Appendix 13:
Silt Sample ALS Chemex Assay Certificates

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 29- AUG- 2010
Account: GOFICA

CERTIFICATE VA10108227

Project: Woodjam North

P.O. No.: WJN- 2010- 48ss

This report is for 17 Sediment samples submitted to our lab in Vancouver, BC, Canada on 5- AUG- 2010.

The following have access to data associated with this certificate:

NATE BREWER	JOHN HERTEL	BRUCE LAIRD
JULIANNE MADSEN	ROSS SHERLOCK	TWILA SKINNER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI- 21	Received Sample Weight
LOG- 22	Sample login - Rcd w/o BarCode
SCR- 41	Screen to - 180um and save both

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au- ICP21	Au 30g FA ICP- AES Finish	ICP- AES
ME- MS41	51 anal. aqua regia ICPMS	

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
ATTN: JULIANNE MADSEN
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
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To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 29- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10108227

Sample Description	Method	WEI- 21	Au- ICP21	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Recvd Wt.	Au	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Units	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.001	0.01	0.01	0.1	0.2	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1
WJXJ- 001		0.44	<0.001	0.17	1.73	4.9	<0.2	<10	700	0.66	0.17	0.93	0.47	50.1	17.3	38
WJXJ- 002		0.48	<0.001	0.14	1.89	4.1	<0.2	<10	800	0.67	0.13	1.05	0.22	47.6	14.4	43
WJXJ- 003		0.52	0.001	0.15	2.22	8.2	<0.2	<10	920	0.93	0.21	1.05	0.32	98.4	20.2	46
WJXJ- 004		0.40	0.001	0.18	1.35	6.2	<0.2	<10	300	0.76	0.29	0.76	0.67	51.2	14.6	31
WJXJ- 005		0.56	0.002	0.11	1.57	6.6	<0.2	<10	300	0.79	0.31	0.64	0.34	56.2	20.0	36
WJXJ- 006		0.58	0.001	0.11	1.79	6.2	<0.2	<10	490	0.58	0.17	0.78	0.33	48.9	19.3	47
WJXJ- 007		0.66	0.002	0.10	2.91	6.4	<0.2	<10	1830	1.35	0.09	1.83	0.16	181.0	26.0	80
WJXJ- 008		0.78	<0.001	0.11	1.25	8.1	<0.2	<10	230	0.53	0.17	0.69	0.27	42.0	14.7	35
WJXJ- 009		0.58	<0.001	0.15	1.93	4.6	<0.2	<10	670	0.56	0.12	0.90	0.20	35.1	14.0	39
WJXJ- 010		0.46	0.001	0.12	1.81	7.2	<0.2	<10	280	0.51	0.21	0.72	0.31	42.3	19.2	45
WJXJ- 011		0.52	0.002	0.09	1.52	6.1	<0.2	<10	570	0.85	0.20	0.83	0.30	77.5	16.9	34
WJXJ- 012		0.86	0.002	0.19	1.30	6.6	<0.2	<10	270	0.88	0.38	0.86	0.42	97.9	13.2	31
WJXJ- 013		0.76	0.002	0.12	1.53	3.8	<0.2	<10	270	0.52	0.15	0.88	0.34	68.0	18.8	61
WJXJ- 014		0.68	0.001	0.10	1.78	6.7	<0.2	<10	510	0.62	0.17	0.85	0.35	72.1	22.8	59
WJXJ- 015		0.46	0.008	0.72	3.01	31.9	<0.2	<10	200	0.55	0.24	1.24	0.42	27.0	23.9	76
WJXJ- 016		0.48	0.002	0.12	2.29	8.3	<0.2	10	250	0.24	0.03	1.72	0.09	21.3	20.6	36
WJXJ- 017		0.78	0.003	0.13	1.51	12.3	<0.2	<10	340	0.26	0.06	1.32	0.21	40.4	19.7	69

***** See Appendix Page for comments regarding this certificate *****

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1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 29- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10108227

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Cs	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%
	LOR	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01
WJXJ- 001		1.28	27.8	2.68	5.51	0.10	0.23	0.05	0.025	0.18	26.4	13.9	1.01	3380	2.06	0.03
WJXJ- 002		1.39	28.7	2.56	5.92	0.13	0.63	0.04	0.023	0.19	21.9	14.1	1.24	821	1.34	0.04
WJXJ- 003		1.69	32.0	3.36	7.21	0.17	0.19	0.03	0.036	0.32	47.4	14.3	1.97	1330	2.46	0.07
WJXJ- 004		1.50	33.7	2.46	4.83	0.09	0.19	0.05	0.029	0.19	24.7	14.2	0.80	1180	1.35	0.02
WJXJ- 005		2.11	32.5	2.99	5.60	0.10	0.32	0.03	0.032	0.21	27.4	15.8	1.00	1060	1.70	0.02
WJXJ- 006		1.44	28.4	3.22	6.10	0.11	0.16	0.04	0.025	0.16	23.0	15.1	1.05	2140	1.23	0.02
WJXJ- 007		1.35	36.3	3.68	9.37	0.30	0.13	0.02	0.034	0.56	91.5	11.2	3.59	1180	1.09	0.13
WJXJ- 008		1.40	30.1	2.98	4.46	0.11	0.12	0.05	0.021	0.12	19.8	10.4	0.63	1400	1.48	0.02
WJXJ- 009		1.19	26.0	2.56	5.85	0.11	0.24	0.03	0.020	0.18	16.5	11.8	1.13	503	0.56	0.03
WJXJ- 010		1.94	29.8	3.27	5.96	0.11	0.13	0.03	0.023	0.18	21.6	17.4	0.96	801	1.64	0.02
WJXJ- 011		1.40	26.3	2.52	5.13	0.12	0.35	0.03	0.029	0.23	37.7	12.4	1.34	791	1.59	0.05
WJXJ- 012		1.69	31.8	2.82	5.44	0.13	0.44	0.04	0.045	0.29	48.9	17.2	0.76	1100	1.29	0.03
WJXJ- 013		1.20	27.8	3.23	5.35	0.13	0.17	0.03	0.023	0.12	33.3	14.9	1.19	1130	1.14	0.04
WJXJ- 014		1.47	24.8	3.81	6.39	0.14	0.23	0.02	0.027	0.18	34.7	15.0	1.22	2900	1.24	0.04
WJXJ- 015		5.67	352	4.91	9.16	0.15	0.09	0.43	0.029	0.27	16.1	30.5	0.94	1040	1.20	0.03
WJXJ- 016		1.20	39.1	4.51	9.97	0.17	0.14	0.15	0.021	0.07	11.2	16.9	1.27	1870	0.91	0.02
WJXJ- 017		0.82	32.7	4.30	5.75	0.16	0.08	0.14	0.017	0.13	20.3	11.5	1.21	7370	1.79	0.10

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 29- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10108227

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th
	Units	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2
WJXJ- 001		1.72	95.1	950	10.1	23.7	0.003	0.05	0.23	5.0	0.9	0.5	180.0	<0.01	0.02	5.5
WJXJ- 002		2.34	88.0	1080	9.2	21.8	0.006	0.07	0.21	5.0	1.9	0.6	172.0	<0.01	0.03	4.0
WJXJ- 003		1.87	127.5	1680	13.2	36.9	0.003	0.03	0.25	6.3	0.9	0.8	385	0.01	0.03	7.7
WJXJ- 004		1.11	59.7	780	11.5	30.9	0.003	0.03	0.34	4.5	1.0	0.5	120.5	0.01	0.04	4.8
WJXJ- 005		0.70	54.9	840	14.3	29.6	0.002	0.03	0.34	5.2	0.7	0.5	68.4	0.01	0.04	7.7
WJXJ- 006		1.18	72.8	1220	9.5	22.8	0.002	0.03	0.23	5.0	0.7	0.5	127.0	<0.01	0.03	3.9
WJXJ- 007		3.92	239	3340	11.2	61.1	0.006	0.03	0.11	7.2	1.2	1.2	948	0.01	0.02	9.8
WJXJ- 008		1.17	66.3	1150	7.7	17.9	0.002	0.03	0.36	4.4	0.8	0.4	72.9	<0.01	0.03	3.2
WJXJ- 009		1.98	69.7	870	8.8	33.1	0.002	0.03	0.15	4.8	0.6	0.5	182.5	<0.01	0.01	2.1
WJXJ- 010		1.52	53.0	840	11.5	29.2	0.001	0.03	0.26	4.9	0.6	0.4	111.5	<0.01	0.03	3.9
WJXJ- 011		1.85	88.9	1280	11.2	27.5	0.002	0.03	0.21	5.0	0.8	0.6	238	0.01	0.03	7.0
WJXJ- 012		0.74	40.5	960	16.7	25.6	0.002	0.05	0.24	5.8	0.7	0.7	154.0	0.01	0.04	10.5
WJXJ- 013		1.55	70.1	1740	9.4	14.5	0.002	0.03	0.17	4.3	0.8	0.5	160.0	<0.01	0.02	4.4
WJXJ- 014		1.26	82.8	1770	9.3	20.8	0.003	0.02	0.21	5.5	0.7	0.6	221	<0.01	0.02	5.5
WJXJ- 015		1.81	55.6	690	6.4	40.1	0.003	0.03	2.13	11.5	1.1	0.5	56.2	0.01	0.08	2.4
WJXJ- 016		1.57	16.8	1340	3.5	6.8	0.021	0.12	1.69	7.8	1.7	0.4	54.7	<0.01	0.01	1.6
WJXJ- 017		1.26	56.6	1780	4.2	11.6	0.004	0.07	0.27	3.9	1.1	0.5	148.5	<0.01	0.04	1.5

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 29- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10108227

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Ti	Tl	U	V	W	Y	Zn	Zr
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.005	0.02	0.05	1	0.05	0.05	2	0.5
WJXJ- 001		0.118	0.39	1.40	64	0.11	11.85	78	12.9
WJXJ- 002		0.159	0.26	1.92	79	0.07	7.99	68	36.1
WJXJ- 003		0.194	0.50	1.69	89	0.11	13.70	83	21.4
WJXJ- 004		0.062	0.59	1.74	42	0.10	14.25	86	9.1
WJXJ- 005		0.085	0.52	1.75	46	0.08	12.65	97	17.1
WJXJ- 006		0.126	0.36	1.10	84	0.11	10.75	80	9.9
WJXJ- 007		0.395	0.30	2.30	119	0.20	14.45	73	12.8
WJXJ- 008		0.094	0.27	1.13	65	0.12	10.80	66	6.0
WJXJ- 009		0.143	0.21	1.21	70	0.08	6.99	57	12.4
WJXJ- 010		0.096	0.27	1.49	76	0.09	8.53	77	6.1
WJXJ- 011		0.131	0.39	1.31	62	0.12	12.85	73	31.4
WJXJ- 012		0.056	0.23	2.31	39	0.06	18.90	90	15.0
WJXJ- 013		0.159	0.19	0.93	75	0.12	12.50	83	9.9
WJXJ- 014		0.157	0.26	1.06	89	0.11	11.55	78	17.6
WJXJ- 015		0.168	0.24	0.68	137	0.38	15.60	71	2.8
WJXJ- 016		0.200	0.05	1.20	108	0.20	10.15	89	3.6
WJXJ- 017		0.154	0.12	1.18	108	0.19	10.65	57	3.2

***** See Appendix Page for comments regarding this certificate *****

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To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 29- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10108227

Method	CERTIFICATE COMMENTS
ME- MS41	Gold determinations by this method are semi- quantitative due to the small sample weight used (0.5g).

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To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 30- AUG- 2010
Account: GOFICA

CERTIFICATE VA10110752

Project: Woodjam North

P.O. No.: WJN- 2010- 51ss

This report is for 1 Sediment sample submitted to our lab in Vancouver, BC, Canada on 10- AUG- 2010.

The following have access to data associated with this certificate:

NATE BREWER JULIANNE MADSEN	JOHN HERTEL ROSS SHERLOCK	BRUCE LAIRD TWILA SKINNER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI- 21	Received Sample Weight
LOG- 21	Sample logging - ClientBarCode
CRU- 31	Fine crushing - 70% <2mm
SPL- 21	Split sample - riffle splitter
PUL- 31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au- ICP21	Au 30g FA ICP- AES Finish	ICP- AES
ME- MS41	51 anal. aqua regia ICPMS	

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
ATTN: JULIANNE MADSEN
1155 ROBSON STREET, SUITE 400
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This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 30- AUG- 2010
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CERTIFICATE OF ANALYSIS VA10110752

Sample Description	Method	WEI-21	Au-ICP21	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Recvd Wt.	Au	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Units	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.001	0.01	0.01	0.1	0.2	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1
207964		2.42	0.002	0.35	1.98	10.8	<0.2	<10	240	0.41	0.07	1.15	0.18	26.2	13.5	39

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CERTIFICATE OF ANALYSIS VA10110752

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Cs	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%
	LOR	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01
207964		0.67	33.2	3.46	6.68	0.13	0.45	0.01	0.030	0.18	13.2	13.2	1.03	1000	0.95	0.11

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CERTIFICATE OF ANALYSIS VA10110752

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th
	Units	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.05	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2
207964		0.30	31.5	1220	11.6	10.5	0.002	0.04	0.48	7.0	0.4	0.5	99.9	<0.01	0.02	2.5

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Finalized Date: 30- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10110752

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Ti	Tl	U	V	W	Y	Zn	Zr
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.005	0.02	0.05	1	0.05	0.05	2	0.5
207964		0.204	0.12	0.67	98	0.15	11.15	55	17.2

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 30- AUG- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10110752

Method	CERTIFICATE COMMENTS
ME- MS41	Gold determinations by this method are semi- quantitative due to the small sample weight used (0.5g).

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 21- OCT- 2010
Account: GOFICA

CERTIFICATE VA10148872

Project: Woodjam North

P.O. No.: WJN- 2010- 71ss

This report is for 1 Sediment sample submitted to our lab in Vancouver, BC, Canada on 13- OCT- 2010.

The following have access to data associated with this certificate:

NATE BREWER	JOHN HERTEL	BRUCE LAIRD
JULIANNE MADSEN	ROSS SHERLOCK	TWILA SKINNER

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI- 21	Received Sample Weight
LOG- 21	Sample logging - ClientBarCode
CRU- 31	Fine crushing - 70% <2mm
SPL- 21	Split sample - riffle splitter
PUL- 31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au- ICP21	Au 30g FA ICP- AES Finish	ICP- AES
ME- MS41	51 anal. aqua regia ICPMS	

To: GOLD FIELDS HORSEFLY EXPLORATION INC.
ATTN: JULIANNE MADSEN
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
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VANCOUVER BC V6E 1B5

Finalized Date: 21- OCT- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10148872

Sample Description	Method	WEI- 21	Au- ICP21	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Recvd Wt.	Au	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr
	Units	kg	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.001	0.01	0.01	0.1	0.2	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1
207423		0.56	0.001	0.08	2.74	2.6	<0.2	<10	70	0.37	0.04	1.83	0.13	14.55	24.8	83

***** See Appendix Page for comments regarding this certificate *****

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Finalized Date: 21- OCT- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10148872

Sample Description	Method	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41	ME- MS41
	Analyte	Cs	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%
	LOR	0.05	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01
207423		0.45	68.0	4.73	10.40	0.22	0.72	0.09	0.033	0.07	6.5	13.7	1.88	896	0.71	0.06

***** See Appendix Page for comments regarding this certificate *****

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To: GOLD FIELDS HORSEFLY EXPLORATION INC.
1155 ROBSON STREET, SUITE 400
VANCOUVER BC V6E 1B5

Finalized Date: 21- OCT- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10148872

Sample Description	Method Analyte Units LOR	ME- MS41 Nb ppm 0.05	ME- MS41 Ni ppm 0.2	ME- MS41 P ppm 10	ME- MS41 Pb ppm 0.2	ME- MS41 Rb ppm 0.1	ME- MS41 Re ppm 0.001	ME- MS41 S % 0.01	ME- MS41 Sb ppm 0.05	ME- MS41 Sc ppm 0.1	ME- MS41 Se ppm 0.2	ME- MS41 Sn ppm 0.2	ME- MS41 Sr ppm 0.2	ME- MS41 Ta ppm 0.01	ME- MS41 Te ppm 0.01	ME- MS41 Th ppm 0.2
207423		0.13	45.0	870	2.6	3.1	0.001	0.09	0.48	10.8	0.7	0.5	48.0	<0.01	0.02	1.1

***** See Appendix Page for comments regarding this certificate *****

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VANCOUVER BC V6E 1B5

Finalized Date: 21- OCT- 2010
Account: GOFICA

Project: Woodjam North

CERTIFICATE OF ANALYSIS VA10148872

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Ti	Tl	U	V	W	Y	Zn	Zr
	Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOR	0.005	0.02	0.05	1	0.05	0.05	2	0.5
207423		0.298	0.03	0.71	163	0.14	12.00	56	28.9

***** See Appendix Page for comments regarding this certificate *****

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VANCOUVER BC V6E 1B5

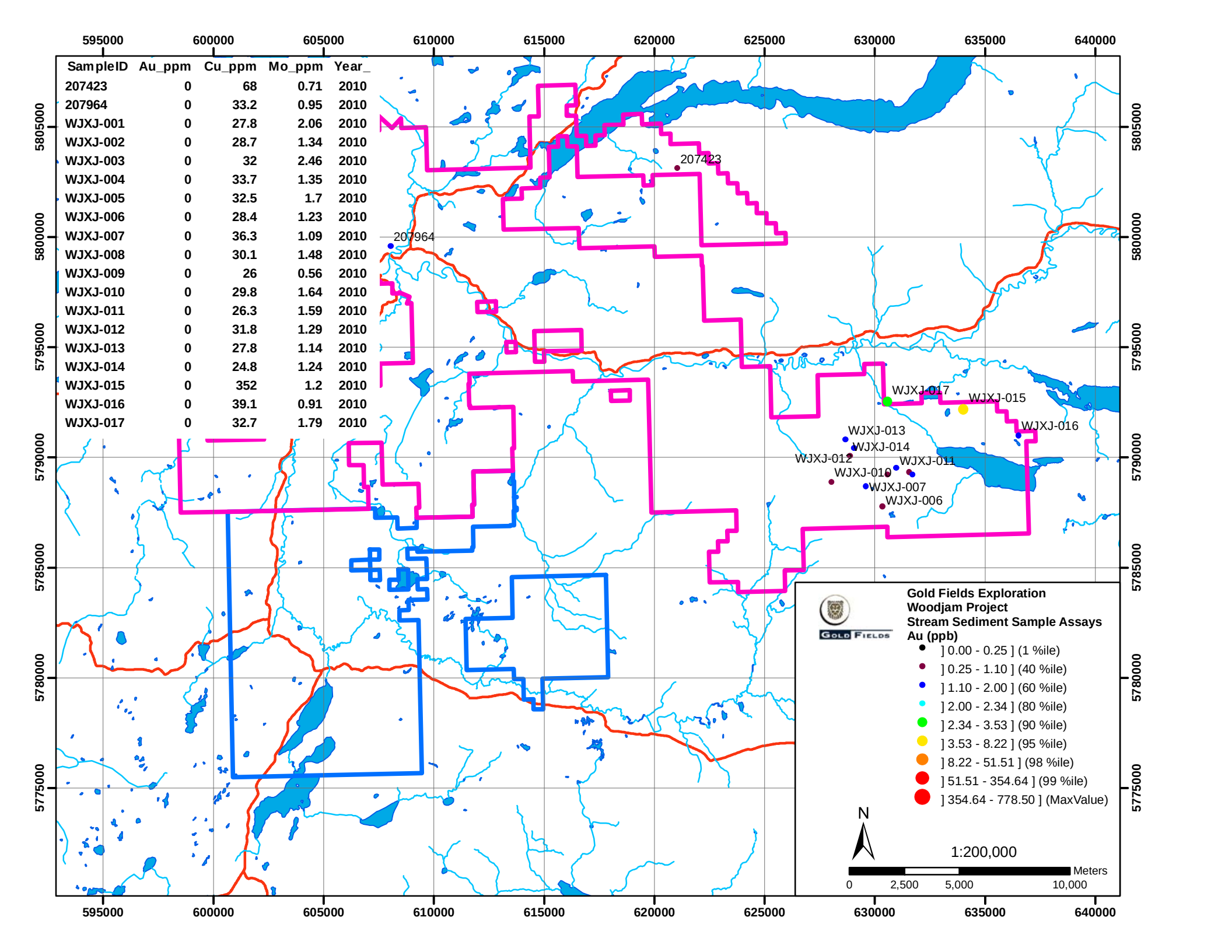
Finalized Date: 21- OCT- 2010
Account: GOFICA

Project: Woodjam North

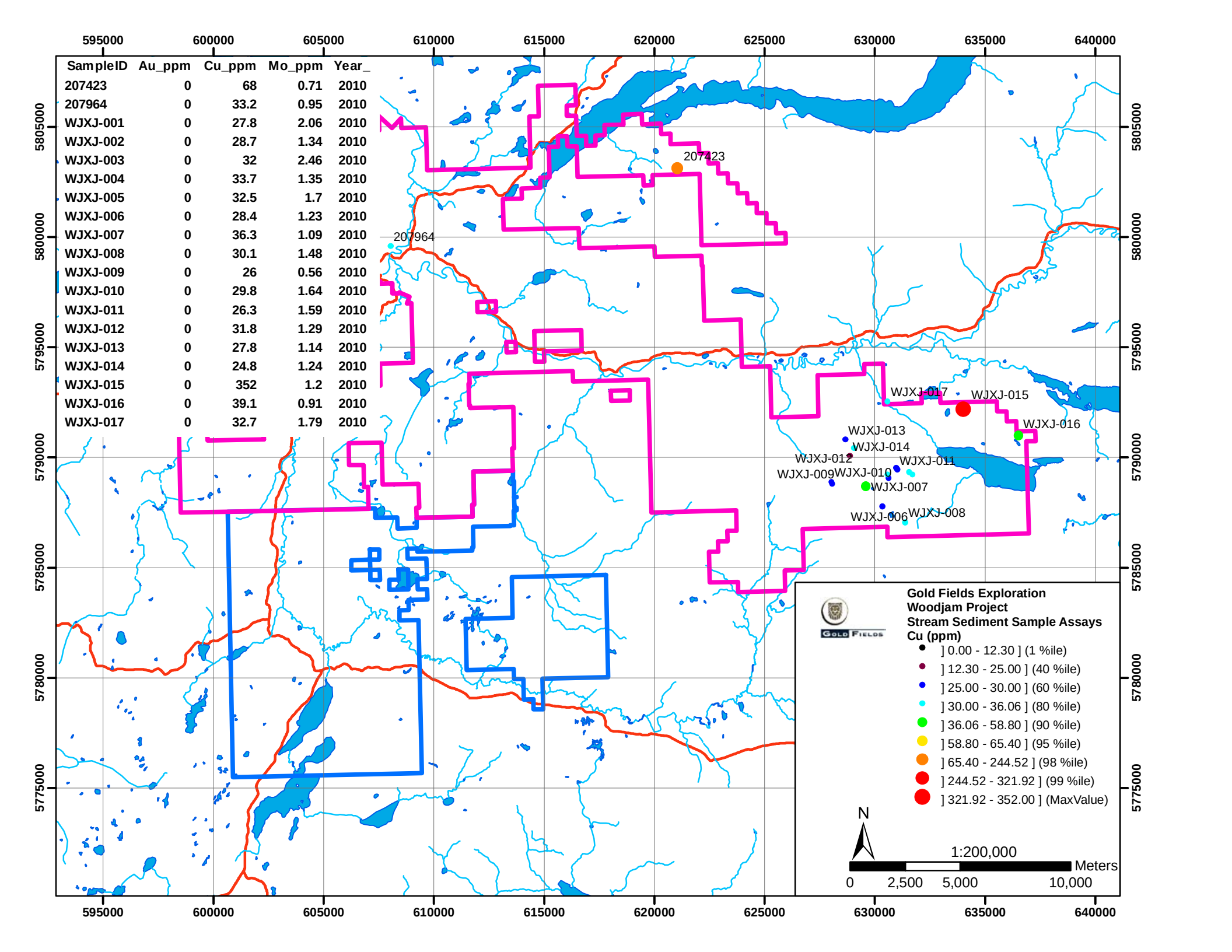
CERTIFICATE OF ANALYSIS VA10148872

Method	CERTIFICATE COMMENTS
ME- MS41	Gold determinations by this method are semi- quantitative due to the small sample weight used (0.5g).

Appendix 14:
Silt Sampling Copper, Gold and Molybdenum Results



SampleID	Au_ppm	Cu_ppm	Mo_ppm	Year_
207423	0	68	0.71	2010
207964	0	33.2	0.95	2010
WJXJ-001	0	27.8	2.06	2010
WJXJ-002	0	28.7	1.34	2010
WJXJ-003	0	32	2.46	2010
WJXJ-004	0	33.7	1.35	2010
WJXJ-005	0	32.5	1.7	2010
WJXJ-006	0	28.4	1.23	2010
WJXJ-007	0	36.3	1.09	2010
WJXJ-008	0	30.1	1.48	2010
WJXJ-009	0	26	0.56	2010
WJXJ-010	0	29.8	1.64	2010
WJXJ-011	0	26.3	1.59	2010
WJXJ-012	0	31.8	1.29	2010
WJXJ-013	0	27.8	1.14	2010
WJXJ-014	0	24.8	1.24	2010
WJXJ-015	0	352	1.2	2010
WJXJ-016	0	39.1	0.91	2010
WJXJ-017	0	32.7	1.79	2010



SampleID	Au_ppm	Cu_ppm	Mo_ppm	Year_
207423	0	68	0.71	2010
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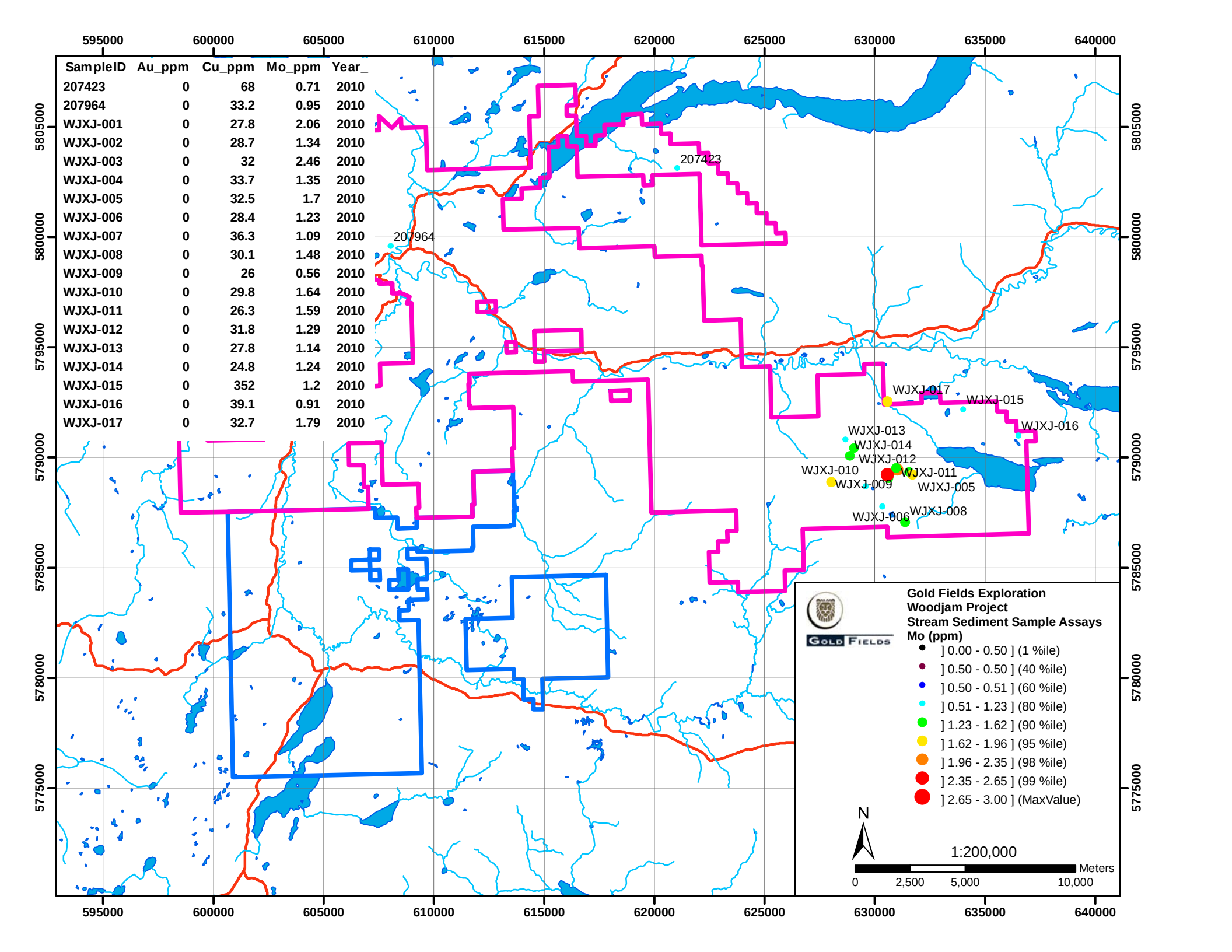
WJXJ-001	0	27.8	2.06	2010
WJXJ-002	0	28.7	1.34	2010
WJXJ-003	0	32	2.46	2010
WJXJ-004	0	33.7	1.35	2010
WJXJ-005	0	32.5	1.7	2010
WJXJ-006	0	28.4	1.23	2010
WJXJ-007	0	36.3	1.09	2010
WJXJ-008	0	30.1	1.48	2010
WJXJ-009	0	26	0.56	2010
WJXJ-010	0	29.8	1.64	2010
WJXJ-011	0	26.3	1.59	2010
WJXJ-012	0	31.8	1.29	2010
WJXJ-013	0	27.8	1.14	2010
WJXJ-014	0	24.8	1.24	2010
WJXJ-015	0	352	1.2	2010
WJXJ-016	0	39.1	0.91	2010
WJXJ-017	0	32.7	1.79	2010

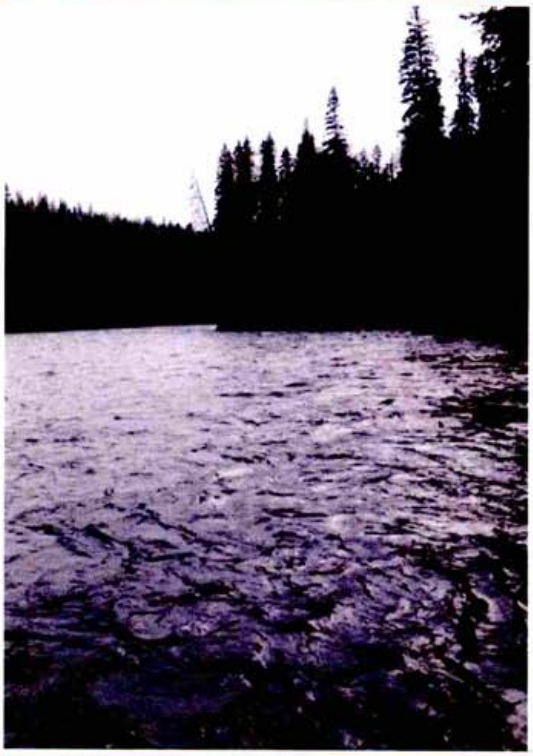


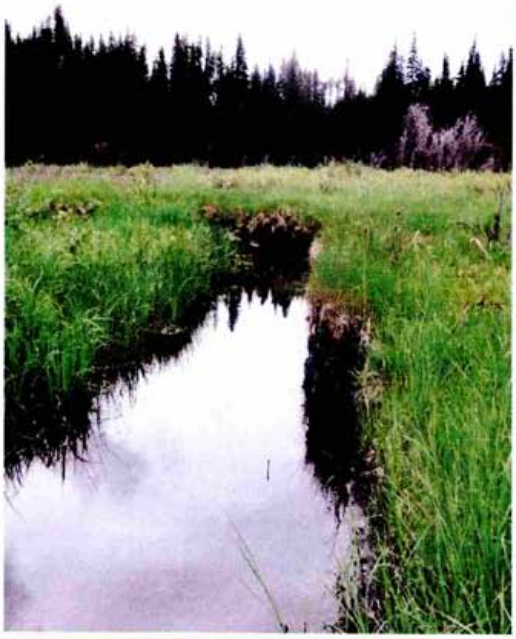
SampleID	Au_ppm	Cu_ppm	Mo_ppm	Year_
207423	0	68	0.71	2010
207964	0	33.2	0.95	2010
WJXJ-001	0	27.8	2.06	2010
WJXJ-002	0	28.7	1.34	2010
WJXJ-003	0	32	2.46	2010
WJXJ-004	0	33.7	1.35	2010
WJXJ-005	0	32.5	1.7	2010
WJXJ-006	0	28.4	1.23	2010
WJXJ-007	0	36.3	1.09	2010
WJXJ-008	0	30.1	1.48	2010
WJXJ-009	0	26	0.56	2010
WJXJ-010	0	29.8	1.64	2010
WJXJ-011	0	26.3	1.59	2010
WJXJ-012	0	31.8	1.29	2010
WJXJ-013	0	27.8	1.14	2010
WJXJ-014	0	24.8	1.24	2010
WJXJ-015	0	352	1.2	2010
WJXJ-016	0	39.1	0.91	2010
WJXJ-017	0	32.7	1.79	2010

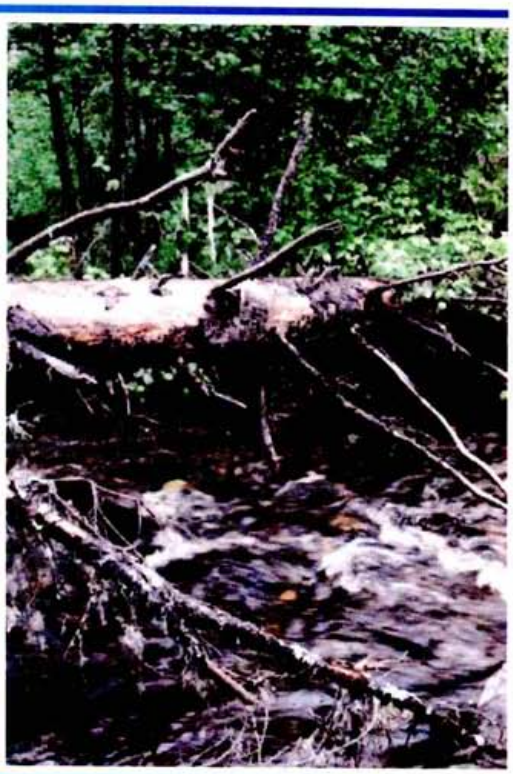
Appendix 15:
Rescan 2010 Water Quality Evaluation Report

Gold Fields Canada Exploration

WOODJAM GOLD-COPPER PROJECT
2010 Water Quality Evaluation







Rescan™ Environmental Services Ltd.
Rescan Building, Sixth Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

August 2010

WOODJAM GOLD-COPPER PROJECT
2010 WATER QUALITY EVALUATION

August 2010
Project #1014-009

Citation:
Rescan. 2010. *Woodjam Gold-Copper Project: 2010 Water quality Evaluation.* Prepared for Gold Fields Canada Exploration by Rescan Environmental Services Ltd.: Vancouver, British Columbia.

Prepared for:

GOLD FIELDS

Gold Fields Canada Exploration

Prepared by:

Rescan™

Engineers and Scientists

Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

WOODJAM GOLD-COPPER PROJECT
2010 WATER QUALITY EVALUATION

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1. Introduction

At the request of Gold Fields Canada Exploration (Gold Fields), Rescan Environmental Services Ltd. (Rescan) collected water quality samples at the Woodjam gold-copper property located 53 km east of the City of Williams Lake, in the Cariboo Region of British Columbia. These water samples were collected from six sites that were sampled previously in 2009, and two new sites located in the Woodjam South Area (Figure 1.1-1). Sites were selected in the vicinity and downstream of mineralized zones and also at reference sites. The Woodjam claim area is located in the Horsefly River Watershed which drains northwards into the Quesnel Lake. The area is composed of rolling hills mainly forested with gentle forested terrain, with few rock outcrop exposures. The land is generally covered by fir and pine forest with some old growth cedars.

On June 9, 2010, water was collected at eight sites in the vicinity of the Woodjam Project Area. Similar to 2009, water samples were collected at two sites within Deerhorn Creek, two sites within the Horsefly River (one upstream of Deerhorn Creek and one downstream), and Mussel Creek and Woodjam Creek (WC-1) were also sampled as reference sites. Two additional sites were selected and sampled downstream of the Woodjam South Area. All samples were analyzed for general variables, nutrients and total and dissolved metals. Results were compared to the *"British Columbia Approved Water Quality Guidelines, 2006 Edition"* (BC MOE 2006) and federal *"Canadian Environmental Quality Guidelines"* (CCME 1999). These are typical guidelines against which project conditions are assessed for the protection of aquatic life as well as for water quality monitoring during mine permitting and effects assessments. Sampling coordinates of each site and its purpose are presented in Table 1.1-1. Sampling methodology is presented in Section 2 and analyses of results are summarized in Section 3.

Table 1.1-1. Locations of Woodjam Project Water Quality Samples

Sampling Date	Location	Sample	UTM Coordinates		Purpose
			Northing	Easting	
June 9, 2010	Deerhorn Creek	DC-1	5791082	610484	Near-field downstream of deposits
		DC-2	5793989	512702	Mid-field downstream of deposits
	Horsefly River	HR-1	5795761	613513	Far- field downstream of deposits
		HR-2	5796428	612784	Far-field downstream of deposits
	Woodjam Creek	WC-0	578850	613049	Near-field downstream of deposits
		WC-1	5787870	613698	Reference site
		WC-2	5788607	613975	Mid-field downstream of deposits
	Mussel Creek	MC-1	5789609	608182	Reference site

1.1 SITE DESCRIPTIONS

1.1.1 Deerhorn Creek

DC-1 is the closest sampling site to the Megabuck deposit (Plate 1.1-1). This narrow, low-flowing creek meanders through forested areas and open areas utilized by cattle, downwards to site DC-2. DC-2 (Plate 1.1-2) is located approximately 3 km downstream of DC-1 and is also adjacent to areas used by cattle. Both creeks were flowing and clear at the time of sampling.

PROJECT # 1014-006 GIS # WDJ-01-010 June 25, 2010

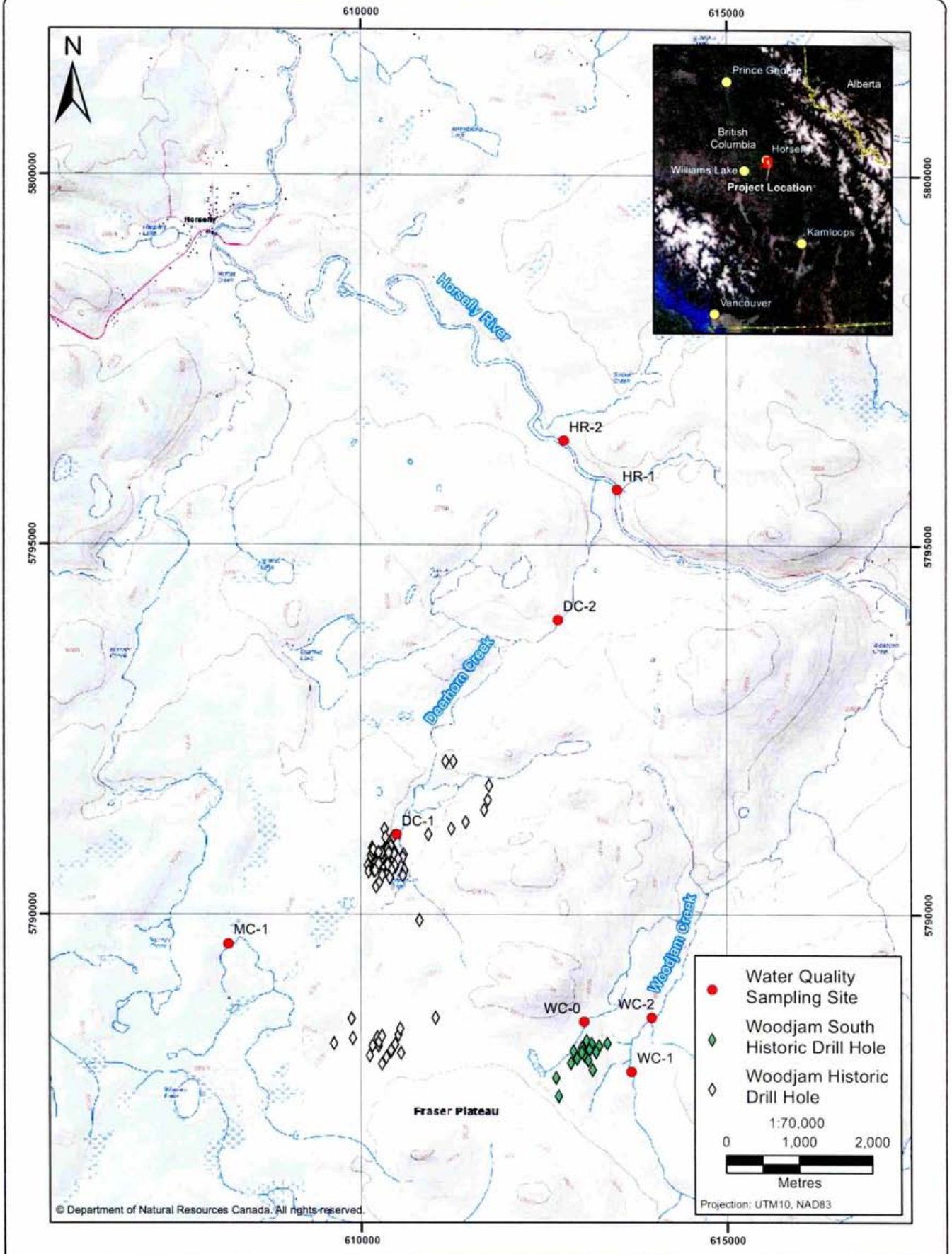


Figure 1.1-1

Woodjam Project Water Quality Sampling Locations, 2010

Rescan Engineers & Scientists

Plate 1.1-1. Downstream view of DC-1 , June 2010

Plate 1.1-2. Upstream view of DC-2, June 2010

1.1.2 Horsefly River

Horsefly River is a wide and shallow river, with predominately boulder and cobble substrate. Both sampling sites HR-1 (Plate 1.1-3) and HR-2 (Plate 1.1-4) have very similar environments. HR-1 is located upstream of the confluence with Deerhorn Creek and HR-2 is located downstream of the confluence.

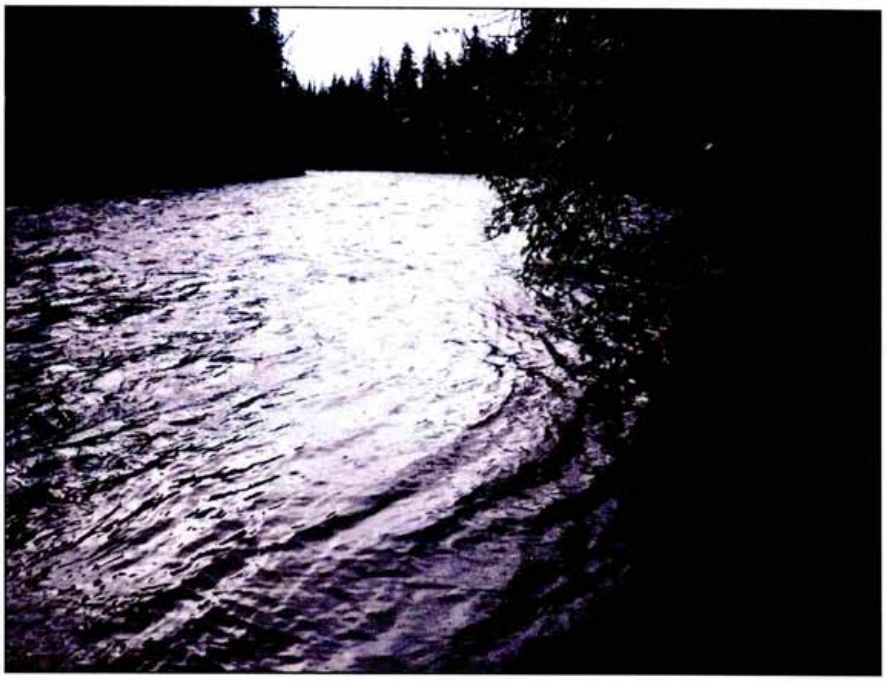


Plate 1.1-3. Downstream view of HR-1, June 2010

Plate 1.1-4. Upstream view of HR-2, June 2010

1.1.3 Woodjam Creek

WC-1 is a small, clear creek with moderate flow and cobble/gravel substrate (Plate 1.1-5). It is located upstream of any potential effects of the Woodjam South Area.

WC-2 is located downstream of WC-1 and downstream of the Woodjam South historical drill site locations (Plate 1.1-6).

WC-0 is a small tributary to Woodjam Creek with very low flow and is located downstream of the Woodjam South historical drill holes (Plate 1.1-7).

Plate 1.1-5. Upstream view of WC-1, June 2010

Plate 1.1-6. Upstream view of WC-2, June 2010

Plate 1.1-7. Upstream view of WC-0, June 2010.

1.1.4 Mussel Creek

MC-1 is a small clear creek used as a reference site and located west of the Woodjam deposits (Plate 1.1-8).

Plate 1.1-8. Upstream view of MC-1, June 2010.

2. Methodology

On June 9, 2010, one water sample was collected per site and analyzed for general physico-chemical variables, anions, nutrients, total organic carbon (TOC), and total and dissolved metals at the lowest available detection limit by ALS Laboratory of Vancouver (ALS). For each sample collected, the scientist stood in the stream facing upstream and filled each sample bottle. Preservatives were added for total metals (ultra-pure nitric acid), TOC (hydrochloric acid), and nutrients (sulphuric acid). No air bubbles were left in any of the bottles. Samples were transported to Vancouver on the same day and shipped to ALS the following day.

During laboratory analysis some variables could not be measured reliably below a specified detection limit and are reported by the analytical laboratory as below that detection limit. For the purposes of statistical analyses and graphical presentation, these values (called non-detects) were replaced with half of the detection limit.

As part of the quality assurance and quality control (QA/QC) program a field and travel blank were analyzed and a duplicate sample was taken at HR-1. The field and travel blank bottles were filled with de-ionized water at the analytical laboratory and shipped with the sample bottles. The field blanks were open to the air at a randomly chosen water quality sample site for one minute. The travel blank was not opened and provided an assessment of potential contamination from travel or from the analytical laboratory. Duplicate samples are used to give an indication of the variability inherent in field sampling (environmental heterogeneity or sampler handling leading to contamination) by using the relative percent difference (RPD) calculation,

where: $$RPD = 100 \mid rep1 - rep2 \mid /[(rep1 + rep2)/2] .$$

The BC provincial government suggests that any field duplicates with RPD values exceeding 20% should be noted and data should be interpreted accordingly (BCMWLAP 2003). Where concentrations are within five times the method detection limit (MDL), the RPD calculation is not completed. This is because the RPD is more sensitive to variation as values approach the analytical detection limit and the resulting calculation maybe misleading.

3. Results and Discussion

The following variables were not detected in any sample: ammonia, bromide, chloride, nitrite, total and dissolved antimony, beryllium, bismuth, lithium, mercury, phosphorus, thallium, tin and dissolved cadmium, cobalt, lead, titanium. Many of the analysed metals had a high proportion (>50%) of samples below their respective analytical detection limits including total boron, silver, titanium and dissolved boron, cadmium, chromium, cobalt, silver, vanadium and zinc.

Analytical detection limits are presented in Appendix 3.1-1. A summary of the results are presented in Appendix 3.1-2 (physical variables, cyanides and nutrients), Appendix 3.1-3 (total metals), Appendix 3.1-4 (dissolved metals). CCME and BC Maximum (Max) water quality guidelines are listed where available.

3.1 GENERAL PHYSICAL VARIABLES AND NUTRIENTS

No specific site or watershed had consistently the greatest variable concentrations, although the Woodjam Creek sites often had relatively high metal concentrations.

Water hardness ranged from 26.4 mg/L (WC-1) to 139 mg/L (DC-2), while the conductivity was highest in the Deerhorn and Mussel creeks 251 in DC-1 to 278 µS/cm in DC-2 (Figure 3.1-1).

Water pH values were slightly alkaline (similar to 2009) with all sites having a pH of close to 8 and turbidity was greatest in the Horsefly River and Woodjam Creek (Figure 3.1-2). All samples fell within the CCME minimum and maximum guidelines for pH (6.5 to 9.0). In 2009, the turbidity of most sites was below 2 NTU except for DC-1, which was over 110 NTU. In 2010, DC-1 had the lowest turbidity (0.8 NTU) and the greatest turbidity was 3.1 NTU (WC-1).

Total dissolved solids (TDS) and total organic carbon (TOC) concentrations in 2010 were similar to those seen in 2009. TDS ranged from 43 mg/L at HR-2 to 192 mg/L at DC-2 (Figure 3.1-3). TOC concentrations were again similar to the previous year in that most sites were below 20 mg/L and the Horsefly River had the lowest concentrations. TOC ranged from 3.5 mg/L at HR-1 and HR-2 to 22.1 mg/L at WC-2 (Figure 3.1-3).

Total nitrogen (TN) is a measure of inorganic and organic nitrogen, while total kjeldahl nitrogen (TKN) measures only the organic fraction of nitrogen concentrations. Concentrations of TKN and TN both ranged from approximately 0.10 mg/L (HR-1) to 0.64 mg/L (WC-1) (Figure 3.1-4). At each site TKN was either slightly less than or equal to the TN concentration. This indicates that nitrogen was primarily in the organic form at each site.

Total phosphate (TP) concentrations were similar to 2009, except for DC-1 which was considerably greater in 2009 than 2010. TP concentrations ranged from 0.013 mg/L (HR-2) to 0.049 mg/L (WC-1) (Figure 3.1-5). Sulphate (SO_4) concentrations were slightly higher than in 2009. SO_4 concentrations ranged from below the detection limit <0.50 mg/L (WC-1 and MC-1) to 4.03 mg/L (HR-2). The BC Max Guideline (100 mg/L) was never exceeded.

3.2 TOTAL AND DISSOLVED METALS

In 2009, metal concentrations were often greatest in Deerhorn Creek likely as a result of the high levels of total suspended solids (TSS) at DC-1 observed during the sampling. This year TSS was relatively low and no single site consistently had the greatest metal concentrations, although, WC-1 and WC-2 often had concentrations higher than most other sites.

Total aluminum concentrations ranged from 0.014 mg/L at DC-2 to 0.58 mg/L at WC-1 and WC-2 (Figure 3.2-1). These two Woodjam Creek sites and the Horsefly River sites exceeded the pH dependent CCME guideline of 0.100 mg/L. The dissolved aluminum concentrations were considerably lower than the total concentrations at each site but the BC Max guideline (0.100 mg/L for a pH > 6.5) was still exceeded by WC-1 and WC-2 where the dissolved aluminum concentration was just above 0.300 mg/L.

Arsenic (total and dissolved) concentrations were greatest in Deerhorn Creek (DC-2) and Mussel Creek (MC-1) with lowest concentration being measured in the Horsefly River (approximately 0.0003 mg/L at each site) (Figure 3.2-1). Dissolved arsenic concentrations were similar to total concentrations, indicating that the majority of the arsenic measured was in a dissolved form. CCME and BC guidelines were exceeded at both Deerhorn Creek sites, WC-0 and MC-1.

Total chromium concentrations were close to 0.0003 mg/L at the Deerhorn Creek sites and MC-1 and greatest at WC-2 (0.0028 mg/L; Figure 3.2-2). The BC Max and CCME guidelines (0.001 mg/L) were exceeded the Horsefly River sites and WC-1 and WC-2. Dissolved chromium concentrations were generally below detection limits except for the Woodjam Creek sites.

Total copper concentrations ranged from 0.0006 mg/L at MC-1 to 0.0029 mg/L at WC-2 (Figure 3.2-2). The hardness dependent BC Mean and CCME guidelines were exceeded at the Horsefly River and Woodjam Creek sites. Dissolved copper concentrations were considerably lower than total copper at most sites except for the Woodjam sites, where a substantial portion of the copper present was in the dissolved form.

Total cadmium concentrations ranged from below detection at several sites to 0.000024 mg/L at HR-2 (Figure 3.2-3). Both sites on the Horsefly River exceeded the CCME guideline of 0.000017 mg/L. Dissolved cadmium concentrations were below detection limits at all sites except WC-0.

Total lead concentrations ranged from below detection at several sites to 0.00015 mg/L at HR-2 and WC-1 (Figure 3.2-3). Concentrations in the Horsefly River and Woodjam Creek were more than twice the detection limit. All dissolved lead concentrations were below detection limits. No site exceeded the BC Max or CCME hardness specific guidelines.

Total iron concentrations are somewhat greater in 2010 compared to 2009 when most sites had concentrations below 0.20 mg/L. In 2010, total iron concentrations ranged from approximately 0.10 at the Deerhorn Creek sites to 0.54 mg/L at WC-1 (Figure 3.2-4). All sites other than the Deerhorn and Mussel creek sites exceeded the BC Max and CCME guideline of 0.3 mg/L. All dissolved concentrations were below this guideline value.

Total molybdenum concentrations were well below CCME and BC guidelines (0.073 mg/L and 2 mg/L; respectively) at all sites, with the greatest concentrations observed at the sites on the Deerhorn Creek (0.00156 mg/L at DC-2) as was the case in 2009 (Figure 3.2-4). Dissolved molybdenum concentrations were within a similar range indicating that most of the molybdenum present was in a dissolved form.

Total nickel concentrations were lowest in Deerhorn Creek and highest in Woodjam Creek (Figure 3.2-5). Dissolved nickel concentrations were also highest at the Woodjam Creek sites. These three sites had concentrations just above 0.0030 mg/L. No site exceeded the hardness specific BC Max or CCME guidelines for nickel.

Total selenium was below detection limits (0.0002 mg/L) at DC-2 and MC-1, while HR-2 (0.00038 mg/L) had the greatest concentration (Figure 3.2-5). All sites were well below the CCME guideline of 0.001 mg/L. Dissolved selenium concentrations were slightly lower than the total concentrations indicating that most of the selenium present was in the dissolved form.

Total manganese concentrations ranged from 0.008 mg/L at WC-1 to 0.065 at MC-1 and WC-0 (Figure 3.2-6). No site exceeded the hardness specific BC Max guideline.

Total zinc concentrations were slightly higher than 2009. The Deerhorn and Mussel creek sites were below the detection limit (0.001 mg/L) but all the Horsefly River and Woodjam sites had measurable concentrations of total zinc (Figure 3.2-6). HR-2 had the highest concentration with 0.002 mg/L and all sites were below the hardness dependent BC Max guideline and the CCME guideline of 0.03 mg/L.

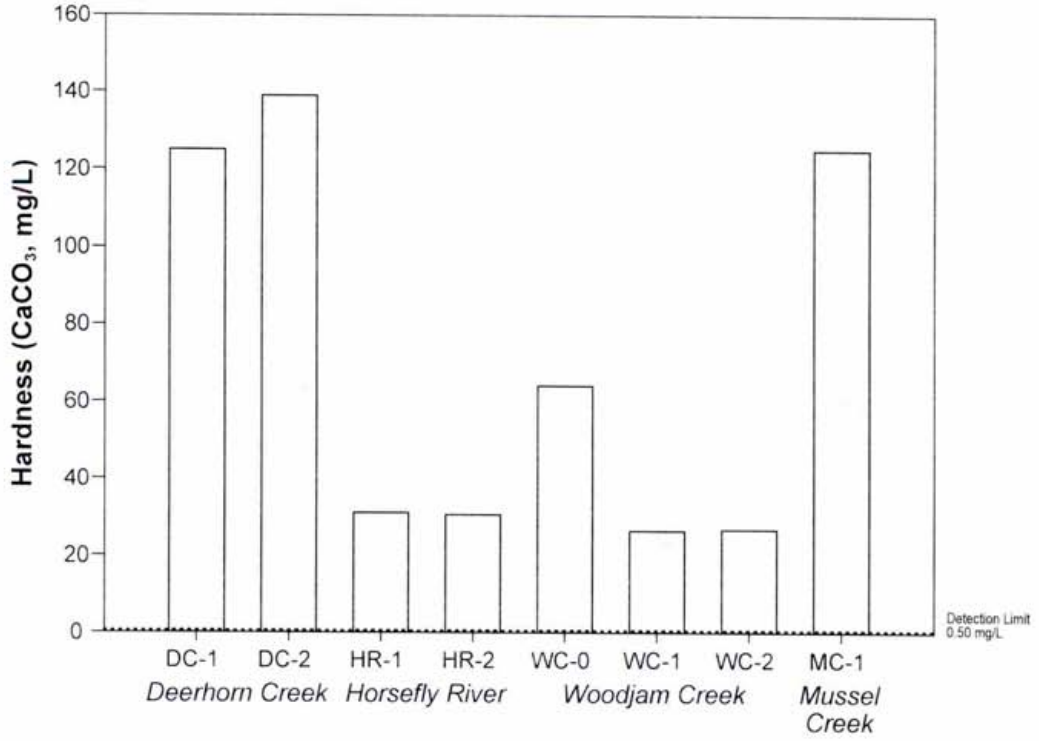
3.3 QUALITY ASSURANCE/QUALITY CONTROL

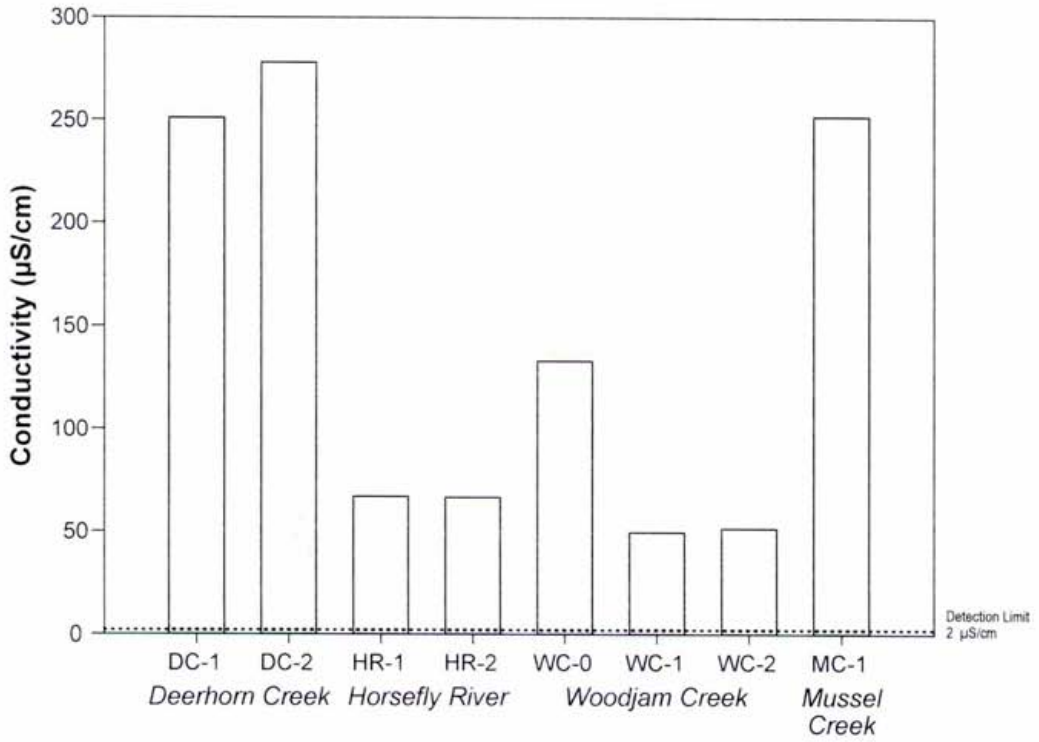
Field and travel blank data are provided in Appendix 3.3-1 and field duplicate data assessment is provided in Appendix 3.3-2.

No variables from the field or travel blanks showed levels above the detection limits, except for pH and acidity which are regularly detected in blank samples (Appendix 3.3-1). The relative percent difference (RPD) value was calculated with paired samples as a measure of the variability inherent in field sampling (as a result of environmental heterogeneity, and potential sampler handling leading to contamination) (Appendix 3.3-2). Of the 35 duplicate pairs for which the RPD could be calculated only 1 had a RPD value above 10% (pH). None of the RPD calculations were greater than 20%, indicating that variability was very low and that results the water quality results are reliable.

4. Summary

The water quality data collected in June 2010 for the Woodjam Project displayed some spatial patterns. Concentrations of nutrients were the lowest in the Horsefly River sites. Concentrations of metals were highest on average in two sites of Woodjam Creek (WC-1 and WC-2) and the two sites within Deerhorn Creek had the lowest concentrations on average. Mussel Creek mimicked Deerhorn Creek for most variables. BC and/or CCME water quality guidelines were exceeded at HR-1, HR-2, WC-1 and WC-2 for aluminum, chromium, iron and copper (in addition to WC-0). Concentrations were exceeded at DC-1, DC-2, WC-0 and MC-1 for arsenic, and cadmium was exceeded at HR-1 and HR-2. Total aluminum, cadmium, chromium, copper and iron concentrations were exceeded at DC-2 DC-1.



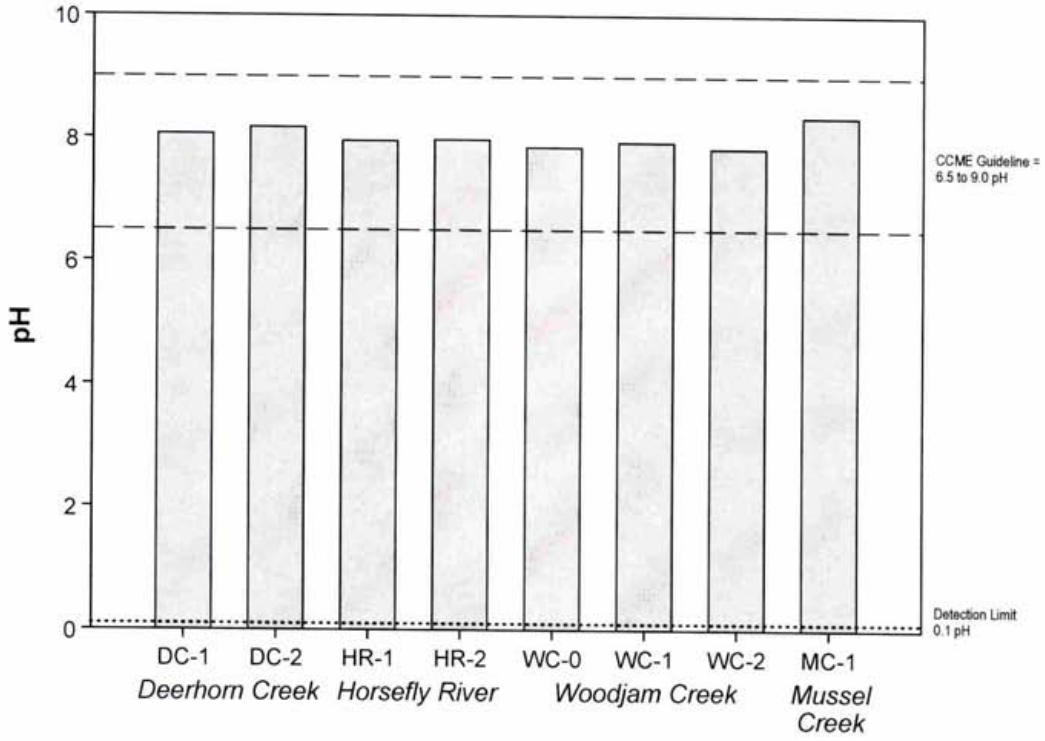


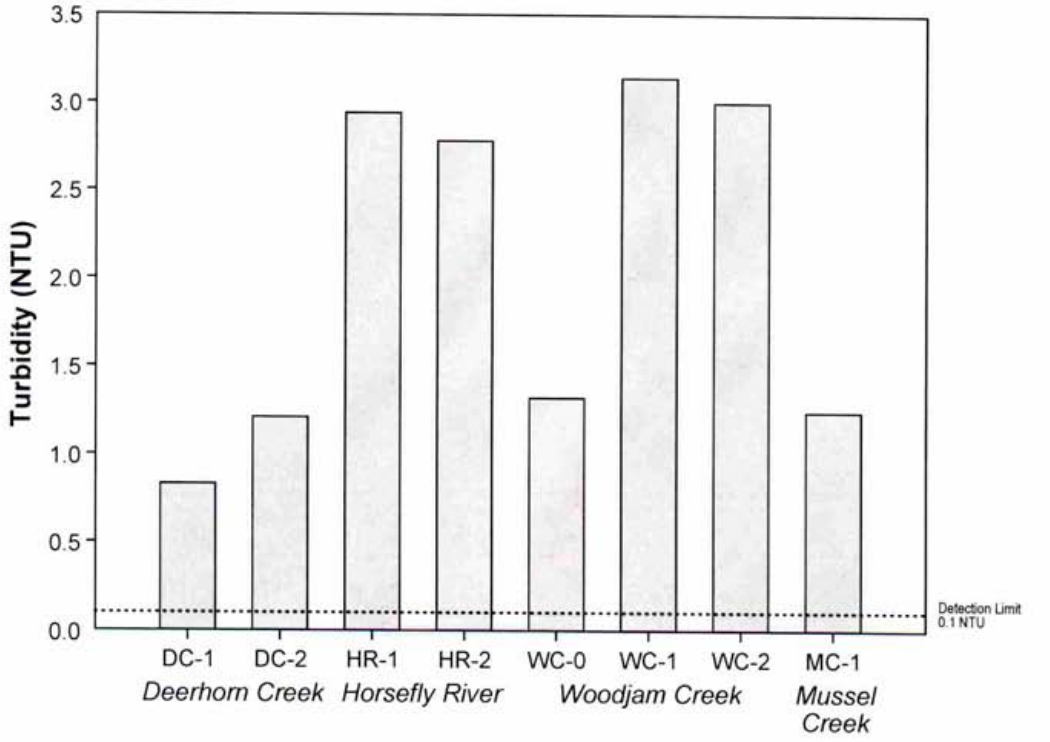
Gold Fields

Hardness and Conductivity Values at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.1-1

Rescan™ Engineers & Scientists



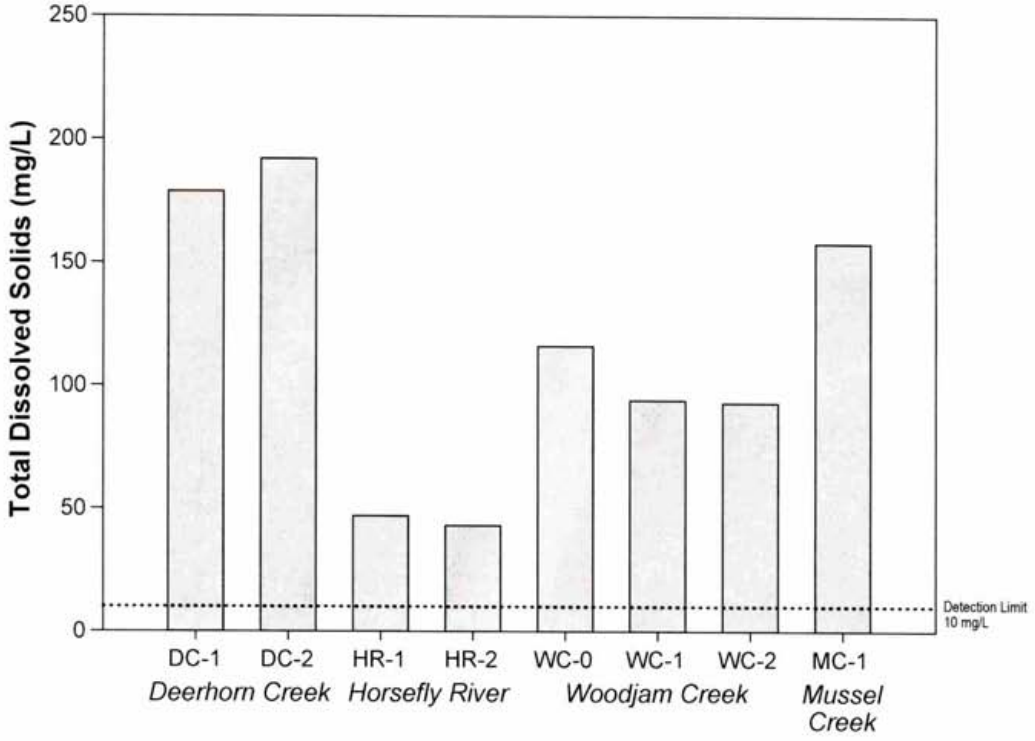


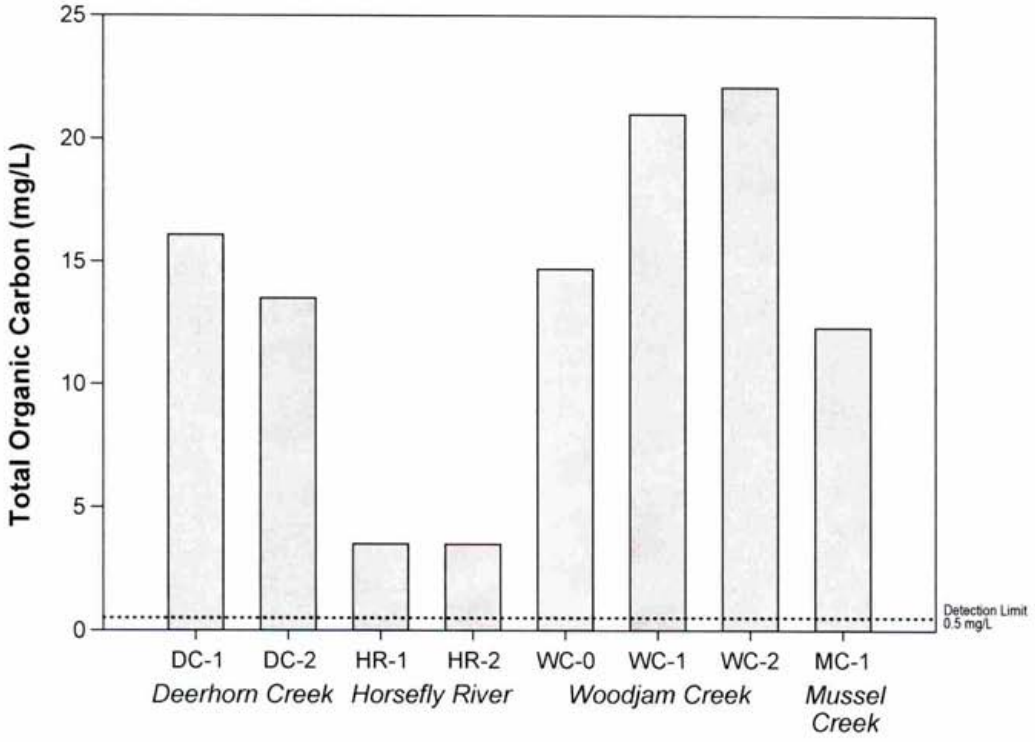
GOLD FIELDS

pH and Turbidity Values at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.1-2

Rescan™ Engineers & Scientists



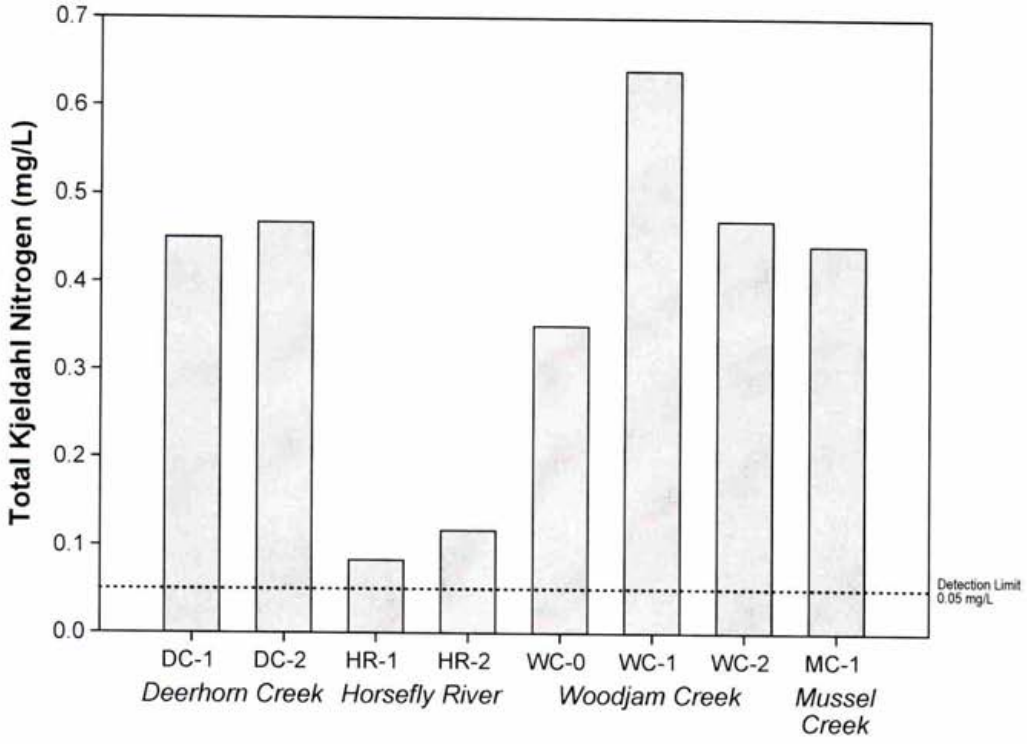


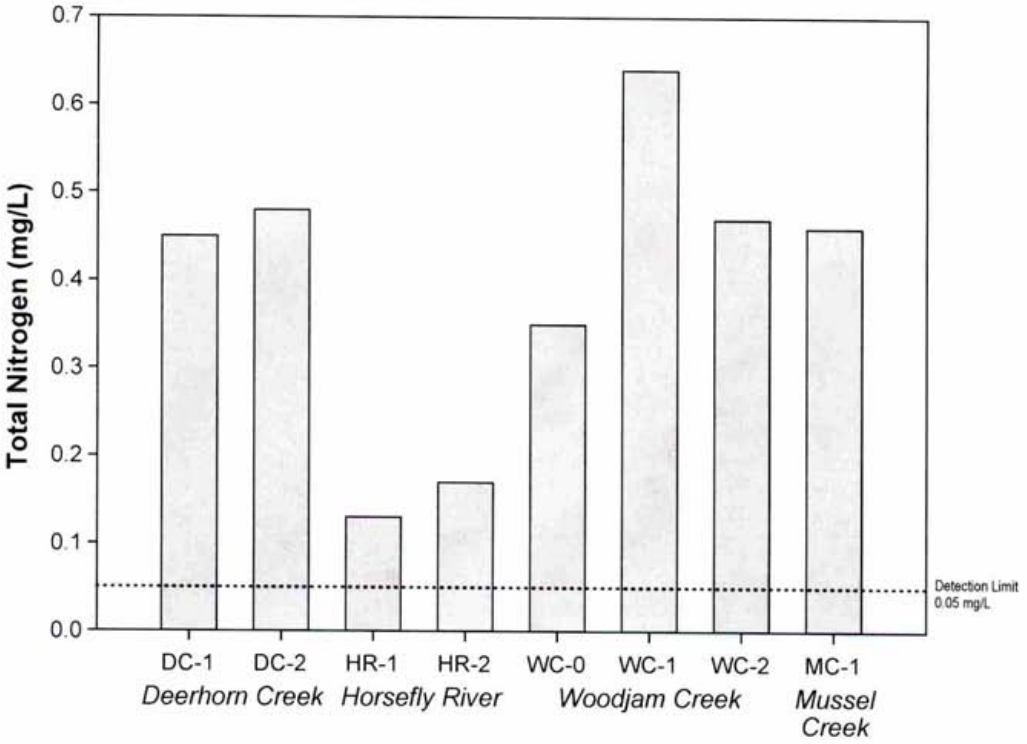
GOLD FIELDS

Total Dissolved Solid (TDS) and Total Organic Carbon (TOC) Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.1-3

Rescan™ Engineers & Scientists



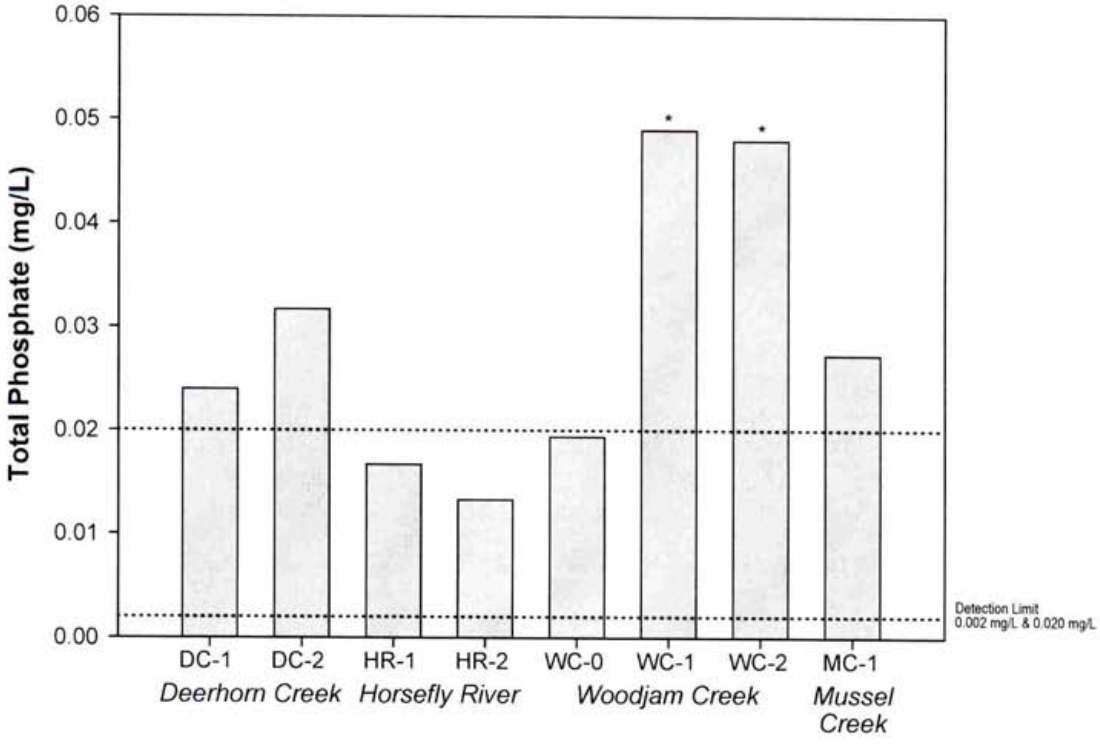


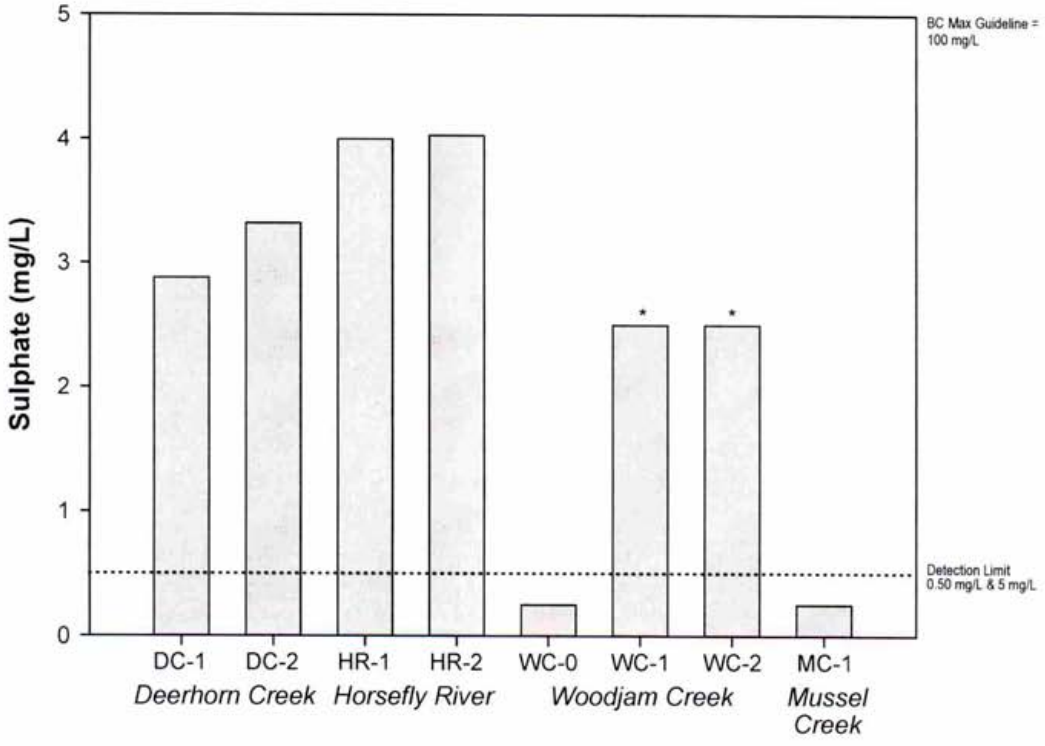
Total Kjeldahl Nitrogen (TKN) and Total Nitrogen (TN) Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.1-4

Gold Fields

Rescan™ Engineers & Scientists





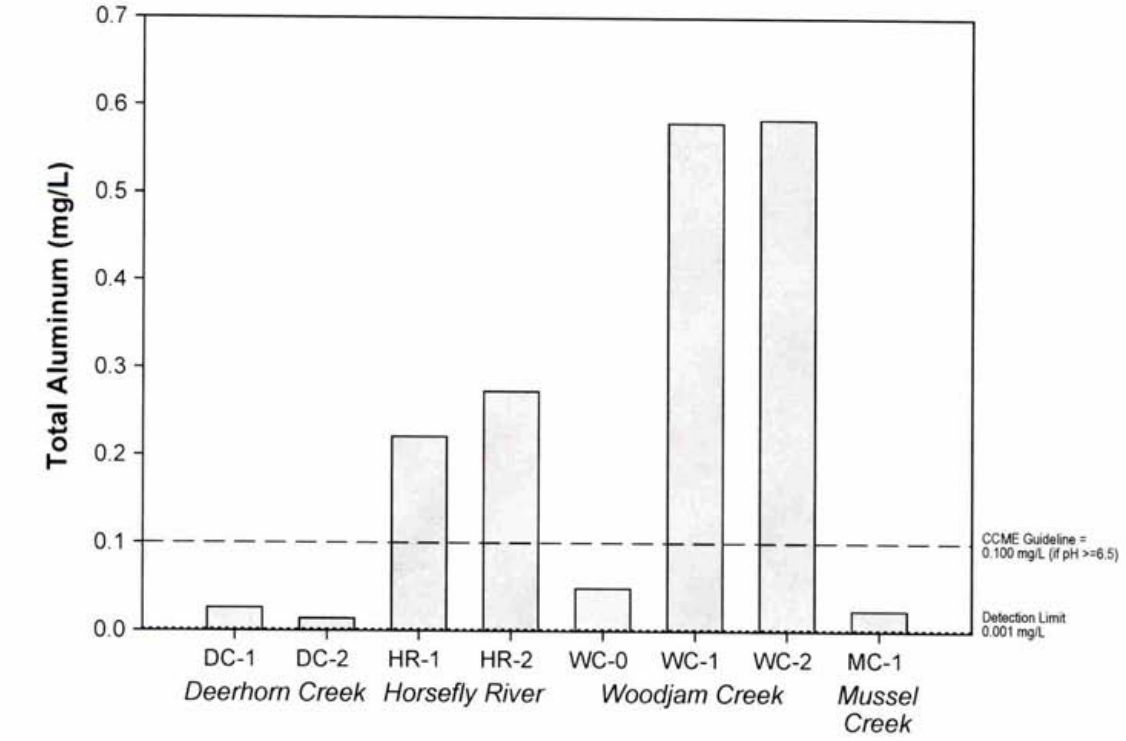
Note: • indicates detection limit for site is the higher concentration.

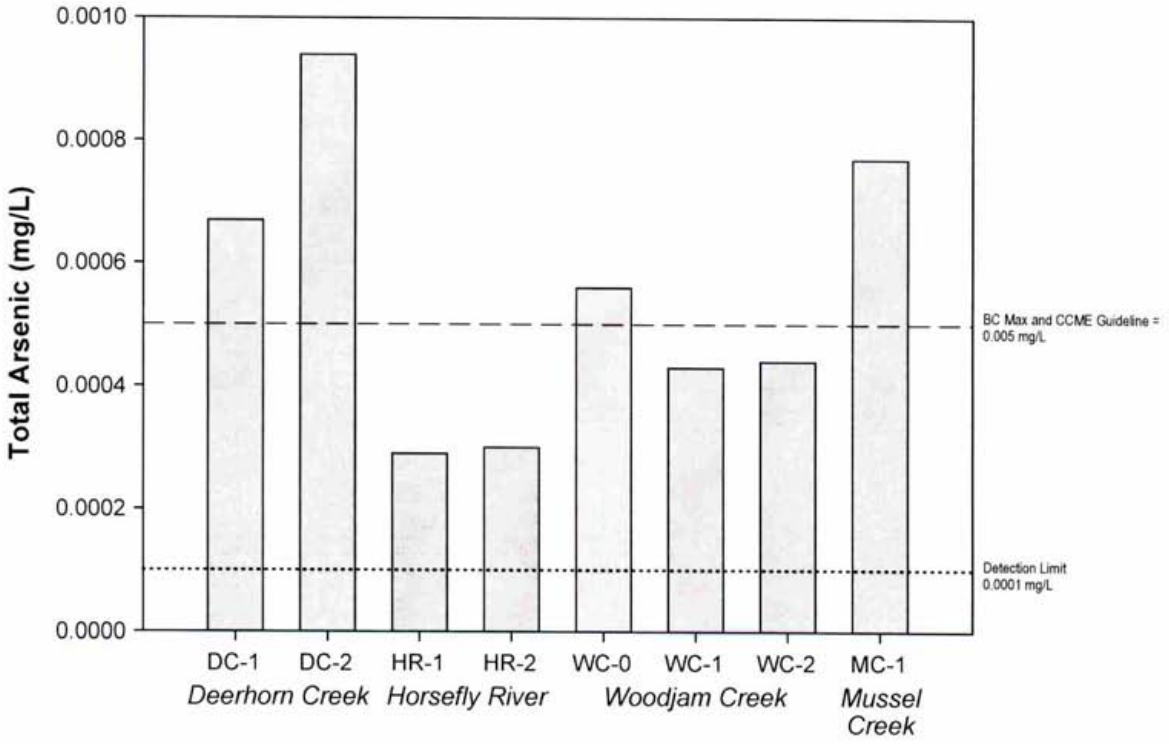
Gold Fields

Total Phosphate and Sulphate Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.1-5

Rescan™ Engineers & Scientists



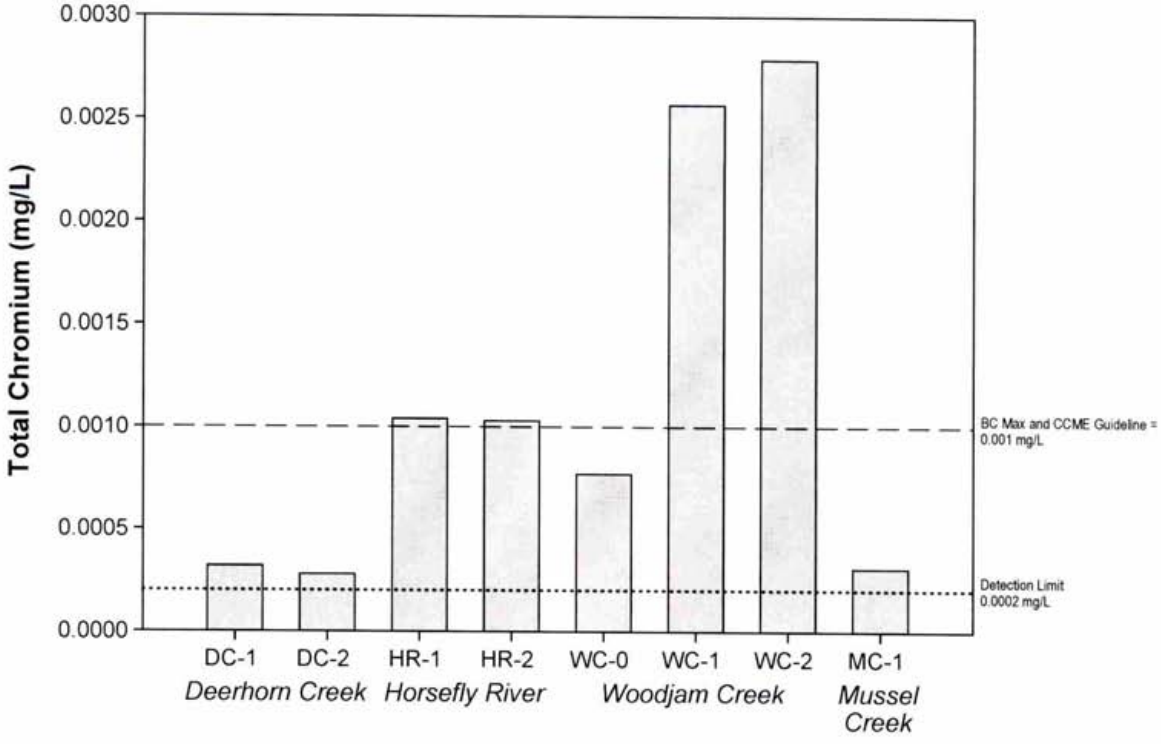


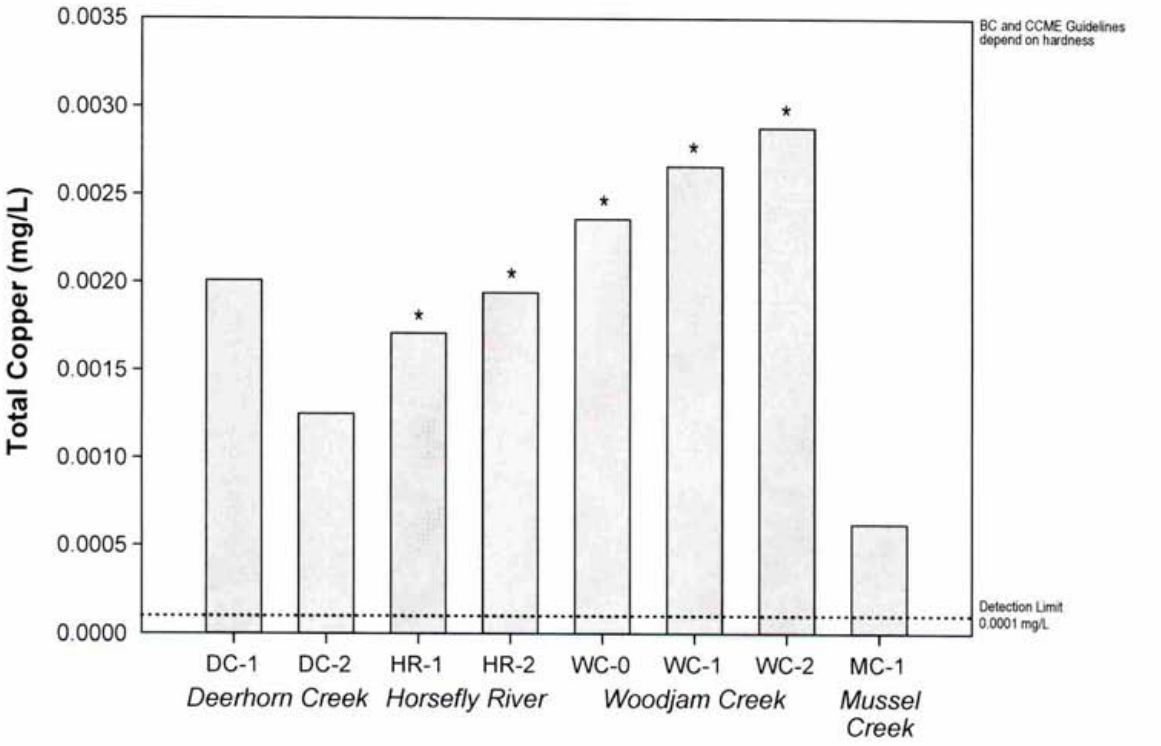
GOLD FIELDS

Total Aluminum and Total Arsenic Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.2-1

Rescan™ Engineers & Scientists





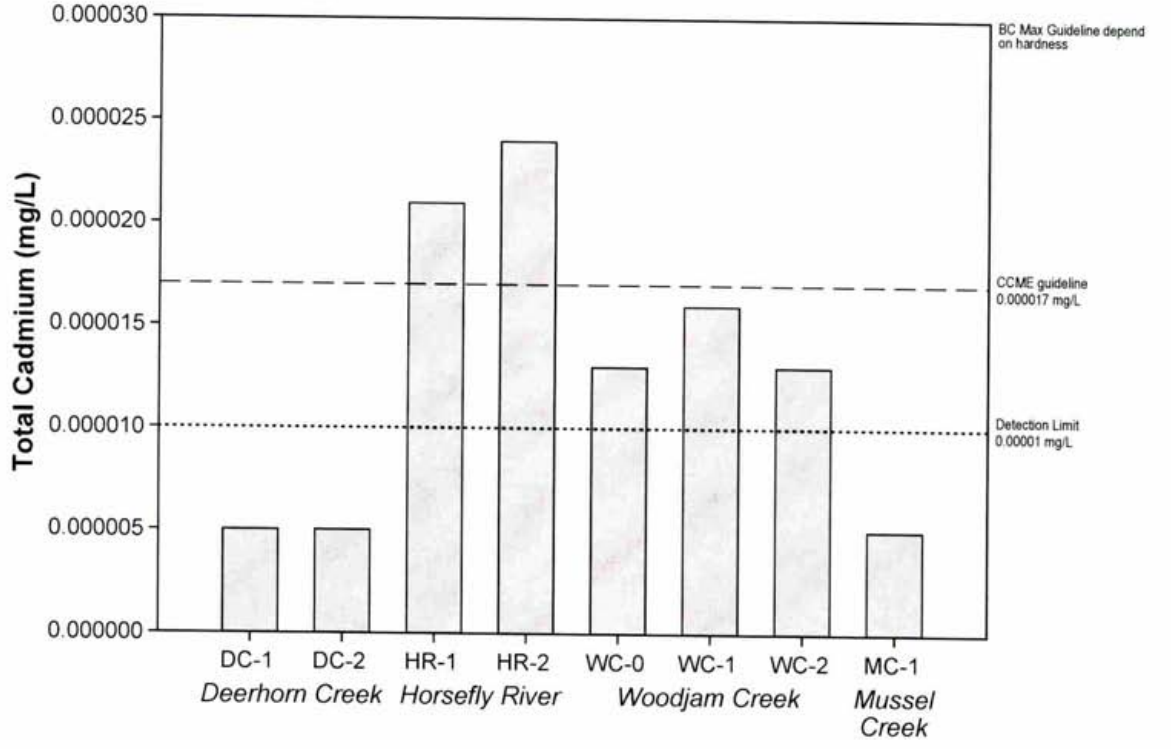
Note: • indicates exceeded CCME Guideline.

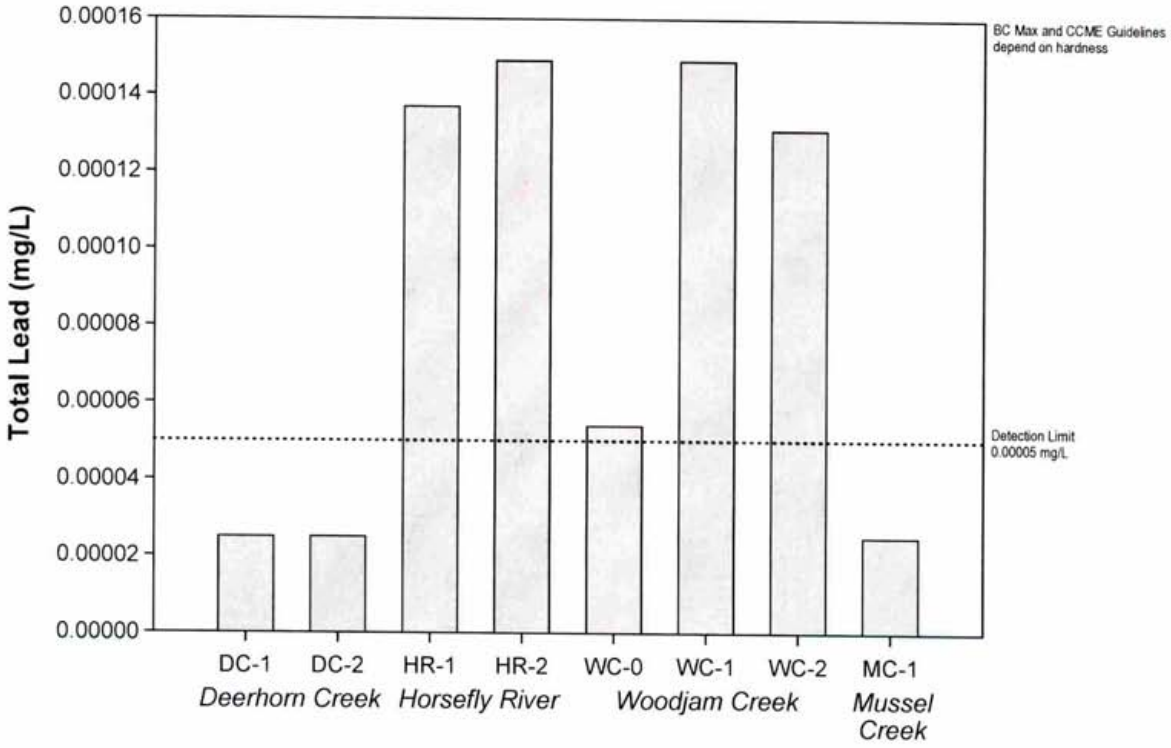
Gold Fields

Total Chromium and Total Copper Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.2-2

Rescan™ Engineers & Scientists



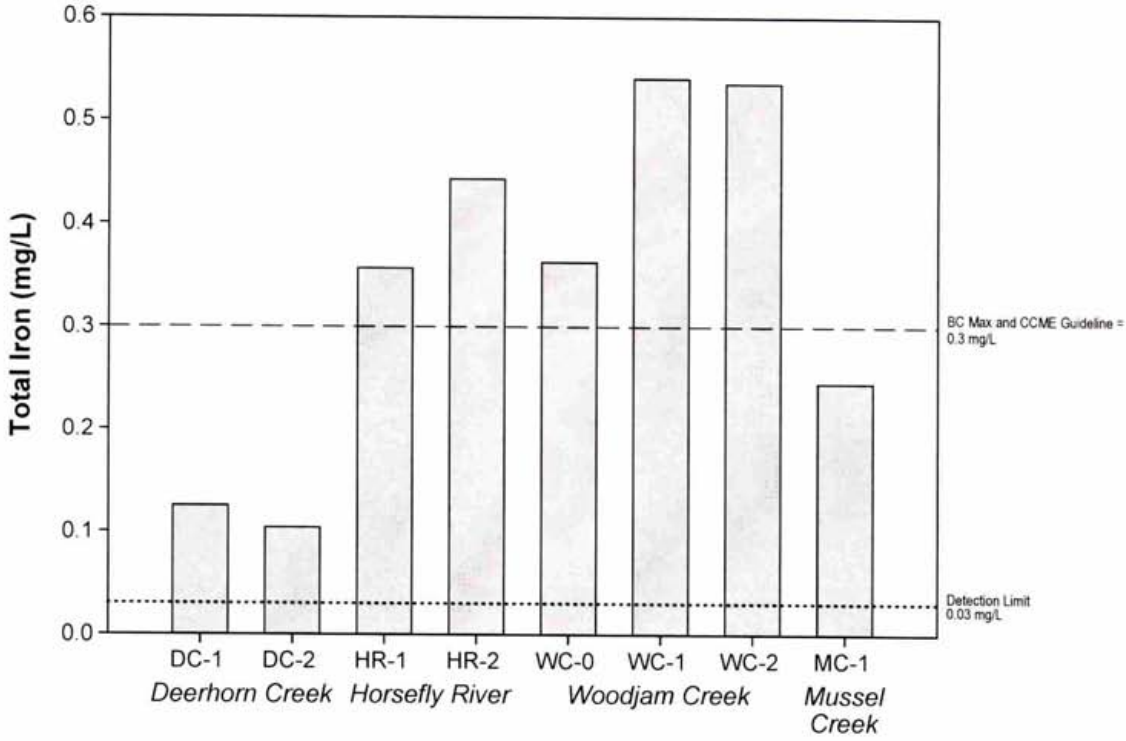


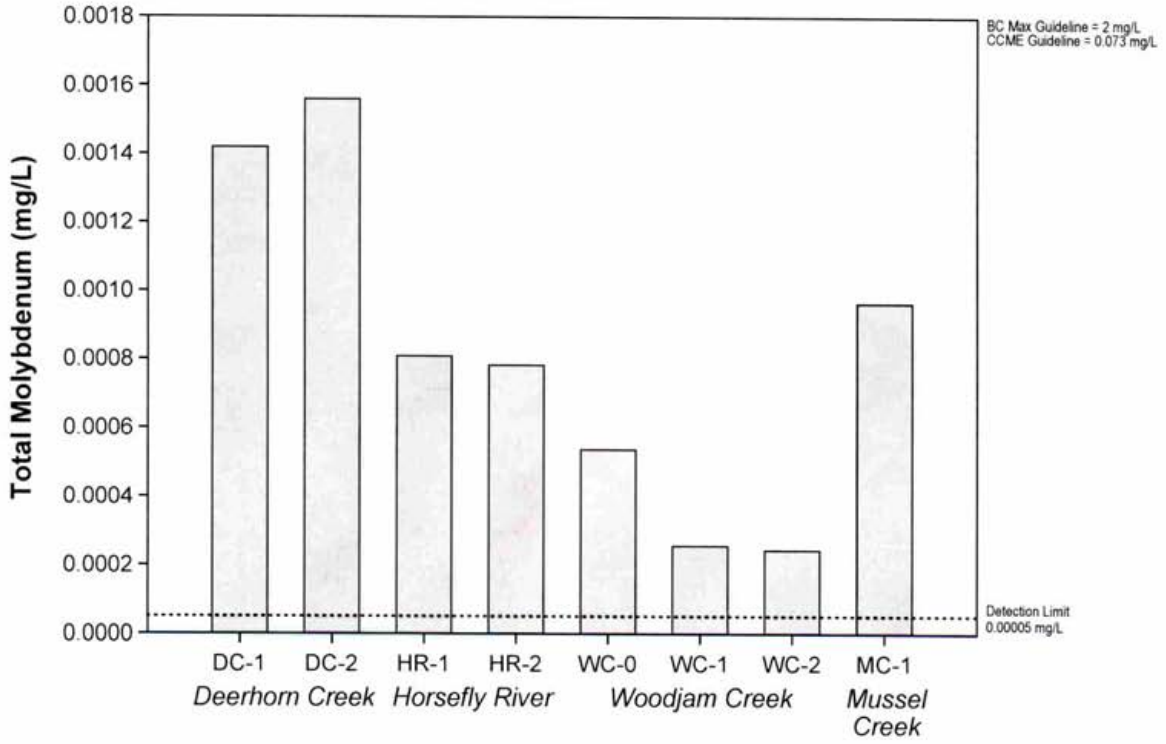
Gold Fields

Total Cadmium and Total Lead Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.2-3

Rescan™ Engineers & Scientists



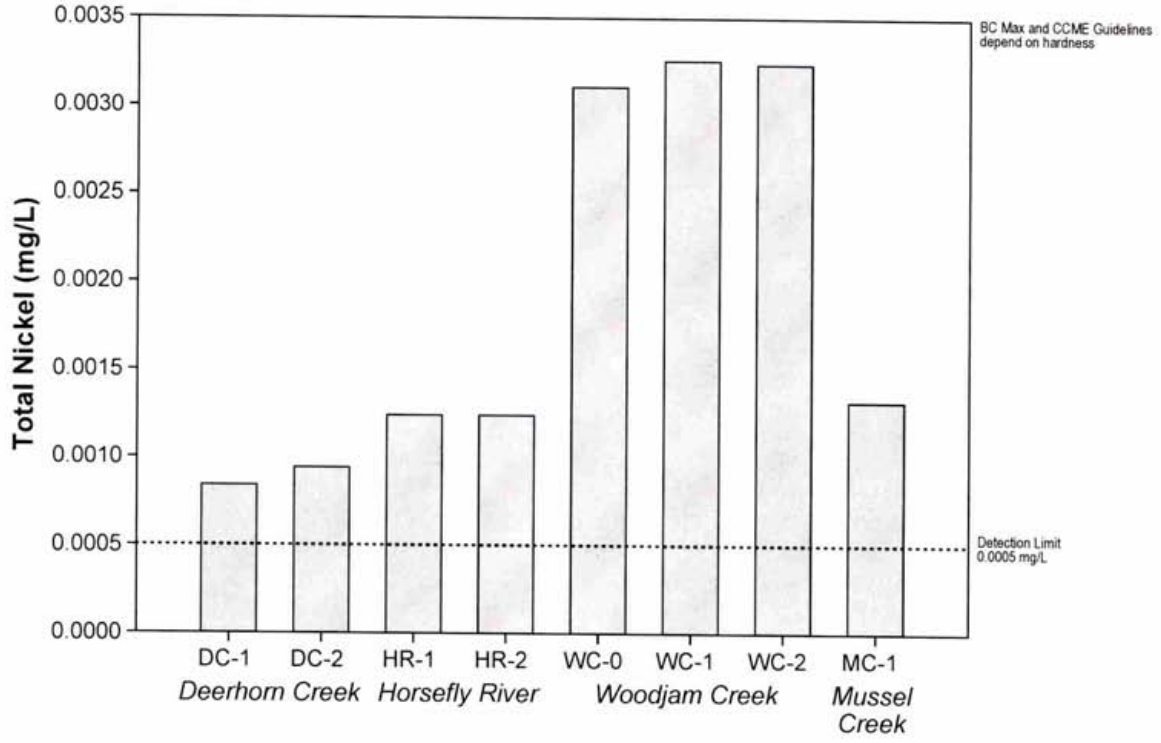


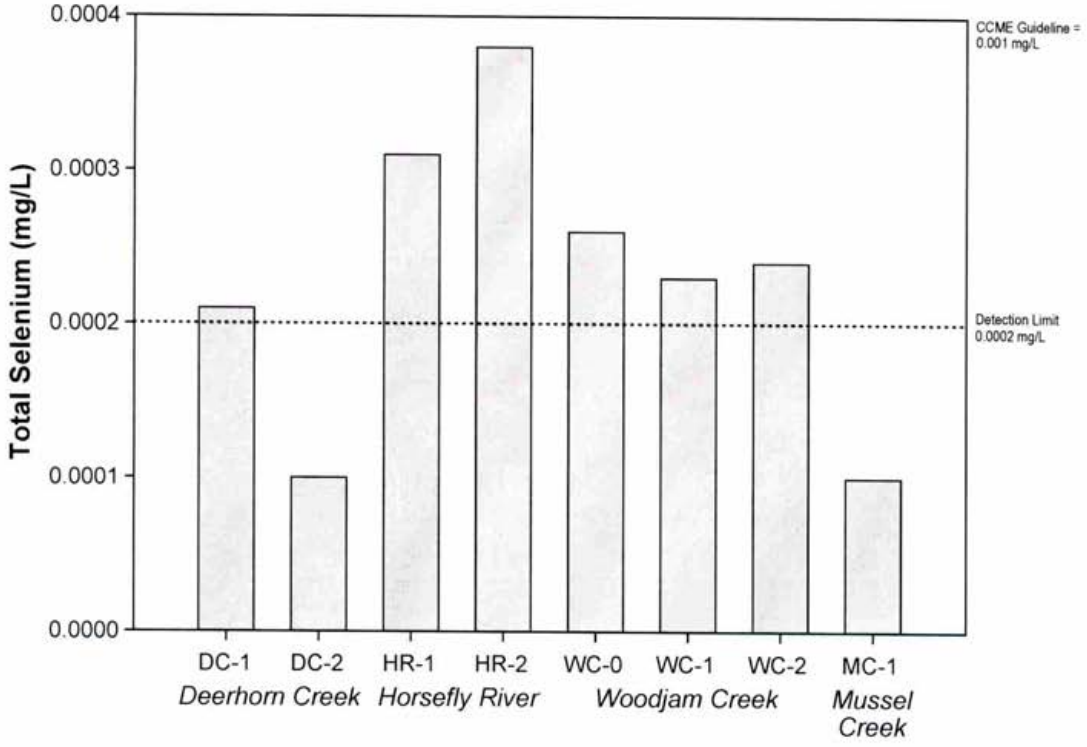
Gold Fields

Total Iron and Total Molybdenum Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.2-4

Rescan™ Engineers & Scientists



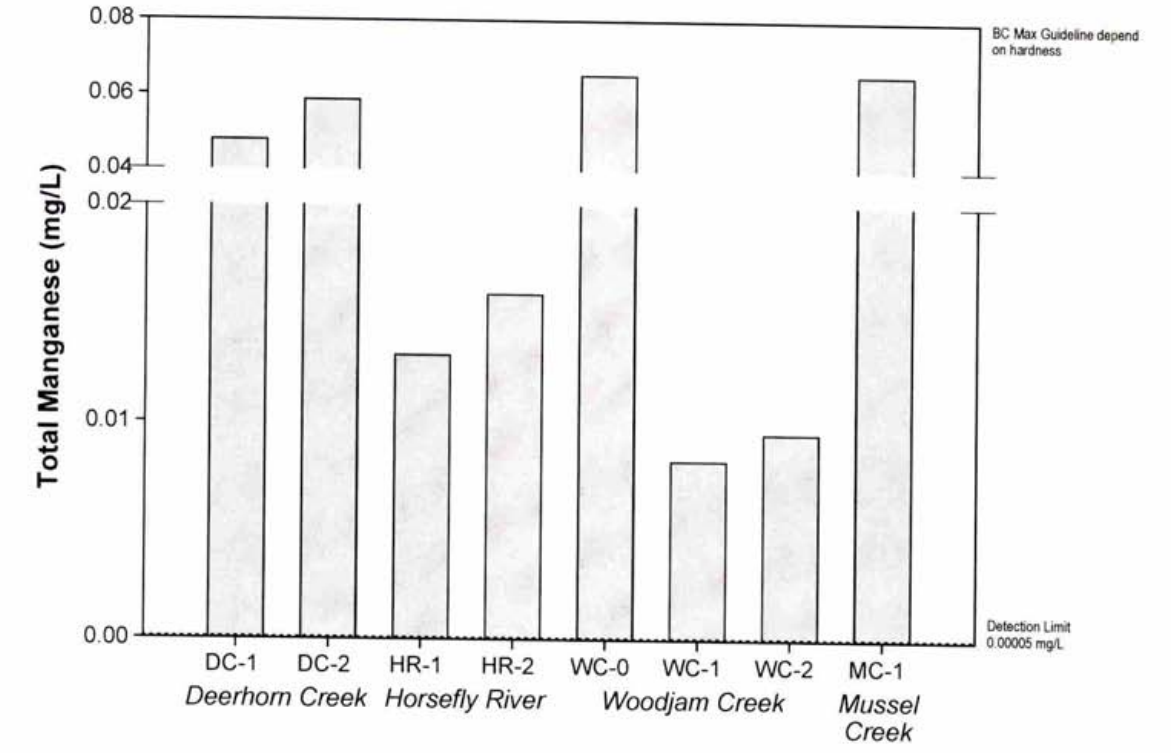


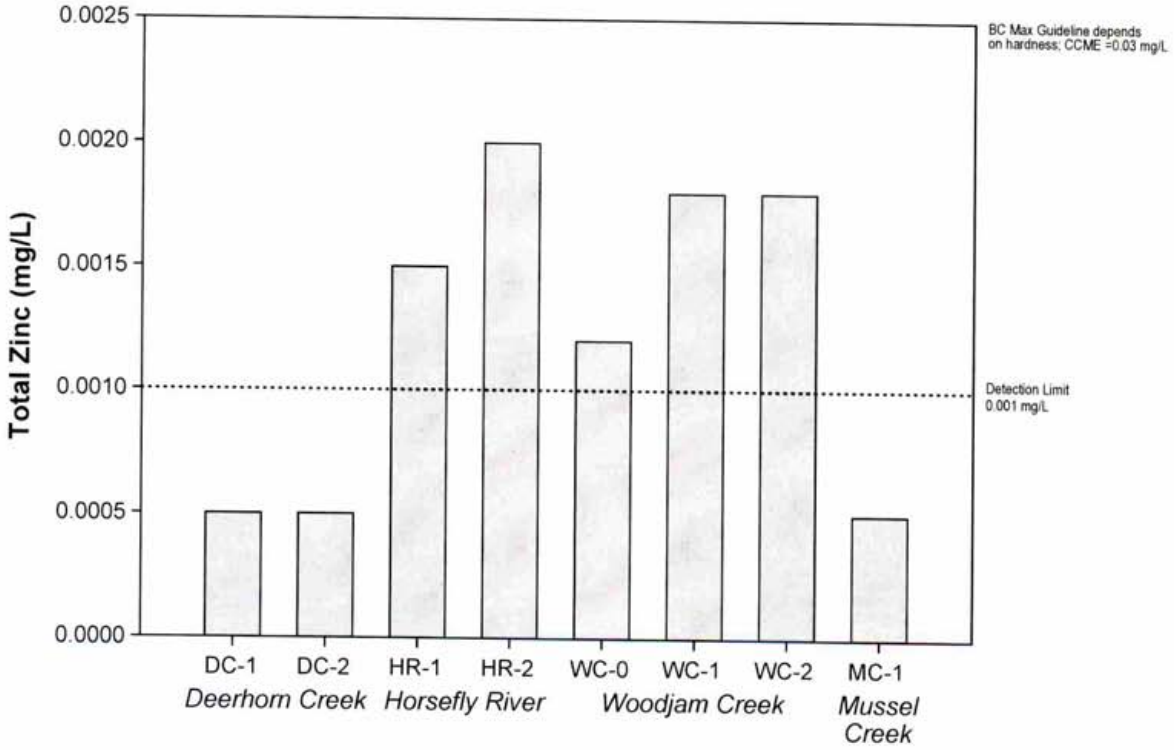
Gold Fields

Total Nickel and Total Selenium Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.2-5

Rescan™ Engineers & Scientists





Gold Fields

Total Manganese and Total Zinc Concentrations at Water Quality Sites in the Woodjam Project Area, June 2010

Figure 3.2-6

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5. References

BC MOE. 2006. *A compendium of working water quality guidelines for British Columbia.* N.p.: British Columbia Ministry of Environment, Environmental Protection Branch.

BCMWLAP. 2003. *British Columbia Field Sampling Manual - For Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples.* Queens Printer, Victoria, BC.

CCME. 1999. *Canadian environmental quality guidelines.* Winnipeg, MB: Update 7.0 (Sept. 2007). Canadian Council of Ministers of the Environment.

Appendix 3.1-1

Stream Water Quality Detection Limits, June 2010

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Appendix 3.1-1. Stream Water Quality Detection Limits, June 2010

Sample ID	WC-1	WC-0	WC-2	DC-1	DC-2	DUP-1	MC-1	FIELD BLANK	TRAVEL BLANK	HR-1	HR-2
Date Sampled	09-JUN-10	09-JUN-10	09-JUN-10	10-JUN-10	10-JUN-10	09-JUN-10	09-JUN-10	10-JUN-10	10-JUN-10	09-JUN-10	09-JUN-10
Time Sampled	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID	L896441-1	L896441-2	L896441-3	L896441-4	L896441-5	L896441-6	L896441-7	L896441-8	L896441-9	L896441-10	L896441-11
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests											
Colour, True	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Conductivity	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Hardness (as $CaCO_3$)	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
pH	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total Suspended Solids	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Total Dissolved Solids	10	10	10	10	10	10	10	10	10	10	10
Turbidity	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Anions and Nutrients											
Acidity (as $CaCO_3$)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Alkalinity, Bicarbonate (as $CaCO_3$)	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0
Alkalinity, Carbonate (as $CaCO_3$)	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0
Alkalinity, Hydroxide (as $CaCO_3$)	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0
Alkalinity, Total (as $CaCO_3$)	2.0	2.0	2.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0
Ammonia as N	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
Bromide (Br)	0.50	0.050	0.50	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Chloride (Cl)	5.0	0.50	5.0	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Fluoride (F)	0.20	0.020	0.20	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
Nitrate (as N)	0.050	0.0050	0.050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
Nitrite (as N)	0.010	0.0010	0.010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
Total Kjeldahl Nitrogen	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Total Nitrogen	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Total Phosphate as P	0.020	0.0020	0.020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Sulfate (SO4)	5.0	0.50	5.0	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Organic / Inorganic Carbon											
Total Organic Carbon	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Total Metals											
Aluminum (Al)-Total	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
Antimony (Sb)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Arsenic (As)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Barium (Ba)-Total	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
Beryllium (Be)-Total	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Bismuth (Bi)-Total	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Boron (B)-Total	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Cadmium (Cd)-Total	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Calcium (Ca)-Total	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
Chromium (Cr)-Total	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Cobalt (Co)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Copper (Cu)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Iron (Fe)-Total	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
Lead (Pb)-Total	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
Lithium (Li)-Total	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
Magnesium (Mg)-Total	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050
Manganese (Mn)-Total	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
Mercury (Hg)-Total	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Molybdenum (Mo)-Total	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050
Nickel (Ni)-Total	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050
Phosphorus (P)-Total	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Potassium (K)-Total	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Selenium (Se)-Total	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Silicon (Si)-Total	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Silver (Ag)-Total	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Sodium (Na)-Total	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Strontium (Sr)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Thallium (Tl)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Tin (Sn)-Total	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010

Appendix 3.1-1. Stream Water Quality Detection Limits, June 2010

Sample ID	WC-1	WC-0	WC-2	DC-1	DC-2	DUP-1	MC-1	FIELD BLANK	TRAVEL BLANK	HR-1	HR-2
Date Sampled	09-JUN-10	09-JUN-10	09-JUN-10	10-JUN-10	10-JUN-10	09-JUN-10	09-JUN-10	10-JUN-10	10-JUN-10	09-JUN-10	09-JUN-10
Time Sampled	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID	L896441-1	L896441-2	L896441-3	L896441-4	L896441-5	L896441-6	L896441-7	L896441-8	L896441-9	L896441-10	L896441-11
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Total Metals											
Titanium (Ti)-Total	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Uranium (U)-Total	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010
Vanadium (V)-Total	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
Zinc (Zn)-Total	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
Dissolved Metals											
Aluminum (Al)-Dissolved	0.0010	0.0010	0.0010	0.0050	0.0020	0.0010	0.0020	-	-	0.0010	0.0010
Antimony (Sb)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Arsenic (As)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Barium (Ba)-Dissolved	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	-	-	0.000050	0.000050
Beryllium (Be)-Dissolved	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	-	-	0.00050	0.00050
Bismuth (Bi)-Dissolved	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	-	-	0.00050	0.00050
Boron (B)-Dissolved	0.010	0.010	0.010	0.010	0.010	0.010	0.010	-	-	0.010	0.010
Cadmium (Cd)-Dissolved	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	-	-	0.000010	0.000010
Calcium (Ca)-Dissolved	0.020	0.020	0.020	0.020	0.020	0.020	0.020	-	-	0.020	0.020
Chromium (Cr)-Dissolved	0.00020	0.00050	0.00020	0.00050	0.00050	0.00020	0.00050	-	-	0.00020	0.00020
Cobalt (Co)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Copper (Cu)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Iron (Fe)-Dissolved	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-	-	0.030	0.030
Lead (Pb)-Dissolved	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	-	-	0.000050	0.000050
Lithium (Li)-Dissolved	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	-	-	0.0050	0.0050
Magnesium (Mg)-Dissolved	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	0.0050	-	-	0.0050	0.0050
Manganese (Mn)-Dissolved	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	-	-	0.000050	0.000050
Mercury (Hg)-Dissolved	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	-	-	0.000010	0.000010
Molybdenum (Mo)-Dissolved	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	0.000050	-	-	0.000050	0.000050
Nickel (Ni)-Dissolved	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	-	-	0.00050	0.00050
Phosphorus (P)-Dissolved	0.30	0.30	0.30	0.30	0.30	0.30	0.30	-	-	0.30	0.30
Potassium (K)-Dissolved	0.050	0.050	0.050	0.050	0.050	0.050	0.050	-	-	0.050	0.050
Selenium (Se)-Dissolved	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020	-	-	0.00020	0.00020
Silicon (Si)-Dissolved	0.050	0.050	0.050	0.050	0.050	0.050	0.050	-	-	0.050	0.050
Silver (Ag)-Dissolved	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	-	-	0.000010	0.000010
Sodium (Na)-Dissolved	2.0	2.0	2.0	2.0	2.0	2.0	2.0	-	-	2.0	2.0
Strontium (Sr)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Thallium (Tl)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Tin (Sn)-Dissolved	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	-	-	0.00010	0.00010
Titanium (Ti)-Dissolved	0.010	0.010	0.010	0.010	0.010	0.010	0.010	-	-	0.010	0.010
Uranium (U)-Dissolved	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	-	-	0.000010	0.000010
Vanadium (V)-Dissolved	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	-	-	0.0010	0.0010
Zinc (Zn)-Dissolved	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	-	-	0.0010	0.0010

Appendix 3.1-2

Summary of Water Quality for Physical Variables, Nutrients, and Total Organic Carbon for the Woodjam Project, June 2010

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Appendix 3.1-2. Summary of Water Quality for Physical Variables, Nutrients, and Total Organic Carbon for the Woodjam Project, June 2010

	WC-1	WC-0	WC-2	DC-1	DC-2	MC-1	HR-1	HR-2	BC Guidelines Max	CCME Guideline
Colour, True	128	45.4	126	57.7	30.1	37.9	12.8	12.3		
Conductivity	49.6	133	51.4	251	278	252	67.0	66.5		
Hardness (as $CaCO_3$)	26.4	64.1	26.8	125		125	31.1	30.6		
pH	7.93	7.85	7.83	8.06	8.17	8.35	7.95	7.97		6.5-9
Total Suspended Solids	<3.0	3.1	3.6	<3.0	<3.0	<3.0	10.6	9.6	A	25 above background
Total Dissolved Solids	94	116	93	179	192	158	47	43		
Turbidity	3.14	1.32	3.00	0.83	1.21	1.24	2.94	2.78	A	
Acidity (as $CaCO_3$)	5.1	5.6	4.9	4.8	3.3	3.5	4.6	4.2		
Alkalinity, Total (as $CaCO_3$)	25.1	73.7	26.0	139	165	158	27.6	28.6		
Bromide (Br)	<0.50	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050	<0.050		
Chloride (Cl)	<5.0	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	600	
Fluoride (F)	<0.20	0.051	<0.20	0.080	0.102	0.088	0.023	0.023	A	
Sulfate (SO4)	<5.0	<0.50	<5.0	2.88	3.32	<0.50	4.00	4.03	100, 50 B	
Ammonia as N	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	C	
Total Kjeldahl Nitrogen	0.640	0.350	0.470	0.450	0.467	0.442	0.083	0.117		
Nitrate (as N)	<0.050	<0.0050	<0.050	<0.0050	0.0129	0.0185	0.0473	0.0531	200	13
Nitrite (as N)	<0.010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	D	
Total Nitrogen	0.640	0.350	0.470	0.450	0.480	0.460	0.130	0.170		
Total Phosphate as P	0.049	0.0194	0.048	0.0240	0.0317	0.0273	0.0167	0.0133		
Total Organic Carbon	21.0	14.7	22.1	16.1	13.5	12.3	3.50	3.49		

Expressed as mg/L except colour (CU), conductivity (µS/cm), pH (pH units), turbidity (NTU).

A: depends on background.

for TSS: if background ≤25 mg/L, then max 25 mg/L increase in 24 h, and a mean increase of 5 mg/L over 30 d. If background 25-250 mg/L, then max increase of 25 mg/L. If background >250 mg/L, then max 10% increase.

for turbidity: if background <8 NTU, then max 8 NTU increase in 24 h, and a mean increase of 2 mg/L in 30d. If background 8-80 NTU, then max increase of 8 NTU. If background >80 NTU, then max 10% increase.

for fluoride: 0.3 mg/L max for hardness 50 mg/L CaCO3 or higher, 0.2 mg/L max F for hardness <50 mg/L CaCO3.

B: alert to monitor aquatic moss populations.

C: depends on T and pH - consult tables (guideline max ranges from 0.681-27.7 mg/L).

D: Nitrite BC Max 0.06 mg/L for Cl<2mg/L. BC Max nitrite 0.12 mg/L for Cl 2-4 mg/L.

< indicates that values are below detection limits

Appendix 3.1-3

Summary of Water Quality for Total Metals for the Woodjam Project, June 2010

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Appendix 3.1-3. Summary of Water Quality for Total Metals for the Woodjam Project, June 2010

	WC-1	WC-0	WC-2	DC-1	DC-2	MC-1	HR-1	HR-2	BC Guidelines Max	CCME Guideline
Aluminum (Al)-Total	0.580	0.0489	0.584	0.0261	0.0137	0.0235	0.221	0.273		0.1 A
Antimony (Sb)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.02 B	
Arsenic (As)-Total	0.00043	0.00056	0.00044	0.00067	0.00094	0.00077	0.00029	0.00030	0.005 B	0.005
Barium (Ba)-Total	0.0157	0.0220	0.0159	0.0213	0.0215	0.0112	0.00980	0.0104	5 B	
Beryllium (Be)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Bismuth (Bi)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Boron (B)-Total	<0.010	<0.010	<0.010	0.017	0.015	<0.010	<0.010	<0.010	1.2	
Cadmium (Cd)-Total	0.000016	0.000013	0.000013	<0.000010	<0.000010	<0.000010	0.000021	0.000024	A, B	0.000017
Calcium (Ca)-Total	6.59	18.7	7.22	39.5	40.0	32.7	10.9	10.9		
Chromium (Cr)-Total	0.00257	0.00077	0.00279	0.00032	0.00028	0.00031	0.00104	0.00103	0.001 B	A
Cobalt (Co)-Total	0.00022	0.00044	0.00023	<0.00010	<0.00010	0.00015	0.00021	0.00028	0.110	
Copper (Cu)-Total	0.00266	0.00236	0.00288	0.00201	0.00125	0.00062	0.00171	0.00194	C	A
Iron (Fe)-Total	0.541	0.363	0.536	0.125	0.104	0.245	0.357	0.443	0.3 B	0.3
Lead (Pb)-Total	0.000149	0.000054	0.000131	<0.000050	<0.000050	<0.000050	0.000137	0.000149	D	A
Lithium (Li)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	5 B	
Magnesium (Mg)-Total	2.83	5.49	2.93	8.47	12.0	12.4	1.70	1.73		
Manganese (Mn)-Total	0.00827	0.0654	0.00952	0.0478	0.0586	0.0656	0.0131	0.0159	E	
Mercury (Hg)-Total	0.000012	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.0001	0.000026 A
Molybdenum (Mo)-Total	0.000256	0.000536	0.000244	0.00142	0.00156	0.000964	0.000808	0.000782	2	0.073
Nickel (Ni)-Total	0.00326	0.00311	0.00324	0.00084	0.00094	0.00132	0.00124	0.00124	A	A
Phosphorus (P)-Total	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30		
Potassium (K)-Total	0.758	1.31	0.765	1.30	2.21	2.07	0.652	0.645		
Selenium (Se)-Total	0.00023	0.00026	0.00024	0.00021	<0.00020	<0.00020	0.00031	0.00038		0.001
Silicon (Si)-Total	8.35	9.40	8.66	6.79	6.09	3.62	2.66	2.77		
Silver (Ag)-Total	0.000018	0.000011	0.000021	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	F	0.000100
Sodium (Na)-Total	2.1	3.2	2.1	5.2	5.5	5.9	<2.0	<2.0		
Strontium (Sr)-Total	0.0731	0.125	0.0763	0.210	0.231	0.210	0.0565	0.0564		
Thallium (Tl)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0003 B	0.0008
Tin (Sn)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010		
Titanium (Ti)-Total	0.020	<0.010	0.020	<0.010	<0.010	<0.010	0.012	0.013	0.1 B	
Uranium (U)-Total	0.000120	0.000052	0.000118	0.000276	0.000412	0.000271	0.000092	0.000097	0.3 B	
Vanadium (V)-Total	0.0032	0.0011	0.0032	0.0011	0.0013	<0.0010	<0.0010	<0.0010		
Zinc (Zn)-Total	0.0018	0.0012	0.0018	<0.0010	<0.0010	<0.0010	0.0015	0.0020	G	0.0300

Expressed as mg/L.

A: depends on background, CCME guideline:

for aluminum: pH>6.5

*for cadmium guideline = 0.001 * $10^{[0.86(\log(\text{hardness})) - 3.2]}$ mg/L*

for chromium guideline = 0.001 mg/L (Cr VI), or 0.0089 (Cr III) , interim

for copper: CCME = 0.002 mg/L at 0-120 mg/L [$CaCO_3$], 0.003mg/L at 120 - 180 mg/L [$CaCO_3$], 0.004 mg/L at > 180 mg/L [$CaCO_3$]

for lead = 0.001 mg/L for [$CaCO_3$]=0-60 mg/L, 0.002 mg/L for [$CaCO_3$]=60-120 mg/L, 0.004 mg/L for [$CaCO_3$]=120-180 mg/L, 0.007 mg/L for [$CaCO_3$] >180 mg/L

for mercury, inorganic fraction

for nickel: both BC and CCME guideline = 0.025 mg/L at 0-60 mg/L [$CaCO_3$], 0.065mg/L at 60 - 120 mg/L [$CaCO_3$], 0.110 mg/L at 120 - 180 mg/L [$CaCO_3$], 0.150 mg/L at > 180 mg/L [$CaCO_3$].

B: Working BC guideline.

C: Max. Cu guideline of (0.094(hardness)+2) µg/L.

D: Max Pb guideline of $e^{(1.273 \ln(\text{hardness}) - 1.460)}$ if hardness > 8mg/L; 0.003 mg Pb/L if hardness ≤ 8mg/L.

E: BC Max Mn guideline 0.01102(hardness)+0.54 mg/L;

F: for silver: BC Max = 0.003 mg/L if hardness > 100mg/L, Max= 0.0001mg/L if hardness < 100mg/L.

G: Max Zn guideline = [33 + 0.75(hardness - 90)] ug/L, minimum of 33 ug/L.*

< indicates that values are below detection limits

Outlined cells indicate CCME Exceedances

Grey cells indicate BC Guideline Exceedances

Appendix 3.1-4

Summary of Water Quality for Dissolved Metals for the Woodjam Project, June 2010

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Appendix 3.1-4. Summary of Water Quality for Dissolved Metals for the Woodjam Project, June 2010

	WC-1	WC-0	WC-2	DC-1	DC-2	MC-1	HR-1	HR-2	BC Guidelines Max
Aluminum (Al)-Dissolved	0.380	0.0299	0.361	<0.0050	<0.0020	<0.0020	0.0203	0.0196	0.1*
Antimony (Sb)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As)-Dissolved	0.00038	0.00053	0.00038	0.00062	0.00091	0.00071	0.00017	0.00017	
Barium (Ba)-Dissolved	0.0127	0.0206	0.0124	0.0198	0.0194	0.00958	0.00703	0.00697	
Beryllium (Be)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Bismuth (Bi)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Boron (B)-Dissolved	<0.010	<0.010	<0.010	0.014	0.012	<0.010	<0.010	<0.010	
Cadmium (Cd)-Dissolved	<0.000010	0.000013	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Calcium (Ca)-Dissolved	6.22	17.2	6.37	36.8	37.0	30.4	9.95	9.77	
Chromium (Cr)-Dissolved	0.00195	0.00060	0.00188	<0.00050	<0.00050	<0.00050	<0.00020	<0.00020	
Cobalt (Co)-Dissolved	0.00013	0.00027	0.00011	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	
Copper (Cu)-Dissolved	0.00226	0.00217	0.00221	0.00164	0.00078	0.00046	0.00090	0.00095	
Iron (Fe)-Dissolved	0.264	0.230	0.250	0.086	0.038	0.131	0.032	<0.030	
Lead (Pb)-Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium (Li)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Magnesium (Mg)-Dissolved	2.63	5.14	2.65	8.01	11.4	11.8	1.52	1.50	
Manganese (Mn)-Dissolved	0.00298	0.0404	0.00308	0.0310	0.00964	0.0174	0.00204	0.00215	
Mercury (Hg)-Dissolved	0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Dissolved	0.000202	0.000500	0.000221	0.00133	0.00147	0.000849	0.000678	0.000675	
Nickel (Ni)-Dissolved	0.00268	0.00272	0.00269	0.00065	0.00073	0.00102	0.00061	0.00058	
Phosphorus (P)-Dissolved	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	
Potassium (K)-Dissolved	0.673	1.21	0.683	1.20	2.07	1.95	0.570	0.566	
Selenium (Se)-Dissolved	<0.00020	0.00022	0.00022	0.00022	<0.00020	<0.00020	0.00032	0.00035	
Silicon (Si)-Dissolved	8.07	9.64	8.10	6.73	6.21	3.65	2.42	2.39	
Silver (Ag)-Dissolved	0.000015	<0.000010	0.000018	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na)-Dissolved	2.1	3.1	2.1	5.1	5.6	5.9	<2.0	<2.0	
Strontium (Sr)-Dissolved	0.0669	0.117	0.0680	0.190	0.215	0.193	0.0504	0.0506	
Thallium (Tl)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Uranium (U)-Dissolved	0.000098	0.000046	0.000105	0.000257	0.000381	0.000245	0.000057	0.000057	
Vanadium (V)-Dissolved	0.0026	<0.0010	0.0024	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	
Zinc (Zn)-Dissolved	0.0012	0.0011	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	

Expressed as mg/L.

**for aluminum: pH>6.5.*

< indicates that values are below detection limits.

Appendix 3.3-1

Stream Water Quality Field and Travel Blank Data, June 2010

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Appendix 3.3-1. Stream Water Quality Field and Travel Blank Data, June 2010

Sample ID		FIELD BLANK	TRAVEL BLANK
Date Sampled		10-JUN-10	10-JUN-10
Time Sampled		00:00	00:00
ALS Sample ID		L896441-8	L896441-9
Matrix		Water	Water
Physical Tests	Units		
Colour, True	CU	<5.0	<5.0
Conductivity	uS/cm	<2.0	<2.0
Hardness (as $CaCO_3$)	mg/L	<0.50	<0.50
pH	pH	5.80	5.80
Total Suspended Solids	mg/L	<3.0	<3.0
Total Dissolved Solids	mg/L	<10	<10
Turbidity	NTU	<0.10	<0.10
Anions and Nutrients			
Acidity (as $CaCO_3$)	mg/L	2.8	2.8
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	<2.0	<2.0
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<2.0	<2.0
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<2.0	<2.0
Alkalinity, Total (as $CaCO_3$)	mg/L	<2.0	<2.0
Ammonia as N	mg/L	<0.0050	<0.0050
Bromide (Br)	mg/L	<0.050	<0.050
Chloride (Cl)	mg/L	<0.50	<0.50
Fluoride (F)	mg/L	<0.020	<0.020
Nitrate (as N)	mg/L	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L	<0.050	<0.050
Total Nitrogen	mg/L	<0.050	<0.050
Total Phosphate as P	mg/L	<0.0020	<0.0020
Sulfate (SO4)	mg/L	<0.50	<0.50
Organic / Inorganic Carbon			
Total Organic Carbon	mg/L	<0.50	<0.50
Total Metals			
Aluminum (Al)-Total	mg/L	<0.0010	<0.0010
Antimony (Sb)-Total	mg/L	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	<0.000050	<0.000050
Beryllium (Be)-Total	mg/L	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	<0.00050	<0.00050
Boron (B)-Total	mg/L	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	<0.000010	<0.000010
Calcium (Ca)-Total	mg/L	<0.020	<0.020
Chromium (Cr)-Total	mg/L	<0.00020	<0.00020
Cobalt (Co)-Total	mg/L	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	<0.00010	<0.00010
Iron (Fe)-Total	mg/L	<0.030	<0.030
Lead (Pb)-Total	mg/L	<0.000050	<0.000050
Lithium (Li)-Total	mg/L	<0.0050	<0.0050
Magnesium (Mg)-Total	mg/L	<0.0050	<0.0050
Manganese (Mn)-Total	mg/L	<0.000050	<0.000050
Mercury (Hg)-Total	mg/L	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	<0.000050	<0.000050
Nickel (Ni)-Total	mg/L	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	<0.30	<0.30
Potassium (K)-Total	mg/L	<0.050	<0.050
Selenium (Se)-Total	mg/L	<0.00020	<0.00020
Silicon (Si)-Total	mg/L	<0.050	<0.050
Silver (Ag)-Total	mg/L	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	<2.0	<2.0
Strontium (Sr)-Total	mg/L	<0.00010	<0.00010
Thallium (Tl)-Total	mg/L	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	<0.010	<0.010
Uranium (U)-Total	mg/L	<0.000010	<0.000010
Vanadium (V)-Total	mg/L	<0.0010	<0.0010
Zinc (Zn)-Total	mg/L	<0.0010	<0.0010

Appendix 3.3-2

Relative Percent Difference (RPD) Results for Stream Water Quality, June 2010

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Appendix 3.3-2. Relative Percent Difference (RPD) Results for Stream Water Quality, June 2010

Sample ID			HR-1	DUP-1	
Date Sampled			09-JUN-10	09-JUN-10	
Time Sampled			00:00	00:00	
ALS Sample ID			L896441-10	L896441-6	
Matrix	Units	5xDL	Water	Water	RPD%
Physical Tests					
Colour, True	CU	25	12.8	12.5	*
Conductivity	mS/cm	10	67.0	67.9	1
Hardness (as $CaCO_3$)	mg/L	2.5	31.1	30.9	1
pH	pH	0.5	7.95	6.64	18
Total Suspended Solids	mg/L	15	10.6	6.6	*
Total Dissolved Solids	mg/L	50	47	48	*
Turbidity	NTU	0.5	2.94	3.04	3
Anions and Nutrients					
Acidity (as $CaCO_3$)	mg/L	5	4.6	5.3	*
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	10	27.6	29.2	6
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	10	**1**	**1**	*
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	10	**1**	**1**	*
Alkalinity, Total (as $CaCO_3$)	mg/L	10	27.6	29.2	6
Ammonia as N	mg/L	0.025	**0.0025**	**0.0025**	*
Bromide (Br)	mg/L	0.25	**0.025**	**0.025**	*
Chloride (Cl)	mg/L	2.5	**0.25**	**0.25**	*
Fluoride (F)	mg/L	0.1	0.023	0.023	0
Nitrate (as N)	mg/L	0.025	0.0473	0.0471	0
Nitrite (as N)	mg/L	0.005	**0.0005**	**0.0005**	*
Total Kjeldahl Nitrogen	mg/L	0.25	0.083	0.093	*
Total Nitrogen	mg/L	0.25	0.130	0.140	7
Total Phosphate as P	mg/L	0.01	0.0167	0.0084	*
Sulfate (SO4)	mg/L	2.5	4.00	4.10	2
Organic / Inorganic Carbon					
Total Organic Carbon	mg/L	2.5	3.50	3.56	2
Total Metals					
Aluminum (Al)-Total	mg/L	0.005	0.221	0.211	5
Antimony (Sb)-Total	mg/L	0.0005	**0.00005**	**0.00005**	*
Arsenic (As)-Total	mg/L	0.0005	0.00029	0.00027	*
Barium (Ba)-Total	mg/L	0.00025	0.00980	0.00982	0
Beryllium (Be)-Total	mg/L	0.0025	**0.00025**	**0.00025**	*
Bismuth (Bi)-Total	mg/L	0.0025	**0.00025**	**0.00025**	*
Boron (B)-Total	mg/L	0.05	**0.005**	**0.005**	*
Cadmium (Cd)-Total	mg/L	0.00005	0.000021	0.000018	*
Calcium (Ca)-Total	mg/L	0.1	10.9	10.9	0
Chromium (Cr)-Total	mg/L	0.0025	0.00104	0.00082	*
Cobalt (Co)-Total	mg/L	0.0005	0.00021	0.00020	5
Copper (Cu)-Total	mg/L	0.0005	0.00171	0.00177	3
Iron (Fe)-Total	mg/L	0.15	0.357	0.331	8
Lead (Pb)-Total	mg/L	0.00025	0.000137	0.000120	*
Lithium (Li)-Total	mg/L	0.025	**0.0025**	**0.0025**	*
Magnesium (Mg)-Total	mg/L	0.025	1.70	1.73	2
Manganese (Mn)-Total	mg/L	0.00025	0.0131	0.0125	5
Mercury (Hg)-Total	mg/L	0.00005	**0.000005**	**0.000005**	*
Molybdenum (Mo)-Total	mg/L	0.00025	0.000808	0.000773	4
Nickel (Ni)-Total	mg/L	0.0025	0.00124	0.00110	*
Phosphorus (P)-Total	mg/L	1.5	**0.15**	**0.15**	*
Potassium (K)-Total	mg/L	0.25	0.652	0.648	1
Selenium (Se)-Total	mg/L	0.0005	0.00031	0.00037	*
Silicon (Si)-Total	mg/L	0.25	2.66	2.67	0
Silver (Ag)-Total	mg/L	0.00005	**0.000005**	**0.000005**	*
Sodium (Na)-Total	mg/L	10	**1**	**1**	*
Strontium (Sr)-Total	mg/L	0.0005	0.0565	0.0571	1
Thallium (Tl)-Total	mg/L	0.0005	**0.00005**	**0.00005**	*
Tin (Sn)-Total	mg/L	0.0005	**0.00005**	**0.00005**	*

Appendix 3.3-2. Relative Percent Difference (RPD) Results for Stream Water Quality, June 2010

Sample ID			HR-1	DUP-1	
Date Sampled			09-JUN-10	09-JUN-10	
Time Sampled			00:00	00:00	
ALS Sample ID			L896441-10	L896441-6	
Matrix	Units	5xDL	Water	Water	RPD%
Total Metals					
Titanium (Ti)-Total	mg/L	0.05	0.012	**0.005**	*
Uranium (U)-Total	mg/L	0.00005	0.000092	0.000090	2
Vanadium (V)-Total	mg/L	0.005	**0.0005**	**0.0005**	*
Zinc (Zn)-Total	mg/L	0.005	0.0015	0.0014	*
Dissolved Metals					
Aluminum (Al)-Dissolved	mg/L	0.005	0.0203	0.0200	1
Antimony (Sb)-Dissolved	mg/L	0.0005	**0.00005**	**0.00005**	*
Arsenic (As)-Dissolved	mg/L	0.0005	0.00017	0.00017	*
Barium (Ba)-Dissolved	mg/L	0.00025	0.00703	0.00700	0
Beryllium (Be)-Dissolved	mg/L	0.0025	**0.00025**	**0.00025**	*
Bismuth (Bi)-Dissolved	mg/L	0.0025	**0.00025**	**0.00025**	*
Boron (B)-Dissolved	mg/L	0.05	**0.005**	**0.005**	*
Cadmium (Cd)-Dissolved	mg/L	0.00005	**0.000005**	0.000010	*
Calcium (Ca)-Dissolved	mg/L	0.1	9.95	9.87	1
Chromium (Cr)-Dissolved	mg/L	0.0025	**0.0001**	**0.0001**	*
Cobalt (Co)-Dissolved	mg/L	0.0005	**0.00005**	**0.00005**	*
Copper (Cu)-Dissolved	mg/L	0.0005	0.00090	0.00092	2
Iron (Fe)-Dissolved	mg/L	0.15	0.032	0.032	*
Lead (Pb)-Dissolved	mg/L	0.00025	**0.000025**	**0.000025**	*
Lithium (Li)-Dissolved	mg/L	0.025	**0.0025**	**0.0025**	*
Magnesium (Mg)-Dissolved	mg/L	0.025	1.52	1.52	0
Manganese (Mn)-Dissolved	mg/L	0.00025	0.00204	0.00193	6
Mercury (Hg)-Dissolved	mg/L	0.00005	**0.000005**	**0.000005**	*
Molybdenum (Mo)-Dissolved	mg/L	0.00025	0.000678	0.000665	2
Nickel (Ni)-Dissolved	mg/L	0.0025	0.00061	0.00056	*
Phosphorus (P)-Dissolved	mg/L	1.5	**0.15**	**0.15**	*
Potassium (K)-Dissolved	mg/L	0.25	0.570	0.549	4
Selenium (Se)-Dissolved	mg/L	0.0005	0.00032	0.00031	*
Silicon (Si)-Dissolved	mg/L	0.25	2.42	2.41	0
Silver (Ag)-Dissolved	mg/L	0.00005	**0.000005**	**0.000005**	*
Sodium (Na)-Dissolved	mg/L	10	**1**	**1**	*
Strontium (Sr)-Dissolved	mg/L	0.0005	0.0504	0.0501	1
Thallium (Tl)-Dissolved	mg/L	0.0005	**0.00005**	**0.00005**	*
Tin (Sn)-Dissolved	mg/L	0.0005	**0.00005**	**0.00005**	*
Titanium (Ti)-Dissolved	mg/L	0.05	**0.005**	**0.005**	*
Uranium (U)-Dissolved	mg/L	0.00005	0.000057	0.000059	3
Vanadium (V)-Dissolved	mg/L	0.005	**0.0005**	**0.0005**	*
Zinc (Zn)-Dissolved	mg/L	0.005	**0.0005**	**0.0005**	*

Values in bold are half the detection limit.

RPD = Relative Percent Difference relative to mean (in %).

DL = Analytical Detection Limit.

** Denotes that RPD was not calculated due to one or both values <5 times the detection limit.*

Yellow values have a RPD % equal to or greater than 20%.

Appendix 16:
Report on the Surficial Geology of the Woodjam Project Area

Surficial Geology of the Woodjam Project Area
NTS Map Areas 93A/03W and 93A/06W
Report prepared for Gold Fields Exploration Inc.
By Vic Levson

INTRODUCTION

This surficial geology mapping project was conducted at the request of Gold Fields Exploration Inc. The project involved air photo interpretation following the surficial geology mapping conventions of the British Columbia Terrain Classification System (Howes and Kenk, 1997). High resolution color air photos were obtained from the British Columbia government by Julianne Madsen at an approximate scale of 1:20,000. Air photo interpretation was verified by field checking over a four day period (October 18-21, 2010). Field observations on the surficial geology were made at a total of 87 field stations. Data were collected on surficial sediment type, grain size distribution, sorting, clast lithology and shape, abundance of striated clasts, ice-flow direction, local geomorphology, sedimentology and Quaternary stratigraphy. This report provides a summary and interpretation of these observations.

Previous work related to surficial geology in the Woodjam project area includes a series of soils and terrain maps produced by Lord and Lacelle (1980) at a scale of 1:50,000. More recently, a surficial geology map of the Lac la Hache map area (NTS 92P/14), just south of the Woodjam area, was produced by Plouffe (2009). Plouffe et al. (2009, 2010) also discussed the ice flow history of the Bonaparte Lake map area (NTS 92P) as part of a regional study on the geochemistry of glacial sediments and the gold grain content of tills in that area.

SURFICIAL GEOLOGY

The surficial geology of the Woodjam project area is dominated by morainal sediments deposited during the last (Late Wisconsinan) glaciation. These sediments include basal tills, deposited at the bottom of the glacier mainly by lodgement and basal meltout processes, as well as supraglacial and englacial ablation tills deposited on the surface and margins of the glacier by meltout processes and sediment gravity flows. Basal tills are typically dense, matrix-supported diamicts with high silt/clay contents (Figure 1), and have abundant striated and faceted clasts (Figure 2).

Basal tills are derived by glacial erosion of bedrock and other substrate materials and exhibit relatively short transport distances in the down-ice direction (typically hundreds of metres to a few kilometres). In contrast, supraglacial and englacial ablation tills are typically loose, have a sandy matrix, and glacially abraded clasts are not abundant (Figure 3). Transport distances of supraglacial and englacial tills are typically large (tens to hundreds of kilometres). The topography in areas of ablation till is often hummocky and commonly referred to as knob and kettle topography. Lakes or swamps typically occur in kettle depressions between the hills (knobs) of till and glaciofluvial sediments.

Figure 1: massive, matrix-supported, clay-rich basal tills (Geotool for scale is 47.5 cm)

Figure 2: striated and faceted boulder with two striae sets formed as the boulder rotated

Figure 3: sandy diamict and interbedded gravels exposed in a small hill in hummocky moraine (Mh)

Basal tills in the map area are common and occur mainly within widespread areas mapped as morainal blankets (Mb – Figure 4). The local derivation of these tills is evidenced by the abundance of clasts of one dominant lithology in many areas. This occurs where the ice overrode areas of one main rock type. For example, basalt clasts are common in the basal tills in the southwest part of the map where widespread subcrops of Chilcotin volcanics likely occur.

Figure 4: Morainal blanket with weakly developed east-west trending ridges (possible flutings)

Ablation tills occur mainly within areas mapped as hummocky moraine (Mh) and to a lesser extent rolling moraine (Mm – Figure 5). Ablation tills are deposited by meltout of debris from either within the glacier (englacial till) or from the ice surface (supraglacial till). Such deposits are often reworked by glacial meltwater that washes out the finer sediments leaving a sandy matrix and gravelly interbeds (Figure 3). Reworking by sediment gravity flow processes also commonly occurs during deposition, resulting in poor sorting and crude stratification (Figure 6).

Figure 5: rolling to hummocky moraine (depression on right is a small former gravel pit)

Figure 6: crudely stratified glacial diamict with minor sands and gravels (Amelia Rainbow for scale)

Also abundant throughout the map area, and interspersed with morainal sediments, are organic soils. These include both thick organic deposits (Ob) such as occur in boggy areas and thin organic veneers (Ov – Figure 7). Organic deposits are most common in the map area within stream and river valleys, and around lakes and swamps in morainal areas. The abundance of organics within morainal areas usually reflects the poor drainage in fine-grained basal tills or the presence of numerous closed depressions in hummocky or rolling moraine areas.

Figure 7: small depression with an organic veneer indicated by the presence of willows and wetland vegetation (dark area in centre of figure) located in a clay-rich, till plain (Mb)

Glaciofluvial deposits are also common in the map area as high terraces, mainly within the Horsefly River valley (Figure 8), and as glaciofluvial outwash areas in the lowlands along the Moffat Creek valley (Figure 9). In addition, glaciofluvial deposits are commonly interspersed with ablation tills everywhere they occur in the map region. Glaciofluvial features with distinctive morphology such as kames (Figures 10) and eskers (Figures 11-12), are present in the map area but not common.

Figure 8: Glaciofluvial terrace along the Horsefly River valley

Figure 9: Small glaciofluvial deposit near the Moffat River valley

Figure 10: Left - Small kame hills in clear-cut; Right - sand and gravel exposed in glaciofluvial kame

Figure 11: small gravel pit in esker

Figure 12: (left) folded sand bed in esker; (right) cobble gravels interbedded with sand in esker

Glaciolacustrine deposits occur in the northern part of the map region, mainly between the Horsefly town site area and the west end of Horsefly Lake. These sediments were deposited in glacial lakes in the late stages of ice retreat in the region when ice-free areas were beginning to open up while, at the same time, drainage was still blocked in adjoining areas by stagnant ice blocks and retreating glacier margins. Glaciolacustrine sediments occur up to about 850 m in the Horsefly town site area. They are composed of well bedded silts, clays and fine sands (Figure 17).

Figure 13: bedded sands and silts near the upper limit of glaciolacustrine sediments near Horsefly

Fluvial deposits are most extensive on the floodplains of Horsefly River (Figure 14) and Moffat Creek as well as other smaller streams in the area. They include stratified sands and gravels that are commonly overlain by, and interbedded with, organic deposits.

Figure 14: floodplain of the Moffat River

Colluvial sediments are not widespread in the map region. They occur mainly as slope deposits on the sides of steep unconsolidated valley walls (Figure 15) along Horsefly River and Moffat Creek. They also occur in association with the bedrock uplands in the eastern part of the map area, mainly as colluvial veneers around areas of outcrop. Thick talus deposits are rare, occurring only at the base of the steepest rock slopes in the area (Figure 16).

Figure 15: unconsolidated colluvial debris below a failing valley-side slope along Moffat Creek. The vertical section in the distance shows about 20 of glacial sediments sharply overlying glaciofluvial gravels.

Figure 16: colluvial deposits (discontinuous talus) along the base of bedrock outcrop

QUATERNARY STRATIGRAPHY and GLACIAL HISTORY

Several exposures of Quaternary sediments are present in the area and provide insight into the local Quaternary stratigraphy and glacial history. The exposures occur mainly in cutbank cliff sections along Moffat Creek. They are up to about 50 m high and reveal a sequence of glacial deposits overlying both glaciofluvial and glaciolacustrine deposits. Two exposures were briefly described. The first is located at field site 64 (E0606516; N5795133) where approximately 20 m of glacial sediments overlie about 10 m of glaciofluvial gravels and 20 m of glaciolacustrine sands, silts and clays (Figures 15 and 17). The second exposure (Figure 18) is at field site 87 where 5-10 m of glacial deposits overlie 10-15 m of glaciofluvial sediments with 2-3 m thick silty interbeds. The upper glacial sediments are locally covered by up to about 4 m of glaciolacustrine silts and clays.

Figure 17: thick glaciolacustrine sediments underlying till and glaciofluvial gravels on Moffat Creek

Figure 18: glaciofluvial gravels underlying till, capped by thin and discontinuous glaciolacustrine sediments

The presence of glaciolacustrine sediments underlying till in the Moffat Creek valley suggests that the drainage there was dammed by ice during the advance of glaciers into the region, probably by ice flowing down the Horsefly River valley. The glaciolacustrine clays are thick and extensive, typical of advance-phase glacial lakes in this part of central British Columbia. The advance of glaciers was relatively slow compared to ice retreat, allowing for the development of extensive, relatively long-lived, proglacial lakes. In a gravel pit just north of Horsefly townsite, a thick unit of steeply dipping sand and gravel beds, underlying till, may represent the foreset sequence of a delta deposited at the north end of this advance-phase, ice-dammed lake.

The sands and gravels that overlie the glaciolacustrine sediments in the Moffat Creek valley reflect glaciofluvial infilling of the lake basin as the ice gradually advanced into the area. Eventually, the glaciers entirely overrode the area and deposited a thick sequence of tills and associated glacigenic deposits. During deglaciation, which occurred relatively rapidly, ice stagnated in low-lying areas such as in the Moffat Creek valley. This resulted in stagnant-ice topography (Mh and Mm) and in the deposition of supraglacial

and englacial meltout tills and glaciofluvial deposits over previously deposited basal till sequences.

The presence of a thick valley fill sequence in the Moffat Creek valley is typical of most valleys that existed prior to the last glaciation. The net result of glaciation is the erosion of high areas that protrude into the ice and accumulation of glacial debris in depositional sinks such as pre-existing valleys. These valleys are often filled with glaciolacustrine and glaciofluvial sediments, as is the case in the Moffat Creek valley and probably also in other areas such as in the vicinity of the SE zone where the overburden is known from drilling to be exceptionally thick. The SE zone occurs in a valley that drops to the northeast into the Horsefly River valley and rises to the west and south. It is likely that ice flowing down the Horsefly River valley would have dammed drainage in this tributary valley and an advance phase glacial lake may have formed there. Sedimentation rates in such glacial lakes can be extremely high with debris coming from the drainage basin, unstable valley sides and, most importantly, from the advancing glacier itself.

In the Horsefly town site area, a late-glacial lake formed between ice retreating up into the Horsefly Lake and Horsefly River valleys, and ice stagnating in the Moffat Creek valley. Glaciofluvial outwash was deposited in front of the glacier retreating up the Horsefly River valley. The lake in the Horsefly town site area apparently drained to the northwest along the large meltwater channel that is now followed by the Beaver Valley road northwest of town. Drainage to the north, along the present course of Horsefly River, was still blocked by ice at this time. Once the lake drained, down cutting by both Horsefly River and Moffat Creek occurred in response to the lowered base level, resulting in valley incision and eventual stability at the modern floodplain levels and present day courses in both valleys.

ICE FLOW HISTORY

The Woodjam project area does not show well developed flutings and drumlins as is typical of most areas in the Interior Plateau of British Columbia. Instead the area is characterized mainly by glacial landforms such as till plains and low relief, rolling to hummocky moraine (Figures 19 and 20). A likely reason for the poor development of flutings and drumlins is the proximity of the area to a major ice divide of the Cordilleran Ice Sheet that existed during the last glaciation at a latitude of about 52 degrees north (Tipper, 1971; Clague, 1989). South of this ice divide, the Cordilleran Ice Sheet flowed mainly to the south while north of the divide, ice flow was northward. In the vicinity of past ice divides, ice flow indicators are commonly poorly preserved because basal ice in divide areas is relatively inactive. In addition, ice divides typically shift over time resulting in the erosion or deformation of previously formed ice-flow indicators. Another reason for the poor preservation of drumlins and flutings in the area, likely is the relatively widespread presence of younger blanketing sediments including ablation tills, creating ice stagnation topography, glaciofluvial deposits and glaciolacustrine sediments. The hilly areas in the east-central part are bedrock controlled.

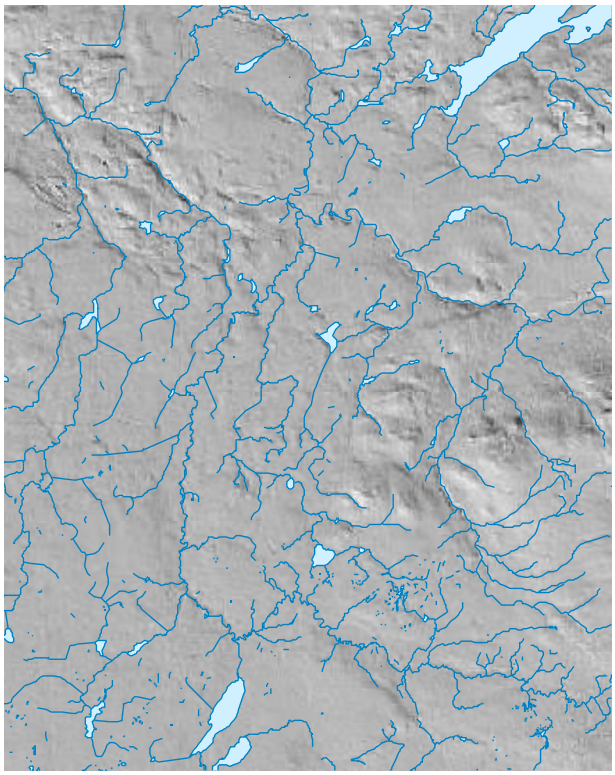

Figure 19: Digital elevation model (from BC TRIM data) of the Woodjam area illustrating the low relief in most of the region and lack of well defined drumlins and flutings.

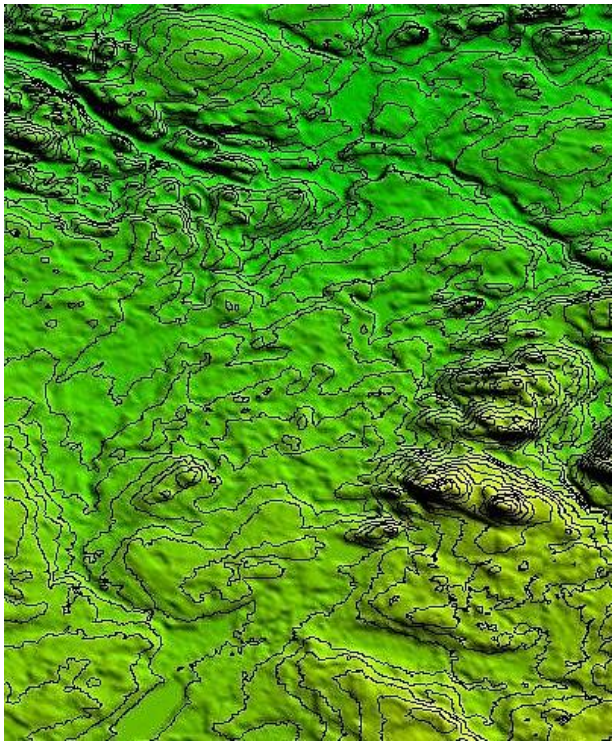

Figure 20: Topography of the Woodjam area overlain on a Shuttle-Radar-Topographic-Mission image illustrating the irregular topography and lack of ice-flow indicators; note the prominent meltwater channel at the top left, interpreted here to have drained the glacial lake that occupied the Horsefly townsite area; the high east-west trending ridges in the east-central part of the area are bedrock controlled.

Fortunately, however, some ice-flow indicators are present in the area including both larger landforms and smaller scale bedrock erosional features. In particular, the higher relief areas on the east side of the property show relatively well developed crag-and-tail ridges that trend west-northwest. Some of the higher bedrock hills in the area have till ridges preserved on their west-northwest sides resulting in well developed crag-and-tail forms (e.g. Figure 21). However, these larger features are relatively broad and mostly forest covered so precise orientations are not measureable on air photos. There are, however, a number of smaller crag-and-tail ridges visible on the air photos in several areas. They are especially apparent in clear-cut areas (Figure 22). The orientation of these features varies from 295° to 310° with an average of 303°. Some of the better preserved crag-and-tail features occur just south and southwest of the Takom zone. Their average trend is 297° as measured on the air photos (note: orthophoto rectification is required to accurately determine trends from air photos).

Figure 21: a prominent crag-and-tail ridge viewed from the southwest; a till ridge tails off to the northwest (left) from the top of the bedrock hill which is rounded and abraded on the southeast side.

Figure 22: small, northwest-trending, crag-and-tail ridge on the side of a larger hill (view from the north); glacially abraded bedrock exposures are common on the stoss end of these crag-and-tail ridges.

Striae were measured at 11 sites on exposed bedrock surfaces. Sites were selected that would not have been subject to flow deflections due to local topography (e.g. on hill tops rather than hill sides). The striae trend from 290° to 305° with an average of 297° (e.g. Figures 23 and 24). The sense of flow direction is provided mainly rat-tails and by stoss-lee relationships on outcrops (rounded and abraded surfaces on the stoss side and glacially plucked, rough surfaces on the lee-side). Striae are best preserved on fine-grained volcanic and sedimentary rocks and poorly preserved on intrusive rocks in the area. The trend of striae in the area is generally consistent with previously recorded sites. Four striae sites recorded during field mapping, range from 260° to 290° with an average of 280°. (Two additional sites are ignored here: one recorded as 60° with the comment of “possible striae” and the other with a trend of 90°). The trend of striae in the area also is generally consistent with the observed orientations of crag-and-tail landforms as described above.

Figure 23: striae on small outcrop indicating ice flow from right to left (295°); note – rough and broken fractures facing in the down-ice direction.

Figure 24: striae on flat outcrop indicating ice flow towards 305°; note – smooth and abraded surfaces facing in the up-ice direction (bottom of photo) versus broken fractures facing down-ice (top of photo).

In the southwest part of the project area there are a few locations where low linear ridges within till covered areas trend west to west-southwest (e.g. Figure 4). Although these landforms provide only very weak suggestions of ice flow, they may reflect a slight diversion of ice towards the west or west-southwest in the southwest part of the map area. However, the poor development of these landforms suggests that this flow event was either not strong or was overprinted by a later event and therefore dispersal effects are likely minimal. Evidence that there was an earlier west-southwest flow event is preserved in the striae record at two sites. One site occurs in the lee (northwest side) of a bedrock hill where striae trending 210° are present. The second occurs near the first site, on the lee-side of a small bedrock outcrop. Striae trending 290° occur on the exposed upper surface of the outcrop and striae trending 220° to 240° occur on the lee-side (northwest side) of the outcrop (Figure 25). The broad east-west trend of the bedrock-controlled hills in the east-central part of the area (Figure 20) may in part reflect ice erosion from this earlier westerly flow event. Taken together, these observations suggest that an earlier west to southwest flow event occurred prior to the west-northwest event that controlled the orientation of glacial landforms and striae records in the area.

Plouffe (2009) and Plouffe et al. (2009, 2010) also found evidence for an early westerly to southwesterly ice flow event in the region just south of the Woodjam project area. This early flow of ice out of the Cariboo Mountains was followed by a shift in flow to the south as the interior ice sheet thickened and an ice divide developed to the north.

Figure 25: Striae on the upper surface of a small outcrop trending 290°. A steep leeside (northwest facing) surface preserved a record of an earlier, southwesterly flow event trending about 230°.

In summary, there is good evidence in the Woodjam area for a west-northwest ice-flow event ranging from 290° to 310° and averaging about 300°. This flow was probably a result of ice coming from the west out of the mountains that was deflected northwestward by ice moving northward in the plateau. This flow event was strong enough to create good northwesterly ice flow indicators in the project area and is interpreted to be the dominant dispersal direction.

In the southeastern part of the area, there is weak landform evidence that the glaciers there may have flowed more towards the west and possibly the west-southwest, probably at an earlier time. A west-southwest flow in the south part of the area may have resulted from an earlier northward shift in the location of the plateau ice divide. Striae data at two leeside sites (ranging from 210° to 240°) are consistent with this and suggest that an older southwesterly flow may have also influenced the east part of the area. This event predates the west-northwest flow and is not reflected in any of the larger landforms so would likely have little influence on glacial dispersal. However, deep subsurface tills may have been transported by this earlier flow.

IMPLICATIONS FOR INTERPRETATION OF SOIL GEOCHEMISTRY

The geochemistry of near surface soils is often considered to reflect the geochemistry of the underlying bedrock, although it is well known that many other factors are involved such as overburden thickness, origin and permeability. Although residual soils and thin colluvial deposits do reflect the underlying bedrock, most soils types in glaciated areas do not. In these areas, the origin of the parent material in which the soil is developed is often the strongest controlling factor on the soil geochemistry and it is critical to understand the genesis of the sampled material in order to effectively interpret geochemical exploration results. The reason for this is that in glaciated areas there are a wide variety of surficial sediments, that may be transported into the area of interest, that do not reflect the local geology. For example, glaciolacustrine and glaciofluvial sediments may be transported long distances by glacial meltwaters and deposited in an area with little or no incorporation of local bedrock. Even where these sediments are thin, they tend to mask the underlying bedrock and any associated mineral deposits that might be present. Conventional sampling of soils within these sediments would not lead to the detection of the buried mineralization.

Fortunately, glaciated areas do contain widespread deposits of basal till that can be very useful for locating buried mineralization. Basal tills are formed by erosion of bedrock at the glacier base and redeposition, usually within relatively short transport distances. In addition, due to glacial dispersal processes, basal tills leave relatively large geochemical footprints in comparison to the size of the original bedrock source. As a consequence, these basal till sampling programs require significantly fewer samples than do soil programs. Basal till geochemical anomalies are also easier to interpret and can be more easily traced to source than soil anomalies. For these reasons and others, basal tills are widely considered to be an ideal sample media in glaciated areas. Plouffe et al. (2010) provide an excellent example and summary of the methodology used in till geochemical surveys for a region just south of the Woodjam project area. For a successful basal till geochemistry program, it is critical to avoid sampling other glacially transported sediments such as englacial and supraglacial ablation tills, which typically have large transport distances, as well as other sediment types such as glaciolacustrine and glaciofluvial deposits.

The wide variety of surficial sediments present in the Woodjam project area will make interpretation of soil geochemistry results challenging there. Parceling of the results by sediment type may be useful, especially if sample descriptions were made in the field. Samples taken in areas with thin colluvial or morainal veneers over bedrock will be the easiest to interpret as these sediment types typically reflect nearby bedrock sources, with short transport distances, either downslope or down-ice. Soil geoechemical exploration programs in glaciated areas are most effective where these types of sediments dominate.

In areas mapped as morainal blankets, the soil geochemistry will largely reflect glacial transport but a number of factors should be considered. First, surface reworking of morainal deposits by eluvial, colluvial, and biogenic processes is common down to depths of about 10 cm to 1 m. These processes generally result in removal of silts and clays in the near surface and a consequential decrease in metal concentrations in comparison with the underlying unaltered parent materials. In some case metal concentrations in this altered surface soil layer can be higher than the parent material creating a “false anomaly”. Notes on soil texture of the samples, if available, may be useful in detecting these altered samples or false anomalies.

Another factor to consider in the Woodjam area is the widespread presence of organic soils. Organics accumulate in soils by a wide variety of processes so it is best to avoid them unless a program is designed specifically to address their complicated origins. Organics often attract metals that have been transported by hydromorphic processes through the soil or, as is the case in most peat bogs, they may be hydrologically isolated from their surroundings and receive their nutrients mainly from precipitation (ombrotrophic soils). As a result, organic soils may be either enriched or depleted in metals, in comparison to the underlying mineral soils. Organic soils usually develop in wet, poorly drained sites such as closed depressions overlying clay-rich sediments with low permeability. In the Woodjam area they commonly occur in association with glacial deposits, especially in low areas within rolling and hummocky moraine. It may be possible to parcel samples from these areas into groups for interpretation purposes.

The widespread presence of glaciofluvial sediments with morainal sediments in the Woodjam area is an additional consideration. These sediments occur as discrete mappable units such as eskers, kames, and outwash terraces but they also occur as discontinuous veneers interspersed with morainal sediments, especially in areas of rolling and hummocky moraine. Even in areas where basal tills are common, washing by meltwater during ice retreat often creates a discontinuous surface veneer of sandy or gravelly soil that is geochemically distinct from the underlying till. These types of washed sediments may be recognized by detailed sample descriptions.

In summary, conventional soil geochemical sampling in the Woodjam area will be most effective where bedrock is relatively close to surface and the surficial sediments are mainly colluvial and morainal veneers. This is the case in the more hilly topography in the east-central part of the area. Likewise, in areas mapped as morainal blankets, soil geochemistry may be relatively useful if basal tills are distinguished from ablation

(englacial and supraglacial) tills, glaciofluvial sediments and organic soils, all of which are widely interspersed with the morainal deposits, especially in areas of rolling to hummocky topography that is typical of much of the southern part of the Woodjam area.

The thick Quaternary valley fill along the Moffat Creek valley and in the valley around the SE zone will make surface geochemistry in those areas difficult to interpret. Conventional geochemical soil sampling in areas where extensive fluvial and glaciofluvial sediments have been mapped will be of little value. Likewise, much of the northern part of the property has a cover of glacial lake sediments which will make soil sampling of little or no value there. Soil samples that have been collected in any of these areas should be, at a minimum, treated as separate population in the data interpretation.

A basal till geochemical sampling program would be effective for identifying buried mineralization in much of the Woodjam property area as basal tills are widespread in the area. Basal tills can often be located below other sediment types if a program is developed to specifically target them as the sample media. Since basal tills create large, linear, dispersal anomalies, significantly fewer basal till samples are required and they can be more easily traced to source than with conventional soil samples. The southern and western parts of the Woodjam project area have good potential for a basal till geochemistry program.

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Appendix 17:
Archaeology Preliminary Field Reconnaissance Studies Report

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April 7, 2010

Gold Fields Canada Exploration
400-1155 Robson Street
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PH: 604.605.8735
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Attention: Ross Sherlock

Re: **Archaeological Preliminary Field Reconnaissance Studies for Proposed Winter Drill Areas**

Terra Archaeology Limited conducted Preliminary Field Reconnaissance (PFR) Studies for 38 proposed development locations. These include drill sites and access roads proposed for winter development in the vicinity of Woodjam Creek. Refer to the attached maps for development locations.

The survey crew conducted pedestrian traverses. Crew members were spaced at approximately five meters dependent upon surface visibility and archaeological site potential. All ground exposures encountered were inspected for cultural materials and all trees (all species standing or fallen, including stumps) along survey transects were examined for indications of cultural modification. Survey was intensified in areas of perceived higher archaeological potential based on topographic and hydrological terrain features observed in the field. Archaeological potential was assessed on: proximity to water, food resources, slope, drainage, forest cover, presence of topographic landforms commonly associated with known archaeological sites in the region (i.e. terraces, knolls, breaks-in-slope) and local knowledge.

One development (Drill site D) was assessed as having moderate to high potential for the presence of archaeological resources. A bench landform overlooking a small lake to the south as well as Deerhorn Creek to the west was observed in the western portion of the development area. This area displays level, well-drained terrain associated with the lake and creek. The recently upgraded road which traverses this area also provide extensive surface and subsurface soil exposures which could not be adequately examined at the time of this assessment due to snow cover and frozen ground. All of the other developments assessed are considered to have low archaeological potential. Descriptions and archaeological potential assessments for each of the 38 proposed developments are provided in Table 1.

Table 1: Summary of Developments Assessed

Drill Site/ Develop-ment ID	Date of Field Visit	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
A	Feb. 5, 2010	Low	Drill Site A is located within an existing clear-cut. The terrain slopes gently down to the southeast towards a poorly-drained lowland. No hydrological features were noted within or immediately adjacent to the study area. Drill Site A displays low archaeological potential based on the sloped or poorly-drained nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Date of Field Visit	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
B	Feb. 5, 2010	Low	Drill Site B encompasses an elongated area extending 10 meters beyond either side of an existing road. Terrain in this development is variable. Moderately undulating terrain with various aspects was observed. Low-lying areas were found to be poorly-drained. No hydrological features were noted within or immediately adjacent to the study area. Drill Site B displays low archaeological potential based on the undulating, sloped and poorly drained nature of the terrain and lack of hydrological features.	No
C	Feb. 5, 2010	Low	Drill Site C is located within an existing clear-cut and is characterized as gently to moderately sloping with a western aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site C displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
D	Feb. 5, 2010	Moderate-High	Drill Site D encompasses a large area, buffering a recently upgraded access road by 100 m on all sides. Terrain within this site is variable. It was observed to be moderately undulating, low-lying and poorly drained or level and well-drained. A bench landform overlooking a small lake to the south as well as Deerhorn Creek to the west was observed in the western portion of the development area. This portion of Drill Site D displays moderate to high archaeological potential based on the presence of flat, well-drained terrain noted in association with a small un-named lake and Deerhorn Creek. The proponent has decided to refine the development area at this time and is aware that additional archaeological assessment (conducted during frost and snow-free conditions) will be required prior to the commencement of any land altering activities in this area. The recently upgraded road has provided extensive subsurface soil exposure. It is also recommended that the road surface be subject to careful examination in snow-free conditions.	Yes
E	Feb. 5, 2010	Low	Drill Site E is located at the junction of three access roads within an existing clear-cut. The proposed drill sites area is located entirely within existing road disturbance. No hydrological features were observed within or immediately adjacent to the study area. Drill Site E displays low archaeological potential based on the presence of significant ground disturbance and lack of hydrological features in the area.	No
F	Feb. 5, 2010	Low	Drill Site F is located immediately adjacent to an existing access road within a forestry clear-cut. The site is characterized as moderately to steeply sloping and undulating. No hydrological features were noted within or immediately adjacent to the study area. Drill Site F displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
H	Feb. 26, 2010	Low	Drill Site H – is located in an old clear-cut and is characterized as gently sloping with an overall north-northwestern aspect. Some areas of gently undulating terrain were also observed. No hydrological features were noted within or immediately adjacent to the study area. Drill Site H displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Date of Field Visit	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
I	Feb. 26, 2010	Low	Drill Site I is located within an old forestry clear-cut. The site varies from moderately undulating to gently sloping with a west-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site I displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No
Ia	Feb. 26, 2010	Low	Drill Site Ia is located in an old forestry clear-cut and is characterized as moderately undulating. No hydrological features were noted within or immediately adjacent to the study area. Drill Site Ia displays low archaeological potential based on the moderately undulating nature of the terrain and lack of hydrological features.	No
Ib	Feb. 26, 2010	Low	Drill Site Ib is located within an old forestry clear-cut and is characterized as moderately undulating. No hydrological features were noted within or immediately adjacent to the study area. Drill Site Ib displays low archaeological potential based on the moderately undulating nature of the terrain and lack of hydrological features.	No
K	Feb. 26, 2010	Low	Drill Site K is located on an existing road had has sustained significant ground disturbance. The area ranges from moderately undulating to flat and poorly drained. No hydrological features were noted within or immediately adjacent to the study area. Drill Site K displays low archaeological potential based on the undulating and poorly drained nature of the terrain as well as the lack of hydrological features.	No
L	Feb. 26, 2010	Low	Drill Site L is located within an existing clear-cut and is characterized as gently to moderately sloping with a northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site L displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
M	Feb. 26, 2010	Low	Drill Site M is located entirely within an existing quarry pit and is characterized as moderately undulating. No hydrological features were noted within or immediately adjacent to the study area. Drill Site M displays low archaeological potential based on the undulating nature of the terrain, lack of hydrological features as well as the existing significant ground disturbance.	No
DH10 A & E	Mar. 8, 2010	Low	Drill Site DH10 A & E is located on an existing road and is as sloping with a west-southwestern aspect. No hydrological features were observed within or immediately adjacent to the study area. Drill Site DH10 A & E displays low archaeological potential based on the gently sloping nature of the terrain, lack of hydrological features as well as the existing significant ground disturbance caused by road construction.	No
DH10B	Mar. 8, 2010	Low	Drill Site DH10B is located within forested terrain and is gently sloping with an overall south-southwestern aspect. Broken/uneven and poorly drained terrain was also observed. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 B displays low archaeological potential based on the gently sloped, broken/uneven and poorly drained nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Date of Field Visit	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10B Access Road	Mar. 8, 2010	Low	The DH10B Access Road is gently sloping with both southern and northwestern aspects. Areas of ground saturation were observed. No hydrological features were observed within or immediately adjacent to the study area. The DH10C Access Road displays low archaeological potential based on the sloped and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10C	Mar. 8, 2010	Low	Drill Site DH 10C is located within forested terrain and is characterized as gently sloping with a southern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 C displays low archaeological potential based on the sloped nature of the terrain and the lack of hydrological features.	No
DH10C Access Road	Mar. 8, 2010	Low	The DH10C Access Road is characterized as gently sloping and gently undulating with various aspects. No hydrological features were noted within or immediately adjacent to the study area. The DH10C Access Road displays low archaeological potential based on the sloped and undulating nature of the terrain as well as the lack of hydrological features.	No
DH10D	Mar. 8, 2010	Low	Drill Site DH10D is located within forested terrain and is moderately undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 D displays low archaeological potential based on the undulating and poorly drained nature of the terrain as well the lack of hydrological features.	No
DH10D Access Road	Mar. 8, 2010	Low	The DH10D Access Road is situated within moderately undulating terrain with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The DH10D Access Road displays low archaeological potential based on the undulating and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10F	Mar. 8, 2010	Low	Drill Site DH10F is located within forested terrain and is gently sloping with a south-southwestern aspect. No hydrological features were identified within or immediately adjacent to the study area. Drill Site DH10 F displays low archaeological potential based on the gently sloping nature of the terrain and the lack of hydrological features.	No
DH10F Access Road	Mar. 8, 2010	Low	The DH10F Access Road is situated within terrain ranging from gently undulating to gently sloping with various aspects. No hydrological features were identified within or immediately adjacent to the study area. The DH10D Access Road displays low archaeological potential based on the undulating and sloping nature of the terrain as well as the lack of hydrological features.	No
DH10G	Mar. 8, 2010	Low	Drill Site DH10G is located on an existing road and is situated within moderately undulating terrain with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 G displays low archaeological potential based on the disturbed, undulating and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10H	Mar. 8, 2010	Low	Drill Site DH10H is located within forested terrain and is gently to moderately sloping with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 H displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Date of Field Visit	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10H Access Road	Mar. 8, 2010	Low	The DH10H Access Road is gently to moderately sloping and undulating with both northern and north-northwest aspects. No hydrological features were noted within or immediately adjacent to the study area. The DH10H Access Road displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No
DH10I	Mar. 8, 2010	Low	Drill Site DH10I is located within forested terrain and is characterized as flat, low-lying and poorly drained. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 I displays low archaeological potential based on the low-lying and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10I Access Road	Mar. 8, 2010	Low	The DH10I Access Road is situated within moderately undulating terrain with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The DH10I Access Road displays low archaeological potential based on the undulating and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10J	Mar. 8, 2010	Low	Drill Site DH10J is located within forested terrain and is characterized as moderately sloping with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 J displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10J Access Road	Mar. 8, 2010	Low	The DH10J Access Road is characterized as gently to moderately sloping with an overall northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The DH10J Access Road displays low archaeological potential based on the sloped nature of the terrain and the lack of hydrological features.	No
DH10K	Mar. 8, 2010	Low	Drill Site DH10K is located within forested terrain which is gently sloping and gently undulating with an overall southern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 K displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No
DH10K Access Road	Mar. 8, 2010	Low	The DH10K Access Road is gently sloping and gently undulating with an overall southern aspect. No hydrological features were noted within or immediately adjacent to the study area. The DH10K Access Road displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No
DH10L	Mar. 8, 2010	Low	Drill Site DH10L is located within forested terrain and is characterized as moderately sloping down and gently undulating with an overall southern aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 L displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No
DH10L Access Road	Mar. 8, 2010	Low	The DH10L Access Road is situated within terrain that is gently to moderately sloping and gently undulating with an overall southern aspect. No hydrological features were identified within or immediately adjacent to the study area. The DH10L Access Road displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Date of Field Visit	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10M	Mar. 8, 2010	Low	Drill Site DH10M is located in forested terrain and is characterized as gently sloping and poorly drained with a slight northern aspect. A small drainage and an associated wetland were observed approximately 15 m north of the study area. Drill Site DH10 M displays low archaeological potential based on the poorly drained nature. No raised, level or well-drained landforms were observed in association with the drainage observed.	No
DH10M Access Road	Mar. 8, 2010	Low	The DH10M Access Road is situated within gently to moderately sloping terrain with various aspects. Areas of ground saturation were observed. The DH10M Access Road displays low archaeological potential based on the sloped and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10N	Mar. 8, 2010	Low	Drill Site DH10N is located within forested terrain and is situated within terrain that is gently sloping and gently undulating with an overall western aspect. No hydrological features were noted within or immediately adjacent to the study area. Drill Site DH10 N displays low archaeological potential based on the sloping and undulating nature of the terrain as well as the lack of hydrological features.	No
DH10N Access Road	Mar. 8, 2010	Low	The DH10N Access Road is characterized as moderately undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The DH10N Access Road displays low archaeological potential based on the undulating and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10O	Mar. 8, 2010	Low	Drill Site DH10O is located on an existing road within terrain that is gently to moderately sloping with a southwestern aspect. No hydrological features were observed within or immediately adjacent to the study area. Drill Site DH10 O displays low archaeological potential based on the disturbed and sloped nature of the terrain as well as the lack of hydrological features.	No

Although no pre-1846 archaeological resources were identified in the areas assessed, an Archaeological Impact Assessment (AIA) conducted under the authority of a *Heritage Conservation Act* Inspection permit is recommended for Drill Site D. This area exhibits archaeological potential warranting subsurface testing and thorough examination of soil exposures in snow-free conditions. The proponent has indicated that the Drill Site D development area will be refined; however development plans have not yet been finalized. The necessity for an AIA or additional work may be reassessed through map review or a second PFR prior to any ground-disturbance.

Archaeological potential in the remainder of the areas subject to PFR is considered low, therefore no further archaeological investigations are recommended for these areas provided current development boundaries are not altered to include any un-assessed areas.

Although the potential presence of archaeological sites is considered low in areas not recommended for AIA, no archaeological assessment can completely eliminate the risk of encountering archaeological resources. If archaeological materials are encountered during any phase of development, all operations in the locality should be suspended until Archaeological Planning and Assessment, as well as the relevant First Nation(s) have been contacted for direction. Any cultural materials which pre-date A.D. 1846 are protected by the Heritage *Conservation Act* of British Columbia.

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This assessment addresses the potential for the existence of physical evidence of past human activity and does not encompass traditional use or other heritage concerns of the First Nations communities. This information should be solicited directly from the First Nations.

Please feel free to contact me if you have any questions regarding these assessments, our recommendations or the archaeological process.

Yours truly,
TERRA ARCHAEOLOGY LIMITED

Sarah Kamp, RPCA

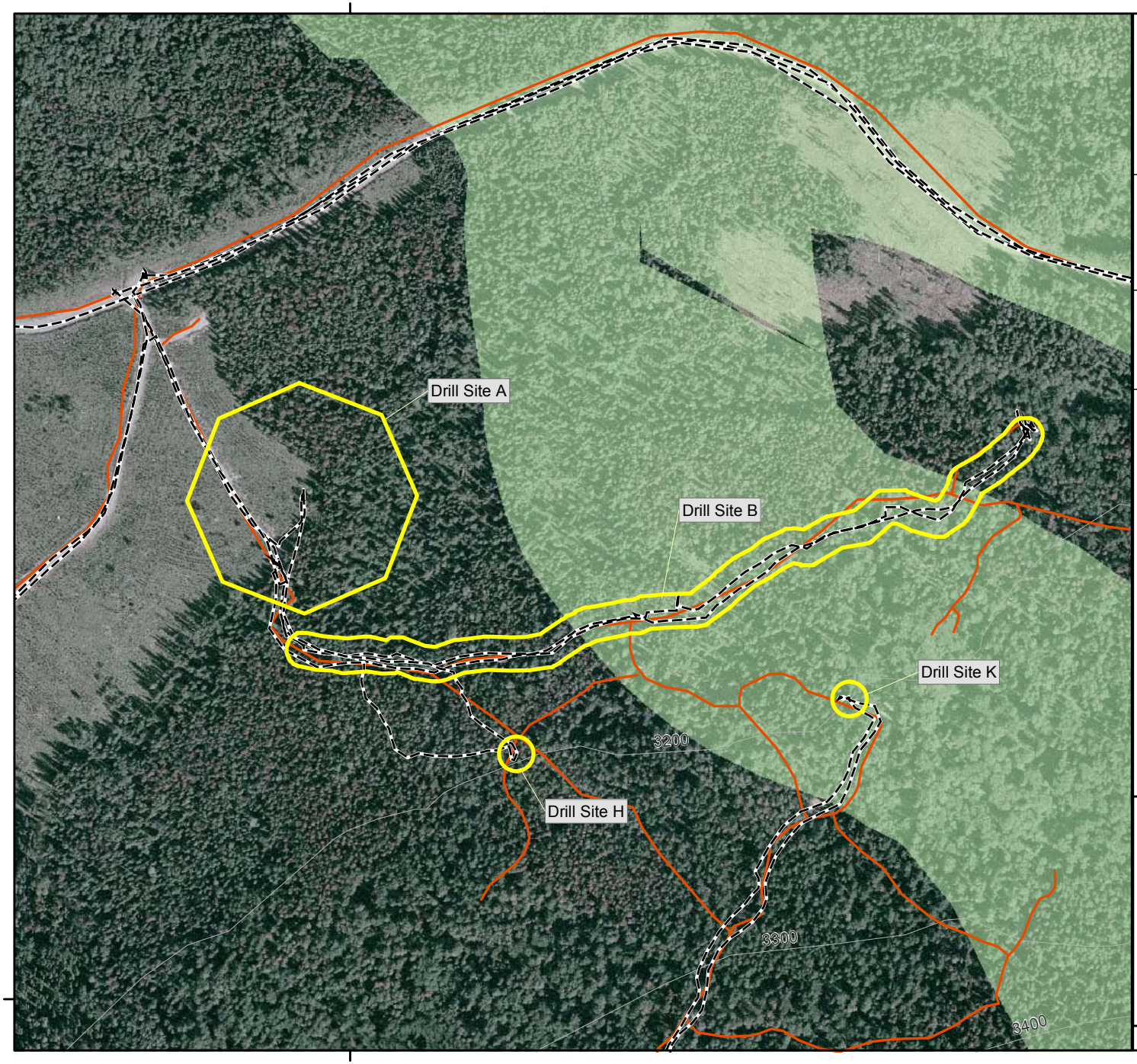


Figure 1. Woodjam Project

Terra ID: 09-0471
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

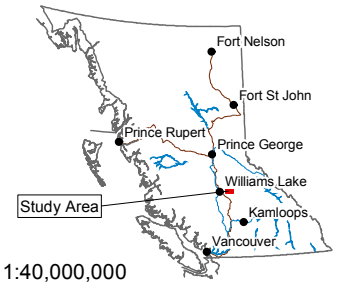
N

1:5,000

0 50 100 150 200

Meters

- Drill Sites
- Survey Transects
- Archaeology Sites
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- High Archaeological Potential
- High/Moderate Arch Potential



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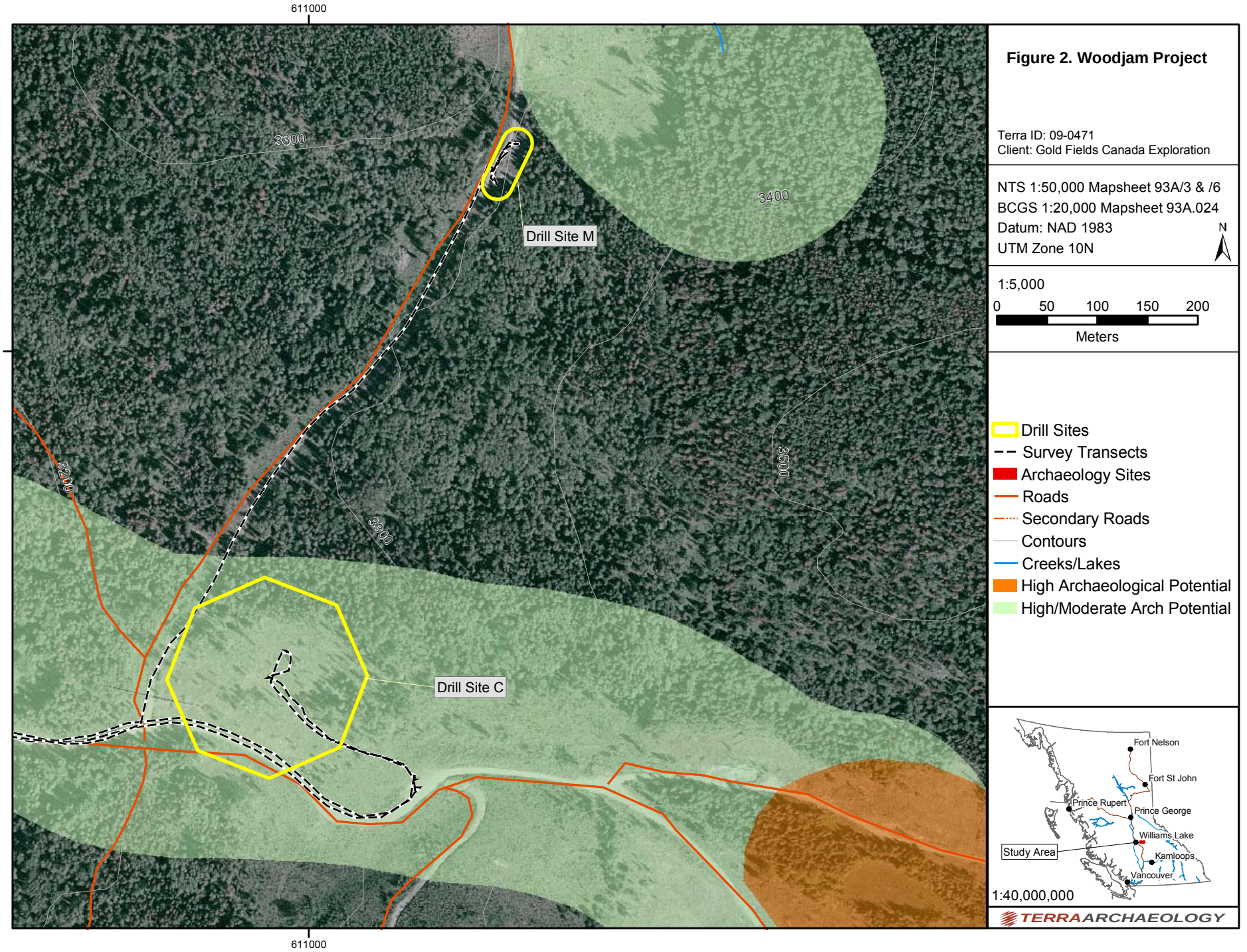

Figure 2. Woodjam Project

Terra ID: 09-0471
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:5,000
0 50 100 150 200
Meters

- Drill Sites
- Survey Transects
- Archaeology Sites
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- High Archaeological Potential
- High/Moderate Arch Potential

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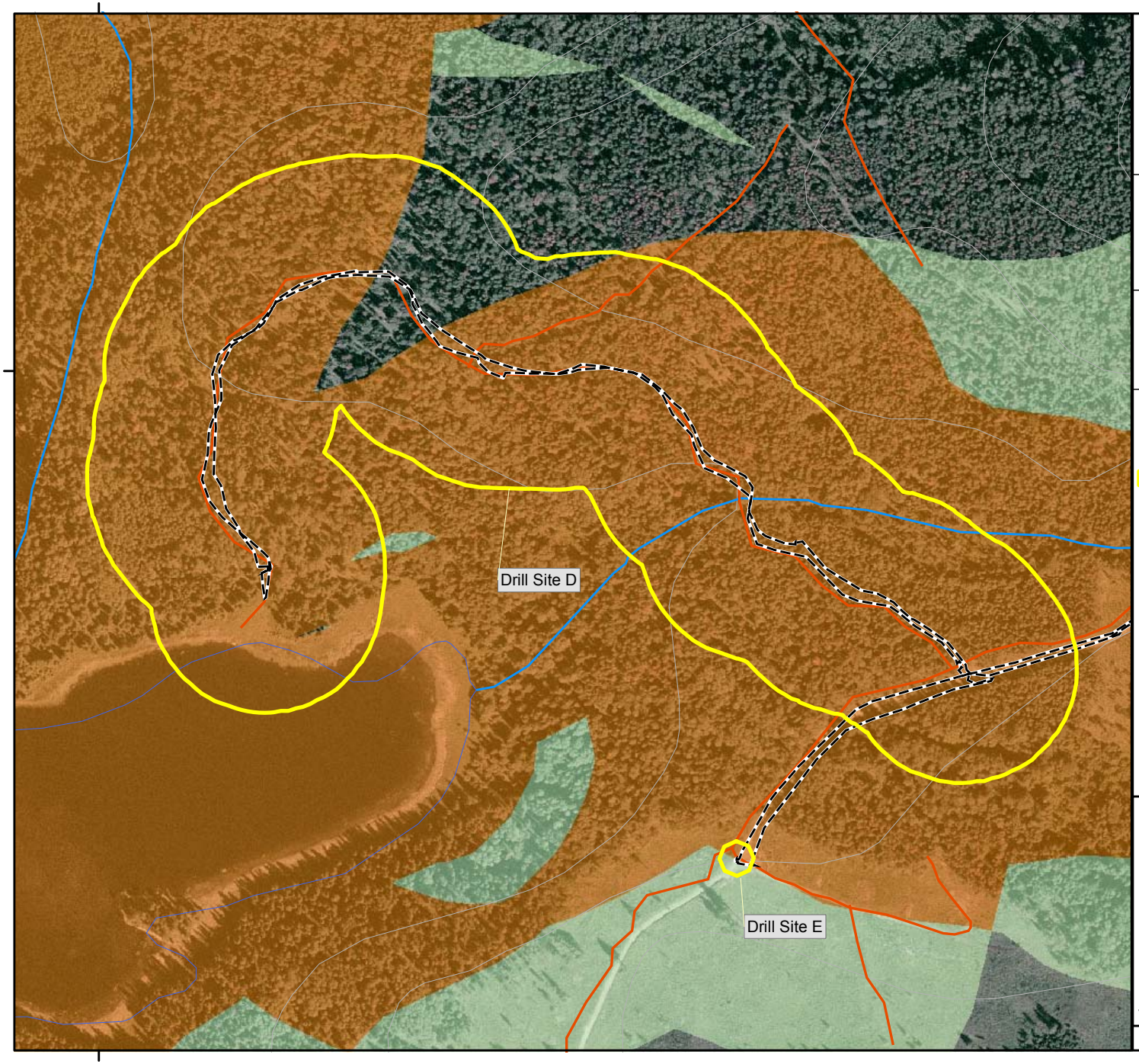


Figure 3. Woodjam Project

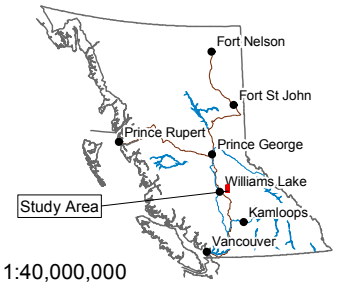
Terra ID: 09-0471
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:5,000
0 50 100 150 200
Meters

- Drill Sites
- Survey Transects
- Archaeology Sites
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- High Archaeological Potential
- High/Moderate Arch Potential



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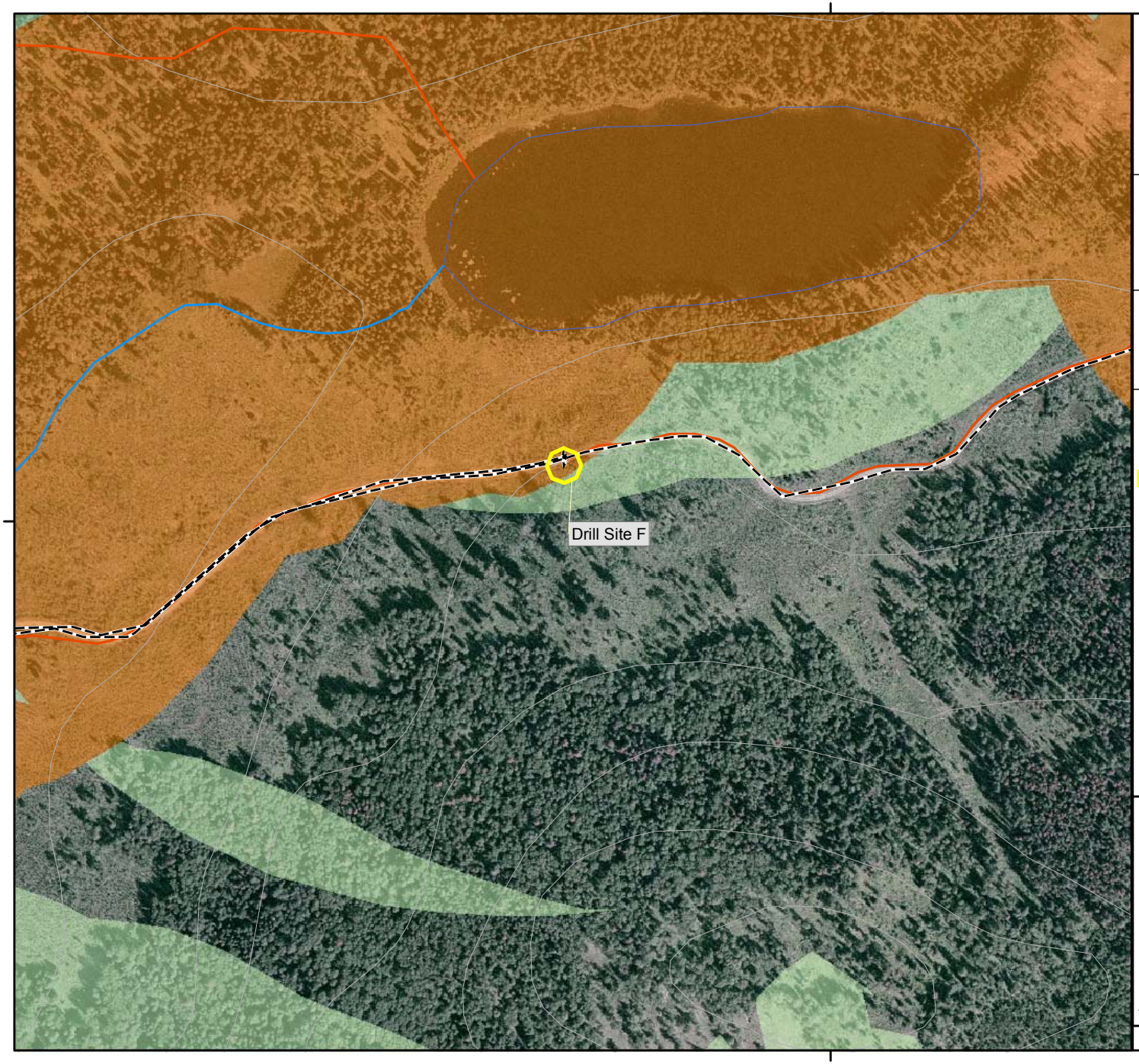

Figure 4. Woodjam Project

Terra ID: 09-0471
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:5,000

0 50 100 150 200

Meters

- Drill Sites
- Survey Transects
- Archaeology Sites
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- High Archaeological Potential
- High/Moderate Arch Potential

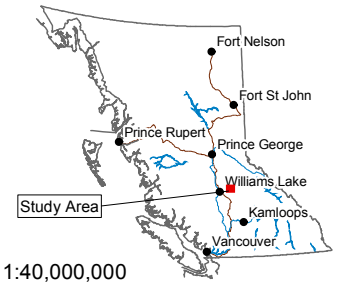

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Figure 5. Woodjam Project

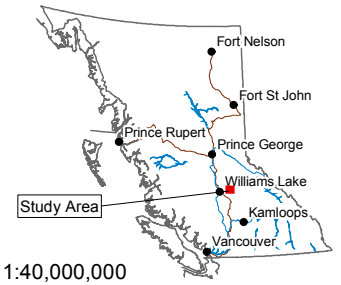
Terra ID: 09-0471
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:5,000
0 50 100 150 200
Meters

- Drill Sites
- Survey Transects
- Archaeology Sites
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- High Archaeological Potential
- High/Moderate Arch Potential



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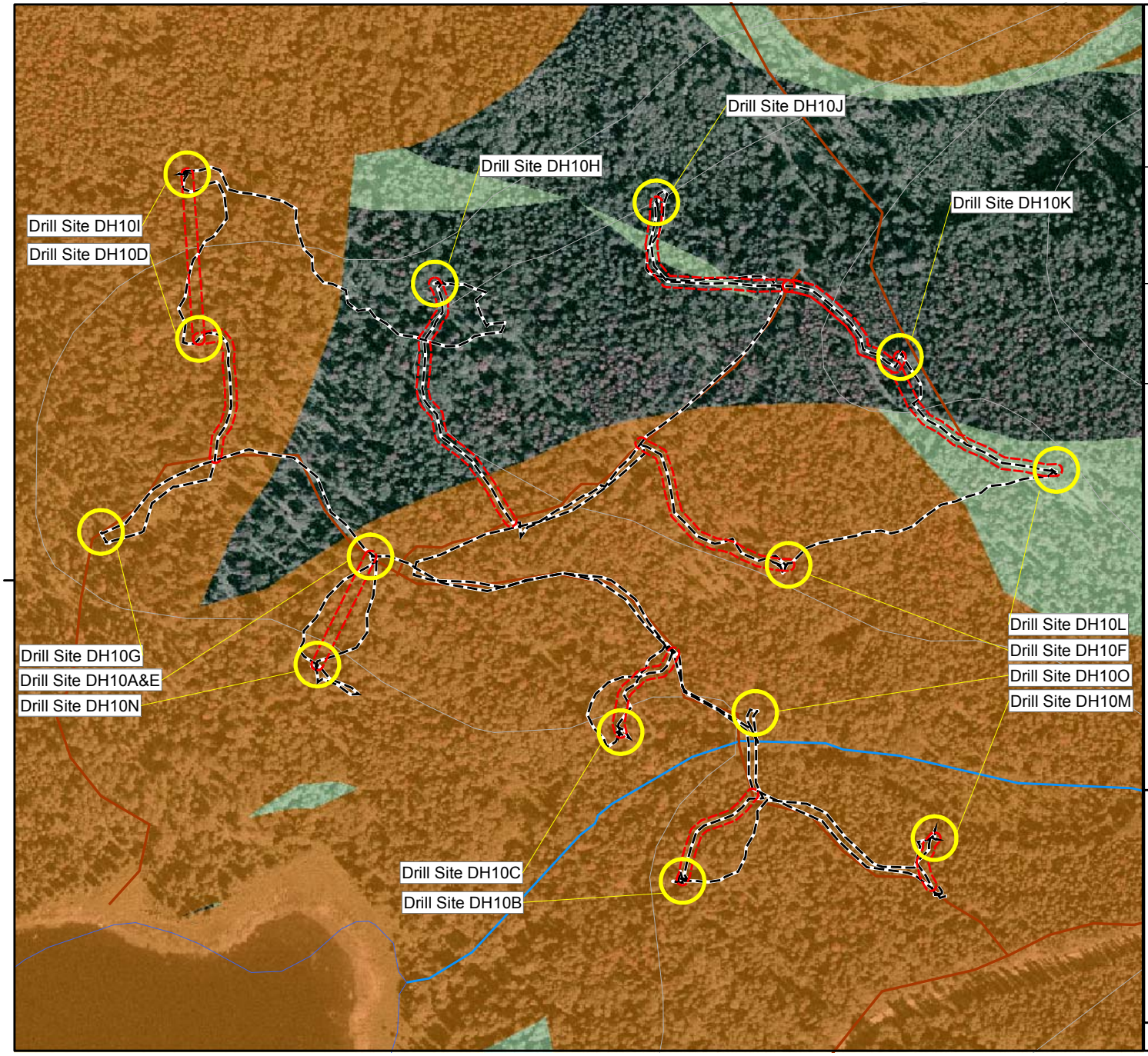


Figure 6. Woodjam Project

Terra ID: 09-0471
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

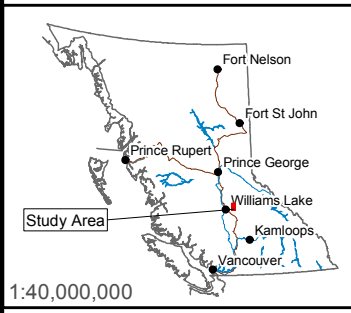
N

1:4,000

0 40 80 120 160

Meters

- Drill Sites
- DH10 Access Roads
- Survey Transects
- Archaeology Sites
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- High Archaeological Potential
- High/Moderate Arch Potential



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August 18, 2010

Gold Fields Canada Exploration
400-1155 Robson Street
Vancouver, BC
V6R 1B5
PH: 604.605.8735
FAX: 604.605.8615

Attention: Ross Sherlock

Re: **May 7, 2010 Archaeological Preliminary Field Reconnaissance Studies – Proposed Deerhorn and Spellbound Drill Areas**

On May 7th of 2010 Terra Archaeology Limited, with the assistance of Leo Michel of the Williams Lake Indian Band, conducted Preliminary Field Reconnaissance (PFR) Studies for 57 proposed development locations. These include drill sites and access roads in the Deerhorn and Spellbound Locales, in the vicinity of Deerhorn Creek and Woodjam Creek. Refer to the attached maps for development locations. Developments previously assessed in these locations are displayed on the attached maps for reference.

Development areas were selected for survey based upon proponent request. A 20 m diameter potential impact zone was examined at each drill site location, and an eight meter wide right-of-way was examined for all proposed access roads. The field crew conducted pedestrian traverses designed to ensure comprehensive survey coverage of these areas. Crew members were spaced no more than five meters apart dependent upon surface visibility and archaeological site potential. All ground exposures encountered were inspected for cultural materials and all trees (all species standing or fallen, including stumps) along survey transects were examined for indications of cultural modification. Survey was intensified in areas of perceived higher archaeological potential based on topographic and hydrological terrain features observed in the field. Archaeological potential was assessed on: proximity to water, food resources, slope, drainage, forest cover, presence of topographic landforms commonly associated with known archaeological sites in the region (i.e. terraces, knolls, breaks-in-slope) and local knowledge.

All 57 proposed developments were assessed as having low potential for the presence of archaeological resources. Descriptions and archaeological potential assessments for each of the 57 proposed developments are provided in Table 1.

Table 1: Summary of Developments Assessed

Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
SB10-Q	Low	The area is located within an existing forestry cut block and is gently to moderately sloping with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
SB10-O	Low	The area is moderately undulating with poorly drained lowlands. No hydrological features were identified within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating and poorly drained nature of the terrain and lack of hydrological features.	No
SB10O Access Road	Low	The area is moderately to steeply undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating and poorly drained nature of the terrain and lack of hydrological features.	No
SB10-P	Low	The area is moderately sloping with an eastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SB10-P Access Road	Low	The area ranges from moderately undulating to steeply sloping. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating and sloped nature of the terrain and lack of hydrological features.	No
SB10-M	Low	The area is gently to moderately sloping with a southern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SB10-M Access Road	Low	The area is gently to moderately sloping with a southern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SB10-N	Low	The area is flat to gently sloping with broken/uneven and slightly poorly drained terrain observed. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
SB10-N Access Road	Low	The area is gently sloping with a southern aspect. Broken/uneven and poorly drained terrain was observed throughout. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
SB10-R	Low	The area is gently sloping and homogenous, with a northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped and homogenous nature of the terrain as well as the lack of hydrological features.	No
SB10-S	Low	The area ranges from flat to moderately sloping and is hummocky throughout. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the hummocky nature of the terrain and lack of hydrological features.	No
SB10-S Access Road	Low	Portions of this area are moderately sloping with a northern aspect. Low-lying areas are flat, hummocky and poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped, hummocky and poorly drained nature of the terrain as well as the lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-AA	Low	The area is gently sloping with an overall north-northwestern aspect. Broken/uneven and poorly drained terrain was observed throughout. A small drainage was noted approximately 30 meters southeast of the drill site area. This development displays low archaeological potential based on the sloped, broken/uneven and poorly drained nature of the terrain. No raised, well-drained landforms were observed in association with the small drainage identified to the southeast of the study area.	No
DH10-AA Access Road	Low	The area is gently sloping and homogenous with a north-northwestern aspect. A small drainage was noted approximately 30 meters southeast of the area assessed. The development displays low archaeological potential based on the sloped, broken/uneven and poorly drained nature of the terrain. No raised, well-drained landforms were observed in association with the small drainage identified to the southeast of the study area.	No
DH10-F	Low	The area is gently undulating with broken/uneven and somewhat poorly drained terrain. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10-F Access Road	Low	The area is gently undulating with broken/uneven and somewhat poorly drained terrain. No hydrological featured were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DG10-AG	Low	Overall, this drill site is flat with areas of broken/uneven terrain. A small lake was observed approximately 100 meters southwest of the drill site area. The development displays low archaeological potential based on the broken/uneven nature of the terrain. No raised, well-drained landforms were observed in association with the small lake identified southwest of the study area.	No
DH10-AG Access Road	Low	The area is gently sloping with a southeastern aspect. Broken/uneven terrain was observed throughout. A small lake was observed approximately 100 meters southwest of the area assessed. The area displays low archaeological potential based on the broken-uneven nature of the terrain. No raised, well-drained landforms were observed in association with the small lake identified southwest of the study area.	No
DH10-V	Low	The area is gently undulating and broken/uneven. Loy-lying areas are observed to be poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10-V Access Road	Low	The area is gently undulating, broken/uneven and somewhat poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10-U	Low	This drill site partially occupies a flat-topped knoll surrounded by broken/uneven terrain. No hydrological features were noted in association with the knoll feature. The area displays low archaeological potential based on the broken/uneven nature of the terrain and lack of hydrological features.	No
DH10-U Access Road	Low	The area is moderately undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating and poorly drained nature of the terrain as well as the lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-Y	Low	Overall, this drill site is flat with areas of broken/uneven terrain. Low-lying areas were observed to be poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10-P	Low	Overall, this drill site is flat with areas of broken/uneven terrain identified. Low-lying areas were observed to be poorly drained. A small lake was noted approximately 120 meters south of the study area. This drill site displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain. No raised, well-drained landforms were observed in association with the small lake identified south of the study area.	No
DH10-P Access Road	Low	Overall, this proposed road is situated within flat terrain. Areas of broken/uneven ground were identified, and low-lying areas were observed to be poorly drained. A small lake was noted approximately 120 meters south of the study area. This drill site displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain. No raised, well-drained landforms were observed in association with the small lake identified south of the study area.	No
DH10-X	Low	This drill site displays broken/uneven terrain with a south-southwestern aspect. Some areas of ground saturation were observed. A small lake was noted approximately 140 meters south of the study area. This drill site displays low archaeological potential based on the sloped, broken/uneven and poorly drained nature of the terrain. No raised, well-drained landforms were observed in association with the small lake identified south of the study area.	No
DH10-X Access Road	Low	The proposed road is situated within terrain that is gently undulating and broken/uneven. A small lake was noted approximately 140 meters south of the study area. The access road displays low archaeological potentials based on the undulating, broken/uneven nature of the terrain. No raised, well-drained landforms were observed in association with the small lake identified south of the study area.	
DH10-W	Low	The area is gently sloping and homogenous with a western aspect. A dry oxbow lake was noted approximately 50 meters east of the study area. The area displays low archaeological potential based on the sloped and homogenous nature of the terrain. No raised, well-drained landforms were observed in association with the dry oxbow lake identified east of the study area.	No
DH10-W Access Road	Low	The area is gently sloping and homogenous with a western aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped and homogenous nature of the terrain as well as the lack of hydrological features.	No
DH10-T	Low	The area is moderately undulating with broken/uneven terrain observed throughout. A small drainage was noted approximately 100 meters west of the study area. The area displays low archaeological potential based on the undulating, broken/uneven nature of the terrain. No level, raised, well-drained landforms were observed in association with the small drainage identified west of the study area.	No
DH10-T Access Road	Low	This drill site location is moderately undulating with poorly drained terrain observed in the low-lying areas. A small drainage was noted approximately 100 meters west of the study area. The area displays low archaeological potential based on the undulating and poorly drained nature of the terrain. No level, raised, well-drained landforms were observed in association with the small drainage identified west of the study area.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-R	Low	The area is gently sloping and homogenous with a northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain as well as the lack of hydrological features.	No
DH10-R Access Road	Low	The area is gently sloping and homogenous with a northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain as well as the lack of hydrological features.	No
DH10-AJ	Low	This drill site is situated within gently undulating terrain. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-AJ Access Road	Low	This proposed access road is situated within gently undulating terrain. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-S	Low	The area is moderately sloping and homogenous with a west-northwestern aspect. A dry gully was noted immediately west of the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain. No level, well-drained landforms were observed in association with the dry gully identified immediately west of the study area.	No
DH10-S Access Road	Low	This proposed access road is situated within moderately undulating terrain with no hydrological features noted within or immediately adjacent to the development. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-AI	Low	The area is moderately undulating with an overall moderate loss-of-elevation down to the north. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, sloped nature of the terrain as well as the lack of hydrological features.	No
DH10-AI Access Road	Low	The area is moderately undulating with an overall moderate loss-of-elevation down to the north. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, sloped nature of the terrain as well as the lack of hydrological features.	No
DH10-AH	Low	The area is moderately undulating with an overall moderate loss-of-elevation down to the north. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, sloped nature of the terrain as well as the lack of hydrological features.	No
DH10-AH Access Road	Low	The area is moderately undulating with an overall moderate loss-of-elevation down to the north. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, sloped nature of the terrain as well as the lack of hydrological features.	No
DH10-AB	Low	The area is moderately sloping with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-AB Access Road	Low	The area is moderately sloping with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10-AK	Low	The area is gently undulating with a slight north-northwestern aspect. The terrain is observed as broken/uneven throughout. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped and broken/uneven nature of the terrain as well as the lack of hydrological features.	No
DH10-AK Access Road	Low	The area is gently undulating with a slight north-northwestern aspect. The terrain is observed as broken/uneven throughout. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped and broken/uneven nature of the terrain as well as the lack of hydrological features.	No
DH10-AL	Low	The area is gently sloping and homogenous with a north-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain and lack of hydrological features.	No
DH10-AL Access Road	Low	The development area is gently sloping and homogenous with a small drainage noted approximately 20 meters northeast of the proposed road. No level, raised, well-drained landforms were observed in association with the small drainage identified northeast of the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain.	No
DH10-AC	Low	The area is moderately undulating with an overall gentle to moderate loss-of-elevation down to the north-northwest. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10-AC Access Road	Low	The area is moderately undulating with an overall gentle to moderate loss-of-elevation down to the north-northwest. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10-AM	Low	The area is moderately undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon the presence of ground saturation, the distance from significant water sources as well as a lack of terrain features with known associations with archaeological sites.	No
DH10-AM Access Road	Low	The area is moderately undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon the presence of ground saturation, the distance from significant water sources as well as a lack of terrain features with known associations with archaeological sites.	No
DH10-Q	Low	Overall, this drill site is flat with areas of broken/uneven terrain. Low-lying areas were observed to be somewhat poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-Q Access Road	Low	The area ranges from level to gently undulating. Broken/uneven terrain and areas of ground saturation were noted throughout. No hydrological features were observed within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
DH10-AD	Low	The area is gently sloping with a west-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10-AD Access Road	Low	The area is gently to moderately sloping with a west-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10-AE	Low	The area is gently to moderately sloping with a south-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
DH10-AE Access Road	Low	The area is gently to moderately sloping with aspects to the west-northwest and south-southwest. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No

No pre-1846 archaeological resources were identified within the development areas subject to survey, and the archaeological potential within these areas is assessed as low; therefore, no further archaeological investigations are recommended provided current development boundaries are not altered to include any un-assessed areas.

Although the potential presence of archaeological sites is considered low, no archaeological assessment can completely eliminate the risk of encountering archaeological resources. If archaeological materials are encountered during any phase of harvesting, all operations in the locality should be suspended until the Archaeology Branch and the relevant First Nation(s), have been contacted for direction. Any cultural materials which pre-date A.D. 1846 are protected by the Heritage Conservation Act of British Columbia.

This assessment addresses the potential for the existence of physical evidence of past human activity and does not encompass traditional use or other heritage concerns of the First Nations communities. This information should be solicited directly from the First Nations.

Please feel free to contact me if you have any questions regarding these assessments, our recommendations or the archaeological process.

Yours truly,
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Gordon G. Moore, RPCA

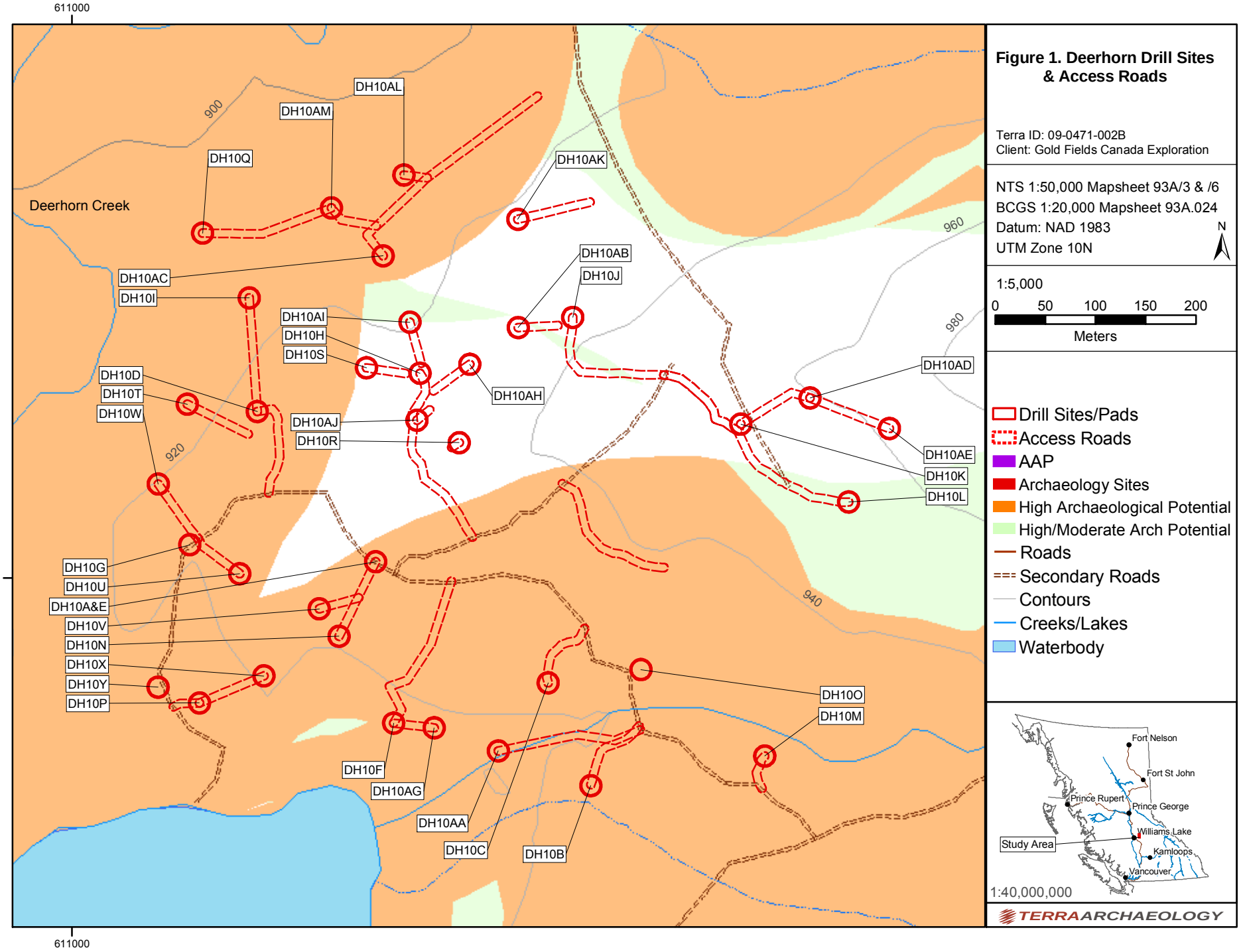

Figure 1. Deerhorn Drill Sites & Access Roads

Terra ID: 09-0471-002B
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:5,000
0 50 100 150 200
Meters

- Drill Sites/Pads
- Access Roads
- AAP
- Archaeology Sites
- High Archaeological Potential
- High/Moderate Arch Potential
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- Waterbody

1:40,000,000

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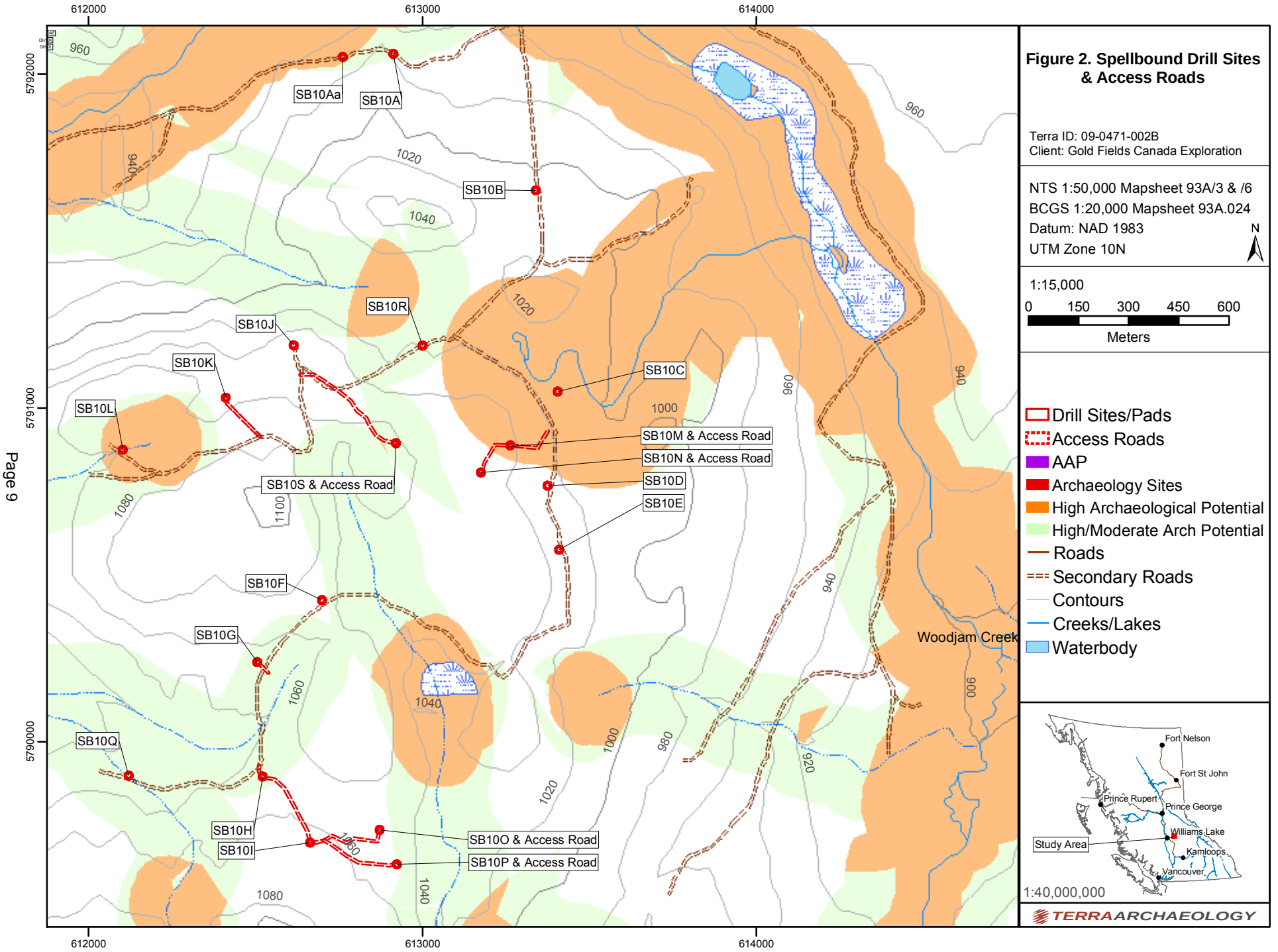
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SB10A
SB10B
SB10R
SB10J
SB10K
SB10L
SB10C
SB10M & Access Road
SB10N & Access Road
SB10D
SB10E
SB10S & Access Road
SB10F
SB10G
SB10Q
SB10H
SB10I
SB10O & Access Road
SB10P & Access Road
Woodjam Creek
960
940
1020
1040
1000
980
1060
1080
1100
920
900
Figure 2. Spellbound Drill Sites & Access Roads
Terra ID: 09-0471-002B
Client: Gold Fields Canada Exploration
NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N
N
1:15,000
0 150 300 450 600
Meters
Drill Sites/Pads
Access Roads
AAP
Archaeology Sites
High Archaeological Potential
High/Moderate Arch Potential
Roads
Secondary Roads
Contours
Creeks/Lakes
Waterbody
Fort Nelson
Fort St John
Prince Rupert
Prince George
Williams Lake
Study Area
Kamloops
Vancouver
1:40,000,000
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August 25, 2010

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Attention: Ross Sherlock

Re: **July 5, 2010 Archaeological Preliminary Field Reconnaissance Studies – Proposed Takom Drill Areas**

On July 5th of 2010 Terra Archaeology Limited, with the assistance of Leo Michel of the Williams Lake Indian Band and Glen Dixon of the Soda Creek Indian Band, conducted Preliminary Field Reconnaissance (PFR) Studies for 11 proposed development locations. These include drill sites and access roads proposed for development in the Takom Locale. Refer to the attached map for development locations.

Development areas were selected for survey based upon proponent request. A 20 m diameter potential impact zone was examined at each drill site location, and an eight meter wide right-of-way was examined for all proposed access roads. The field crew conducted pedestrian traverses designed to ensure comprehensive survey coverage of these areas. Crew members were spaced no more than five meters apart dependent upon surface visibility and archaeological site potential. All ground exposures encountered were inspected for cultural materials and all trees (all species standing or fallen, including stumps) along survey transects were examined for indications of cultural modification. Survey was intensified in areas of perceived higher archaeological potential based on topographic and hydrological terrain features observed in the field. Archaeological potential was assessed on: proximity to water, food resources, slope, drainage, forest cover, presence of topographic landforms commonly associated with known archaeological sites in the region (i.e. terraces, knolls, breaks-in-slope) and local knowledge.

All 11 proposed developments were assessed as having low potential for the presence of archaeological resources. Descriptions and archaeological potential assessments for each of the 11 proposed developments are provided in Table 1.

Table 1: Summary of Developments Assessed

Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
TK10-U	Low	The area is gently sloping and homogenous with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-U Access Road	Low	The area is gently sloping and homogenous with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
TK10-P	Low	The area is gently sloping and homogenous with a west-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-N	Low	The area is gently sloping and homogenous with a western aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-IB	Low	The area is moderately undulating with an overall west-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as a lack of terrain features with known associations with archaeological sites.	No
TK10-R	Low	The area is moderately sloping with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
TK210-W	Low	The area is gently undulating and moderately sloping with an overall north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The development displays low archaeological potential based on the sloped nature of the terrain and its distance from significant water sources.	No
TK10-L	Low	The area is moderately sloping with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
TK10-L Access Road	Low	The area is moderately sloping with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
TK10-O	Low	The area is gently sloping and homogenous with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-O Access Road	Low	The area is gently sloping and homogenous with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No

No pre-1846 archaeological resources were identified within the development areas subject to survey, and the archaeological potential within these areas is assessed as low; therefore, no further archaeological investigations are recommended provided current development boundaries are not altered to include any un-assessed areas.

Although the potential presence of archaeological sites is considered low, no archaeological assessment can completely eliminate the risk of encountering archaeological resources. If archaeological materials are encountered during any phase of harvesting, all operations in the locality should be suspended until the Archaeology Branch and the relevant First Nation(s), have been contacted for direction. Any cultural materials which pre-date A.D. 1846 are protected by the Heritage Conservation Act of British Columbia.

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Please feel free to contact me if you have any questions regarding these assessments, our recommendations or the archaeological process.

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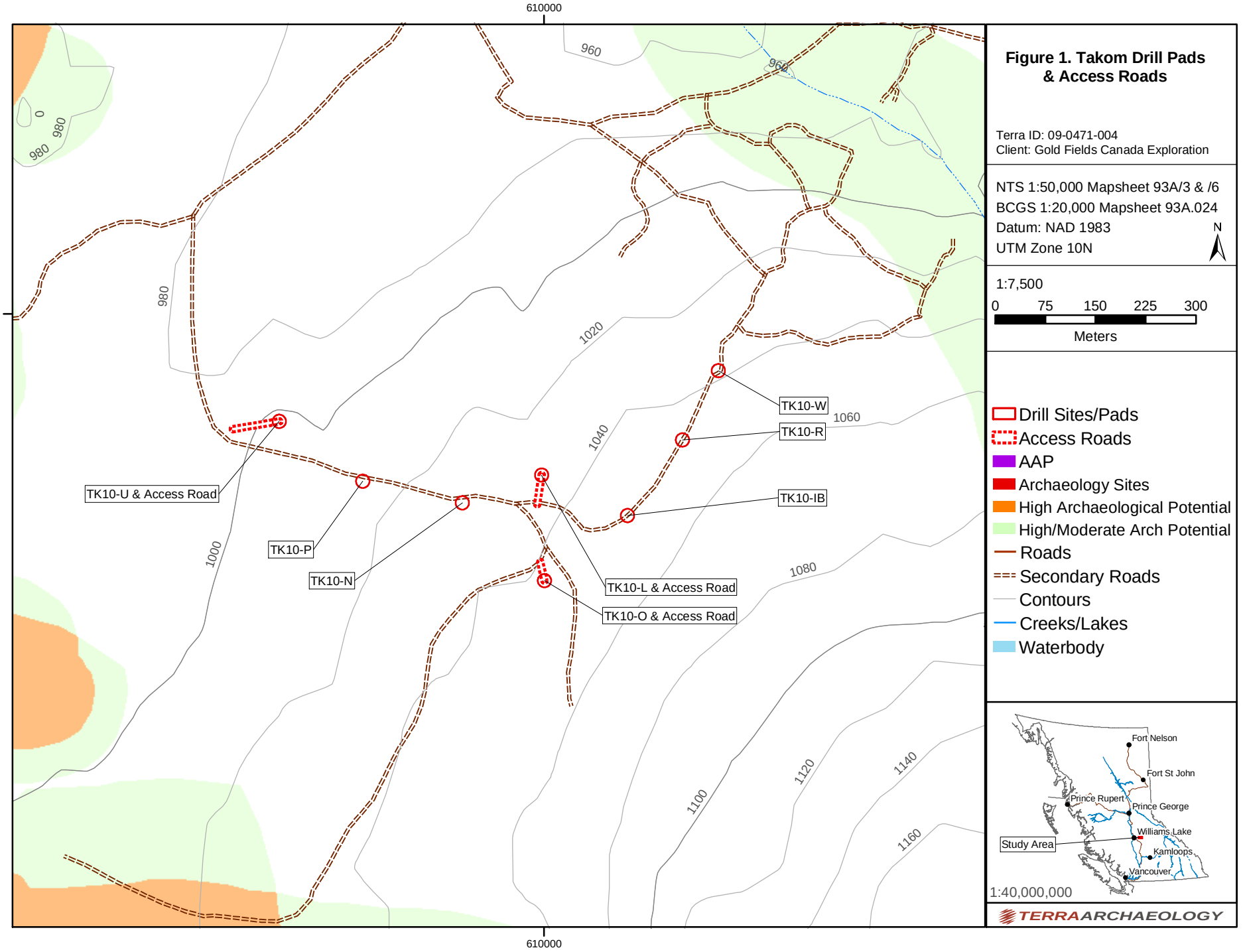
610000
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1160
1000
TK10-W
TK10-R
TK10-IB
TK10-U & Access Road
TK10-P
TK10-N
TK10-L & Access Road
TK10-O & Access Road
Figure 1. Takom Drill Pads & Access Roads
Terra ID: 09-0471-004
Client: Gold Fields Canada Exploration
NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N
N
1:7,500
0 75 150 225 300
Meters
Drill Sites/Pads
Access Roads
AAP
Archaeology Sites
High Archaeological Potential
High/Moderate Arch Potential
Roads
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Contours
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Waterbody
Fort Nelson
Fort St John
Prince Rupert
Prince George
Williams Lake
Study Area
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August 30, 2010

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Attention: Ross Sherlock

Re: **July 19, 2010 Archaeological Preliminary Field Reconnaissance Studies – Proposed Takom, Deerhorn and Southeast Drill Areas**

On July 19th of 2010 Terra Archaeology Limited, with the assistance of Leo Michel of the Williams Lake Indian Band, conducted Preliminary Field Reconnaissance (PFR) Studies for 48 proposed development locations. These include drill sites and access roads proposed for development in the Takom, Deerhorn and Southeastern Locales. Refer to the attached maps for development locations.

Development areas were selected for survey based upon proponent request. A 20 m diameter potential impact zone was examined at each drill site location, and an eight meter wide right-of-way was examined for all proposed access roads. The field crew conducted pedestrian traverses designed to ensure comprehensive survey coverage of these areas. Crew members were spaced no more than five meters apart dependent upon surface visibility and archaeological site potential. All ground exposures encountered were inspected for cultural materials and all trees (all species standing or fallen, including stumps) along survey transects were examined for indications of cultural modification. Survey was intensified in areas of perceived higher archaeological potential based on topographic and hydrological terrain features observed in the field. Archaeological potential was assessed on: proximity to water, food resources, slope, drainage, forest cover, presence of topographic landforms commonly associated with known archaeological sites in the region (i.e. terraces, knolls, breaks-in-slope) and local knowledge.

All 48 proposed developments were assessed as having low potential for the presence of archaeological resources. Descriptions and archaeological potential assessments for each of the 48 proposed developments are provided in Table 1.

Table 1: Summary of Developments Assessed

Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
TK10-AD	Low	This drill site has already been heavily impacted by drilling activities and the field visit for this development should be considered a Post Impact Assessment. The area is gently sloping with a western aspect. The terrain is homogenous and somewhat saturated. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous and poorly drained nature of the terrain as well as the lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
TK10-G	Low	This drill site has already been heavily impacted by drilling activities and the field visit for this development should be considered a Post Impact Assessment. The area is gently sloping and homogenous with a west-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AB	Low	The area is gently sloping and homogenous with a western aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AB Access Road	Low	The area is gently sloping and homogenous with a western aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AC	Low	The area is gently sloping and homogenous with a west-northwestern aspect. This development is situated approximately 20 m north-northeast of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the homogenous nature of the terrain.	No
TK10-Y	Low	The development area is predominantly level, with broken/uneven and poorly drained terrain observed throughout. This proposed drill site is situated approximately 60 m east of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain.	No
TK10-Y Access Road	Low	The area is gently sloped down to the west and homogenous. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AH	Low	The area is gently sloping and homogenous with a western aspect. No hydrological features were noted within or immediately adjacent to the proposed drill site. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AH Access Road	Low	The area is gently sloping and homogenous with a western aspect. No hydrological features were noted within or immediately adjacent to the proposed access route. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AI	Low	The area is gently sloping and homogenous with a west-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-AI Access Road	Low	The area is gently sloping and homogenous with a west-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
TK10-Z	Low	The area is gently sloping and homogenous with a west-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
TK10-AG	Low	This location is moderately undulating with poorly drained lowlands. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, poorly drained nature of the terrain and lack of hydrological features.	No
TK10-AE	Low	This location is gently undulating and poorly drained throughout. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the poorly drained nature of the terrain and lack of hydrological features.	No
TK10-AE Access Road	Low	This proposed access route situated within gently undulating and poorly drained terrain. No hydrological features were noted within or immediately adjacent to the study area. The development displays low archaeological potential based on poorly drained nature of the terrain and lack of hydrological features.	No
TK10-AA	Low	The development area is predominantly level, with broken/uneven and poorly drained terrain observed throughout. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain as well as the lack of hydrological features.	No
TK10-AA Access Road	Low	The area is flat with broken/uneven and poorly drained terrain. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain and lack of hydrological features.	No
TK10-X	Low	The area is moderately sloping throughout, with a western aspect. This development is situated less than 20 m north of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the sloping nature of the terrain.	No
TK10-J	Low	The area is gently sloping and homogenous throughout, with a northwestern aspect. This proposed drill site is situated approximately 50 m north of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the homogenous nature of the terrain.	No
TK10-J Access Road	Low	This proposed access route parallels a mapped intermittent drainage which is 20-50 m to the south. The development is gently sloping and homogenous throughout, with a northwestern aspect. The mapped drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified in the area. The development displays low archaeological potential based on the homogenous nature of the terrain.	No
SE10-A	Low	The area is gently sloping and homogenous with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
SE10-A Access Road	Low	The area is gently sloping and homogenous with a northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features	No
SE10-C	Low	The area is moderately sloping with an east-northeastern aspect. One small, ephemeral, drainage was noted approximately 40 metres east-northeast of the study area. The area displays low archaeological potential based on the sloped nature of the terrain as well as the lack of raised, well-drained landforms associated with the small drainage.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
SE10-C Access Road	Low	The area is moderately undulating with low-lying areas observed to be broken/uneven and poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, broken/uneven, poorly drained nature of the terrain and lack of hydrological features.	No
SE10-B	Low	The area is gently sloping and homogenous with a north-northeastern aspect. This development is situated approximately 20 m east of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the homogenous nature of the terrain.	No
SE10-B Access Road	Low	The area is gently sloping and homogenous with a north-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
SE10-X	Low	The area is moderately sloping with an east-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-X Access Road	Low	The area is moderately sloping with an east-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-L	Low	The area is moderately sloping with a northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-L Access Road	Low	The area is moderately sloping with a northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-Y	Low	The area is moderately sloping with a northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-Y Access Road	Low	The area is moderately sloping with a northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-M	Low	The area is moderately sloping with an east-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
SE10-M Access Road	Low	The area is moderately sloping with an east-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
TK10-V	Low	The area is gently to moderately sloping and gently undulating. The development has an overall northern aspect. One small, ephemeral, drainage was noted approximately 40 metres northeast of the study area. The area displays low archaeological potential based on the sloped nature of the terrain as well as the lack of raised, level, well-drained landforms associated with the small drainage.	No
TK10-V Access Road	Low	The area ranges from level to moderately sloping with an overall north-northwestern aspect. Low-lying and level areas were observed to be poorly drained. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped and poorly-drained nature of the terrain as well as the lack of hydrological features.	No
TK10-Q	Low	The area is gently to moderately sloping with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
TK10-Q Access Road	Low	The area is gently undulating and gently to moderately sloping. The development has an overall north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the undulating, sloped nature of the terrain and lack of hydrological features.	No
TK10-S	Low	The area is moderately sloping with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped nature of the terrain and lack of hydrological features.	No
TK10-S Access Road	Low	The area is gently to moderately sloping and homogenous, with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain as well as the lack of hydrological features.	No
TK10-AK	Low	The area is gently sloping and homogenous with a northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
DH10-AN	Low	The area ranges from flat and homogenous to gently undulating. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-AP	Low	The area is moderately undulating with no hydrological features observed within or immediately adjacent to the study area. The development is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-AQ	Low	The area is gently sloping and homogenous with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No
DH10-AS	Low	The area is gently to moderately sloping and homogenous, with an east-northeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped and homogenous nature of the terrain as well as the lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-AV	Low	The area is gently sloping and homogenous with a south-southeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain and lack of hydrological features.	No
DH10-AU	Low	The development area is gently sloping gently undulating. It has an overall south-southeastern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-AT	Low	The area is gently sloping and homogenous with a west-southwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No

No pre-1846 archaeological resources were identified within the development areas subject to survey, and the archaeological potential within these areas is assessed as low; therefore, no further archaeological investigations are recommended provided current development boundaries are not altered to include any un-assessed areas.

Although the potential presence of archaeological sites is considered low, no archaeological assessment can completely eliminate the risk of encountering archaeological resources. If archaeological materials are encountered during any phase of harvesting, all operations in the locality should be suspended until the Archaeology Branch and the relevant First Nation(s), have been contacted for direction. Any cultural materials which pre-date A.D. 1846 are protected by the Heritage Conservation Act of British Columbia.

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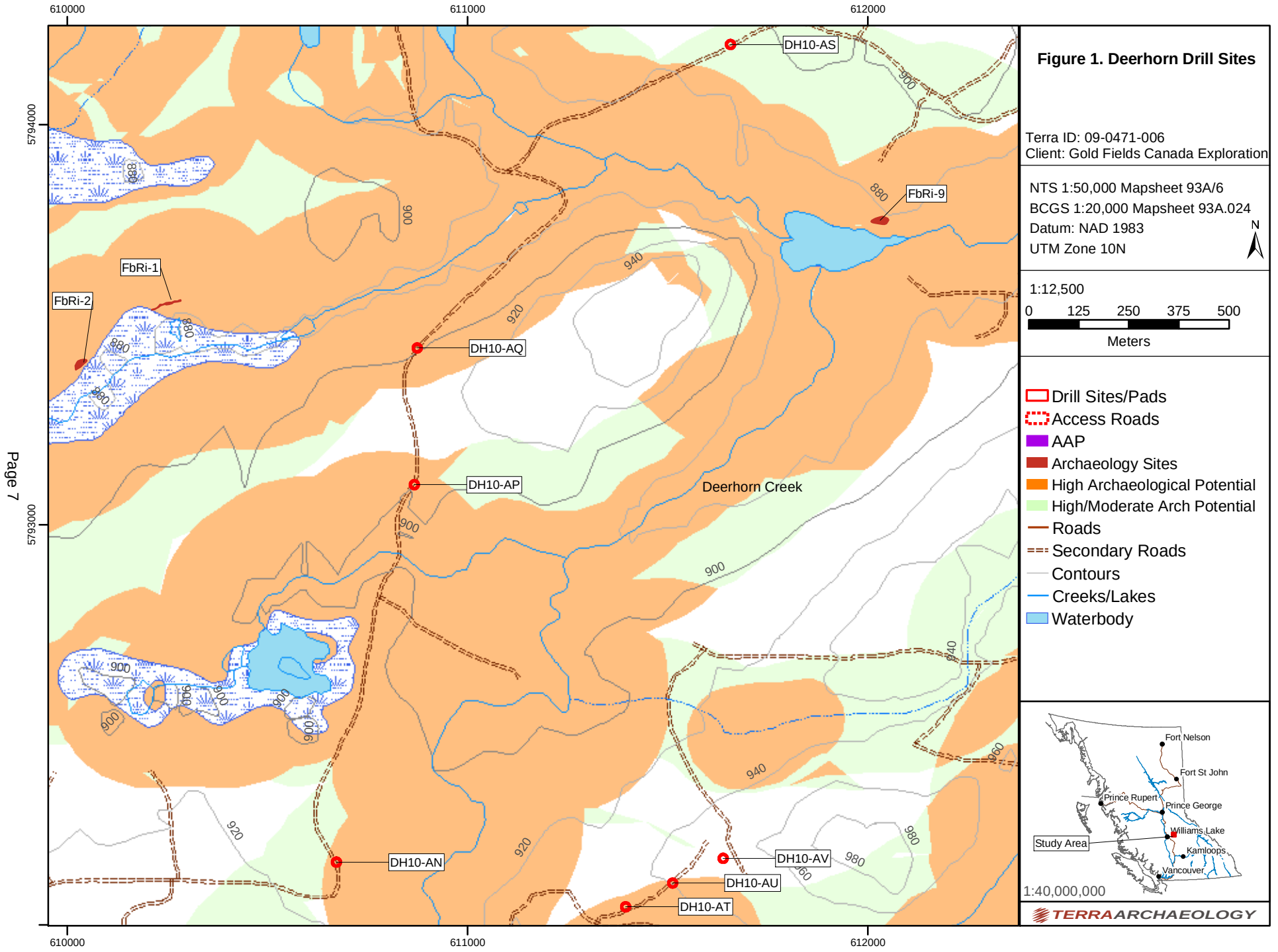
Gordon G. Moore, RPCA


610000
611000
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DH10-AS
FbRi-9
FbRi-1
FbRi-2
DH10-AQ
DH10-AP
Deerhorn Creek
DH10-AN
DH10-AV
DH10-AU
DH10-AT
880
900
920
940
960
980
Figure 1. Deerhorn Drill Sites
Terra ID: 09-0471-006
Client: Gold Fields Canada Exploration
NTS 1:50,000 Mapsheet 93A/6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N
N
1:12,500
0 125 250 375 500
Meters
Drill Sites/Pads
Access Roads
AAP
Archaeology Sites
High Archaeological Potential
High/Moderate Arch Potential
Roads
Secondary Roads
Contours
Creeks/Lakes
Waterbody
Fort Nelson
Fort St John
Prince Rupert
Prince George
Williams Lake
Study Area
Kamloops
Vancouver
1:40,000,000
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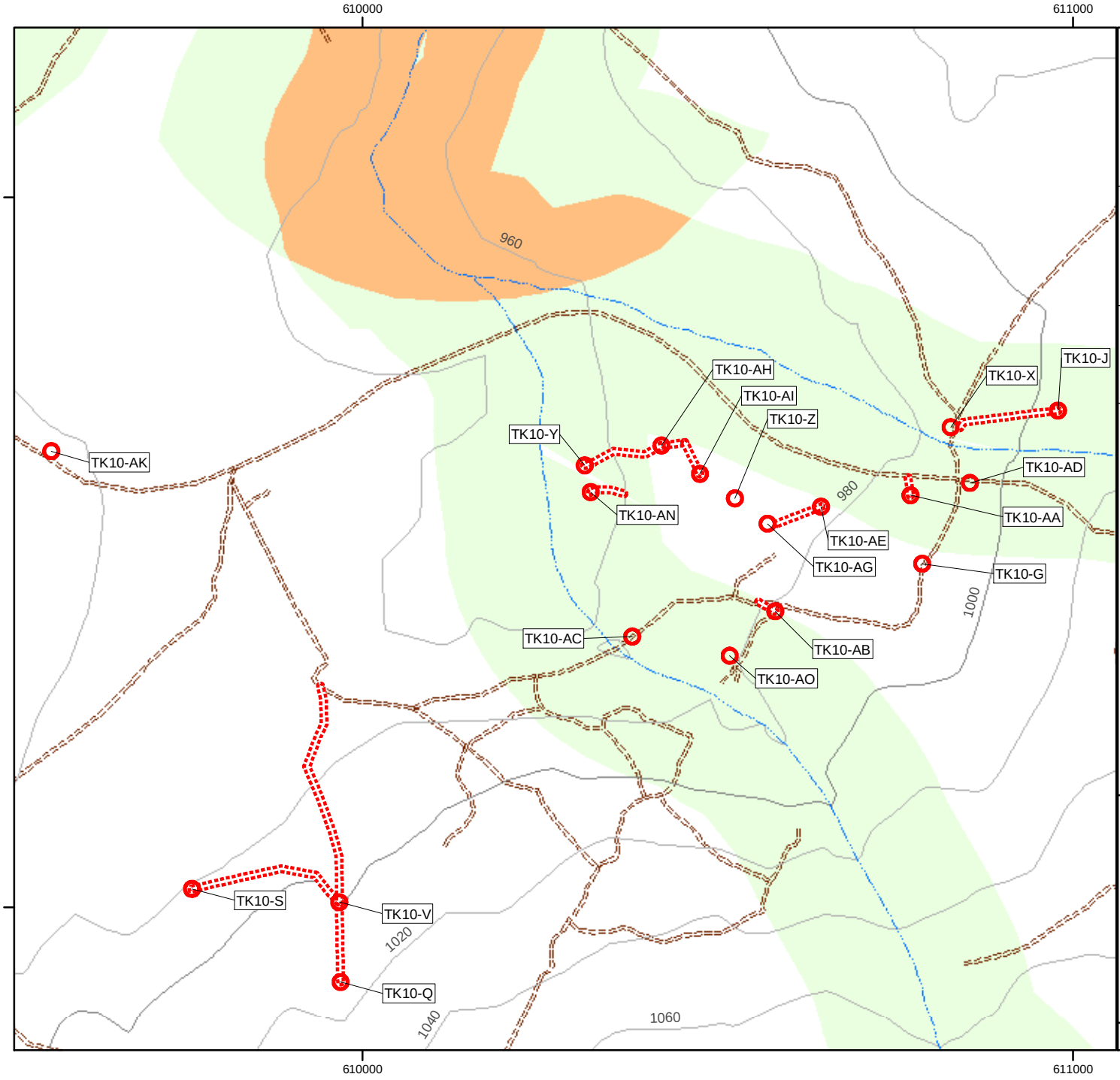


Figure 2. TK Drill Sites & Access Roads

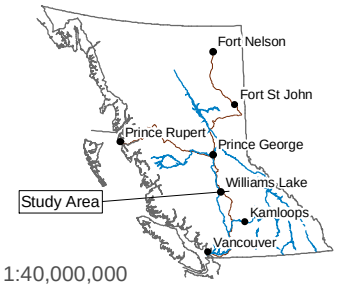
Terra ID: 09-0471-006
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:8,000
0 80 160 240 320
Meters

- Drill Sites/Pads
- Access Roads
- Archaeology Sites
- High Archaeological Potential
- High/Moderate Arch Potential
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- Waterbody



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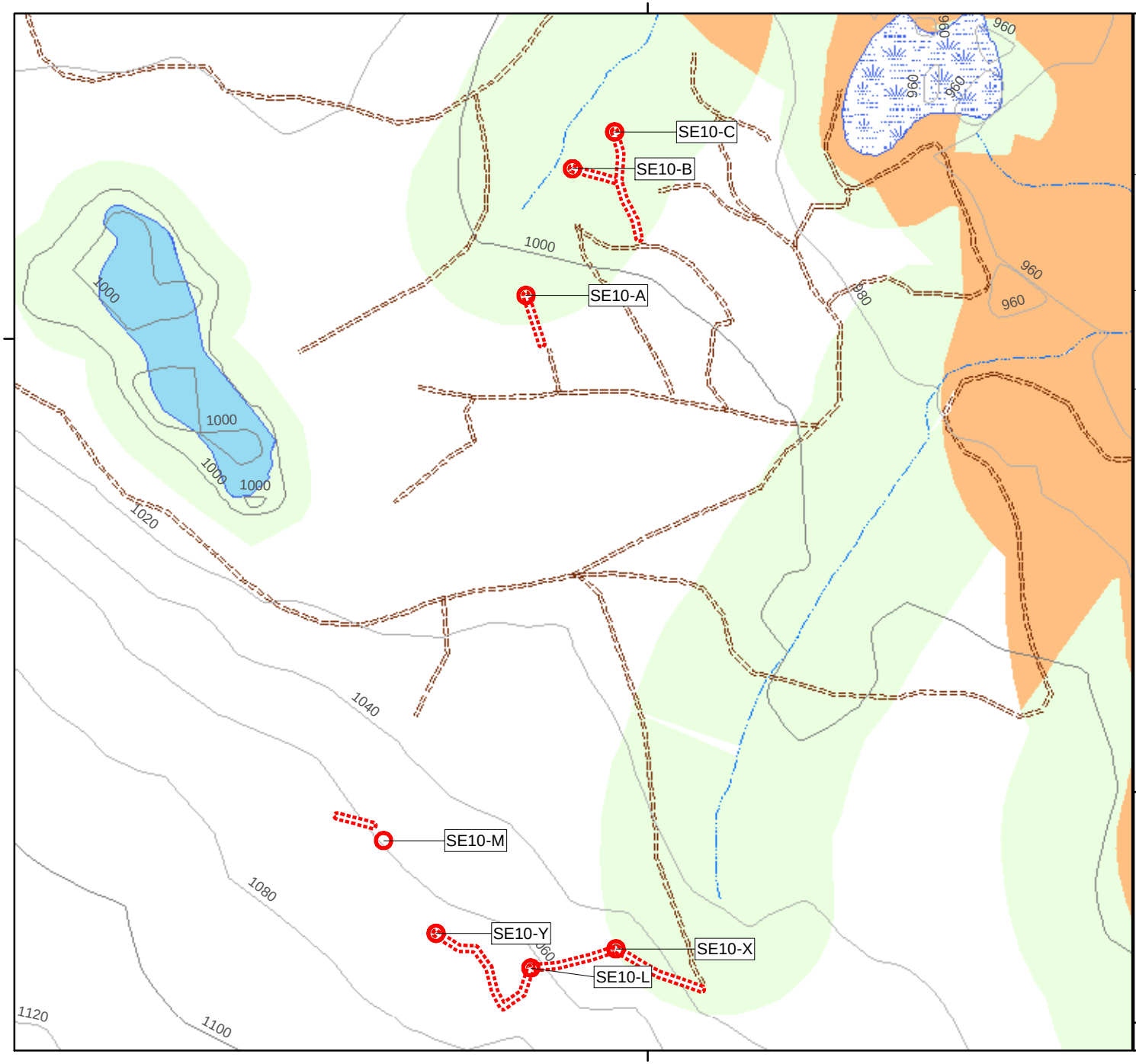


Figure 3. SE Drill Sites & Access Roads

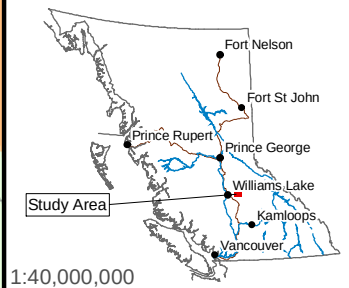
Terra ID: 09-0471-006
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/3 & /6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:7,500
0 75 150 225 300
Meters

- Drill Sites/Pads
- Access Roads
- AAP
- Archaeology Sites
- High Archaeological Potential
- High/Moderate Arch Potential
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- Waterbody



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August 31, 2010

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Attention: Ross Sherlock

Re: **July 27, 2010 Archaeological Preliminary Field Reconnaissance Studies – Proposed Southeast, Takom and Deerhorn Drill Areas**

On July 27th of 2010 Terra Archaeology Limited, with the assistance of Leonard Supernault of the Williams Lake Indian Band and Glen Dixon of the Soda Creek Indian Band, conducted Preliminary Field Reconnaissance (PFR) Studies for 15 proposed development locations. These include drill sites and access roads proposed for development in the Southeastern, Takom and Deerhorn Locales. Refer to the attached maps for development locations.

Development areas were selected for survey based upon proponent request. A 20 m diameter potential impact zone was examined at each drill site location, and an eight meter wide right-of-way was examined for all proposed access roads. The field crew conducted pedestrian traverses designed to ensure comprehensive survey coverage of these areas. Crew members were spaced no more than five meters apart dependent upon surface visibility and archaeological site potential. All ground exposures encountered were inspected for cultural materials and all trees (all species standing or fallen, including stumps) along survey transects were examined for indications of cultural modification. Survey was intensified in areas of perceived higher archaeological potential based on topographic and hydrological terrain features observed in the field. Archaeological potential was assessed on: proximity to water, food resources, slope, drainage, forest cover, presence of topographic landforms commonly associated with known archaeological sites in the region (i.e. terraces, knolls, breaks-in-slope) and local knowledge.

All 15 proposed developments were assessed as having low potential for the presence of archaeological resources. Descriptions and archaeological potential assessments for each of the 15 proposed developments are provided in Table 1.

Table 1: Summary of Developments Assessed

Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
SE10-S	Low	The area is gently sloping, homogenous and saturated. The proposed drill site displays a southern aspect. No hydrological features were noted within or immediately adjacent to the development. The area displays low archaeological potential based on the poorly drained and homogenous nature of the terrain as well s the lack of raised, well-drained landforms with known associations with archaeological sites.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
SE10-S Access Road	Low	The proposed access route is gently sloping, homogenous and saturated. Overall the development displays a southern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the poorly drained and homogenous nature of the terrain as well s the lack of raised, well-drained landforms with known associations with archaeological sites.	No
TK10-AN	Low	The area is predominantly level with broken/uneven and poorly drained terrain observed throughout. The proposed drill site is situated approximately 50 m east of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the broken/uneven and poorly drained nature of the terrain.	No
TK10-AN Access Road	Low	The development area is flat with broken/uneven and poorly drained terrain observed. No hydrological features were noted within or immediately adjacent to the study area. The proposed access route is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
TK10-AO	Low	The area is gently sloping and poorly drained with a west-northwestern aspect. The proposed drill site is situated approximately 50 m north-northeast of a mapped intermittent drainage. This drainage was not observed during the field visit, and no raised, level landforms with known associations with archaeological sites were identified. The area displays low archaeological potential based on the poorly drained nature of the terrain.	No
DH10-AO-B	Low	The area is gently to moderately undulating with an overall northern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources as well as its lack of terrain features with known associations with archaeological sites.	No
DH10-AO-B Access Road	Low	This proposed access route is gently to moderately undulating with poorly drained lowlands and an overall northern aspect. No hydrological features were noted within or immediately adjacent to the study area. A large wetland complex is located approximately 75 m southwest of the northwestern extent of the development. The wetland was not observed during the field visit, and no raised, level, well-drained landforms with known associations with archaeological sites were identified. The area is assessed as having low archaeological potential.	No
DH10-AR	Low	This proposed drill site is situated within elevated, gently undulating terrain. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based upon its distance from significant water sources.	No
DH10-AR Access Road	Low	The area is gently sloping and homogenous with a northwestern aspect. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of hydrological features.	No

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Drill Site/ Develop-ment ID	Archaeological Potential Assessment	Terrain Description / Remarks	Further Work Required
DH10-AW	Low	The area is gently undulating and somewhat saturated. A small unmapped drainage was noted approximately 35 metres west of the proposed drill site. This feature is likely a tributary of Deerhorn creek which is located approximately 75 m west of the area. This development displays low archaeological potential based on the poorly drained nature of the terrain. No raised, level, well-drained landforms were observed in association with the small drainage or Deerhorn Creek.	No
DH10-AW Access Road	Low	The area is gently undulating and somewhat saturated. No hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the poorly-drained nature of the terrain and lack of hydrological features.	No
DH10-AY	Low	The area is gently sloping and homogenous with a southwestern aspect. A small unnamed drainage was noted on the map approximately 110 m south of the proposed drill site. No other hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of raised, level, well-drained landforms associated with the abovementioned drainage.	No
DH10-AY Access Road	Low	The area is gently sloping and homogenous with a southwestern aspect. A small unnamed drainage was noted on the map approximately 110 m south of the southern extent of the development. No other hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of raised, level, well-drained landforms associated with the abovementioned drainage.	No
DH10-AX	Low	The area is gently sloping and homogenous with a southern aspect. A small unnamed drainage was noted on the map approximately 65 m south of the study area. No other hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous nature of the terrain and lack of raised, level, well-drained landforms associated with the abovementioned drainage.	No
DH10-AX Access Road	Low	This proposed access route ranges from level to gently sloping and displays an overall southwestern aspect. Level terrain is homogenous and areas of ground saturation were observed throughout. A small unnamed drainage was noted on the map approximately 65 m south of the western extent of the development and 110 m south of the eastern extent. No other hydrological features were noted within or immediately adjacent to the study area. The area displays low archaeological potential based on the homogenous and poorly drained nature of the terrain as well as the lack of raised, level, well-drained landforms in association with the abovementioned drainage.	No

No pre-1846 archaeological resources were identified within the development areas subject to survey, and the archaeological potential within these areas is assessed as low; therefore, no further archaeological investigations are recommended provided current development boundaries are not altered to include any un-assessed areas.

Although the potential presence of archaeological sites is considered low, no archaeological assessment can completely eliminate the risk of encountering archaeological resources. If archaeological materials are encountered during any phase of harvesting, all operations in the locality should be suspended until the Archaeology Branch and

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the relevant First Nation(s), have been contacted for direction. Any cultural materials which pre-date A.D. 1846 are protected by the Heritage Conservation Act of British Columbia.

This assessment addresses the potential for the existence of physical evidence of past human activity and does not encompass traditional use or other heritage concerns of the First Nations communities. This information should be solicited directly from the First Nations.

Please feel free to contact me if you have any questions regarding these assessments, our recommendations or the archaeological process.

Yours truly,
TERRA ARCHAEOLOGY LIMITED

Gordon G. Moore, RPCA

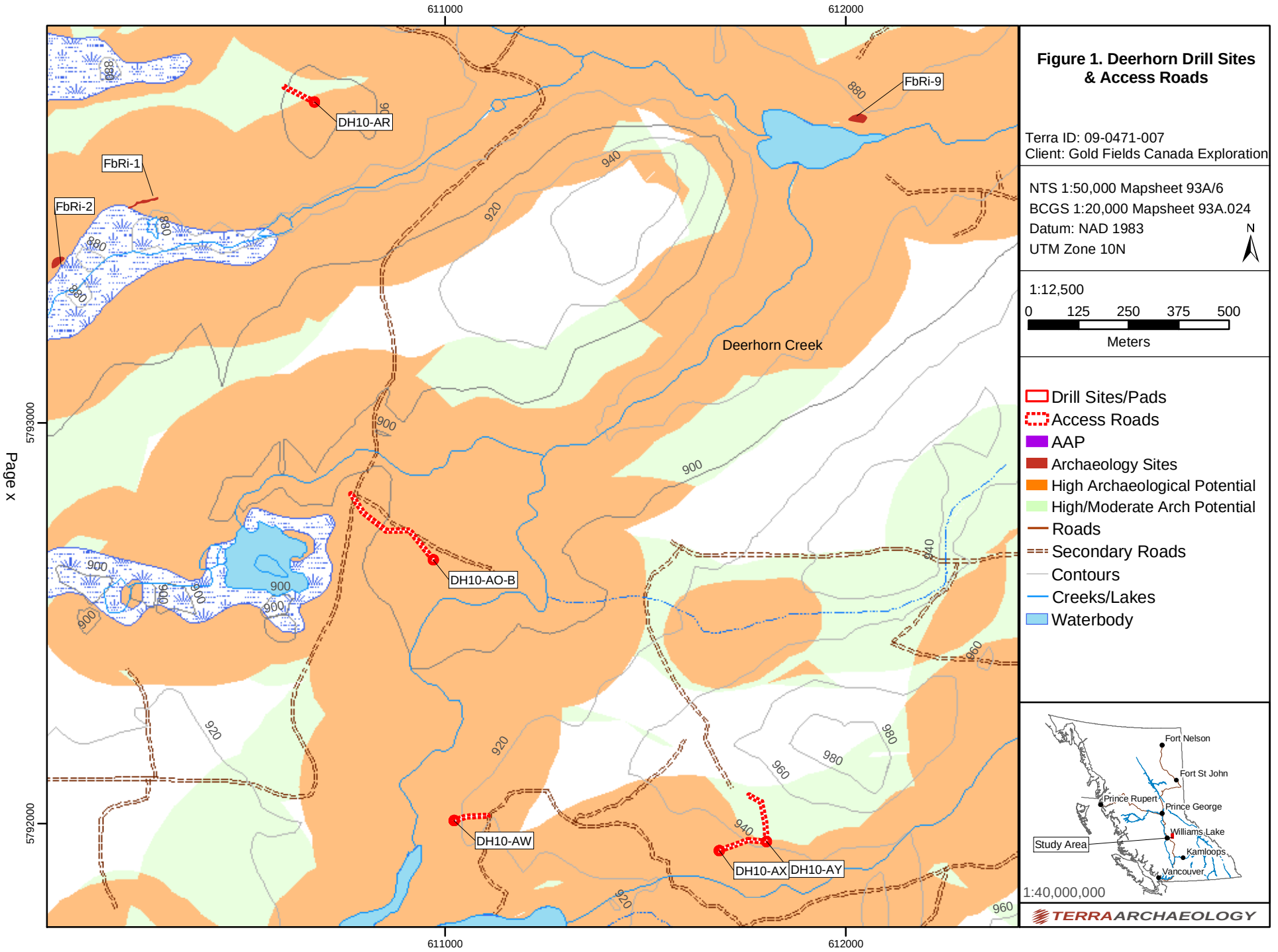

Figure 1. Deerhorn Drill Sites & Access Roads

Terra ID: 09-0471-007
Client: Gold Fields Canada Exploration

NTS 1:50,000 Mapsheet 93A/6
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

N

1:12,500
0 125 250 375 500
Meters

- Drill Sites/Pads
- Access Roads
- AAP
- Archaeology Sites
- High Archaeological Potential
- High/Moderate Arch Potential
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- Waterbody

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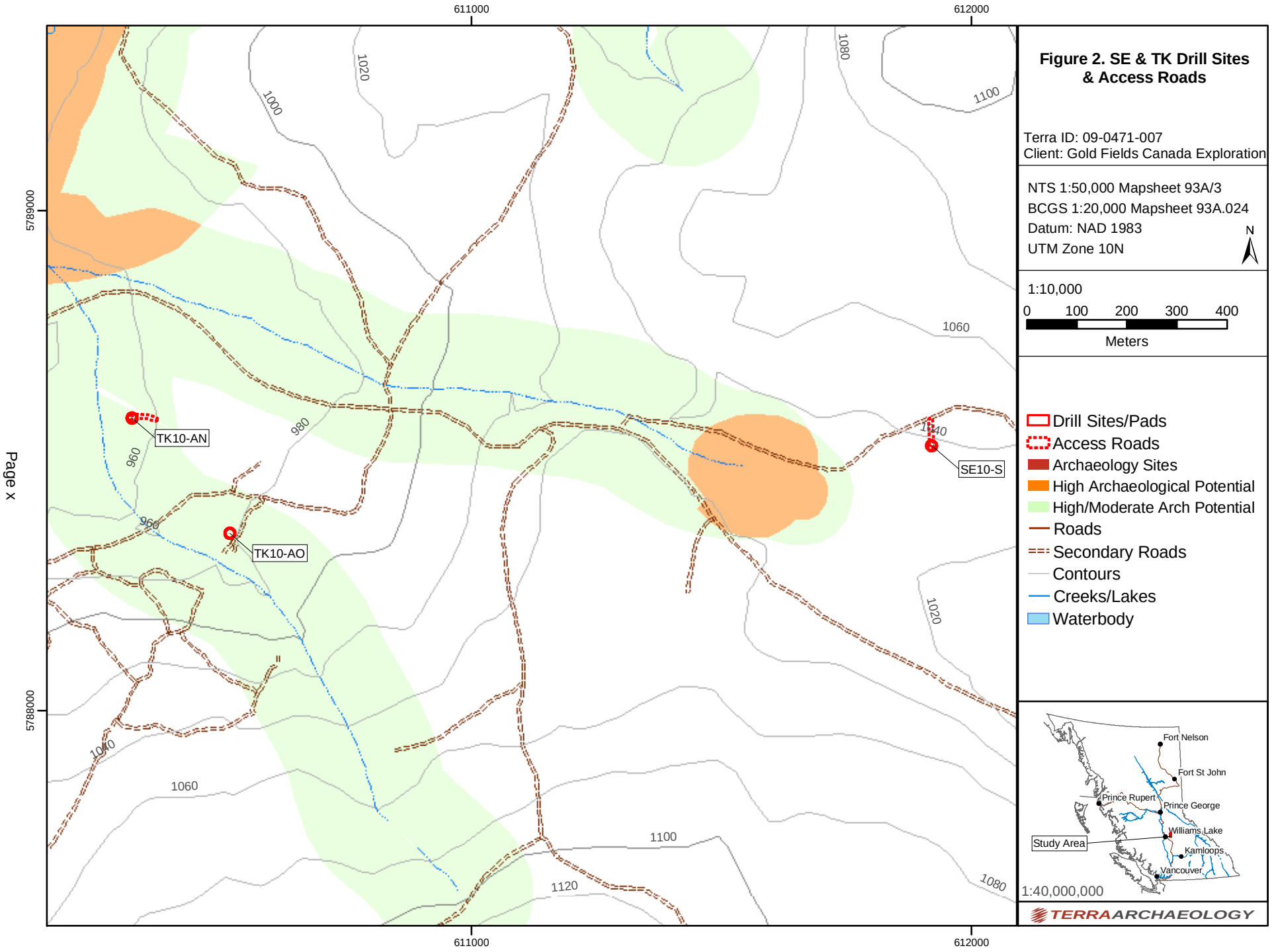

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January 25, 2010

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Attention: John Hertel

Re: **Archaeological Preliminary Field Reconnaissance Studies for the Southeast Woodjam, Rand, Megabuck East and Deerhorn Creek Areas**

Terra Archaeology Limited conducted Preliminary Field Reconnaissance (PFR) Studies for 38 proposed development locations between September 11th and November 16th, 2010. These development locations include drill sites and access roads proposed for spring development in the Woodjam South, Rand, Megabuck East and Deerhorn Creek localities. Refer to the attached maps for development locations. As per the proponent's instructions, a 20 m diameter assessment area was applied to the drill site locations, and an approximate 8 m wide right-of-way was assessed for all proposed access routes (4 m on either side of the centerline).

The survey crew conducted pedestrian traverses. Crew members were spaced at approximately 5-10 meters dependent upon surface visibility and archaeological site potential. All ground exposures encountered were inspected for cultural materials and all trees (all species standing or fallen, including stumps) along survey transects were examined for indications of cultural modification. Survey was intensified in areas of perceived higher archaeological potential based on topographic and hydrological terrain features observed in the field. Archaeological potential was assessed on: proximity to water, food resources, slope, drainage, forest cover, presence of topographic landforms commonly associated with known archaeological sites in the region (i.e. terraces, knolls, breaks-in-slope) and local knowledge. Descriptions and archaeological potential assessments for each of the 38 proposed developments are provided in Table 1.

Table 1: Summary of Developments Assessed

Terra ID	Drill Site/ Development ID	Date of Field Visit	Figure Reference	Area(s) of Arch. Potential Identified	Terrain Description / Potential Assessment / Remarks
09-0471-009	Pump Access Road	Sept. 11, 2010	1	No	This proposed access road is situated within variable terrain ranging from moderately undulating to steeply sloping with aspects to the east and east-southeast. A moderately-sized lake is located to the south of the proposed pump access road, and a small ephemeral drainage channel was observed to the east. The drainage varies in distance between 40 and 350 m from the proposed road. The areas proximal to these water features range from sloping to undulating, and no well-defined, raised, level landforms were observed in association. This area is therefore considered to have low archaeological potential.

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Terra ID	Drill Site/ Development ID	Date of Field Visit	Figure Reference	Area(s) of Arch. Potential Identified	Terrain Description / Potential Assessment / Remarks
09-0471-009	SE 10-AG	Sept. 11, 2010	2	No	This area is gently sloping and homogenous with an east-northeastern aspect. The proposed drill site is situated along an existing access road. The road itself traverses the western half of the area subject to assessment. As such, the ground is heavily disturbed in this location. No hydrological features were noted within of immediately adjacent to this development. The area displays low archaeological potential based on the homogenous, disturbed nature of the terrain as well as the lack of hydrological features. The existing road will be utilized for access without need for upgrade.
09-0471-009	SE 10-Z Access Road	Sept. 11, 2010	1	Yes	This proposed access route ranges from gently to moderately sloping with an overall eastern aspect. The route traverses two small, flat, well-drained knolls. Two small wetlands are located within 50-100 m of the development, one to the north and one to the south. The SE 10-Z Access Road displays archaeological potential based on the presence of two well-defined, level landforms observed in association with the wetlands. Area of Archaeological Potential (AAP) 1, as indicated on Figure 1, encompasses both knolls. These landforms warrant further archaeological inspection, including subsurface testing. The SE 10-Z drill site has already been cleared.
09-0471-009	SE 10-AC	Sept. 11, 2010	1	No	This area is moderately undulating with an overall moderate loss-of-elevation down to the northeast. No hydrological features were noted within or immediately adjacent to the proposed development. The area displays low archaeological potential based on the undulating and sloped nature of the terrain as well as the lack of hydrological features.
09-0471-009	SE 10-AC Access Road	Sept. 11, 2010	1	No	This area is moderately undulating with an overall moderate loss-of-elevation down to the northeast. No hydrological features were noted within or immediately adjacent to the proposed development. The area displays low archaeological potential based on the undulating and sloped nature of the terrain as well as the lack of hydrological features.
09-0471-009	SE 10-AD	Sept. 11, 2010	2	No	This proposed drill site is situated within flat and homogenous terrain. No hydrological features were noted within or immediately adjacent to the development location. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features.
09-0471-009	SE 10-AD Access Road	Sept. 11, 2010	2	No	This location is gently sloping and homogenous with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the proposed drill site. The area displays low archeological potential based on the sloping and homogenous nature of the terrain as well as the lack of hydrological features.
09-0471-009	SE 10-AE	Sept. 11, 2010	1 & 2	No	This area is gently sloping and homogenous with an eastern aspect. A small, incised ephemeral drainage channel was observed approximately 40 m south of the assessment area. The terrain proximal to the drainage feature is gently sloping and homogenous. The area displays low archaeological potential based on the sloped, homogenous nature of the terrain and the lack of well-defined topographic landforms associated with the small drainage identified to the south.
09-0471-009	SE 10-AE Access Road	Sept. 11, 2010	1 & 2	No	This area is gently sloping and homogenous throughout, with an overall eastern aspect. A small ephemeral drainage was observed approximately 50 m west of the western extent of the proposed access route. The proposed development does not traverse any well-defined topographic landforms associated with the observed drainage feature. The development is therefore assessed as having low archaeological potential.

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Terra ID	Drill Site/ Development ID	Date of Field Visit	Figure Reference	Area(s) of Arch. Potential Identified	Terrain Description / Potential Assessment / Remarks
09-0471-009	SE 10-AH	Sept. 11, 2010	2	No	This proposed drill site is situated within uniform gently undulating terrain displaying an overall east-southeastern aspect. A small, incised, ephemeral drainage was observed approximately 40 m east of the assessment area. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of well-defined topographic landforms associated with the small drainage identified to the east. This drill site is situated along an existing road or skid trail which can be utilized for access without need for upgrade.
09-0471-009	SE 10-AF	Sept. 11, 2010	2	No	This area is gently undulating and homogenous with an overall gentle loss-of-elevation down to the north-northeast. No hydrological features were noted within or immediately adjacent to the proposed development. The area displays low archaeological potential based on the homogenous nature of the terrain as well as the lack of hydrological features.
09-0471-009	SE 10-AF Access Road	Sept. 11, 2010	2	No	This proposed access route is situated within uniform gently undulating terrain with an overall gentle loss-of-elevation down to the north-northeast. No hydrological features were identified within or immediately adjacent to the proposed road. The area displays low archaeological potential based on the homogenous nature of the terrain as well as the lack of hydrological features.
09-0471-010	RND 10-03	Sept. 11, 2010	3	No	This area is gently sloping and homogenous with a northern aspect. No hydrological features were observed within or immediately adjacent to the proposed development. The area displays low archaeological potential based on the homogenous nature of the terrain as well as the lack of hydrological features.
09-0471-010	RND 10-03 Access Road	Sept. 11, 2010	3	No	This development is situated within gently sloping, homogenous terrain with a northern aspect. No hydrological features were noted within or immediately adjacent to the assessment area. The area is assessed as having low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features.
09-0471-010	RND 10-02	Sept. 11, 2010	3	No	This area is moderately sloping and homogenous with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the assessment area. The development displays low archaeological potential based on the sloped, homogenous nature of the terrain as well as the lack of hydrological features.
09-0471-010	RND 10-02 Access Road	Sept. 11, 2010	3	No	This proposed access route is situated within variable terrain ranging from moderately sloping to undulating. Sloping terrain provides aspects to the northwest and the north-northwest. No hydrological features were identified within or immediately adjacent to the assessment area. The area is considered to have low archaeological potential based on the sloped nature of the terrain as well as the lack of hydrological features.
09-0471-010	RND 10-01	Sept. 11, 2010	3	No	This location is gently sloping and homogenous with a north-northwestern aspect. No hydrological features were noted within or immediately adjacent to the proposed drill site. The area is assessed as having low archaeological potential based on the homogenous nature of the terrain as well as the lack of hydrological features.

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Terra ID	Drill Site/ Development ID	Date of Field Visit	Figure Reference	Area(s) of Arch. Potential Identified	Terrain Description / Potential Assessment / Remarks
09-0471-010	RND 10-01 Access Road	Sept. 11, 2010	3	No	This proposed road is located within gently sloping, homogenous terrain with a north-northwestern aspect. No hydrological features were observed within or immediately adjacent to the proposed road. The development displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features.
09-0471-010	RND 10-04	Sept. 11, 2010	3	No	This location is gently sloping and homogenous with a northern aspect. No hydrological features were noted within or immediately adjacent to the proposed drill site. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features.
09-0471-010	RND 10-04 Access Road	Sept. 11, 2010	3	No	This development area is gently sloping and homogenous with a northern aspect. The greater part of the proposed access route overlaps with an existing forestry road and is therefore heavily disturbed. The southernmost 85 m, approaching drill site RND 10-04, are situated within previously undeveloped terrain. No hydrological features were observed within or immediately adjacent to the assessment area. The development area is assessed as having low archaeological potential based on the sloped, homogenous and disturbed nature of the terrain as well as the lack of hydrological features.
09-0471-011	ME 10-A	Sept. 11, 2010	4	No	This area is gently sloping and homogenous with a western aspect. No hydrological features were identified within or immediately adjacent to the development area. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features. This drill site is situated along an existing access road.
09-0471-011	ME 10-B	Sept. 11, 2010	4	No	This area is gently sloping, homogenous and somewhat saturated. It displays a slight north-northwestern aspect, and overlaps with portions of an existing road. No hydrological features were noted within or immediately adjacent to the proposed drill site. The area displays low archaeological potential based on the homogenous and poorly-drained nature of the terrain as well as the lack of hydrological features.
09-0471-011	ME 10-B Access Road	Sept. 11, 2010	4	No	This area is moderately undulating with an overall northwestern aspect. No hydrological features were noted within or immediately adjacent to the assessment area. The area is considered to have low archaeological potential based on the sloped and poorly-defined nature of the terrain as well as the lack of hydrological features. This proposed access route displays some ground disturbance as a result of previous road developments.
09-0471-011	ME 10-C	Sept. 11, 2010	4	No	This location is gently sloping and homogenous with a north-northeastern aspect. No hydrological features were observed within or immediately adjacent to the proposed development area. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features.
09-0471-011	ME 10-C Access Road	Sept. 11, 2010	4	No	This short access rout area is situated within gently sloping and homogenous terrain with a slight north-northeastern aspect. No hydrological features were identified within or immediately adjacent to the development area. The area is considered to have low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features.

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Terra ID	Drill Site/ Development ID	Date of Field Visit	Figure Reference	Area(s) of Arch. Potential Identified	Terrain Description / Potential Assessment / Remarks
09-0471-011	ME 10-D	Sept. 11, 2010	4	No	This location is gently sloping and homogenous with a north-northeastern aspect. No hydrological features were observed within or immediately adjacent to the proposed drill site. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features. This drill site will be accessed via a small existing spur road connecting it to the to the main access road to the southeast.
09-0471-011	ME 10-E	Sept. 11, 2010	4	No	This location is gently sloping and homogenous with a slight northwestern aspect. No hydrological features were identified within or immediately adjacent to the proposed drill site. The area displays low archaeological potential based on the homogenous nature of the terrain and the lack of hydrological features. This drill site is situated along an existing access road proposed for use as the Pump Access Road East.
09-0471-011	Pump Access Road West	Sept. 11, 2010	4	No	The proponent will utilize an existing forestry road for the purpose of this pump access route. As such, an archaeological potential assessment was not completed for this area. Provided no improvements/upgrades or additional road construction are proposed for this route, and provided no terrain beyond the existing road footprint is impacted by its use, no further archaeological work is necessary. Additional work may be required prior to future road maintenance or upgrades if previously undisturbed terrain is proposed to be impacted.
09-0471-011	Pump Access Road East	Sept. 11, 2010	4	No	The proponent will utilize an existing forestry road for the purpose of this pump access route. As such, an archaeological potential assessment was not completed for this area. Provided no improvements/upgrades or additional road construction are proposed for this route, and provided no terrain beyond the existing road footprint is impacted by its use, no further archaeological work is necessary. Additional work may be required prior to future road maintenance or upgrades if previously undisturbed terrain is proposed to be impacted.
09-0471-012	DH10-BA	Nov. 16, 2010	4	No	This drill site is situated on low-lying ground amidst undulating terrain. An ephemeral drainage gully, approximately three meters deep, is located approximately 35m to the northwest of the proposed development. Terrain associated with this feature is sloping and poorly drained. Archaeological potential is assessed as low in this location.
09-0471-012	DH10-BB	Nov. 16, 2010	4	No	This drill site is located on low-lying terrain with a gentle slope towards a small lake situated approximately 130 m to the west. Terrain is hummocky and poorly drained. Archaeological potential is assessed as low in this location.
09-0471-012	DH10-BA, DH10-BB & Access Road	Nov. 16, 2010	4	No	Terrain along the length of this proposed access route is low-lying and poorly drained with a gentle northwestern aspect. Archaeological potential is assessed as low throughout.
09-0471-012	DH10-BC	Nov. 16, 2010	4	No	This drill site is situated on low-lying, saturated terrain with a gentle northwestern aspect. A small lake is located approximately 80 m northwest of the proposed development. Archaeological potential is assessed as low in this location. This drill site is accessed via an existing road to the east,
09-0471-012	SE10-AA	Sept. 11, Nov. 16, 2010	1	No	This drill site is situated on a heavily disturbed deactivated logging road. The area is moderately undulating with an overall moderate loss of elevation down to the south-southeast. No significant hydrological features or landforms were observed in the vicinity of this proposed development. Archaeological potential is assessed as low in this location.

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Terra ID	Drill Site/ Development ID	Date of Field Visit	Figure Reference	Area(s) of Arch. Potential Identified	Terrain Description / Potential Assessment / Remarks
09-0471-012	SE10-AA South Access Road	Nov. 16, 2010	1	No	This proposed access route is approximately 1 km in length. It trends northeast through gently sloping, poorly drained terrain with a slight southeastern aspect. The southernmost 200 m and the northernmost 250-300 m of the road are situated within regenerated clear cuts, and the northernmost 100 m follows a heavily disturbed deactivated logging road. Drill site SE10-AA is situated on this road. The central 500 m of the proposed road pass through naturally forested terrain. No significant hydrological features or landforms were observed at any point along the development. Archaeological potential is therefore assessed as low.
09-0471-012	SE10-AA North Access Road	Sept. 11, 2010	1	No	The proposed access road trends along an existing deactivated forestry road. The area is heavily disturbed, and no hydrological features were observed in the immediate vicinity. Archaeological potential is assessed as low throughout
09-0471-012	SE10-AB	Sept. 11, Nov. 16, 2010	1	No	This area is flat to moderately sloping with an east-southeastern aspect. The terrain is predominantly low-lying and saturated. There is a high degree of ground disturbance due to an existing, deactivated, forestry road. No hydrological features were noted within or immediately adjacent to the study area. The area is assessed as having low archaeological potential based on the poorly-drained and disturbed nature of the terrain as well as the lack of hydrological features.
09-0471-012	SE10-AB Spur Road	Nov. 16, 2010	1	No	This proposed access route is approximately 180 m in length, and lies on a heavily disturbed skid trail. The northern extent of this spur is situated within a 50 m wide, 5-7 m deep gully with poorly defined, sloping sides. Archaeological potential is assessed as low throughout.

A number of the proposed roads, which will be used for drill site access or lake access, overlap existing forestry roads. In the cases where existing roads will be utilized, and no new developments are proposed, archaeological potential assessments were not completed. Provided no improvements, upgrades or additional construction activities are proposed, and provided no terrain beyond the existing road right-of-ways is impacted by the use of the roads, no further archaeological work is considered necessary. Additional work may be required prior to future road maintenance or upgrades if soil excavation is necessary or previously undisturbed terrain is proposed to be impacted.

Although no pre-1846 archaeological resources were identified in the areas assessed, an Archaeological Impact Assessment (AIA) conducted under the authority of a *Heritage Conservation Act* Inspection permit is recommended for AAP 1 which is in conflict with the proposed SE 10-Z Access Road located in the Woodjam South area. This area exhibits archaeological potential warranting subsurface testing and thorough examination of soil exposures in snow-free conditions.

Archaeological potential in the remainder of the areas subject to PFR is considered low, therefore no further archaeological investigations are recommended for these areas provided current development boundaries are not altered to include any un-assessed areas.

Although the potential presence of archaeological sites is considered low in areas not recommended for AIA, no archaeological assessment can completely eliminate the risk of encountering archaeological resources. If archaeological materials are encountered during any phase of development, all operations in the locality should be suspended until Archaeological Planning and Assessment, as well as the relevant First Nation(s) have been contacted for direction. Any cultural materials which pre-date A.D. 1846 are protected by the Heritage *Conservation Act* of British Columbia.

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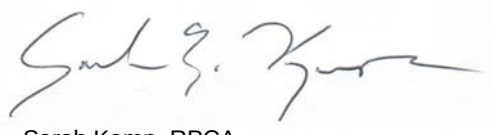
This assessment addresses the potential for the existence of physical evidence of past human activity and does not encompass traditional use or other heritage concerns of the First Nations communities. This information should be solicited directly from the First Nations.

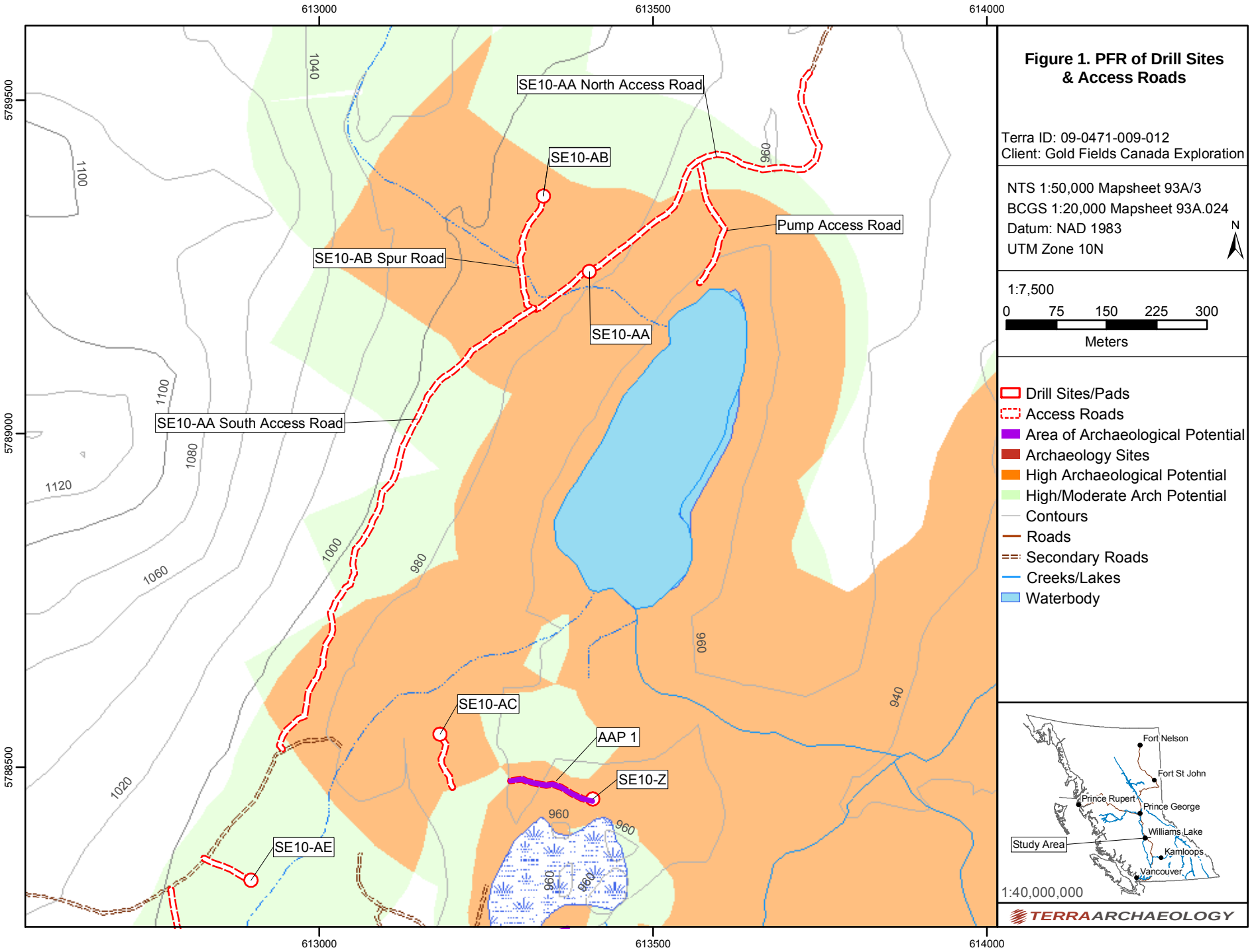
Please feel free to contact me if you have any questions regarding these assessments, our recommendations or the archaeological process.

Yours truly,

TERRA ARCHAEOLOGY LIMITED



Sarah Kamp, RPCA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SE10-AA North Access Road
SE10-AB
Pump Access Road
SE10-AB Spur Road
SE10-AA
SE10-AA South Access Road
SE10-AC
AAP 1
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SE10-AE
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Figure 1. PFR of Drill Sites & Access Roads
Terra ID: 09-0471-009-012
Client: Gold Fields Canada Exploration
NTS 1:50,000 Mapsheet 93A/3
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N
N
1:7,500
0 75 150 225 300
Meters
Drill Sites/Pads
Access Roads
Area of Archaeological Potential
Archaeology Sites
High Archaeological Potential
High/Moderate Arch Potential
Contours
Roads
Secondary Roads
Creeks/Lakes
Waterbody
Fort Nelson
Fort St John
Prince Rupert
Prince George
Williams Lake
Study Area
Kamloops
Vancouver
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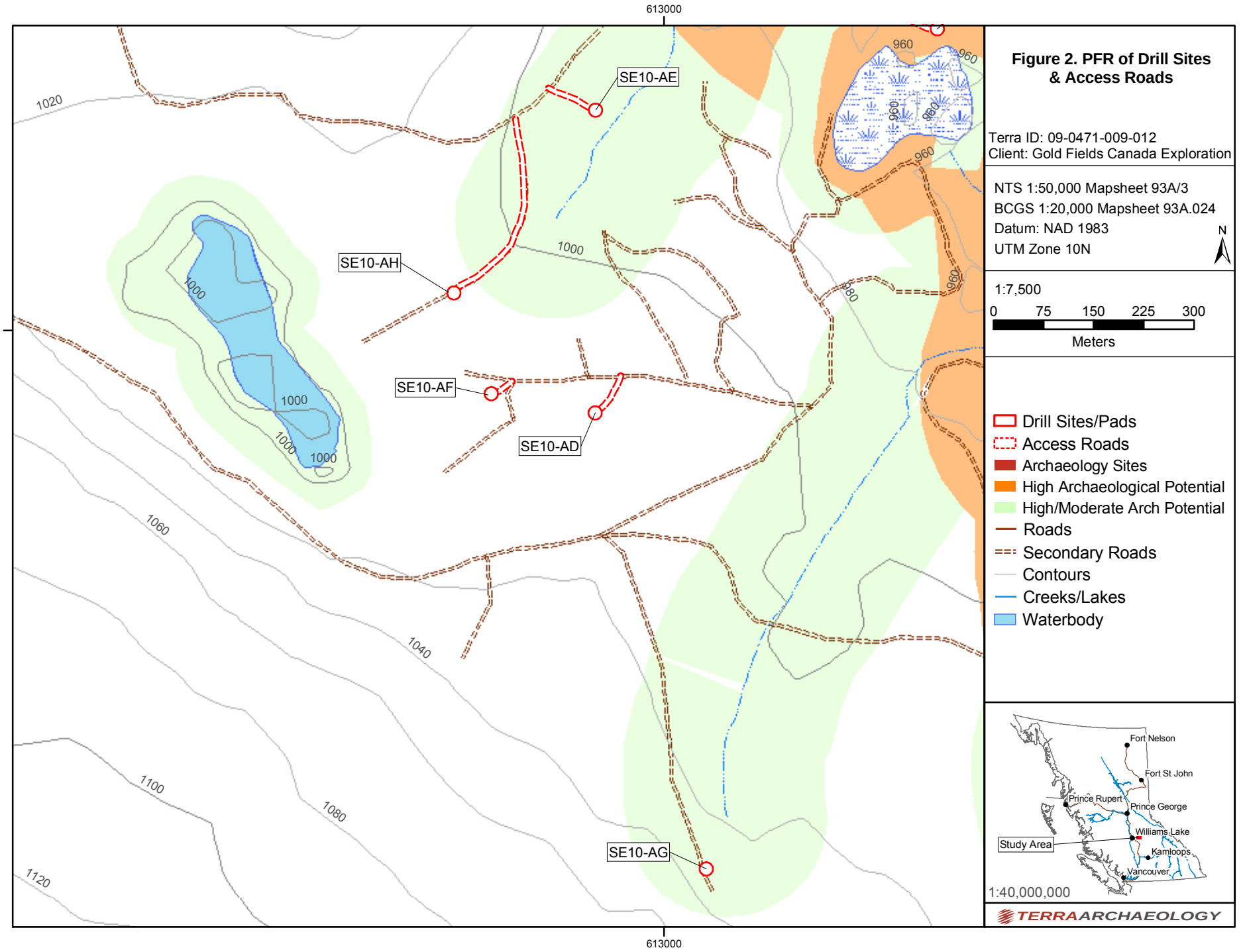
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Figure 2. PFR of Drill Sites & Access Roads
Terra ID: 09-0471-009-012
Client: Gold Fields Canada Exploration
NTS 1:50,000 Mapsheet 93A/3
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N
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1:7,500
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Meters
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Access Roads
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High Archaeological Potential
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Creeks/Lakes
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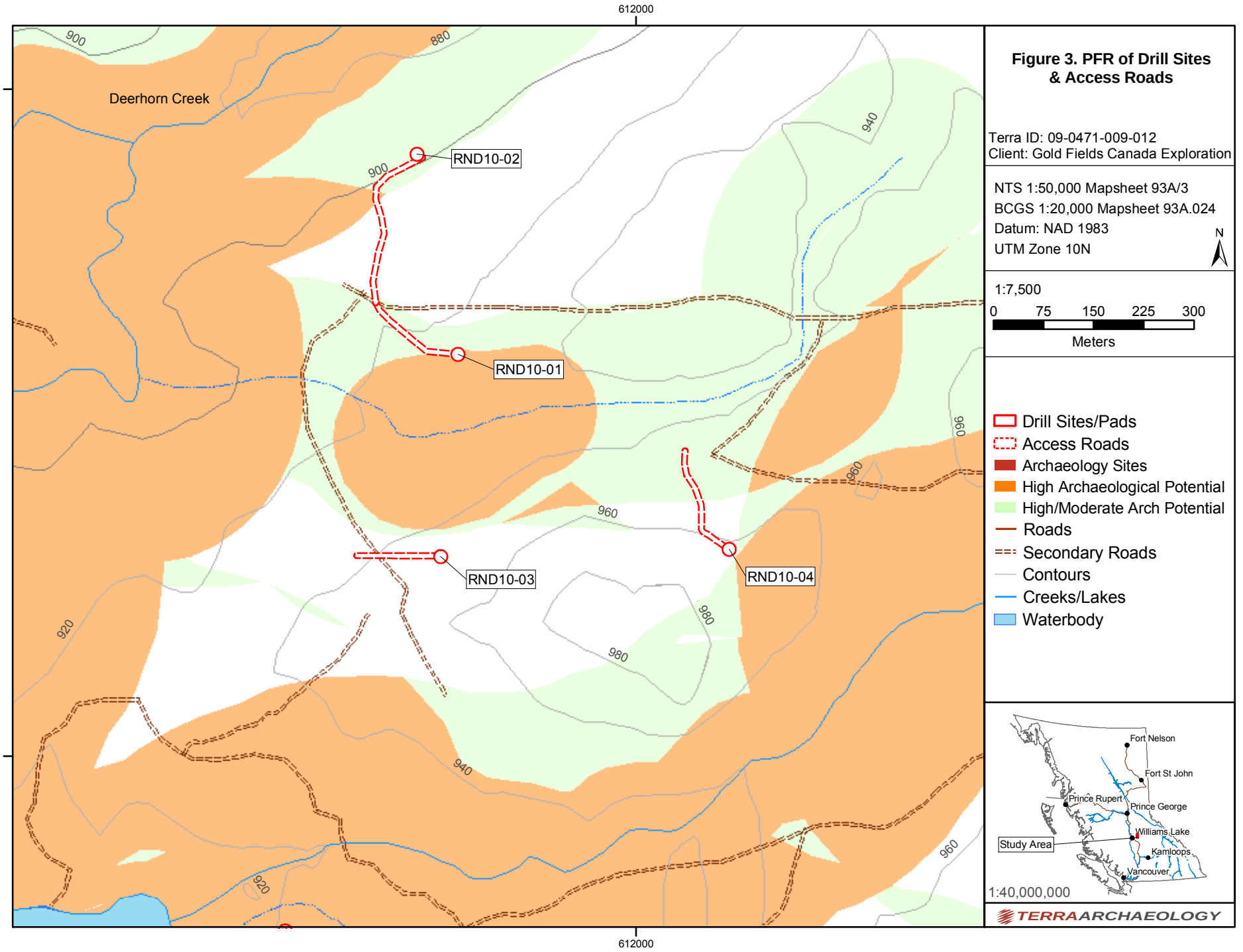
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Deerhorn Creek
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RND10-01
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920
Figure 3. PFR of Drill Sites & Access Roads
Terra ID: 09-0471-009-012
Client: Gold Fields Canada Exploration
NTS 1:50,000 Mapsheet 93A/3
BCGS 1:20,000 Mapsheet 93A.024
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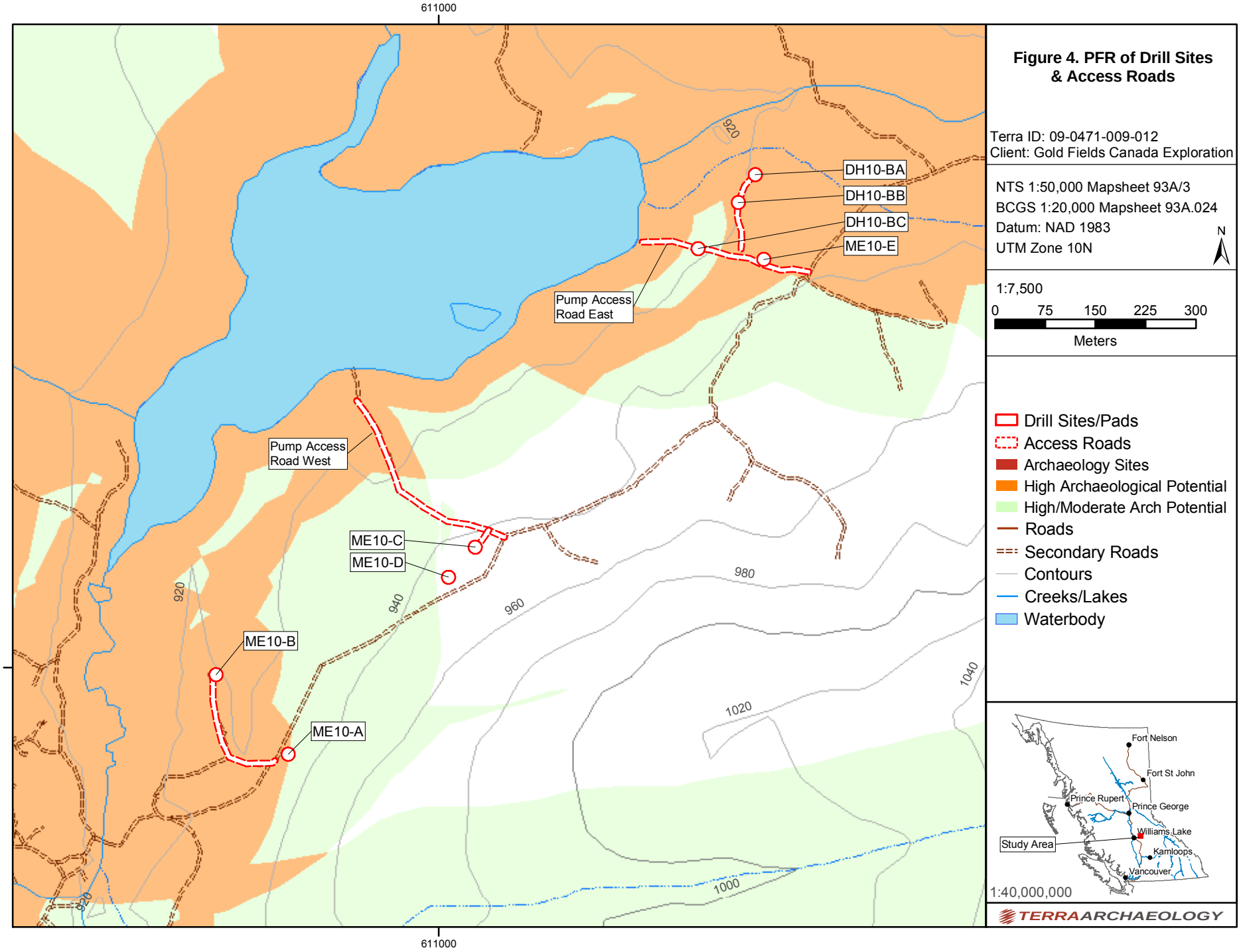

Figure 4. PFR of Drill Sites & Access Roads

Terra ID: 09-0471-009-012
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NTS 1:50,000 Mapsheet 93A/3
BCGS 1:20,000 Mapsheet 93A.024
Datum: NAD 1983
UTM Zone 10N

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Meters

- Drill Sites/Pads
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- Archaeology Sites
- High Archaeological Potential
- High/Moderate Arch Potential
- Roads
- Secondary Roads
- Contours
- Creeks/Lakes
- Waterbody

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