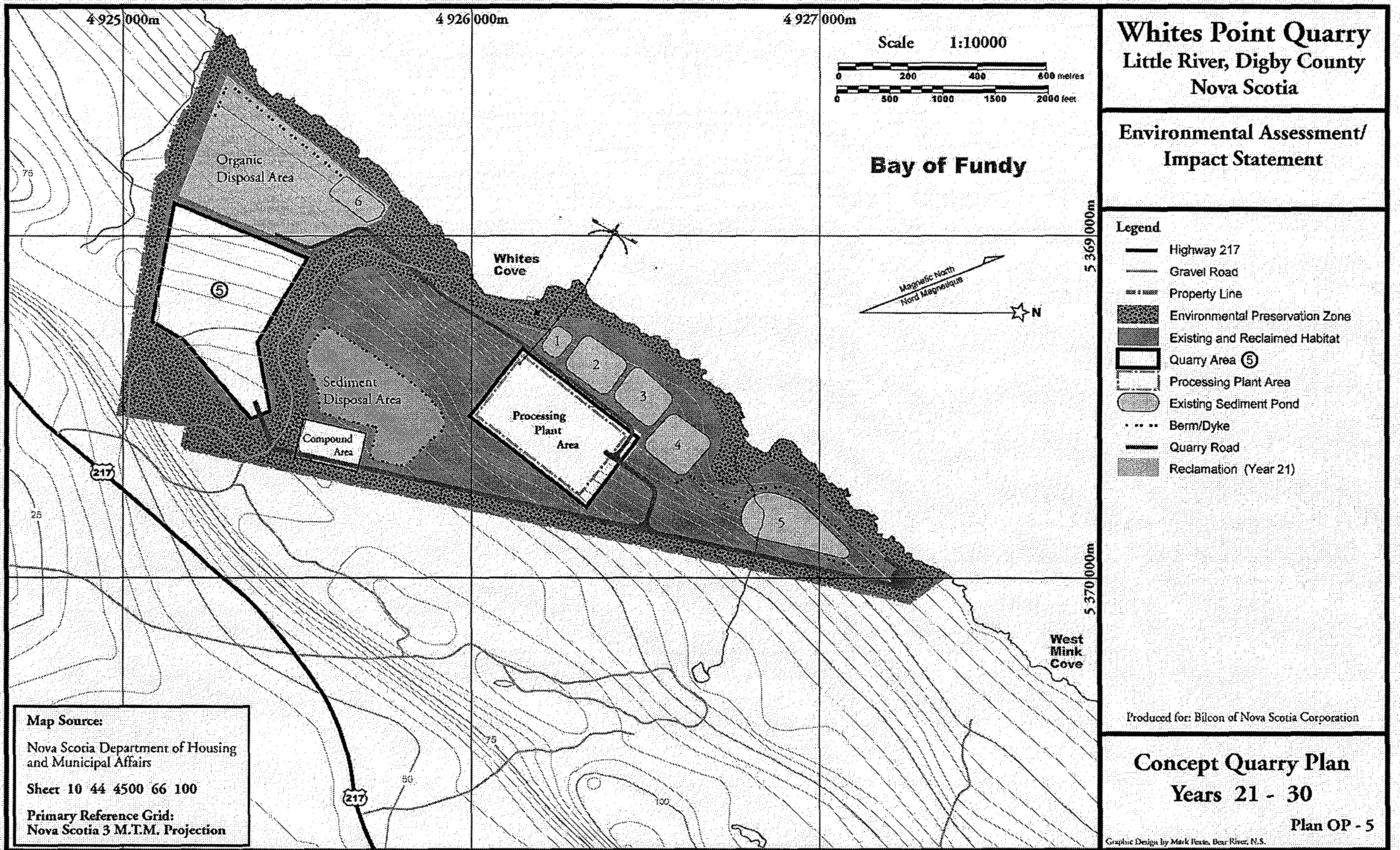
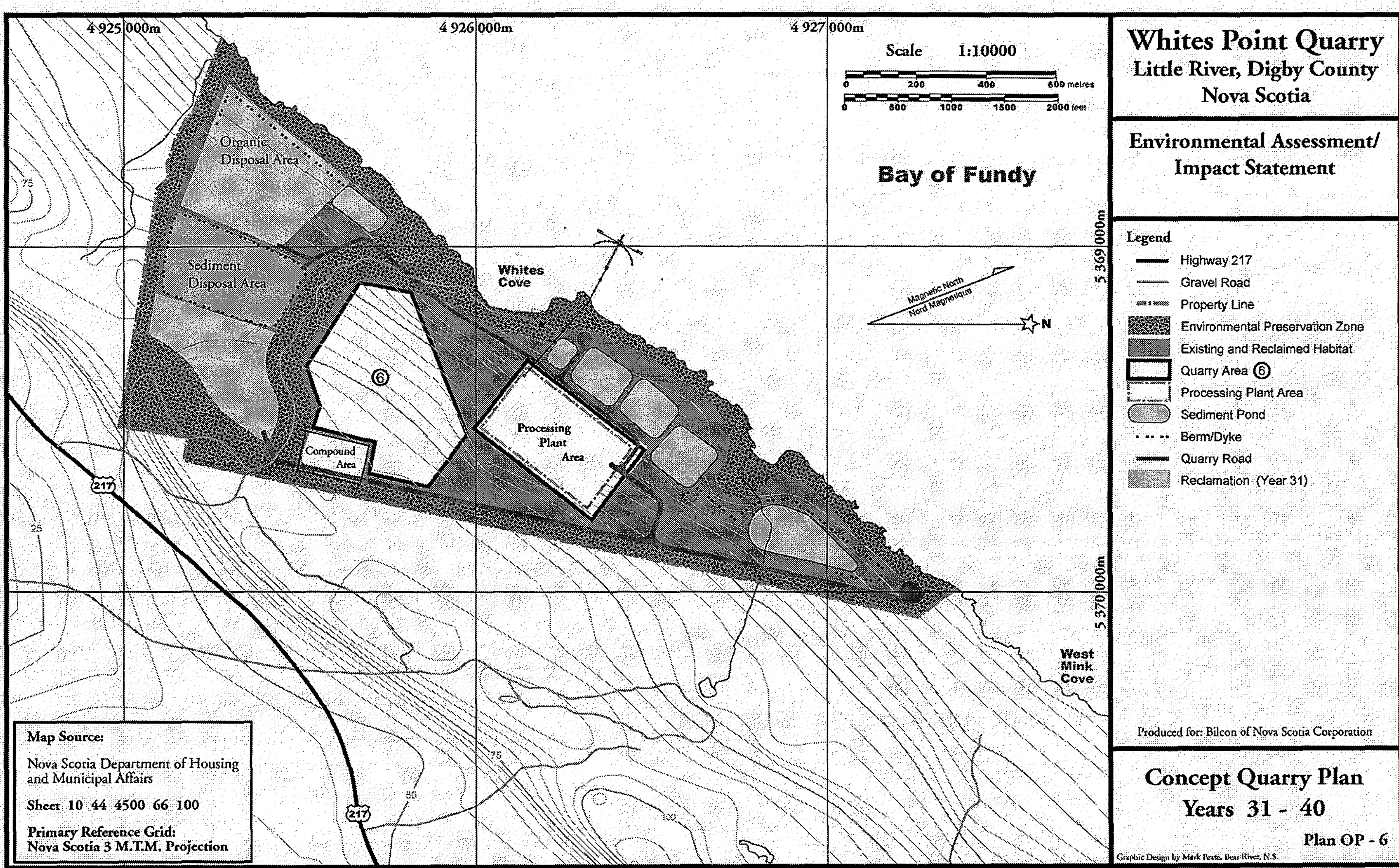

Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Existing and Reclaimed Habitat
Quarry Area ⑤
Processing Plant Area
Existing Sediment Pond
Berm/Dyke
Quarry Road
Reclamation (Year 21)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Years 21 - 30
Plan OP - 5
Graphic Design by Mark Peters, Bear River, N.S.
4 925 000m
4 926 000m
4 927 000m
5 369 000m
5 370 000m
Scale 1:10000
0 200 400 600 metres
0 500 1000 1500 2000 feet
Bay of Fundy
Whites Cove
West Mink Cove
Magnetic North
Nord Magnetique
N
Organic Disposal Area
Sediment Disposal Area
Compound Area
Processing Plant Area
217
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

Buxton & Kern

C0639-185



Buxton & Kern

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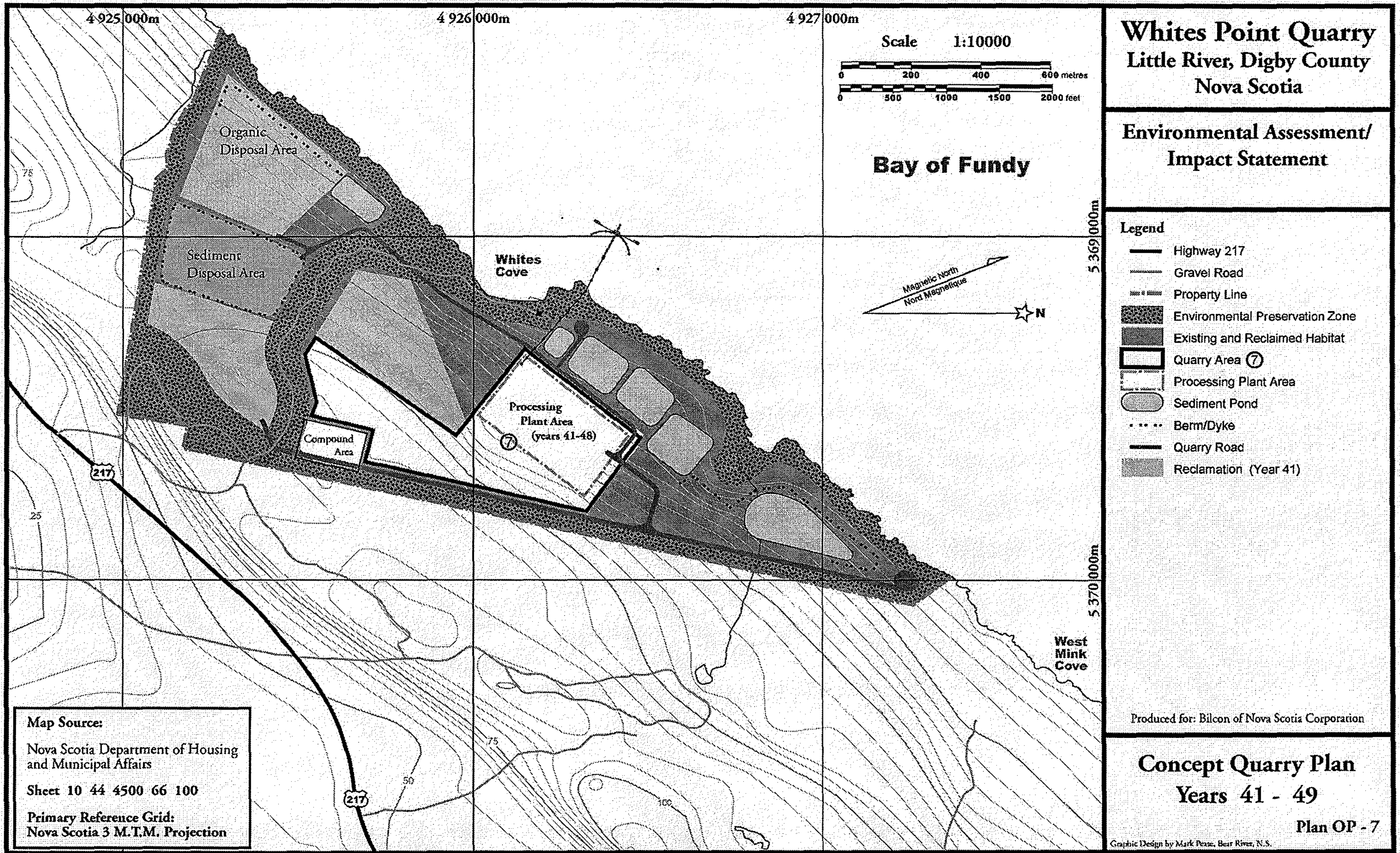
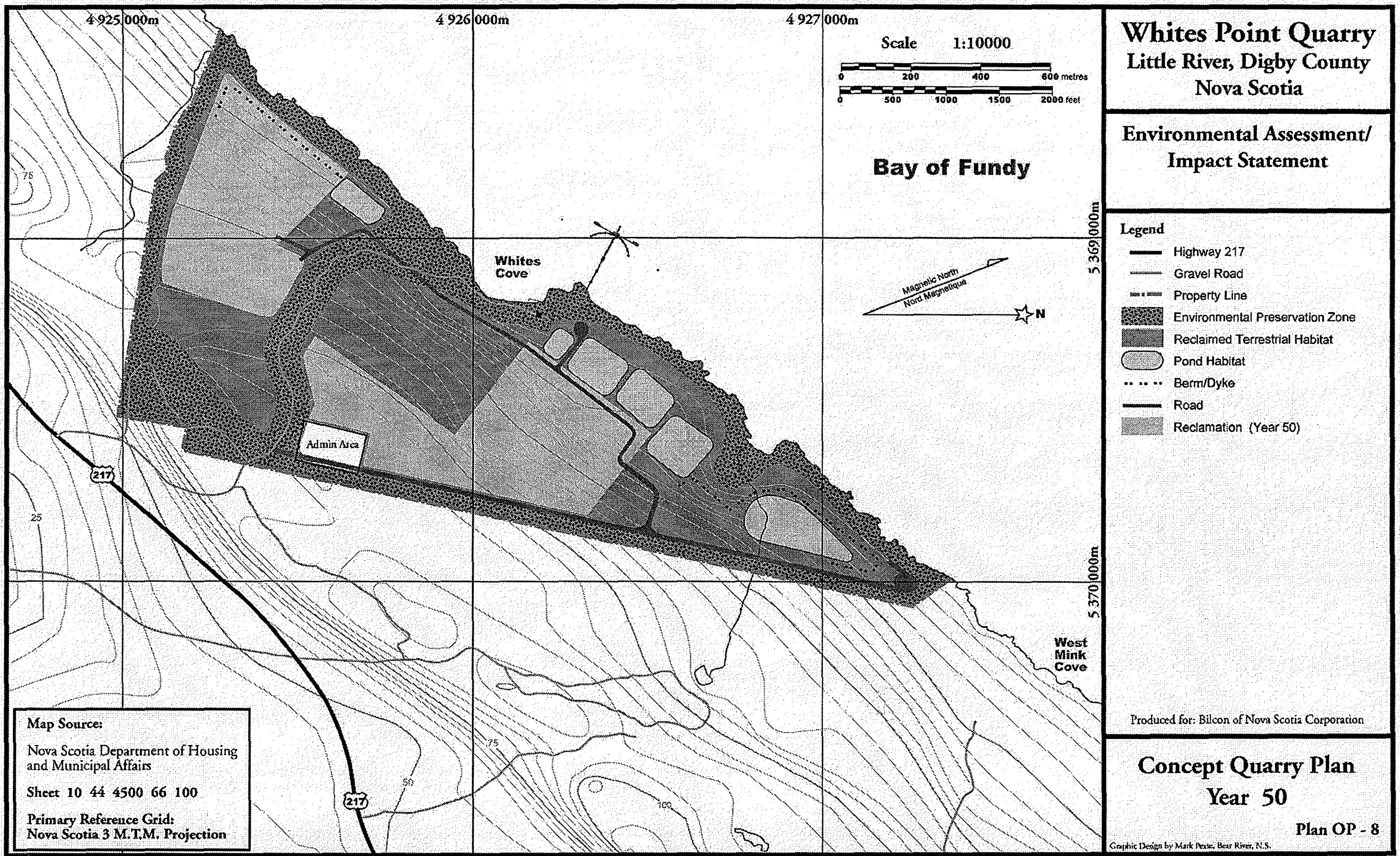


Buxton & Kern


Whites Point Quarry
Little River, Digby County
Nova Scotia
Environmental Assessment/
Impact Statement
Legend
Highway 217
Gravel Road
Property Line
Environmental Preservation Zone
Reclaimed Terrestrial Habitat
Pond Habitat
Berm/Dyke
Road
Reclamation (Year 50)
Produced for: Bilcon of Nova Scotia Corporation
Concept Quarry Plan
Year 50
Plan OP - 8
Graphic Design by Mark Pease, Bear River, N.S.
Scale 1:10000
0 200 400 600 metres
0 500 1000 1500 2000 feet
Bay of Fundy
Magnetic North
Nord Magnetique
N
4 925 000m
4 926 000m
4 927 000m
5 369 000m
5 370 000m
Whites Cove
West Mink Cove
Admin Area
217
Map Source:
Nova Scotia Department of Housing and Municipal Affairs
Sheet 10 44 4500 66 100
Primary Reference Grid:
Nova Scotia 3 M.T.M. Projection

Buxton & Kern

APPENDIX B

SUMMARY MODEL OUTPUT DATA - AVERAGE CONDITIONS

Weymouth Falls, NS WATER BUDGET MEANS FOR THE PERIOD 1963-1997 DC20492

LAT.... 44.40 WATER HOLDING CAPACITY... 25 MM HEAT INDEX... 29.75
LONG... 65.95 LOWER ZONE............... 15 MM A............ .975

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.4	117	59	41	3	3	0	97	35	25	491
28- 2	-3.5	101	53	49	3	3	0	98	34	25	590
31- 3	.2	103	79	56	10	10	0	125	2	25	695
30- 4	5.0	100	97	6	30	30	0	73	0	25	795
31- 5	9.9	103	103	0	65	64	-1	44	0	20	898
30- 6	14.2	92	92	0	94	86	-8	14	0	12	990
31- 7	17.2	86	86	0	114	83	-31	9	0	6	1077
31- 8	17.1	80	80	0	105	75	-30	5	0	6	1157
30- 9	13.6	99	99	0	73	68	-5	20	0	17	1256
31-10	9.3	102	102	0	46	45	-1	52	0	22	102
30-11	4.9	131	128	2	21	21	0	106	1	25	231
31-12	-.6	137	98	20	7	7	0	112	19	25	370
AVE	7.0 TTL	1251	1076	174	571	495	-76	755			

Weymouth Falls, NS STANDARD DEVIATIONS FOR THE PERIOD 1963-1997 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	1.8	46	40	31	3	3	0	55	49	0	106
28- 2	1.7	38	39	44	3	3	0	60	37	0	106
31- 3	1.3	43	42	48	4	4	0	65	8	0	120
30- 4	1.4	34	34	9	8	8	0	33	0	0	141
31- 5	1.3	52	52	0	9	9	3	45	0	9	155
30- 6	1.4	44	44	0	9	16	12	32	0	11	172
31- 7	1.6	53	53	0	10	33	32	24	0	11	186
31- 8	1.4	44	44	0	9	29	32	12	0	10	190
30- 9	1.1	48	48	0	6	14	13	35	0	11	200
31-10	1.1	39	39	0	5	6	4	36	0	7	39
30-11	1.2	43	43	5	5	5	0	43	4	0	59
31-12	2.2	50	54	20	4	4	0	52	27	0	91

Weymouth Falls, NS WATER BUDGET MEANS FOR THE PERIOD 1963-1997 DC20492

LAT.... 44.40 WATER HOLDING CAPACITY... 50 MM HEAT INDEX... 29.75
LONG... 65.95 LOWER ZONE.............. 30 MM A............ .975

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.4	117	59	41	3	3	0	96	35	50	491
28- 2	-3.5	101	53	49	3	3	0	98	34	50	590
31- 3	.2	103	79	56	10	10	0	125	2	50	695
30- 4	5.0	100	97	6	30	30	0	73	0	50	795
31- 5	9.9	103	103	0	65	65	0	44	0	44	898
30- 6	14.2	92	92	0	94	92	-2	13	0	31	990
31- 7	17.2	86	86	0	114	93	-21	8	0	15	1077
31- 8	17.1	80	80	0	105	79	-26	2	0	13	1157
30- 9	13.6	99	99	0	73	68	-5	15	0	29	1256
31-10	9.3	102	102	0	46	45	-1	42	0	44	102
30-11	4.9	131	128	2	21	21	0	102	1	50	231
31-12	-.6	137	98	20	7	7	0	112	19	50	370
AVE	7.0 TTL	1251	1076	174	571	516	-55	730			

Weymouth Falls, NS STANDARD DEVIATIONS FOR THE PERIOD 1963-1997 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	1.8	46	40	31	3	3	0	55	49	0	106
28- 2	1.7	38	39	44	3	3	0	60	37	0	106
31- 3	1.3	43	42	48	4	4	0	65	8	0	120
30- 4	1.4	34	34	9	8	8	0	33	0	0	141
31- 5	1.3	52	52	0	9	9	0	45	0	12	155
30- 6	1.4	44	44	0	9	10	4	32	0	20	172
31- 7	1.6	53	53	0	10	28	27	23	0	20	186
31- 8	1.4	44	44	0	9	28	30	6	0	20	190
30- 9	1.1	48	48	0	6	13	12	31	0	20	200
31-10	1.1	39	39	0	5	6	3	35	0	14	39
30-11	1.2	43	43	5	5	5	0	45	4	0	59
31-12	2.2	50	54	20	4	4	0	52	27	0	91

Weymouth Falls, NS WATER BUDGET MEANS FOR THE PERIOD 1963-1997 DC20492

LAT.... 44.40 WATER HOLDING CAPACITY... 75 MM HEAT INDEX... 29.75
LONG... 65.95 LOWER ZONE............... 45 MM A............ .975

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.4	117	59	41	3	3	0	96	35	75	491
28- 2	-3.5	101	53	49	3	3	0	98	34	75	590
31- 3	.2	103	79	56	10	10	0	125	2	75	695
30- 4	5.0	100	97	6	30	30	0	73	0	75	795
31- 5	9.9	103	103	0	65	65	0	44	0	69	898
30- 6	14.2	92	92	0	94	94	0	13	0	54	990
31- 7	17.2	86	86	0	114	103	-11	8	0	29	1077
31- 8	17.1	80	80	0	105	84	-21	2	0	23	1157
30- 9	13.6	99	99	0	73	69	-4	12	0	41	1256
31-10	9.3	102	102	0	46	45	-1	33	0	65	102
30-11	4.9	131	128	2	21	21	0	98	1	75	231
31-12	-.6	137	98	20	7	7	0	112	19	75	370
AVE	7.0 TTL	1251	1076	174	571	534	-37	714			

Weymouth Falls, NS STANDARD DEVIATIONS FOR THE PERIOD 1963-1997 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	1.8	46	40	31	3	3	0	55	49	0	106
28- 2	1.7	38	39	44	3	3	0	60	37	0	106
31- 3	1.3	43	42	48	4	4	0	65	8	0	120
30- 4	1.4	34	34	9	8	8	0	33	0	0	141
31- 5	1.3	52	52	0	9	9	0	45	0	12	155
30- 6	1.4	44	44	0	9	9	0	32	0	22	172
31- 7	1.6	53	53	0	10	21	21	23	0	29	186
31- 8	1.4	44	44	0	9	26	27	5	0	28	190
30- 9	1.1	48	48	0	6	12	10	25	0	29	200
31-10	1.1	39	39	0	5	6	3	35	0	22	39
30-11	1.2	43	43	5	5	5	0	47	4	0	59
31-12	2.2	50	54	20	4	4	0	52	27	0	91

WBNRMSD.100.TXT

Weymouth Falls, NS   WATER BUDGET MEANS FOR THE PERIOD 1963-1997   DC20492

LAT.... 44.40   WATER HOLDING CAPACITY...100 MM   HEAT INDEX... 29.75
LONG... 65.95   LOWER ZONE.............. 60 MM   A............ .975

DATE	TEMP (C)		PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.4		117	59	41	3	3	0	96	35	100	491
28- 2	-3.5		101	53	49	3	3	0	98	34	100	590
31- 3	.2		103	79	56	10	10	0	125	2	100	695
30- 4	5.0		100	97	6	30	30	0	73	0	100	795
31- 5	9.9		103	103	0	65	65	0	44	0	94	898
30- 6	14.2		92	92	0	94	94	0	13	0	79	990
31- 7	17.2		86	86	0	114	110	-5	8	0	47	1077
31- 8	17.1		80	80	0	105	90	-15	2	0	36	1157
30- 9	13.6		99	99	0	73	70	-3	9	0	55	1256
31-10	9.3		102	102	0	46	45	-1	28	0	83	102
30-11	4.9		131	128	2	21	21	0	92	1	100	231
31-12	-.6		137	98	20	7	7	0	112	19	100	370
AVE	7.0	TTL	1251	1076	174	571	548	-24	700			

Weymouth Falls, NS   STANDARD DEVIATIONS FOR THE PERIOD 1963-1997   DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	1.8	46	40	31	3	3	0	55	49	0	106
28- 2	1.7	38	39	44	3	3	0	60	37	0	106
31- 3	1.3	43	42	48	4	4	0	65	8	0	120
30- 4	1.4	34	34	9	8	8	0	33	0	0	141
31- 5	1.3	52	52	0	9	9	0	45	0	12	155
30- 6	1.4	44	44	0	9	9	0	32	0	22	172
31- 7	1.6	53	53	0	10	15	13	23	0	36	186
31- 8	1.4	44	44	0	9	24	25	5	0	36	190
30- 9	1.1	48	48	0	6	11	10	22	0	38	200
31-10	1.1	39	39	0	5	6	4	36	0	28	39
30-11	1.2	43	43	5	5	5	0	49	4	0	59
31-12	2.2	50	54	20	4	4	0	52	27	0	91

Weymouth Falls, NS WATER BUDGET MEANS FOR THE PERIOD 1963-1997 DC20492

LAT.... 44.40 WATER HOLDING CAPACITY...150 MM HEAT INDEX... 29.75
LONG... 65.95 LOWER ZONE.............. 90 MM A........... .975

DATE	TEMP (C)		PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.4		117	59	41	3	3	0	95	35	150	491
28- 2	-3.5		101	53	49	3	3	0	98	34	150	590
31- 3	.2		103	79	56	10	10	0	125	2	150	695
30- 4	5.0		100	97	6	30	30	0	73	0	150	795
31- 5	9.9		103	103	0	65	65	0	44	0	144	898
30- 6	14.2		92	92	0	94	94	0	13	0	129	990
31- 7	17.2		86	86	0	114	114	-1	8	0	93	1077
31- 8	17.1		80	80	0	105	98	-7	2	0	73	1157
30- 9	13.6		99	99	0	73	71	-2	9	0	92	1256
31-10	9.3		102	102	0	46	45	-1	26	0	124	102
30-11	4.9		131	128	2	21	21	0	84	1	148	231
31-12	-.6		137	98	20	7	7	0	110	19	150	370
AVE	7.0	TTL	1251	1076	174	571	561	-11	687			

Weymouth Falls, NS STANDARD DEVIATIONS FOR THE PERIOD 1963-1997 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	1.8	46	40	31	3	3	0	55	49	0	106
28- 2	1.7	38	39	44	3	3	0	60	37	0	106
31- 3	1.3	43	42	48	4	4	0	65	8	0	120
30- 4	1.4	34	34	9	8	8	0	33	0	0	141
31- 5	1.3	52	52	0	9	9	0	45	0	12	155
30- 6	1.4	44	44	0	9	9	0	32	0	22	172
31- 7	1.6	53	53	0	10	10	4	23	0	42	186
31- 8	1.4	44	44	0	9	17	17	5	0	48	190
30- 9	1.1	48	48	0	6	9	6	21	0	51	200
31-10	1.1	39	39	0	5	6	3	36	0	39	39
30-11	1.2	43	43	5	5	5	0	53	4	7	59
31-12	2.2	50	54	20	4	4	0	54	27	0	91

Weymouth Falls, NS WATER BUDGET MEANS FOR THE PERIOD 1963-1997 DC20492

LAT.... 44.40 WATER HOLDING CAPACITY...250 MM HEAT INDEX... 29.75
LONG... 65.95 LOWER ZONE..............150 MM A............ .975

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.4	117	59	41	3	3	0	94	35	250	491
28- 2	-3.5	101	53	49	3	3	0	98	34	250	590
31- 3	.2	103	79	56	10	10	0	125	2	250	695
30- 4	5.0	100	97	6	30	30	0	73	0	250	795
31- 5	9.9	103	103	0	65	65	0	44	0	244	898
30- 6	14.2	92	92	0	94	94	0	13	0	229	990
31- 7	17.2	86	86	0	114	114	0	8	0	192	1077
31- 8	17.1	80	80	0	105	104	-2	2	0	167	1157
30- 9	13.6	99	99	0	73	73	0	9	0	184	1256
31-10	9.3	102	102	0	46	45	0	25	0	216	102
30-11	4.9	131	128	2	21	21	0	81	1	244	231
31-12	-.6	137	98	20	7	7	0	108	19	248	370
AVE	7.0 TTL	1251	1076	174	571	569	-2	680			

Weymouth Falls, NS STANDARD DEVIATIONS FOR THE PERIOD 1963-1997 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	1.8	46	40	31	3	3	0	57	49	0	106
28- 2	1.7	38	39	44	3	3	0	60	37	0	106
31- 3	1.3	43	42	48	4	4	0	65	8	0	120
30- 4	1.4	34	34	9	8	8	0	33	0	0	141
31- 5	1.3	52	52	0	9	9	0	45	0	12	155
30- 6	1.4	44	44	0	9	9	0	32	0	22	172
31- 7	1.6	53	53	0	10	10	0	23	0	44	186
31- 8	1.4	44	44	0	9	9	7	5	0	58	190
30- 9	1.1	48	48	0	6	6	2	21	0	62	200
31-10	1.1	39	39	0	5	6	2	36	0	51	39
30-11	1.2	43	43	5	5	5	0	53	4	21	59
31-12	2.2	50	54	20	4	4	0	55	27	11	91

APPENDIX C

SUMMARY MODEL OUTPUT DATA - DROUGHT (1965) CONDITIONS

Weymouth Falls, NS WATER BUDGET VALUES FOR THE PERIOD 1965 DC20492

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1965- 1	-4.5	40.4	15.3	3.4	.5	.5	.0	18.1	21.7	25.0	417.3
1965- 2	-4.3	89.7	34.3	31.2	1.1	1.1	.0	64.4	45.9	25.0	507.0
1965- 3	-.4	29.0	10.2	50.9	4.6	4.6	.0	56.5	13.8	25.0	536.0
1965- 4	3.1	89.9	89.9	13.8	18.9	18.9	.0	84.8	.0	25.0	625.9
1965- 5	8.6	23.5	23.5	.0	56.7	48.5	-8.2	.0	.0	.0	649.4
1965- 6	12.2	59.6	59.6	.0	80.5	59.6	-20.9	.0	.0	.0	709.0
1965- 7	14.6	19.6	19.6	.0	97.1	19.6	-77.5	.0	.0	.0	728.6
1965- 8	15.6	91.7	91.7	.0	96.4	91.7	-4.7	.0	.0	.0	820.3
1965- 9	11.9	25.1	25.1	.0	64.2	25.1	-39.1	.0	.0	.0	845.4
1965-10	8.4	83.9	83.9	.0	41.1	41.1	.0	17.8	.0	25.0	83.9
1965-11	3.1	98.6	98.6	.0	13.5	13.5	.0	85.1	.0	25.0	182.5
1965-12	-.8	106.8	64.2	42.6	4.1	4.1	.0	102.7	.0	25.0	289.3

Weymouth Falls, NS WATER BUDGET VALUES FOR THE PERIOD 1965 DC20492

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1965- 1	-4.5	40.4	15.3	3.4	.5	.5	.0	18.1	21.7	50.0	417.3
1965- 2	-4.3	89.7	34.3	31.2	1.1	1.1	.0	64.4	45.9	50.0	507.0
1965- 3	-.4	29.0	10.2	50.9	4.6	4.6	.0	56.5	13.8	50.0	536.0
1965- 4	3.1	89.9	89.9	13.8	18.9	18.9	.0	84.8	.0	50.0	625.9
1965- 5	8.6	23.5	23.5	.0	56.7	56.7	.0	.0	.0	16.8	649.4
1965- 6	12.2	59.6	59.6	.0	80.5	71.3	-9.2	.0	.0	5.1	709.0
1965- 7	14.6	19.6	19.6	.0	97.1	24.7	-72.4	.0	.0	.0	728.6
1965- 8	15.6	91.7	91.7	.0	96.4	91.7	-4.7	.0	.0	.0	820.3
1965- 9	11.9	25.1	25.1	.0	64.2	25.1	-39.1	.0	.0	.0	845.4
1965-10	8.4	83.9	83.9	.0	41.1	41.1	.0	.0	.0	42.8	83.9
1965-11	3.1	98.6	98.6	.0	13.5	13.5	.0	77.9	.0	50.0	182.5
1965-12	-.8	106.8	64.2	42.6	4.1	4.1	.0	102.7	.0	50.0	289.3

Weymouth Falls, NS WATER BUDGET VALUES FOR THE PERIOD 1965 DC20492

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1965- 1	-4.5	40.4	15.3	3.4	.5	.5	.0	18.1	21.7	75.0	417.3
1965- 2	-4.3	89.7	34.3	31.2	1.1	1.1	.0	64.4	45.9	75.0	507.0
1965- 3	-.4	29.0	10.2	50.9	4.6	4.6	.0	56.5	13.8	75.0	536.0
1965- 4	3.1	89.9	89.9	13.8	18.9	18.9	.0	84.8	.0	75.0	625.9
1965- 5	8.6	23.5	23.5	.0	56.7	56.7	.0	.0	.0	41.8	649.4
1965- 6	12.2	59.6	59.6	.0	80.5	79.0	-1.5	.0	.0	22.4	709.0
1965- 7	14.6	19.6	19.6	.0	97.1	42.0	-55.1	.0	.0	.0	728.6
1965- 8	15.6	91.7	91.7	.0	96.4	91.7	-4.7	.0	.0	.0	820.3
1965- 9	11.9	25.1	25.1	.0	64.2	25.1	-39.1	.0	.0	.0	845.4
1965-10	8.4	83.9	83.9	.0	41.1	41.1	.0	.0	.0	42.8	83.9
1965-11	3.1	98.6	98.6	.0	13.5	13.5	.0	52.9	.0	75.0	182.5
1965-12	-.8	106.8	64.2	42.6	4.1	4.1	.0	102.7	.0	75.0	289.3

Weymouth Falls, NS   WATER BUDGET VALUES FOR THE PERIOD 1965   DC20492

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1965- 1	-4.5	40.4	15.3	3.4	.5	.5	.0	18.1	21.7	100.0	417.3
1965- 2	-4.3	89.7	34.3	31.2	1.1	1.1	.0	64.4	45.9	100.0	507.0
1965- 3	-.4	29.0	10.2	50.9	4.6	4.6	.0	56.5	13.8	100.0	536.0
1965- 4	3.1	89.9	89.9	13.8	18.9	18.9	.0	84.8	.0	100.0	625.9
1965- 5	8.6	23.5	23.5	.0	56.7	56.7	.0	.0	.0	66.8	649.4
1965- 6	12.2	59.6	59.6	.0	80.5	80.5	.0	.0	.0	45.9	709.0
1965- 7	14.6	19.6	19.6	.0	97.1	65.5	-31.6	.0	.0	.0	728.6
1965- 8	15.6	91.7	91.7	.0	96.4	91.7	-4.7	.0	.0	.0	820.3
1965- 9	11.9	25.1	25.1	.0	64.2	25.1	-39.1	.0	.0	.0	845.4
1965-10	8.4	83.9	83.9	.0	41.1	41.1	.0	.0	.0	42.8	83.9
1965-11	3.1	98.6	98.6	.0	13.5	13.5	.0	27.9	.0	100.0	182.5
1965-12	-.8	106.8	64.2	42.6	4.1	4.1	.0	102.7	.0	100.0	289.3

Weymouth Falls, NS WATER BUDGET VALUES FOR THE PERIOD 1965 DC20492

YR MO	TEMP(C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
1965- 1	-4.5	40.4	15.3	3.4	.5	.5	.0	18.1	21.7	250.0	417.3
1965- 2	-4.3	89.7	34.3	31.2	1.1	1.1	.0	64.4	45.9	250.0	507.0
1965- 3	-.4	29.0	10.2	50.9	4.6	4.6	.0	56.5	13.8	250.0	536.0
1965- 4	3.1	89.9	89.9	13.8	18.9	18.9	.0	84.8	.0	250.0	625.9
1965- 5	8.6	23.5	23.5	.0	56.7	56.7	.0	.0	.0	216.8	649.4
1965- 6	12.2	59.6	59.6	.0	80.5	80.5	.0	.0	.0	195.9	709.0
1965- 7	14.6	19.6	19.6	.0	97.1	97.1	.0	.0	.0	118.4	728.6
1965- 8	15.6	91.7	91.7	.0	96.4	95.4	-1.0	.0	.0	114.7	820.3
1965- 9	11.9	25.1	25.1	.0	64.2	55.0	-9.2	.0	.0	84.8	845.4
1965-10	8.4	83.9	83.9	.0	41.1	41.1	.0	.0	.0	127.6	83.9
1965-11	3.1	98.6	98.6	.0	13.5	13.5	.0	.0	.0	212.7	182.5
1965-12	-.8	106.8	64.2	42.6	4.1	4.1	.0	65.4	.0	250.0	289.3

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February 2, 2007

Reference No. 821191D

Mr. Paul Buxton, P. Eng.
Bilcon of Nova Scotia
305 Highway #303, Suite #3
Digby, Nova Scotia
B0V 1A0

Dear Mr. Buxton:

Re: Groundwater Monitoring and Aquifer Testing - Whites Point Quarry

Conestoga-Rovers & Associates (CRA) has recently completed a number of activities to upgrade the hydrogeological data for the Whites Point site. These included a groundwater monitoring and aquifer testing program. The program included measuring water levels and groundwater sampling at six existing groundwater monitoring wells located at and immediately adjacent to the quarry property. Bail tests were performed at five of the six wells to determine the hydraulic conductivity of the aquifer. The final component of the aquifer testing consisted of a 24 hour pump test. The results of program are outlined below.

1. Monitoring Well Integrity/Data Reliability

Before reviewing the results of the field programs that were implemented, the following should be noted with respect to the integrity of the monitoring wells and the resulting confidence in the data obtained from them. Monitoring wells MW-1, MW-2 and MW-6, as well as boreholes NS-02-02 and NS-02-03, have been vandalized in the past. In some cases, Bilcon reports that vandalism has occurred on more than one occasion. The vandalism is reported to have included the placement of obstructions, such as rocks, branches and, in some cases, large branches or logs, into the wells. During the field programs, local individuals under contract to Bilcon, who accompanied CRA staff to assist in locating and accessing the monitoring wells, reported that attempts were made to rehabilitate the wells. These individuals reported that the rehabilitation of the monitoring wells (MW1, MW2 and MW6) was generally successful, with the exception of one well, possibly MW6. Steel plates were subsequently welded to the tops of the open wells to prohibit the placement of large objects in the wells. A small opening was left in the top of the well to allow for the use of a water level meter. Tables A1 to A8 (Attachment A) present the water level data obtained by Bilcon staff for the period September 2005 to December 2006 for monitoring wells MW1-MW6 and boreholes NS-02-01 and NS-02-04. Rainfall data collected by Bilcon is also presented in these tables.

In an attempt to qualify the reliability in the data, CRA produced graphs of the water levels measured by Bilcon between September 2005 and December 2006. Graph A-1 (Attachment A) illustrates the groundwater levels measured in all of the wells, as well as the rainfall recorded by Bilcon. Rainfall data is presented along the upper X-axis in this graph and those to follow. As can be seen in Graph A-1, the groundwater level in MW6 increased suddenly shortly after the start of monitoring in September 2005. Similarly, the water levels measured at MW1 increased suddenly and drastically in approximately July 2006. The water levels in both MW1 and MW6 are seen to be quite variable after approximately October 2006. CRA is not aware when the vandalism was reported to have occurred, therefore, we cannot make any comment regarding the possible relationship between the water table fluctuations and the vandalism. There does not appear to be as much variability at MW2 (also reported to have been vandalized), however, the variability may not be apparent in Graph A-1 due to the scale of the Y-Axis.

Graphs A-2A and A-2B were generated to attempt to evaluate the effects of rainfall, if any, on water levels in the wells considered reliable (i.e. not vandalized). The water levels in borehole NS-02-04 were plotted separately in Graph A-2B due to the difference in the scale of the Y-Axis of this graph. In Graph A-2A, a possible relationship appears to exist between rainfall and the groundwater levels in MW3. In particular, a peak in groundwater elevation at MW3 occurs just after a heavy rainfall event in June 2006. Similarly, peaks in groundwater levels appear to occur after rainfalls in approximately June 2006 and October 2006. There may also be a weaker relationship between groundwater levels in wells MW5 and NS-02-01. This is based on the apparent increase in groundwater levels in approximately June 2006 and November/December 2006, sometime after periods of increased precipitation. The apparent increases in groundwater levels in MW5 and NS-02-01 are delayed and less severe than those suggested in MW3. The apparent relationship between rainfall and water levels in MW3, MW5 and NS-02-01 is discussed in the Conceptual Hydrogeologic Model section of this report.

Any relationship in groundwater levels at MW4 (Graph A-2A) and NS-02-04 (Graph A-2B) and rainfall is less apparent from the available data. Water levels in MW4 appear to be more stable and not variation in response to rainfall is suggested. The groundwater level at NS-02-04 may have increased in approximately July 2006, following a preceding period of rain. Again, this will be discussed further in the conceptual hydrogeological model discussion.

As noted above, the water level data for MW2 presented in Graph A-1 is not as variable as that presented for MW1 and MW6. Well MW2 is also reported to have been vandalized. In an attempt to further assess the reliability of the data from MW2, the water levels in MW2 and NS-02-01, which has not been vandalized and is located close to MW2, are plotted together in Graph A-3. As can be seen in Graph A-3, the relative water levels in these two wells trend very close together. This suggests that water level data collected at MW2 may be reliable.

In light of the concerns noted above, the reliability of the data collected at wells MW1 and MW6 must be considered when considering the results of the current field programs described below. Some concern may also exist with respect to MW2, however, the available data appears to indicate that water levels measured in this well may be reliable.

2. Water Level Monitoring and Groundwater Sampling

Water levels were monitored prior to well sampling between November 30th, 2006 and December 8th, 2006. Table B-1 (Attachment B) contains the static water levels for each well and ranged from 69.59 metres above sea level (masl) at MW- 1 down to 26.17 masl at MW-6. These water levels are consistent with the water level monitoring Bilcon has completed on these wells for 2006.

Water samples were analyzed for RCAp MS (general chemistry and metals). The results were compared to the CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (FWAL) and the Guidelines for Canadian Drinking Water Quality (CDWQ). Table B-2 (Attachment B) contains the analytical results of the sampling. Exceedences are highlighted and were noted for colour (1), turbidity (4), aluminium (2), cadmium (4), copper (1), iron (2), zinc (1), and sodium (6).

The laboratory Certificates of Analysis are contained in Attachment C.

3. Bail Tests

Recovery tests were conducted for five (MW1, 2, 3, 4 and 5) of the six wells located at the site. The results of the tests are contained in Attachment D.

MW-1 was pumped to a water level of 30 metres below the top of the casing and water levels were measured for a 2 hour period with no change. After 24 hours the water level had only recovered to 29.91 metres below the top of casing and therefore the results of the test were not plotted to determine hydraulic conductivity. It is interpreted to be extremely low. A low conductivity was expected for this well as it is collared within the Upper Flow Unit (UFU) with only 15-20% of the well located in the Middle Flow Unit (MFU). As noted above, well MW1 has been subsequently reported to be unreliable and this may have affected the results of the bail test performed here.

The results for MW-2 indicated a hydraulic conductivity of $1.24\text{x}10^{-4}$ cm/sec. This well is located within located within both the UFU and MFU.

The results for MW-3 indicated a hydraulic conductivity of $3.68\text{x}10^{-4}$ cm/sec. This well is collared in the UFU and 40-50% within the MFU. It was observed during testing that water could be heard falling into the well prior to pumping. It is assumed that this water was coming from the contact between the UFU and MFU and acts as a zone of high hydraulic conductivity due to weathering between the flow units. It is typical for North Mountain Basalt flow units to have zones of higher hydraulic conductivity at their contacts.

The results for MW-4 indicated a hydraulic conductivity of 1.28×10^{-5} cm/sec. and the results for MW-5 indicated a hydraulic conductivity of 1.51×10^{-5} cm/sec. Both wells are located entirely within the MFU and their hydraulic conductivity results reflect this. The hydraulic conductivity values are a full order of magnitude lower than those of the wells located across the contact between the UFU and MFU.

The hydraulic conductivity testing was not completed for MW-6 due to a combination of equipment malfunction and extremely poor weather conditions. Subsequent to the completion of the field program, CRA was advised that this well may not provide reliable data, as discussed above. This well is located entirely in the UFU and based on the results from the other wells it is assumed that the hydraulic conductivity would be lower than those reported for the other wells.

4. Aquifer Testing Program

An aquifer testing program, consisting of a 24-hour pump test was also completed. The main objective of the program was to attempt to determine if the UFU and MFU were hydraulically connected. A secondary objective was to attempt to estimate the aquifer hydraulic properties of the aquifer. The aquifer testing program was completed in two stages, including step-drawdown testing, followed by an attempt to complete a 24-hour constant yield test.

Prior to the initiation of the aquifer testing program, the available well logs, cross sections and other pertinent information were reviewed to determine the appropriate well to use for testing purposes. As the intent was to attempt to identify if the two flow units were hydraulically connected, the goal was to identify wells that were only completed in one of the two flow units. A review of the available data indicated that wells MW4 and MW5 appeared to be completed only in the MFU, while MW6 was completed in the UFU only. The remaining wells, MW1, MW2 and MW3 appeared to penetrate both the UFU and MFU. The latter were deemed inappropriate for use as a pumping well (unless packers were employed), as pumping these wells would affect both flow units. In addition, the use of a well in the MFU as a pumping well was considered more suitable for the purposes of this program for two reasons: (1) the MFU is generally considered to have a higher hydraulic conductivity; and (2) stressing the lower of the two flow units was more likely to influence the other unit. Ultimately, MW5 was selected as the pumping well due to its closer proximity to the remaining wells and the fact that MW4 was located adjacent to Highway 217, which posed some safety concerns.

Monitoring well MW5 has a total depth of approximately 47.8 m (157 feet). Therefore, the pump was placed at a depth of approximately 43 m below the top of the well casing (mbTOC) (approximately 141 ft below TOC) to maintain a sump below the pump in order to avoid any sediment that may have accumulated at the bottom of the well.

The step-drawdown testing program was initially implemented on December 20, 2006. The initial design of the step-drawdown test called for three (3) half-hours tests at pumping rates of approximately 0.4, 0.6 and 1.0 litres/second (L/s) (5, 8.5 and 15 imperial gallons per minute (igpm)). The well was not allowed to recover between steps. The selected rates were based on the well yield reported at the time of drilling as determined using an air-lift test. Unfortunately, the water level in the well was drawn to the level of the pump during the third step and the procedure was abandoned.

A second step-drawdown test was initiated on December 21, 2006, this time using pumping rates of approximately 0.03, 0.5 and 0.7 L/s (0.4, 6.6 and 9.2 igpm). Again, three (3) half-hour steps were used and the well was not allowed to recover between steps. The results of the step testing program are provided in Table E-1 and Graph E-1 (Attachment E). The step-drawdown test results were used to attempt to estimate an appropriate pumping rate for the 24-hour constant yield test. The goal was to determine a pumping rate that would draw the water level in the well down to a depth approximately 1 m above the pump by the end of the 24 hours. In this way, maximum stress could be placed on the aquifer while maintaining sufficient water above the pump to avoid damaging the pump or causing cavitation. Therefore the desired drawdown was approximately 33.5 m, based on a static water level in MW5 of 8.3 m below the top of the well casing (mbTOC) and a target water level of approximately 42 mbTOC (1 m above the pump located at 43 mbTOC). The interpretation of the step drawdown data using the Hantush-Biershenk method resulted in an estimated discharge rate of approximately 1.6 L/s (22 igpm). However, the results of the initial step draw-down test indicated that the well would quickly go dry at a pumping rate of approximately 1.0 L/s. This may be due to the fact that aquifer in question in a fractured bedrock aquifer and the wells do not fully penetrate the aquifer, whereas, the Hantush-Biershenk method assumes fully penetrating wells and a porous media aquifer. Since it was known that the well could not support a discharge rate of approximately 1.6 L/s, a lower discharge rate of approximately 0.6 L/s was selected for the 24-hour constant yield test.

The water level in the pumping well was allowed to the level observed prior to the step-drawdown test prior to initiating the constant yield test at a discharge rate of 0.6 L/s. This water level recovered to within approximately 71% of the pre-pumping level within one hour of the end of the step-drawdown test and 100% by the next morning, when the constant yield test was started.

The 24-hour test of DW5 was initiated at approximately 11:30 AM on December 22, 2006. A total of five (5) observation wells: MW1, MW2, MW3, MW4 and MW6 were used during the test. The locations of the observations wells are shown in various maps that have been produced by

Bilcon as part of the Environmental Impact Statement (EIS) and other supporting documents. The raw data for both the pumping well and observation wells is provided in Table E-2 in Attachment E. The constant yield test was initially started at a discharge rate of approximately 0.6 L/s (8 igpm). After approximately 60 minutes of pumping, the rate at which the water level in the well was being drawn down was used to attempt to predict drawdown in the longer term. The results of this indicated that the well would go dry before the end of the 22 hours and a decision was made to reduce the pumping rate to approximately 0.4 L/s (5.3 igpm). After approximately 150 minutes of pumping, concerns still existed with respect to the rate at which the water level was lowering, and, from this time forward, the pumping rate was occasionally adjusted (lower or raised, as necessary, by approximately 0.1-0.2 L/s) to maintain the groundwater level at an elevation that was stressing the aquifer while not dewatering the pump. In essence, the constant yield test became a constant-head test after approximately 150 minutes.

As will be discussed below, there was little, if any, evidence of drawdown in the observation wells. Therefore, a decision was made to stop the pump test after approximately 22 hours to ensure sufficient time was available to collect groundwater recovery data. The recovery data is also provided in Table E-2.

Graph E-2 (Attachment E) shows the drawdown and recovery data collected during the pump test. As can be seen in Graph E-2, the water level in the well fluctuated over a range of between approximately 3 and 7 m as a result of adjustments in the discharge rate.

Graph E-3 shows the drawdown (or lack thereof) observed in the observation wells. As can be seen in this graph, the water level at MW4 did not change during the pump test. The water levels in wells MW1 and MW6 actually increased by approximately 0.5 m during the pump test and continued to rise after the pump was stopped. The reason for this increase is unclear. It is noted that these are two of the wells Bilcon has expressed a lack of confidence in due to vandalism, as described above. Conversely, the water level at MW-2 was drawn down approximately 0.5 m during the pump test and continued to lower after pumping was stopped. Again, Bilcon has also expressed a lack of confidence in this well. Finally, the water level in MW3 was observed to be somewhat variable during the test. A relatively sudden decrease in the water level of approximately 2.4 m occurred approximately 6 hours into the pump test (December 21, 2006 2:30 PM, Graph E-3). The water level in MW3 then quickly returned to its original level approximately 90 minutes later (December 21, 2006 4:00 PM, Graph E-3). A second cycle of relatively sudden drawdown followed by a return to the approximately static water level occurred between approximately 4:00 PM December 21 and 12:00 AM December 22. This second cycle appears to be less severe than the first however this may be a function of the point in time at which data was collected at MW3 (i.e. it is possible that the lowest groundwater level over this time period occurred between the times when data was collected). A third cycle also appears to occur at the end of the pump test, with full recovery occurring by the end of the recovery test. The reason for the cyclic nature of the water level at MW3 cannot be determined form the available data. As discussed in the conceptual model below, the groundwater level in MW3 appears to approximately coincide with the location of the UFU/MFU contact. It is possible that this contact is a zone of fracture-controlled flow and the changes in the groundwater level are the results of 'pulses' of groundwater flow, typical for the North Mountain Basalts, along these fractures as a result of pumping at MW5.

The local tidal fluctuations over the course of the pump test were obtained from the Department of Fisheries and Oceans' (DFO's) Tides, Currents and Water Levels website (http://www.tides.gc.ca) and are plotted on Table E-3. This was done to determine what effect, if any, the tides in the Bay of Fundy may have had on the water levels in the observation wells. As can be seen in Table E-3, there does not appear to be any relationship between tide levels and groundwater levels in the monitoring wells. It should be noted that nearest well to the Bay of Fundy is MW6, which Bilcon has identified as being unreliable.

Overall, the results of the aquifer testing program do not provide any conclusive evidence to support a conclusion as to whether or not the UFU and MFU are hydraulically connected. The pumping well (MW5) only penetrates the MFU, while the only well located solely in the UFU is MW6. No evidence that the water level in MW6 was influenced during the pump test was noted. This may be a result of the distance between MW5 and MW6. In addition, the vandalism of MW6, and the resulting lack of confidence in this well, compounds the inability to draw any conclusions from this well. A similar lack of confidence exists with respect to MW2, hence no conclusions are reached from the water levels observed in this well. The potential for the UFU and MFU to be connected hydraulically is explored further in the discussion of the conceptual hydrogeologic model for the site presented later.

As noted above, a secondary objective of the aquifer testing program was to attempt to estimate the hydraulic properties of the aquifer. The analysis of the drawdown and recovery data from the pumping well (DW5) by the Jacob Straight-Line method was used for this purpose. The Jacob Straight-Line method uses the following equation (for metric units) to estimate the transmissivity of an aquifer:

$$T = 0.183Q/\Delta S$$

where: T = Transmissivity (m^2/d);
Q = pumping rate (m^3/d); and
ΔS = drawdown (m) over one log cycle of time.

The straight line expression of both the drawdown and recovery data is shown in Graph E-3. In both cases, ΔS is estimated at approximately 17.5 m over one log cycle of time. Therefore, the transmissivities estimated using both the drawdown and recovery data are the same. An average discharge rate of approximately 0.5 L/s (43.2 m^3/d) for the pump test was used. The data indicates a transmissivity of approximately 5.2×10^{-3} m^2/d. The aquifer storativity could not be estimated due to the lack of drawdown at the observation wells (or lack of confidence in the observation wells).

Safe short and long term pumping rates for a well can be estimated based on the aquifer transmissivity and total available drawdown (TADD) in the well, using the following equations:

$$Q_{st} = (T \times TADD)/1.3$$
$$Q_{lt} = 0.7(((T \times TADD)/1.3)$$

where: Q_{st} = safe short term (<30 days) pumping rate (m^3/d);
Q_{lt} = safe long term pumping rate (m^3/d);
T = Transmissivity (m^2/d);
TADD = Total Available Drawdown (m).

Assuming a long term total available drawdown in DW5 of 30 m, to account for seasonal fluctuations in groundwater level, pump submergence and allowance for a sump at the base of the well, the calculated safe short term yield is in the order of 0.084 m^3/d (84 L/d). A safe short term yield of approximately 0.12 m^3/d (120 L/d) is estimated.

It should be noted that transmissivity and safe and long term safe yields estimated above should be considered approximations at best. They have been estimated using a relatively short duration pump test (22 hours) and the pumping rate was not held constant due to concerns about dewatering the well. In addition, the equations presented above are based on a porous media aquifer, while the aquifer tested is fractured bedrock.

5. Conceptual Hydrogeologic Model for Site

The intent of this discussion is to update (either augment or refine) the hydrogeologic model that has been developed for the project site by previous workers (*Preliminary Hydrogeological Assessment, Proposed Quarry, Whites Cove, Digby Neck, Nova Scotia,* Jacques Whitford Environment Limited (JWEL) December 2002; *Geology and Groundwater Assessment, Whites Point Quarry, Digby County, Nova Scotia,* Mineral Valuation and Capital, Inc. (MVCI), December 2005). It should be noted that no new monitoring wells or boreholes have been drilled since the MVCI report.

The previous investigations describe the general aquifer characteristics for the site. In essence, the bedrock aquifer is layered, consisting of the UFU basalt overlying the MFU basalt. The UFU has been described as a relatively massive basalt with low fracturing and jointing. The exception is the lower approximately 10 m of this flow, which has been reported to consist of columnar basalt. Fracturing in this columnar basalt zone would be anticipated to consist of sub-vertical, relatively closely spaced fractures with some irregular and relatively discontinuous sub-horizontal fractures. MVCI (2005) reports that there is virtually no communication between the joints at the base of the UFU. The MFU has been described as a vesicular, amygdaloidal basalt flow. The MFU is considered to represent the better aquifer of the two flow units, based on the greater degree of permeability and its softer, less massive nature as compared to the UFU.

Regionally, the basalt flows strike approximately southwest-northeast and dip approximately 5-10° to the northwest, towards the Bay of Fundy in the study area. The contact between the UFU and MFU has been identified by the previous workers as a likely zone of preferential flow. JWEL (2002) suggests that this contact results in a perched water table. Where wells penetrate this perched water table and also intersect deeper zones of higher permeability, JWEL suggests that the well will essentially cause the higher perched groundwater to drain to lower elevations. Evidence for this is provided by JWEL's observation that groundwater could be heard cascading into open borehole NS-02-02 during their field program.

The approximate location of the UFU-MFU contact has been indicated in cross sections previously prepared by Bilcon (e.g. Figures 6A and 6B in Whites Point Quarry Environmental Impact Statement, attached here in Attachment F). It should be noted that the location of this contact has been, to a large degree, inferred based on its observed location in select boreholes and/or monitoring wells. The known regional dip of the basalts has also been used to estimate this contact. In reality, the surface elevation and lateral continuity of individual basalt flows can vary considerably from one location to another, and care must be exercised when interpreting information between a relatively few information points.

In addition to the bedrock aquifer, unconsolidated overburden deposits are also present in the area. Little has been reported of the overburden, with the exception that, based on a review of the provincial well drillers' logs database at the time, the overburden was shown to range in thickness from approximately 1 to 55 m (average 5 m) between Little River and Mink Cove. Casual observations by CRA staff (December 2006) indicate that the overburden appears to be relatively thin (approximately 1-2 m or less) at the plateau at the top of the North Mountain on the subject property (vicinity of wells MW1, MW2 and MW3) and may reach several metres along the southern flank, in the vicinity of well MW5.

JWEL (2002) developed a hydrogeologic model for the site in which infiltrating precipitation is the sole source of groundwater recharge for the bedrock aquifer. In this model, precipitation infiltrates the overburden, where it is temporarily stored then slowly released to the bedrock aquifer. The recharge area is considered to approximately coincide with the topographic high for the site and groundwater is seen to flow downwards and to the southeast and northwest, away form the topographic high (refer to JWEL Drawing No. 17221-2, Attachment F). The inferred outcrop of the columnar base of the UFU and the UFU-MFU contact on the southern flank of the subject property is considered a groundwater discharge area in this model, where springs would be expected to occur.

The data that has been generated since the JWEL report, including details of the monitoring wells MW1 to MW6 (drilled subsequent to JWEL's work) and the groundwater elevation information collected by CRA (November to December 2006, see above) alters the conceptual model prepared by JWEL.

Similar to JWEL's observation at NS-02-02, CRA noted consistent evidence of cascading water in MW3. The groundwater elevation at MW3, as reported in Bilcon's monitoring data from September 2005 to December 2006 and the limited data collected by CRA in December 2006, appears to coincide with the approximate location of the MFU/UFU contact. In addition, JWEL reported a static groundwater level of approximately 53 m below grade at NS-02-01. CRA projected well NS-02-01 onto the cross section provided in Bilcon Figure 6B (Attachment F). A reported depth of approximately 53 m below grade would appear to roughly coincide with the elevation of the UFU-MFU contact. Based on this, it appears that the UFU-MFU contact may influence the location of the groundwater table in the area of MW3 and BH-02-01.

The static water level in MW5 at the time of the pump test was approximately 8 m below grade, which is consistent with the data collected by Bilcon (Table A-5, Attachment A). This would place the water table at a higher elevation than that shown in the attached Bilcon Figures 6A and 6B (Attachment F). The water table would be very close to surface at the location of MW5 in the cross sections provided.

Based on the groundwater levels described above, the revised conceptual hydrogeologic model provided herein is one in which groundwater recharge occurs along the outcrop of the columnar base of the UFU and the UFU-MFU contact (i.e. to the northwest (left hand side) of MW5 in Figures 6A and 6B, Attachment F). Recharge could also be expected to occur along the outcrop of the MFU, towards and beyond Highway 217 in Figures 6A and 6B. In this model, the water table is interpreted to roughly follow the UFU-MFU contact until, at some point, surface water in the Bay of Fundy influences the groundwater and causes the water table to flatten. The approximate location where the gradient of the water table begins to flatten is difficult to determine from the available data. Based on the limited groundwater elevation data for NS-02-02 (Bore hole #2 in Figure 6B), as interpreted from the location of the water table in Figure 6B, it appears that the water table flattens somewhere between MW3 and NS-02-02. However, due to the loss of NS-02-02 as a monitoring point, additional data is not available to support this assumption. From Figure 6A, it would appear that the groundwater table flattens between wells MW1 and MW6. It is possible that the water table gradient between these wells is steeper than that shown in Figure 6A. This is based on the limited data available from MW6 prior to it being vandalized. Bilcon staff indicate that the static water level in MW6 was approximately 39 m below grade prior to the well being vandalized and that it is believed this represents more accurately represents the water table elevation at this location, as opposed to the levels measured after the vandalism. If this is indeed the case, the water table in the area of the cross section shown in Figure 6A may actually be closer to the UFU-MFU contact (i.e. closer to sea level) at MW6. Additional groundwater level data, collected from a reliable well, would be required to support this preliminary hypothesis for the area of MW6.

In the conceptual model described above, the groundwater divide would be shifted to the southeast (i.e. towards the right in Figure 6B) from that postulated by JWEL. Based on the relative groundwater elevations measured by CRA in MW3 and MW5 (December 2006) and the topography to the southeast of MW5, it is possible that MW5 has been drilled close to the groundwater divide.

Additional observations supporting the conceptual model in which the UFU-MFU contact is a recharge zone includes a possible relationship between the groundwater levels measured at MW3 and periods of heavy rain. For example, 141 mm of rain was measured on June 10, 2006 (Table A-3) and within approximately a few days, the groundwater level in MW3 was observed to rise and then fall again. Similarly, relatively heavy rainfalls recorded on July 16 (78 mm) and July 22 (60 mm) were followed by a rise in the water table at MW3 within a few days, as was a heavy rainfall measured on October 8, 2006 (78 mm). This suggests that precipitation is quickly infiltrating the UFU-MFU contact and then following this contact, via fracture flow, to and past MW3.

In contrast, a similar relationship does not appear to exist at well NS-02-01 (which appears to be similar to MW3 in location, construction details and stratigraphy encountered) or at MW5. As noted above in the discussion of the well integrity and data confidence, a weaker relationship may also exist between groundwater levels in wells MW5 and NS-02-01 and precipitation, based on the apparent increase in groundwater levels in approximately June 2006 and November/December 2006, after periods of increased precipitation. The length of time between the precipitation events and the apparent increases in groundwater levels are longer than those noted for MW3 and the relative increases in the water table elevation are less at MW5 and NS-02-01. It is possible that the fractures controlling flow along the UFU-MFU contact offer a more direct connection to MW3 than MW5 or NS-02-01, however, no information is available to state this with any degree of certainty.

Additional evidence supporting the outcrop of the UFU-MFU contact as a recharge area is the apparent lack of springs in this area. As noted by JWEL, under the conceptual model developed at the time, springs would be expected to occur where the UFU-MFU and columnar base in the UFU intersect the ground surface. Although a detailed survey was not completed by CRA, cursory observations during the field programs in November and December 2006 did not note the presence of springs near MW5 or between MW5 and Highway 217. A small sand and gravel pit is also present at the location of MW5 and there is no evidence of springs or groundwater discharge in this shallow excavation. Conversely, springs were noted by CRA staff in the vicinity of MW6, which would be an anticipated groundwater discharge area in the conceptual model presented here.

There is a lack of subsurface information specific to the UFU at the higher topographic elevations of the property on which to develop a conceptual hydrogeologic model for this unit. A number of scenarios are possible with respect to the infiltration of precipitation and movement of groundwater here. Surface water features are limited to non-existent along the topographic high (vicinity of MW2, MW3 and NS-02-01) or on either side of it. Therefore, it would appear that precipitation quickly infiltrates the surface here. It is possible that this infiltrating water is initially held in the thin overburden layer in this area. It may then be re-released to the atmosphere via evaporation and transpiration, it may flow towards the Bay of Fundy through the overburden and/or along the contact between the overburden and the bedrock (UFU) and/or some of the infiltrating water may migrate downwards into the UFU via minor, occasional fractures. It is likely that a combination of these processes is occurring. Due to the massive nature of the UFU and its low permeability, the bedrock in this area is anticipated to act as an aquitard. The construction and hydraulic testing of wells drilled only in the UFU in the area of the topographic high and on the northwest side of it would be required to provide additional data in this regard.

Based on the above, the conceptual hydrogeologic model for the property can be summarized as follows:

- Groundwater recharge occurs mainly along the southwest flank of the topographic high on the subject property, as a result of precipitation infiltrating via the columnar base of the UFU and the UFU-MFU contact;
- The infiltrating groundwater flows along the path of this contact, or within the MFU (following the dip of the UFU), towards the northeast, in the direction of the Bay of Fundy. Eventually, the influence of the Bay of Fundy results in a flattening of the water table close to the Bay of Fundy and the groundwater moves laterally into the UFU (this suggests some connectivity between the UFU and MFU, at least near the Bay of Fundy);
- Lesser recharge occurs along the topographic high and on the northeast flank via precipitation infiltrating into the overburden deposits. Some of this water may be released back to the atmosphere via evaporation and transpiration. Additionally, groundwater flow may occur within the overburden and/or along the overburden-bedrock contact and eventually be discharged to the Bay of Fundy. Limited quantities of the water from the overburden may also migrate downward vertically into the UFU, via local fractures. The latter would be expected to be limited to minor quantities of water due to the massive and impermeable nature of the UFU. If this process is occurring, the water would be

expected to eventually reach the columnar base of the UFU and migrate along the UFU-MFU contact as described above;

- Discharge would be occurring at the base of the northeast flank of the mountain, either as springs, local surface water expressions or the direct discharge of groundwater to the surface water. Due to the limited number of springs and surface water systems in this area, direct discharge to the surface water is anticipated to represent the major groundwater discharge process.

6. Recommendations

As noted throughout the discussion of the conceptual model for the subject area, additional information is required to support the conclusions reached herein. In addition, there is a need to either properly rehabilitate (and protect) or replace the existing monitoring wells that have been damaged. Finally, it is also noted that there is a lack of information regarding subsurface conditions in the area proposed to be quarried in Years 1-10 (see Plans OP 1-R1, OP 2-R1, in the Revised Project Description dated November 2006) and in Years 16-20 (Plan OP 4-R1 in the Revised Project Description).

As such the following preliminary recommendations are provided (it is noted that the need for additional wells cannot be ruled out, pending the results of additional site investigations):

- Monitoring wells MW1, MW2, MW6, NS-02-02 and NS-02-03 should be rehabilitated or replaced and provisions made to secure them against further vandalism (e.g. provide steel, lockable, tamperproof security covers that are generally available).
- Wells NS-02-02, NS-02-03, NS-02-04 and MW6 are completed in the UFU only. A series of deeper wells should be completed into the MFU create multi-level monitoring wells that provide information specific to the UFU and MFU. In this regard, a deeper well should be drilled at either NS-02-02 or NS-02-03 and another deeper well at NS-02-04 or MW6.
- The use of multi-level monitoring wells in the area of MW1 to MW3 would also be beneficial to for providing additional information to support and/or refine the conceptual hydrogeology model presented here. As a minimum, two shallow wells should be completed in the UFU only at the locations of MW1 and MW3.
- In addition to the 'two-level' multi-level monitoring wells recommended above, the use of 'three-level' wells should be considered in select locations. In these cases, two of the wells should be completed a different depths into the MFU. The intent would be to determine the vertical hydraulic gradients in this unit to

assist in attempting to identify groundwater recharge and discharge areas. This should be considered at MW5, MW3 and MW6.

- The wells recommended herein should be drilled with a geotechnical or geological drill rig capable of bedrock coring, as opposed to the use of a water well rig. The recovery of bedrock core allows a better evaluation and interpretation of the subsurface conditions encountered.
- Downhole video inspections should be completed at NS-02-01 and MW3 in an attempt to determine where groundwater is cascading into these wells and where it discharges from them. Consideration should be given to expanding this program to other wells at the site, pending the results of the drilling program recommended above.

Hydraulic testing of some of the wells recommended above could be implemented. This would likely include a combination of bail testing and aquifer testing. The wells to include in such testing and the design of an aquifer testing program (e.g. length of pump test, observation wells to include, etc.) would be based on data that becomes available through the recommended drilling program. The additional wells recommended above could also be incorporated into future water level monitoring and/or water quality monitoring programs. In addition to helping better define the geologic and hydrogeologic conditions at the site, the availability of the wells recommended above could provide information in the event of future perceived changes in water quality or groundwater flow.

In conclusion, if you have any questions regarding the results of the work described herein, please contact us at your convenience.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Peter Oram, CESA, P.Geo.

Stephen Sauveur, M.A.Sc., P.Geo.

ATTACHMENT A

WATER LEVEL DATA COLLECTED BY BILCON
AND ASSOCIATED GRAPHS

Table A-1: Bilcon Water Level Data - MW-1

BILCON NOTES THIS WELL HAS BEEN COMPROMISED
Typical SWL expected to be ~222 ft (67.7 m) below TOC

TOC Elevation:	275.5 ft asl	83.9724 masl
Well Depth:	245 ft	74.676 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-1 (masl)	RAINFALL (mm)	COMMENT
9/21/05 9:00 AM	242	73.76	10.21		
9/22/05 9:00 AM	237	72.24	11.73		
9/23/05 1:00 PM	232	70.71	13.26		
9/24/05 9:00 AM	229	69.80	14.17		
10/18/05 10:00 AM	222.25	67.74	16.23		
10/28/05 10:50 AM	222.2	67.73	16.25		
11/4/05 9:40 AM	222.3	67.76	16.22		Road and well being used for target practice
11/11/05 10:30 AM	222.25	67.74	16.23	19	
11/18/05 10:00 AM	222.3	67.76	16.22	23	
11/25/05 10:02 AM	221.5	67.51	16.46	41	
12/2/05 11:40 AM	222	67.67	16.31	45	
12/12/05 1:11 PM	221.6	67.54	16.43	22	
12/17/05 1:19 PM	222.1	67.70	16.28	10	
12/30/05 11:48 AM	221.7	67.57	16.40	18	
1/6/06 3:01 PM	221.4	67.48	16.49	23	
1/13/06 11:02 AM	221.8	67.60	16.37	15	
1/21/06 11:56 AM	222.2	67.73	16.25	25	
1/27/06 2:16 PM	221.9	67.64	16.34	9	
2/3/06 11:17 AM	221.9	67.64	16.34	2	
2/10/06 10:45 AM	221.5	67.51	16.46	30	
2/19/06 11:50 AM	ND			0	Well is damaged due to vandalism
2/24/06 11:50 AM	ND			5	Well out of service
3/3/06 2:15 PM	ND			0	Well out of service and rain gauge vandalized- has since been fixed
3/10/06 12:42 PM	ND			5	"
3/17/06 11:35 AM	ND			13	"
3/24/06 11:26 AM	ND			1.5	"
3/31/06 1:41 PM	ND			0	"
4/4/06 9:18 AM	ND			24	"
4/14/06 10:05 AM	ND			22	"
4/21/06 8:21 AM	ND			29	"
5/5/06 9:41 AM	ND			31	"
5/12/06 10:29 AM	ND			28	"
5/20/06 1:08 PM	ND			36	"
5/26/06 2:10 PM	ND			0	"
6/3/06 10:18 AM	ND			27	"
6/10/06 3:30 PM	196.8	59.98	23.99	141	Well has been repaired
6/17/06 3:30 PM	168	51.21	32.77	50	Still debris in this well
6/23/06 12:40 PM	143.4	43.71	40.26	33	"
7/2/06 11:42 AM	143.4	43.71	40.26	27	"
7/9/06 4:52 PM	143.3	43.68	40.29	3	"
7/16/06 12:10 PM	76.8	23.41	60.56	78	"
7/22/06 11:09 AM	63.1	19.23	64.74	66	"
7/30/06 1:38 PM	52.2	15.91	68.06	9	"
8/5/06 11:52 AM	44	13.41	70.56	17	"
8/13/06 12:25 PM	37.6	11.46	72.51	2	"
8/17/06 12:15 PM	33.7	10.27	73.70	13	"
8/27/06 12:25 PM	30.2	9.20	74.77	0	"
9/3/06 3:05 PM	28.1	8.56	75.41	4	"
9/17/06 11:42 AM	25.1	7.65	76.32	0	"
9/22/06 2:55 PM	24.2	7.38	76.60	36	"

Table A-1: Bilcon Water Level Data - MW-1

BILCON NOTES THIS WELL HAS BEEN COMPROMISED
Typical SWL expected to be ~222 ft (67.7 m) below TOC

TOC Elevation:	275.5 ft asl	83.9724 masl
Well Depth:	245 ft	74.676 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-1 (masl)	RAINFALL (mm)	COMMENT
10/1/06 11:30 AM	23.4	7.13	76.84	11	"
10/8/06 10:23 AM	22.3	6.80	77.18	78	"
10/14/06 1:00 PM	21.4	6.52	77.45	15	"
10/21/06 9:42 AM	22.7	6.92	77.05	26	"
10/28/06 1:12 PM	22.9	6.98	76.99	2	"
11/4/06 9:52 AM	22.3	6.80	77.18	10	"
11/12/06 11:22 AM	23.6	7.19	76.78	ND	
11/18/06 11:05 AM	24.7	7.53	76.44	5	"
11/25/06 12:28 PM	28	8.53	75.44	ND	
12/2/06 11:30 AM	98	29.87	54.10	33	New rain gauge - old one destroyed
12/9/06 11:38 AM	69.5	21.18	62.79	25	"
12/16/06 12:27 PM	51.1	15.58	68.40	7	
12/23/06 10:05 AM	40.4	12.31	71.66	18	
12/31/06 12:59 PM	36.2	11.03	72.94	0	

Table A-2: Bilcon Water Level Data - MW-2

BILCON NOTES THIS WELL HAS BEEN COMPROMISED
Typical SWL expected to be ~165 ft(50 m) below TOC

TOC Elevation:	296.4 ft asl	90.34272 masl
Well Depth:	220 ft	67.056 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-2 (masl)	RAINFALL (mm)	COMMENT
9/22/05 9:00 AM	182	55.47	34.87		
9/23/05 1:30 PM	179	54.56	35.78		
9/24/05 9:45 AM	177	53.95	36.39		
10/18/05 10:00 AM	165	50.29	40.05		
10/28/05 11:02 AM	164.7	50.20	40.14		
11/4/05 10:00 AM	164	49.99	40.36		
11/11/05 10:46 AM	164.8	50.23	40.11	19	
11/18/05 10:15 AM	165.5	50.44	39.90	23	
11/25/05 10:15 AM	165.5	50.44	39.90	41	
12/2/05 11:47 AM	165.1	50.32	40.02	45	
12/12/05 1:23 PM	164.6	50.17	40.17	22	
12/17/05 1:31 PM	165.5	50.44	39.90	10	
12/30/05 12:00 PM	166	50.60	39.75	18	
1/6/06 3:10 PM	165.6	50.47	39.87	23	
1/13/06 11:14 AM	166.5	50.75	39.59	15	
1/21/06 12:12 PM	167.7	51.11	39.23	25	
1/27/06 2:35 PM	167.5	51.05	39.29	9	
2/3/06 11:28 AM	168.3	51.30	39.04	2	
2/10/06 10:35 AM	168.5	51.36	38.98	30	
2/19/06 11:42 AM	168.8	51.45	38.89	0	
2/24/06 2:45 PM	168.6	51.39	38.95	5	
3/3/06 2:30 PM	ND			0	Well has been vandalized -no clear measure as a result And rain gauge vandalized- has since been fixed.
3/10/06 12:50 PM	170.7	52.03	38.31	5	New lock put on well
3/17/06 11:25 AM	172.6	52.61	37.73	13	
3/31/06 1:36 PM	172.6	52.61	37.73	0	
4/7/06 9:12 AM	173.5	52.88	37.46	24	
4/14/06 10:58 AM	174.1	53.07	37.28	22	
4/21/06 8:13 AM	174.4	53.16	37.19	29	
5/5/06 9:25 AM	173.6	52.91	37.43	31	
5/12/06 10:23 AM	173.5	52.88	37.46	28	
5/20/06 1:01 PM	173	52.73	37.61	36	
5/26/06 2:01 PM	172.9	52.70	37.64	0	
6/3/06 10:09 AM	173	52.73	37.61	27	
6/10/06 3:22 PM	170.3	51.91	38.44	141	
6/17/06 3:24 PM	170.2	51.88	38.47	50	
6/23/06 12:56 PM	167.5	51.05	39.29	33	
7/2/06 11:35 AM	167.1	50.93	39.41	27	
7/9/06 4:40 PM	167.1	50.93	39.41	3	
7/16/06 12:20 PM	167.4	51.02	39.32	78	
7/22/06 11:01 AM	166.8	50.84	39.50	66	
7/30/06 1:46 PM	165.7	50.51	39.84	9	
8/5/06 11:56 AM	166.7	50.81	39.53	17	
8/13/06 12:17 PM	167.7	51.11	39.23	2	
8/17/06 12:25 PM	169.1	51.54	38.80	13	
8/27/06 12:30 PM	170	51.82	38.53	0	

Table A-2: Bilcon Water Level Data - MW-2

BILCON NOTES THIS WELL HAS BEEN COMPROMISED
Typical SWL expected to be ~165 ft(50 m) below TOC

TOC Elevation:	296.4 ft asl	90.34272 masl
Well Depth:	220 ft	67.056 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-2 (masl)	RAINFALL (mm)	COMMENT
9/3/06 3:12 PM	172.4	52.55	37.80	4	
9/17/06 11:49 AM	174.6	53.22	37.12	0	
9/22/06 3:01 PM	175.3	53.43	36.91	36	
10/1/06 11:35 AM	177	53.95	36.39	11	
10/8/06 10:29 AM	176.8	53.89	36.45	78	
10/14/06 1:06 PM	177.2	54.01	36.33	15	
10/21/06 9:47 AM	177.6	54.13	36.21	26	
10/28/06 1:18 PM	177.5	54.10	36.24	2	
11/4/06 9:58 AM	177.7	54.16	36.18	10	
11/12/06 11:28 AM	177.1	53.98	36.36	ND	
11/18/06 11:11 AM	177.2	54.01	36.33	5	
11/25/06 11:58 AM	174.1	53.07	37.28	ND	
12/2/06 11:20 AM	161.6	49.26	41.09	33	New rain gauge - old one destroyed
12/9/06 11:45 AM	169.5	51.66	38.68	25	* Cover not welded back on
12/16/06 12:34 PM	167.4	51.02	39.32	7	
12/23/06 9:59 AM	167.6	51.08	39.26	18	
12/31/06 1:07 PM	168.4	51.33	39.01	0	

Table A-3: Bilcon Water Level Data - MW-3

TOC Elevation:	286.3 ft asl	87.26424 masl
Well Depth:	260 ft	79.248 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-3 (masl)	RAINFALL (mm)	COMMENT
9/22/05 1:00 PM	172	52.43	34.84		
9/23/05 2:00 PM	165	50.29	36.97		
9/24/05 10:45 AM	165	50.29	36.97		
10/18/05 11:00 AM	142.5	43.43	43.83		
10/28/05 1:00 PM	153.6	46.82	40.45		
11/4/05 10:40 AM	153.2	46.70	40.57		
11/11/05 10:20 AM	154.5	47.09	40.17	19	
11/18/05 9:45 AM	154.8	47.18	40.08	23	
11/25/05 9:44 AM	154.8	47.18	40.08	41	
12/2/05 12:00 PM	154.8	47.18	40.08	45	Someone hauled a tree and left it at well
12/12/05 12:49 PM	154	46.94	40.33	22	
12/17/05 1:51 PM	155	47.24	40.02	10	
12/30/05 11:25 AM	155.3	47.34	39.93	18	
1/6/06 4:23 PM	154.5	47.09	40.17	23	
1/13/06 11:45 AM	156	47.55	39.72	15	
1/21/06 12:20 PM	157	47.85	39.41	25	
1/27/06 3:37 PM	156.8	47.79	39.47	9	
2/3/06 11:05 AM	157.7	48.07	39.20	2	
2/10/06 10:30 AM	157.5	48.01	39.26	30	
2/19/06 11:30 AM	158	48.16	39.11	0	
2/24/06 2:38 PM	158.4	48.28	38.98	5	
3/3/06 2:19 PM	158.8	48.40	38.86	0	Rain gauge vandalized- has since been fixed.
3/10/06 12:35 PM	160	48.77	38.50	5	
3/17/06 11:15 AM	160	48.77	38.50	13	
3/24/06 11:07 AM	155.5	47.40	39.87	1.5	
3/31/06 1:27 PM	155.4	47.37	39.90	0	
4/7/06 9:00 AM	151.1	46.06	41.21	24	
4/14/06 10:48 AM	150.3	45.81	41.45	22	
4/21/06 8:00 AM	152.4	46.45	40.81	29	
5/5/06 9:19 AM	163.2	49.74	37.52	31	
5/12/06 10:01 AM	163.3	49.77	37.49	28	
5/20/06 12:56 PM	162.5	49.53	37.73	36	
5/26/06 1:47 PM	162.2	49.44	37.83	0	
6/3/06 10:01 AM	162.3	49.47	37.80	27	
6/10/06 3:13 PM	159.2	48.52	38.74	141	
6/17/06 3:17 PM	159.3	48.55	38.71	50	
6/23/06 12:24 PM	157	47.85	39.41	33	
7/2/06 11:30 AM	157.1	47.88	39.38	27	
7/9/06 3:54 PM	156.5	47.70	39.56	3	
7/16/06 12:01 PM	156.3	47.64	39.62	78	
7/22/06 10:55 AM	150.1	45.75	41.51	66	
7/30/06 1:28 PM	162.5	49.53	37.73	9	
8/5/06 11:43 AM	161.8	49.32	37.95	17	
8/13/06 12:09 PM	157.3	47.95	39.32	2	
8/17/06 12:00 PM	158.7	48.37	38.89	13	
8/27/06 10:40 AM	158.6	48.34	38.92	0	
9/3/06 2:55 PM	162	49.38	37.89	4	
9/17/06 11:22 AM	164.1	50.02	37.25	0	
9/22/06 2:45 PM	163	49.68	37.58	36	
10/1/06 11:23 AM	166.6	50.78	36.48	11	
10/8/06 10:10 AM	165.5	50.44	36.82	78	
10/14/06 12:55 PM	165	50.29	36.97	15	
10/21/06 9:29 AM	166.5	50.75	36.52	26	

Table A-3: Bilcon Water Level Data - MW-3

TOC Elevation:	286.3 ft asl	87.26424 masl
Well Depth:	260 ft	79.248 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-3 (masl)	RAINFALL (mm)	COMMENT
10/28/06 1:00 PM	167	50.90	36.36	2	
11/4/06 9:37 AM	167.4	51.02	36.24	10	
11/12/06 11:07 AM	166.7	50.81	36.45	ND	
11/18/06 10:58 AM	166.6	50.78	36.48	5	
11/25/06 10:40 AM	163.1	49.71	37.55	ND	
12/2/06 10:42 AM	159.1	48.49	38.77	33	New rain gauge – old one destroyed
12/9/06 11:26 AM	143.3	43.68	43.59	25	
12/16/06 12:10 PM	156.5	47.70	39.56	7	
12/23/06 9:48 AM	156.5	47.70	39.56	18	
12/31/06 1:52 PM	157.1	47.88	39.38	0	

Table A-4: Bilcon Water Level Data - MW-4

TOC Elevation:	167.7 ft asl	51.11496 masl
Well Depth:	120 ft	36.576 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-4 (masl)	RAINFALL (mm)	COMMENT
9/22/05 4:00 PM	27	8.23	42.89		
9/23/05 3:00 PM	22	6.71	44.41		
9/24/05 11:15 AM	22	6.71	44.41		
10/18/05 11:00 AM	21.3	6.49	44.62		
10/28/05 1:15 PM	21.35	6.51	44.61		
11/4/05 12:10 PM	21.6	6.58	44.53		
11/11/05 1:30 PM	21.2	6.46	44.65	19	
11/18/05 12:00 PM	21.4	6.52	44.59	23	
11/25/05 11:55 AM	21.3	6.49	44.62	41	
12/2/05 12:35 PM	21.3	6.49	44.62	45	
12/12/05 3:00 PM	21.3	6.49	44.62	22	
12/17/05 2:20 PM	21.4	6.52	44.59	10	
12/30/05 12:30 PM	21.4	6.52	44.59	18	
1/6/06 4:15 PM	21.4	6.52	44.59	23	
1/13/06 1:00 PM	21.4	6.52	44.59	15	
1/21/06 12:45 PM	21.6	6.58	44.53	25	
1/27/06 4:13 PM	21.6	6.58	44.53	9	
2/3/06 12:45 PM	21.6	6.58	44.53	2	
2/10/06 11:40 AM	21.6	6.58	44.53	30	
2/19/06 1:42 PM	21.5	6.55	44.56	0	
2/24/06 2:10 PM	21.5	6.55	44.56	5	
3/3/06 4:08 PM	21.4	6.52	44.59	0	Rain gauge vandalized- has since been fixed.
3/10/06 2:35 PM	21.4	6.52	44.59	5	Culvert painted
3/17/06 1:00 PM	21.5	6.55	44.56	13	
3/24/06 12:49 PM	23.5	7.16	43.95	1.5	
3/31/06 11:00 PM	23.5	7.16	43.95	0	
4/7/06 8:00 AM	23.5	7.16	43.95	24	
4/14/06 9:35 AM	23.5	7.16	43.95	22	
4/21/06 9:30 AM	24	7.32	43.80	29	
5/5/06 11:10 AM	21.6	6.58	44.53	31	
5/12/06 9:30 AM	21.4	6.52	44.59	28	
5/20/06 2:30 PM	21.3	6.49	44.62	36	
5/26/06 1:21 PM	21.6	6.58	44.53	0	
6/3/06 12:25 PM	21.5	6.55	44.56	27	
6/10/06 5:00 PM	20.7	6.31	44.81	141	
6/17/06 4:40 PM	21.4	6.52	44.59	50	
6/23/06 2:07 PM	21.5	6.55	44.56	33	
7/2/06 12:25 PM	21.4	6.52	44.59	27	
7/9/06 5:03 PM	21.6	6.58	44.53	3	
7/16/06 11:41 AM	21.4	6.52	44.59	78	
7/22/06 12:04 PM	21.3	6.49	44.62	66	
7/30/06 2:53 PM	21.6	6.58	44.53	9	
8/5/06 12:45 PM	21.5	6.55	44.56	17	
8/13/06 1:22 PM	21.8	6.64	44.47	2	
8/17/06 1:35 PM	21.7	6.61	44.50	13	
8/27/06 12:50 PM	21.7	6.61	44.50	0	
9/3/06 3:55 PM	22.1	6.74	44.38	4	
9/17/06 11:12 AM	22.2	6.77	44.35	0	
9/22/06 3:54 PM	21.8	6.64	44.47	36	
10/1/06 12:38 PM	21.9	6.68	44.44	11	
10/8/06 11:30 AM	21.8	6.64	44.47	78	
10/14/06 2:05 PM	21.6	6.58	44.53	15	
10/21/06 10:31 AM	21.7	6.61	44.50	26	
10/28/06 2:25 PM	21.7	6.61	44.50	2	
11/4/06 11:15 AM	21.7	6.61	44.50	10	
11/12/06 10:55 AM	21.3	6.49	44.62	ND	
11/18/06 10:47 AM	21.3	6.49	44.62	5	
11/25/06 12:47 PM	21.3	6.49	44.62	ND	

Table A-4: Bilcon Water Level Data - MW-4

TOC Elevation:	167.7 ft asl	51.11496 masl
Well Depth:	120 ft	36.576 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-4 (masl)	RAINFALL (mm)	COMMENT
12/2/06 12:00 AM				33	1)New rain gauge - old one destroyed. 2) No water level measurement taken in well as the well was being worked on.
12/9/06 12:40 PM	21.4	6.52	44.59	25	
12/16/06 1:37 PM	21.3	6.49	44.62	7	
12/23/06 10:48 AM	21.5	6.55	44.56	18	
12/31/06 2:15 PM	21.5	6.55	44.56	0	

Table A-5: Bilcon Water Level Data - MW-5

TOC Elevation:	156.9 ft asl	47.82312 masl
Well Depth:	150 ft	45.72 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-5 (masl)	RAINFALL (mm)	COMMENT
9/23/05 2:45 PM	32	9.75	38.07		
9/24/05 11:00 AM	30.3	9.24	38.59		
10/18/05 12:00 PM	23.7	7.22	40.60		
10/28/05 10:35 AM	23.4	7.13	40.69		
11/4/05 12:10 AM	23.2	7.07	40.75		
11/11/05 10:00 AM	23.7	7.22	40.60	19	
11/18/05 9:31 AM	24.1	7.35	40.48	23	
11/25/05 9:31 AM	24.1	7.35	40.48	41	
12/2/05 12:15 PM	24.2	7.38	40.45	45	
12/12/05 12:31 PM	23.5	7.16	40.66	22	
12/17/05 2:10 PM	24.1	7.35	40.48	10	
12/30/05 11:11 AM	24.5	7.47	40.36	18	
1/6/06 2:40 PM	24.3	7.41	40.42	23	
1/13/06 10:40 AM	25	7.62	40.20	15	
1/21/06 12:45 PM	21.6	6.58	41.24	25	
1/27/06 3:49 PM	25.6	7.80	40.02	9	
2/3/06 12:15 PM	26.3	8.02	39.81	2	
2/10/06 10:15 AM	26.3	8.02	39.81	30	
2/19/06 11:14 AM	26.5	8.08	39.75	0	
2/24/06 3:30 PM	26.5	8.08	39.75	5	
3/3/06 2:00 PM	ND			0	Lock has been vandalized Rain gauge vandalized- has since been fixed.
3/10/06 12:10 PM	ND			5	
3/17/06 11:00 AM	ND			13	
3/24/06 10:52 AM	29.9	9.11	38.71	1.5	New locks put on
3/31/06 1:15 PM	29.9	9.11	38.71	0	
4/7/06 8:45 AM	30.3	9.24	38.59	24	
4/21/06 7:48 AM	31.4	9.57	38.25	29	
5/5/06 10:55 AM	30.9	9.42	38.40	31	
5/12/06 9:47 AM	31.1	9.48	38.34	28	
5/20/06 12:43 PM	29.3	8.93	38.89	36	
5/26/06 1:35 PM	29.4	8.96	38.86	0	
6/3/06 9:47 AM	29.5	8.99	38.83	27	
6/10/06 4:34 PM	29.1	8.87	38.95	141	
6/17/06 3:09 PM	25.6	7.80	40.02	50	
6/23/06 12:14 PM	25.5	7.77	40.05	33	
7/2/06 11:22 AM	25.4	7.74	40.08	27	
7/9/06 3:35 PM	25.5	7.77	40.05	3	
7/16/06 11:53 AM	25.4	7.74	40.08	78	More vandalism - someone put rocks into the keyhole.
7/22/06 10:47 AM	24.6	7.50	40.33	66	
7/30/06 1:19 PM	24.2	7.38	40.45	9	
8/5/06 11:38 AM	25.2	7.68	40.14	17	
8/13/06 11:57 AM	26.1	7.96	39.87	2	
8/17/06 11:55 AM	27.2	8.29	39.53	13	
8/27/06 10:30 AM	28.6	8.72	39.11	0	
9/3/06 2:45 PM	29.7	9.05	38.77	4	
9/17/06 11:18 AM	31.4	9.57	38.25	0	
9/22/06 2:35 PM	32.4	9.88	37.95	36	
10/1/06 11:15 AM	33.4	10.18	37.64	11	
10/8/06 10:05 AM	32.9	10.03	37.80	78	
10/14/06 12:48 PM	33.2	10.12	37.70	15	
10/21/06 9:25 AM	32.8	10.00	37.83	26	

Table A-5: Bilcon Water Level Data - MW-5

TOC Elevation:	156.9 ft asl	47.82312 masl
Well Depth:	150 ft	45.72 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-5 (masl)	RAINFALL (mm)	COMMENT
10/28/06 12:50 PM	33.2	10.12	37.70	2	
11/4/06 9:32 AM	33.7	10.27	37.55	10	
11/12/06 11:02 AM	33.6	10.24	37.58	ND	
11/18/06 11:40 AM	33.5	10.21	37.61	5	
11/25/06 10:30 AM	29.8	9.08	38.74	ND	
12/2/06 12:00 AM				33	1)New rain gauge - old one destroyed. 2) No water level measurement taken in well as the well was being worked on.
12/9/06 11:22 AM	27.2	8.29	39.53	25	
12/16/06 12:01 PM	25.6			7	
12/23/06 9:44 AM	26.6	8.11	39.72	18	
12/31/06 2:00 PM	26.4	8.05	39.78	0	

Table A-6: Bilcon Water Level Data - MW-6

BILCON NOTES THIS WELL HAS BEEN COMPROMISED
Typical SWL expected to be ~129 ft (39.3 m) below TOC

TOC Elevation:	147.2 ft asl	44.86656 masl
Well Depth:	130 ft	39.624 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-6 (masl)	RAINFALL (mm)	COMMENT
9/23/05 12:30 AM	129.2	39.38	5.49		
9/23/05 3:15 PM	129.8	39.56	5.30		
9/24/05 10:15 AM	128	39.01	5.85		
10/18/05 11:30 AM	67.1	20.45	24.41		Well Vandalized
10/28/05 11:35 AM	52.2	15.91	28.96		
11/4/05 10:30 AM	45.5	13.87	31.00		
11/11/05 11:45 AM	38.65	11.78	33.09	19	
11/18/05 11:14 AM	34.3	10.45	34.41	23	
11/25/05 10:46 AM	34	10.36	34.50	41	
12/2/05 10:42 PM	28	8.53	36.33	45	
12/12/05 2:00 PM	30	9.14	35.72	22	
12/17/05 2:10 PM	25.6	7.80	37.06	10	
12/30/05 12:30 PM	24	7.32	37.55	18	
1/6/06 3:35 PM	23.5	7.16	37.70	23	
1/13/06 12:35 PM	23.2	7.07	37.80	15	
1/21/06 11:40 AM	22.9	6.98	37.89	25	
1/27/06 3:08 PM	22.9	6.98	37.89	9	
2/3/06 12:05 PM	22.8	6.95	37.92	2	
2/10/06 11:03 AM	22.8	6.95	37.92	30	
2/19/06 12:35 PM	22.6	6.89	37.98	0	
2/24/06 3:15 PM	22.6	6.89	37.98	5	
3/3/06 3:10 PM	ND			0	Well has been vandalized. Rain gauge vandalized- has since been fixed.
3/10/06 1:30 PM	ND			5	
3/17/06 11:40 AM	ND			13	
3/24/06 11:38 AM	ND			1.5	
3/31/06 2:00 PM	ND			0	
4/7/06 9:49 AM	ND			24	
4/14/06 11:30 AM	ND			22	
4/21/06 8:48 AM	ND			29	
5/5/06 10:05 AM	ND			31	
5/12/06 10:48 AM	ND			28	
5/20/06 1:33 PM	ND			36	
5/26/06 2:47 PM	ND			0	
6/3/06 10:36 AM	ND			27	
6/10/06 4:09 PM	22.6	6.89	37.98	141	Well has been repaired
6/17/06 3:57 PM	22.6	6.89	37.98	50	Still has debris in well
6/23/06 1:21 PM	22.5	6.86	38.01	33	"
7/2/06 11:50 AM	22.5	6.86	38.01	27	"
7/9/06 4:07 PM	22.5	6.86	38.01	3	"
7/16/06 12:36 PM	22.5	6.86	38.01	78	"
7/22/06 11:35 AM	22.6	6.89	37.98	66	"
7/30/06 2:08 PM	22.5	6.86	38.01	9	"
8/5/06 12:18 PM	22.6	6.89	37.98	17	"
8/13/06 12:48 PM	22.6	6.89	37.98	2	"
8/17/06 12:55 PM	21.6	6.58	38.28	13	"
8/27/06 10:50 AM	22.6	6.89	37.98	0	"
9/3/06 3:26 PM	22.6	6.89	37.98	4	"
9/17/06 12:20 PM	22.8	6.95	37.92	0	"

Table A-6: Bilcon Water Level Data - MW-6

BILCON NOTES THIS WELL HAS BEEN COMPROMISED
Typical SWL expected to be ~129 ft (39.3 m) below TOC

TOC Elevation:	147.2 ft asl	44.86656 masl
Well Depth:	130 ft	39.624 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - MW-6 (masl)	RAINFALL (mm)	COMMENT
9/22/06 3:25 PM	22.8	6.95	37.92	36	"
10/1/06 12:05 PM	22.7	6.92	37.95	11	"
10/8/06 10:41 AM	22.7	6.92	37.95	78	"
10/14/06 2:30 PM	22.8	6.95	37.92	15	"
10/21/06 10:05 AM	22.6	6.89	37.98	26	"
10/28/06 1:40 PM	94.5	28.80	16.06	2	"
11/4/06 10:10 AM	62.2	18.96	25.91	10	"
11/12/06 11:55 AM	43.6	13.29	31.58	ND	
11/18/06 12:28 PM	33.4	10.18	34.69	5	"
11/25/06 11:17 AM	27.6	8.41	36.45	ND	
12/2/06 10:52 AM	97.7	29.78	15.09	33	1)New rain gauge – old one destroyed.
12/9/06 12:00 PM	69.3	21.12	23.74	25	"
12/16/06 1:00 PM	41.8	12.74	32.13	7	
12/23/06 10:30 AM	40.6	12.37	32.49	18	
12/31/06 1:27 PM	39.8	12.13	32.74	0	

Table A-7: Bilcon Water Level Data - NS-02-01

TOC Elevation:	291.6 ft asl	88.87968 masl
Well Depth:	206.6 ft	62.97168 m

Date/Time	Water Level Depth (ft)	Water Level Depth (m)	Water Elev - NS-02-01 (masl)	RAINFALL (mm)	COMMENT
9/22/05 9:00 AM	177	53.95	34.93		
9/23/05 2:30 PM	173	52.73	36.15		
9/24/05 10:30 PM	172	52.43	36.45		
10/28/05 11:45 AM	158.9	48.43	40.45		
11/4/05 11:20 AM	158.7	48.37	40.51		
11/11/05 12:00 AM				19	Couldn't get cover off
11/18/05 10:35 AM	159.6	48.65	40.23	23	
11/25/05 10:22 AM	159.6	48.65	40.23	41	
12/2/05 11:25 PM	159.5	48.62	40.26	45	
12/12/05 1:33 PM	-			22	Ground frozen and cover won't come off
12/17/05 1:05 PM	-			10	
12/30/05 1:35 PM	159.8	48.71	40.17	18	
1/6/06 4:15 PM	160	48.77	40.11	23	
1/13/06 12:00 AM				15	Couldn't get cover off
1/21/06 12:15 PM	160.6	48.95	39.93	25	
1/27/06 2:45 PM	159.8	48.71	40.17	9	
2/3/06 11:40 AM	163	49.68	39.20	2	
2/10/06 11:20 AM	163	49.68	39.20	30	
2/19/06 12:10 PM	163.5	49.83	39.04	0	
2/24/06 2:55 PM	163.4	49.80	39.08	5	
3/3/06 3:50 PM	163.4	49.80	39.08	No measure	Rain gauge vandalized- has since been fixed.
3/10/06 11:00 PM	161.7	49.29	39.59	5	
3/17/06 12:40 PM	161.9	49.35	39.53	13	
3/24/06 12:40 PM	161.9	49.35	39.53	1.5	
3/31/06 2:45 PM	162	49.38	39.50	0	
4/7/06 9:31 AM	168.7	51.42	37.46	24	
4/14/06 11:12 AM	168.8	51.45	37.43	22	
4/21/06 8:20 AM	168.5	51.36	37.52	29	
5/5/06 10:45 AM	167.9	51.18	37.70	31	
5/12/06 10:23 AM	168.2	51.27	37.61	28	
5/20/06 2:13 PM	168.4	51.33	37.55	36	
5/26/06 2:18 PM	167.4	51.02	37.86	0	
6/3/06 12:00 PM	167.2	50.96	37.92	27	
6/10/06 3:43 PM	161.5	49.23	39.65	141	
6/17/06 3:41 PM	161.6	49.26	39.62	50	
6/23/06 1:02 PM	161.4	49.19	39.68	33	
7/2/06 12:15 PM	161.8	49.32	39.56	27	
7/9/06 4:30 PM	161.7	49.29	39.59	3	
7/16/06 1:10 PM	161.5	49.23	39.65	78	
7/22/06 11:20 AM	162.5	49.53	39.35	66	
7/30/06 1:49 PM	162.4	49.50	39.38	9	
8/5/06 12:23 PM	162	49.38	39.50	17	
8/13/06 12:33 PM	162.2	49.44	39.44	2	
8/17/06 12:30 PM	162.1	49.41	39.47	13	
8/27/06 11:45 AM	166.4	50.72	38.16	0	
9/3/06 3:18 PM	166.5	50.75	38.13	4	
9/17/06 11:54 AM	164.5	50.14	38.74	0	
9/22/06 3:10 PM	170.4	51.94	36.94	36	
10/1/06 11:42 PM	174.6	53.22	35.66	11	
10/8/06 10:35 AM	175.1	53.37	35.51	78	
10/14/06 1:45 PM	174.8	53.28	35.60	15	
10/21/06 9:55 AM	171.8	52.36	36.52	26	
10/28/06 2:10 PM	170.6	52.00	36.88	2	
11/4/06 10:42 AM	170.1	51.85	37.03	10	

Table A-7: Bilcon Water Level Data - NS-02-01

TOC Elevation:	291.6 ft asl	88.87968 masl
Well Depth:	206.6 ft	62.97168 m

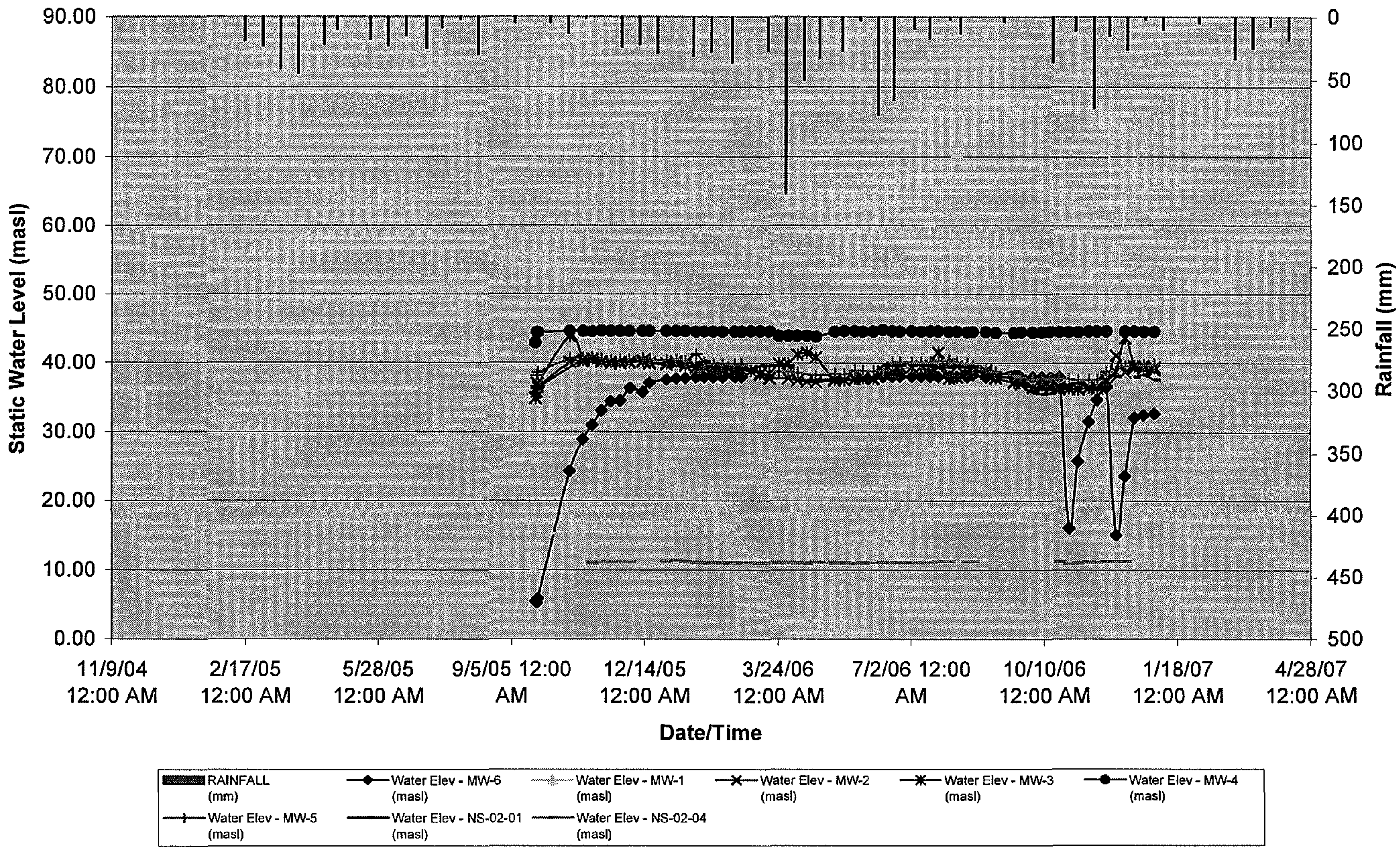
Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - NS-02-01 (masl)	RAINFALL (mm)	COMMENT
11/12/06 11:35 AM	172	52.43	36.45	ND	
11/18/06 11:18 AM	172.1	52.46	36.42	5	
11/25/06 11:35 AM	172	52.43	36.45	ND	
12/2/06 11:12 AM	166.6	50.78	38.10	33	1)New rain gauge - old one destroyed.
12/9/06 12:22 PM	166.4			25	
12/16/06 1:24 PM	167	50.90	37.98	7	
12/23/06 10:17 AM	166	50.60	38.28	18	
12/31/06 1:12 PM	168.2	51.27	37.61	0	

Table A-8: Bilcon Water Level Data - NS-02-04

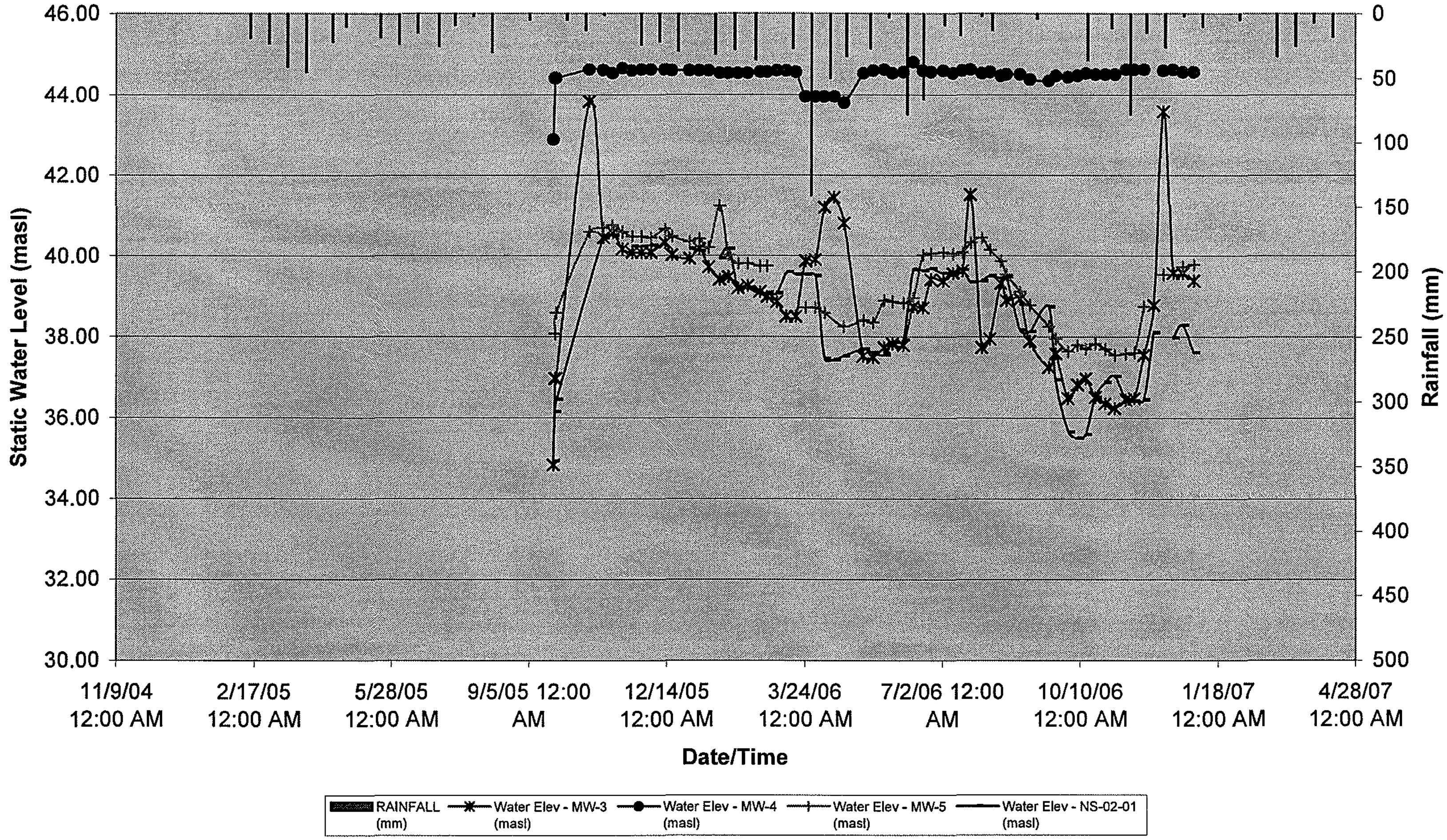
TOC Elevation:	40.7 ft asl	12.40536 masl
Well Depth:	65.6 ft	19.99488 m

Date/Time	Water Level Depth (ft.)	Water Level Depth (m)	Water Elev - NS-02-04 (masl)	RAINFALL (mm)	COMMENT
11/4/05 10:45 AM	4.5	1.37	11.03		
11/11/05 11:16 AM	3.7	1.13	11.28		
11/18/05 11:00 AM	3.8	1.16	11.25	23	
11/25/05 10:58 AM	3.8	1.16	11.25	41	
12/2/05 10:55 PM	3.6	1.10	11.31	45	
12/12/05 12:25 PM				22	A lot of surface water around well, with deep puddle
12/17/05 12:00 AM				10	
12/30/05 12:43 PM	3.5	1.07	11.34	18	
1/6/06 3:46 PM	3.3	1.01	11.40	23	
1/13/06 12:02 PM	3.9	1.19	11.22	15	
1/21/06 11:25 AM	4.4	1.34	11.06	25	
1/27/06 3:20 PM	4.5	1.37	11.03	9	
2/3/06 12:15 PM	4.4	1.34	11.06	2	
2/10/06 11:13 AM	4.5	1.37	11.03	30	
2/19/06 12:40 PM	4.5	1.37	11.03	0	
2/24/06 3:30 PM	4.4	1.34	11.06	5	
3/3/06 3:19 PM	4.4	1.34	11.06	ND	Rain gauge vandalized- has since been fixed.
3/10/06 1:45 PM	4.5	1.37	11.03	5	
3/17/06 11:55 AM	4.4	1.34	11.06	13	
3/24/06 11:46 AM	4.5	1.37	11.03	1.5	
3/31/06 2:10 PM	4.4	1.34	11.06	0	
4/7/06 10:00 AM	4.5	1.37	11.03	24	
4/14/06 11:39 AM	4.6	1.40	11.00	22	
4/21/06 9:00 AM	4.2	1.28	11.13	29	
5/5/06 10:20 AM	4.5	1.37	11.03	31	
5/12/06 10:58 AM	4.5	1.37	11.03	28	
5/20/06 1:43 PM	4.7	1.43	10.97	36	
5/26/06 3:00 PM	4.5	1.37	11.03	0	
6/10/06 4:17 PM	4.4	1.34	11.06	141	
6/17/06 4:08 PM	4.4	1.34	11.06	50	
6/23/06 1:32 PM	4.4	1.34	11.06	33	
7/2/06 12:00 PM	4.4	1.34	11.06	27	
7/9/06 4:14 PM	4.4	1.34	11.06	3	
7/16/06 12:50 PM	4.3	1.31	11.09	78	
7/22/06 11:40 AM	3.8	1.16	11.25	66	
7/30/06 2:14 PM	3.8	1.16	11.25	9	
8/5/06 12:07 PM	3.9			17	
8/13/06 12:58 PM	3.9	1.19	11.22	2	
8/17/06 12:55 PM	3.8	1.16	11.25	13	
8/27/06 11:00 AM	0			0	
9/3/06 3:35 PM				4	
9/17/06 12:07 PM	0			0	
9/22/06 3:35 PM	0			36	
10/1/06 12:15 PM	0			11	
10/8/06 10:55 AM	0			78	
10/14/06 2:40 PM	0			15	
10/21/06 10:16 AM	3.8	1.16	11.25	26	
10/28/06 1:51 PM	4.7	1.43	10.97	2	
11/4/06 10:21 AM	4.5	1.37	11.03	10	
11/12/06 12:12 AM	4	1.22	11.19	ND	
11/18/06 12:37 PM	4.1	1.25	11.16	5	
11/25/06 10:58 AM	3.9	1.19	11.22	ND	
12/2/06 11:00 AM	3.9	1.19	11.22	33	1)New rain gauge - old one destroyed.
12/9/06 12:15 PM	3.8	1.16	11.25	25	
12/16/06 12:00 AM				7	
12/23/06 12:00 AM				18	
12/31/06 12:00 AM				0	

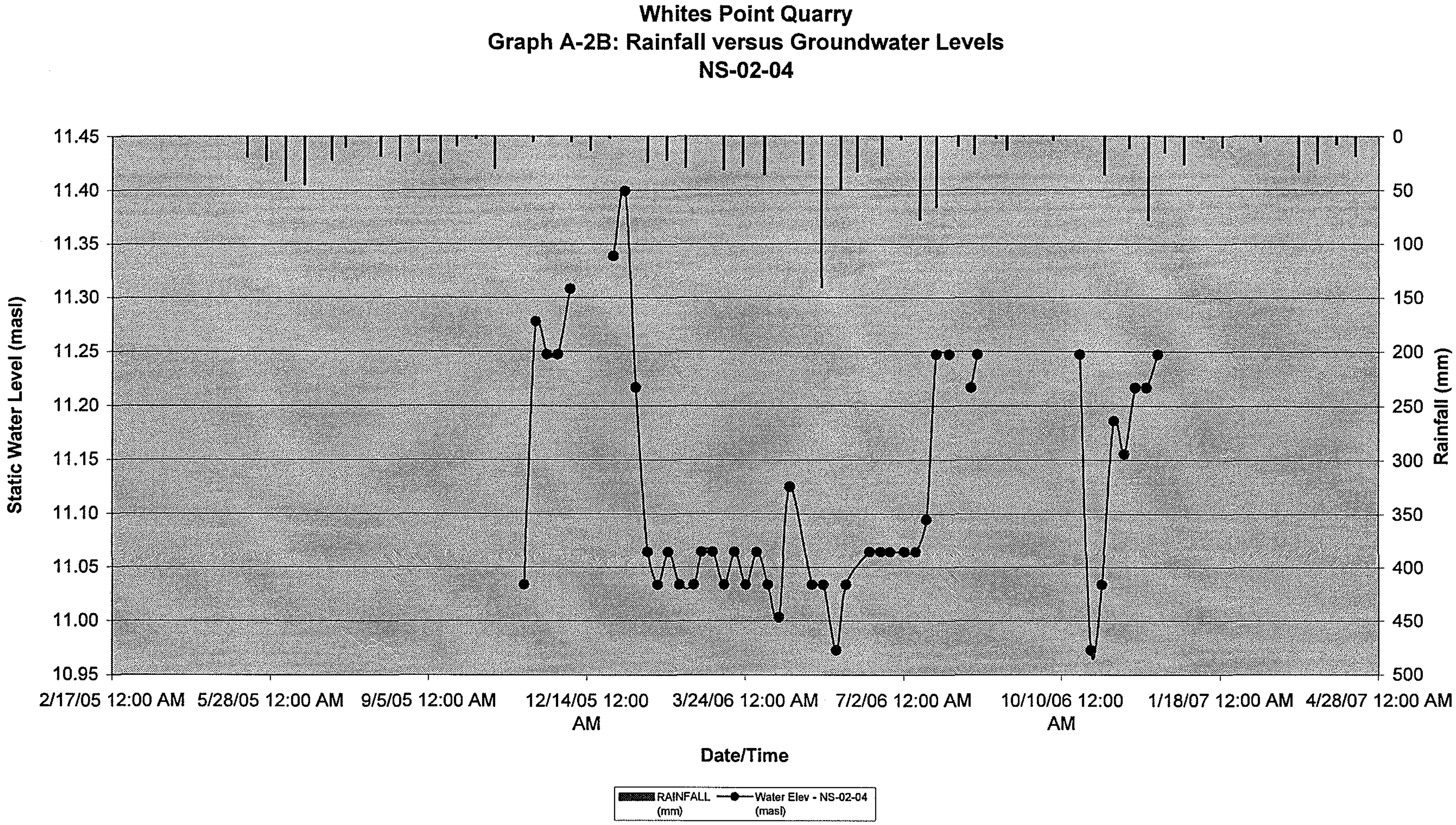
Whites Point Quarry
Graph A-1: Rainfall versus Groundwater Levels



Whites Point Quarry
Graph A-2A: Rainfall versus Groundwater Levels
MW-3, MW-4, MW-5, NS-02-01

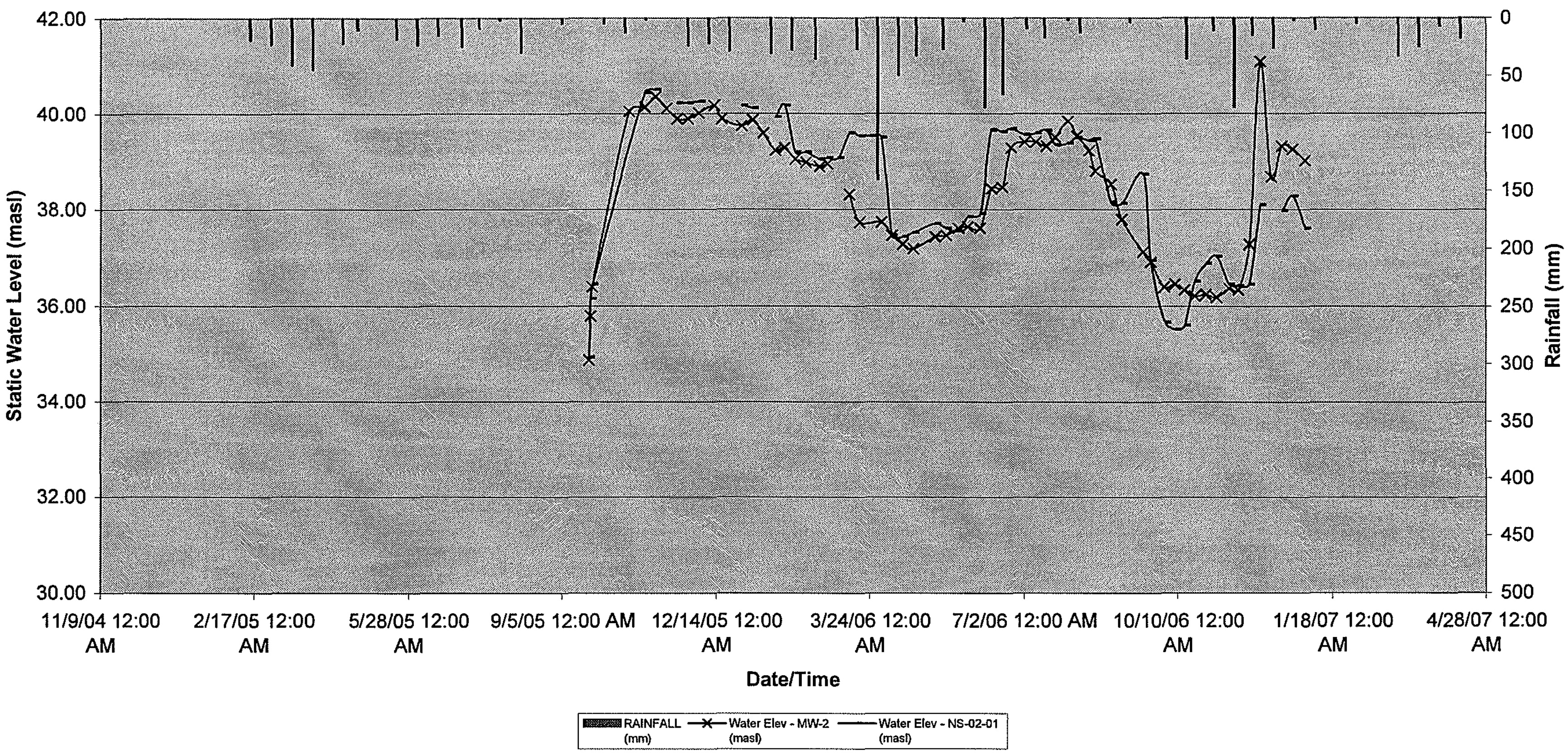


C0639-233



Whites Point Quarry
Graph A-2B: Rainfall versus Groundwater Levels
NS-02-04
Static Water Level (masl)
11.45
11.40
11.35
11.30
11.25
11.20
11.15
11.10
11.05
11.00
10.95
Rainfall (mm)
0
50
100
150
200
250
300
350
400
450
500
2/17/05 12:00 AM
5/28/05 12:00 AM
9/5/05 12:00 AM
12/14/05 12:00 AM
3/24/06 12:00 AM
7/2/06 12:00 AM
10/10/06 12:00 AM
1/18/07 12:00 AM
4/28/07 12:00 AM
Date/Time
RAINFALL (mm)
Water Elev - NS-02-04 (masl)

Whites Point Quarry
Graph A-3: Comparison of water levels in MW-2 (vandalized) and NS-02-01 (intact well)



ATTACHMENT B

WATER LEVEL AND QUALITY DATA
COLLECTED BY CRA

Table B-1
Static Water Levels (CRA Data)
(masl)
Whites Point Quarry, Little River, NS

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
Well Elevation (masl)	83.97	90.34	86.35	51.11	47.82	44.87
Well Depth (m)	74.68	67.06	79.25	36.58	45.72	39.62
30-Nov-06	69.59				39.21	36.99
1-Dec-06				44.59	39.21	
7-Dec-06		38.57	39.25	44.63		
8-Dec-06						26.17

Table B-2
Analytical Results
Whites Point Quarry, Little River, NS

		CDWQ 2004		CCME 2003		MW-1	MW-2	MW-2 Lab-Dup	MW-3	MW-3 Lab-Dup	MW-4	MW-5	MW-5 Lab-dup	MW-6
	Units	MAC	AO	FWAL	RDL	30-Nov-06	7-Dec-06	7-Dec-06	7-Dec-06	7-Dec-06	1-Dec-06	1-Dec-06	1-Dec-06	30-Nov-06
INORGANICS														
Total Alkalinity (Total as CaCO3)	mg/L				30	110	56		61		65	67		77
Dissolved Chloride (Cl)	mg/L		≤ 250		5	39	21		23		24	23		36
Colour	TCU		≤ 15		5	34	<5		<5		<5	<5		6
Hardness (CaCO3)	mg/L				N/A	44	14		52		62	70		16
Nitrate + Nitrite	mg/L				0.05	<0.05	0.67		0.69		0.1	0.27		<0.05
Nitrite (N)	mg/L			0.06	0.01	<0.01	0.05		<0.01		<0.01	<0.01		<0.01
Nitrogen (Ammonia Nitrogen)	mg/L				0.05	<0.05	<0.05		<0.05		<0.05	<0.05		0.08
Total Organic Carbon (C)	mg/L				0.5	11	<5		0.6	0.7	1.4	1.1		1.5
Orthophosphate (P)	mg/L				0.01	<0.01	<0.01		<0.01		0.01	0.03		<0.01
pH	pH		6.5-8.5	6.5-9.0	N/A	7.83	8.44		7.91		7.91	7.88		7.95
Reactive Silica (SiO2)	mg/L				0.5	24	17		20		21	22		22
Dissolved Sulphate (SO4)	mg/L		≤ 500		2	10	14		8		6	7		14
Turbidity	NTU	1	≤ 5		0.1	73	110		<0.1		2	0.7		1.9
Conductivity	uS/cm				1	350	200		200		210	210		290
RCAP CALCULATIONS														
Anion Sum	me/L				N/A	3.48	2.06		2.1		2.12	2.15		2.87
Bicarb. Alkalinity (calc. as CaCO3)	mg/L				1	108	55		61		65	67		77
Calculated TDS	mg/L				1	219	135		138		135	139		184
Carb. Alkalinity (calc. as CaCO3)	mg/L				1	<1	1		<1		<1	<1		<1
Cation Sum	me/L				N/A	3.6	2.01		2.22		2.14	2.24		2.84
Ion Balance (% Difference)	%				N/A	1.65	1.03		2.78		0.517	1.87		0.631
Langelier Index (@ 20C)	N/A				N/A	-0.339	-0.444		-0.428		-0.324	-0.304		-0.776
Langelier Index (@ 4C)	N/A				N/A	-0.589	-0.695		-0.679		-0.574	-0.555		-1.03
Saturation pH (@ 20C)	N/A				N/A	8.17	8.88		8.34		8.23	8.18		8.73
Saturation pH (@ 4C)	N/A				N/A	8.42	9.14		8.59		8.48	8.44		8.98
Elements (ICP-MS)														
Total Aluminum (Al)	ug/L			5-100	10	154	11.9	11.9	<5.0		8.6	292	288	11.4
Total Antimony (Sb)	ug/L	6			2	<2	<2.0	<2.0	<2.0		<2.0	<2	<2	<2
Total Arsenic (As)	ug/L	25		5	2	<2	2.7	2.7	<2.0		<2.0	<2	<2	<2
Total Barium (Ba)	ug/L	1000			5	7.2	<5.0	<5.0	<5.0		<5.0	<5	<5	<5
Total Beryllium (Be)	ug/L				2	<2	<2.0	<2.0	<2.0		<2.0	<2	<2	<2
Total Bismuth (Bi)	ug/L				2	<2	<2.0	<2.0	<2.0		<2.0	<2	<2	<2
Total Boron (B)	ug/L	5000			5	88.8	136	135	51.2		18	13.5	14.3	50.4
Total Cadmium (Cd)	ug/L	5		0.017	0.3	0.058	<0.017	<0.017	0.034		<0.017	0.082	0.089	0.101
Total Chromium (Cr)	ug/L	50			2	9.4	<2.0	<2.0	<2.0		<2	<2	<2	<2
Total Cobalt (Co)	ug/L				1	<0.40	<0.40	<0.40	<0.40		<0.40	0.44	0.45	<0.4
Total Copper (Cu)	ug/L		≤ 1000	2-4	2	12.9	<2.0	<2.0	2.5		<2	2.1	2.1	<2
Total Iron (Fe)	ug/L		≤ 300	300	50	738	<50	<50	<50		<50	416	448	116
Total Lead (Pb)	ug/L	10		1-7	0.5	1.99	<0.50	<0.50	22.5		<0.50	<0.50	<0.50	0.55
Total Manganese (Mn)	ug/L		≤ 50		2	36.9	<2.0	<2.0	<2.0		6.9	5.9	5.8	2.5
Total Molybdenum (Mo)	ug/L			73	2	3.9	<2.0	<2.0	<2.0		<2.0	<2	<2	<2
Total Nickel (Ni)	ug/L			25-150	2	9.9	<2.0	<2.0	<2.0		<2	<2	<2	<2
Total Selenium (Se)	ug/L			1	2	<1.0	<1.0	<1.0	4.7		<1	<1	<1	<1
Total Silver (Ag)	ug/L			0.1	0.5	<0.10	<0.10	<0.10	<0.10		<0.10	<0.10	<0.11	<0.1
Total Strontium (Sr)	ug/L				5	59.1	16	16	34.9		66.4	46.1	46.3	19.2
Total Thallium (Tl)	ug/L				0.1	<0.1	<0.10	<0.10	<0.10		<0.1	<0.10	<0.10	<0.10
Total Tin (Sn)	ug/L				2	<2	<2.0	<2.0	<2.0		<2	<2	<2.0	<2.0
Total Titanium (Ti)	ug/L				2	6.1	<2.0	<2.0	<2.0		<2	4.8	5.8	<2.0
Total Uranium (U)	ug/L	20			0.1	<0.1	0.29	0.29	0.18		0.3	0.32	0.31	0.27
Total Vanadium (V)	ug/L				2	<2	45.4	45.4	27.1		12.4	17.6	18.3	<2.0
Total Zinc (Zn)	ug/L		≤ 5000	30	5	11.8	<5.0	<5.0	44.3		<5	13.2	13.6	<5.0
Elements (ICP-OES)														
Total Calcium (Ca)	mg/L				0.1	15	5.5		17		21	23	22	5.9
Total Magnesium (Mg)	mg/L				0.1	1.2	0.1		2		2.6	3.2	3.2	0.3
Total Phosphorus (P)	mg/L				0.1	<0.1	<0.1		<0.1		<0.1	<0.12	<0.1	<0.1
Total Potassium (K)	mg/L				0.1	0.6	0.4		1.2		0.4	0.5	0.6	0.3
Total Sodium (Na)	mg/L		≤ 200	0.01	0.1	62	39		26		20	19	19	58
RCAP CALCULATIONS														
Nitrate (N)	mg/L	45		13	0.05	<0.05	0.62		0.69		0.1	0.27		<0.05

RDL = Reportable Detection Limit
MAC = Maximum Acceptable Concentration
AO = Asthetic Objective
Lab-Dup = Laboratory Initiated Duplicate

821191-Buxton-5-TB-2

ATTACHMENT C

LABORATORY CERTIFICATES OF ANALYSIS

Your Project #: 821191D/DIGBY NECK
Site: LITTLE RIVER
Your C.O.C. #: B 19379

Attention: Heather Sutherland
Conestoga-Rovers and Associates Ltd
Dartmouth
31 Gloster Crt
Dartmouth , NS
B3B 1X9

Report Date: 2006/12/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A6D4269
Received: 2006/12/11, 10:48

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide (1)	3	N/A	2006/12/11		
Alkalinity (1)	3	N/A	2006/12/13	ATL SOP 00013	Based on EPA310.2
Chloride (1)	3	N/A	2006/12/13	ATL SOP 00014 R2	Based on SM4500-Cl-
Colour (1)	3	N/A	2006/12/13	ATL SOP 00020	Based on EPA110.2
Conductance - water (1)	3	N/A	2006/12/13	ATL SOP 00004/00006	Based on SM2510B
Hardness (calculated as CaCO3) (1)	3	N/A	2006/12/11	Based on SM2340B	ATL SOP 00048
Dis.metals in water ICP-OES (1)	3	N/A	2006/12/13	ATL SOP 00025	Based on EPA200.7
Elements by ICPMS - dissolved (FIAS, LL) (1)	3	N/A	2006/12/12	ATL SOP 00024	Based on EPA6020A
Ion Balance (% Difference) (1)	3	N/A	2006/12/11		
Anion and Cation Sum (1)	3	N/A	2006/12/11		
Nitrogen Ammonia - water (1)	3	N/A	2006/12/12	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	3	N/A	2006/12/13	ATL SOP 00016 R2	Based on USGS - Enz.
Nitrogen - Nitrite (1)	3	N/A	2006/12/13	ATL SOP 00017	Based on USEPA 354.1
Nitrogen - Nitrate (as N) (1)	3	N/A	2006/12/11	ATL SOP 00018	Based on ASTMD3867
pH (1)	3	N/A	2006/12/13	ATL SOP 00003/00005	Based on EPA150.1
Phosphorus - ortho (1)	3	N/A	2006/12/13	ATL SOP 00021	Based on USEPA 365.1
Sat. pH and Langelier Index (@ 20C) (1)	3 *	N/A	2006/12/11		
Sat. pH and Langelier Index (@ 4C) (1)	3	N/A	2006/12/11		
Reactive Silica (1)	3	N/A	2006/12/13	ATL SOP 00022	Based on EPA 366.0
Sulphate (1)	3	N/A	2006/12/13	ATL SOP 00023	Based on EPA 375.4
Total Dissolved Solids (TDS calc) (1)	3	N/A	2006/12/11		
Organic carbon - Total (TOC) (1,2)	1	N/A	2006/12/14	ATL SOP 00037	Based on SM5310C
Organic carbon - Total (TOC) (1,2)	2	N/A	2006/12/15	ATL SOP 00037	Based on SM5310C
Turbidity (1,2)	3	N/A	2006/12/14	ATL SOP 00011	based on EPA 180.1

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bedford
(2) SCC/CAEAL

../2

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Your Project #: 821191D/DIGBY NECK
Site: LITTLE RIVER
Your C.O.C. #: B 19379

Attention: Heather Sutherland
Conestoga-Rovers and Associates Ltd
Dartmouth
31 Gloster Crt
Dartmouth , NS
B3B 1X9

Report Date: 2006/12/18

CERTIFICATE OF ANALYSIS

-2-

Encryption Key Karen Gilbert Karen Gilbert 18 Dec 2006 12:27:15 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MICHELLE HILL, Project Manager
Email: Michelle.Hill.Reports@maxxamanalytics.com
Phone# (902) 420-0203

==

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 2

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Maxxam Job #: A6D4269
Report Date: 2006/12/18

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		Q03173	Q03173		
Sampling Date		2006/12/07	2006/12/07		
COC Number		B 19379	B 19379		
	Units	**WELL#A**	**WELL#A Lab-Dup**	**RDL**	**QC Batch**
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	61		5	1125175
Dissolved Chloride (Cl)	mg/L	23		1	1125178
Colour	TCU	<5		5	1125187
Hardness (CaCO3)	mg/L	53		1	1123333
Nitrate + Nitrite	mg/L	0.69		0.05	1125191
Nitrite (N)	mg/L	<0.01		0.01	1125192
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05		0.05	1124989
Total Organic Carbon (C)	mg/L	0.7		0.5	1126884
Orthophosphate (P)	mg/L	<0.01		0.01	1125188
pH	pH	7.82	7.89	N/A	1125128
Reactive Silica (SiO2)	mg/L	20		0.5	1125183
Dissolved Sulphate (SO4)	mg/L	8		2	1125179
Turbidity	NTU	<0.1		0.1	1126629
Conductivity	uS/cm	210	210	1	1125124
RCAP CALCULATIONS					
Anion Sum	me/L	2.10		N/A	1123335
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	61		1	1123332
Calculated TDS	mg/L	134		1	1123339
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1		1	1123332
Cation Sum	me/L	2.06		N/A	1123335
Ion Balance (% Difference)	%	0.964		N/A	1123334
Langelier Index (@ 20C)	N/A	-0.495		N/A	1123337
Langelier Index (@ 4C)	N/A	-0.745		N/A	1123338
Saturation pH (@ 20C)	N/A	8.32		N/A	1123337
Saturation pH (@ 4C)	N/A	8.57		N/A	1123338
Elements (ICP-MS)					
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	1124311
Dissolved Antimony (Sb)	ug/L	<2.0		2.0	1124311
Dissolved Arsenic (As)	ug/L	<2.0		2.0	1124311
Dissolved Barium (Ba)	ug/L	<5.0		5.0	1124311
Dissolved Beryllium (Be)	ug/L	<2.0		2.0	1124311
Dissolved Bismuth (Bi)	ug/L	<2.0		2.0	1124311

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D4269
Report Date: 2006/12/18

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		Q03173	Q03173		
Sampling Date		2006/12/07	2006/12/07		
COC Number		B 19379	B 19379		
	Units	**WELL#A**	**WELL#A Lab-Dup**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	37.9		5.0	1124311
Dissolved Cadmium (Cd)	ug/L	0.042		0.017	1124311
Dissolved Chromium (Cr)	ug/L	<2.0		2.0	1124311
Dissolved Cobalt (Co)	ug/L	<0.40		0.40	1124311
Dissolved Copper (Cu)	ug/L	<2.0		2.0	1124311
Dissolved Iron (Fe)	ug/L	<50		50	1124311
Dissolved Lead (Pb)	ug/L	3.22		0.50	1124311
Dissolved Manganese (Mn)	ug/L	<2.0		2.0	1124311
Dissolved Molybdenum (Mo)	ug/L	<2.0		2.0	1124311
Dissolved Nickel (Ni)	ug/L	<2.0		2.0	1124311
Dissolved Selenium (Se)	ug/L	4.7		1.0	1124311
Dissolved Silver (Ag)	ug/L	<0.10		0.10	1124311
Dissolved Strontium (Sr)	ug/L	20.9		5.0	1124311
Dissolved Thallium (Tl)	ug/L	<0.10		0.10	1124311
Dissolved Tin (Sn)	ug/L	<2.0		2.0	1124311
Dissolved Titanium (Ti)	ug/L	<2.0		2.0	1124311
Dissolved Uranium (U)	ug/L	0.28		0.10	1124311
Dissolved Vanadium (V)	ug/L	25.2		2.0	1124311
Dissolved Zinc (Zn)	ug/L	6.5		5.0	1124311
Elements (ICP-OES)					
Dissolved Calcium (Ca)	mg/L	18		0.1	1125177
Dissolved Magnesium (Mg)	mg/L	1.9		0.1	1125177
Dissolved Phosphorus (P)	mg/L	<0.1		0.1	1125177
Dissolved Potassium (K)	mg/L	0.3		0.2	1125177
Dissolved Sodium (Na)	mg/L	23		0.4	1125177
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.69		0.05	1123336

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: A6D4269
Report Date: 2006/12/18

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		Q03177	Q03177		
Sampling Date		2006/12/07	2006/12/07		
COC Number		B 19379	B 19379		
	Units	**WELL#4**	**WELL#4 Lab-Dup**	**RDL**	**QC Batch**
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	56		5	1125175
Dissolved Chloride (Cl)	mg/L	21		1	1125178
Colour	TCU	<5		5	1125187
Hardness (CaCO3)	mg/L	14		1	1123333
Nitrate + Nitrite	mg/L	0.67		0.05	1125191
Nitrite (N)	mg/L	0.05		0.01	1125192
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05		0.05	1124989
Total Organic Carbon (C)	mg/L	<5		5	1127609
Orthophosphate (P)	mg/L	<0.01		0.01	1125188
pH	pH	8.44		N/A	1125128
Reactive Silica (SiO2)	mg/L	17		0.5	1125183
Dissolved Sulphate (SO4)	mg/L	14		2	1125179
Turbidity	NTU	110		1	1126629
Conductivity	uS/cm	200		1	1125124
RCAP CALCULATIONS					
Anion Sum	me/L	2.06		N/A	1123335
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	55		1	1123332
Calculated TDS	mg/L	135		1	1123339
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		1	1123332
Cation Sum	me/L	2.01		N/A	1123335
Ion Balance (% Difference)	%	1.03		N/A	1123334
Langelier Index (@ 20C)	N/A	-0.444		N/A	1123337
Langelier Index (@ 4C)	N/A	-0.695		N/A	1123338
Saturation pH (@ 20C)	N/A	8.88		N/A	1123337
Saturation pH (@ 4C)	N/A	9.14		N/A	1123338
Elements (ICP-MS)					
Dissolved Aluminum (Al)	ug/L	11.9	11.9	5.0	1124311
Dissolved Antimony (Sb)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Arsenic (As)	ug/L	2.7	2.7	2.0	1124311
Dissolved Barium (Ba)	ug/L	<5.0	<5.0	5.0	1124311
Dissolved Beryllium (Be)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	1124311

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D4269
Report Date: 2006/12/18

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		Q03177	Q03177		
Sampling Date		2006/12/07	2006/12/07		
COC Number		B 19379	B 19379		
	Units	**WELL#4**	**WELL#4 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	136	135	5.0	1124311
Dissolved Cadmium (Cd)	ug/L	<0.017	<0.017	0.017	1124311
Dissolved Chromium (Cr)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Cobalt (Co)	ug/L	<0.40	<0.40	0.40	1124311
Dissolved Copper (Cu)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Iron (Fe)	ug/L	<50	<50	50	1124311
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	1124311
Dissolved Manganese (Mn)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	1.0	1124311
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	0.10	1124311
Dissolved Strontium (Sr)	ug/L	16.0	16.2	5.0	1124311
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	0.10	1124311
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	2.0	1124311
Dissolved Uranium (U)	ug/L	0.29	0.25	0.10	1124311
Dissolved Vanadium (V)	ug/L	45.4	45.7	2.0	1124311
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	5.0	1124311
Elements (ICP-OES)					
Dissolved Calcium (Ca)	mg/L	5.5		0.1	1125177
Dissolved Magnesium (Mg)	mg/L	0.1		0.1	1125177
Dissolved Phosphorus (P)	mg/L	<0.1		0.1	1125177
Dissolved Potassium (K)	mg/L	0.4		0.2	1125177
Dissolved Sodium (Na)	mg/L	39		0.4	1125177
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.62		0.05	1123336

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D4269
Report Date: 2006/12/18

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		Q03178	Q03178		
Sampling Date		2006/12/07	2006/12/07		
COC Number		B 19379	B 19379		
	Units	**WELL#3**	**WELL#3 Lab-Dup**	**RDL**	**QC Batch**
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	61		5	1125175
Dissolved Chloride (Cl)	mg/L	23		1	1125178
Colour	TCU	<5		5	1125187
Hardness (CaCO3)	mg/L	52		1	1123333
Nitrate + Nitrite	mg/L	0.69		0.05	1125191
Nitrite (N)	mg/L	<0.01		0.01	1125192
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05		0.05	1124989
Total Organic Carbon (C)	mg/L	0.6	0.7	0.5	1127609
Orthophosphate (P)	mg/L	<0.01		0.01	1125188
pH	pH	7.91		N/A	1125128
Reactive Silica (SiO2)	mg/L	20		0.5	1125183
Dissolved Sulphate (SO4)	mg/L	8		2	1125179
Turbidity	NTU	<0.1		0.1	1126629
Conductivity	uS/cm	200		1	1125126
RCAP CALCULATIONS					
Anion Sum	me/L	2.10		N/A	1123335
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	61		1	1123332
Calculated TDS	mg/L	138		1	1123339
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1		1	1123332
Cation Sum	me/L	2.22		N/A	1123335
Ion Balance (% Difference)	%	2.78		N/A	1123334
Langelier Index (@ 20C)	N/A	-0.428		N/A	1123337
Langelier Index (@ 4C)	N/A	-0.679		N/A	1123338
Saturation pH (@ 20C)	N/A	8.34		N/A	1123337
Saturation pH (@ 4C)	N/A	8.59		N/A	1123338
Elements (ICP-MS)					
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	1124311
Dissolved Antimony (Sb)	ug/L	<2.0		2.0	1124311
Dissolved Arsenic (As)	ug/L	<2.0		2.0	1124311
Dissolved Barium (Ba)	ug/L	<5.0		5.0	1124311
Dissolved Beryllium (Be)	ug/L	<2.0		2.0	1124311
Dissolved Bismuth (Bi)	ug/L	<2.0		2.0	1124311

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D4269
Report Date: 2006/12/18

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		Q03178	Q03178		
Sampling Date		2006/12/07	2006/12/07		
COC Number		B 19379	B 19379		
	Units	**WELL#3**	**WELL#3 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	51.2		5.0	1124311
Dissolved Cadmium (Cd)	ug/L	0.034		0.017	1124311
Dissolved Chromium (Cr)	ug/L	<2.0		2.0	1124311
Dissolved Cobalt (Co)	ug/L	<0.40		0.40	1124311
Dissolved Copper (Cu)	ug/L	2.5		2.0	1124311
Dissolved Iron (Fe)	ug/L	<50		50	1124311
Dissolved Lead (Pb)	ug/L	22.5		0.50	1124311
Dissolved Manganese (Mn)	ug/L	<2.0		2.0	1124311
Dissolved Molybdenum (Mo)	ug/L	<2.0		2.0	1124311
Dissolved Nickel (Ni)	ug/L	<2.0		2.0	1124311
Dissolved Selenium (Se)	ug/L	4.7		1.0	1124311
Dissolved Silver (Ag)	ug/L	<0.10		0.10	1124311
Dissolved Strontium (Sr)	ug/L	34.9		5.0	1124311
Dissolved Thallium (Tl)	ug/L	<0.10		0.10	1124311
Dissolved Tin (Sn)	ug/L	<2.0		2.0	1124311
Dissolved Titanium (Ti)	ug/L	<2.0		2.0	1124311
Dissolved Uranium (U)	ug/L	0.18		0.10	1124311
Dissolved Vanadium (V)	ug/L	27.1		2.0	1124311
Dissolved Zinc (Zn)	ug/L	44.3		5.0	1124311
Elements (ICP-OES)					
Dissolved Calcium (Ca)	mg/L	17		0.1	1125177
Dissolved Magnesium (Mg)	mg/L	2.0		0.1	1125177
Dissolved Phosphorus (P)	mg/L	<0.1		0.1	1125177
Dissolved Potassium (K)	mg/L	1.2		0.2	1125177
Dissolved Sodium (Na)	mg/L	26		0.4	1125177
RCAP CALCULATIONS					
Nitrate (N)	mg/L	0.69		0.05	1123336

RDL = Reportable Detection Limit
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Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/DIGBY NECK
Project name: LITTLE RIVER
Sampler Initials:

GENERAL COMMENTS

Sample Q03173-01: Potassium: Elevated detection limit due to blank performance.

Sample Q03177-01: Potassium: Elevated detection limit due to blank performance.

The detection limit for TOC was increased due to matrix interference.

Sample Q03178-01: Potassium: Elevated detection limit due to blank performance.

Results relate only to the items tested.

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191D/DIGBY NECK
P.O. #:
Project name: LITTLE RIVER

Quality Assurance Report

Maxxam Job Number: DA6D4269

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1124311 DLB	MATRIX SPIKE [Q03173-01]	Dissolved Aluminum (Al)	2006/12/12		106	%	80 - 120
		Dissolved Antimony (Sb)	2006/12/12		107	%	80 - 120
		Dissolved Arsenic (As)	2006/12/12		118	%	80 - 120
		Dissolved Barium (Ba)	2006/12/12		109	%	80 - 120
		Dissolved Beryllium (Be)	2006/12/12		115	%	80 - 120
		Dissolved Bismuth (Bi)	2006/12/12		101	%	80 - 120
		Dissolved Boron (B)	2006/12/12		111	%	80 - 120
		Dissolved Cadmium (Cd)	2006/12/12		113	%	80 - 120
		Dissolved Chromium (Cr)	2006/12/12		106	%	80 - 120
		Dissolved Cobalt (Co)	2006/12/12		109	%	80 - 120
		Dissolved Copper (Cu)	2006/12/12		105	%	80 - 120
		Dissolved Lead (Pb)	2006/12/12		106	%	80 - 120
		Dissolved Manganese (Mn)	2006/12/12		102	%	80 - 120
		Dissolved Molybdenum (Mo)	2006/12/12		106	%	80 - 120
		Dissolved Nickel (Ni)	2006/12/12		107	%	80 - 120
		Dissolved Selenium (Se)	2006/12/12		122 (1)	%	80 - 120
		Dissolved Silver (Ag)	2006/12/12		93	%	80 - 120
		Dissolved Strontium (Sr)	2006/12/12		105	%	80 - 120
		Dissolved Thallium (Tl)	2006/12/12		104	%	80 - 120
		Dissolved Tin (Sn)	2006/12/12		100	%	80 - 120
		Dissolved Titanium (Ti)	2006/12/12		106	%	80 - 120
		Dissolved Uranium (U)	2006/12/12		110	%	80 - 120
		Dissolved Vanadium (V)	2006/12/12		109	%	80 - 120
		Dissolved Zinc (Zn)	2006/12/12		121 (1)	%	80 - 120
	QC STANDARD	Dissolved Aluminum (Al)	2006/12/12		100	%	80 - 120
		Dissolved Antimony (Sb)	2006/12/12		102	%	80 - 120
		Dissolved Arsenic (As)	2006/12/12		101	%	80 - 120
		Dissolved Barium (Ba)	2006/12/12		96	%	80 - 120
		Dissolved Beryllium (Be)	2006/12/12		110	%	80 - 120
		Dissolved Boron (B)	2006/12/12		106	%	80 - 120
		Dissolved Cadmium (Cd)	2006/12/12		102	%	80 - 120
		Dissolved Chromium (Cr)	2006/12/12		96	%	80 - 120
		Dissolved Cobalt (Co)	2006/12/12		98	%	80 - 120
		Dissolved Copper (Cu)	2006/12/12		95	%	80 - 120
		Dissolved Lead (Pb)	2006/12/12		97	%	80 - 120
		Dissolved Manganese (Mn)	2006/12/12		93	%	80 - 120
		Dissolved Molybdenum (Mo)	2006/12/12		99	%	80 - 120
		Dissolved Nickel (Ni)	2006/12/12		94	%	80 - 120
		Dissolved Selenium (Se)	2006/12/12		106	%	80 - 120
		Dissolved Silver (Ag)	2006/12/12		91	%	80 - 120
		Dissolved Strontium (Sr)	2006/12/12		95	%	80 - 120
		Dissolved Vanadium (V)	2006/12/12		104	%	80 - 120
		Dissolved Zinc (Zn)	2006/12/12		108	%	80 - 120
	Spiked Blank	Dissolved Aluminum (Al)	2006/12/12		122 (1)	%	80 - 120
		Dissolved Antimony (Sb)	2006/12/12		102	%	80 - 120
		Dissolved Arsenic (As)	2006/12/12		101	%	80 - 120
		Dissolved Barium (Ba)	2006/12/12		108	%	80 - 120
		Dissolved Beryllium (Be)	2006/12/12		105	%	80 - 120
		Dissolved Bismuth (Bi)	2006/12/12		111	%	80 - 120
		Dissolved Boron (B)	2006/12/12		99	%	80 - 120
		Dissolved Cadmium (Cd)	2006/12/12		105	%	80 - 120
		Dissolved Chromium (Cr)	2006/12/12		102	%	80 - 120
		Dissolved Cobalt (Co)	2006/12/12		105	%	80 - 120
		Dissolved Copper (Cu)	2006/12/12		104	%	80 - 120

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191D/DIGBY NECK
P.O. #:
Project name: LITTLE RIVER

Quality Assurance Report (Continued)

Maxxam Job Number: DA6D4269

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1124311 DLB	Spiked Blank	Dissolved Lead (Pb)	2006/12/12		110	%	80 - 120
		Dissolved Manganese (Mn)	2006/12/12		117	%	80 - 120
		Dissolved Molybdenum (Mo)	2006/12/12		106	%	80 - 120
		Dissolved Nickel (Ni)	2006/12/12		104	%	80 - 120
		Dissolved Selenium (Se)	2006/12/12		99	%	80 - 120
		Dissolved Silver (Ag)	2006/12/12		97	%	80 - 120
		Dissolved Strontium (Sr)	2006/12/12		107	%	80 - 120
		Dissolved Thallium (Tl)	2006/12/12		110	%	80 - 120
		Dissolved Tin (Sn)	2006/12/12		108	%	80 - 120
		Dissolved Titanium (Ti)	2006/12/12		99	%	80 - 120
		Dissolved Uranium (U)	2006/12/12		108	%	80 - 120
		Dissolved Vanadium (V)	2006/12/12		103	%	80 - 120
		Dissolved Zinc (Zn)	2006/12/12		104	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2006/12/12	<5.0		ug/L	
		Dissolved Antimony (Sb)	2006/12/12	<2.0		ug/L	
		Dissolved Arsenic (As)	2006/12/12	<2.0		ug/L	
		Dissolved Barium (Ba)	2006/12/12	<5.0		ug/L	
		Dissolved Beryllium (Be)	2006/12/12	<2.0		ug/L	
		Dissolved Bismuth (Bi)	2006/12/12	<2.0		ug/L	
		Dissolved Boron (B)	2006/12/12	<5.0		ug/L	
		Dissolved Cadmium (Cd)	2006/12/12	<0.017		ug/L	
		Dissolved Chromium (Cr)	2006/12/12	<2.0		ug/L	
		Dissolved Cobalt (Co)	2006/12/12	<0.40		ug/L	
		Dissolved Copper (Cu)	2006/12/12	<2.0		ug/L	
		Dissolved Iron (Fe)	2006/12/12	<50		ug/L	
		Dissolved Lead (Pb)	2006/12/12	<0.50		ug/L	
		Dissolved Manganese (Mn)	2006/12/12	<2.0		ug/L	
		Dissolved Molybdenum (Mo)	2006/12/12	<2.0		ug/L	
		Dissolved Nickel (Ni)	2006/12/12	<2.0		ug/L	
		Dissolved Selenium (Se)	2006/12/12	<1.0		ug/L	
		Dissolved Silver (Ag)	2006/12/12	<0.10		ug/L	
		Dissolved Strontium (Sr)	2006/12/12	<5.0		ug/L	
		Dissolved Thallium (Tl)	2006/12/12	<0.10		ug/L	
		Dissolved Tin (Sn)	2006/12/12	<2.0		ug/L	
		Dissolved Titanium (Ti)	2006/12/12	<2.0		ug/L	
		Dissolved Uranium (U)	2006/12/12	<0.10		ug/L	
		Dissolved Vanadium (V)	2006/12/12	<2.0		ug/L	
		Dissolved Zinc (Zn)	2006/12/12	<5.0		ug/L	
	RPD [Q03177-01]	Dissolved Aluminum (Al)	2006/12/12	NC		%	35
		Dissolved Antimony (Sb)	2006/12/12	NC		%	25
		Dissolved Arsenic (As)	2006/12/12	NC		%	25
		Dissolved Barium (Ba)	2006/12/12	NC		%	25
		Dissolved Beryllium (Be)	2006/12/12	NC		%	25
		Dissolved Bismuth (Bi)	2006/12/12	NC		%	25
		Dissolved Boron (B)	2006/12/12	1.1		%	25
		Dissolved Cadmium (Cd)	2006/12/12	NC		%	25
		Dissolved Chromium (Cr)	2006/12/12	NC		%	25
		Dissolved Cobalt (Co)	2006/12/12	NC		%	25
		Dissolved Copper (Cu)	2006/12/12	NC		%	25
		Dissolved Iron (Fe)	2006/12/12	NC		%	25
		Dissolved Lead (Pb)	2006/12/12	NC		%	25
		Dissolved Manganese (Mn)	2006/12/12	NC		%	25
		Dissolved Molybdenum (Mo)	2006/12/12	NC		%	25
		Dissolved Nickel (Ni)	2006/12/12	NC		%	25
		Dissolved Selenium (Se)	2006/12/12	NC		%	25

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191D/DIGBY NECK
P.O. #:
Project name: LITTLE RIVER

Quality Assurance Report (Continued)

Maxxam Job Number: DA6D4269

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1124311 DLB	RPD [Q03177-01]	Dissolved Silver (Ag)	2006/12/12	NC		%	25
		Dissolved Strontium (Sr)	2006/12/12	NC		%	25
		Dissolved Thallium (Tl)	2006/12/12	NC		%	25
		Dissolved Tin (Sn)	2006/12/12	NC		%	25
		Dissolved Titanium (Ti)	2006/12/12	NC		%	25
		Dissolved Uranium (U)	2006/12/12	NC		%	25
		Dissolved Vanadium (V)	2006/12/12	0.6		%	25
		Dissolved Zinc (Zn)	2006/12/12	NC		%	25
1124989 LMA	MATRIX SPIKE	Nitrogen (Ammonia Nitrogen)	2006/12/12		101	%	80 - 120
	QC STANDARD	Nitrogen (Ammonia Nitrogen)	2006/12/12		107	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2006/12/12		101	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2006/12/12	<0.05		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2006/12/12	NC		%	25
1125124 SMT	QC STANDARD	Conductivity	2006/12/13		98	%	80 - 120
	Method Blank	Conductivity	2006/12/13	1.5		uS/cm	
	RPD [Q03173-01]	Conductivity	2006/12/13	0		%	25
1125126 SMT	QC STANDARD	Conductivity	2006/12/13		98	%	80 - 120
	Method Blank	Conductivity	2006/12/13	0.88		uS/cm	
	RPD	Conductivity	2006/12/13	1.1		%	25
1125128 SMT	QC STANDARD	pH	2006/12/13		100	%	80 - 120
	Method Blank	pH	2006/12/13	5.57		pH	
	RPD [Q03173-01]	pH	2006/12/13	0.9		%	25
1125175 JOA	MATRIX SPIKE	Total Alkalinity (Total as CaCO3)	2006/12/13		NC (2)	%	80 - 120
	QC STANDARD	Total Alkalinity (Total as CaCO3)	2006/12/13		100	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2006/12/13		96	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2006/12/13	<5		mg/L	
	RPD	Total Alkalinity (Total as CaCO3)	2006/12/13	NC		%	25
1125177 MLB	MATRIX SPIKE	Dissolved Calcium (Ca)	2006/12/13		95	%	80 - 120
		Dissolved Magnesium (Mg)	2006/12/13		91	%	80 - 120
		Dissolved Phosphorus (P)	2006/12/13		98	%	80 - 120
		Dissolved Potassium (K)	2006/12/13		96	%	80 - 120
		Dissolved Sodium (Na)	2006/12/13		79 (3)	%	80 - 120
	QC STANDARD	Dissolved Calcium (Ca)	2006/12/13		107	%	80 - 120
		Dissolved Magnesium (Mg)	2006/12/13		104	%	80 - 120
		Dissolved Phosphorus (P)	2006/12/13		80	%	80 - 120
		Dissolved Potassium (K)	2006/12/13		101	%	80 - 120
		Dissolved Sodium (Na)	2006/12/13		102	%	80 - 120
	Spiked Blank	Dissolved Calcium (Ca)	2006/12/13		101	%	80 - 120
		Dissolved Magnesium (Mg)	2006/12/13		100	%	80 - 120
		Dissolved Phosphorus (P)	2006/12/13		93	%	80 - 120
		Dissolved Potassium (K)	2006/12/13		102	%	80 - 120
		Dissolved Sodium (Na)	2006/12/13		102	%	80 - 120
	Method Blank	Dissolved Calcium (Ca)	2006/12/13	<0.1		mg/L	
		Dissolved Magnesium (Mg)	2006/12/13	<0.1		mg/L	
		Dissolved Phosphorus (P)	2006/12/13	<0.1		mg/L	
		Dissolved Potassium (K)	2006/12/13	<0.1		mg/L	
		Dissolved Sodium (Na)	2006/12/13	<0.1		mg/L	
	RPD	Dissolved Calcium (Ca)	2006/12/13	1.0		%	25
		Dissolved Magnesium (Mg)	2006/12/13	1		%	25
		Dissolved Phosphorus (P)	2006/12/13	NC		%	25
		Dissolved Potassium (K)	2006/12/13	1.4		%	25
		Dissolved Sodium (Na)	2006/12/13	1.2		%	25
1125178 JOA	MATRIX SPIKE	Dissolved Chloride (Cl)	2006/12/13		NC (2)	%	80 - 120
	QC STANDARD	Dissolved Chloride (Cl)	2006/12/13		103	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2006/12/13		104	%	80 - 120

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191D/DIGBY NECK
P.O. #:
Project name: LITTLE RIVER

Quality Assurance Report (Continued)

Maxxam Job Number: DA6D4269

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1125178 JOA	Method Blank	Dissolved Chloride (Cl)	2006/12/13	<1		mg/L	
	RPD	Dissolved Chloride (Cl)	2006/12/13	1.7		%	25
1125179 JOA	MATRIX SPIKE	Dissolved Sulphate (SO4)	2006/12/13		107	%	80 - 120
	QC STANDARD	Dissolved Sulphate (SO4)	2006/12/13		103	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2006/12/13		106	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2006/12/13	<2		mg/L	
	RPD	Dissolved Sulphate (SO4)	2006/12/13	0.7		%	25
1125183 JOA	MATRIX SPIKE	Reactive Silica (SiO2)	2006/12/13		96	%	80 - 120
	QC STANDARD	Reactive Silica (SiO2)	2006/12/13		106	%	75 - 125
	Spiked Blank	Reactive Silica (SiO2)	2006/12/13		99	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2006/12/13	<0.5		mg/L	
	RPD	Reactive Silica (SiO2)	2006/12/13	1.1		%	25
1125187 JOA	QC STANDARD	Colour	2006/12/13		98	%	80 - 120
	Method Blank	Colour	2006/12/13	<5		TCU	
	RPD	Colour	2006/12/13	NC		%	25
1125188 JOA	MATRIX SPIKE	Orthophosphate (P)	2006/12/13		94	%	80 - 120
	QC STANDARD	Orthophosphate (P)	2006/12/13		97	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2006/12/13		97	%	80 - 120
	Method Blank	Orthophosphate (P)	2006/12/13	<0.01		mg/L	
	RPD	Orthophosphate (P)	2006/12/13	NC		%	25
1125191 JOA	MATRIX SPIKE	Nitrate + Nitrite	2006/12/13		98	%	80 - 120
	QC STANDARD	Nitrate + Nitrite	2006/12/13		102	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2006/12/13		100	%	80 - 120
	Method Blank	Nitrate + Nitrite	2006/12/13	<0.05		mg/L	
	RPD	Nitrate + Nitrite	2006/12/13	NC		%	25
1125192 JOA	MATRIX SPIKE	Nitrite (N)	2006/12/13		95	%	80 - 120
	QC STANDARD	Nitrite (N)	2006/12/13		101	%	80 - 120
	Spiked Blank	Nitrite (N)	2006/12/13		98	%	80 - 120
	Method Blank	Nitrite (N)	2006/12/13	<0.01		mg/L	
	RPD	Nitrite (N)	2006/12/13	NC		%	25
1126629 SSI	QC STANDARD	Turbidity	2006/12/14		104	%	80 - 120
	Method Blank	Turbidity	2006/12/14	<0.1		NTU	
	RPD	Turbidity	2006/12/14	NC		%	25
1126884 CRA	MATRIX SPIKE	Total Organic Carbon (C)	2006/12/14		104	%	75 - 125
	QC STANDARD	Total Organic Carbon (C)	2006/12/14		111	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2006/12/14		110	%	75 - 125
	Method Blank	Total Organic Carbon (C)	2006/12/14	<0.5		mg/L	
	RPD	Total Organic Carbon (C)	2006/12/14	NC		%	25
1127609 CRA	MATRIX SPIKE [Q03178-01]	Total Organic Carbon (C)	2006/12/15		96	%	75 - 125
	QC STANDARD	Total Organic Carbon (C)	2006/12/15		101	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2006/12/15		97	%	75 - 125
	Method Blank	Total Organic Carbon (C)	2006/12/15	<0.5		mg/L	
	RPD [Q03178-01]	Total Organic Carbon (C)	2006/12/15	NC		%	25

NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample
(1) Recovery within acceptance limits.
(2) Recoveries are Not Applicable due to the high concentration(s) of analyte(s) within spiked sample.
(3) Please refer to General Comments page for specific clarification.

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Your Project #: 821191D/BILCON
Site: DIGBY NECK
Your C.O.C. #: B 19241

Attention: Heather Sutherland
Conestoga-Rovers and Associates Ltd
Dartmouth
31 Gloster Crt
Dartmouth , NS
B3B 1X9

Report Date: 2006/12/11

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A6D1520
Received: 2006/12/04, 12:45

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide (1)	4	N/A	2006/12/04		
Alkalinity (1)	4	N/A	2006/12/06	ATL SOP 00013	Based on EPA310.2
Chloride (1)	4	N/A	2006/12/06	ATL SOP 00014	Based on SM4500-Cl-
Colour (1)	4	N/A	2006/12/06	ATL SOP 00020	Based on EPA110.2
Conductance - water (1)	4	N/A	2006/12/06	ATL SOP 00004/00006	Based on SM2510B
Hardness (calculated as CaCO3) (1)	4	N/A	2006/12/04	Based on SM2340B	ATL SOP 00048
Dis.metals in water ICP-OES (1)	4	N/A	2006/12/07	ATL SOP 00025	Based on EPA200.7
Elements by ICPMS - dissolved (FIAS, LL) (1)	4	N/A	2006/12/07	ATL SOP 00024	Based on EPA6020A
Ion Balance (% Difference) (1)	4	N/A	2006/12/04		
Anion and Cation Sum (1)	4	N/A	2006/12/04		
Nitrogen Ammonia - water (1)	4	N/A	2006/12/06	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	4	N/A	2006/12/06	ATL SOP 00016 R2	Based on USGS - Enz.
Nitrogen - Nitrite (1)	4	N/A	2006/12/06	ATL SOP 00017	Based on USEPA 354.1
Nitrogen - Nitrate (as N) (1)	4	N/A	2006/12/04	ATL SOP 00018	Based on ASTMD3867
pH (1)	4	N/A	2006/12/06	ATL SOP 00003/00005	Based on EPA150.1
Phosphorus - ortho (1)	4	N/A	2006/12/06	ATL SOP 00021	Based on USEPA 365.1
Sat. pH and Langelier Index (@ 20C) (1)	4	N/A	2006/12/04		
Sat. pH and Langelier Index (@ 4C) (1)	4	N/A	2006/12/04		
Reactive Silica (1)	4	N/A	2006/12/06	ATL SOP 00022	Based on EPA 366.0
Sulphate (1)	4	N/A	2006/12/06	ATL SOP 00023	Based on EPA 375.4
Total Dissolved Solids (TDS calc) (1)	4	N/A	2006/12/04		
Organic carbon - Total (TOC) (1,2)	4	N/A	2006/12/08	ATL SOP 00037	Based on SM5310C
Turbidity (1,2)	4	N/A	2006/12/07	ATL SOP 00011	based on EPA 180.1

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bedford
(2) SCC/CAEAL

../2

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C0639-252

Your Project #: 821191D/BILCON
Site: DIGBY NECK
Your C.O.C. #: B 19241

Attention: Heather Sutherland
Conestoga-Rovers and Associates Ltd
Dartmouth
31 Gloster Crt
Dartmouth , NS
B3B 1X9

Report Date: 2006/12/11

CERTIFICATE OF ANALYSIS
-2-

Encryption Key Karen Gilbert Karen Gilbert
11 Dec 2006 09:27:47 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MICHELLE HILL, Project Manager
Email: Michelle.Hill.Reports@maxxamanalytics.com
Phone# (902) 420-0203

==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 2

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Maxxam Job #: A6D1520
Report Date: 2006/12/11

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/BILCON
Project name: DIGBY NECK
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		P89809		P89817		
Sampling Date		2006/11/30		2006/11/30		
COC Number		B 19241		B 19241		
	Units	WELL#6	RDL	WELL#5	RDL	QC Batch
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	77	5	110	20	1120625
Dissolved Chloride (Cl)	mg/L	36	1	39	1	1120635
Colour	TCU	6	5	34	5	1120643
Hardness (CaCO3)	mg/L	16	1	44	1	1118309
Nitrate + Nitrite	mg/L	<0.05	0.05	<0.05	0.05	1120652
Nitrite (N)	mg/L	<0.01	0.01	<0.01	0.01	1120653
Nitrogen (Ammonia Nitrogen)	mg/L	0.08	0.05	<0.05	0.05	1120563
Total Organic Carbon (C)	mg/L	1.5	0.5	11	5	1122375
Orthophosphate (P)	mg/L	<0.01	0.01	<0.01	0.01	1120650
pH	pH	7.95	N/A	7.83	N/A	1120177
Reactive Silica (SiO2)	mg/L	22	0.5	24	0.5	1120641
Dissolved Sulphate (SO4)	mg/L	14	2	10	2	1120640
Turbidity	NTU	1.9	0.1	73	1	1121513
Conductivity	uS/cm	290	1	350	1	1120174
RCAP CALCULATIONS						
Anion Sum	me/L	2.87	N/A	3.48	N/A	1118311
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	77	1	108	1	1118308
Calculated TDS	mg/L	184	1	219	1	1118315
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1	1	<1	1	1118308
Cation Sum	me/L	2.84	N/A	3.60	N/A	1118311
Ion Balance (% Difference)	%	0.631	N/A	1.65	N/A	1118310
Langelier Index (@ 20C)	N/A	-0.776	N/A	-0.339	N/A	1118313
Langelier Index (@ 4C)	N/A	-1.03	N/A	-0.589	N/A	1118314
Saturation pH (@ 20C)	N/A	8.73	N/A	8.17	N/A	1118313
Saturation pH (@ 4C)	N/A	8.98	N/A	8.42	N/A	1118314
Elements (ICP-MS)						
Dissolved Aluminum (Al)	ug/L	11.4	5.0	154	5.0	1121204
Dissolved Antimony (Sb)	ug/L	<2.0	2.0	<2.0	2.0	1121204
Dissolved Arsenic (As)	ug/L	<2.0	2.0	<2.0	2.0	1121204
Dissolved Barium (Ba)	ug/L	<5.0	5.0	7.2	5.0	1121204
Dissolved Beryllium (Be)	ug/L	<2.0	2.0	<2.0	2.0	1121204
Dissolved Bismuth (Bi)	ug/L	<2.0	2.0	<2.0	2.0	1121204

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D1520
Report Date: 2006/12/11

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/BILCON
Project name: DIGBY NECK
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		P89809		P89817		
Sampling Date		2006/11/30		2006/11/30		
COC Number		B 19241		B 19241		
	Units	**WELL#6**	**RDL**	**WELL#5**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	50.4	5.0	88.8	5.0	1121204
Dissolved Cadmium (Cd)	ug/L	0.101	0.017	0.058	0.017	1121204
Dissolved Chromium (Cr)	ug/L	<2.0	2.0	9.4	2.0	1121204
Dissolved Cobalt (Co)	ug/L	<0.40	0.40	<0.40	0.40	1121204
Dissolved Copper (Cu)	ug/L	<2.0	2.0	12.9	2.0	1121204
Dissolved Iron (Fe)	ug/L	116	50	738	50	1121204
Dissolved Lead (Pb)	ug/L	0.55	0.50	1.99	0.50	1121204
Dissolved Manganese (Mn)	ug/L	2.5	2.0	36.9	2.0	1121204
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.0	3.9	2.0	1121204
Dissolved Nickel (Ni)	ug/L	<2.0	2.0	9.9	2.0	1121204
Dissolved Selenium (Se)	ug/L	<1.0	1.0	<1.0	1.0	1121204
Dissolved Silver (Ag)	ug/L	<0.10	0.10	<0.10	0.10	1121204
Dissolved Strontium (Sr)	ug/L	19.2	5.0	59.1	5.0	1121204
Dissolved Thallium (Tl)	ug/L	<0.10	0.10	<0.10	0.10	1121204
Dissolved Tin (Sn)	ug/L	<2.0	2.0	<2.0	2.0	1121204
Dissolved Titanium (Ti)	ug/L	<2.0	2.0	6.1	2.0	1121204
Dissolved Uranium (U)	ug/L	0.27	0.10	<0.10	0.10	1121204
Dissolved Vanadium (V)	ug/L	<2.0	2.0	<2.0	2.0	1121204
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	11.8	5.0	1121204
Elements (ICP-OES)						
Dissolved Calcium (Ca)	mg/L	5.9	0.1	15	0.1	1120967
Dissolved Magnesium (Mg)	mg/L	0.3	0.1	1.2	0.1	1120967
Dissolved Phosphorus (P)	mg/L	<0.1	0.1	<0.1	0.1	1120967
Dissolved Potassium (K)	mg/L	0.3	0.1	0.6	0.1	1120967
Dissolved Sodium (Na)	mg/L	58	0.2	62	0.2	1120967
RCAP CALCULATIONS						
Nitrate (N)	mg/L	<0.05	0.05	<0.05	0.05	1118312

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A6D1520
Report Date: 2006/12/11

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/BILCON
Project name: DIGBY NECK
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		P89818	P89818	P89820		
Sampling Date		2006/12/01	2006/12/01	2006/12/01		
COC Number		B 19241	B 19241	B 19241		
	Units	WELL#2	WELL#2 Lab-Dup	WELL#1	RDL	QC Batch
INORGANICS						
Total Alkalinity (Total as CaCO3)	mg/L	67		65	5	1120625
Dissolved Chloride (Cl)	mg/L	23		24	1	1120635
Colour	TCU	<5		<5	5	1120643
Hardness (CaCO3)	mg/L	70		62	1	1118309
Nitrate + Nitrite	mg/L	0.27		0.10	0.05	1120652
Nitrite (N)	mg/L	<0.01		<0.01	0.01	1120653
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05		<0.05	0.05	1120563
Total Organic Carbon (C)	mg/L	1.1		1.4	0.5	1122375
Orthophosphate (P)	mg/L	0.03		0.01	0.01	1120650
pH	pH	7.88		7.91	N/A	1120177
Reactive Silica (SiO2)	mg/L	22		21	0.5	1120641
Dissolved Sulphate (SO4)	mg/L	7		6	2	1120640
Turbidity	NTU	0.7		2.0	0.1	1121513
Conductivity	uS/cm	210		210	1	1120174
RCAP CALCULATIONS						
Anion Sum	me/L	2.15		2.12	N/A	1118311
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	67		65	1	1118308
Calculated TDS	mg/L	139		135	1	1118315
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1		<1	1	1118308
Cation Sum	me/L	2.24		2.14	N/A	1118311
Ion Balance (% Difference)	%	1.87		0.517	N/A	1118310
Langelier Index (@ 20C)	N/A	-0.304		-0.324	N/A	1118313
Langelier Index (@ 4C)	N/A	-0.555		-0.574	N/A	1118314
Saturation pH (@ 20C)	N/A	8.18		8.23	N/A	1118313
Saturation pH (@ 4C)	N/A	8.44		8.48	N/A	1118314
Elements (ICP-MS)						
Dissolved Aluminum (Al)	ug/L	292	288	8.6	5.0	1121204
Dissolved Antimony (Sb)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Arsenic (As)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Barium (Ba)	ug/L	<5.0	<5.0	<5.0	5.0	1121204
Dissolved Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	2.0	1121204

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D1520
Report Date: 2006/12/11

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/BILCON
Project name: DIGBY NECK
Sampler Initials:

ATLANTIC RCAP-MS DIS. CCME FWAL W (WATER)

Maxxam ID		P89818	P89818	P89820		
Sampling Date		2006/12/01	2006/12/01	2006/12/01		
COC Number		B 19241	B 19241	B 19241		
	Units	**WELL#2**	**WELL#2 Lab-Dup**	**WELL#1**	**RDL**	**QC Batch**
Dissolved Boron (B)	ug/L	13.5	14.3	18.0	5.0	1121204
Dissolved Cadmium (Cd)	ug/L	0.082	0.089	<0.017	0.017	1121204
Dissolved Chromium (Cr)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Cobalt (Co)	ug/L	0.44	0.45	<0.40	0.40	1121204
Dissolved Copper (Cu)	ug/L	2.1	2.1	<2.0	2.0	1121204
Dissolved Iron (Fe)	ug/L	416	448	<50	50	1121204
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.50	1121204
Dissolved Manganese (Mn)	ug/L	5.9	5.8	6.9	2.0	1121204
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	1.0	1121204
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	0.10	1121204
Dissolved Strontium (Sr)	ug/L	46.1	46.3	66.4	5.0	1121204
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	0.10	1121204
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	2.0	1121204
Dissolved Titanium (Ti)	ug/L	4.8	5.8	<2.0	2.0	1121204
Dissolved Uranium (U)	ug/L	0.32	0.31	0.30	0.10	1121204
Dissolved Vanadium (V)	ug/L	17.6	18.3	12.4	2.0	1121204
Dissolved Zinc (Zn)	ug/L	13.2	13.6	<5.0	5.0	1121204
Elements (ICP-OES)						
Dissolved Calcium (Ca)	mg/L	23	22	21	0.1	1120967
Dissolved Magnesium (Mg)	mg/L	3.2	3.2	2.6	0.1	1120967
Dissolved Phosphorus (P)	mg/L	<0.1	<0.1	<0.1	0.1	1120967
Dissolved Potassium (K)	mg/L	0.5	0.6	0.4	0.1	1120967
Dissolved Sodium (Na)	mg/L	19	19	20	0.2	1120967
RCAP CALCULATIONS						
Nitrate (N)	mg/L	0.27		0.10	0.05	1118312

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A6D1520
Report Date: 2006/12/11

Conestoga-Rovers and Associates Ltd
Client Project #: 821191D/BILCON
Project name: DIGBY NECK
Sampler Initials:

GENERAL COMMENTS

Sample P89817-01: The detection limit for TOC was increased due to matrix interference.

Results relate only to the items tested.

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Conestoga-Rovers and Associates Ltd
Attention: Heather Sutherland
Client Project #: 821191D/BILCON
P.O. #:
Project name: DIGBY NECK

Quality Assurance Report

Maxxam Job Number: DA6D1520

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1120174 SMT	QC STANDARD	Conductivity	2006/12/06		101	%	80 - 120
	Method Blank	Conductivity	2006/12/06	1.1		uS/cm	
	RPD	Conductivity	2006/12/06	0.1		%	25
1120177 SMT	QC STANDARD	pH	2006/12/06		101	%	80 - 120
	Method Blank	pH	2006/12/06	5.79		pH	
	RPD	pH	2006/12/06	0.3		%	25
1120563 LMA	MATRIX SPIKE	Nitrogen (Ammonia Nitrogen)	2006/12/06		97	%	80 - 120
	QC STANDARD	Nitrogen (Ammonia Nitrogen)	2006/12/06		103	%	80 - 120
	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2006/12/06		100	%	80 - 120
	Method Blank	Nitrogen (Ammonia Nitrogen)	2006/12/06	<0.05		mg/L	
	RPD	Nitrogen (Ammonia Nitrogen)	2006/12/06	NC		%	25
1120625 MCN	MATRIX SPIKE	Total Alkalinity (Total as CaCO3)	2006/12/06		101	%	80 - 120
	QC STANDARD	Total Alkalinity (Total as CaCO3)	2006/12/06		106	%	80 - 120
	Spiked Blank	Total Alkalinity (Total as CaCO3)	2006/12/06		99	%	80 - 120
	Method Blank	Total Alkalinity (Total as CaCO3)	2006/12/06	<5		mg/L	
	RPD	Total Alkalinity (Total as CaCO3)	2006/12/06	NC		%	25
1120635 MCN	MATRIX SPIKE	Dissolved Chloride (Cl)	2006/12/06		93	%	80 - 120
	QC STANDARD	Dissolved Chloride (Cl)	2006/12/06		102	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2006/12/06		105	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2006/12/06	<1		mg/L	
	RPD	Dissolved Chloride (Cl)	2006/12/06	0.6		%	25
1120640 MCN	MATRIX SPIKE	Dissolved Sulphate (SO4)	2006/12/06		106	%	80 - 120
	QC STANDARD	Dissolved Sulphate (SO4)	2006/12/06		104	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2006/12/06		107	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2006/12/06	<2		mg/L	
	RPD	Dissolved Sulphate (SO4)	2006/12/06	NC		%	25
1120641 MCN	MATRIX SPIKE	Reactive Silica (SiO2)	2006/12/06		102	%	80 - 120
	QC STANDARD	Reactive Silica (SiO2)	2006/12/06		105	%	75 - 125
	Spiked Blank	Reactive Silica (SiO2)	2006/12/06		101	%	80 - 120
	Method Blank	Reactive Silica (SiO2)	2006/12/06	<0.5		mg/L	
	RPD	Reactive Silica (SiO2)	2006/12/06	NC		%	25
1120643 MCN	QC STANDARD	Colour	2006/12/06		104	%	80 - 120
	Method Blank	Colour	2006/12/06	<5		TCU	
	RPD	Colour	2006/12/06	NC		%	25
1120650 MCN	MATRIX SPIKE	Orthophosphate (P)	2006/12/06		95	%	80 - 120
	QC STANDARD	Orthophosphate (P)	2006/12/06		105	%	80 - 120
	Spiked Blank	Orthophosphate (P)	2006/12/06		101	%	80 - 120
	Method Blank	Orthophosphate (P)	2006/12/06	<0.01		mg/L	
	RPD	Orthophosphate (P)	2006/12/06	NC		%	25
1120652 MCN	MATRIX SPIKE	Nitrate + Nitrite	2006/12/06		96	%	80 - 120
	QC STANDARD	Nitrate + Nitrite	2006/12/06		112	%	80 - 120
	Spiked Blank	Nitrate + Nitrite	2006/12/06		104	%	80 - 120
	Method Blank	Nitrate + Nitrite	2006/12/06	<0.05		mg/L	
	RPD	Nitrate + Nitrite	2006/12/06	NC		%	25
1120653 MCN	MATRIX SPIKE	Nitrite (N)	2006/12/06		99	%	80 - 120
	QC STANDARD	Nitrite (N)	2006/12/06		100	%	80 - 120
	Spiked Blank	Nitrite (N)	2006/12/06		102	%	80 - 120
	Method Blank	Nitrite (N)	2006/12/06	<0.01		mg/L	
	RPD	Nitrite (N)	2006/12/06	NC		%	25
1120967 MLB	MATRIX SPIKE						
	[P89820-01]	Dissolved Calcium (Ca)	2006/12/07		100	%	80 - 120
		Dissolved Magnesium (Mg)	2006/12/07		99	%	80 - 120
		Dissolved Phosphorus (P)	2006/12/07		98	%	80 - 120
		Dissolved Potassium (K)	2006/12/07		99	%	80 - 120
		Dissolved Sodium (Na)	2006/12/07		101	%	80 - 120

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Quality Assurance Report (Continued)

Maxxam Job Number: DA6D1520

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1120967 MLB	QC STANDARD	Dissolved Calcium (Ca)	2006/12/07		112	%	80 - 120
		Dissolved Magnesium (Mg)	2006/12/07		105	%	80 - 120
		Dissolved Phosphorus (P)	2006/12/07		91	%	80 - 120
		Dissolved Potassium (K)	2006/12/07		101	%	80 - 120
		Dissolved Sodium (Na)	2006/12/07		104	%	80 - 120
	Spiked Blank	Dissolved Calcium (Ca)	2006/12/07		103	%	80 - 120
		Dissolved Magnesium (Mg)	2006/12/07		100	%	80 - 120
		Dissolved Phosphorus (P)	2006/12/07		97	%	80 - 120
		Dissolved Potassium (K)	2006/12/07		99	%	80 - 120
		Dissolved Sodium (Na)	2006/12/07		102	%	80 - 120
	Method Blank	Dissolved Calcium (Ca)	2006/12/07	<0.1		mg/L	
		Dissolved Magnesium (Mg)	2006/12/07	<0.1		mg/L	
		Dissolved Phosphorus (P)	2006/12/07	<0.1		mg/L	
		Dissolved Potassium (K)	2006/12/07	<0.1		mg/L	
		Dissolved Sodium (Na)	2006/12/07	<0.1		mg/L	
	RPD [P89818-01]	Dissolved Calcium (Ca)	2006/12/07	1.5		%	25
		Dissolved Magnesium (Mg)	2006/12/07	0.3		%	25
		Dissolved Phosphorus (P)	2006/12/07	NC		%	25
		Dissolved Potassium (K)	2006/12/07	13.7		%	25
		Dissolved Sodium (Na)	2006/12/07	1.0		%	25
1121204 DLB	MATRIX SPIKE						
	[P89809-01]	Dissolved Aluminum (Al)	2006/12/07		103	%	80 - 120
		Dissolved Antimony (Sb)	2006/12/07		107	%	80 - 120
		Dissolved Arsenic (As)	2006/12/07		117	%	80 - 120
		Dissolved Barium (Ba)	2006/12/07		109	%	80 - 120
		Dissolved Beryllium (Be)	2006/12/07		115	%	80 - 120
		Dissolved Bismuth (Bi)	2006/12/07		96	%	80 - 120
		Dissolved Boron (B)	2006/12/07		110	%	80 - 120
		Dissolved Cadmium (Cd)	2006/12/07		112	%	80 - 120
		Dissolved Chromium (Cr)	2006/12/07		104	%	80 - 120
		Dissolved Cobalt (Co)	2006/12/07		106	%	80 - 120
		Dissolved Copper (Cu)	2006/12/07		103	%	80 - 120
		Dissolved Lead (Pb)	2006/12/07		106	%	80 - 120
		Dissolved Manganese (Mn)	2006/12/07		97	%	80 - 120
		Dissolved Molybdenum (Mo)	2006/12/07		99	%	80 - 120
		Dissolved Nickel (Ni)	2006/12/07		105	%	80 - 120
		Dissolved Silver (Ag)	2006/12/07		79 (1)	%	80 - 120
		Dissolved Strontium (Sr)	2006/12/07		104	%	80 - 120
		Dissolved Thallium (Tl)	2006/12/07		105	%	80 - 120
		Dissolved Tin (Sn)	2006/12/07		98	%	80 - 120
		Dissolved Titanium (Ti)	2006/12/07		106	%	80 - 120
		Dissolved Uranium (U)	2006/12/07		109	%	80 - 120
		Dissolved Vanadium (V)	2006/12/07		108	%	80 - 120
		Dissolved Zinc (Zn)	2006/12/07		118	%	80 - 120
	QC STANDARD	Dissolved Aluminum (Al)	2006/12/07		101	%	80 - 120
		Dissolved Antimony (Sb)	2006/12/07		103	%	80 - 120
		Dissolved Arsenic (As)	2006/12/07		99	%	80 - 120
		Dissolved Barium (Ba)	2006/12/07		97	%	80 - 120
		Dissolved Beryllium (Be)	2006/12/07		106	%	80 - 120
		Dissolved Boron (B)	2006/12/07		103	%	80 - 120
		Dissolved Cadmium (Cd)	2006/12/07		104	%	80 - 120
		Dissolved Chromium (Cr)	2006/12/07		95	%	80 - 120
		Dissolved Cobalt (Co)	2006/12/07		100	%	80 - 120
		Dissolved Copper (Cu)	2006/12/07		96	%	80 - 120
		Dissolved Lead (Pb)	2006/12/07		98	%	80 - 120

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Quality Assurance Report (Continued)

Maxxam Job Number: DA6D1520

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1121204 DLB	QC STANDARD	Dissolved Manganese (Mn)	2006/12/07		96	%	80 - 120
		Dissolved Molybdenum (Mo)	2006/12/07		99	%	80 - 120
		Dissolved Nickel (Ni)	2006/12/07		96	%	80 - 120
		Dissolved Selenium (Se)	2006/12/07		104	%	80 - 120
		Dissolved Silver (Ag)	2006/12/07		93	%	80 - 120
		Dissolved Strontium (Sr)	2006/12/07		96	%	80 - 120
		Dissolved Vanadium (V)	2006/12/07		103	%	80 - 120
		Dissolved Zinc (Zn)	2006/12/07		108	%	80 - 120
	Spiked Blank	Dissolved Aluminum (Al)	2006/12/07		119	%	80 - 120
		Dissolved Antimony (Sb)	2006/12/07		99	%	80 - 120
		Dissolved Arsenic (As)	2006/12/07		101	%	80 - 120
		Dissolved Barium (Ba)	2006/12/07		108	%	80 - 120
		Dissolved Beryllium (Be)	2006/12/07		103	%	80 - 120
		Dissolved Bismuth (Bi)	2006/12/07		115	%	80 - 120
		Dissolved Boron (B)	2006/12/07		102	%	80 - 120
		Dissolved Cadmium (Cd)	2006/12/07		103	%	80 - 120
		Dissolved Chromium (Cr)	2006/12/07		102	%	80 - 120
		Dissolved Cobalt (Co)	2006/12/07		103	%	80 - 120
		Dissolved Copper (Cu)	2006/12/07		103	%	80 - 120
		Dissolved Lead (Pb)	2006/12/07		111	%	80 - 120
		Dissolved Manganese (Mn)	2006/12/07		117	%	80 - 120
		Dissolved Molybdenum (Mo)	2006/12/07		105	%	80 - 120
		Dissolved Nickel (Ni)	2006/12/07		105	%	80 - 120
		Dissolved Selenium (Se)	2006/12/07		96	%	80 - 120
		Dissolved Silver (Ag)	2006/12/07		98	%	80 - 120
		Dissolved Strontium (Sr)	2006/12/07		107	%	80 - 120
		Dissolved Thallium (Tl)	2006/12/07		111	%	80 - 120
		Dissolved Tin (Sn)	2006/12/07		107	%	80 - 120
		Dissolved Titanium (Ti)	2006/12/07		101	%	80 - 120
		Dissolved Uranium (U)	2006/12/07		113	%	80 - 120
		Dissolved Vanadium (V)	2006/12/07		102	%	80 - 120
		Dissolved Zinc (Zn)	2006/12/07		103	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2006/12/07	<5.0		ug/L	
		Dissolved Antimony (Sb)	2006/12/07	<2.0		ug/L	
		Dissolved Arsenic (As)	2006/12/07	<2.0		ug/L	
		Dissolved Barium (Ba)	2006/12/07	<5.0		ug/L	
		Dissolved Beryllium (Be)	2006/12/07	<2.0		ug/L	
		Dissolved Bismuth (Bi)	2006/12/07	<2.0		ug/L	
		Dissolved Boron (B)	2006/12/07	<5.0		ug/L	
		Dissolved Cadmium (Cd)	2006/12/07	<0.017		ug/L	
		Dissolved Chromium (Cr)	2006/12/07	<2.0		ug/L	
		Dissolved Cobalt (Co)	2006/12/07	<0.40		ug/L	
		Dissolved Copper (Cu)	2006/12/07	<2.0		ug/L	
		Dissolved Iron (Fe)	2006/12/07	<50		ug/L	
		Dissolved Lead (Pb)	2006/12/07	<0.50		ug/L	
		Dissolved Manganese (Mn)	2006/12/07	<2.0		ug/L	
		Dissolved Molybdenum (Mo)	2006/12/07	<2.0		ug/L	
		Dissolved Nickel (Ni)	2006/12/07	<2.0		ug/L	
		Dissolved Selenium (Se)	2006/12/07	<1.0		ug/L	
		Dissolved Silver (Ag)	2006/12/07	<0.10		ug/L	
		Dissolved Strontium (Sr)	2006/12/07	<5.0		ug/L	
		Dissolved Thallium (Tl)	2006/12/07	<0.10		ug/L	
		Dissolved Tin (Sn)	2006/12/07	<2.0		ug/L	
		Dissolved Titanium (Ti)	2006/12/07	<2.0		ug/L	
		Dissolved Uranium (U)	2006/12/07	<0.10		ug/L	

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Quality Assurance Report (Continued)

Maxxam Job Number: DA6D1520

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
1121204 DLB	Method Blank	Dissolved Vanadium (V)	2006/12/07	<2.0		ug/L	
		Dissolved Zinc (Zn)	2006/12/07	<5.0		ug/L	
	RPD [P89818-01]	Dissolved Aluminum (Al)	2006/12/07	1.4		%	35
		Dissolved Antimony (Sb)	2006/12/07	NC		%	25
		Dissolved Arsenic (As)	2006/12/07	NC		%	25
		Dissolved Barium (Ba)	2006/12/07	NC		%	25
		Dissolved Beryllium (Be)	2006/12/07	NC		%	25
		Dissolved Bismuth (Bi)	2006/12/07	NC		%	25
		Dissolved Boron (B)	2006/12/07	NC		%	25
		Dissolved Cadmium (Cd)	2006/12/07	NC		%	25
		Dissolved Chromium (Cr)	2006/12/07	NC		%	25
		Dissolved Cobalt (Co)	2006/12/07	NC		%	25
		Dissolved Copper (Cu)	2006/12/07	NC		%	25
		Dissolved Iron (Fe)	2006/12/07	7.5		%	25
		Dissolved Lead (Pb)	2006/12/07	NC		%	25
		Dissolved Manganese (Mn)	2006/12/07	NC		%	25
		Dissolved Molybdenum (Mo)	2006/12/07	NC		%	25
		Dissolved Nickel (Ni)	2006/12/07	NC		%	25
		Dissolved Selenium (Se)	2006/12/07	NC		%	25
		Dissolved Silver (Ag)	2006/12/07	NC		%	25
		Dissolved Strontium (Sr)	2006/12/07	0.4		%	25
		Dissolved Thallium (Tl)	2006/12/07	NC		%	25
		Dissolved Tin (Sn)	2006/12/07	NC		%	25
		Dissolved Titanium (Ti)	2006/12/07	NC		%	25
		Dissolved Uranium (U)	2006/12/07	NC		%	25
		Dissolved Vanadium (V)	2006/12/07	4.0		%	25
		Dissolved Zinc (Zn)	2006/12/07	NC		%	25
1121513 SMT	QC STANDARD	Turbidity	2006/12/07		108	%	80 - 120
	Method Blank	Turbidity	2006/12/07	<0.1		NTU	
	RPD	Turbidity	2006/12/07	NC		%	25
1122375 CRA	MATRIX SPIKE	Total Organic Carbon (C)	2006/12/08		107	%	75 - 125
	QC STANDARD	Total Organic Carbon (C)	2006/12/08		106	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2006/12/08		108	%	75 - 125
	Method Blank	Total Organic Carbon (C)	2006/12/08	<0.5		mg/L	
	RPD	Total Organic Carbon (C)	2006/12/08	NC		%	25

NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample
(1) Recovery is within acceptance criteria.

ATTACHMENT D

BAIL TEST RESULTS

Test performed on 01 December 2006.

Bail Test Results
821191 D
Monitor Well MW-2

Test Hole	**MW-2**		
Depth to water table before bail	**51.776**	Radius of PVC	**0.0762**
		Radius of Screen	**0.0762**
Depth to water table after bail	**58.2**	Length of Screen	**62.484**
Depth of test hole	**68.58**	Length of Saturated Screen	**10.708** (calculated)

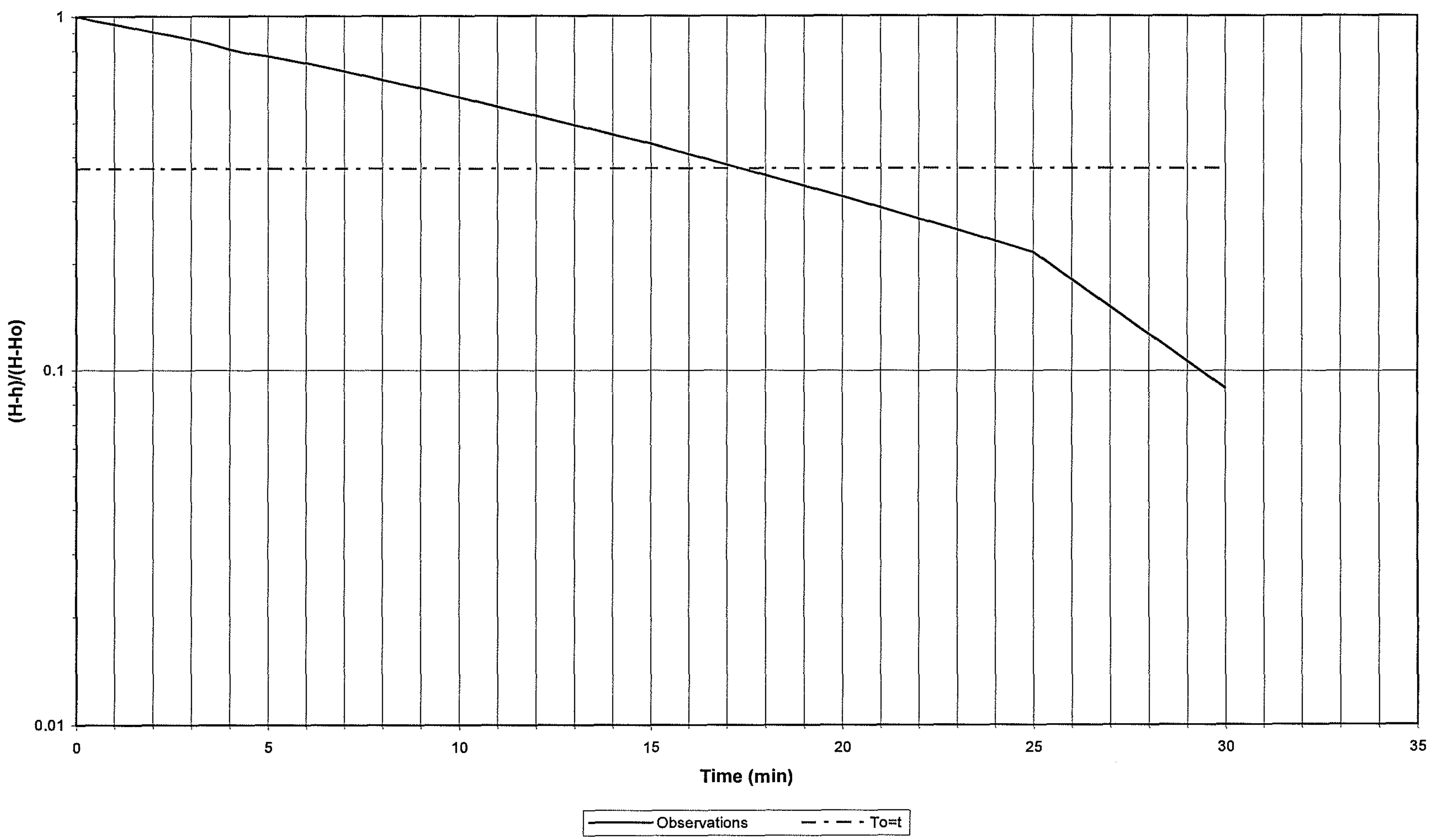
Time (min)	Depth (metres)	Depth from datum	(H-h)/(H-Ho)	log(H-h)/(Ho-H)	Log=0.37
0	58.2	10.38	1	0	0.37
0.5	58.02	10.56	0.97198007	-0.012342638	0.37
1	57.88	10.7	0.9501868	-0.022191007	0.37
1.5	57.73	10.85	0.92683686	-0.032996702	0.37
2	57.575	11.005	0.90270859	-0.044452424	0.37
2.5	57.45	11.13	0.88325031	-0.053916201	0.37
3	57.305	11.275	0.8606787	-0.065158942	0.37
3.5	57.14	11.44	0.83499377	-0.078316763	0.37
4	56.96	11.62	0.80697385	-0.093140539	0.37
4.5	56.81	11.77	0.78362391	-0.105892321	0.37
5	56.72	11.86	0.76961395	-0.11372707	0.37
6	56.5	12.08	0.73536737	-0.133495643	0.37
7	56.26	12.32	0.69800747	-0.156139928	0.37
8	56.01	12.57	0.65909091	-0.181054679	0.37
9	55.79	12.79	0.62484433	-0.204228164	0.37
10	55.56	13.02	0.5890411	-0.229854405	0.37
15	54.57	14.01	0.43493151	-0.36157913	0.37
20	53.76	14.82	0.30884184	-0.510263864	0.37
25	53.16	15.42	0.21544209	-0.666669442	0.37
30	52.35	16.23	0.08935243	-1.04889364	0.37

To = **18**

Hydraulic Conductivity:

3.92E+01 (metres/year)
7.45E-05 (metres/min)
1.24E-06 (metres/sec)
1.24E-04 (cm/sec)

Bail Test Results
821191 D
Monitor Well MW-2



Test performed on 01 December 2006.

Bail Test Results
821191 D
Monitor Well MW-3

Test Hole	**MW-3**		
Depth to water table before bail	**47.1**	Radius of PVC	**0.0762**
		Radius of Screen	**0.0762**
Depth to water table after bail	**47.565**	Length of Screen	**73.152**
Depth of test hole	**79.248**	Length of Saturated Screen	**31.683** (calculated)

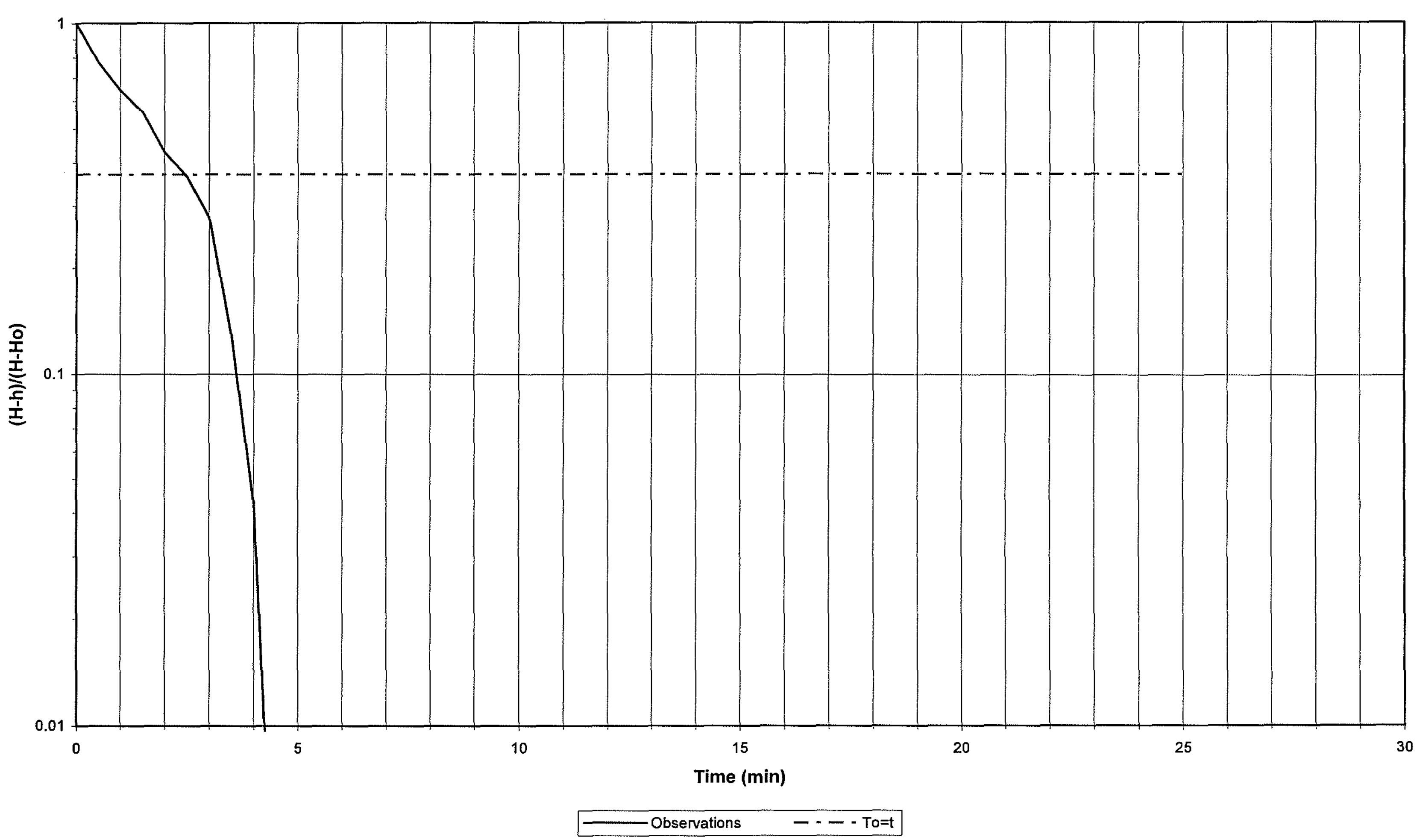
Time (min)	Depth (metres)	Depth from datum	(H-h)/(H-Ho)	log(H-h)/(Ho-H)	Log=0.37
0	47.565	31.683	1	0	0.37
0.5	47.46	31.788	0.77419355	-0.111150452	0.37
1	47.4	31.848	0.64516129	-0.190331698	0.37
1.5	47.36	31.888	0.55913978	-0.252479605	0.37
2	47.3	31.948	0.43010753	-0.366422957	0.37
2.5	47.27	31.978	0.3655914	-0.437004032	0.37
3	47.23	32.018	0.27956989	-0.553509601	0.37
3.5	47.16	32.088	0.12903226	-0.889301703	0.37
4	47.12	32.128	0.04301075	-1.366422957	0.37
4.5	47.101	32.147	0.00215054	-2.667452953	0.37
5	47.101	32.147	0.00215054	-2.667452953	0.37
6	47.101	32.147	0.00215054	-2.667452953	0.37
7	47.101	32.147	0.00215054	-2.667452953	0.37
8	47.101	32.147	0.00215054	-2.667452953	0.37
9	47.101	32.147	0.00215054	-2.667452953	0.37
10	47.101	32.147	0.00215054	-2.667452953	0.37
12	47.101	32.147	0.00215054	-2.667452953	0.37
14	47.101	32.147	0.00215054	-2.667452953	0.37
16	47.101	32.147	0.00215054	-2.667452953	0.37
18	47.101	32.147	0.00215054	-2.667452953	0.37
20	47.101	32.147	0.00215054	-2.667452953	0.37
25	47.101	32.147	0.00215054	-2.667452953	0.37

To = **2.5**

Hydraulic Conductivity:

1.16E+02 (metres/year)
2.21E-04 (metres/min)
3.68E-06 (metres/sec)
3.68E-04 (cm/sec)

Bail Test Results
821191 D
Monitor Well MW-3



Test performed on 01 December 2006.

Bail Test Results
821191 D
Monitor Well MW-4

Test Hole	**MW-4**			
Depth to water table before bail	**6.485**	Radius of PVC	**0.0762**	65.556
		Radius of Screen	**0.0762**	
Depth to water table after bail	**9.12**	Length of Screen	**68.58**	
Depth of test hole	**74.676**	Length of Saturated Screen	**65.556** (calculated)	

Time (min)	Depth (metres)	Depth from datum	(H-h)/(H-Ho)	log(H-h)/(Ho-H)	Log=0.37
0	9.12	65.556	1	0	0.37
0.5	9.03	65.646	0.9658444	-0.015092833	0.37
1	8.99	65.686	0.95066414	-0.021972889	0.37
1.5	8.93	65.746	0.92789374	-0.032501756	0.37
2	8.87	65.806	0.90512334	-0.043292236	0.37
2.5	8.83	65.846	0.88994307	-0.050637772	0.37
3	8.78	65.896	0.87096774	-0.05999793	0.37
3.5	8.74	65.936	0.85578748	-0.067634073	0.37
4	8.7	65.976	0.84060721	-0.075406889	0.37
4.5	8.65	66.026	0.82163188	-0.085322719	0.37
5	8.61	66.066	0.80645161	-0.093421685	0.37
6	8.52	66.156	0.77229602	-0.112216206	0.37
7	8.46	66.216	0.74952562	-0.12521352	0.37
8	8.41	66.266	0.73055028	-0.136349886	0.37
9	8.35	66.326	0.70777989	-0.150101783	0.37
10	8.29	66.386	0.68500949	-0.164303413	0.37
11	8.24	66.436	0.66603416	-0.176503499	0.37
12	8.19	66.486	0.64705882	-0.189056236	0.37
15	8.06	66.616	0.59772296	-0.223500061	0.37
20	7.89	66.786	0.53320683	-0.273104295	0.37
25	7.744	66.932	0.47779886	-0.320754889	0.37
30	7.63	67.051	0.43263757	-0.363875768	0.37
35	7.53	67.146	0.39658444	-0.401664329	0.37
40	7.45	67.226	0.36622391	-0.436253306	0.37
45	7.38	67.296	0.33965844	-0.468957584	0.37
50	7.32	67.358	0.31612903	-0.500135618	0.37
55	7.26	67.416	0.29411765	-0.531478917	0.37
60	7.22	67.461	0.27703985	-0.557457759	0.37
65	7.17	67.506	0.25996205	-0.585090048	0.37
70	7.13	67.546	0.24478178	-0.611220905	0.37
75	7.10	67.579	0.23225806	-0.634029197	0.37
80	7.07	67.611	0.22011385	-0.657352626	0.37
85	7.04	67.641	0.20872865	-0.68041793	0.37

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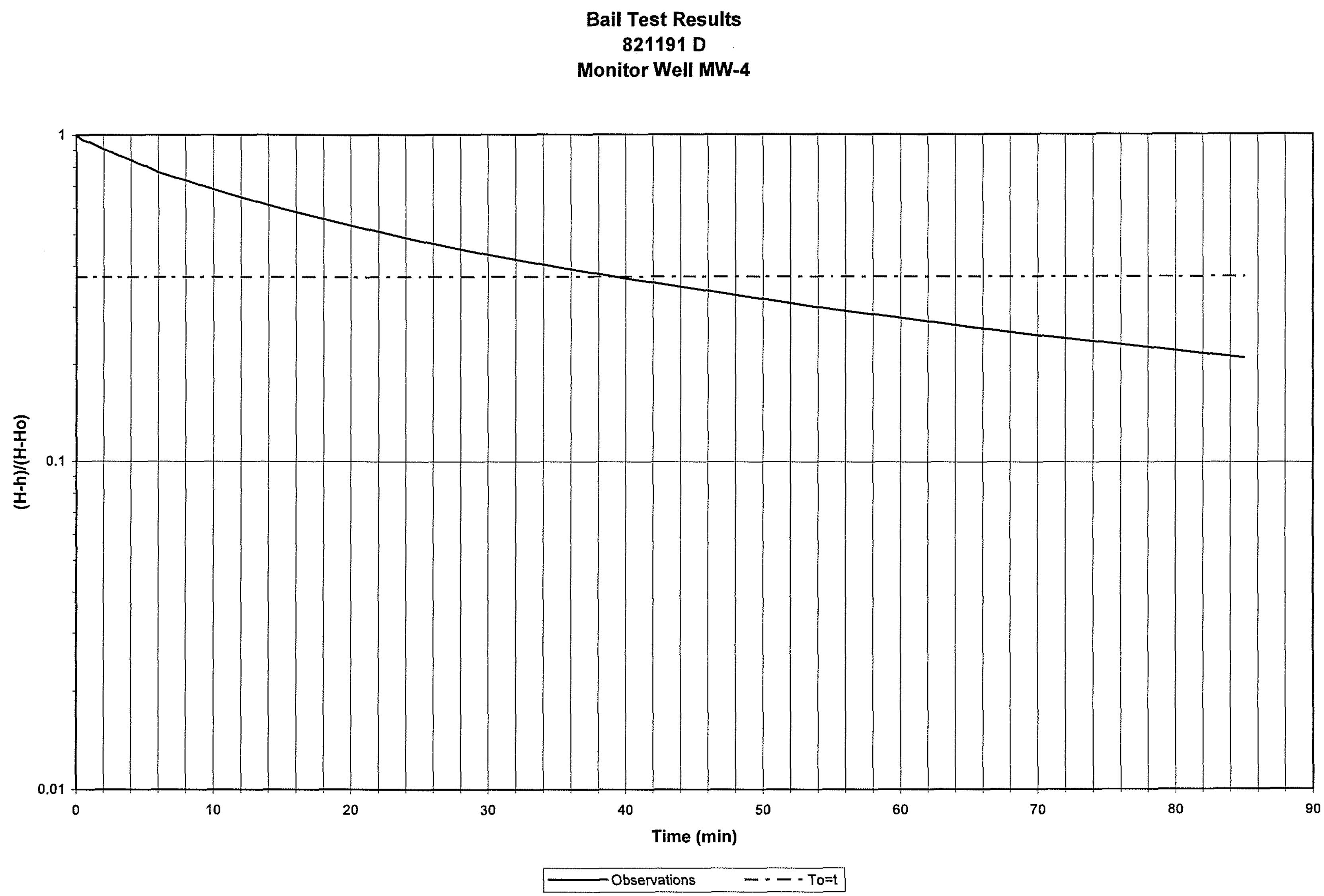


Bail Test Results
821191 D
Monitor Well MW-4
1
0.1
0.01
(H-h)/(H-Ho)
0
10
20
30
40
50
60
70
80
90
Time (min)
Observations
To=t

Test performed on 01 December 2006.

Bail Test Results
821191 D
Monitor Well MW-5

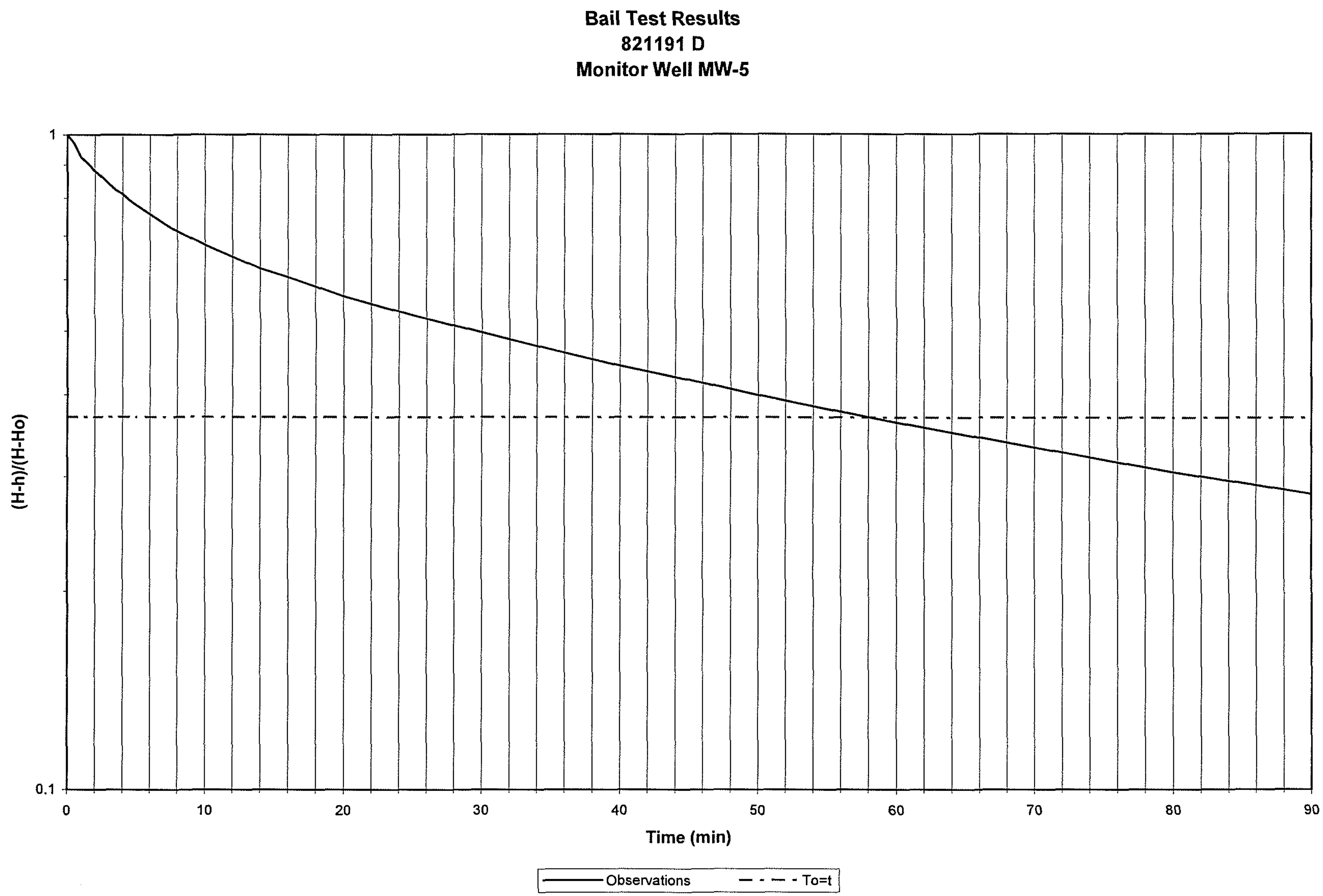
Test Hole	**MW-5**		
Depth to water table before bail	**8.61**	Radius of PVC	**0.0762**
		Radius of Screen	**0.0762**
Depth to water table after bail	**10.71**	Length of Screen	**33.528**
Depth of test hole	**39.624**	Length of Saturated Screen	**33.528** (calculated)

Time (min)	Depth (metres)	Depth from datum	(H-h)/(H-Ho)	log(H-h)/(Ho-H)	Log=0.37
0	10.71	28.914	1	0	0.37
0.5	10.65	28.974	0.97142857	-0.012589127	0.37
1	10.55	29.074	0.92380952	-0.034417565	0.37
1.5	10.51	29.114	0.9047619	-0.043465694	0.37
2	10.46	29.164	0.88095238	-0.055047566	0.37
2.5	10.42	29.204	0.86190476	-0.06454072	0.37
3	10.38	29.244	0.84285714	-0.074246028	0.37
3.5	10.34	29.284	0.82380952	-0.084173192	0.37
4	10.315	29.309	0.81190476	-0.090494911	0.37
4.5	10.28	29.344	0.7952381	-0.099502824	0.37
5	10.25	29.374	0.78095238	-0.107375447	0.37
6	10.2	29.424	0.75714286	-0.12082217	0.37
7	10.15	29.474	0.73333333	-0.134698574	0.37
8	10.105	29.519	0.71190476	-0.147578102	0.37
9	10.07	29.554	0.6952381	-0.157866439	0.37
10	10.034	29.59	0.67809524	-0.168709305	0.37
12	9.975	29.649	0.65	-0.187086643	0.37
14	9.92	29.704	0.62380952	-0.204947999	0.37
16	9.881	29.743	0.6052381	-0.218073744	0.37
18	9.84	29.784	0.58571429	-0.232314183	0.37
20	9.798	29.826	0.56571429	-0.247402854	0.37
25	9.722	29.902	0.52952381	-0.276114507	0.37
30	9.66	29.969	0.49761905	-0.303103004	0.37
35	9.59	30.03	0.46857143	-0.329224196	0.37
40	9.54	30.084	0.44285714	-0.353736346	0.37
45	9.50	30.129	0.42142857	-0.375276024	0.37
50	9.45	30.174	0.4	-0.397940009	0.37
55	9.41	30.214	0.38095238	-0.419129308	0.37
60	9.37	30.25	0.36380952	-0.439125936	0.37
70	9.31	30.314	0.33333333	-0.477121255	0.37
80	9.25	30.372	0.30571429	-0.514684267	0.37
90	9.21	30.419	0.28333333	-0.547702329	0.37

To = **58**

Hydraulic Conductivity:

4.78E+00 (metres/year)
9.09E-06 (metres/min)
1.51E-07 (metres/sec)
1.51E-05 (cm/sec)



Bail Test Results
821191 D
Monitor Well MW-5
1
0.1
(H-h)/(H-Ho)
0
10
20
30
40
50
60
70
80
90
Time (min)
Observations
To=t

ATTACHMENT E

AQUIFER TEST DATA AND GRAPHS

Table E-1: Whites Point Quarry - Step-Drawdown Test Data					
Step 1 - 0.03 L/sec		Step 2 - 0.5 L/sec		Step 3 - 0.7 L/sec	
Time	Depth to Water (m)	Time	Depth to Water (m)	Time	Depth to Water (m)
0	8.32	30	8.73	60	21.98
1	8.32	31	12.30	61	22.62
2	11.42	32	13.45	62	25.15
3	10.62	33	14.27	63	26.31
4	10.24	34	14.92	64	27.26
5	10.19	35	15.42	65	28.04
6	9.80	36	15.89	66	28.61
7	9.52	37	16.26	67	29.09
8	9.30	38	16.60	68	29.74
9	9.11	39	16.96	69	30.33
10	9.10	40	17.21	70	31.08
15	8.89	45	17.86	75	37.49
20	8.88	50	19.28	80	37.45
25	8.82	55	20.61	85	38.06
30	8.73	60	21.98	90	42.04

C0639-274

Table E-2: Whites Point Quarry - 22-hr Pump Test Data

Pumping Data (MW5)

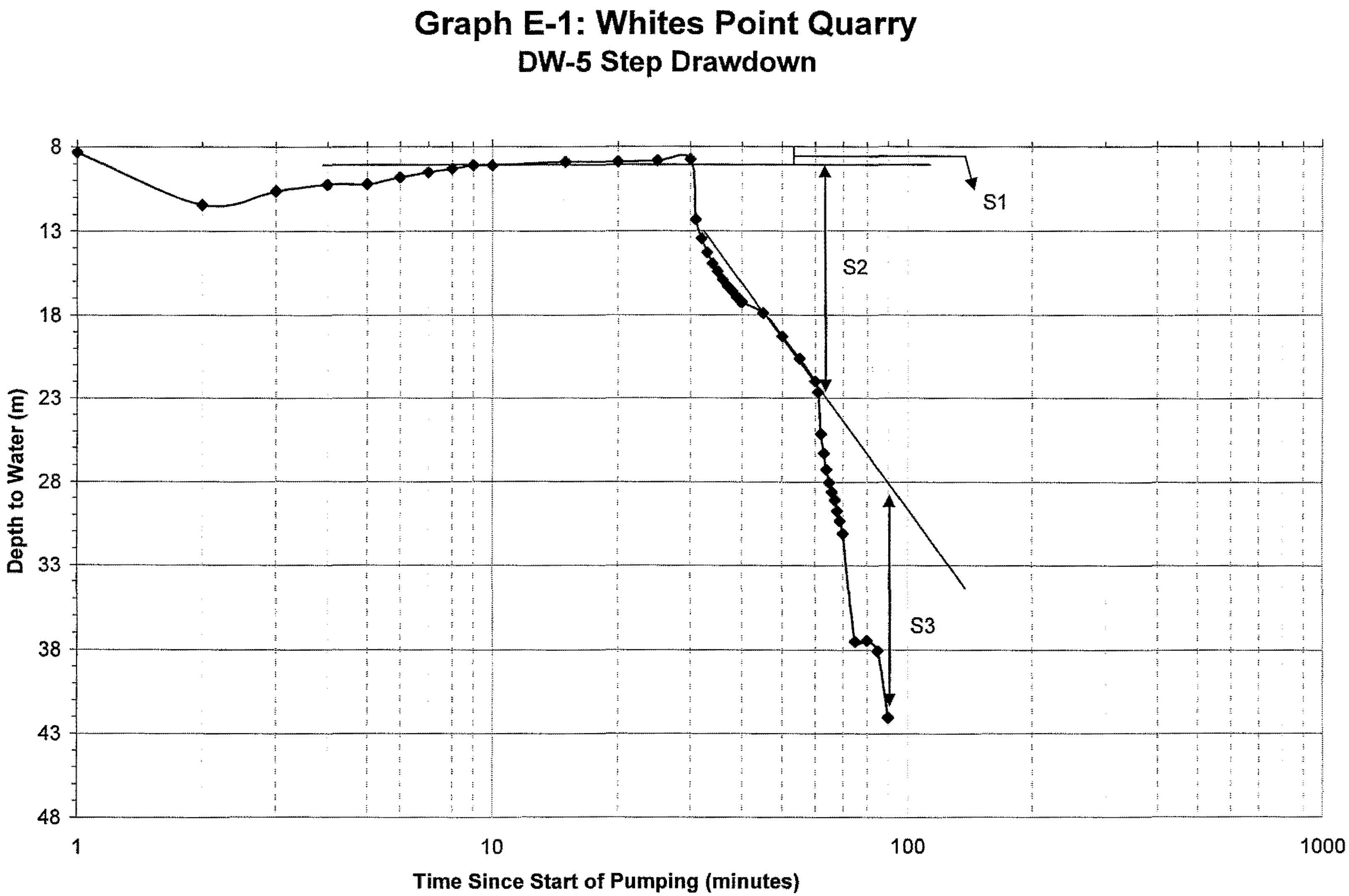
Date	Time	Elapsed Time (min)	Depth to Water (m)	Drawdown (m)	Discharge (L/s)
21-Dec-06	11:27 AM	0.1	8.15	0.00	0.6
	11:28 AM	1	10.00	1.85	
	11:29 AM	2	10.96	2.81	
	11:30 AM	3	12.54	4.39	
	11:31 AM	4	13.39	5.24	
	11:32 AM	5	14.34	6.19	
	11:33 AM	6	15.10	6.95	
	11:34 AM	7	15.81	7.66	
	11:35 AM	8	16.46	8.31	
	11:36 AM	9	17.17	9.02	0.6
	11:37 AM	10	17.81	9.66	
	11:42 AM	15	20.75	12.60	
	11:47 AM	20	23.70	15.55	
	11:52 AM	25	25.88	17.73	0.6
	11:57 AM	30	27.10	18.95	
	12:14 PM	47	30.50	22.35	
	12:17 PM	50	30.20	22.05	0.4
	12:22 PM	55	31.50	23.35	0.6
	12:27 PM	60	32.75	24.60	0.5
	12:42 PM	75	34.80	26.65	0.45
	12:57 PM	90	34.25	26.10	
	1:12 PM	105	35.79	27.64	
	1:27 PM	120	37.60	29.45	0.4
	1:57 PM	150	37.50	29.35	
	2:27 PM	180	36.30	28.15	0.4
	2:57 PM	210	34.80	26.65	0.45
	3:27 PM	240	37.74	29.59	
	3:57 PM	270	36.65	28.50	0.4
	4:27 PM	300	34.85	26.70	
	4:57 PM	330	37.72	29.57	0.5
	5:27 PM	360	36.50	28.35	0.5
	6:27 PM	420	35.25	27.10	
	7:40 PM	493	39.34	31.19	0.2
	9:10 PM	583	32.00	23.85	
	10:27 PM	660	35.60	27.45	0.4
	11:27 PM	720	36.30	28.15	
22-Dec-06	1:27 AM	840	35.70	27.55	0.4
	3:27 AM	960	34.14	25.99	
	5:27 AM	1080	40.65	32.50	0.55
	7:27 AM	1200	34.55	26.40	0.55
	9:18 AM	1311	31.35	23.20	0.55
	9:18 AM	End of Pumping Test - Start of Recovery Test			

Recovery Data (MW5)

		t/t'	Depth to Water (m)	Residual Drawdown
1311	0		31.35	23.2
	1	1312.00	31.26	23.11
	2	656.50	27.15	19
	3	438.00	26.48	18.33
	4	328.75	25.51	17.36
	5	263.20	24.37	16.22
	6	219.50	23.37	15.22
	7	188.29	22.49	14.34
	8	164.88	21.61	13.46
	9	146.67	20.74	12.59
	10	132.10	19.94	11.79
	15	88.40	16.40	8.25
	20	66.55	14.1	5.95
	25	53.44	12.45	4.3
	30	44.70	11.60	3.45
	35	38.46	11.23	3.08
	40	33.78	11.02	2.87
	45	30.13	10.86	2.71
	50	27.22	10.71	2.56
	55	24.84	10.59	2.44
	60	22.85	10.47	2.32
	75	18.48	9.71	1.56
	88	15.90	9.48	1.33

Observation Well Data

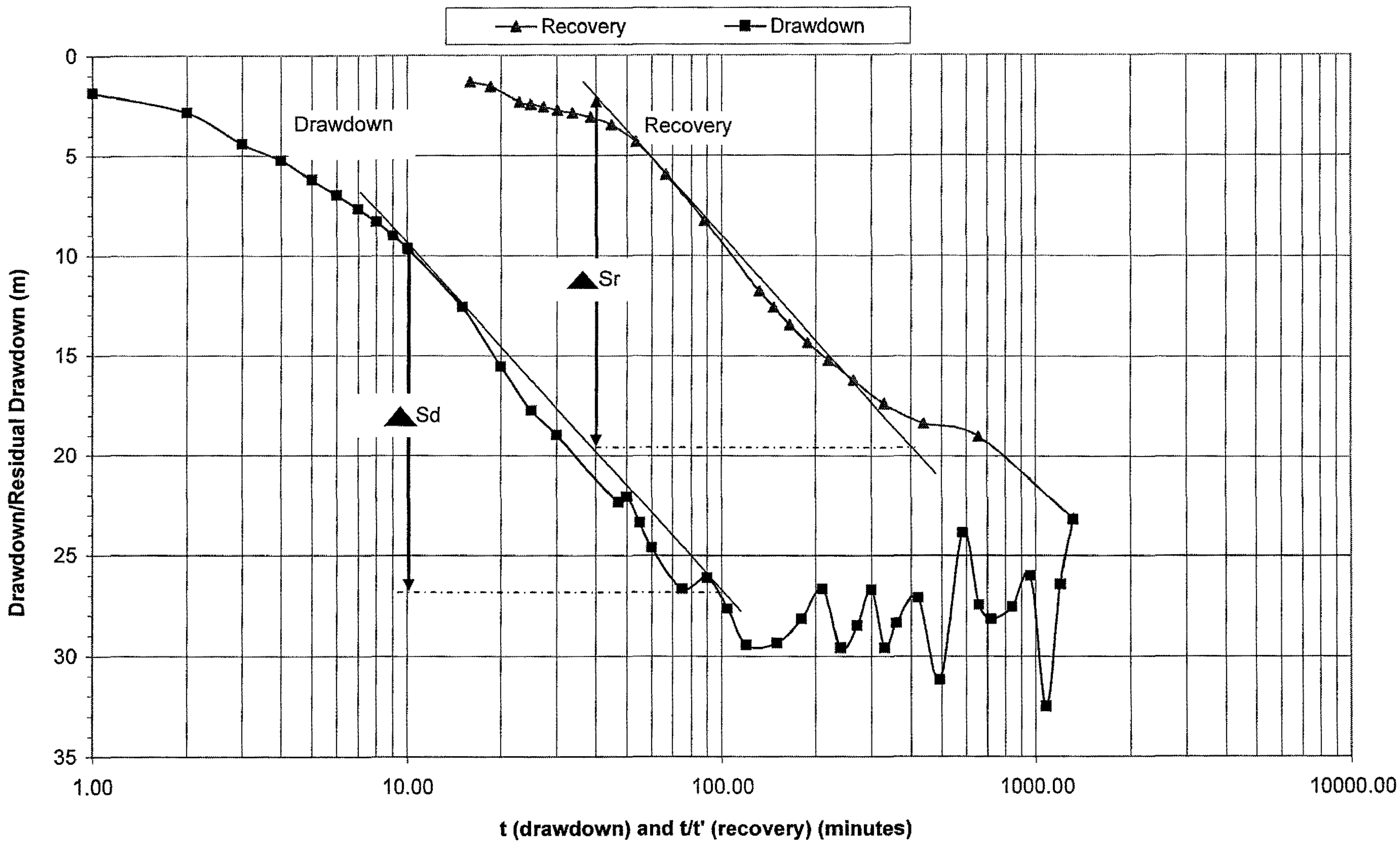
	Time	MW6	MW1	MW2	MW3	MW4
21-Dec-06	11:27	10.95	14.52	51.07	47.1	6.58
	12.00					
	12.15	10.90				
	12.30		14.48			
	12.45			51.06	47.09	
	1.00					6.60
	1.15					
	1.30					
	1.45					
	2.00	10.86				
	2.15		14.44			
	2.30			51.07	49.48	
	2.45					6.59
	3.00					
	3.15					
	3.30					
	3.45	10.83				
	4.00		14.41	51.08		
	4.15				47.10	
	4.30					6.58
	7.00	10.75	14.36			
	7.30			51.15	47.58	
	8.00					6.59
	11.15		14.23	51.29		
	11.30				47.09	6.61
22-Dec-06	3.30		14.21	51.33	47.09	
	7.30	10.50				
	7.45		14.13	51.41		
	8.00				47.10	6.61
Recovery						
	10.30	10.44	14.08			
	10.45			51.48	47.47	
	12.00	10.41	14.05			
	12.30			51.53	47.10	
	12.45					6.62



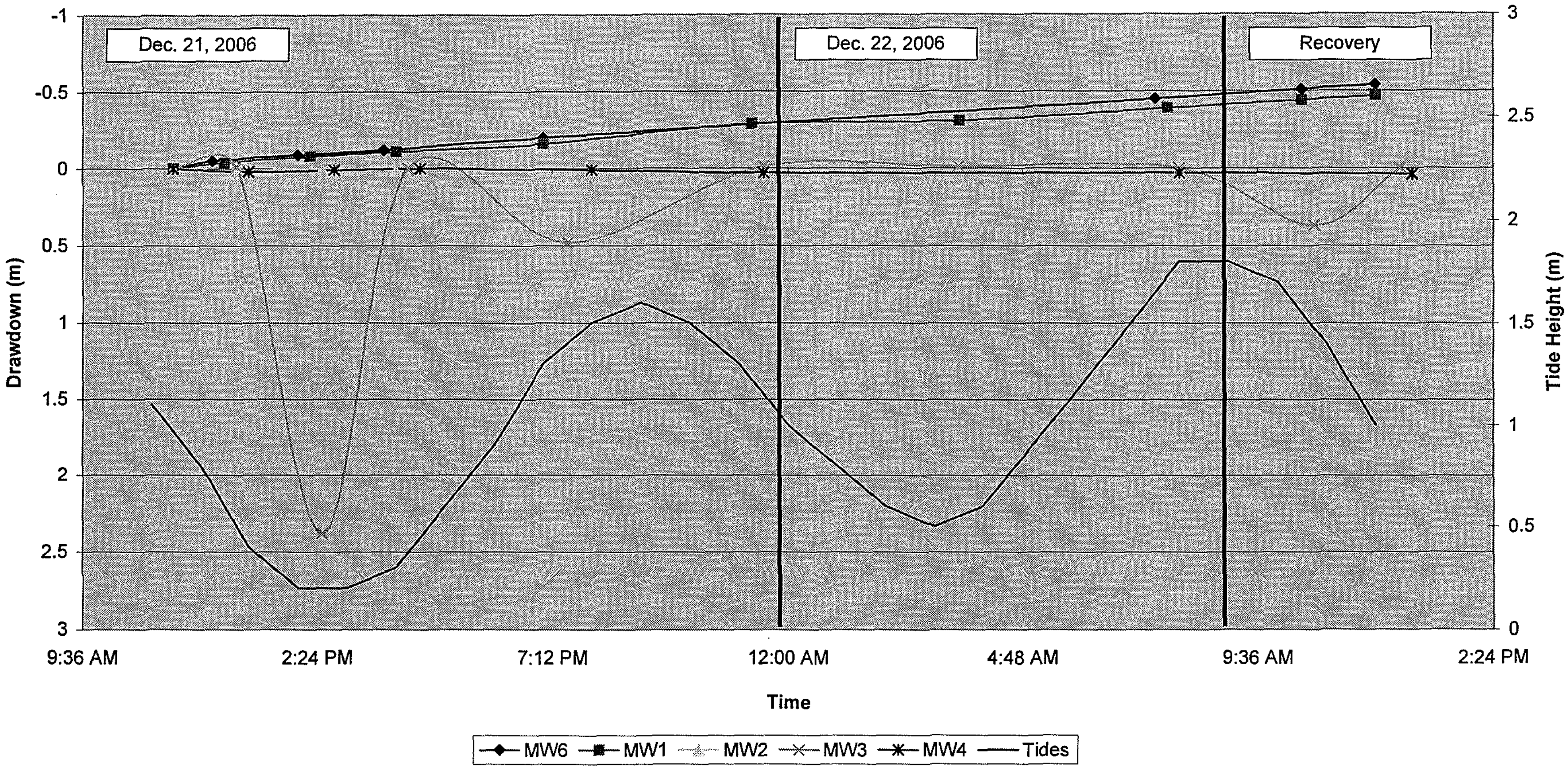
Graph E-1: Whites Point Quarry
DW-5 Step Drawdown
S1
S2
S3
Depth to Water (m)
8
13
18
23
28
33
38
43
48
1
10
100
1000
Time Since Start of Pumping (minutes)

Graph E-2: Whites Point Quarry 12-hr Pump Test

Drawdown and Recovery Plots - DW-5

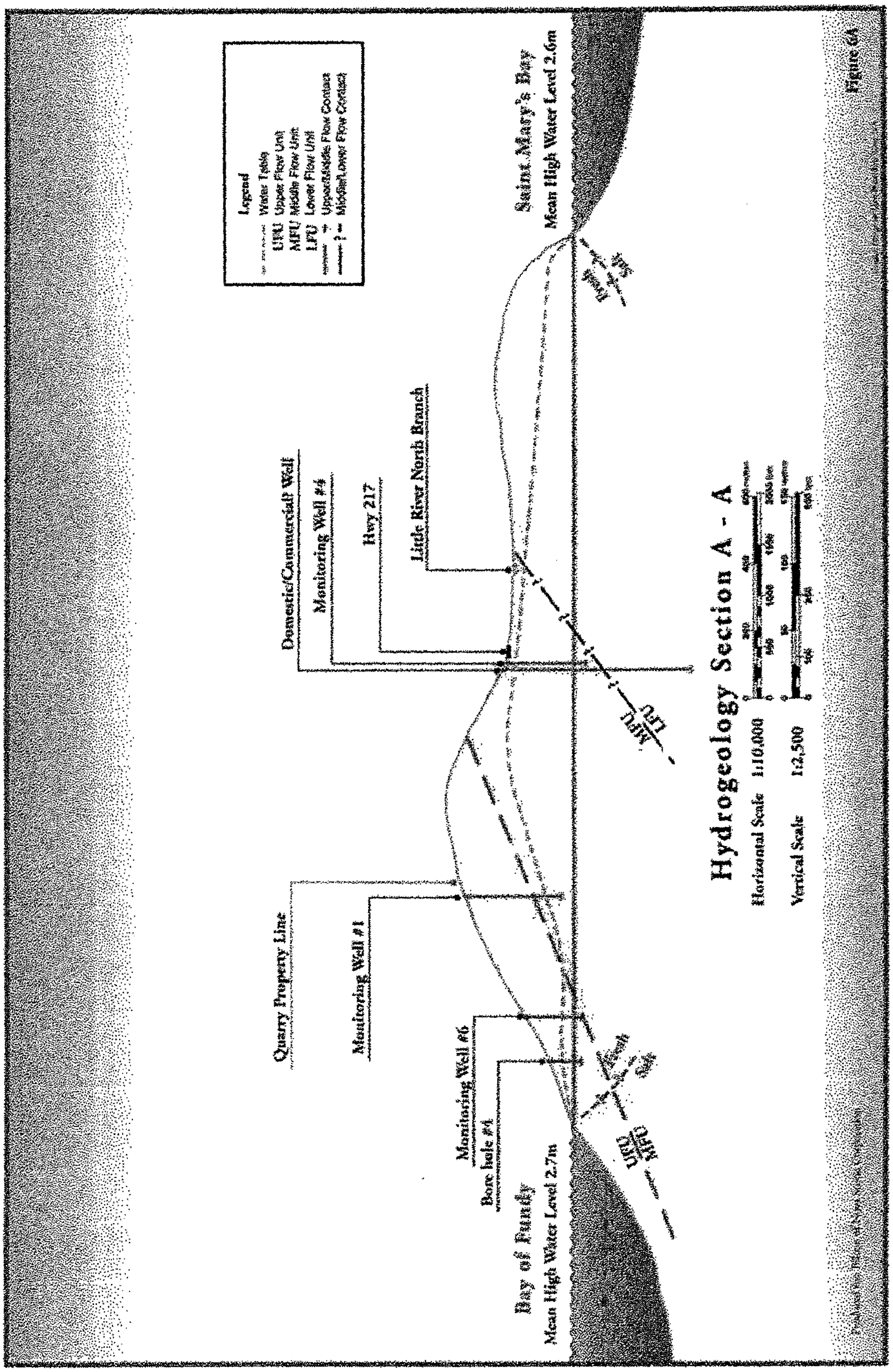


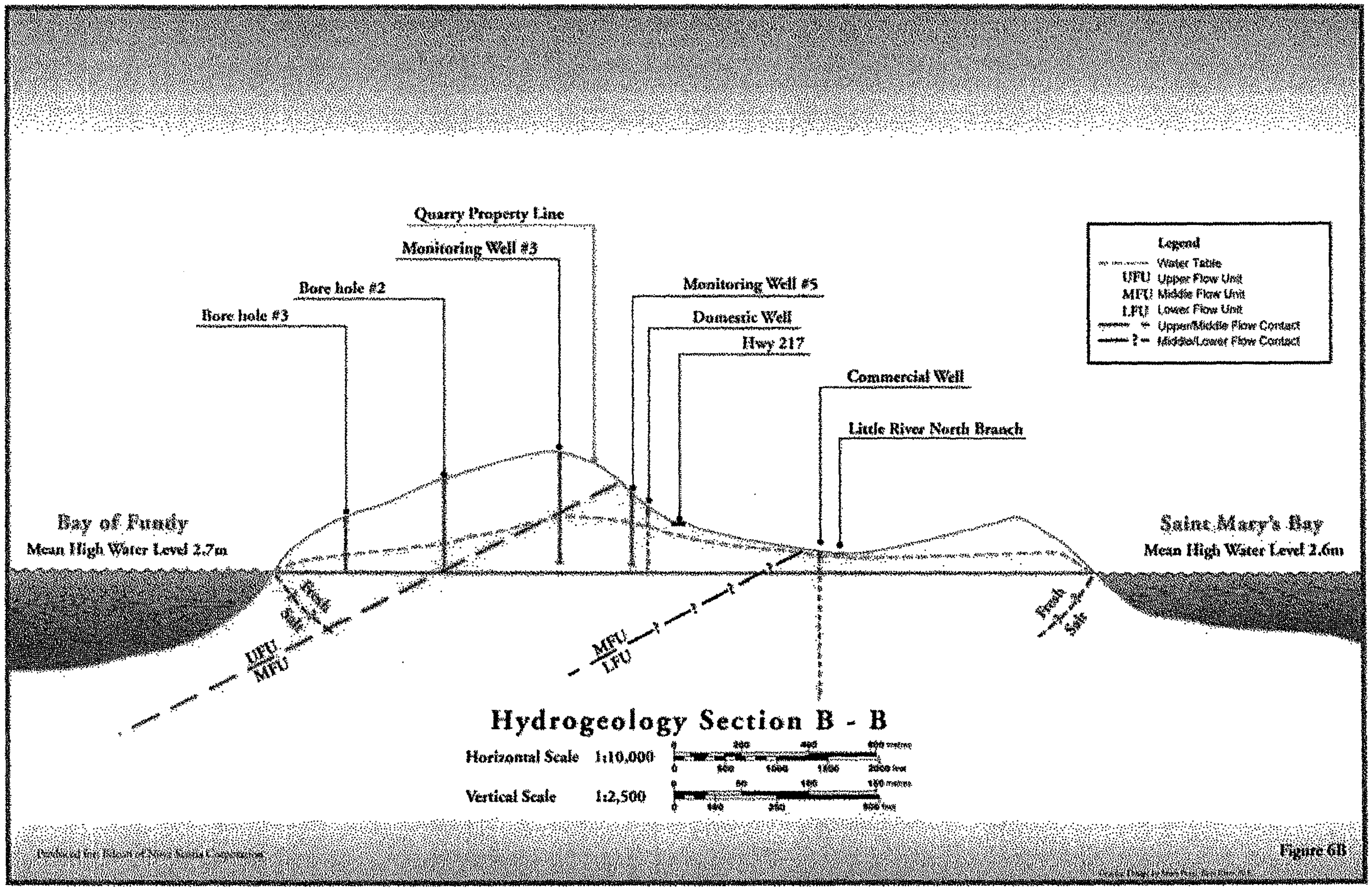
Graph E-3: Whites Point Quarry 12-hr Pump Test
Observation Well Data



ATTACHMENT F

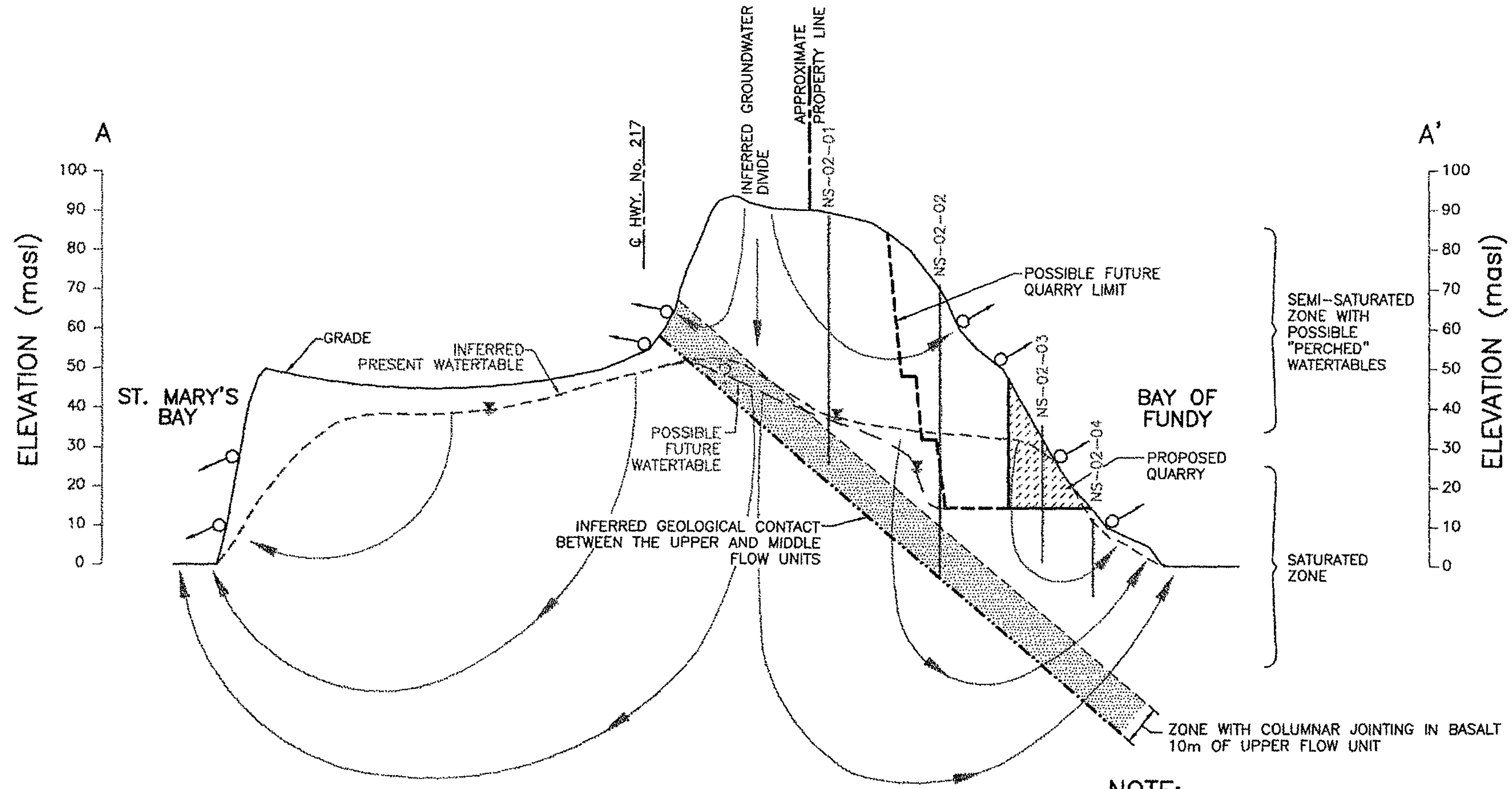
ADDITIONAL SUPPORTING FIGURES


Legend
Water Table
UFU Upper Flow Unit
MFU Middle Flow Unit
LFU Lower Flow Unit
Upper/Middle Flow Contact
Middle/Lower Flow Contact
Saint Mary's Bay
Mean High Water Level 2.6m
Figure 6A
Domestic/Commercial Well
Monitoring Well #4
Hwy 217
Little River North Branch
Fresh
Salt
MFU
LFU
Hydrogeology Section A - A
Horizontal Scale 1:10,000
Vertical Scale 1:2,500
Quarry Property Line
Monitoring Well #1
Monitoring Well #6
Bore hole #4
Bay of Fundy
Mean High Water Level 2.7m
UFU
MFU



Quarry Property Line
Monitoring Well #3
Bore hole #2
Bore hole #3
Monitoring Well #5
Domestic Well
Hwy 217
Commercial Well
Little River North Branch
Bay of Fundy
Mean High Water Level 2.7m
Saint Mary's Bay
Mean High Water Level 2.6m
UFU
MFU
MFU
LFU
Fresh
Salt
Legend
Water Table
UFU Upper Flow Unit
MFU Middle Flow Unit
LFU Lower Flow Unit
Upper/Middle Flow Contact
Middle/Lower Flow Contact
Hydrogeology Section B - B
Horizontal Scale 1:10,000
Vertical Scale 1:2,500
Figure 6B

C0639-281



LEGEND:

- INFERRED GROUNDWATER TABLE
- INFERRED GROUNDWATER FLOW DIRECTION
- EXPECTED SPRING FLOW

SCALE
1:10000 HORIZ.
1:1000 VERT.

NOTE:

1. REFER TO DWG. NO. 17221-1 FOR CROSS-SECTION LOCATION.
2. THE BOREHOLES AND THE INFERRED GEOLOGICAL CONTACT AT NS-02-02 WERE PROJECTED ONTO THE CROSS-SECTION.

Jacques Whitford	REFERENCE:	SCALE : AS NOTED DATE : 02/10/30 DRAWN BY : APPROVED BY :	GLOBAL QUARRY PRODUCTS PRELIMINARY HYDROGEOLOGICAL ASSESSMENT PROPOSED QUARRY, WHITES COVE, DIGBY COUNTY, NS	CROSS-SECTION A-A'	DRAWING NO. 17221-2

amec

RESPONSE TO PANEL QUESTIONS

WHITES POINT QUARRY AND MARINE TERMINAL

Prepared by:

John Schupner, MS
Kevin Reinert, PhD

AMEC Earth and Environmental, Inc.
Somerset NJ and Plymouth Meeting PA

Prepared for:

Bilcon of Nova Scotia Corporation

October 30, 2006

TABLE OF CONTENTS

ACRONYMS

BAF	Bioaccumulation Factor
CCC	Criterion Continuous Concentration
CMC	Criterion Maximum Concentration
EIS	Environmental Impact Statement
EQL	Estimated Quantitation Limit
GMAV	Genus Mean Acute Value
ISQG	Interim Sediment Quality Guidelines
LC50	Lethal Concentration 50%
PEL	Probable Effects Level
TSS	Total Suspended Solids
UFU	Upper Flow Unit
VEC	Valued Environmental Components

1.0 INTRODUCTION

AMEC Earth and Environmental, Inc. (AMEC) was asked to review the current Environmental Impact Statement (EIS) for the Whites Point Quarry and Marine Terminal proposed for a location in Digby Neck, Nova Scotia, Canada. Based on this review, AMEC was tasked to provide responses to each of the questions and comments originated by the EIS Joint Review Panel as well as other authorities in Canada (e.g., Environment Canada, Health Canada, etc.). These were excerpted from the original comment and question document for the EIS review by the client and proponent, Bilcon of Nova Scotia Corporation. The excerpted questions and comments, coverage in the EIS and responses for each are listed in order below.

2.0 GEOLOGY (9.1.2)

2.1 Panel

The chemistry of the basalts is currently characterized by only three analyses from different levels of a single borehole. Copper values, which are of special concern to the assessment, range from 27 to 170 ppm from those three samples. (Considerably higher values have been determined by others in tests of the North Mountain Basalts.) Provide statistically meaningful averages, especially for copper, from the basalts that are to be quarried, along with the range of values encountered. Document the sampling protocol used for the analysis. (For this purpose, "statistically meaningful" may be defined as +/- 10% at 95% confidence level of the measured statistics.)

2.2 EIS Coverage:

EIS Volume VI, Chapters 9.1 - Physical Environmental and Impact Analysis, Section 9.1.2.

Field surveys and borings found the Upper Flow Unit (UFU) to be a uniform, hard, massive, vesicle free, medium dark gray to black basalt. The thickness of the upper flow unit reportedly varies from 0 to 154 m deep. Basalt bedrock samples from core #1 were laboratory analyzed by PSC Analytical Services for baseline metals. Three rock samples from depths of 5 m, 33 m, and 61 m were analyzed – see Appendix 4 for analytical test results for metals in the bedrock.

The results of copper analysis of the basalt from core #1 are 27, 48, and 170 mg/kg for depths 5, 33, and 61 meters respectively.

2.3 Response to the Panel:

In order to characterize basalt and determine a "statistically meaningful" average for any constituent there would be a requirement for extensive boring and sampling. It was stated that "considerably higher values have been determined by others in tests of the North Mountain Basalts". Available data on North Mountain Basalt could be used to estimate a range of values that would be expected to occur, as well as estimate the sampling size. An estimate of the sampling effort that would be required to meet the suggested +/- 10% at 95% probability, statistically meaningful average, was completed using North Mountain Basalt glacial till data from NSDME (1982) and with data available from the Ocean Drilling Program for basalt off the coast of Greenland (Hooper et al. 1999). Based on these data roughly 60 to 66 samples would be necessary to allow for the derivation of a "statistically meaningful" average. As this is an extreme amount of effort, it is suggested that the available data are evaluated. In addition, Bilcon of Nova Scotia Corporation has undertaken a reduced sampling program with 3 additional samples, one from each of 3 boreholes in the basalt of the UFU (since this is the unit to be mined). Bilcon had these basalt samples from other cores in storage and has initiated the proposed analysis. Preliminary results indicate copper levels of 39, 230, and 91 mg/kg for depths of approximately 36, 34, and 16 meters respectively. The sampling protocol used for the sampling and analysis will be described or included with any report of the results.

3.0 SURFICIAL GEOLOGY AND SOILS (9.1.4)

3.1 Panel

Soil Analyses

In view of the ISQG guidelines for copper in marine (18.7 ppm) and freshwater sediments (35.7ppm), provide statistically meaningful averages for concentration levels of inorganic parameters, particularly for copper, from the soils on the property. Describe the range of values encountered. Document the sampling protocol and spatial distribution used for the analysis. (For this purpose, "statistically meaningful" may be defined as +/- 10% at 95% probability of the measured statistic).

On Pg 36, the Proponent should note that the sample taken from the existing sediment pond is not typical of material that is expected to be in the sediment ponds during the operation of the Project. (It is the product of surface runoff from grubbing the site, not the result of a basalt-crushing process.)

3.2 EIS Coverage

EIS Volume VI, Chapters 9.1 - Physical Environmental and Impact Analysis, 9.1.4 Surficial Geology and Soils

Soil Analyses

The EIS states Site specific soil samples were taken from the same site location (S.W.P. 1) on May 22, 2002 and again on June 4, 2002 for analysis regarding available metals and BTEX/TPH MUST – Hydrocarbons for baseline data. The analytical data are presented in Appendices 38 and 38A. The results indicate that the concentration of copper in both samples was 39 mg/kg.

A sediment sample was taken (sediment sample site 7) on July 14, 2005 for the purpose of documenting sediment contamination levels from the land disturbance due to grubbing of a four hectare quarry site. The results for the sediment pond sample are stated in the subsequent section (9.1.4.2 Analyses) as 52 mg/kg.

3.3 Response to the Panel

The sampling effort that was utilized to characterize the soil copper levels on a site wide basis was not optimum, but not considered insufficient given a weight of evidence approach. Since the sediment that was sampled from the retention pond is a result of soil runoff from the four hectare quarry site, it is in essence an "integrated" soil sample. The sediment pond samples were analyzed by Maxxam Analytics Inc. (Analytical Report

2005/08/31). Appendix 36 of the EIS containing the laboratory analysis of these samples was not included with the EIS. Appendix 36 is included here as an attached errata sheet.

The retention pond sediment sample can be considered a conservative representation of the soil copper level considering that, in general, (1) soil copper levels diminish with depth, (2) greater concentrations of copper would be expected in the upper 5–10 centimeters of soil (Breslin 1999), (3) soil particle runoff is most likely from the upper soil layer, and (4) the two previous samples of actual soil from the site were 39 mg/kg. Average soil copper levels have been reported for the U.S. and Canada. The national average concentration for copper in U.S. soils is 30 mg/kg (Davies 1986). In Canada, average copper concentration in uncontaminated soils is 25 mg/kg and in sludge amended soils is 41 mg/kg (Webber and Singh 1995). The maximum trace element concentration limit for copper in compost is 100 mg/kg (Composting Council of Canada 2006).

With the current information, it is not possible to provide statistically meaningful averages for concentration levels of inorganic parameters, particularly for copper, from the soils on the property. Historical soil concentrations on site are relatively unknown, so derivation of the expected variability for use in sample size determinations would be guesswork. The Nova Scotia Department of Mines and Energy (NSDME 1982) performed background geochemical analysis of the Beaver River Till at sample sites at Whites Cove (341A) and Whale Cove (342A). Copper in these samples ranged from 80 mg/kg at 341A to 107 mg/kg at 342A. Site 341A is located on the quarry property and 342A approximately 3 km from the quarry property. Given the totality of what is known about copper concentrations in soil, glacial till, basalt, and in the sediment retention pond at the site, reasonably good estimates of copper concentrations in soil can be made (39 to 52 mg/kg). Additional sampling is not likely to yield additional useful information.

With regard to the sediment retention pond sample, the Panel is correct in stating the sample taken from the existing sediment pond is not typical of material that is expected to be in the sediment ponds during the operation of the Project. This was made clear in the EIS. The basalt crushing process is expected to generate a slurry with a pH approaching 10. At that pH, high copper concentrations are not expected given that, on average, only 0.078% leached out of the basalt at a pH of 4.9 (Maxxam Analytics Inc., *Atlantic CGSB Leachate + Metals (Leachate) 2006/07/20*, and *Atlantic CGSB Leachate+ Metals (Liquid),* attached). The proposed sampling of pond effluents will provide confirmation (see Response to Panel under Fisheries and Oceans Canada).

4.0 BIOACCUMULATION IN LOCALLY HARVESTED SPECIES (9.2.3.2)

4.1 Panel

Clarify who will conduct the monitoring of VECs throughout the course of the Project to ensure that the effects of Project-derived metals are not significant. Ensure that monitoring intervals reflect a precautionary approach.

4.2 EIS Coverage

Section 9.2.3.2 of the EIS is labelled Analysis and does not address the issue of bioaccumulation in locally harvested species. However, it is addressed in Section 9.3.21 Human Health - Country Foods.

4.3 Response to the Panel

A response to the human health issues pertaining to copper in locally harvested species is provided later in this document.

The monitoring of VECs during the construction and operation phases will be undertaken by a qualified consultant retained by Bilcon. Monitoring results will be made available to the public.

Since the Project area has a naturally high background copper concentration, it is not expected that metal concentrations in intertidal and offshore waters will exceed current background conditions due to the site operations. Precautionary measures will reduce the possibility of contaminants entering the marine environment and affecting marine organisms. It is proposed that all outflows from sediment retention ponds be sampled semi-annually and analyzed for copper (see section 5.0 Contaminants for additional information). Total Suspended Solids and pH sampling and analysis are already planned (weekly) and that will indicate any change in that aspect of water quality. Bioaccumulation of several metals is already occurring due to the background levels. Background levels of copper have been analyzed in periwinkles (22.1 mg/kg; see Appendix 31 of EIS). A sampling program for periwinkle has been proposed (see section 7.0 9.3.21 Human Health – Country Foods). However, bioaccumulation (BCF) has been found not to be a useful indicator of hazard for metals to aquatic organisms (Adams et al. 2000; Chapman et al. 2003). Many invertebrate organisms that could potentially be monitored (e.g., molluscs, crustaceans) are able to regulate and/or store copper (Bryan 1968; Dallinger 1977) with large differences in residues found in muscle (low) versus regulatory organs (high) such as the hepatopancreas (Bagatto and Alikhan 1987).

It is highly unlikely that any potential release from the site could be detected in the local biota. The proposed sampling program reflects a precautionary approach. Therefore, sampling of additional VEC's is deemed unnecessary at this time.

5.0 CONTAMINANTS

5.1 Panel

Provide information on the potential effects of copper on marine life. What are the normal range of levels and acceptable levels for marine sediments and waters? What organism could take up or accumulate copper and what organisms are particularly susceptible to the presence or effects of copper? What strategies may be applied to mitigate (a) the potential release of copper in the marine environment or (b) the effects of its release?

5.2 EIS Coverage

This information is not currently in the EIS. A summary of the fate and effects of copper in marine life is presented below in the response to panel questions.

5.3 Response to the Panel

Embryo-larval life-stages of bivalve mollusc represent the genera most sensitive to copper (USEPA 2003). By sensitivity rank, the genera are *Mytilus* (GMAV[1] = 11.5 µg/L) and *Crassostrea* (GMAV = 12.6 µg/L). No chronic toxicity data exists for these genera. Chronic data were available for the sheepshead minnow, *Cyprinodon variegatus*. In that study, the chronic value, based on growth as the most sensitive endpoint, was 249 µg/L. The 96-hour LC50 was 368 µg/L. The U.S. EPA is currently using an Acute to Chronic Ratio (ACR) of 3.1 to determine the chronic criterion. Data of acceptable quality pertaining to bioaccumulation of copper in marine or estuarine organisms are given for polychaete worms (BAF = 1,006–2,950), mussels (BAF = 2,491–7,730), and Pacific oysters (BAF = 33,400–57,000).

According to the ATSDR (2004), the concentration of copper in lakes and rivers typically ranges from 0.5 to 1,000 ug/L with an average concentration of 10 ug/L. The average copper concentration in groundwater is 5 ug/L. The average concentration of copper in tap water ranges from 20 to 75 ug/L. The concentration of copper in the oceans has been reported to be in the range of 1-34 ug/L at sites from Woods Hole, MA to the Bahamas (Galtsoff 1943). Jenkins (1981) reported it as 3 ug/L. Copper in samples of marine water from sample station 5 off of the Whites Point Quarry site ranged from 0.4 to 0.8 ug/L.

[1] GMAV = Genus Mean Acute Value

The current Canadian water quality guidelines (CCME 2006) for copper in freshwater range from 2 – 4 ug/L, depending on a hardness ($CaCO_3$) ranging from 0 to >180 mg/L. No guideline for copper in seawater is given. The guideline for copper in community water, based on an aesthetic objective, is ≤1000 ug/L. Water for agricultural use in irrigation is allowed to contain copper at 200 to 1000 ug/L and water for livestock, 500 to 5000 ug/L. The current U.S. EPA water quality criteria (USEPA 2006) for copper are as follows for freshwater (hardness dependent): Criterion Maximum Concentration (CMC) = 13 ug/L; Criterion Continuous Concentration (CCC) = 9.0 ug/L; For saltwater: CMC = 4.8; CCC = 3.1 ug/L. U. S. EPA notes that when the concentration of dissolved organic carbon is elevated, copper is substantially less toxic and use of Water-Effect Ratios might be appropriate. U. S. EPA has drafted an update to the copper criteria[2] which is available at the URL http://www.epa.gov/waterscience/criteria/copper/.

Soil generally contains between 2 and 250 mg/kg copper, and in relatively clean sediment, the copper concentration is typically <50 mg/kg (ATSDR 2004). Canadian soil quality guidelines allow 63 mg/kg in agricultural and residential/parkland land uses. In commercial and industrial land use, 91 mg/kg is allowed. The Ontario Ministry of Agriculture and Food and Ontario Ministry of Environment (1992) allows up to 100 mg/kg in sludge amended soil. Canadian sediment quality guidelines for freshwater specify an ISQG of 35.7 mg/kg and Probable Effect Level (PEL) of 197 mg/kg. The ISQG for marine sediments is 18.7 mg/kg and the PEL is 108 mg/kg. The ISQG or SQG is defined as the level at which no biological effects occur. The PEL is defined as the level above which adverse biological effects are usually or always observed.

Loring (1979) sampled and analyzed for metals in the sediments of the Bay of Fundy and found copper concentrations in sediments averaged 19 mg/kg. Sediments were characterized by grain size and showed an increase in copper concentration with decreasing grain size, sand to mud, with a range of average copper concentration of 12 to 22 mg/kg. For the Whites Point Quarry EIS, analyses were performed for total copper in sediment samples collected from three sites in the waters offshore of Whites Cove. The total copper concentration ranged from 11 to 17 mg/kg.

According to the Province of Nova Scotia – Department of Mines and Energy, the Basalt Till Facies of the Beaver River Till Unit in the area of the quarry has naturally high levels of copper (NSDME 1982). Loring (1979) noted that copper concentrations in near shore

2 *Freshwater*
The procedures described in the Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses indicate that, except where a locally important species is very sensitive, freshwater aquatic organisms an their uses should not be affected unacceptably if the 4-day average concentration of dissolved copper does not exceed the BLM-derived site-water LC50 (i.e., Final Acute Value (FAV)) divided by the final acute-chronic ratio more than once every 3 years on the average (i.e., the CCC); and if the 24-hour average dissolved copper concentration does not exceed the BLM-derived site-LC50 (or FAV) divided by two, more than once every 3 years on the average (i.e., the CMC).

Saltwater
The procedures described in the Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses indicate that, except where a locally important species is very sensitive, saltwater aquatic organisms an their uses should not be affected unacceptably if the 4-day average concentration of dissolved copper does not exceed 1.9 µg/L more than once every 3 years on the average (i.e., the CCC); and if the 24-hour average dissolved copper concentration does not exceed 3.1 µg/L more than once every 3 years on the average (i.e., the CMC).

sediments are relatively higher as compared to offshore sediments due to detrital bedrock material derived from the underlying and coastal basalts. The geochemical analysis of the Beaver River Till showed a mean copper concentration of 131 mg/kg (n=5) and ranged from 80 – 218 mg/kg. In the two samples closest to the site (Whale Cove and West Mink Cove), copper concentration ranged from 80 to 107 mg/kg. In borehole samples of the basalt, average copper concentration was 101 mg/kg, with a range of 27 to 230 mg/kg at depths ranging from 5 to 61 meters. Basalt samples with copper concentrations ranging from 39 to 270 mg/kg were subjected to leachate tests (Maxxam Analytics Inc., *Atlantic CGSB Leachate + Metals (Leachate) 2006/07/20*, and *Atlantic CGSB Leachate+ Metals (Liquid)*, attached), using acetic acid at average final pH of 4.9. Average initial pH of the basalt samples was 9.8. The resultant leachates had copper concentrations ranging from non-detect (20 ug/L) to 480 ug/L, with an average percent leached of 0.078 % (range: 0.012 to 0.209%) of the basalt concentrations. Analysis of copper in ground water (pH = 7.4) was consistently below the EQL of 2 ug/L. Surface water samples (pH = 5.7 to 7.2) ranged from non-detect (EQL = 1.0 ug/L) to 3.0 ug/L.

Copper in natural water is predominantly in the Cu(II) state. In this form, copper is complexed or tightly bound to organic matter; little is present in the free (hydrated) or readily exchangeable - bioavailable form. Copper adsorbs to organic matter, hydrous iron and manganese oxides, and clay (Davies-Colley et al. 1984). Harrison and Bishop (1984) determined that, in water, a significant fraction of the copper is adsorbed within the first hour of introduction, with equilibrium usually obtained within 24 hours. Copper complexation capacity of waters controls copper toxicity by keeping the aqueous concentration of Cu(II) at nontoxic levels (Rivera–Duarte 2005). The chemical conditions in most natural water are such that, even at relatively high copper concentrations, these processes will reduce the free Cu(II) concentration to extremely low values (ATSDR 2004).

In seawater, organic matter is generally the most important complexing agent (Coale and Bruland 1988). Copper has been shown to be subject to binding by dissolved organic carbon (Arnold, W.R. 2005). Iron oxides are also an important binding agent, particularly in estuarine sediments (Davies-Colley et al. 1984), and binding does not vary significantly with salinity reduced from 35 to 5‰.

Analysis of surface water at the site resulted in a mean total organic carbon content of 8.6 mg/L (N = 8), ranging from 2.7 to 16.6 mg/L. Iron was highly variable, ranging from 0.32 ug/L to 5.2 mg/L. Iron in marine water samples ranged from 25 to 120 ug/L. The total organic carbon in marine sediments offshore of the site ranged from 1.1 to 60 g/kg

Concern has been expressed about the potential effects that copper may have on marine life. As stated in section 4.3, for in many organisms, copper, an essential element, is regulated and/or stored. Bioaccumulation of copper in these organisms reflects this process and is not indicative of hazard. Based on (1) the mitigation proposed in the EIS, Sections 9.2.2.3, 9.1.2.3, 9.1.6.3 to minimize runoff into marine waters (i.e., drainage channels, sediment retention ponds, constructed wetlands, and an environmental preservation zone), (2) the potential binding capacity of the organic carbon and iron content in the surface and marine waters, and (3) the expected high pH of basalt slurry, it is highly unlikely that any marine organisms will have a significant exposure to copper from the site over and above background levels. The background concentration of copper in surface water at the site has been measured as high as 3 ug/L. Chronic effects from background concentrations are not apparent, probably due to environmental complexation and/or regulation by biota. As a precautionary approach Bilcon proposes that if dissolved copper concentrations in sediment retention pond effluents exceed 4.8 ug/L, samples of pond effluent will be submitted to a qualified contract laboratory for a toxicity screening test using a marine species known to be sensitive to copper. If significant mortality is observed, additional mitigation measures (e.g., treatment by coagulation, flocculation, filtration, adsorption or other appropriate methods) will be undertaken to reduce the copper to a non-toxic concentration prior to discharge.

6.0 HUMAN HEALTH – MARINE CONTAMINANTS (9.3.19)

6.1 Panel

9.3.19.2 The on-site sampling is not adequate to generate scientifically defensible information concerning copper concentrations. The Proponent argues that "implications to human health are uncertain". The Panel expects the Proponent to present current scientific information on the implications of copper on human health.

Given that periwinkles harvested for human consumption in the near shore environment on the site may be exposed to high concentrations of copper draining from the sediment ponds, this matter requires clarification.

6.2 EIS Coverage:

In EIS Section 9.3.19.2 Analysis, it is stated that copper levels in the soil at Whites Point was low (39 mg/kg at EQL 2). Also, copper levels in surface water entering the Bay from the Whites Point site is extremely low (2 – 3 ug/L at EQL 2). Likewise copper in the intertidal marine waters was extremely low (0.8 mg/L at EQL 0.1). Copper content in the basalt rock to be processed at the quarry site was also low (27 – 61 mg/kg, depending on depth at EQL 2).

On-site analyses as stated above are described in multiple sections of the EIS (e.g., Basalt bedrock and groundwater in 9.1.2.1 Research; Geochemistry of the Beaver River Till–Basalt Till Facies, soil, and pond sediments in 9.1.4.1 Research; surface water in 9.1.6.1 Research).

As stated in section 9.3.19.5 Impact Statement, Marine Contaminants – Human Health, background levels of metals are relatively low on-site. Surface water runoff and sediments from quarry operations will be contained in on-land environmental control structures, and sediments for future use during reclamation will be placed in diked disposal areas on-site. These precautionary measures will reduce the possibility of contaminants entering the marine environment and affecting marine organisms harvested for human consumption.

A review of scientific information on the implications of copper on human health is briefly presented below in the Response to the Panel. Fate of copper in the environment is reviewed in Response to the Panel in the section on Contaminants.

6.3 Response to the Panel

Like iron and zinc, humans have developed a homeostatic mechanism with regard to copper exposure. Copper is an essential element for humans involved in aerobic enzyme function, hemoglobin synthesis, and gene transcription (Ralph and McArdle 2001). Many organisms have developed similar mechanisms for regulating copper levels at the biochemical and molecular levels (IPCS 1998), seeking to maintain their copper levels in a range that avoids deficiency and excess. Doses below the recommended daily allowance (RDA) can produce adverse developmental consequences and heart disease, while higher doses can produce toxic responses, including liver (primary organ for copper distribution in humans), kidney, cardiovascular, hematopoetic, and central nervous system effects (Georgopoulos et al. 2006; Ralph and McArdle 2001). In essence, the toxicity and essentiality of copper produces a U-shaped dose response curve, a hormetic response (Calibrese and Baldwin 2001; Calebrese 2004). The United States RDA for adult men and women is 900 ug/day; the median intake of copper in the US ranges from 1.0-1.6 mg/day, again, for adult men and women (global average is 1.5 mg/d for adults (Ralph and McArdle 2001)). IPCS (1998) lists the lower acceptable level of intake at 20 ug Cu/kg/day generally with a higher level of 50 ug Cu/kg/day for infants. The maximum daily allowances for various global regions ranges from 130 to 500 ug/kg/day (Ralph and McArdle 2001).

Chronic effects in humans are rare but may occur in individuals with Wilson's disease (1:30,000 live births) in which copper transport enzymes are inactive and copper accumulates in the liver and brain (Ralph and McArdle 2001). Also, the usually fatal Menkes disease (1:200,000 live births) resembles a copper deficiency in which Cu is not distributed past the gastrointestinal tract (IPCS 1998; Ralph and McArdle 2001). Based on the copper level required to produce liver damage, the tolerable upper intake level for adults is 10,000 ug/day. Additionally, acute, gastrointestinal upset often occurs at levels of 3 mg/L in water and above (Georgopoulos et al. 2006). This GI irritation usually is associated with copper in water and not in food where it is typically less bioavailable (i.e., complexed to proteins, lipids, etc. (Ralph and McArdle 2001)). In the US, the secondary maximal contaminant level (MCL) for drinking water based on taste and odor (aesthetics) is 1.3 mg/L. Under the Canadian Drinking Water Guidelines, the Canadian Guideline limit is 1 mg/L. IPCS (1998) lists the maximum level of intake around 2-3 mg/day.

Periwinkles are anticipated to be harvested for human consumption from the near shore tide pools, adjacent to and on the site. These sea snails, *Littorina* sp., have exhibited a maximum copper level of 22.1 mg/kg in pre-operation sampling. Periwinkles do not appear to be sensitive to the levels of copper already present in this environment. Given the potentially elevated background levels of copper and the fact that on-site operations are not expected to significantly elevate those levels, additional impacts to this harvested food source are not expected. ATSDR (2004) notes that individuals who regularly consume shellfish typically have higher copper intakes (an additional 2-150 mg/day) than those who do not consume shellfish. Research for this response did not identify current guidelines for copper content in marine organisms. Stewart and White (2001), in a review paper of contaminants on the Scotian Shelf, referred to a Health and Welfare Canada Guideline (circa 1996) of 100 µg/g in marine and freshwater animal products. According to the EIS (Section 9.3.19), levels above 800 ug/g (mg/kg or ppm) are considered excessive in aquatic food organisms. The current maximum levels found in periwinkles are over 30 times lower than that tissue concentration.

Country foods such as dewberry, raspberry and blueberry exhibit pre-operation levels of copper below 1 mg/kg. Health Canada recommends an upper limit dose of copper in adults (19 years and older) of 10 mg/day from drugs and health products (Health Canada 2004). Given the elevated background level of copper for this general vicinity, the fact that the berries do not show elevated levels of copper and the existence of homeostatic copper mechanisms in humans, the site is not expected to significantly elevate existing copper levels.

7.0 HUMAN HEALTH - COUNTRY FOODS (9.3.21)

7.1 Health Canada

Country Foods (Table ECM-2)

Health Canada recommends that raspberries and periwinkles be analyzed for metal following the first year of operation and then every subsequent five years. This would enable early detection of any elevated metals concentrations that may have been the result of quarry construction and early operations.

7.2 EIS Coverage:

EIS Section 9.3.21.4 Monitoring, states, in addition to monitoring air, water, and soil pathways as presented in previous sections of this EIS, Bilcon of Nova Scotia Corporation proposes to monitor country foods. Every five years, laboratory analysis of the metal content in wild raspberries and periwinkles will be conducted. A report comparing background levels to present levels will be compiled and made available to Health Canada if requested.

7.3 Response to the Panel

Considering the low background levels of metals (excepting copper in basalt and glacial till) in on-site soil, rock, and water, the proposed design considerations for spill containment, hazardous material handling, and proposed precautionary measures, the possibility of contaminants entering human food resources is extremely unlikely. However, Bilcon of Nova Scotia Corporation has proposed in EIS Section 9.3.21.4 Monitoring that wild raspberries and periwinkles be analyzed for copper following the first year of operation and then every subsequent five years; if the results are not substantially different between sampling events, the frequency may be decreased or even discontinued. In the unlikely event that the results are significantly higher, the potential hazard will be assessed, the mitigation processes re-evaluated if need be, and the monitoring frequency adjusted as appropriate.

8.0 SURFACE WATER QUALITY, REFERENCE: VOLUME IV APPENDICES, APPENDIX 45

8.1 Environment Canada

Information on the quality assurance/quality control program used by the laboratory analyzing water quality samples should be included. It is noted that the results for most sampling stations are for a single sample.

8.2 EIS Coverage

Environment Canada is correct in identifying this issue as a deficiency in the EIS.

8.3 Response to the Panel

Bilcon of Nova Scotia Corporation will provide the necessary information on the quality assurance/quality control program used by the laboratory.

9.0 CONTAMINANTS (SECTIONS 9.3.18 TO 9.3.20)

9.1 Fisheries and Oceans Canada

Page 127 – There is no proposal within this EIS for environmental effects monitoring of the commercially valuable species such as lobster, crab, and scallop that are sensitive to the toxic metal exposures, especially in the Bay of Fundy areas. The monitoring of water quality of outflow from the sediment retention ponds is insufficient to detect the possible problem of contamination associated with quarrying operation. In the study of the selection of bioindicators for monitoring marine environmental quality of the Bay of Fundy, Chou et al. (2003) reported that lobsters from Digby had elevated digestive gland copper (70 ug/g) in comparison to lobsters from Pubnico (10 ug/g). Chou et al. also reported the ineffectiveness of mussels and sediments as reliable indicators of contaminants. Mussels and sediments failed to reveal the problem of high toxic metals in the Bay of Fundy area. The EIS quotes the Gulfwatch results and states that heavy metal concentrations in blue mussels are near natural levels (Table MC-I, page 128). The report should include recent bioindicator studies by Chou et al. with regard to the contaminant levels in lobsters and crabs from the Bay of Fundy areas. The selection of bioindicators is key to revealing the toxic metal exposure in marine organisms.

9.2 EIS Coverage:

Section 9.3.18 Human Health - Drinking Water Quality; 9.3.19 Human Health - Marine Contaminants; 9.3.20 Human Health - Land Contaminants; 9.1.6 On-site Surface Water Drainage

In Section 9.1.6.4 Monitoring, it is stated that water quality monitoring of all outflows from sediment retention ponds will be conducted weekly for Total Suspended Solids (TSS) and pH and monthly for general chemistry. TSS will be maintained at less than 50 mg/L per grab sample or 25 mg/L monthly arithmetic mean while pH will be maintained within a range of 5 – 9 per grab sample or 6 – 9 monthly arithmetic mean at the sediment pond outlet. These TSS and pH limits correspond with those contained in the permit for the four hectare quarry on this site. The frequency of monitoring will be weekly for TSS and pH and a monthly summary of results will be prepared by Bilcon of Nova Scotia Corporation and be available to regulatory agencies.

In Section 9.3.19 Human Health – Marine Contaminants, 9.3.19.1 Research, it is stated that contaminants such as metals have been measured in scallop and lobster in the Bay of Fundy. Scallop from most of the Bay generally had metal levels comparable to those from uncontaminated areas (Bay of Fundy Ecosystem Partnership 2004, Ref. 99). Copper measurements in the tissues of lobster in the upper Bay of Fundy, **predominately in a non-industrialized area** (emphasis added), had levels as much as 30 – 100 times higher than industrialized areas.

9.3 Response to the Panel

Given the concern over the potential for high copper levels, it is proposed that all outflows from sediment retention ponds be sampled semi-annually and the samples analyzed for copper. This program would then be sunsetted if the levels of copper can be shown to be of no concern (see Response to Panel at section 4.3).

The use of bioindicators is said to be "key to revealing the toxic metal exposure in marine organisms". This is incorrect because it assumes there will be significant exposure to organisms in the marine environment, which is a false premise. As indicated in the response to the panel in the previous section on contaminants, copper exposure is expected to be extremely low due to the planned mitigation strategy and the physical/chemical processes acting upon the copper in the environment. Analysis of periwinkle has shown copper levels of 22.1 mg/kg, a consequence of the naturally occurring background levels of copper. Research for this response did not identify current guidelines for copper content in marine organisms. Stewart and White (2001), in a review paper of contaminants on the Scotian Shelf, referred to a Health and Welfare Canada Guideline (circa 1996) of 100 µg/g in marine and freshwater animal products. Bilcon of Nova Scotia Corporation, in good faith, has proposed to continue the sampling and analysis of periwinkles for copper. It is anticipated that any biomonitoring will not discern exposure due to the site activities nor show copper levels over and above that which is due to background exposure (refer to section 7.3).

The full range of elevated digestive gland copper in lobster as presented in Chou et al. (2003) include the following digestive gland (ug/g wet weight) copper concentrations from the Bay of Fundy:

Inner Bay of Fundy	–	Cobequid Bay	856 ug/g ± 40
	Minas Basin		405 ug/g ± 20
		Minas Channel	110 ug/g ± 25
New Brunswick Coast	–	Shepody Bay	637 ug/g ± 36
Nova Scotia Coast	–	Cumberland Basin	836 ug/g ± 17
Saint John Harbour	–	Dumpsite	317 ug/g ± 16
Annapolis Basin	–	Annapolis Basin	70.5 ug/g ± 2.8
Outer Bay of Fundy	–	Pubnico	10.4 ug/g ± 3.6

There are several issues against the use of lobster in a biomonitoring strategy. In Chou et al. (2003), there were high levels of copper in the digestive gland (hepatopancreas) of lobster, but edible tissues were not analyzed. It is expected that muscle tissue would likely have been much lower in copper concentration than the level determined in the hepatopancreas. This phenomenon has been observed in other decapod crustaceans that regulate metals (Bryan 1968; Bagatto and Alikhan 1987). Metals are sequestered in the hepatopancreas via metallothioneins, membrane metal transport proteins, and vacuolar sequestration mechanisms (Ahearn et al. 2004) and thus removed from circulation. The correlation of hepatopancreas copper and the copper concentration in the sediments in the Bay of Fundy was poor. The source of copper was unknown and could be from background sources. Lobsters appear to have a greater capacity for metal uptake and accumulation. Lobsters are also rather mobile, making it even more difficult to pinpoint a contributing source of contamination.

Metals have been measured in scallop and lobster in the Bay of Fundy. Scallop from most of the Bay generally had metal levels comparable to those from uncontaminated areas (Bay of Fundy Ecosystem Partnership 2004). Copper measurements in the tissues of lobster in the upper Bay of Fundy, predominately in a non-industrialized area, had levels as much as 30 – 100 times higher than industrialized areas.

These facts raise serious questions as to the suitability of lobster in a monitoring program. A periwinkle biomonitoring program has been proposed. Use of lobster in a biomonitoring program is not recommended.

10.0 INFORMATION REQUEST IR-3

10.1 Issue

The planned settling ponds will receive fine basalt that will contain an elevated copper content. The resulting sediments will leach into the overlying water which can then migrate into the ground water below or spill into the nearby intertidal zone.

10.2 Information Request - IR-3

Provide the details and results of leaching tests on finely ground basalt (grain size equivalent to the material in the settling ponds) with a composition typical of the quarried material and dissolution rates of metals (particularly copper) for this material to allow the potential for the transfers outlined above to be quantified. Propose mitigation measures to minimize the risks of adverse effects.

10.3 EIS Coverage

The sediment retention ponds (settling ponds) are addressed in several sections of the EIS (e.g., 7.0; 9.1.2; 9.1.4; 9.1.6; 9.3.19). The issue of contamination of groundwater is addressed in Section 9.1.3 of the EIS.

10.4 Response to the Panel

The results of leaching tests for basalt samples from the site, as performed by Maxxam Analytics, Inc., are attached in Section 4.1 Proper Scientific Standards. The following is a summary of the results for copper:

Sample ID	Initial Cu (mg/kg)	Initial pH	Final pH	Leached Cu (ug/L)	Percent Leached
N03377	170	10	4.8	21	0.012
O87412	39	9.7	4.9	ND	0.051
O87419	230	9.7	4.9	480	0.209
O87421	91	9.6	4.9	35	0.038
Average	132	9.8	4.9	139	0.078

ND: not detected at RDL = 20 ug/l, used in calculating average.

Mitigation measures (e.g., treatment by coagulation, flocculation, filtration, adsorption or other appropriate methods) have been proposed based on the results of additional sampling, analysis, and toxicity studies as described above in section 5.3.

11.0 REFERENCES

Adams, W. J., Conard, B., Ethier, G., Brix, K. V., Paul R. Paquin, P. R., and D. M. DiToro. 2000. The challenges of hazard identification and classification of insoluble metals and metal substances for the aquatic environment. Human and Ecological Risk Assessment. 6: 1019 – 1038.

Ahearn, G. A., Mandal, P. K., and A. Mandal. 2004. Mechanisms of heavy-metal sequestration and detoxification in crustaceans: a review. Journal of Comparative Physiology B: Biochemical, Systemic, and Environmental Physiology. Volume 174, Number 6 / August, 2004.

Arnold, W. Ray. 2005. Effects of Dissolved Organic Carbon on Copper Toxicity: Implications for Saltwater Copper Criteria. Integrated Environmental Assessment and Management – Volume 1, Number 1 – pp. 34-39. 2005.

Bagatto, G. and M. A, Alikhan. 1987. Copper, Cadmium, and Nickel Accumulation in Crayfish Populations Near Copper-Nickel Smelters at Sudbury, Ontario, Canada.
Bull. Environ. Contam. Toxicol. (1987) 38:540-545.

Bay of Fundy Ecosystem Partnership. 2004. "Contamination Concerns: Heavy Metals and the Bay of Fundy". Fundy Issue #25. Spring 2004.

Breslin, V. T. 1999. Retention of metals in agricultural soils after amending with MSW and MSW biosolids compost. Water Air Soil Pollut 109:163-178.

Brown, B. E. 1982. The form and function of metal-containing 'granules' in invertebrate tissues. Biol Rev 57:621-667.

Calabrese, E. J. 2004. Hormesis—Basic, Generalizable, Central to Toxicology and a Method to Improve the Risk-assessment Process. Int J Occup Environ Health. 10:466–467.

Calabrese, E. J. and L. A. Baldwin. 2001. The Frequency of U-Shaped Dose Responses in the Toxicological Literature. Toxicological Sciences 62: 330–338.

CCME. 2006. Canadian Environmental Quality Guidelines. Canadian Council of Ministers of the Environment, 1999, updated 2001, 2002, 2003, 2004, 2005, 2006.

Chapman, P. M., Feiyue Wang, F., Colin R. Janssen, C. R., Richard R. Goulet, R. R., and C. N. Kamunde. 2003. Conducting Ecological Risk Assessments of Inorganic Metals and Metalloids: Current Status. Human and Ecological Risk Assessment: Vol. 9, No. 4, pp. 641-697.

Chou C.L., L.A. Paon, J.D. Moffatt, T. King. 2003. Selection of bioindicators for monitoring marine environmental quality in the Bay of Fundy, Atlantic Canada.

Marine Pollution Bulletin 46 (2003) 756–762.

Coale KH, Bruland KW. 1988. Copper complexation in the Northeast Pacific. Limnol Oceanogr. 33:1084-1101.

Composting Council of Canada. 2006. Setting the Standard: A Summary of Compost Standards in Canada. www.compost.org/standard/html . Accessed Sept 25, 2006.

Dallinger, R. 1977. The flow of copper through a terrestrial food chain. I I I . Selection of an optimum copper diet by isopods. Oecologia (Berlin) 30:273-276

Davies, P.H. 1986. Toxicology and chemistry of metals in urban runoff. In B. Urbonas, T. Barnwell, D. Jones, L. Roesner, and L. Tucker, eds., Urban Runoff Quality, American Society of Civil Engineers, New York, NY, pp. 60-78.

Davies-Colley RJ, Nelson PO, Williamson KJ. 1984. Copper and cadmium uptake by estuarine sedimentary phases. Environ Sci Technol 18:491-499.

Galtsoff, P. S. 1943. Copper Content of Sea Water. Ecology, Vol. 24, No. 2 (Apr., 1943), pp. 263-265.

Georgopoulos, P.G., S.W. Wang, I.G. Georgopoulos, M.J. Yonone-Lioy, P.J. Lioy. 2006. Assessment of human exposure to copper: A case study using NHEXAS database. J. Exposure Science and Environmental Epidemiology. 16: 397-409.

Harrison FL, Bishop DJ. 1984. A review of the impact of copper released into freshwater environments. U.S. Nuclear Regulatory Commission. Livermore, CA: Lawrence Livermore National Laboratory. NUREG/CR-3478.

Health Canada. 2004. Monograph. Copper. Draft. Health Canada Drugs and Health Products. Natural Health Products. Applications and Submissions. Product Licensing. Compendium of Monographs. July 5, 2004. Last Updated: 2004-05-01. Accessed: 31 October 2006.

Hooper, P., Rehacek, J., and Morris, G. 1999. 10. Data Report: Major and trace element composition, strontium, neodymium, and oxygen isotope ratios, and mineral compositions of samples. In: Larsen, H.C., Duncan, R.A., Allan, J.F., Brooks, K. (Eds.), 1999. *Proceedings of the Ocean Drilling Program, Scientific Results,* Vol. 163. Ocean Drilling Program, Texas A&M University. National Science Foundation and Joint Oceanographic Institutions, Inc. 18 September 1999. http://www-odp.tamu.edu/publications/163_SR/chap_10/chap_10.htm

International Programme on Chemical Safety (IPCS). 1998. Environmental Health Criteria. 200. Copper. WHO. Geneva, 1998. http://www.inchem.org/documents/ehc/ehc/ehc200.htm

Jenkins, D. W. 1981. Biological monitoring of toxic trace elements.

EPA Report 600/S3-80-090, pp. 1-9.

Loring, D. H. 1979. Baseline levels of transition and heavy metals in the bottom sediments of the Bay of Fundy, Nova Scotia, Canada. Proceedings of the Nova Scotia Institute of Science, Volume 29, number 4, pages 335-346.

NSDME. 1982. Province of Nova Scotia – Department of Mines and Energy. "Pleistocene Geology – Southwestern Nova Scotia". Sheet 7. 1982.

Ontario Ministry of Agriculture and Food and Ontario Ministry of the Environment. 1992. Guidelines for sewage sludge utilization on agricultural lands. Sludge and Waste Utilization Committee, OMAF and OME, Toronto, Ont. 32 pp.

Ralph, A. and H. McArdle. 2001. Copper Metabolism and Copper Requirements in the Pregnant Mother, her Fetus, and Children. A Critical Review. International Copper Assoc., Ltd. New Your, NY. 198 pp.

Rivera–Duarte, I., Rosen, G., Lapota, D., Chadwick, D. B., Kear-Padilla, L., and A. Zirino . 2005. Copper Toxicity to Larval Stages in Three Marine Invertebrates and Copper Complexation Capacity in San Diego Bay, California. Environ. Sci. Technol. 2005, 39, 1542-1546.

Stewart, P. L. and L. White. 2001. A Review of Contaminants on the Scotian Shelf and in Adjacent Coastal Waters:1970 to 1995. Canadian Technical Report of Fisheries and Aquatic Sciences 2351. Oceans and Environment Branch. Maritimes Region. Department of Fisheries and Oceans. Bedford Institute of Oceanography. Dartmouth, Nova Scotia, Canada.

United States Environmental Protection Agency. 2006. National Recommended Water Quality Criteria. Office of Water. Office of Science and Technology. (4304T)

Webber, M. D. and S.S. Singh. 1995. Contamination of Agricultural Soils. Chapter 9 in The Health of our Soils: Toward sustainable agriculture in Canada: D.F. Acton and L.J. Gregorich (editors). Centre for Land and Biological Resources Research. Research Branch. Agriculture and Agri-Food Canada Publication 1906/E