SER

United States Department of Agriculture
Forest Service
Plumas National Forest
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File Code: 2540
Date: March 5, 2009

Mr. Steve Rosenbaum
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite #200
Rancho Cordova,, CA 95670-6114

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Dear Mr. Rosenbaum:

Enclosed is a complete set of 2008 water quality monitoring reports by the U.S. Department of Agriculture, Forest Service, Plumas National Forest, for the Walker Mine Tailings in Plumas County. The four Quarterly Monitoring Reports are: (1) June, (2) July, (3) September (all are 2008) and (4) the Annual Monitoring Report for 2008.

Results of the 2008 sampling are consistent with the results from 2007. Copper remains the pollutant of concern and the sample results indicate that significant levels of copper enter solution as Dolly Creek flows over the tailings. Significantly elevated levels of dissolved copper are documented in samples from Little Grizzly Creek downstream of its confluence with Dolly Creek.

All water samples were transported to Basic Laboratories in Redding, CA for analysis. Lawrence and Associates of Redding, CA installed five exploratory boreholes, two piezometers and one monitoring well to better determine geologic nature and groundwater table of Walker Mine Tailings.

In 2007, construction of a lined channel was completed to minimize copper seepage into Dolly Creek. Since then, the grade structure that drops Dolly Creek into the new channel has not functioned as designed. Approximately fifty percent of flows seep under the grade control structure and are diverted back into the original channel. In 2009, possibilities are being explored to reduce seepage under the grade control structure. One possibility is to place a footing approximately 4' into the ground at the beginning of the grade control structure which would cause flows to be diverted into the constructed channel.

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A pilot project to remediate soils and revegetate the tailings with biosolids and nutrient loading is also being planned.

Please call Engineer Ryan Nupen at (530) 283-7712, if you have any questions.

Sincerely,

Alice B Carlton

ALICE B. CARLTON
Forest Supervisor

Enclosures

cc: Ryan Nupen, Angela Gregory, Joseph A Hoffman, Jonathan D Berry

United States Department of Agriculture
Forest Service
Plumas National Forest
159 Lawrence Street
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File Code: 2540
Date: December 11, 2008

Mr. Steve Rosenbaum
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite #200
Rancho Cordova,, CA 95670-6114

Dear Mr. Rosenbaum:

Attached please find a complete set of 2008 water quality monitoring reports by the U.S. Department of Agriculture, Forest Service, Plumas National Forest, for the Walker Mine Tailings in Plumas County. The four reports are (1-3) Quarterly Monitoring Reports for June, July, and September 2008 and (4) the Annual Monitoring Report for 2008.

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Please call Ryan Nupen of this office at (530) 283-7712 if you have any questions.

Sincerely,

ALICE B. CARLTON
Forest Supervisor

cc: Ryan Nupen, Angela Gregory, Joseph A Hoffman, Jonathan D Berry

ANNUAL MONITORING REPORT

Discharger: USDA Forest Service, Plumas National Forest

Facility: Walker Mine Tailings, Plumas County

Monitoring Period: Calendar Year 2008

Findings:

(1) Surface Water. Samples were collected in June, July, and September 2008. Adjusting for hardness at the compliance station on Little Grizzly Creek (R-5), the calculated limitation for dissolved copper for the three sampling periods ranged from 2.8 ug/L to 4.9 ug/L. The limitation for copper, 4.95ug/L, set in Waste Discharge Requirements Order No. 5-00-028 was exceeded during June of 2008 with a value of 25.5 ug/L (the average dissolved copper concentration at R-5 was 11 ug/L down from an average of 58 ug/L in 2006). The limitations for iron and zinc were not exceeded in any of the R-5 samples collected.

Low concentrations of dissolved copper were detected at R-3, the background station on Little Grizzly Creek, and R-4, Little Grizzly Creek above the confluence with Dolly Creek, during each of the three sampling events (see Table 1 and attached Map). Reviewing the 83 copper testing results from 1991 to present for R-3 and R-4 indicates no significant trends. The average dissolved copper concentration for the two sites over this period is very similar (2.9 ug/L for R-3 and 3.5 ug/L for R-4). Copper concentrations above the laboratory detection limits were found in the waters of Little Grizzly Creek above the confluence with Dolly Creek just 31% (R-3) and 34% (R-4) of the time. However, the concentrations found frequently do not follow the hypothesis that the copper concentration in Little Grizzly Creek is increasing as it flows past the tailings material. Only 20% of the sampling events show higher dissolved copper concentrations at R-4 than at R-3 and about half the time that copper is detected at R-3 it is not detected at all downstream at R-4. There is actually little concrete explanation for the detection of copper at the R-3 station. The only apparent contamination of Little Grizzly Creek at that location is the occasional drift of tailings material blown by the wind into this upstream area. Even with this minor contamination pathway, it does not seem plausible that concentrations of copper in samples taken at R-3 could be detected.

The June sampling event was the only event in which dissolved copper was found at R-1, Dolly Creek above the tailings area, in concentrations that exceeded the limitations established for freshwater aquatic life protection. The results from the R-2 samples, Dolly Creek below the tailings area, confirm the tailings area as the primary source of copper to the receiving waters. Over the three sampling events, the increase in copper concentration from R-1 to R-2 amounted to (on average) 58% of the copper found at R-2 (see Table 2 and Chart 1).

The reduction in copper concentrations between stations R-2 and R-5, the compliance station on Little Grizzly Creek – presumably due to dilution - was 39% in June, 68% in July, and 71% in September. The 2008 water year was considered below average and received only 58% of its annual average precipitation. Table 3 displays flow rates for the sampling periods from 1991 through 2008.

(2) Groundwater. Groundwater samples were collected from two monitoring wells (W-5 and W-7) in June and September of 2008 (see attached map). A summary of the groundwater test results for sampling performed in 1994, 1995, 2000-2004, 2007-2008 is presented in Table 4 (samples were not collected from 1996-1999 or 2005-2006). Test results for total copper, iron, and zinc in the 1994 and 1995 samples indicate that small concentrations of these metals are present in the tailings material, in both dissolved and non-dissolved states, throughout the site. The characterization of the tailings material in 1992 by Westec confirmed presence of these constituents throughout the tailings area. The characterization program included not only seven monitoring well but also an additional seven boreholes.

Copper, iron, and zinc were detected in both wells during each sampling period with the exception of W-7, in which no iron was detected in June.
There was also a notable increase in dissolved iron in W-5 where the June and September test results were 11,200 ug/L and 15,700 ug/L, respectively. It is also possible that the increase in dissolved iron detected is due to a change in the groundwater flow regime caused by previous reclamation activities.

Previously, the detection of dissolved iron has been relatively rare in any of the wells. For the 40 samples analyzed for iron from 2000 to 2004, and 2007-2008, iron was detected in 20 samples (50% detection). The mean and median dissolved concentrations for samples with detected iron are 1675 ug/L and 160 ug/L (respectively). The median falls well below the prescribed water quality limitation at R-5 of 1000 ug/L but the mean was greatly increased due to the unexpectedly high laboratory results for W-5 in 2007 and 2008. For zinc, the mean and median detected dissolved concentrations are 8.2 ug/L and 6.3 ug/L with a maximum detected concentration of 21.0 ug/L. All of these values are well below the prescribed limitation for zinc which is 66 ug/L. Zinc concentrations are dependent upon the measured water hardness, which averaged 65.5 mg/L as $CaCO_3$ for the 2000-2004 and 2007-2008 surface water samples at R-5 (with a median of 70 mg/L as $CaCO_3$). Another way in which the presence of zinc can be predicted is by looking at the presence of copper at Walker Mine Tailings. Because of the physical similarities between copper and zinc and given the overall water quality records at this site, the presence of zinc when copper is present occurs 70% of the time.

Well W-7 is situated upgradient and off of the tailings site and is used as the background well. When compared with W-7 sample results, dissolved iron and zinc concentrations detected in downgradient wells W-3 and W-5 (both wells situated on the tailings) do not demonstrate an increase in the concentration of these metals as groundwater passes through the tailings material. For zinc, an increased downgradient concentration was

observed in just 1 of the 20 sample events conducted from 2000 to 2004. For iron, an increased downgradient concentration in W-3 or W-5 is documented in just 4 of the 20 events.

In analyzing the groundwater sample results for copper, it is best to look closely at the samples collected between 2002 and 2004. These samples were analyzed using methods and instrumentation that allowed a very sensitive detection level of 1.0 ug/L (the 2000 samples were analyzed with a detection level of 5.0 ug/L and the 2001 detection level was 10 ug/L).

Additionally, only one of the 30 groundwater samples collected between 2000 and 2004 resulted in a dissolved copper concentration of more than 5.0 ug/L (the detection level used for the 2000 anlyses). The sample at W-3 for September 2001 resulted in a dissolved copper concentration of 12 ug/L. Well W-3 is situated on the tailings very close to the Dolly Creek channel. The well-documented high concentrations of dissolved copper in the Dolly Creek surface water are a likely source for the elevated copper concentration in this groundwater sample.

As stated above, the low levels of dissolved copper observed in the eighteen 2002 to 2004 groundwater samples measured between 1.0 and 2.8 ug/L. Moreover, a trend of increasing copper concentration as groundwater flows through the tailings is not demonstrated by the well data. For dissolved copper, an increased downgradient concentration in wells W-3 and W-7, when compared with the background well W-7, was observed in just 6 of the 12 sample events conducted from 2002 to 2004. This 50% trend indicates – as do the rest of the groundwater metal data – that low groundwater copper concentrations are distributed practically at random across the tailings pile.

Since September 2007, copper concentrations have increased in W-5, and W-7. It is hypothesized that copper may have been mobilized locally by vibration and/or compaction of the strata that decreased pore space or caused pumping that disturbed the groundwater and temporarily increased the concentrations.

With the elevation of the Little Grizzly Creek channel approximately 20 feet below the surface of the tailings area, there is a strong gradient towards Little Grizzly Creek all along its course with the tailings area. These site conditions indicate that the potential exists for contamination of Little Grizzly Creek due to groundwater seeping from the tailings pile.

The results of previous sampling did not indicate any significant trends for dissolved metal concentrations. Additionally, despite the almost continuous line of groundwater seeps along the base of the tailings area and the Little Grizzly Creek channel bank, the metals concentration results are nearly identical (as discussed above) for samples taken from Little Grizzly Creek above and below the tailings interface (at R-3 and R-4, both upstream of the confluence with Dolly Creek).

One can basically conclude that even though copper and zinc are present in the tailings material throughout the site, they are not entering into solution (except in surface water along the Dolly Creek channel). This is confirmed by the surface water-sampling program, in which samples taken at the base of the tailings in Little Grizzly Creek (R-4) generally indicate that these constituents are at non-detectable levels. It's only after Little Grizzly Creek mixes with Dolly Creek that soluble copper and zinc are detected.

Therefore, the groundwater pathway is demonstrated to be a decidedly unlikely pathway for tailings pollution on Little Grizzly Creek. The Forest Service will continue to monitor groundwater metals concentrations in wells W-5 and W-7 due to increased iron concentrations.

The water level in each well was measured in 2008 during each of the three sampling events. Maps displaying the groundwater flow gradient and direction were produced for each event (attached). Generally, the groundwater in the tailings area drains in two directions, towards the tailings dam near the end of Dolly Creek and towards the settling pond near R-6. The groundwater gradient steepens by the end of the summer season, dropping nearly five feet at the dam and ten feet at the settling pond.

Table 5 lists the measured groundwater depths for the years in which this data has been collected (1993 – 1995 and 2000 - 2008). Groundwater elevations at W-3 are important to look at from the standpoint of the proposed anaerobic wetland. The depth to water in 2008 dropped from 4.2 feet to 3.1 feet from June to September. The depth to groundwater at W-3 averages 5.4 feet and the seasonal water table drop is typically about two feet. Except for the driest year since monitoring began, water appears to flow over the tailings dam at all times; in August 1992, Dolly Creek flows did not reach the tailings dam during the heat of the day.

In October of 2008 five exploratory boreholes, two piezometers, and one monitoring well were installed in close proximity to the inlet structure on Dolly Creek to further determine the geologic properties of the subsurface to depth of 30 feet below the ground surface (see the attached report for further detail). The monitoring well, W-1B, was installed approximately 150 feet from the original W-1, which was destroyed during construction in the fall of 2007. Monitoring will begin on W-1B in summer of 2009.

(3) Channel Substrate Analysis (Pebble Count). One of the measured changes that should occur as a result of rehabilitating the tailings area is a decreased transport of tailings material to Little Grizzly Creek. Though most of the material moves during times of high flows when sampling does not normally occur, evidence of its occurrence should be measurable by analyzing channel substrate size classes. In past years, a "Wolman pebble count" has been conducted once a year in the fall to analyze the channel substrate.

Pebble counts at the two established pebble count transects were not monitored since. However, pebble count data for the previous four years (2000-2003) exhibited very similar results: the R-5 transect (on Little Grizzly Creek below its confluence with Dolly Creek) did contain sand-sized material, including the medium, fine and very fine sands

found over most of the tailings area, whereas the R-6 (on Little Grizzly Creek above its confluence with Dolly Creek) transect did not. Based on the data collected and visible evidence made at the time the transects were established, most of the sands are being washed downstream during winter and spring flows, but material from the tailings area apparently continues to wash into Little Grizzly Creek for an extended period of time and some of it is trapped around the coarser material of the R-5 channel section. Pebble counts will again be performed at the two established transects in 2009.

Copper Concentrations at R-3 and R-4
Little Grizzly Creek Above and Below Walker Tailings

Table 1

Date	R-3 Copper mg/L	R-4 Copper mg/L
May 91	0	0.0020
Jun 91	0	0
Jul 91	0	0
Aug 91	0	0.0030
Sep 91	0	0
Oct 91	0	0
Nov 91	0	0
Dec 91	0	0.0030
Apr 92	0	0
May 92	0	0.0390
Jun 92	0.0039	0
Jul 92	0	0
Aug 92	0.0036	0
Sep 92	0.1200	0.1200
Oct 92	0	0.0024
Nov 92	0	0
May 93	0	0
Jun 93	0.0028	0
Jul 93	0.0024	0.0070
Aug 93	0	0
Sep 93	0	0.0083
Oct 93	0	0
Nov 93	0	0.0040
May 94	0	0
Jun 94	0.0090	0.0057
Jul 94	0	0
Aug 94	0	0
Sep 94	0	0
Oct 94	0	0
Jun 95	0	0
Jul 95	0	0
Aug 95	0.0041	0
Sep 95	0	0
Oct 95	0	0
Nov 95	0	0.0023
May 96	0	0
June 96	0	0
July 96	0.0029	0
Aug 96	0.0022	0
Sept 96	0	0
May 97	0	0
June 97	0	0
July 97	0	0
Aug 97	0	0
Sept 97	0	0
Oct 97	0	0
June 98	0	0
July 98	0.0110	0.0034
Aug 98	0.0046	0.0015
Sept 98	0	0
Oct 98	0.0130	0.0088
Jun 99	0	0
Jul 99	0	0
Aug 99	0	0
Sept 99	0	0
Oct 99	0	0

Date	R-3 Copper mg/L	R-4 Copper mg/L
May 00	0	0
Jul 00	0.0230	0
Sep 00	0	0
May 01	0	0
Jul 01	0	0
Sep 01	0	0
May 02	0.0051	0
Jul 02	0.0039	0.0013
Sep 02	0	0.0037
June 03	0.0017	0.0013
Jul 03	0	0.0027
Sep 03	0.0032	0.0010
May-04	0.0034	0.0420
Jul-04	0	0
Sep-04	0	0
Jun-05	0	0
Jul-05	0	0
Sep-05	0	0
Jun-06	0.0032	0.0012
Jul-06	0.0033	0.0011
Sep-06	0	0
May 07	0.0049	0.0043
July 07	0.0012	0.0035
Sep 07	0.0069	0.0078
Jun-08	0.0017	0.0050
Jul-08	0.0005	0.0029
Sep-08	0.0005	0.0016
x	0.0029	0.0035
n	83	83
s	0.0135	0.0144
max	0.1200	0.1200
min	ND	ND

Summary of Copper Data for R-1, R-2 and R-5
1991-2008

Table 2

	R-1 Cu Conc. (mg/L)				R-2 Cu Conc. (mg/L)				R-5 Cu Conc. (mg/L)		
Year	May/June	July	September		May/June	July	September		May/June	July	September
1991	0.110	0.044	0.023		0.572	0.256	0.362		0.040	0.060	0.102
1992	0.034	0.034	0.033		0.250	0.360	0.240		0.000	0.066	0.000
1993	0.024	0.110	0.047		0.370	0.450	0.230		0.036	0.140	0.099
1994	0.074	0.029	0.021		0.500	0.210	0.088		0.050	0.051	0.017
1995	0.086	0.055	0.042		0.190	0.220	0.100		0.024	0.070	0.053
1996	0.065	0.017	0.014		0.150	0.180	0.066		0.032	0.076	0.031
1997	0.002	0.011	0.013		0.092	0.082	0.060		0.015	0.036	0.029
1998	0.050	0.015	0.011		0.150	0.180	0.080		0.012	0.055	0.040
1999	0.016	0.014	0.017		0.017	0.180	0.071		0.002	0.068	0.028
2000	0.014	0.016	0.009		0.310	0.220	0.096		0.033	0.085	0.033
2001	0.020	0.012	0.014		0.270	0.130	0.042		0.029	0.030	0.019
2002	0.030	0.015	0.009		0.450	0.310	0.092		0.024	0.110	0.022
2003	0.024	0.027	0.011		0.097	0.320	0.100		0.034	0.120	0.030
2004	0.028	0.021	0.008		0.003	0.220	0.052		0.380	0.067	0.000
2005	0.019	0.016	0.005		0.260	0.290	0.100		0.038	0.090	0.030
2006	0.024	0.012	0.007		0.240	0.230	0.078		0.048	0.095	0.031
2007	0.017	0.014	0.015		0.076	0.059	0.034		0.012	0.021	0.012
2008	0.018	0.005	0.004		0.042	0.014	0.010		0.026	0.004	0.003
x	0.04	0.03	0.02	x	0.22	0.22	0.11	x	0.05	0.07	0.03
n	18	18	18	n	18	18	18	n	18	18	18
s	0.03	0.02	0.01	s	0.17	0.11	0.09	s	0.08	0.03	0.03
max	0.110	0.110	0.047	max	0.572	0.450	0.362	max	0.380	0.140	0.102
min	0.002	0.005	0.004	min	0.003	0.014	0.010	min	0.000	0.004	0.000

Summary of Flow Rates at R-1, R-2 and R-5
1991-2008

Table 3

	R-1 Flow Rate (cfs)				R-2 Flow Rate (cfs)				R-5 Flow Rate (cfs)		
Year	May/June	July	September		May/June	July	September		May/June	July	September
1991	0.88	0.52	0.60		1.28	0.31	0.28		19.62	0.84	1.35
1992	0.18	0.14	0.11		0.12	0.06	0.02		1.06	0.43	0.22
1993	7.28	1.31	0.73		7.28	1.25	0.57		46.10	3.53	1.10
1994	0.31	0.14	0.14		0.72	0.15	0.01		7.30	0.45	0.44
1995	6.97	2.48	1.05		8.22	2.38	2.01		97.20	7.46	1.88
1996	12.30	1.10	0.90		15.60	1.30	1.00		80.90	3.40	1.70
1997	5.05	1.24	0.66		5.69	1.18	0.86		54.09	1.43	1.34
1998	9.60	1.80	1.00		10.20	2.00	0.90		120.00	7.10	2.10
1999	5.24	1.30	0.78		5.74	1.13	0.72		34.97	3.74	1.35
2000	2.00	0.70	0.40		2.20	0.70	0.40		23.40	2.10	1.00
2001	0.44	0.18	0.24		0.42	0.13	0.28		3.99	0.52	0.73
2002	1.25	0.37	0.34		1.62	0.31	0.18		18.13	1.12	0.56
2003	3.41	0.77	0.45		3.78	0.75	0.38		22.05	1.67	1.20
2004	1.37	0.14	0.07		1.29	0.34	0.08		13.39	1.99	0.23
2005	2.88	0.66	0.52		2.91	0.98	0.57		22.78	2.34	1.16
2006	10.20	0.99	0.26		14.10	1.25	0.26		12.30	2.45	0.43
2007	0.19	0.07	0.07		0.19	0.08	0.06		1.48	0.19	0.14
2008	0.20	0.23	0.29		0.09	0.11	0.06		2.66	0.60	0.38
x	3.87	0.79	0.48	x	4.53	0.80	0.48	x	32.30	2.30	0.96
n	18	18	18	n	18	18	18	n	18	18	18
s	3.91	0.66	0.32	s	4.84	0.69	0.50	s	34.78	2.12	0.60
max	12.30	2.48	1.05	max	15.60	2.38	2.01	max	120.00	7.46	2.10
min	0.18	0.07	0.07	min	0.09	0.06	0.01	min	1.06	0.19	0.14

GROUNDWATER QUALITY AT WALKER MINE TAILINGS
1994-2008

Table 4

		Copper		Iron		Zinc	
Well No.	Sample Date	Total (mg/L)	Filtered (mg/L)	Total (mg/L)	Filtered (mg/L)	Total (mg/L)	Filtered (mg/L)
W-3	07/18/1994	0.0200	-	1.4000	-	ND	-
W-3	08/24/1994	0.0200	ND	1.4000	ND	ND	ND
W-3	09/22/1994	ND	ND	0.7300	0.1700	ND	ND
W-3	10/25/1994	ND	ND	1.1000	0.7000	ND	ND
W-3	06/24/1995	ND	ND	1.6000	ND	ND	ND
W-3	11/13/1995	ND	ND	0.3600	0.0400	ND	ND
W-3	05/24/2000	-	ND	-	0.0210	ND	ND
W-3	09/13/2000	-	ND	-	ND	ND	ND
W-3	05/22/2001	-	ND	-	ND	-	ND
W-3	09/25/2001	-	0.0120	-	ND	-	ND
W-3	05/10/2002	-	ND	-	ND	-	ND
W-3	09/26/2002	-	0.0021	-	ND	-	ND
W-3	05/23/2003	-	0.0020	-	ND	-	0.0032
W-3	09/18/2003	-	0.0025	-	ND	-	ND
W-3	05/21/2004	-	0.0015	-	0.0620	-	0.0069
W-3	09/05/2004	-	0.0024	-	ND	-	0.0016
W-3	5/31/2007	-	0.0030	-	0.3600	-	0.0120
W-3	9/17/2007	-	0.0510	-	0.0330	-	0.0210
W-4	08/24/1994	0.8900	0.5500	93.0000	0.4100	0.0800	0.0400
W-4	09/22/1994	1.7000	0.6200	120.0000	0.4100	0.1500	0.0500
W-4	10/25/1994	0.9800	ND	100.0000	32.0000	0.1200	ND
W-4	06/24/1995	ND	ND	28.0000	28.0000	ND	ND
W-4	11/13/1995	ND	ND	47.0000	25.0000	ND	ND
W-5	07/18/1994	0.1100	-	32.0000	-	ND	-
W-5	08/24/1994	0.0400	ND	31.0000	0.1000	ND	ND
W-5	09/22/1994	0.0500	ND	30.0000	ND	ND	ND
W-5	10/25/1994	0.0600	ND	32.0000	2.2000	ND	ND
W-5	06/24/1995	ND	ND	2.5000	1.9000	ND	ND
W-5	11/13/1995	ND	ND	17.0000	0.1500	ND	ND
W-5	05/24/2000	-	ND	-	0.0680	ND	ND
W-5	09/13/2000	-	ND	-	0.7400	ND	ND
W-5	05/22/2001	-	ND	-	1.2000	-	ND
W-5	09/25/2001	-	ND	-	ND	-	ND
W-5	05/10/2002	-	ND	-	0.1400	-	ND
W-5	09/26/2002	-	0.0013	-	0.1200	-	ND
W-5	05/23/2003	-	0.0015	-	ND	-	ND
W-5	09/18/2003	-	0.0028	-	ND	-	0.0056
W-5	05/21/2004	-	0.0012	-	ND	-	0.0054
W-5	09/05/2004	-	0.0011	-	ND	-	ND
W-5	5/31/2007	-	0.0020	-	9.4000	-	0.0088
W-5	9/17/2007	-	0.0060	-	19.0000	-	0.0140
W-5	6/3/2008	-	0.0013	-	112.000	-	0.0077
W-5	9/9/2008	-	0.0006	-	157.000	-	0.0107
W-6	08/24/1994	0.4600	ND	14.0000	ND	0.0400	ND
W-6	09/22/1994	0.9900	0.0100	31.0000	0.6900	0.0800	ND
W-6	10/25/1994	0.7200	0.0100	23.0000	0.2700	0.0200	ND
W-6	06/24/1995	ND	ND	ND	ND	ND	ND
W-6	11/13/1995	0.0900	ND	3.9000	0.0600	ND	ND
W-7	07/18/1994	ND	ND	1.9000	-	0.0200	-
W-7	08/24/1994	0.0200	ND	30.0000	0.4500	0.0500	ND
W-7	09/22/1994	0.0400	ND	43.0000	0.9600	0.0700	ND
W-7	10/25/1994	0.0400	ND	52.0000	1.1000	0.0600	ND
W-7	06/24/1995	ND	ND	ND	ND	ND	ND
W-7	11/13/1995	0.0100	ND	14.0000	0.6700	0.0200	0.0100
W-7	05/24/2000	-	ND	-	0.0790	-	ND
W-7	09/13/2000	-	ND	-	0.1800	-	ND
W-7	05/22/2001	-	ND	-	0.1400	-	ND
W-7	09/25/2001	-	ND	-	ND	-	ND
W-7	05/10/2002	-	ND	-	0.2800	-	ND
W-7	09/26/2002	-	0.0021	-	0.1000	-	0.0034
W-7	05/23/2003	-	0.0010	-	ND	-	0.0034
W-7	09/18/2003	-	ND	-	ND	-	0.0039
W-7	05/21/2004	-	0.0023	-	ND	-	0.0090
W-7	09/05/2004	-	ND	-	ND	-	0.0049
W-7	5/31/2007	-	0.0030	-	ND	-	0.0051
W-7	9/17/2007	-	0.0053	-	0.0880	-	0.0110

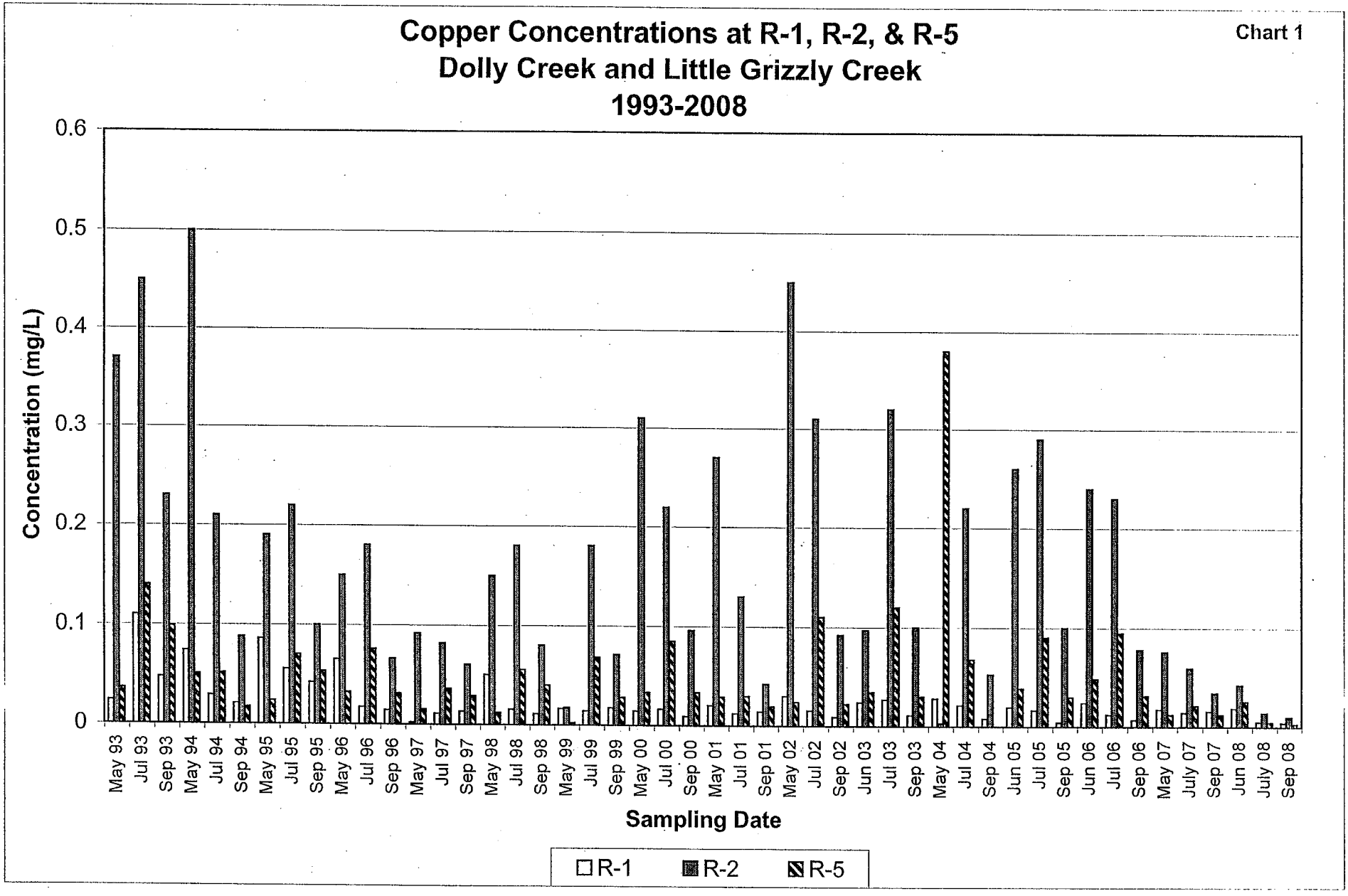
W-7	6/3/2008	-	0.0013	-	ND	-	0.0053
W-7	9/9/2008	-	0.0005	-	0.0310		0.0205

Table 5

Groundwater Depths at Walker Mine Tailings
1993 - 2008

Depth to Groundwater	Monitoring Well Number: Depth to Water (ft)							
From Top of Casing	W-1	W-2	W-3	W-4	W-5	W-6	W-7	Average Depth (ft)
Top of Casing Elevation	5729.24	5741.74	5738.83	5768.00	5754.09	5747.87	5754.91	
07-17-1993	13.34	2.14	5.12	16.96	7.90	5.64	1.06	7.45
07-18-1994	15.06	3.00	6.11	23.43	11.94	6.74	1.71	9.71
08-24-1994	15.35	3.26	6.59	24.52	12.88	7.63	2.07	10.33
09-22-1994	15.49	2.94	6.62	25.25	13.46	8.14	2.05	10.56
10-25-1994	15.59	2.60	6.28	25.90	13.97	8.33	1.91	10.65
06-24-1995	11.17	0.86	3.76	11.61	4.43	3.33	0.13	5.04
11-13-1995	14.75	2.34	5.98	22.64	11.32	7.09	1.03	9.31
05-24-2000	12.54	0.95	4.22	16.58	6.62	3.73	0.33	6.42
09-13-2000	14.80	2.77	6.08	22.76	11.34	7.09	0.25	9.30
05-22-2001	14.06	1.61	4.89	21.88	10.26	5.05	0.57	8.33
09-25-2001	15.27	3.16	6.69	25.21	13.39	8.25	1.68	10.52
05-10-2002	13.18	0.94	4.02	19.56	8.35	3.73	0.56	7.19
09-26-2002	14.96	2.92	6.40	24.37	12.59	7.87	1.43	10.08
05-23-2003	12.45	0.68	3.86	16.86	6.39	3.75	0.00	6.28
09-18-2003	14.54	2.58	6.08	22.84	11.35	7.16	0.79	9.33
05-21-2004	13.11	1.16	4.51	18.93	8.17	4.34	0.13	7.19
09-05-2004	14.57	2.63	6.30	23.52	11.89	7.44	1.20	9.65
06-16-2005	12.31	0.82	3.89	16.95	6.69	3.70	0.00	6.34
07-22-2005	13.26	1.63	5.26	18.96	8.45	5.66	0.42	7.66
09-15-2005	14.09	2.02	5.50	21.94	10.70	6.52	0.68	8.78
06-14-2006	11.19	0.68	4.39	14.24	5.68	4.20	0.00	5.77
06-24-2006	12.63	1.48	5.27	17.63	7.77	5.80	0.23	7.26
09-19-2006	13.88	2.31	6.05	21.34	10.29	7.06	0.59	8.79
05-31-2007	13.67	1.24	4.89	21.34	9.72	5.03	0.63	8.07
07-26-2007	14.11	2.19	5.90	22.86	11.32	6.18	1.44	9.14
09-17-2007	N/A	2.37	6.33	24.27	12.52	7.84	1.51	9.14
06-03-2008	N/A	0.47	4.23	20.77	9.41	4.21	0.87	6.66
07-31-2008	N/A	2.25	5.92	22.69	11.17	6.73	2.05	8.47
09-09-2008	N/A	2.49	6.29	23.93	12.20	7.59	2.05	9.09
Average Depth	13.81	1.95	5.43	21.03	10.07	6.06	0.94	8.47
n	25	29	29	29	29	29	29	29
s	1.27	0.86	0.96	3.57	2.57	1.63	0.71	1.70
max	15.59	3.26	6.69	25.90	13.97	8.33	2.07	10.65
min	11.17	0.47	3.76	11.61	4.43	3.33	0.00	5.04

Well W-1 was lost during construction summer 2007


Copper Concentrations at R-1, R-2, & R-5
Dolly Creek and Little Grizzly Creek
1993-2008
Chart 1
Concentration (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
May 93
Jul 93
Sep 93
May 94
Jul 94
Sep 94
May 95
Jul 95
Sep 95
May 96
Jul 96
Sep 96
May 97
Jul 97
Sep 97
May 98
Jul 98
Sep 98
May 99
Jul 99
Sep 99
May 00
Jul 00
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Jun 03
Jul 03
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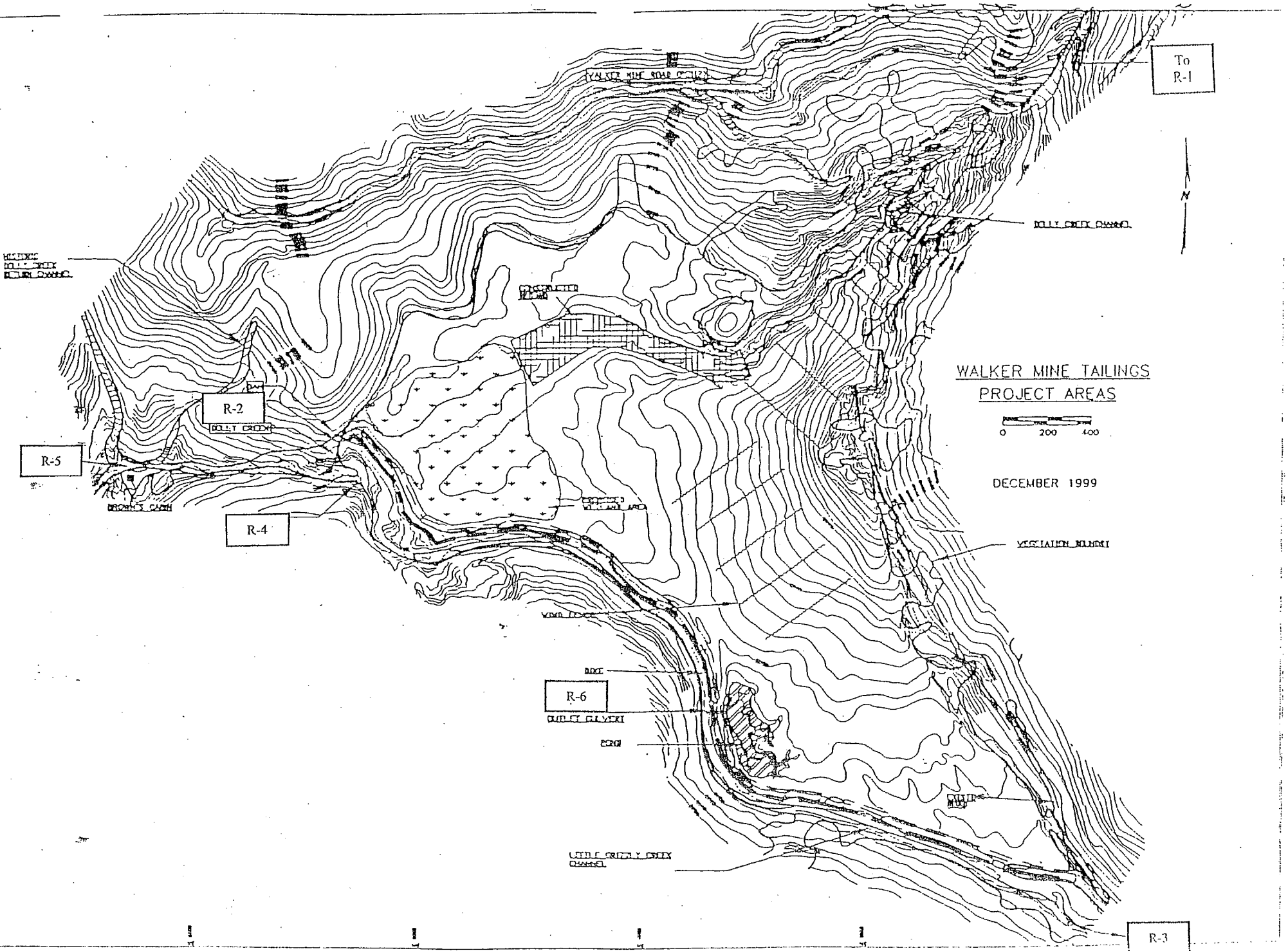
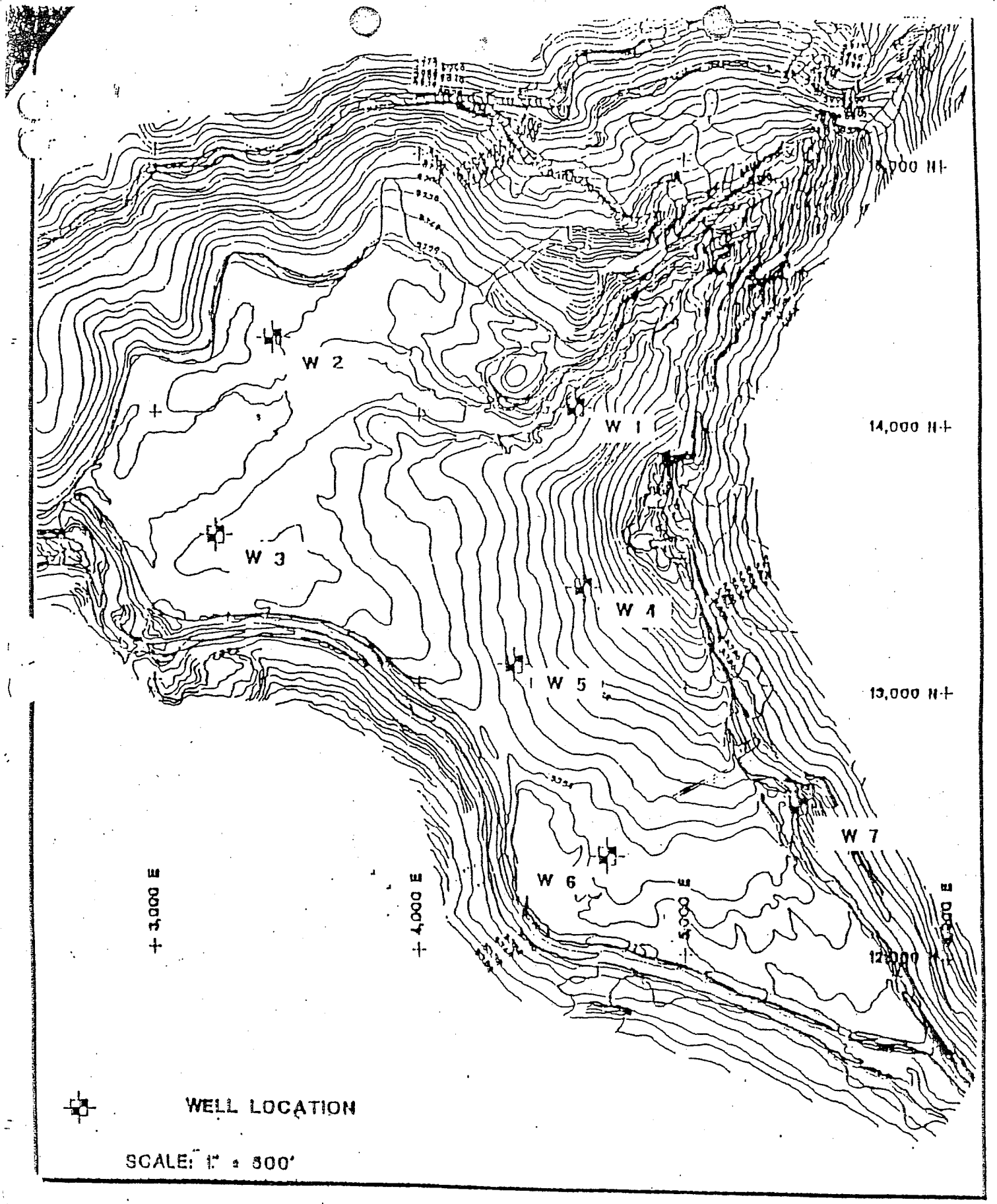
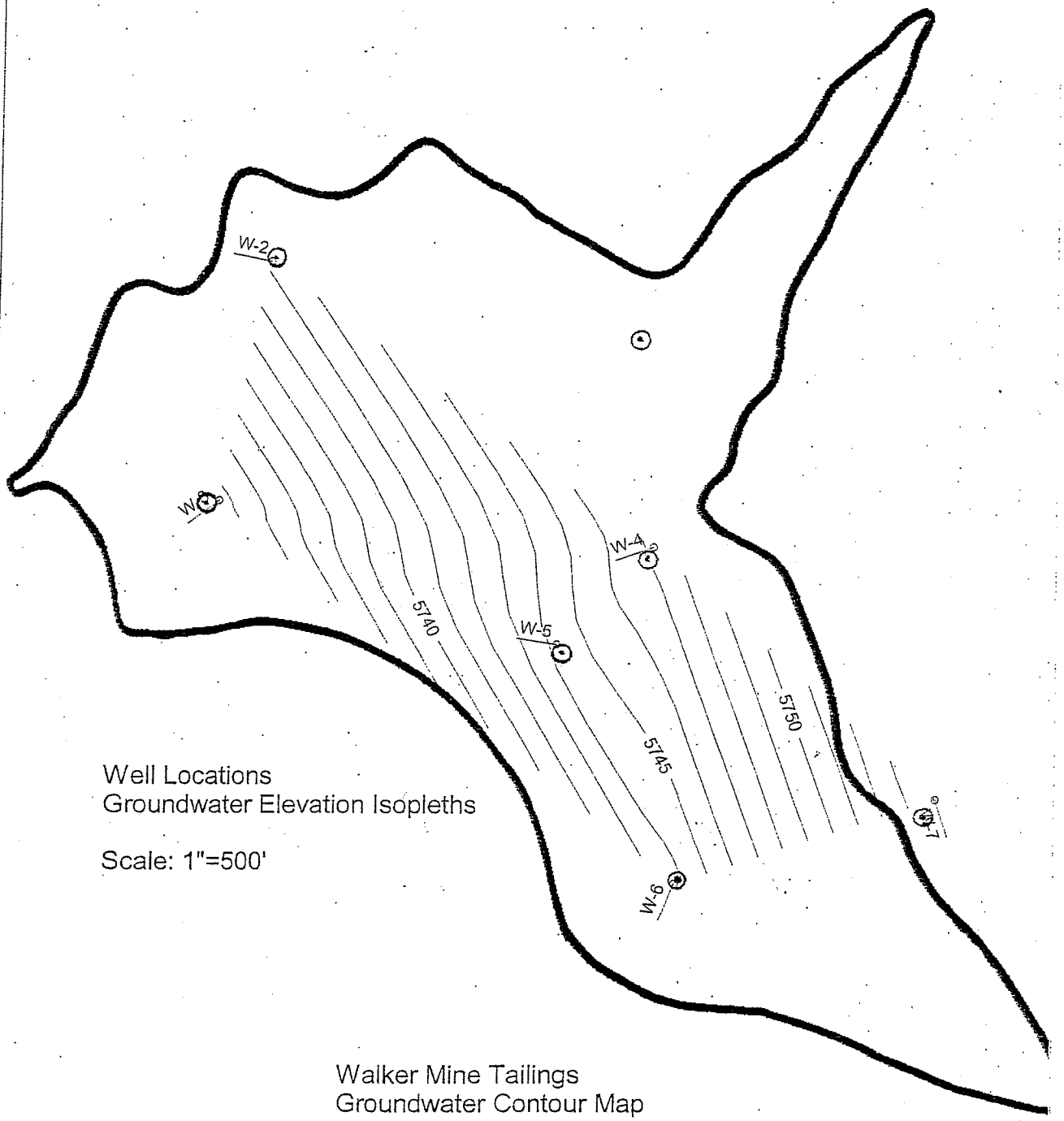
Sep 06
May 07
July 07
Sep 07
Jun 08
July 08
Sep 08
Sampling Date
R-1
R-2
R-5

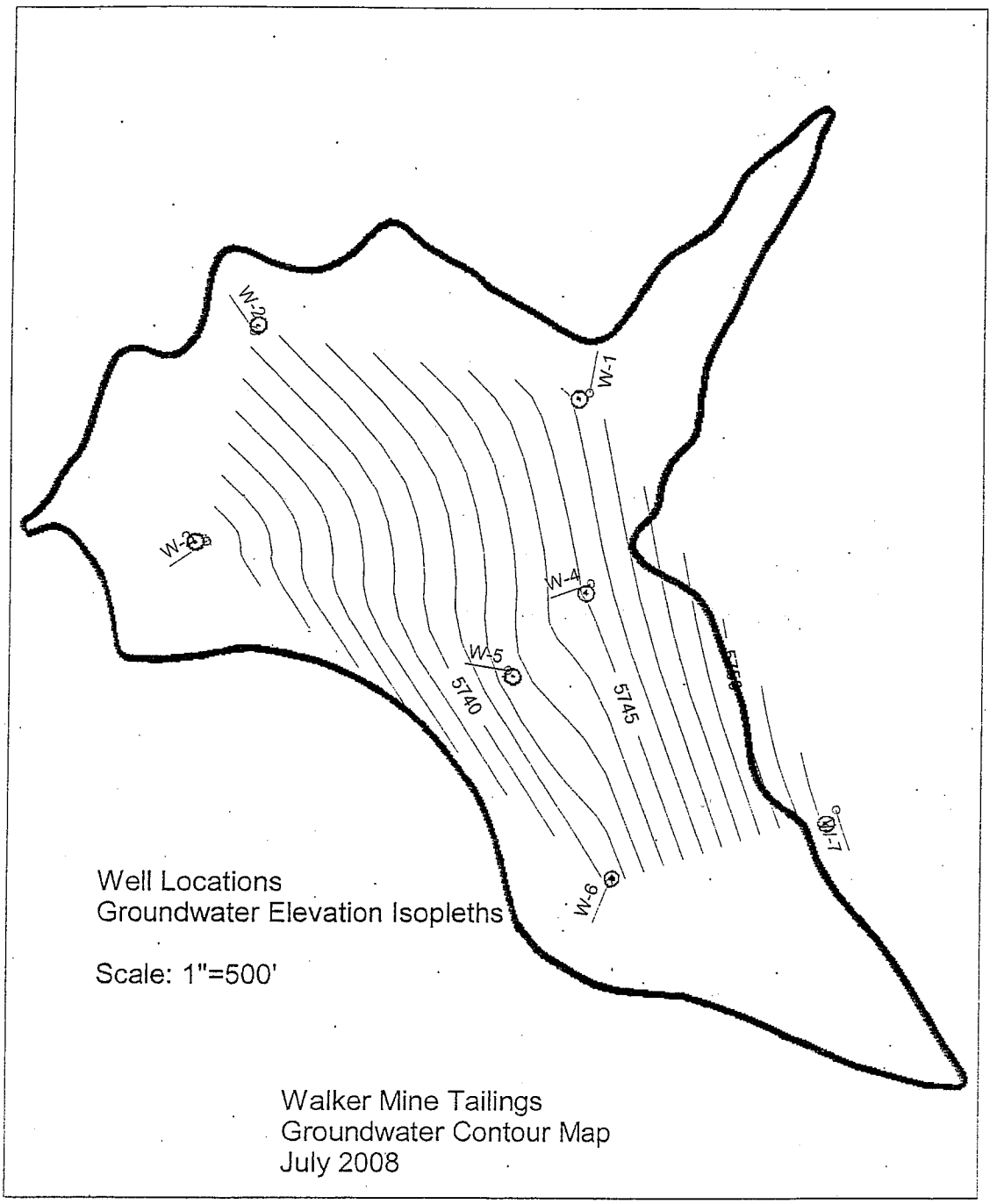

To R-1
R-2
R-5
R-4
R-6
R-3
WALKER MINE TAILINGS
PROJECT AREAS
0 200 400
DECEMBER 1999
N



WALKER MINE TAILINGS



Walker Mine Tailings
Groundwater Contour Map
June 2008


W-1
W-2
W-3
W-4
W-5
W-6
W-7
5740
5745
Well Locations
Groundwater Elevation Isopleths
Scale: 1"=500'
Walker Mine Tailings
Groundwater Contour Map
July 2008

JUNE 2008

SURFACE AND GROUNDWATER TEST RESULTS AND SUPORTING DOCUMENTATION

MONITORING REPORT

Discharger: USDA Forest Service, Plumas National Forest

Facility: Walker Mine Tailings, Plumas County

Reporting Frequency: Quarterly

Monitoring Period: June 2008

Findings:

(1) Surface Water. Samples were collected on June 3, 2008. The surface water sample collected at the compliance station, R-5, Little Grizzly Creek near Brown's Cabin, continues to exceed the limitation for copper (see Table 1). The remaining R-5 constituents fall within the prescribed limitations for dissolved iron and zinc. The release of copper from the tailings area to Dolly Creek, as measured at R-2, also continues to exceed the limitation. Concentrations of zinc were detected in all of the 5 samples taken but none of these concentrations exceeded the limitation of zinc. The concentration of iron, highest at R-2, was within the limitation at all of the stations.

(2) Groundwater. Samples were collected on June 3, 2008. Table 2 summarizes the findings for groundwater samples collected from the site. Small concentrations of dissolved copper (<3.0ug/l) were found at both of the sampling wells (W-5, W-7). Additionally, concentrations of dissolved zinc were found in both wells, with a maximum concentration of 7.7 ug/l at W-5. Dissolved iron was found in W-5 with a measured concentration of 11200 ug/l. The reason for the drastic increase in dissolved iron at W-5 is unclear but represents a 1700% increase over the dissolved iron from the May of 2004 sample and is 120% greater than the reported May 2008 iron concentrations. These results will require out-year testing of W-5 to continually monitor the marked change that has occurred in the groundwater iron concentrations at this location.

Groundwater elevations were measured in six of seven wells at the site; W-1 was destroyed during construction last summer. Depth to water measurements increased from May 2007 with the exception of W-7, which was approximately 2/10 of a foot lower. Water depths continue to remain low, with depths a W-4 being 6.5 ft lower than in May 2006. The results show a definite gradient towards Little Grizzly Creek of approximately 1.4% along the Dolly Creek Channel and approximately 1.4% to the settling pond (R-6). With the elevation of the Little Grizzly Creek channel approximately 20 feet below the surface of the tailings area, there is a strong gradient towards little Grizzly Creek all along its course with the tailings area.

TABLE OF CONTENTS

Table 1. SURFACE WATER SUMMARY

Map of the tailings area with the surface water monitoring sites

Discharge Measurement Notes

Chain-of-Custody record for surface water samples and groundwater samples

Basic Laboratory Analysis Reports for surface water and groundwater tests

Table 2. GROUND WATER SUMMARY

Map of the tailings are with groundwater monitoring sites

Map of tailings area with groundwater elevations and flow directions

Water Level Data

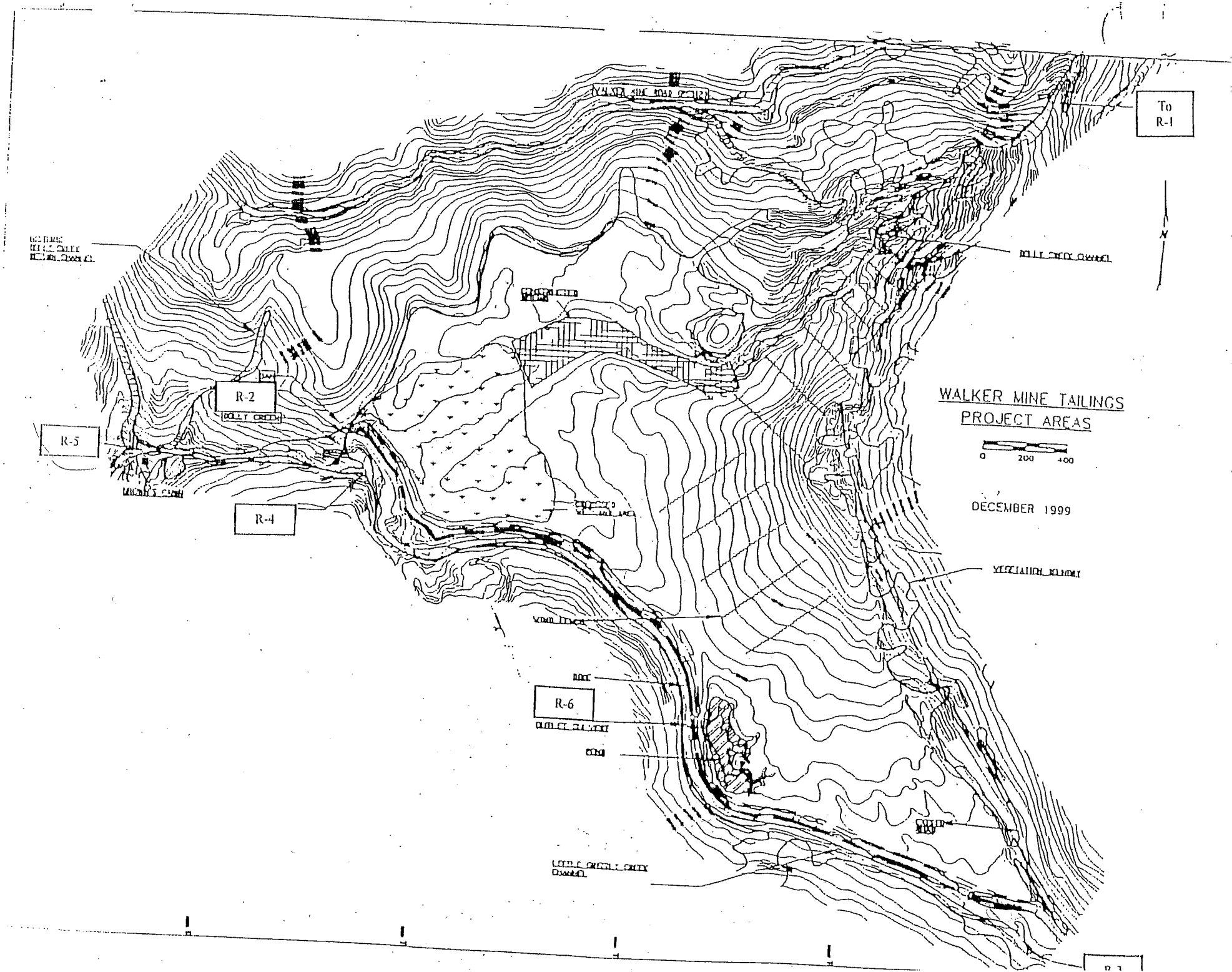
Groundwater Monitoring, Water Sampling Field Sheet

Table 1. SURFACE WATER SUMMARY REPORT

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
Jun-08

CONSTITUENT	UNITS	DETECTION LIMITS	R-1	R-2	R-3[1]	R-4	R-5[2]	R-6	Limitation @R-5[3]
Field Parameters									
Flow	cfs	N/A	0.2	0.09	2.04	2.73	2.66	0	N/A
pH	number	N/A	7.57	7.69	6.81	7.13	7.51	N/A	N/A
Specific Conductance	umhos/cm	N/A	88.4	110	47.3	52.4	55.9	N/A	N/A
Air Temperature	F	N/A	56	53	57	62	59	N/A	N/A
Water Temperature	C	N/A	10.3	15.4	11.4	10.1	11.7	N/A	N/A
Laboratory									
Total Hardness as CaCO3	mg/l	5	70	64	34	42	50	N/A	N/A
Total Alkalinity as CaCO3	mg/l	1	63	61	37	38	39	N/A	N/A
Sulfate	mg/l	0.5	2.76	9.37	0.14	1.93	2.1	N/A	N/A
Turbidity	NTU	0.05	8.88	6.51	1.46	1.5	1.12	N/A	2.46
Dissolved Iron	ug/l	20	185	414	86	136	146	N/A	1000
Copper	ug/l	0.5	18.2	42	1.7	5	25.5	N/A	4.95
Dissolved Zinc	ug/l	1.0	7.4	13	2.4	11	61.5	N/A	65.66

[1] R-3 is the background station located above the tailiings area on Little Grizzly Creek.
[2] R-5 is the compliance station located near Brown's Cabin, downstream from the confluence of Dolly Creek with Little Grizzly Creek.
[3] The compliance values for copper and zinc are calculated with the R-5 hardness value of 50 mg/l as CaCO3.


To
R-1
R-2
R-4
R-5
R-6
WALKER MINE TAILINGS
PROJECT AREAS
0
200
400
DECEMBER 1999

Location: R-1
Date: 06/03/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	5.3	**X-sectional Area (ft^2):**	3.03
Hydraulic Depth (ft):	0.57	**Average Velocity (fps):**	0.07
		Discharge (cfs):	0.20

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.7	Lew				
1	0.4	0.4	0.160	0.000	0.000
1.5	0.5	0.55	0.275	0.020	0.006
2	0.5	0.7	0.350	0.000	0.000
2.5	0.5	0.75	0.375	0.000	0.000
3	0.5	0.63	0.315	0.000	0.000
3.5	0.5	0.9	0.450	0.050	0.023
4	0.5	0.85	0.425	0.050	0.021
4.5	0.5	0.5	0.250	0.130	0.033
5	0.5	0.55	0.275	0.430	0.118
5.5	0.5	0.3	0.150	0.000	0.000
6	REW				

Percent Error (%) 59.1%

Location: R-2
Date: 06/03/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	4.05	**X-sectional Area (ft^2):**	1.13
Hydraulic Depth (ft):	0.28	**Average Velocity (fps):**	0.08
		Discharge (cfs):	0.09

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.45	LEW	0.00			
1.00	0.53	0.20	0.105	0.000	0.000
1.50	0.50	0.30	0.150	0.060	0.009
2.00	0.50	0.40	0.200	0.080	0.016
2.50	0.50	0.25	0.125	0.120	0.015
3.00	0.00	0.55	0.000	0.120	0.000
2.50	0.50	0.40	0.200	0.130	0.026
4.00	1.00	0.35	0.350	0.080	0.028
4.50	REW	0.00			

Percent Error (%) 29.8%

Location: R-3
Date: 06/03/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	9.55	**X-sectional Area (ft^2):**	5.09
Hydraulic Depth (ft):	0.53	**Average Velocity (fps):**	0.30
		Discharge (cfs):	2.04

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.45					
2.00	0.53	0.10	0.053	0.000	0.000
2.50	0.50	0.10	0.050	0.000	0.000
3.00	0.50	0.22	0.110	0.000	0.000
3.50	0.50	0.35	0.175	0.150	0.026
4.00	0.50	0.40	0.200	0.360	0.072
4.50	0.50	0.60	0.300	0.290	0.087
5.00	0.50	0.80	0.400	0.540	0.216
5.50	0.50	0.80	0.400	0.410	0.164
6.00	0.50	0.80	0.400	0.540	0.216
6.50	0.50	0.75	0.375	0.650	0.244
7.00	0.50	0.95	0.475	0.620	0.295
7.50	0.50	0.80	0.400	0.420	0.168
8.00	0.50	0.75	0.375	0.310	0.116
8.50	0.50	0.75	0.375	0.570	0.214
9.00	0.50	0.75	0.375	0.410	0.154
9.50	0.50	0.70	0.350	0.170	0.060
10.00	0.50	0.35	0.175	0.040	0.007
10.50	0.50	0.20	0.100	0.000	0.000
11.00					

Percent Error (%) 14.5%

Location: R-4
Date: 06/03/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	11.6	**X-sectional Area (ft^2):**	7.75
Hydraulic Depth (ft):	0.67	**Average Velocity (fps):**	0.32
		Discharge (cfs):	2.73

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.40	LEW				
2.00	0.55	0.20	0.110	0.030	0.003
2.50	0.50	0.60	0.300	0.110	0.033
3.00	0.50	0.70	0.350	0.170	0.060
3.50	0.50	0.65	0.325	0.230	0.075
4.00	0.50	0.80	0.400	0.300	0.120
4.50	0.50	0.75	0.375	0.320	0.120
5.00	0.50	0.85	0.425	0.310	0.132
5.50	0.50	0.85	0.425	0.360	0.153
6.00	0.50	0.85	0.425	0.380	0.162
6.50	0.50	0.95	0.475	0.480	0.228
7.00	0.50	1.00	0.500	0.470	0.235
7.50	0.50	1.05	0.525	0.460	0.242
8.00	0.50	0.80	0.400	0.480	0.192
8.50	0.50	1.00	0.500	0.430	0.215
9.00	0.50	0.85	0.425	0.420	0.179
9.50	0.50	0.85	0.425	0.420	0.179
10.00	0.50	0.65	0.325	0.390	0.127
10.50	0.50	0.55	0.275	0.390	0.107
11.00	0.50	0.50	0.250	0.300	0.075
11.50	0.50	0.42	0.210	0.250	0.053
12.00	0.50	0.35	0.175	0.180	0.032
12.50	0.50	0.25	0.125	0.130	0.016
13.00					

Percent Error (%) 8.6%

Location: R-5
Date: 06/03/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	8.7	**X-sectional Area (ft^2):**	6.34
Hydraulic Depth (ft):	0.73	**Average Velocity (fps):**	0.37
		Discharge (cfs):	2.66

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.40	LEW				
2.00	0.55	0.55	0.303	0.070	0.021
2.50	0.50	1.00	0.500	0.230	0.115
3.00	0.50	1.15	0.575	0.490	0.282
3.50	0.50	1.25	0.625	0.710	0.444
4.00	0.50	1.00	0.500	0.740	0.370
4.50	0.50	1.10	0.550	0.350	0.193
5.00	0.50	1.05	0.525	0.520	0.273
5.50	0.50	0.90	0.450	0.670	0.302
6.00	0.50	0.65	0.325	0.590	0.192
6.50	0.50	0.60	0.300	0.480	0.144
7.00	0.50	0.75	0.375	0.310	0.116
7.50	0.50	0.55	0.275	0.260	0.072
8.00	0.50	0.55	0.275	0.200	0.055
8.50	0.50	0.58	0.290	0.160	0.046
9.00	0.50	0.55	0.275	0.120	0.033
9.50	0.55	0.35	0.193	0.030	0.006
10.1	REW				

Percent Error (%) 16.7%

9-275-1
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by _____
Checked by _____

Sta. No. R-1

Dolly Creek above Tailings @ Road 112

Date 6/3, 2008 Party Flynn / Nupen

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method 6/10 No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots ____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____ changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____ Air 56°F @ 1604

Gage _____ Water 10.3 °C @ 1607

_____ Record removed _____ Intake flushed U

Observer _____

Control _____

pH 7.57

CONDUCTANCE 88.4 umhos/cm

G. H. of zero flow _____ ft.

Samples @ 16:06

River at—

Angle coefficient	Dist. from initial Ft point	Width	Depth Ft	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or _____	Area	Discharge
LB	0.7						m/s				
	1.0		0.4				0				
	1.5		0.55				0.02				
	2.0		0.7				0				
	2.5		0.75				0				
	3.0		0.63				0				
	3.5		0.9				0.05				
	4.0		0.85				0.05				
	4.5		0.5				0.13				
	5.0		0.55				0.03				
	5.5		0.3				0				
RB	6.0										

WALKER MINE TAILINGS MONITORING PROGRAM

9-2754P
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....
Comp. by .....
Checked by .....

Sta. No. R-2

Dolly Creek below Tailings Dam

Date 6/3 ~~19~~ 2008 Party Flynn / Nupen

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots .... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....

Check-bar, found .....

changed to ..... at .....

Correct .....

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather .....

Other ..... Air 53°F @ 1335

Gage ..... Water 15.4°C @ 1332

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 7.69

CONDUCTANCE 110. umhos/cm

G. H. of zero flow ..... ft.

Samples @ 1338

River at—

Angle coefficient	Dist. from initial point ft	Width	Depth ft	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	0.75						m/s				
	1.0		0.2				0				
	1.5		0.3				0.06				
	~~2.0~~		~~0.35~~				/				
	2.0		0.4				0.08				
	2.5		0.25				0.12				
	3.0		0.55				0.12				
	3.5		0.4				0.13				
	4.0		0.35				0.08				
RB	4.5										

9-275-F
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by _____
Checked by _____

Sta. No. R-3

Little Grizzly Creek above Tailings

Date 6/3, 2008 Party Flynn / Nugent

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method 6/10 No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots _____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____ changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather Cloudy / cool

Other _____ Air 57°F @ 1520

Gage _____ Water 11.4 °C @ 1521

_____ Record removed _____ Intake flushed _____

Observer _____

Control _____

pH 6.81

CONDUCTANCE 47.3 umhos/cm

G. H. of zero flow _____ ft.

Samples @ 1517

River at—

Angle coefficient	Dist. from initial point Ft	Width	Depth Ft	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or _____	Area	Discharge
LB	1.45						m/s				
	2.0		0.1				0				
	2.5		0.1				0				
	3.0		0.22				0				
	3.5		0.35				0.15				
	4.0		0.4				0.36				
	4.5		0.6				0.29				
	5.0		0.8				0.54				
	5.5		0.8				0.41				
	6.0		0.8				0.54				
	6.5		0.75				0.65				
	7.0		0.95				0.62				
	7.5		0.8				0.42				
	8.0		0.75				0.31				
⊙	8.5		0.75				0.57				
	9.0		0.75				0.41				
	9.5		0.7				0.17				
	10.0		0.35				0.09				
	10.5		0.2				0				
RB	11.0										

WALKER MINE TAILINGS MONITORING PROGRAM

9-276-1
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....
Comp. by .....
Checked by .....

Sta. No. R-4

Little Grizzly Creek below Tailings

Date 6/3, 2008 Party Flynn / Nuper

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots ..... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....

Check-bar, found .....

changed to ..... at .....

Correct .....

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather Cloudy / Cool

Other ..... Air 62°F @ 1417

Gage ..... Water 10.1°C @ 1418

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 7.13

CONDUCTANCE 52.4 umhos/cm

G. H. of zero flow ..... ft.

Samples @ 1415

River at—

Angle coefficient	Dist. from initial point ft	Width	Depth ft	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	1.4						M/S				
	2.0		0.2				0.03				
	2.5		0.6				0.11				
	3.0		0.7				0.17				
	3.5		0.65				0.23				
	4.0		0.8				0.30				
	4.5		0.75				0.32				
	5.0		0.85				0.31				
	5.5		0.85				0.36				
	6.0		0.85				0.38				
	6.5		0.95				0.48				
	7.0		1.0				0.47				
	7.5		1.05				0.46				
	8.0		0.80				0.48				
⊙	~~8.5~~		~~0.90~~								
	8.5		1.0				0.43				
	9.0		0.85				0.42				
	9.5		0.85				0.42				
	10.0		0.65				0.39				
	10.5		0.55				0.31				
	11.0		0.5				0.33				
	11.5		0.42				0.25				
	12.0		0.35				0.18				
	12.5		0.25				0.13				
RB	13.0										

WALKER MINE TAILINGS MONITORING PROGRAM

9-275-P
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....
Comp. by .....
Checked by .....

Sta. No. R-5

Little Grizzly Creek @ Brown's Cabin

Date 6/3, 2008 Party Flynn / Nupen

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots .... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....

Check-bar, found .....

changed to ..... at .....

Correct .....

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather partly Cloudy / Cool

Other ..... Air 59°F °C @ 1700

Gage ..... Water 11.7 °C @ 1645

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 7.51

CONDUCTANCE 55.9 umhos/cm

G. H. of zero flow ..... ft.

Samples @ 1640

River at—

Angle coefficient	Dist. from initial point ft	Width	Depth ft	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	1.4						m/s				
	2.0		0.55				0.07				
	2.5		1.0				0.23				
	3.0		1.15				0.49				
	3.5		1.25				0.71				
	4.0		1.0				0.74				
	4.5		1.1				0.35				
	5.0		1.05				0.52				
	5.5		0.9				0.67				
	6.0		~~1.15~~	0.65			0.59				
	6.5		0.6				0.48				
	7.0		0.75				0.31				
	7.5		0.55				0.26				
	8.0		0.55				0.20				
⊙	8.5		0.58				0.16				
	9.0		0.55				0.12				
	9.5		0.35				0.03				
RB	10.1										

9-275-F
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. ....
Comp. by ....
Checked by ....

Sta. No. R-6
Sediment Basin Outlet
Date 6/3, 2008 Party Flynn / Nupen
Width .... Area .... Vel. .... G. H. .... Disch. ....
Method .... No. secs. .... G. H. change .... in .... hrs. Susp. ....
Method coef. .... Hor. angle coef. .... Susp. coef. .... Meter No. ....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter ....
Date rated .... for rod, other.
Meter .... ft. above bottom of weight.
Spin before meas. .... after ....
Meas. plots .... % diff. from rating ....
Wading, cable, ice, boat, upstr., downstr., side bridge .... feet, mile, above, below gage, and ....
Check-bar, found ....
changed to .... at ....
Correct ....
Levels obtained ....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section ....
Flow No Flow Weather ....
Other .... Air .... °C@ ....
Gage .... Water .... °C@ ....
.... Record removed .... Intake flushed ....
Observer ....
Control ....
pH ....
CONDUCTANCE .... umhos/cm
G. H. of zero flow .... ft.

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
		No Flow									

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 8060227

PAGE 1 OF 1

CLIENT NAME: USDA FOREST SERVICE-PLUMAS NF

PROJECT NAME: WATER

PROJECT #: 5-00-028

MAILING ADDRESS: 159 LAWRENCE ST, QUINCY, CA 95971

REPORT DUE DATE: 30 Days 6/19/08

TURN AROUND TIME: Standard Rush

OF SAMPLES: 7

MATRIX/TYPE: Water

PROJECT MANAGER: RYAN NUPEN

CUSTODY SEAL INTACT? Yes No N/A

PHONE: 530 283-7712

EMAIL: rnupen@fs.fed.us

SYSTEM #:

FAX: 530 283 7729

RESULTS SENT: Email Fax EDD Mail

EDD TYPE:

INVOICE TO: Ryan Nupen

PO#:

QC: Standard Level II

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	As, Cd, Cu, Pb, Mo, Ni, Se, Zn, K, Hg, TATC	DISS Fe, Cu, Zn	HARD, ALK, SO4	NH3, TPO4, NITROGEN	[redacted]	Turbidity						LAB ID	CHLORINE RESIDUAL OR COMMENTS
6/3/08	1036	X			W-7		X	X	X	X								1	
	1155	X			W-5		X	X	X	X								2	
	1338	X			R-2			X	X			X						3	
	1415	X			R-4			X	X			X						4	
	1517	X			R-3			X	X			X						5	
	1606	X			R-1			X	X			X						6	
	1645	X			R-5			X	X			X						7	
																			Metals Pos + HNO3 and field filtered
					Cancel Turbidity on 1 + 2, cancel all PHs per Ryan 6/5/08														
					PH<2														

PRESERVED WITH: HNO_3 H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER

SAMPLED BY (PRINT): Ryan Nupen	SAMPLE DATE/TIME: 6/3/08	RELINQUISHED BY: [signature]	DATE/TIME: 6/4/08 200
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB): [signature]	DATE/TIME: 6/5/08 1144	PROCESSED AND VERIFIED BY: [signature]	DATE/TIME: 6/5/08 1514
LOGGED BY: [signature]	DATE/TIME: 6/5/08 1514	CARRIER: _____	COOLER TEMPERATURE: ____ °C

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

basic
laboratory
www.basiclab.com
voice 530.243.7234 2218 Railroad Avenue
fax 530.243.7494 Redding, California 96001

Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8060227
Reported: 06/23/08
Phone: (530) 283-7764
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
W 7 Water (8060227-01) Sampled:06/03/08 10:36 Received:06/05/08 11:44									
Hardness	mg/l	40		2	5	SM 2340C	06/09/08	06/09/08	B8F0191
Nitrogen, Total	"	0.46			0.25	EPA 351.2	06/20/08	06/20/08	[CALC]
Alkalinity as CaCO3	"	42		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
Bicarbonate	"	51		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	0.19	J	0.05	0.40	EPA 300.0	06/17/08	06/17/08	B8F0419
Ammonia as N	"	0.06	QR-04	0.02	0.05	EPA 350.1	06/18/08	06/18/08	B8F0491
Total Phosphorus as P	"	0.13		0.02	0.05	SM 4500P-BE	06/15/08	06/15/08	B8F0398
W 5 Water (8060227-02) Sampled:06/03/08 11:55 Received:06/05/08 11:44									
ardness	mg/l	160		2	5	SM 2340C	06/09/08	06/09/08	B8F0191
itrogen, Total	"	0.51			0.25	EPA 351.2	06/20/08	06/20/08	[CALC]
ikalinity as CaCO3	"	62		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
icarbonate	"	76		1	5	"	"	"	"
arbonate	"	ND		1	5	"	"	"	"
ydroxide	"	ND		1	5	"	"	"	"
ulfate as SO4	"	122		0.25	2.00	EPA 300.0	06/18/08	06/17/08	B8F0419
mmonia as N	"	0.42	QR-04	0.02	0.05	EPA 350.1	06/18/08	06/18/08	B8F0491
otal Phosphorus as P	"	0.08		0.02	0.05	SM 4500P-BE	06/22/08	06/20/08	B8F0558
2 Water (8060227-03) Sampled:06/03/08 13:38 Received:06/05/08 11:44									
ardness	mg/l	64		2	5	SM 2340C	06/09/08	06/09/08	B8F0194
kalinity as CaCO3	"	61		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
carbonate	"	74		1	5	"	"	"	"
roonate	"	ND		1	5	"	"	"	"
droxide	"	ND		1	5	"	"	"	"
lfate as SO4	"	9.37		0.05	0.40	EPA 300.0	06/17/08	06/17/08	B8F0419
rbidity	NTU	6.51	I-03	0.05	0.10	SM 2130B	06/05/08	06/05/08	B8F0129
4 Water (8060227-04) Sampled:06/03/08 14:15 Received:06/05/08 11:44									
rdness	mg/l	42		2	5	SM 2340C	06/09/08	06/09/08	B8F0194
alinity as CaCO3	"	38		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
arbonate	"	47		1	5	"	"	"	"
bonate	"	ND		1	5	"	"	"	"
roxide	"	ND		1	5	"	"	"	"
fate as SO4	"	1.93		0.05	0.40	EPA 300.0	06/17/08	06/17/08	B8F0419
bidity	NTU	1.53	I-03	0.05	0.10	SM 2130B	06/05/08	06/05/08	B8F0129
Water (8060227-05) Sampled:06/03/08 15:17 Received:06/05/08 11:44									
dness	mg/l	34		2	5	SM 2340C	06/09/08	06/09/08	B8F0194
alinity as CaCO3	"	37		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
arbonate	"	45		1	5	"	"	"	"
onate	"	ND		1	5	"	"	"	"
oxide	"	ND		1	5	"	"	"	"
ate as SO4	"	0.14	J	0.05	0.40	EPA 300.0	06/17/08	06/17/08	B8F0419
idity	NTU	1.46		0.05	0.10	SM 2130B	06/05/08	06/05/08	B8F0129
Water (8060227-06) Sampled:06/03/08 16:06 Received:06/05/08 11:44									
ness	mg/l	70		2	5	SM 2340C	06/09/08	06/09/08	B8F0194
linity as CaCO3	"	63		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
rbonate	"	77		1	5	"	"	"	"
onate	"	ND		1	5	"	"	"	"
oxide	"	ND		1	5	"	"	"	"
ate as SO4	"	2.76		0.05	0.40	EPA 300.0	06/18/08	06/17/08	B8F0419

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sic Laboratory, Inc.
fornia D.O.H.S. Cert #1677

basic laboratory
www.basiclab.com
voice 530.243.7234 2218 Railroad Avenue
fax 530.243.7494 Redding, California 96001

Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8060227
Reported: 06/23/08
Phone: (530) 283-7764
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
R 1 Water (8060227-06)	Sampled:06/03/08 16:06		Received:06/05/08 11:44						
Turbidity	NTU	8.88		0.05	0.10	SM 2130B	06/05/08	06/05/08	B8F0129
R 5 Water (8060227-07)	Sampled:06/03/08 16:40		Received:06/05/08 11:44						
Hardness	mg/l	50		2	5	SM 2340C	06/09/08	06/09/08	B8F0194
Alkalinity as CaCO3	"	39		1	5	SM 2320B	06/06/08	06/06/08	B8F0144
Bicarbonate	"	48		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	2.10		0.05	0.40	EPA 300.0	06/18/08	06/17/08	B8F0419
Turbidity	NTU	1.12		0.05	0.10	SM 2130B	06/05/08	06/05/08	B8F0129

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Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8060227
Reported: 06/23/08
Phone: (530) 283-7764
P.O. #

Metals - Total

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
W 7 Water (8060227-01) Sampled:06/03/08 10:36 Received:06/05/08 11:44									
Arsenic	ug/l	ND		0.1	0.6	EPA 200.8	06/18/08	06/06/08	B8F0162
Cadmium	"	ND		0.06	0.31	"	"	"	"
Copper	"	**5.7**		0.1	0.6	"	06/19/08	"	B8F0484
Lead	"	**0.7**		0.1	0.6	"	06/18/08	"	B8F0162
Mercury	"	ND		0.07	0.20	EPA 7470A	06/12/08	06/12/08	B8F0339
Molybdenum	"	ND		0.1	0.6	EPA 200.8	06/18/08	06/06/08	B8F0162
Nickel	"	**0.6**	J	0.2	1.2	"	06/19/08	"	B8F0484
Potassium	mg/l	**2**		0.2	1	EPA 6010B	06/12/08	06/06/08	B8F0154
Selenium	ug/l	ND		0.5	2.5	EPA 200.8	06/18/08	06/06/08	B8F0162
Zinc	"	**7.1**		0.5	2.5	"	"	"	"
W 5 Water (8060227-02) Sampled:06/03/08 11:55 Received:06/05/08 11:44									
Arsenic	ug/l	**1.2**		0.1	0.6	EPA 200.8	06/18/08	06/06/08	B8F0162
Cadmium	"	ND		0.06	0.31	"	"	"	"
Copper	"	**9.2**		0.1	0.6	"	06/19/08	"	B8F0484
Lead	"	**0.3**	J	0.1	0.6	"	06/18/08	"	B8F0162
Mercury	"	ND		0.07	0.20	EPA 7470A	06/12/08	06/12/08	B8F0339
Molybdenum	"	**0.2**	J	0.1	0.6	EPA 200.8	06/18/08	06/06/08	B8F0162
Nickel	"	**1.1**	J	0.2	1.2	"	06/19/08	"	B8F0484
Potassium	mg/l	**9**		0.2	1	EPA 6010B	06/12/08	06/06/08	B8F0154
Selenium	ug/l	ND		0.5	2.5	EPA 200.8	06/18/08	06/06/08	B8F0162
Zinc	"	**3.7**		0.5	2.5	"	"	"	"

Approved By
basic Laboratory, Inc.
California D.O.H.S. Cert #1677

basic laboratory
www.basiclab.com
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fax 530.243.7494 Redding, California 96001

Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8060227
Reported: 06/23/08
Phone: (530) 283-7764
P.O. #

Metals - Dissolved

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
W 7 Water (8060227-01) Sampled:06/03/08 10:36 Received:06/05/08 11:44									
Copper	ug/l	1.3		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
Iron	"	ND		3	10	"	"	"	"
Zinc	"	5.3		0.4	2.0	"	"	"	"
W 5 Water (8060227-02) Sampled:06/03/08 11:55 Received:06/05/08 11:44									
Copper	ug/l	1.3		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
Iron	"	11200		3	10	"	"	"	"
Zinc	"	7.7		0.4	2.0	"	"	"	"
R 2 Water (8060227-03) Sampled:06/03/08 13:38 Received:06/05/08 11:44									
Copper	ug/l	42.0		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
Iron	"	414		3	10	"	"	"	"
Zinc	"	13.0		0.4	2.0	"	"	"	"
4 Water (8060227-04) Sampled:06/03/08 14:15 Received:06/05/08 11:44									
opper	ug/l	5.0		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
ron	"	136		3	10	"	"	"	"
inc	"	11.0		0.4	2.0	"	"	"	"
3 Water (8060227-05) Sampled:06/03/08 15:17 Received:06/05/08 11:44									
opper	ug/l	1.7		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
on	"	86		3	10	"	"	"	"
nc	"	2.4		0.4	2.0	"	"	"	"
1 Water (8060227-06) Sampled:06/03/08 16:06 Received:06/05/08 11:44									
pper	ug/l	18.2		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
on	"	185		3	10	"	"	"	"
nc	"	7.4		0.4	2.0	"	"	"	"
5 Water (8060227-07) Sampled:06/03/08 16:40 Received:06/05/08 11:44									
pper	ug/l	25.5		0.1	0.5	EPA 200.8	06/19/08	06/19/08	B8F0156
n	"	146		3	10	"	"	"	"
c	"	61.5		0.4	2.0	"	"	"	"

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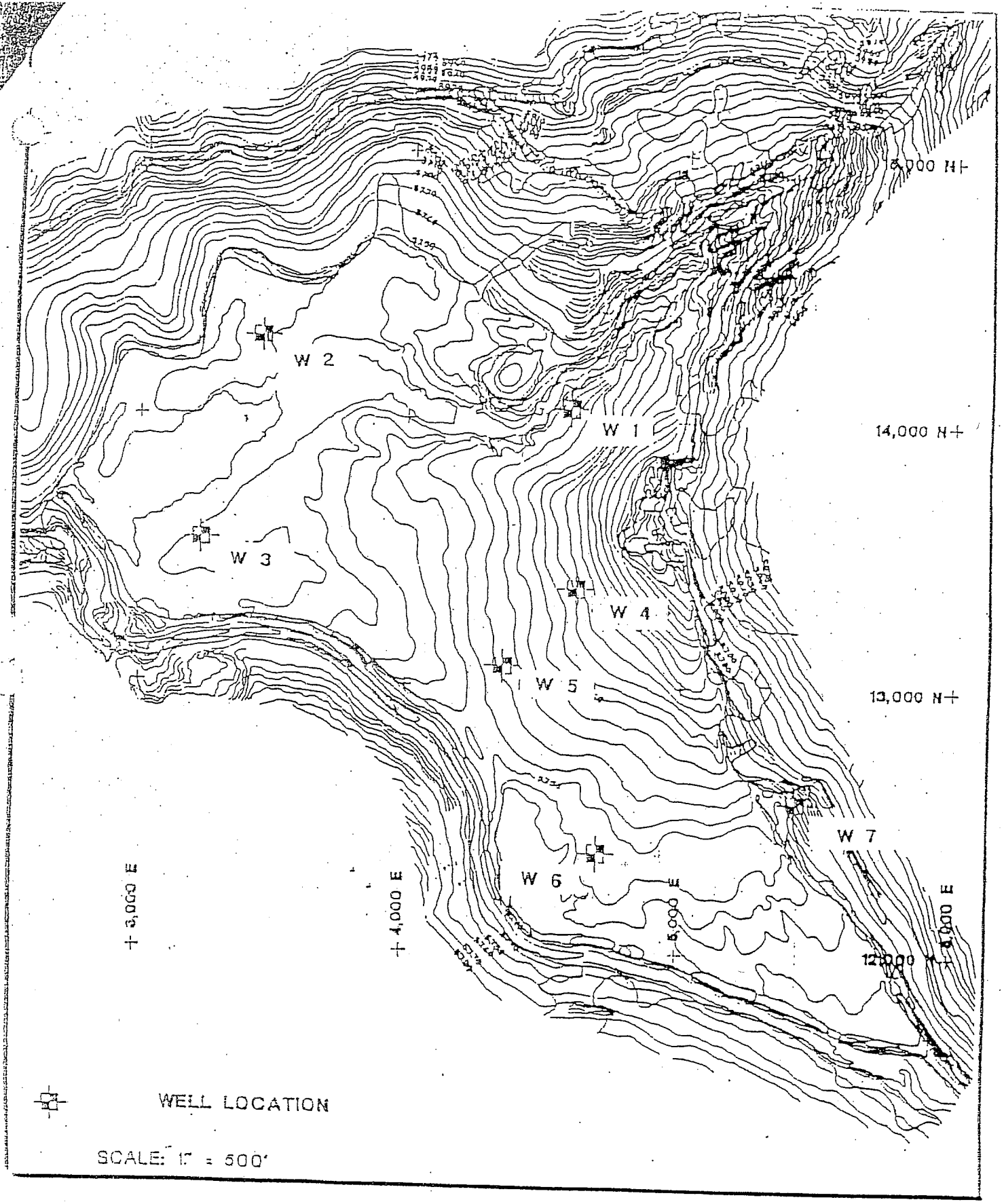
Table 2. GROUND WATER SUMMARY

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
JUNE 2008

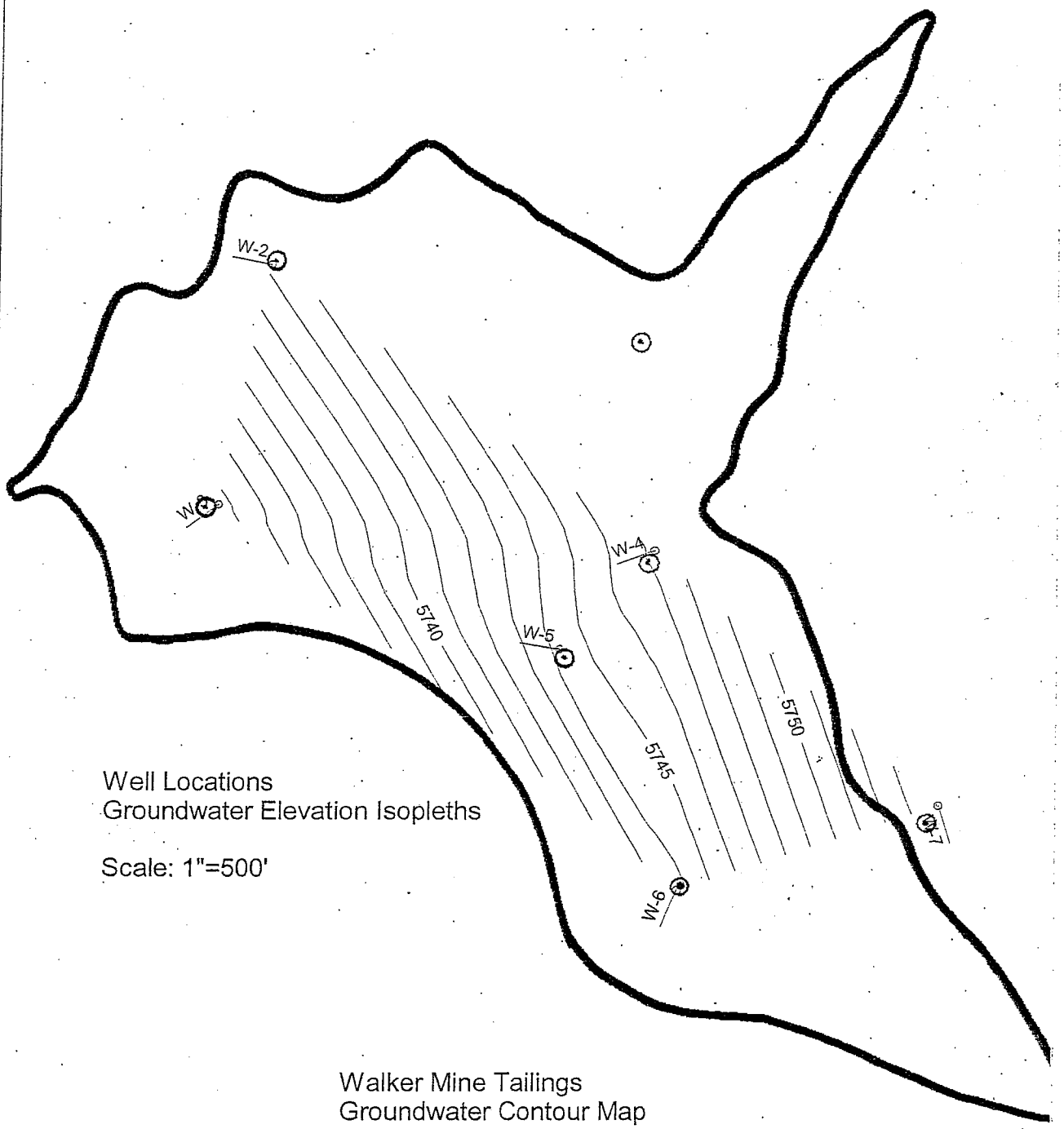
CONSTITUENT	UNIT	DETECTION LIMIT	WELL SITES W-1	W-2	W-3	W-4	W-5	W-6	W-7*
Field Parameters									
Ground Surface Elevation	ft	0.01	N/A	5742.05	5739.15	5768.27	5754.28	5748.04	5753.85
Top of Cap Elevation	ft	0.01	N/A	5741.74	5738.83	5768.00	5754.09	5747.87	5754.91
Depth to Water	ft	0.01	N/A	0.47	4.23	20.77	9.41	4.21	0.87
Water Surface Elevation	ft	0.01	N/A	5741.27	5734.60	5747.23	5744.68	5743.66	5754.04
Laboratory									
Total Hardness as CaCO3	mg/l	5.0	N/A	N/A	N/A	N/A	160.0	N/A	40.0
Total Alkalinity	mg/l	1.0	N/A	N/A	N/A	N/A	62.0	N/A	42.0
Sulfate	mg/l	0.5	N/A	N/A	N/A	N/A	122.0	N/A	0.2
Dissolved Iron	ug/l	20.0	N/A	N/A	N/A	N/A	11200.0	N/A	ND[1]
Dissolved Copper	ug/l	0.5	N/A	N/A	N/A	N/A	1.3	N/A	1.3
Dissolved Zinc	ug/l	1.0	N/A	N/A	N/A	N/A	7.7	N/A	5.3

*W-7 is located upgradient and off-site in a wet area. The data collected from this well are used for background comparisons.

[1] ND is not detected at or above the detection limit



WALKER MINE TAILINGS



Walker Mine Tailings
Groundwater Contour Map
June 2008

WALKER TAILINGS
GROUNDWATER MONITORING PROGRAM

FLUID LEVEL GAUGING

SITE LOCATION: Walker Mine Tailings DATE: 6/3/08
COMPANY NAME: USES
PERSONNEL: Flynn / Nupen

WELL	TIME	DEPTH TO WATER	COMMENTS
W-1	Destroyed	in 2007	
2	13:01	0.97	
3	12:48	4.23	
4	1146	20.77	
5	1048	9.41	
6	12:13	4.21	
7	0949	0.87	

Water-Quality Sampling Information

Project Number: _____ Page 1 of 1

Project Name: Walker Mine Tailings Date: 6/3/08

Project Location: Walker Mine Day: M (T) W Th F S S

Site Conditions/Weather: Cool - light rain Staff: Flynn/Nuper

Comments : _____

SAMPLING METHOD

- [ ] Centrifugal Pump
- [ ] Submersible Pump
- [ ] Hand Bail
- [x] Disposable Bailer
- [ ] Teflon Bailer
- [ ] _____ (other)

Sample Number: W-5

- [ ] FB: _____
- [ ] DUP: _____

Analysis Requested

Check COC

Number and Types of Bottle Used

Method of shipment

Basic Labs (lab name)

- [x] Courier Fed Ex
- [ ] Hand Deliver

Well Number: W-5

Depth of Water: 9.41

Well Depth: 40.30

Height of Water Column: 30.89

Volume in Well: (gallons) 4.94

3 Well Volumes: (gallons) 14.83

Well Diameter: 2"

- [x] 2" (0.16 gallon / feet)
- [ ] 4" (0.65 gallon/ feet)
- [ ] 5" (1.02 gallon/ feet)
- [ ] 6" (1.47 gallon/ feet)

Calculation Area

Height of water column =

Depth to water =

80% DTW _____

Time	Depth to Water	Volume Purged (gallons)	Totalizer Reading	Temperature °F	pH	Cond. ms/ cm	Turbidity (NTU)	Remarks
11:08								Start Purge
11:15		5		8.7	6.52	272	20.2	Low Tb No Odor
11:28		10		8.4	6.68	281	17.3	Low Tb No Odor
11:39		15		8.4	6.75	280	12.8	" "
11:55								Sample W-5

Inlet Depth: _____

Signed: _____ Date: _____

Water-Quality Sampling Information

Project Number: —

Page 1 of 1

Project Name: Walker Mine Tailings

Date: 6/3/08

Project Location: Walker Mine

Day: M (T) W Th F S S

Site Conditions/Weather: Moist / Partly Cloudy – Cool

Staff: Flynn

Comments :

SAMPLING METHOD

- [ ] Centrifugal Pump
- [ ] Submersible Pump
- [ ] Hand Bail
- [x] Disposable Bailer
- [ ] Teflon Bailer
- [ ] _____ (other)

Sample Number: W-7

- [ ] FB:
- [ ] DUP:

Analysis Requested

Check COC

Number and Types of Bottle Used

Method of shipment

Basic Labs (lab name)

- [x] Courier Fed Ex
- [ ] Hand Deliver

Well Number: W-7

Depth of Water: 0.87

Well Depth: 11.00

Height of Water Column: 10.13

Volume in Well: (gallons) 1.62

3 Well Volumes: (gallons) 4.86

Well Diameter: 2"

- [x] 2" (0.16 gallon / feet)
- [ ] 4" (0.65 gallon/ feet)
- [ ] 5" (1.02 gallon/ feet)
- [ ] 6" (1.47 gallon/ feet)

Calculation Area
Height of water column =
Depth to water =
80% DTW

Time	Depth to Water	Volume Purged (gallons)	Totalizer Reading	Temperature °C	pH	Cond. ms/ cm	Turbidity (NTU)	Remarks
0949	0.87							Start Purge
0952		2		7.6	5.76	59	9.54	Low Tb / No odor
1015		4		6.2	5.99	52.1	17.2	" "
1022		6		5.9	5.99	51.7	54.9	mod Tb / "
1030								Sample W-7

Inlet Depth:

Signed: Date:

JULY 2008

SURFACE AND GROUNDWATER TEST RESULTS AND SUPORTING DOCUMENTATION

MONITORING REPORT

Discharger: USDA Forest Service, Plumas National Forest

Facility: Walker Mine Tailings, Plumas County

Reporting Frequency: Quarterly

Monitoring Period: July 2008

Findings:

(1) Surface Water. Turbidity at surface water sites was not measured, and therefore the limiting concentration for copper could not be calculated. Concentrations of zinc were detected in all of the 5 samples taken but none of these concentrations were greater than the limiting concentration (Table 1). The concentration of iron, highest at R-2, was within the limitation at all of the stations.

(2) Groundwater. No groundwater samples were collected for this monitoring event.

Groundwater elevations were measured in six of seven wells at the site; W-1 was destroyed during construction last summer. Depths to water level remain low in comparison of those taken in July of 2006, with well W-4 having the most significant difference of approximately 5 feet. The results show a definite gradient towards Little Grizzly Creek of approximately 1% along the Dolly Creek Channel and approximately 1.6% to the settling pond (R-6). With the elevation of the Little Grizzly Creek channel approximately 20 feet below the surface of the tailings area, there is a strong gradient towards little Grizzly Creek all along its course with the tailings area.

(3) Soils. Background information was collected to begin the process of selecting biosolids for a pilot project that treats 2 acres of the Walker Mine Tailings. The area was divided into halves where two soil samples were taken from each half using the methods presented in the U.S.E.P.A Region 9, "Field Sampling Guidance Document #1025; Soil Sampling." Soils were tested for pH and heavy metals and the results are reported in Table 3 along with a map of the two acre area. Tailings were tested to meet all permitting aspects per the California Regional Water Quality Control Board. Biosolids will be selected per 40 CFR Ch.1 503.13, Table 1 which identifies ceiling concentrations of pollutants, and the findings of the lab results.

TABLE OF CONTENTS

Table 1. SURFACE WATER SUMMARY

Map of the tailings area with the surface water monitoring sites

Discharge Measurement Notes

Chain-of-Custody record for surface water samples

Basic Laboratory Analysis Reports for surface and soil samples

Table 2. GROUND WATER SUMMARY

Map of the tailings are with groundwater monitoring sites

Map of tailings area with groundwater elevations and flow directions

Water Level Data

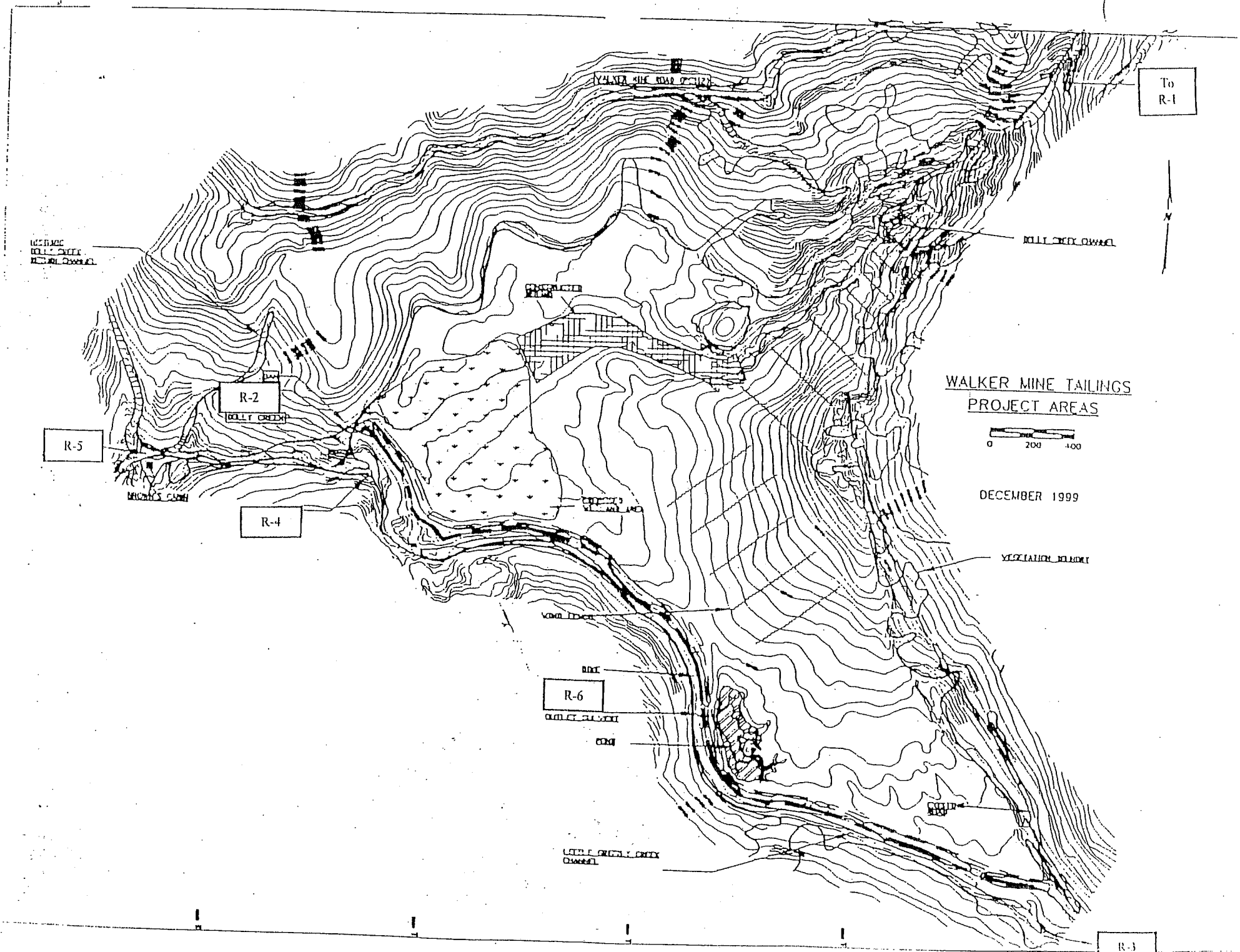
Table 3. SOIL CHEMISTRY SUMMARY REPORT

Table 1. SURFACE WATER SUMMARY REPORT

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
Jul-08

CONSTITUENT	UNITS	DETECTION LIMITS	R-1	R-2	R-3[1]	R-4	R-5[2]	R-6	Limitation @R-5[3]
Field Parameters									
Flow	cfs	N/A	0.23	0.11	0.25	0.46	0.6	0	N/A
pH	number	N/A	7.73	7.54	7.66	7.54	8.1	N/A	N/A
Specific Conductance	umhos/cm	N/A	93	141	98	146	157	N/A	N/A
Air Temperature	F	N/A	76	70	76	77	80	N/A	N/A
Water Temperature	C	N/A	11.8	16.3	15.2	12.4	17	N/A	N/A
Laboratory									
Total Hardness as CaCO3	mg/l	5	71	71	50	83	75	N/A	N/A
Total Alkalinity as CaCO3	mg/l	1	82	89	66	83	83	N/A	N/A
Sulfate	mg/l	0.5	2.76	9.37	0.14	1.93	2.1	N/A	N/A
Dissolved Iron	ug/l	20	94	333	155	169	228	N/A	1000
Copper	ug/l	0.5	4.9	13.8	0.5	2.9	4.4	N/A	N/A
Dissolved Zinc	ug/l	1.0	12.9	2.6	3.1	10.4	7.9	N/A	92.58

[1] R-3 is the background station located above the tailiings area on Little Grizzly Creek.
[2] R-5 is the compliance station located near Brown's Cabin, downstream from the confluence of Dolly Creek with Little Grizzly Creek.
[3] The compliance values for copper and zinc are calculated with the R-5 hardness value of 75 mg/l as CaCO3.


To
R-1
R-2
R-3
R-4
R-5
R-6
WALKER MINE TAILINGS
PROJECT AREAS
0
200
400
DECEMBER 1999
N

Location: R-1
Date: 07/31/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	5.05	**X-sectional Area (ft^2):**	2.31
Hydraulic Depth (ft):	0.46	**Average Velocity (fps):**	0.10
		Discharge (cfs):	0.23

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.85	Lew				
1	0.33	0.14	0.05	0.00	0.00
1.5	0.50	0.42	0.21	0.00	0.00
2	0.50	0.52	0.26	0.00	0.00
2.5	0.50	0.62	0.31	0.00	0.00
3	0.50	0.52	0.26	0.01	0.00
3.5	0.50	0.72	0.36	0.04	0.01
4	0.50	0.68	0.34	0.12	0.04
4.5	0.50	0.38	0.19	0.42	0.08
5	0.50	0.48	0.24	0.40	0.10
5.5	0.45	0.20	0.09	0.00	0.00
5.9					

Percent Error (%) 41.10%

Location: R-2
Date: 07/31/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	3.90	**X-sectional Area (ft^2):**	0.94
Hydraulic Depth (ft):	0.24	**Average Velocity (fps):**	0.10
		Discharge (cfs):	0.11

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.00	LEW	0.00		0	
0.5	0.5	0.15	0.075	0.000	0.000
1	0.5	0.25	0.125	0.090	0.011
1.5	0.5	0.25	0.125	0.09	0.011
2	0.5	0.35	0.175	0.03	0.005
2.5	0.5	0.40	0.200	0.27	0.054
3	0.5	0.3	0.150	0.2	0.030
3.5	0.45	0.2	0.090	0	0.000
3.9					

percentage error 48.32%

Location: R-3
Date: 07/31/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	5.85	**X-sectional Area (ft^2):**	1.33
Hydraulic Depth (ft):	0.23	**Average Velocity (fps):**	0.20
		Discharge (cfs):	0.25

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.35	LEW				
2.00	0.58	0.10	0.058	0.000	0.000
2.50	0.50	0.20	0.100	0.240	0.024
3.00	0.50	0.25	0.125	0.940	0.118
3.50	0.50	0.26	0.130	0.020	0.003
4.00	0.50	0.28	0.140	0.000	0.000
4.50	0.50	0.22	0.110	0.000	0.000
5.00	0.50	0.26	0.130	0.750	0.098
5.50	0.50	0.46	0.230	0.000	0.000
6.00	0.50	0.36	0.180	0.050	0.009
6.50	0.50	0.26	0.130	0.000	0.000
7.00	0.35	0.00	0.000		
7.20					

Percent Error (%) 46.9%

Location: R-4
Date: 07/31/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	7.90	**X-sectional Area (ft^2):**	1.74
Hydraulic Depth (ft):	0.22	**Average Velocity (fps):**	0.24
		Discharge (cfs):	0.46

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.50	LEW	0.00			
1.00	0.50	0.00	0	0	
1.50	0.50	0.15	0.075	0.010	0.001
2.00	0.50	0.22	0.11	0.210	0.023
2.50	0.50	0.22	0.11	0.340	0.037
3.00	0.50	0.20	0.1	0.330	0.033
3.50	0.50	0.18	0.09	0.240	0.022
4.00	0.50	0.25	0.125	0.390	0.049
4.50	0.50	0.20	0.1	0.380	0.038
5.00	0.50	0.34	0.17	0.380	0.065
5.50	0.50	0.32	0.16	0.310	0.050
6.00	0.50	0.30	0.15	0.300	0.045
6.50	0.50	0.32	0.16	0.200	0.032
7.00	0.50	0.32	0.16	0.320	0.051
7.50	0.50	0.24	0.12	0.120	0.014
8.00	0.45	0.24	0.108	0.050	0.005
8.40					

Percent Error (%) 13.9%

Location: R-5
Date: 07/31/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	4.85	**X-sectional Area (ft^2):**	2.08
Hydraulic Depth (ft):	0.43	**Average Velocity (fps):**	0.23
		Discharge (cfs):	0.60

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.40	LEW				
1.00	0.55	0.66	0.363	0.310	0.113
1.50	0.50	0.50	0.250	0.600	0.150
2.00	0.50	0.55	0.275	0.360	0.099
2.50	0.50	0.62	0.310	0.460	0.143
3.00	0.50	0.58	0.290	0.220	0.064
3.50	0.50	0.38	0.190	0.040	0.008
4.00	0.50	0.36	0.180	0.040	0.007
4.50	0.50	0.40	0.200	0.070	0.014
5.00	0.38	0.05	0.019	0.000	0.000
5.25					

Percent Error (%) 25.1%

9-275-F
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by _____
Checked by _____

Sta. No. R-1

Dolly Creek above Tailings @ Road 112

Date 07/31/08 Party Flynn / Dreager

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method 6/10 No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS

Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots _____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____

changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____

Gage _____ Air 7.6 °C @ 1328

Water 11.8 °C @ 1326

Record removed _____ Intake flushed _____

Observer _____

Control _____

pH 7.93

CONDUCTANCE 93 umhos/cm

G. H. of zero flow _____ ft.

Sampled at 1321

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or _____	Area	Discharge
LB	.85										
	1.0		.14				0				
	1.5		.42				0				
	2.0		.52				0				
	2.5		.67				0				
	3.0		.52				.01				
	3.5		.72				.04				
	4.0		.68				.12				
	4.5		.38				.42				
	5.0		.48				.40				
	5.5		.20				0				
	5.9										

WALKER MINE TAILINGS MONITORING PROGRAM

9-275-P
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by _____
Checked by _____

Sta. No. R-2

Dolly Creek below Tailings Dam

Date 7/31 2008 Party Flynn / Dragger

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method 6/10 No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots _____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____

changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____ Air 70°F°C@ 10:38

Gage _____ Water 16.3°C@ 1038

_____ Record removed _____ Intake flushed _____

Observer _____

Control _____

pH 7.54

CONDUCTANCE 141 umhos/cm

G. H. of zero flow _____ ft.

Samples @ 10:32 pm

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	0										
	0.5	.5	.15				0				
	1.0	.5	.25				.09				
	1.5	.5	.25				.09				
	2.0	.5	.35				.03				
	2.5	.5	.40				.27				
	3.0	.5	.30				.20				
	3.5	.45	.20				0				
RB	3.9										

9-275-T
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by _____
Checked by _____

Sta. No. R-3

Little Grizzly Creek above Tailings

Date 07/31 2002 Party Flynn / Dreager

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method _____ No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots _____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____ changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%) based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____ Air 76°F @ 12:36

Gage _____ Water 15.2°C @ 12:34

Record removed _____ Intake flushed _____

Observer _____

Control _____

pH 7.66

CONDUCTANCE 98 umhos/cm

G. H. of zero flow _____ ft.

Samples @ 12:28

River at—

Anglt coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	1.35										
	2.0	1	0.10				0				
	2.5	0.5	0.20				.24				
	3.0	0.5	0.25				.94				
	3.5	0.5	0.26				.02				
	4.0	0.5	0.29				0				
	4.5	0.5	0.22				0				
	5.0	0.5	0.26				0.75				
	5.5	0.5	0.46				0				
	6.0	0.5	.36				.05				
	6.5	0.5	.26				0				
	7.0	.35	0								
	7.2										

9-2764
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by _____
Checked by _____

Sta. No. R-4

Little Grizzly Creek below Tailings

Date 07/31, 1988 Party Flynn/Onager

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method _____ No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS

Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots ____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____ changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____ Air 77 °C @ 11:22

Gage _____ Water 12.4 °C @ 11:21

_____ Record removed _____ Intake flushed _____

Observer _____

Control _____

pH 7.54

CONDUCTANCE 145 umhos/cm

G. H. of zero flow _____ ft.

Samples @ 11:16

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	Velocity At point	Velocity Mean in vertical	Adjusted for hor. angle or _____	Area	Discharge
LB	.5		.1				0				
	1.5		.15				.01				
	2.0	.5	.22				.21				
	2.5	.5	.22				.34				
	3.0	.5	.21				.33				
	3.5	.5	.18				.24				
	4.0	.5	.25				.39				
	4.5	.5	.21				.38				
	5.0	.5	.34				.38				
	5.5	.5	.32				.31				
	6.0	.5	.20				.26				
	6.5	.5	.32				.20				
	7.0	.5	.22				.22				
	7.5	.5	.24				.12				
⊙	8.0	.45	.14				.05				
	8.4										

9-275-1
(May 1971)

WALKER MINE TAILINGS MONITORING PROGRAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____

Comp. by _____

Checked by _____

Sta. No. R-5

Little Grizzly Creek @ Brown's Cabin

Date 07/31, 1400 Party Flynn / Dreagan

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method 6/10 No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots _____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side bridge _____ feet, mile, above, below gage, and _____

Check-bar, found _____ changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____ Air 80°F @ 1400

Gage _____ Water 17.0 °C @ 1461

_____ Record removed _____ Intake flushed _____

Observer _____

Control _____

pH 8.10

CONDUCTANCE 157 umhos/cm

G. H. of zero flow _____ ft.

Sampled at 1356

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or _____	Area	Discharge
LB	0.4										
	1.0		.66				.31				
	1.5		.50				.00				
	2.0		.55				.36				
	2.5		.62				.41				
	3.0		.58				.22				
	3.5		.38				.04				
	4.0		.36				.04				
	4.5		.40				.07				
	5.0		.65				.0				
	5.25										

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 8080047

PAGE 1 OF 1

CLIENT NAME: USDA FOREST SERVICE-PLUMAS NF

PROJECT NAME: WATER/ SURFACE & SOIL

PROJECT #: 5-00-028

MAILING ADDRESS: -ON FILE-

REPORT DUE DATE: 30 days

TURN AROUND TIME: Standard Rush

OF SAMPLES: 9 (all Total)

MATRIX / TYPE: Water/ Soil

PROJECT MANAGER: RYAN NUPEN

PHONE: (530) 283-7712

EMAIL: rnupen@fs.fed.us

FAX: (530) 283-7729

RESULTS SENT: Email Fax EDD Mail

CUSTODY SEAL INTACT? Yes No N/A

SYSTEM #:

EDD TYPE:

QC: Standard Level II

INVOICE TO: Ryan Nupen c/o USFS

PO#:

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	DISS. FE, CU, ZN	HARD, ALK, SO4	Arsenic, Cadmium, copper	Lead, Mercury, Molybdenum	Nickel, Selenium, Zinc	pH, Cation Exchange Capacity	Total Nitrogen, Ammonia N as N	Total Phosphorus as P	Total Potassium	LAB ID	CHLORINE RESIDUAL OR COMMENTS
7/31/08	1032	X			R-2		X	X								1	
	1116	X			R-4		X	X								2	metals:
	1228	X			R-3		X	X								3	preserved
	1321	X			R-1		X	X								4	and field
	1356	X			R-5		X	X								5	filtered
7/31/08	0850			X	1A1				X	X	X	X	X	X	X	6	Soil
	0855			X	2A1				X	X	X	X	X	X	X	7	
	0905			X	3A2				X	X	X	X	X	X	X	8	
	0910			X	4A2				X	X	X	X	X	X	X	9	

PRESERVED WITH: HNO_3 H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER

SAMPLED BY (PRINT): Patrick Flynn	SAMPLE DATE/TIME: 7/31/08	RELINQUISHED BY: Angela Meager	DATE/TIME: 8/4/08 09:00
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB):	DATE/TIME: 8-2-08@1155	PROCESSED AND VERIFIED BY:	DATE/TIME: 8-2-08@1155
LOGGED IN BY:	DATE/TIME: 8-2-08@1155	CARRIER:	COOLER TEMPERATURE: °C

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

Sabrina Strong 8/4/08@9:35

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

basic laboratory
www.basiclab.com
voice 530.243.7234 2218 Railroad Avenue
fax 530.243.7494 Redding, California 96001

Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8080047
Reported: 08/22/08
Phone: (530) 283-7764
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
R-2 Surface Water (8080047-01) Sampled:07/31/08 10:32 Received:08/02/08 11:55									
Hardness	mg/l	71		2	5	SM 2340C	08/07/08	08/07/08	B8H0159
Alkalinity as CaCO3	"	89		1	5	SM 2320B	08/04/08	08/04/08	B8H0047
Bicarbonate	"	108		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	3.93		0.05	0.40	EPA 300.0	08/05/08	08/05/08	B8H0050
R-4 Surface Water (8080047-02) Sampled:07/31/08 11:16 Received:08/02/08 11:55									
Hardness	mg/l	83		2	5	SM 2340C	08/07/08	08/07/08	B8H0159
Alkalinity as CaCO3	"	83		1	5	SM 2320B	08/04/08	08/04/08	B8H0047
Bicarbonate	"	101		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	18.5		0.05	0.40	EPA 300.0	08/05/08	08/05/08	B8H0050
R-3 Surface Water (8080047-03) Sampled:07/31/08 12:28 Received:08/02/08 11:55									
Hardness	mg/l	50		2	5	SM 2340C	08/07/08	08/07/08	B8H0159
Alkalinity as CaCO3	"	66		1	5	SM 2320B	08/04/08	08/04/08	B8H0047
Bicarbonate	"	81		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	ND		0.05	0.40	EPA 300.0	08/05/08	08/05/08	B8H0050
R-1 Surface Water (8080047-04) Sampled:07/31/08 13:21 Received:08/02/08 11:55									
Hardness	mg/l	71		2	5	SM 2340C	08/07/08	08/07/08	B8H0159
Alkalinity as CaCO3	"	82		1	5	SM 2320B	08/04/08	08/04/08	B8H0047
Bicarbonate	"	101		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	ND		0.05	0.40	EPA 300.0	08/05/08	08/05/08	B8H0050
R-5 Surface Water (8080047-05) Sampled:07/31/08 13:56 Received:08/02/08 11:55									
Hardness	mg/l	75		2	5	SM 2340C	08/07/08	08/07/08	B8H0159
Alkalinity as CaCO3	"	83		1	5	SM 2320B	08/04/08	08/04/08	B8H0047
Bicarbonate	"	101		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	15.4		0.05	0.40	EPA 300.0	08/05/08	08/05/08	B8H0050

Approved By
Basic Laboratory, Inc.
California D.O.H.S. Cert #1677

basic laboratory
www.basiclab.com
voice 530.243.7234 2218 Railroad Avenue
fax 530.243.7494 Redding, California 96001

Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8080047
Reported: 08/22/08
Phone: (530) 283-7764
P.O. #

Metals - Dissolved

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
R-2 Surface Water (8080047-01) Sampled:07/31/08 10:32 Received:08/02/08 11:55									
Copper	ug/l	13.8		0.1	0.5	EPA 200.8	08/18/08	08/12/08	B8H0296
Iron	"	333		3	10	"	"	"	"
Zinc	"	2.6		0.4	2.0	"	"	"	"
R-4 Surface Water (8080047-02) Sampled:07/31/08 11:16 Received:08/02/08 11:55									
Copper	ug/l	2.9		0.1	0.5	EPA 200.8	08/18/08	08/12/08	B8H0296
Iron	"	169		3	10	"	"	"	"
Zinc	"	10.4		0.4	2.0	"	"	"	"
R-3 Surface Water (8080047-03) Sampled:07/31/08 12:28 Received:08/02/08 11:55									
Copper	ug/l	0.5		0.1	0.5	EPA 200.8	08/18/08	08/12/08	B8H0296
Iron	"	155		3	10	"	"	"	"
Zinc	"	3.1		0.4	2.0	"	"	"	"
R-1 Surface Water (8080047-04) Sampled:07/31/08 13:21 Received:08/02/08 11:55									
Copper	ug/l	4.9		0.1	0.5	EPA 200.8	08/18/08	08/12/08	B8H0296
Iron	"	94		3	10	"	"	"	"
Zinc	"	12.9		0.4	2.0	"	"	"	"
R-5 Surface Water (8080047-05) Sampled:07/31/08 13:56 Received:08/02/08 11:55									
Copper	ug/l	4.4		0.1	0.5	EPA 200.8	08/18/08	08/12/08	B8H0296
Iron	"	228		3	10	"	"	"	"
Zinc	"	7.9		0.4	2.0	"	"	"	"

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Basic Laboratory, Inc.
California D.O.H.S. Cert #1677

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Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8080047
Reported: 08/22/08
Phone: (530) 283-7764
P.O. #

General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1A1 Soil (8080047-06) Sampled:07/31/08 08:50 Received:08/02/08 11:55									
Nitrogen, Total	mg/kg	ND			25.0	EPA 351.2	08/17/08	08/17/08	[CALC]
pH	pH Units	**6.76**		0.01	0.01	EPA 9045	08/07/08	08/07/08	B8H0176
Phosphorus Pentoxide	mg/kg	**377**			114	CALC	08/19/08	08/18/08	[CALC]
Ammonia as N	"	**0.60**	QM-07	0.20	0.50	EPA 350.1	08/21/08	08/21/08	B8H0358
Total Phosphorus as P	"	**165**		10	50	EPA 6020	08/19/08	08/18/08	B8H0417
2A1 Soil (8080047-07) Sampled:07/31/08 08:55 Received:08/02/08 11:55									
Nitrogen, Total	mg/kg	ND			25.0	EPA 351.2	08/17/08	08/17/08	[CALC]
pH	pH Units	**6.61**		0.01	0.01	EPA 9045	08/07/08	08/07/08	B8H0176
Phosphorus Pentoxide	mg/kg	**369**			114	CALC	08/19/08	08/18/08	[CALC]
Ammonia as N	"	**0.33**	QM-07	0.10	0.25	EPA 350.1	08/21/08	08/21/08	B8H0358
Total Phosphorus as P	"	**161**		10	50	EPA 6020	08/19/08	08/18/08	B8H0417
3A2 Soil (8080047-08) Sampled:07/31/08 09:05 Received:08/02/08 11:55									
Nitrogen, Total	mg/kg	ND			25.0	EPA 351.2	08/17/08	08/17/08	[CALC]
pH	pH Units	**6.87**		0.01	0.01	EPA 9045	08/07/08	08/07/08	B8H0176
Phosphorus Pentoxide	mg/kg	**347**			114	CALC	08/19/08	08/18/08	[CALC]
Ammonia as N	"	**0.43**	QM-07	0.10	0.25	EPA 350.1	08/21/08	08/21/08	B8H0358
Total Phosphorus as P	"	**152**		10	50	EPA 6020	08/19/08	08/18/08	B8H0417
4A2 Soil (8080047-09) Sampled:07/31/08 09:10 Received:08/02/08 11:55									
Nitrogen, Total	mg/kg	ND			25.0	EPA 351.2	08/17/08	08/17/08	[CALC]
pH	pH Units	**6.71**		0.01	0.01	EPA 9045	08/07/08	08/07/08	B8H0176
Phosphorus Pentoxide	mg/kg	**328**			114	CALC	08/19/08	08/18/08	[CALC]
Ammonia as N	"	**0.29**	QM-07	0.10	0.25	EPA 350.1	08/21/08	08/21/08	B8H0358
Total Phosphorus as P	"	**143**		10	50	EPA 6020	08/19/08	08/18/08	B8H0417

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California D.O.H.S. Cert #1677

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Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8080047
Reported: 08/22/08
Phone: (530) 283-7764
P.O. #

Metals - TTLC

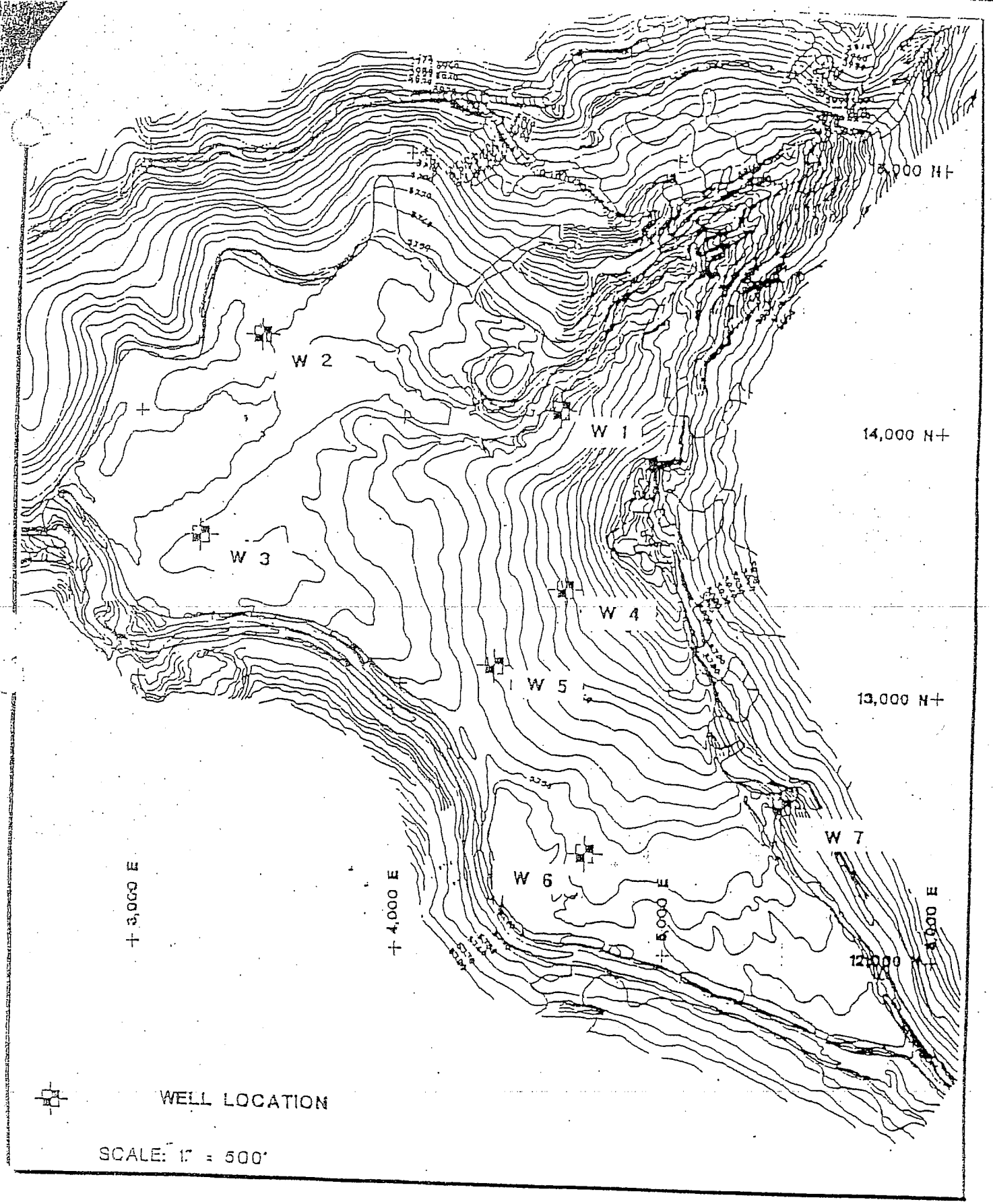
Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1A1 Soil (8080047-06) Sampled:07/31/08 08:50 Received:08/02/08 11:55									
Arsenic	mg/kg	3.2	J	0.8	4.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Cadmium	"	ND		0.4	2.0	"	"	"	"
Copper	"	452		0.2	1.0	"	"	"	"
Lead	"	44.6		0.5	2.5	"	"	"	"
Mercury	"	0.2	J	0.05	0.3	EPA 7471A	08/14/08	08/14/08	B8H0376
Molybdenum	"	1.2	J	1.0	5.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Nickel	"	4.2		0.5	2.0	"	"	"	"
Potassium	"	1400		40	200	"	08/12/08	"	"
Selenium	"	1.5	J, QR-04	0.5	2.0	"	08/13/08	"	"
Zinc	"	51.4		2.0	10.0	"	"	"	"
2A1 Soil (8080047-07) Sampled:07/31/08 08:55 Received:08/02/08 11:55									
Arsenic	mg/kg	2.5	J	0.8	4.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Cadmium	"	ND		0.4	2.0	"	"	"	"
Copper	"	504		0.2	1.0	"	"	"	"
Lead	"	49.0		0.5	2.5	"	"	"	"
Mercury	"	0.2	J	0.05	0.3	EPA 7471A	08/14/08	08/14/08	B8H0376
Molybdenum	"	1.3	J	1.0	5.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Nickel	"	3.7		0.5	2.0	"	"	"	"
Potassium	"	1290		40	200	"	08/12/08	"	"
Selenium	"	0.7	J, QR-04	0.5	2.0	"	08/13/08	"	"
Zinc	"	48.4		2.0	10.0	"	"	"	"
3A2 Soil (8080047-08) Sampled:07/31/08 09:05 Received:08/02/08 11:55									
Arsenic	mg/kg	3.4	J	0.8	4.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Cadmium	"	ND		0.4	2.0	"	"	"	"
Copper	"	490		0.2	1.0	"	"	"	"
Lead	"	42.2		0.5	2.5	"	"	"	"
Mercury	"	0.2	J	0.05	0.3	EPA 7471A	08/14/08	08/14/08	B8H0376
Molybdenum	"	1.6	J	1.0	5.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Nickel	"	3.7		0.5	2.0	"	"	"	"
Potassium	"	1250		40	200	"	08/12/08	"	"
Selenium	"	0.8	J, QR-04	0.5	2.0	"	08/13/08	"	"
Zinc	"	40.0		2.0	10.0	"	"	"	"
3A2 Soil (8080047-09) Sampled:07/31/08 09:10 Received:08/02/08 11:55									
Arsenic	mg/kg	3.0	J	0.8	4.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Cadmium	"	ND		0.4	2.0	"	"	"	"
Copper	"	530		0.2	1.0	"	"	"	"
Lead	"	42.8		0.5	2.5	"	"	"	"
Mercury	"	0.2	J	0.05	0.3	EPA 7471A	08/14/08	08/14/08	B8H0376
Molybdenum	"	1.5	J	1.0	5.0	EPA 6010B	08/13/08	08/11/08	B8H0219
Nickel	"	3.4		0.5	2.0	"	"	"	"
Potassium	"	1160		40	200	"	08/12/08	"	"
Selenium	"	1.1	J, QR-04	0.5	2.0	"	08/13/08	"	"
Zinc	"	50.8		2.0	10.0	"	"	"	"

Approved By
Basic Laboratory, Inc.
California D.O.H.S. Cert #1677

Table 2. GROUND WATER SUMMARY

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
JUIY 2008

CONSTITUENT	UNIT	DETECTION LIMIT	WELL SITES W-1	W-2	W-3	W-4	W-5	W-6	W-7*
Field Parameters									
Ground Surface Elevation	ft	0.01	N/A	5742.05	5739.15	5768.27	5754.28	5748.04	5753.85
Top of Cap Elevation	ft	0.01	N/A	5741.74	5738.83	5768.00	5754.09	5747.87	5754.91
Depth to Water	ft	0.01	N/A	2.25	5.92	22.69	11.17	6.73	2.05
Water Surface Elevation	ft	0.01	N/A	5739.49	5732.91	5745.31	5742.92	5741.14	5752.86



WALKER MINE TAILINGS

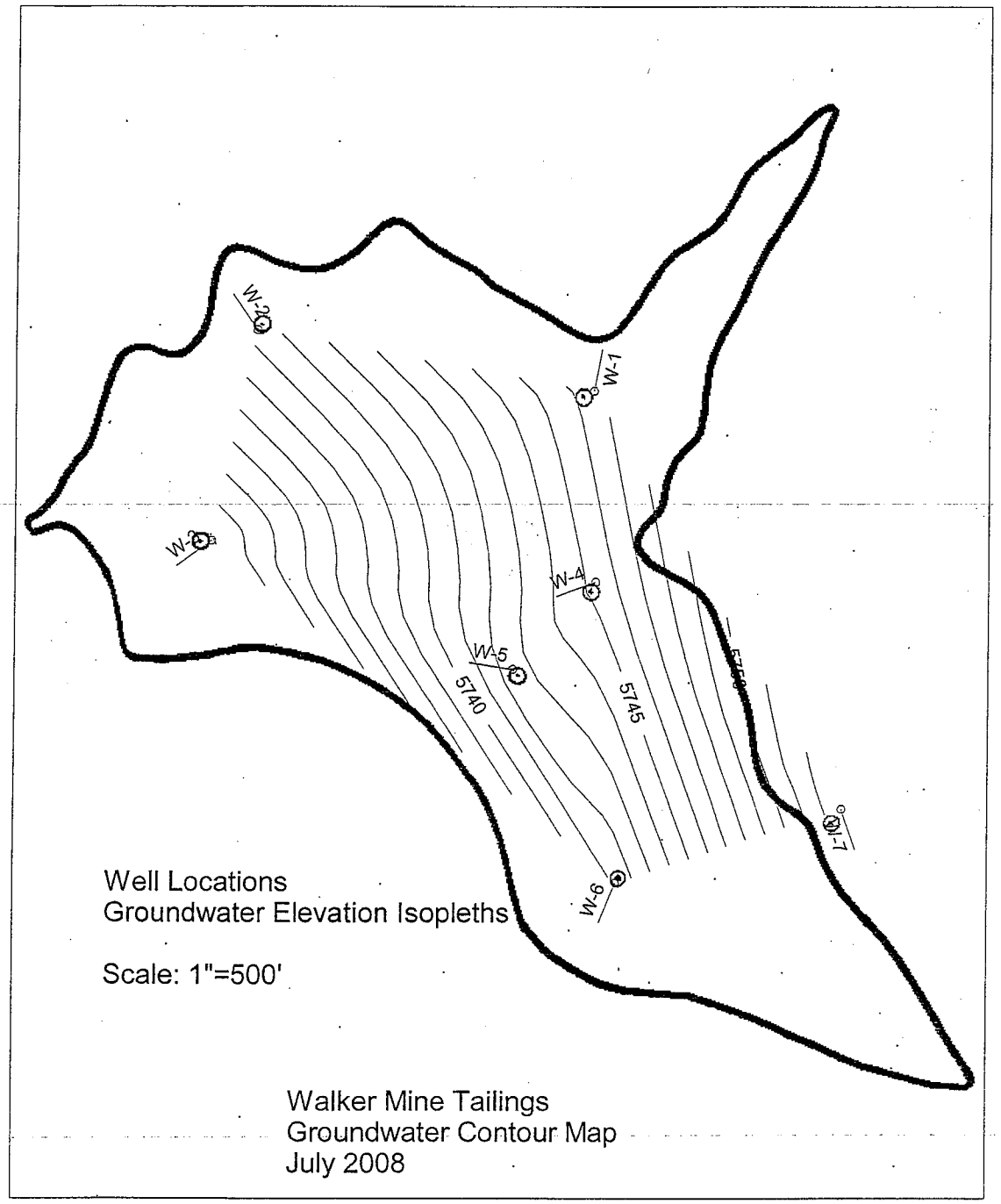

W-1
W-2
W-3
W-4
W-5
W-6
W-7
5740
5745
5750
Well Locations
Groundwater Elevation Isopleths
Scale: 1"=500'
Walker Mine Tailings
Groundwater Contour Map
July 2008

Table 1. SOIL CHEMISTRY SUMMARY REPORT

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
Jul-08

CONSTITUENT	**UNITS**	Sample A-1	Sample A-2	Sample B-1	Sample B-2
Laboratory					
pH	number	6.76	6.61	6.87	6.71
Total Nitrogen	mg/kg	ND	ND	ND	ND
Ammonia as Nitrogen	mg/kg	0.6	0.33	0.43	0.29
Total Phosphorous	mg/kg	165	161	152	143
Phosphorous Pentoxide	mg/kg	377	369	347	328
Arsenic	mg/kg	3.2	2.5	3.4	3
Cadmium	mg/kg	ND	ND	ND	ND
Copper	mg/kg	452	504	490	530
Lead	mg/kg	44.6	49	42.2	42.8
Mercury	mg/kg	0.2	0.2	0.2	0.2
Molybdenum	mg/kg	1.2	1.3	1.6	1.5
Nickel	mg/kg	4.2	3.7	3.7	3.4
Potassium	mg/kg	1400	1290	1250	1160
Selenium	mg/kg	1.5	0.7	0.8	1.1
Zinc	mg/kg	51.4	48.4	40	50.8

WALKER TAILINGS
GROUNDWATER MONITORING PROGRAM

FLUID LEVEL GAUGING

SITE LOCATION: Walker Mine Tailings DATE: 7/31/08
COMPANY NAME: USES
PERSONNEL: Flynn

WELL	TIME	DEPTH TO WATER	COMMENTS
W-1		Destroyed in 2007	
2	0954	2.25	
3	1002	5.92	
4	0923	22.69	
5	0934	11.17	
6	0850	6.73	
7	0900	2.05	

September 2008

SURFACE AND GROUNDWATER TEST RESULTS AND SUPORTING DOCUMENTATION

MONITORING REPORT

Discharger: USDA Forest Service, Plumas National Forest

Facility: Walker Mine Tailings, Plumas County

Reporting Frequency: Quarterly

Monitoring Period: September 2008

Findings:

(1) Surface Water. Samples were collected on September 9, 2008. The surface water samples collected at the compliance station, R-5, Little Grizzly Creek near Brown's Cabin, is below copper limitations (see Table 1). The remaining R-5 constituents fall within the prescribed limitations for dissolved iron and zinc. The release of copper from the tailings area to Dolly Creek, as measured at R-2, continues to exceed the limitation. Concentrations of zinc were detected in all of the five samples taken but none of these concentrations exceeded the limitation of zinc. The concentration of iron, highest at R-2, was within the limitation at all of the stations. Detected levels of sulfates have increased since July at stations R-5 and R-6 and may be the result of small local mining claims above sections where evidence of disturbance could be seen in channel substrate.

Groundwater. Samples were collected on September 9, 2008. Table 2 summarizes the findings for groundwater samples collected from the site. Small concentrations of dissolved copper (<3.0ug/l) were found both of the sampling wells (W-5, W-7). Additionally, concentrations of dissolved zinc were found in both wells, with a maximum concentration of 7.7 ug/l at W-5. Dissolved iron was found in W-5 with a measured concentration of 11200 ug/l. The reason for the drastic increase in dissolved iron at W-5 is unclear but represents a 1700% increase over the dissolved iron from the May of 2004 sample and is 120% greater than the reported May 2008 iron concentrations. These results will require out-year testing of W-5 to continually monitor the marked change that has occurred in the groundwater iron concentrations at this location.

Groundwater elevations were measured in six of seven wells at the site; W-1 was destroyed during construction last summer. Water depths continue to remain low since 2006. With the elevation of the Little Grizzly Creek channel approximately 20 feet below the surface f the tailings area, there is a strong gradient towards little Grizzly Creek all along its course with the tailings area.

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Table 1. SURFACE WATER SUMMARY

Map of the tailings area with the surface water monitoring sites

Discharge Measurement Notes

Chain-of-Custody record for surface water samples

Basic Laboratory Analysis Reports for surface and soil samples

Table 2. GROUND WATER SUMMARY

Map of the tailings are with groundwater monitoring sites

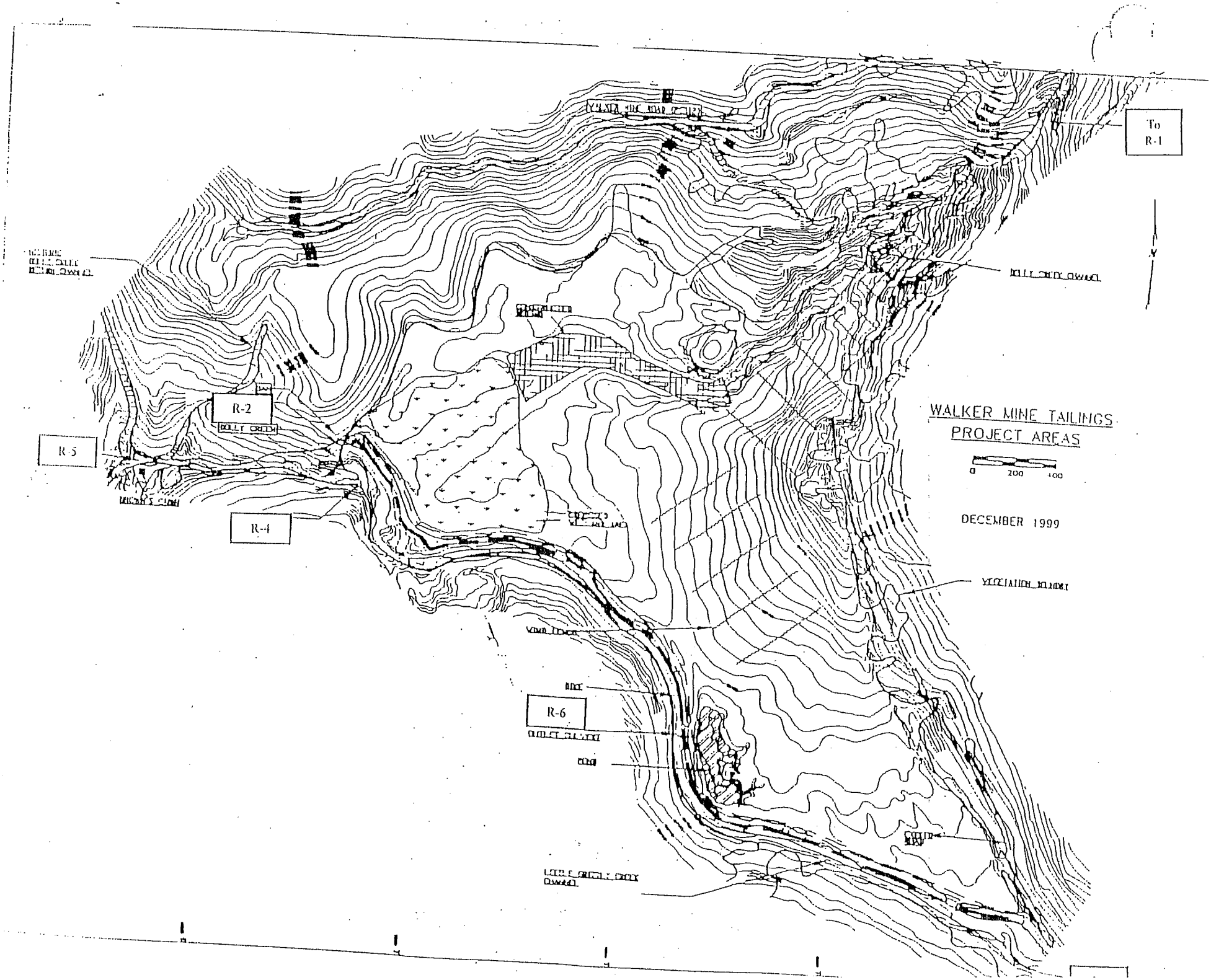
Water Level Data

Table 1. SURFACE WATER SUMMARY REPORT

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
Sep-08

CONSTITUENT	UNITS	DETECTION LIMITS	R-1	R-2	R-3[1]	R-4	R-5[2]	R-6	Limitation @R-5[3]
Field Parameters									
Flow	cfs	N/A	0.29	0.06	0.1	0.25	0.38	N/A	N/A
pH	number	N/A	7.98	7.88	7.94	7.59	8.16	N/A	N/A
Specific Conductance	umhos/cm	N/A	83	140	103	164	157	N/A	N/A
Air Temperature	F	N/A	77	73	74	67	70	N/A	N/A
Water Temperature	C	N/A	11.2	16.8	15	11.7	12.3	N/A	N/A
Laboratory									
Total Hardness as CaCO3	mg/l	5	77	84	61	108	94	N/A	N/A
Total Alkalinity as CaCO3	mg/l	1	79	85	66	85	84	N/A	N/A
Sulfate	mg/l	0.5	0.37	2.51	ND[4]	27.8	22.8	N/A	N/A
Dissolved Iron	ug/l	20	136	231	168	104	111	N/A	1000
Copper	ug/l	0.5	4.1	9.7	0.5	0.8	2.8	N/A	4.95
Dissolved Zinc	ug/l	1.0	2.8	3.8	1.8	1.6	0.8	N/A	65.66

[1] R-3 is the background station located above the tailiings area on Little Grizzly Creek.
[2] R-5 is the compliance station located near Brown's Cabin, downstream from the confluence of Dolly Creek with Little Grizzly Creek.
[3] The compliance values for copper and zinc are calculated with the R-5 hardness value of 50 mg/l as CaCO3.
[4] ND is not detected at or above the detection limit


To
R-1
R-2
R-4
R-5
R-6
WALKER MINE TAILINGS
PROJECT AREAS
0
200
100
DECEMBER 1999

Location: R-1
Date: 09/09/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	4.8	**X-sectional Area (ft^2):**	2.12
Hydraulic Depth (ft):	0.44	**Average Velocity (fps):**	0.12
		Discharge (cfs):	0.29

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.8	Lew				
1	0.35	0.00	0.00	0.00	0.00
1.5	0.50	0.18	0.09	0.00	0.00
2	0.50	0.50	0.25	0.00	0.00
2.5	0.50	0.56	0.28	0.00	0.00
3	0.50	0.65	0.33	0.01	0.00
3.5	0.50	0.58	0.29	0.04	0.00
4	0.50	0.64	0.32	0.22	0.07
4.5	0.50	0.50	0.25	0.46	0.12
5	0.50	0.42	0.21	0.47	0.10
5.5	0.30	0.36	0.11	0.00	0.00
5.6		0.05			

Percent Error (%) 34.35%

Location: R-2
Date: 09/09/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	3.80	**X-sectional Area (ft^2):**	0.81
Hydraulic Depth (ft):	0.21	**Average Velocity (fps):**	0.06
		Discharge (cfs):	0.06

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.00	LEW	0.00		0	
1.5	0.5	0.15	0.075	0.000	0.000
2	0.5	0.22	0.110	0.030	0.003
2.5	0.5	0.24	0.120	0.04	0.005
3	0.5	0.2	0.100	0.08	0.008
3.5	0.5	0.40	0.200	0.17	0.034
4	0.5	0.24	0.120	0.08	0.010
4.5	0.4	0.22	0.088	0.03	0.003
4.8					

percentage error 54.54%

Location: R-3
Date: 09/09/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	5.60	**X-sectional Area (ft^2):**	1.02
Hydraulic Depth (ft):	0.18	**Average Velocity (fps):**	0.10
		Discharge (cfs):	0.10

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.80	LEW				
2.00	0.35	0.10	0.035	0.000	0.000
2.50	0.50	0.16	0.080	0.000	0.000
3.00	0.50	0.16	0.080	0.350	0.028
3.50	0.50	0.18	0.090	0.290	0.026
4.00	0.50	0.22	0.110	0.000	0.000
4.50	0.50	0.22	0.110	0.000	0.000
5.00	0.50	0.28	0.140	0.250	0.035
5.50	0.50	0.20	0.100	0.030	0.003
6.00	0.50	0.22	0.110	0.030	0.003
6.50	0.50	0.20	0.100	0.000	0.000
7.00	0.45	0.14	0.063		
7.40					

Percent Error (%) 29.4%

Location: R-4
Date: 09/09/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	8.80	**X-sectional Area (ft^2):**	1.46
Hydraulic Depth (ft):	0.17	**Average Velocity (fps):**	0.11
		Discharge (cfs):	0.25

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
0.90	LEW	0.00			
1.00	0.30	0.00	0	0	
1.50	0.50	0.00	0	0.000	0.000
2.00	0.50	0.05	0.025	0.000	0.000
2.50	0.50	0.02	0.01	0.000	0.000
3.00	0.50	0.16	0.08	0.140	0.011
3.50	0.50	0.22	0.11	0.130	0.014
4.00	0.50	0.22	0.11	0.200	0.022
4.50	0.50	0.18	0.09	0.150	0.014
5.00	0.50	0.28	0.14	0.290	0.041
5.50	0.50	0.12	0.06	0.070	0.004
6.00	0.50	0.34	0.17	0.340	0.058
6.50	0.50	0.16	0.08	0.100	0.008
7.00	0.50	0.30	0.15	0.210	0.032
7.50	0.50	0.30	0.15	0.220	0.033
8.00	0.50	0.22	0.11	0.130	0.014
8.50	0.50	0.15	0.075	0.000	0.000
9.00	0.50	0.18	0.090	0.000	0.000
9.50	0.35	0.04	0.014	0.000	0.000
9.70					

Percent Error (%) 23.1%

Location: R-5
Date: 09/09/2008
Measurement Method: 6/10
Meter Type: Marsh McBirney
Measurement Rating: Poor

Channel Width (ft):	5.70	**X-sectional Area (ft^2):**	1.61
Hydraulic Depth (ft):	0.28	**Average Velocity (fps):**	0.21
		Discharge (cfs):	0.38

Distance (ft)	Width (ft)	Depth (ft)	Area (ft^2)	Velocity (fps)	Discharge (cfs)
1.70	LEW				
2.00	0.40	0.10	0.040	0.000	0.000
2.50	0.50	0.45	0.225	0.160	0.036
3.00	0.50	0.40	0.200	0.310	0.062
3.50	0.50	0.40	0.200	0.100	0.020
4.00	0.50	0.44	0.220	0.110	0.024
4.50	0.50	0.38	0.190	0.240	0.046
5.00	0.50	0.32	0.160	0.440	0.070
5.50	0.50	0.28	0.140	0.390	0.055
6.00	0.50	0.32	0.160	0.310	0.050
6.50	0.50	0.14	0.070	0.300	0.021
7.00	0.45	0.00	0.000	0.000	0.000
7.40					

Percent Error (%) 18.4%

WALKER MINE TAILINGS MONITORING PROGRAM

9-276-T
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....

Comp. by .....

Checked by .....

Sta. No. R-1

Date 09/09 ~~10~~08 Party Flynn/Gregory

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots .... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....

Check-bar, found .....

" changed to ..... at .....

Correct .....

Level obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather .....

Other ..... Air 77 °F @ 15

Gage ..... Water 11.2 °C @ 15

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 7.98

CONDUCTANCE 83 umhos/cm

G. H. of zero flow ..... ft.

Sample at 15:08

River at—

	Angle coef. Point	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB		0.8		0								
		1.0		0.18				0				
		1.5		0.5				0				
		2.0		0.56				0				
		2.5		0.65				0				
		3.0		0.58				0				
		3.5		0.64				0				
		4.0		0.5				.22				
		4.5		0.42				.46				
		5.0		0.36				.47				
		5.5		0.05				0				
	5.6	~~0.0~~		0.								

WALKER MINE TAILINGS MONITORING PROGRAM

9-276-P
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....
Comp. by .....
Checked by .....

Sta. No. B-2
Dolly Creek below tailings dam
Date 09/09 ~~X.08~~ Party Flynn, Gregory
Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....
Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....
Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. ~~A~~
Type of meter Marsh McBirney
Date rated ..... for rod, other.
Meter ..... ft. above bottom of weight.
Spin before meas. ..... after .....
Meas. plots .... % diff. from rating .....
Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....
Check-bar, found .....
changed to ..... at .....
Correct .....
Levels obtained .....

GAGE READINGS

Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions; Cross section .....
Flow ..... Weather .....
Other .....
Gage ..... Air 73 ~~°C~~ F @ 1304
Water 16.8°C @ 1305
..... Record removed ..... Intake flushed .....
Observer .....
Control .....

pH 7.88

CONDUCTANCE 140 umhos/cm

G. H. of zero flow ..... ft.

Samples @ 1300

River at—

Angle coef. factor	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
	~~0~~										
LB	1.0		0								
	1.5		.15			~~X~~	0				
	2.0		.22				.03				
	2.5		.24				.04				
	3.0		.20				.08				
	3.5		.46				.17				
	4.0		.24				.08				
	4.5		.22				.03				
	4.8										

WALKER MINE TAILINGS MONITORING PROGRAM

9-276 (May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....

Comp. by .....

Checked by .....

Sta. No. R-3

Date 9/9 3808 Party Flynn / Gregory

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Marsh McBirney

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots .... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge .. .. feet, mile, above, below gage, and .....

Check-bar, found .....

changed to .. .. at .....

Correct .....

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather .....

Other ..... Air 74.0 °F @ 1430

Gage ..... Water 15.0 °C @ 1426

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 7.94

CONDUCTANCE 103 umhos/cm

G. H. of zero flow ..... ft.

Samples @ 1435

River at—

Angle coef. Form	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	1.8										
	2		.1				0				
	2.5		.16				0				
	3		.16				.35				
	3.5		.18				.29				
	4		.22				0				
	4.5		.22				0				
	5		.28				.25				
	5.5		.20				.03				
	6		.22				.03				
	6.5		.20				0				
	7		.14				0				
RB	7.4										

WALKER MINE TAILINGS MONITORING PROGRAM

9-276-F
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....
Comp. by .....
Checked by .....

Sta. No. R-4
0

Date 09/09, 2008 Party Flynn, Gregory

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter .....

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots .... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....

Check-bar, found .....

changed to ..... at .....

Correct .....

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather .....

Other ..... Air 67 °F @ 1343

Gage ..... Water 11.7 °C @ 1340

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 7.59

CONDUCTANCE 1164 umhos/cm

C. H. of zero flow ..... ft.

sampling 1340

River at—

Angle coef. Right	Dist. from initial point	Width	Depth	Correction depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	.9										
	1.0		0				0				
	1.5		0				0				
	2.0		.05				0				
	2.5		.02				0				
	3.0		.10				.14				
	3.5		.22				.13				
	4.0		.22				.20				
	4.5		.18				.15				
	5.0		.28				.29				
	5.5		.12				.07				
	6.0		.34				.34				
	6.5		.10				.10				
	7.0		.30				.21				
	7.5		.30				.22				
	8.0		.22				.13				
	8.5		.15				.00				
	9.0		.18				0				
	9.5		.04				0				
RB	9.7										

WALKER MINE TAILINGS MONITORING PROGRAM

9-2767
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. .....

Comp. by .....

Checked by .....

Sta. No. R-5

Date 09/09 X08 Party Flynn/Gregory

Width ..... Area ..... Vel. ..... G. H. ..... Disch. .....

Method 6/10 No. secs. ..... G. H. change ..... in ..... hrs. Susp. .....

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. .....

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter .....

Date rated ..... for rod, other.

Meter ..... ft. above bottom of weight.

Spin before meas. ..... after .....

Meas. plots .... % diff. from rating .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage, and .....

Check-bar, found .....

changed to ..... at .....

Correct .....

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section .....

Flow ..... Weather .....

Other ..... Air 70 °F @ ~~1030~~ 1545

Gage ..... Water 23 °C @ 1545

..... Record removed ..... Intake flushed .....

Observer .....

Control .....

pH 8.16

CONDUCTANCE 1517 umhos/cm

G. H. of zero flow ..... ft.

Sample @ 1538

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
LB	1.7										
	2.0		.1				0				
	2.5		.45				.16				
	3.0		.4				.31				
	3.5		.4				.10				
	4.0		.44				.11				
	4.5		.38				.24				
	5.0		.32				.44				
	5.5		.28				.39				
	6.0		.32				.31				
	6.5		.14				.30				
	7.0		0				0				
RB	7.4										

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Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8090432
Reported: 09/25/08
Phone: (530) 283-7764
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
R2 Surface Water (8090432-01) Sampled:09/09/08 13:00 Received:09/11/08 14:46									
Hardness	mg/l	**84**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**85**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301
Bicarbonate	"	**104**		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	**2.51**		0.05	0.40	EPA 300.0	09/18/08	09/17/08	B8I0465
Turbidity	NTU	**2.85**	I-03	0.05	0.10	SM 2130B	09/18/08	09/18/08	B8I0482
R4 Surface Water (8090432-02) Sampled:09/09/08 13:32 Received:09/11/08 14:46									
Hardness	mg/l	**108**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**85**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301
Bicarbonate	"	**104**		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	**27.8**		0.05	0.40	EPA 300.0	09/19/08	09/17/08	B8I0465
Turbidity	NTU	**2.55**	I-03	0.05	0.10	SM 2130B	09/18/08	09/18/08	B8I0482
R3 Surface Water (8090432-03) Sampled:09/09/08 14:35 Received:09/11/08 14:46									
Hardness	mg/l	**61**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**66**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301
Bicarbonate	"	**81**		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	ND		0.05	0.40	EPA 300.0	09/19/08	09/17/08	B8I0465
Turbidity	NTU	**1.57**	I-03	0.05	0.10	SM 2130B	09/18/08	09/18/08	B8I0482
R1 Surface Water (8090432-04) Sampled:09/09/08 15:08 Received:09/11/08 14:46									
Hardness	mg/l	**77**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**79**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301
Bicarbonate	"	**97**		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	**0.37**	J	0.05	0.40	EPA 300.0	09/19/08	09/17/08	B8I0465
Turbidity	NTU	**1.46**	I-03	0.05	0.10	SM 2130B	09/18/08	09/18/08	B8I0482
R5 Surface Water (8090432-05) Sampled:09/09/08 15:38 Received:09/11/08 14:46									
Hardness	mg/l	**94**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**84**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301
Bicarbonate	"	**102**		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	**22.8**		0.05	0.40	EPA 300.0	09/19/08	09/17/08	B8I0465
Turbidity	NTU	**2.00**	I-03	0.05	0.10	SM 2130B	09/18/08	09/18/08	B8I0482
W5 Surface Water (8090432-06) Sampled:09/09/08 11:02 Received:09/11/08 14:46									
Hardness	mg/l	**150**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**80**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301
Bicarbonate	"	**97**		1	5	"	"	"	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	**102**		0.25	2.00	EPA 300.0	09/19/08	09/17/08	B8I0465
Turbidity	NTU	**202**	I-03	0.50	1.00	SM 2130B	09/18/08	09/18/08	B8I0482
W7 Surface Water (8090432-07) Sampled:09/09/08 11:25 Received:09/11/08 14:46									
Hardness	mg/l	**42**		2	5	SM 2340C	09/15/08	09/15/08	B8I0395
Alkalinity as CaCO3	"	**41**		1	5	SM 2320B	09/11/08	09/11/08	B8I0301

Approved By

Basic Laboratory, Inc.
California D.O.H.S. Cert #1677

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Report To: U S D A FOREST SERVICE- PLUMAS NATIONAL FOREST
P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8090432
Reported: 09/25/08
Phone: (530) 283-7764
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
W7 Surface Water (8090432-07) Sampled:09/09/08 11:25 Received:09/11/08 14:46									
Bicarbonate	"	**50**		1	5	"	"	09/11/08	"
Carbonate	"	ND		1	5	"	"	"	"
Hydroxide	"	ND		1	5	"	"	"	"
Sulfate as SO4	"	**0.32**	J	0.05	0.40	EPA 300.0	09/19/08	09/17/08	B8I0465
Turbidity	NTU	**17.4**	I-03	0.05	0.10	SM 2130B	09/18/08	09/18/08	B8I0482

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Lab No: 8090432
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P.O. #

Metals - Dissolved

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
R2 Surface Water (8090432-01) Sampled:09/09/08 13:00 Received:09/11/08 14:46									
Copper	ug/l	9.7		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	231		3	10	"	09/23/08	"	B8I0607
Zinc	"	3.8		0.4	2.0	"	09/23/08	"	B8I0401
R4 Surface Water (8090432-02) Sampled:09/09/08 13:32 Received:09/11/08 14:46									
Copper	ug/l	0.8		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	104		3	10	"	09/23/08	"	B8I0607
Zinc	"	1.6	J	0.4	2.0	"	09/23/08	"	B8I0401
R3 Surface Water (8090432-03) Sampled:09/09/08 14:35 Received:09/11/08 14:46									
Copper	ug/l	0.5		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	168		3	10	"	09/23/08	"	B8I0607
Zinc	"	1.8	J	0.4	2.0	"	09/23/08	"	B8I0401
R1 Surface Water (8090432-04) Sampled:09/09/08 15:08 Received:09/11/08 14:46									
Copper	ug/l	4.1		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	136		3	10	"	09/23/08	"	B8I0607
Zinc	"	2.8		0.4	2.0	"	09/23/08	"	B8I0401
R5 Surface Water (8090432-05) Sampled:09/09/08 15:38 Received:09/11/08 14:46									
Copper	ug/l	2.8		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	111		3	10	"	09/23/08	"	B8I0607
Zinc	"	0.8	J	0.4	2.0	"	09/23/08	"	B8I0401
W5 Surface Water (8090432-06) Sampled:09/09/08 11:02 Received:09/11/08 14:46									
Copper	ug/l	0.6		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	15700		3	10	"	09/23/08	"	B8I0607
Zinc	"	10.7		0.4	2.0	"	09/23/08	"	B8I0401
W7 Surface Water (8090432-07) Sampled:09/09/08 11:25 Received:09/11/08 14:46									
Copper	ug/l	0.5		0.1	0.5	EPA 200.8	09/23/08	09/15/08	B8I0401
Iron	"	31		3	10	"	09/23/08	"	B8I0607
Zinc	"	20.5		0.4	2.0	"	09/23/08	"	B8I0401

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P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8090432
Reported: 09/25/08
Phone: (530) 283-7764
P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
General Chemistry										
Batch B8I0301 - General Prep - GC										
Blank										
Alkalinity as CaCO3	1	5	mg/l							J
Bicarbonate	2	5	mg/l							J
Carbonate	ND	5	mg/l							
Hydroxide	ND	5	mg/l							
LCS										
Alkalinity as CaCO3	52		mg/l	50.0		104	80-120			
Duplicate **Source: 8090432-01**										
Alkalinity as CaCO3	85	5	mg/l		85			0.00	20	
Batch B8I0395 - General Prep - GC										
Blank										
Hardness	ND	5	mg/l							
LCS										
Hardness	80.0		mg/l	80.0		100	80-120			
Duplicate **Source: 8090432-01**										
Hardness	82.0	5	mg/l		84.0			2.41	20	
Duplicate **Source: 8090448-01**										
Hardness	125	5	mg/l		125			0.00	20	
Matrix Spike **Source: 8090432-01**										
Hardness	183	5	mg/l	100	84.0	99.0	75-125			
Matrix Spike **Source: 8090448-01**										
Hardness	224	5	mg/l	100	125	99.0	75-125			
Batch B8I0465 - General Prep - GC										
Blank										
Sulfate as SO4	ND	0.40	mg/l							
LCS										
Sulfate as SO4	20.9		mg/l	20.0		104	90-110			
Duplicate **Source: 8090262-02**										
Sulfate as SO4	7.85	0.40	mg/l		7.87			0.356	20	
Duplicate **Source: 8090432-01**										
Sulfate as SO4	2.58	0.40	mg/l		2.51			2.64	20	
Matrix Spike **Source: 8090262-02**										
Sulfate as SO4	18.1	0.40	mg/l	10.0	7.87	102	75-125			
Matrix Spike **Source: 8090432-01**										
Sulfate as SO4	13.1	0.40	mg/l	10.0	2.51	106	75-125			
Batch B8I0482 - General Prep - GC										
Blank										
Turbidity	0.053	0.10	NTU							J

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P O BOX 11500
QUINCY, CA 95971
Attention: RYAN NUPEN
Project: SURFACE & GROUND WATER TESTING 5-00-028

Lab No: 8090432
Reported: 09/25/08
Phone: (530) 283-7764
P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
General Chemistry										
Batch B8I0482 - General Prep - GC										
LCS										
Turbidity	1.46		NTU	1.50		97.3	80-120			
Duplicate **Source: 8090432-01**										
Turbidity	2.88	0.10	NTU		2.85			1.05	20	
Duplicate **Source: 8090595-02**										
Turbidity	5.62	0.10	NTU		5.58			0.714	20	
Metals - Dissolved										
Batch B8I0401 - EPA 200 Series										
Blank										
Copper	ND	0.5	ug/l							
Zinc	ND	2.0	ug/l							
LCS										
Copper	97.2	0.5	ug/l	100		97.2	85-115			
Zinc	94.1	2.0	ug/l	100		94.1	85-115			
Duplicate **Source: 8090432-01**										
Copper	9.91	0.5	ug/l		9.75			1.65	20	
Zinc	3.77	2.0	ug/l		3.77			0.0490	20	
Matrix Spike **Source: 8090432-01**										
Copper	96.7	0.5	ug/l	100	9.75	87.0	75-125			
Zinc	95.3	2.0	ug/l	100	3.77	91.5	75-125			
Batch B8I0607 - EPA 200 Series										
Blank										
Iron	8.70	10	ug/l							J
LCS										
Iron	5130	10	ug/l	5000		103	85-115			
Duplicate **Source: 8090432-01**										
Iron	217	10	ug/l		231			6.16	20	
Matrix Spike **Source: 8090432-01**										
Iron	4910	10	ug/l	5000	231	93.5	75-125			

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Notes and Definitions

J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J flag is equivalent to the DNQ Estimated Concentration flag.
I-03	Sample was received past the EPA recommended holding time.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure

Approved By
Basic Laboratory, Inc.
California D.O.H.S. Cert #1677

BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 8090432

PAGE 1 OF 1

CLIENT NAME: USDA FOREST SERVICE - Plumas

PROJECT NAME: Water/ Surface

PROJECT #: 5-00-028

MAILING ADDRESS:

REPORT DUE DATE: 9/25/08

TURN AROUND TIME: (Standard) Rush

OF SAMPLES: 8

MATRIX / TYPE: Water

PROJECT MANAGER: Ryan Nupen

CUSTODY SEAL INTACT? Yes No N/A

PHONE: 530 283-7758

EMAIL: rnupen@fs.fed.us

SYSTEM #:

FAX: 530 283 7729

RESULTS SENT: (Email) Fax EDD (Mail)

EDD TYPE:

INVOICE TO: Ryan Nupen c/o USFS

PO#:

QC: Standard Level II

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	Diss. Fe, Cu, Zn	Hardness, Alk, SO4	LAB ID	CHLORINE RESIDUAL OR COMMENTS
09/09/08	~~1337~~ 1380	X			R-2		X	X	1	
	1332	X			R-4		X	X	2	metals:
	1435	X			R-3		X	X	3	preserved
	1508	X			R-1		X	X	4	and field
	1538	X			~~R-5~~		X	X	5	filtered
									~~6~~	
	1102	X			W-5		X	X	~~7~~ 6	
	1125	X			W-7		X	X	~~8~~ 7	

Turb added 9/18/08 per Angela. Turb outside H.T.

pH<2

PRESERVED WITH: (HNO_3) H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER

SAMPLED BY (PRINT): Patrick Flynn	SAMPLE DATE/TIME: 09/09/2008	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB): [signature]	DATE/TIME: 9/11/08 1446	PROCESSED AND VERIFIED BY: [signature]	DATE/TIME: 9/11/08 1446
LOGGED IN BY: [signature]	DATE/TIME: 9/11/08 1446	CARRIER:	COOLER TEMPERATURE: 1.4 °C

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

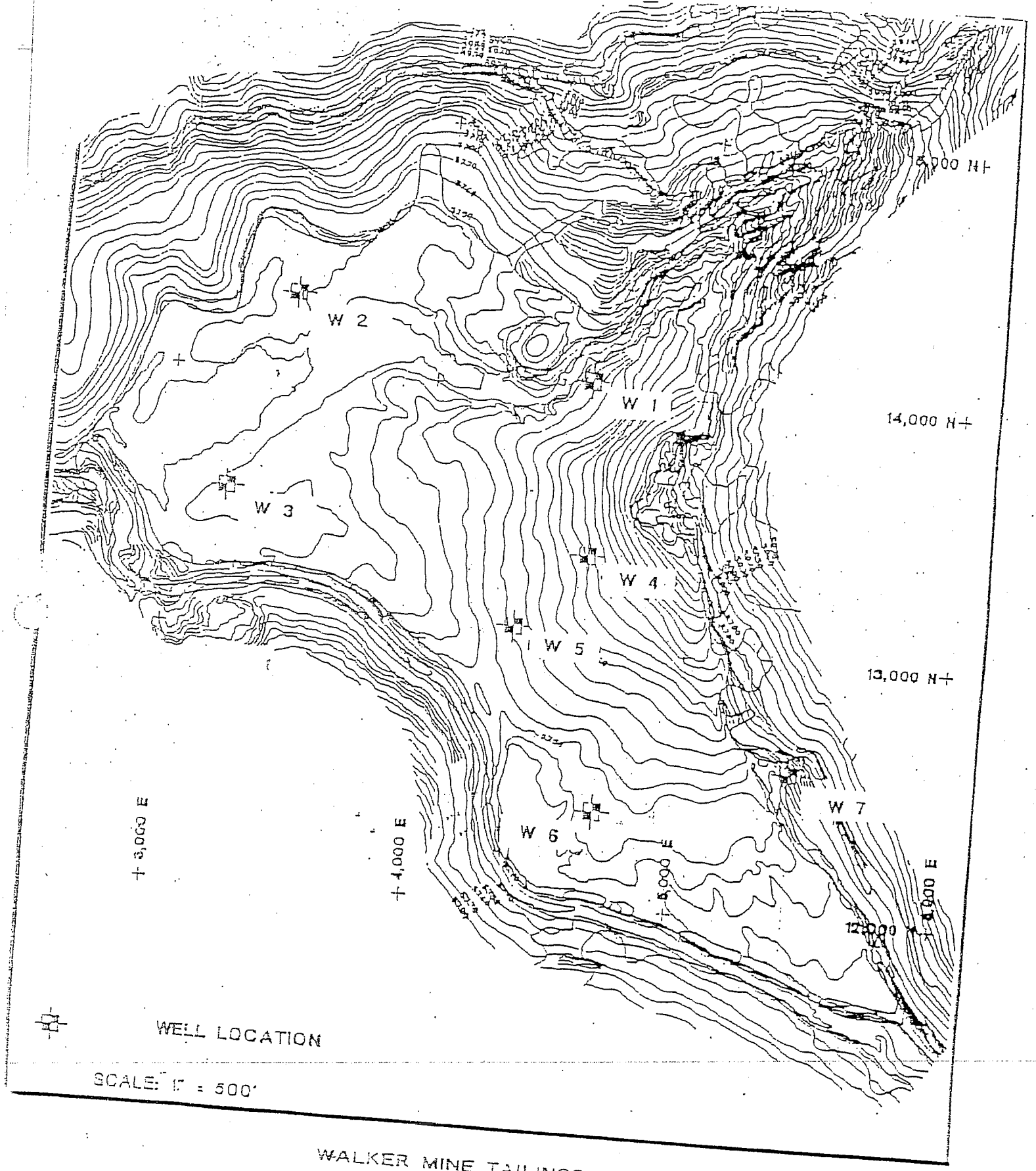
SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

Table 2. GROUND WATER SUMMARY

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, PLUMAS NATIONAL FOREST
WALKER MINE TAILINGS, PLUMAS COUNTY
September 2008

CONSTITUENT	UNIT	DETECTION LIMIT	WELL SITES W-1	W-2	W-3	W-4	W-5	W-6	W-7*
Field Parameters									
Ground Surface Elevation	ft	0.01	N/A	5742.05	5739.15	5768.27	5754.28	5748.04	5753.85
Top of Cap Elevation	ft	0.01	N/A	5741.74	5738.83	5768.00	5754.09	5747.87	5754.91
Depth to Water	ft	0.01	N/A	2.49	6.29	23.93	12.20	7.59	2.05
Water Surface Elevation	ft	0.01	N/A	5739.25	5732.54	5744.07	5741.89	5740.28	5752.86
Laboratory									
Total Hardness as $CaCO_3$	mg/l	5.0	N/A	N/A	N/A	N/A	150.0	N/A	42.0
Total Alkalinity	mg/l	1.0	N/A	N/A	N/A	N/A	80.0	N/A	41.0
Sulfate	mg/l	0.5	N/A	N/A	N/A	N/A	102.0	N/A	0.32
Dissolved Iron	ug/l	20.0	N/A	N/A	N/A	N/A	15700.0	N/A	31.0
Dissolved Copper	ug/l	0.5	N/A	N/A	N/A	N/A	0.6	N/A	0.5
Dissolved Zinc	ug/l	1.0	N/A	N/A	N/A	N/A	10.7	N/A	20.5

*W-7 is located upgradient and off-site in a wet area. The data collected from this well are used for background comparisons.



WALKER MINE TAILINGS

Water-Quality Sampling Information

Project Number: _____

Project Name: Walker Mine Tailings

Project Location: Walker Mine

Site Conditions/Weather: Dry / Cool - Clear, Windy

Page 1 of 1

Date: 9/9/08

Day: M T W Th F S S

Staff: Flynn

Comments : _____

SAMPLING METHOD

- ☐ Centrifugal Pump
- ☐ Submersible Pump
- ☐ Hand Bail
- ☒ Disposable Bailer
- ☐ Teflon Bailer
- ☐ _____ (other)

Sample Number: W-5

- ☐ FB: _____
- ☐ DUP: _____

Analysis Requested

Number and Types of Bottle Used

Calculation Area

Height of water column =

Depth to water =

80% DTW _____

Method of shipment

Basic Labs (lab name)

- ☒ Courier FedEx
- ☐ Hand Deliver

Well Number: W-5

Depth of Water: 12.20

Well Depth: 40.3

Height of Water Column: _____

Volume in Well: (gallons) _____

3 Well Volumes: (gallons) _____

Well Diameter: _____

- ☒ 2" (0.16 gallon / feet)
- ☐ 4" (0.65 gallon/ feet)
- ☐ 5" (1.02 gallon/ feet)
- ☐ 6" (1.47 gallon/ feet)

Time	Depth to Water	Volume Purged (gallons)	Totalizer Reading	Temperature °C	pH	Cond. ms/ cm	Turbidity (NTU)	Remarks
1019								Start Page
1026		5		9.9	6.50	273	4.9	Very TB / No odor
1037		10		9.2	6.81	272	4.4	Low TB / No odor
1046		15		9.1	6.84	271	5.3	" "
1102								Sample W-5

Inlet Depth: _____

_____ Signed: _____ Date: _____

Water-Quality Sampling Information

Project Number: —

Project Name: Walker Mine Tailings

Project Location: Walker Mine

Site Conditions/Weather: Dry / Cool - Clear

Page 1 of 1

Date: 9/9/08

Day: ~~M~~ ~~T~~ W Th F S S

Staff: Flynn

Comments :

SAMPLING METHOD

- ☐ Centrifugal Pump
- ☐ Submersible Pump
- ☐ Hand Bail
- ☐ Disposable Bailer
- ☐ Teflon Bailer
- ☐ _____ (other)

Sample Number: W-7

- ☐ FB:
- ☐ DUP:

Analysis Requested

Number and Types of Bottle Used

Calculation Area

Height of water column =

Depth to water =

80% DTW

Method of shipment

Basic Labs (lab name)

- ☒ Courier Fed EX
- ☐ Hand Deliver

Well Number: W-7

Depth of Water: 2.05

Well Depth: 11.00

Height of Water Column:

Volume in Well: (gallons)

3 Well Volumes: (gallons)

Well Diameter:

- ☒ 2" (0.16 gallon / feet)
- ☐ 4" (0.65 gallon/ feet)
- ☐ 5" (1.02 gallon/ feet)
- ☐ 6" (1.47 gallon/ feet)

Time	Depth to Water	Volume Purged (gallons)	Totalizer Reading	Temperature °C	pH	Cond. ms/ cm	Turbidity (NTU)	Remarks
0921								Start Purge
0925		2		9.6	6.24	135	14.2	Low TB / no odor
0931		4		7.5	5.79	56	66	Mod TB / no odor
0938		6		7.2	5.73	55	117	Mod TB / no odor
								Bailed almost dry
								Allow Recharge
1125								Sample W-7

Inlet Depth:

Signed: Date:

LAWRENCE
& ASSOCIATES
ENGINEERING GEOLOGY
CIVIL ENGINEERING
GROUND-WATER HYDROLOGY

008133.00

November 14, 2008

Mr. Ryan Nupen
Watershed Engineer
Plumas National Forest
P.O. Box 11500
Quincy, CA 95971

Dear Mr. Nupen:

SUBJECT: RESULTS OF THE GEOTECHNICAL INVESTIGATION AT THE DOLLY CREEK INLET STRUCTURE AT WALKER MINE, PLUMAS NATIONAL FOREST, CALIFORNIA

INTRODUCTION

This letter presents findings from a geotechnical investigation performed by Lawrence & Associates (L&A) on October 20 through 23, 2008 at the Dolly Creek Inlet Structure at Walker Mine, Plumas National Forest, California (**Figure 1**). The purpose of the investigation was to determine the geologic properties of the subsurface to a depth of 30 feet below ground surface (bgs). Five exploratory borings, BH-1, BH-2(P-1), BH-3, BH-4(P-2), and MW-1B were drilled. One groundwater-monitoring well was installed in boring MW-1B, and two piezometers were installed in borings BH-2(P-1) and BH-4(P-2)

GEOLOGY

The boreholes were drilled within an area consisting of alluvial mine tailings from Walker Mine, and a geologic unit described by C. Durrell as Granitoid Rocks[1]. The mine tailings consist of well-sorted sands and silts washed down from Walker Mine through Dolly Creek less than 100 years ago. The depth of these deposits exceeds 35 feet near the confluence of Dolly Creek and Little Grizzly Creek. The granitoid rocks consist of granodiorite, quartz diorite, tonalite, trondjemite, and quartz monzonite[2].

Geologic units near the project site consist of quaternary-period (0-1.5 million years ago) alluvial deposits to the east of the site, and Basalt from the Lovejoy Formation to the south of the site.

---

[1] Durrell, C; Mt. Ingalls Quadrangle, California-Plumas County, 7.5 Minute Series; United States Geological Survey, 1975
[2] Saucedo, Wagner, Chico Quadrangle-Map NO. 7A (Geology), California Department of Conservation, Division of Mines and Geology; 1992

2001 Market Street • Room 523 • Redding, California 96001 • (530) 244-9703 • fax (530) 244-5021 • info@lwrnc.com

GEOTECHNICAL BORINGS AND MONITORING-WELL INSTALLATION

On October 20 through 23, 2008, L&A (Contractor's License No. C57-539447) drilled five exploratory borings, BH-1, BH-2(P-1), BH-3, BH-4(P-2), and MW-1B, and installed one groundwater-monitoring well in boring MW-1B, and two piezometers in borings BH-2(P-1) and BH-4(P-2) (**Figure 2**). Drilling was performed using a CME-55 drill rig with 7-5/8-inch OD hollow-stem augers and a 3-inch tri-cone bit with air rotary circulation. Soil cuttings from the borings were visually logged using the Unified Soil Classification System. Core samples were collected and Standard Penetration tests were performed at 25 bgs in BH-2(P-1) and at 20 bgs in BH-3. Soil-boring logs for all borings, and well-completion details for MW-1B, P-1, and P-2, are presented in **Figures 3** through 7.

GROUNDWATER SAMPLING METHODOLOGY AND RESULTS

Depth to Groundwater

Depth to groundwater, from the natural ground surface, was measured in each boring using an electronic well sounder. The depth to groundwater was recorded to the nearest 0.1 foot. Depths to groundwater are shown in **Table 1**.

Table 1
Groundwater Depths
(October 2008)

Well	First Water (Estimated During Drilling) (feet bgs)	Static Water Level (feet bgs)
BH-1	15	15.5
BH-2 (P-1)	15	17.5
BH-3	15	9.7
BH-4 (P-2)	NM	NM
MW-1B	10	10

FINDINGS

Soil

The soils encountered during drilling are highly heterogeneous. The upper zone, generally between 0 and 20 feet bgs, consists of varying percentages of fines with sand, gravel, cobbles, and boulders. The lower zone is semi-decomposed granitic rock. Cuttings from this granitic rock are described as approximately 50% brown silt, 40% medium to course sand, and 10% clay. Core samples from this unit show mineral lenses up to one centimeter long, and an abundance of quartz and biotite cemented in a fine-grained matrix.

A competent bedrock unit was not encountered in any of the borings. Logs of all borings are shown in **Figures** 3 through 7.

Groundwater

There appear to be three types of groundwater-bearing units at the site.

The first groundwater-bearing unit is an unconsolidated, unconfined aquifer consisting of silt, sand, cobbles and boulders. The presence of water in this zone was found to be approximately 15-20 feet bgs. This unit was encountered in borings BH-1, BH-2(P-1), BH-3, and BH-4(P-2). Additionally, piezometer P-2 was completed in this zone.

The second groundwater-bearing unit is the semi-decomposed granite layer located in borings BH-1, BH-2(P-1), and BH-3, at 14, 20, and 18 feet bgs, respectively. Core samples collected from this unit showed that less decomposed areas of material were not water-bearing, but water is held in the more-decomposed fractures of the rock. Piezometer P-1 was completed in this zone. It is unclear whether this zone is connected to the shallower groundwater zone described above.

The third groundwater-bearing unit was encountered in borehole MW-1B. This unit is located within the Walker Mine tailings and consists entirely of sand and silt deposits.

CONCLUSIONS

1. Shallow groundwater is present around the Dolly Creek inlet structure in unconsolidated silts, sands, gravels, cobbles, and boulders. Static water level around the inlet structure ranged from 9.7 to 17.5 feet bgs.
2. A competent bedrock unit was not encountered in any of the borings.
3. Monitoring well MW-1B is completed entirely within sand and silt mine tailings from the Walker Mine.

Please call one of us at (530) 244-9703 if you have any questions regarding this report.

Sincerely,

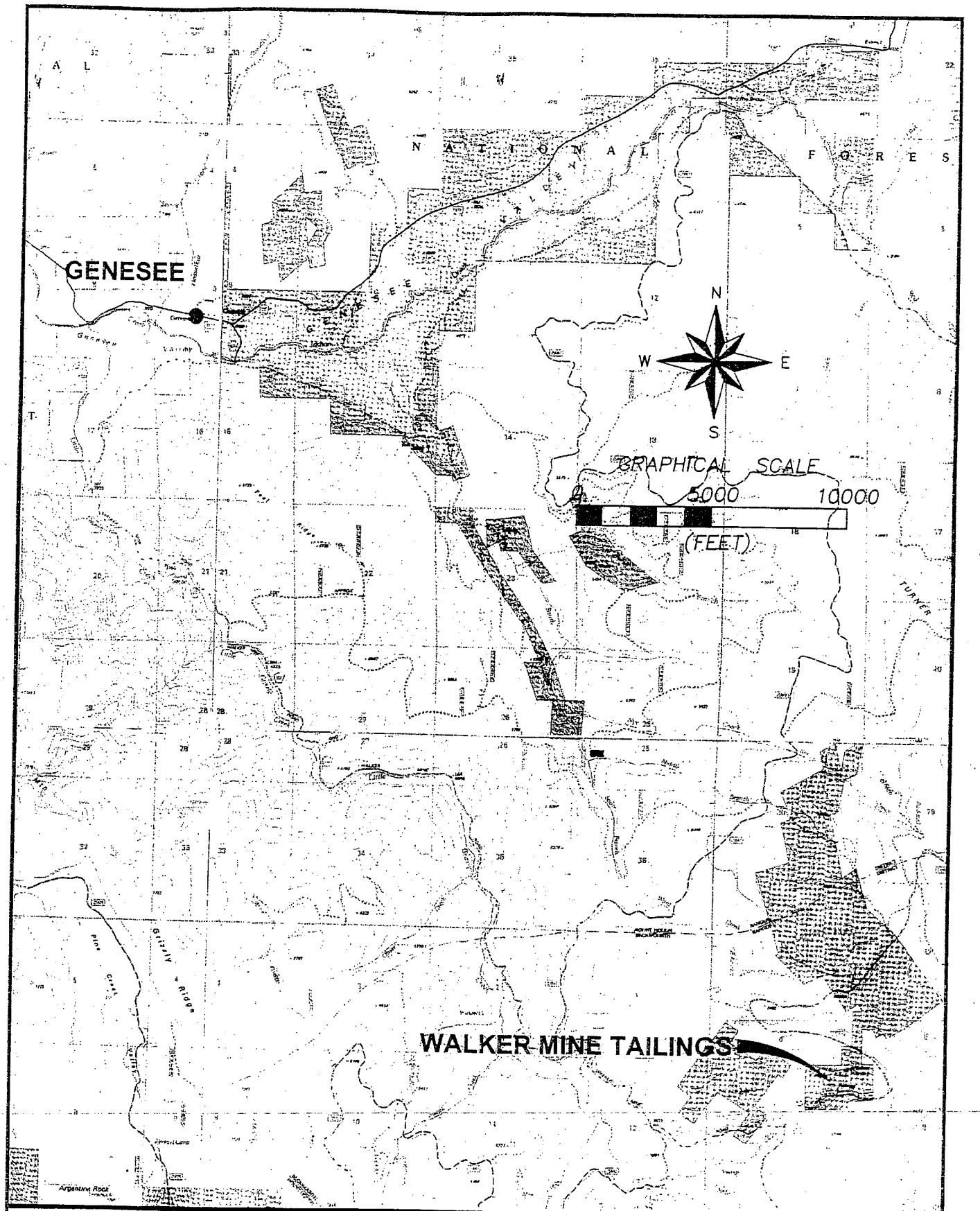
Colin O. Klinesteker

Colin Klinesteker
Staff Geologist

David L. Kirk

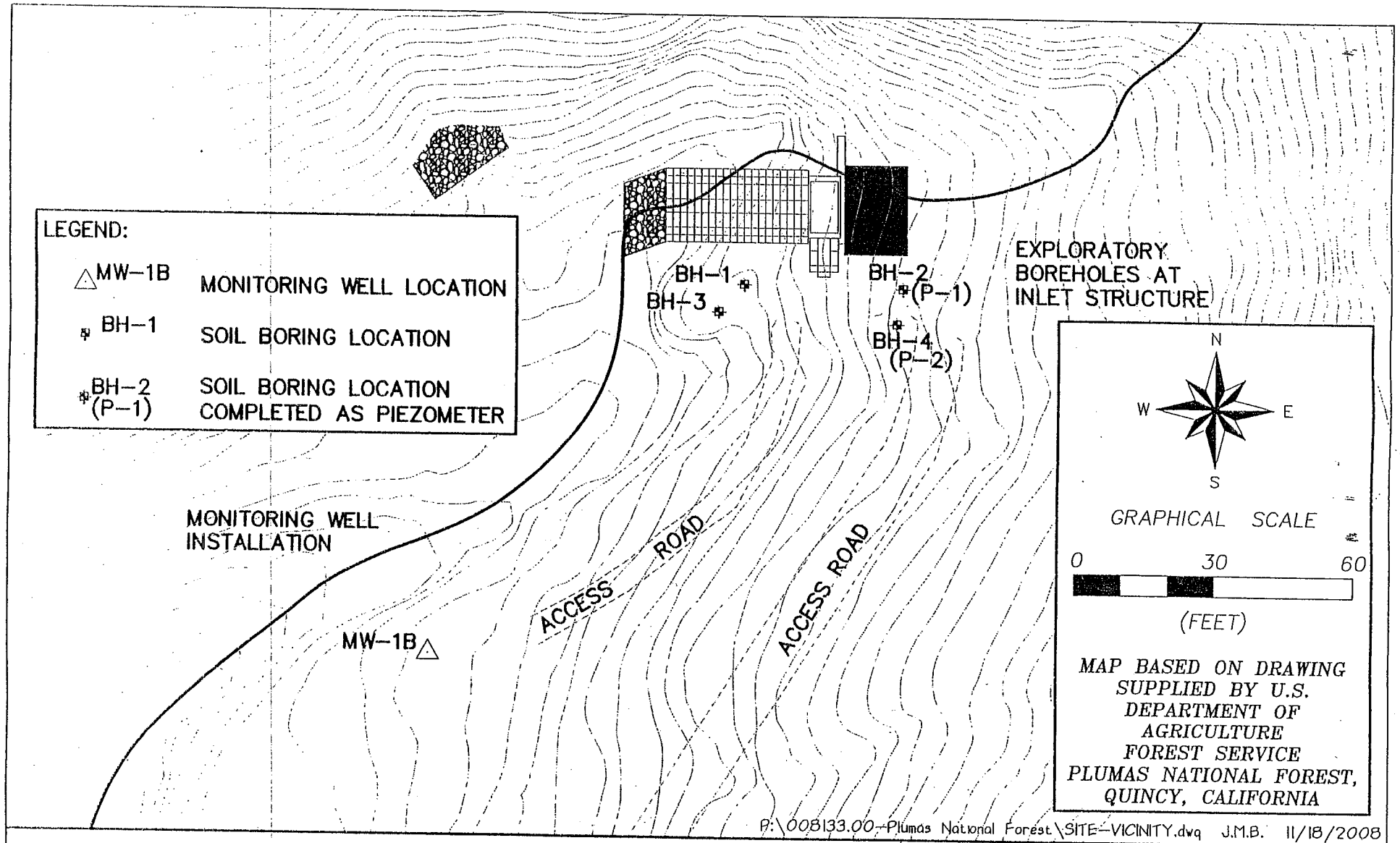
David Kirk
Senior Geologist, PG 6673

Figure 1: Site Location Map
Figure 2: Boring Locations
Figure 3: Boring Log, BH-1
Figure 4: Boring Log and Well Construction Detail, BH-2(P-1)
Figure 5: Boring Log, BH-3
Figure 6: Boring Log, and Well Construction Detail, BH-4(P-2)
Figure 7A: Boring Log and Well Construction Detail, MW-1B
Figure 7B: Boring Log and Well Construction Detail Continued, MW-1B



SITE–LOCATION MAP MAP ADAPTED FROM USGS 7.5–MINUTE TOPOGRAPHIC QUAD, DORRIS, CALIF., 1985		LAWRENCE & ASSOCIATES 2001 MARKET STREET, RM. 523 REDDING, CA 96001 PHONE (530) 244–9703 FAX (530) 244–5021	SCALE: 1"=5,000' DATE: 11/14/2008 JOB NO: 008133.00
CLIENT: PLUMAS NATIONAL FOREST	PROJECT: WALKER MINE	DRAWN BY: J. BAYER	FIGURE 1

P:\008133.00–Plumas National Forest\SITE–LOC.dwg J.M.B. 11/17/2008



P:\008133.00-Plumas National Forest\SITE-VICINITY.dwg J.M.B. 11/18/2008

SITE VICINITY MAP		LAWRENCE & ASSOCIATES 2001 MARKET STREET, RM. 523 REDDING, CA 96001 PHONE (530) 244-9703 FAX (530) 244-5021	SCALE: ~30' DATE: 11/17/2008 JOB NO: 008133.00
CLIENT: PLUMAS NATIONAL FOREST	PROJECT: WALKER MINE	DRAWN BY: J. BAYER	FIGURE 2

LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE : (530) 244-9703
FAX : (530) 244-5021

PROJECT: PLUMAS NATIONAL FOREST WALKER MINE	SHEET 1 OF 1
	BH #: BH-1
JOB #: 008133.00	DATE: 10/20/08
LOGGED BY: C. KLINESTEKER DRILLER:	
WELL CASING ELEVATION: N/A	
EQUIPMENT AND SPECIFICATIONS: CME-55 DRILL RIG WITH 7 5/8" AUGERS AND 3" TRI-CONE BIT WITH AIR ROTARY	

FIELD LOCATION OF WELL

DEPTH (FT)	SOIL SAMPLE LOCATION	BLOW COUNTS	SOIL GROUP USCS SYMBOL	LITHOLOGY PROFILE		DESCRIPTION
0			ML		0 – 1'	SILT WITH CLAY, DRY, POWDERY, SOFT, LOW TOUGHNESS AND PLASTICITY, WHITE
			ML		1' – 3'	SILT WITH CLAY AND BOULDERS, FINE MATERIAL IS SAME AS ABOVE BOULDERS WERE PUSHED TO THE SIDE AND DID NOT COME TO THE SURFACE
			SP		3' – 5'	SAND, FINE SAND, WELL-SORTED, MOIST, FLUFFY, SOFT, NO TOUGHNESS OR PLASTICITY, BROWN
5			SW		5' – 8'	SAND, AS ABOVE, WITH GRAVEL AND COBBLES, SAND IS WET, GRAVEL IS SUB-ANGULAR
10			SW / SM		8' – 14'	SAND WITH SILT AND GRAVEL, POORLY SORTED, ~25% GRAVEL, 15% SILT, SAND IS MOSTLY FINE, MOIST, LOW TOUGHNESS AND PLASTICITY, GRAVEL IS UP TO 2" LONG, SUB-ANGULAR AND SUB-ROUNDED, BROWN
					14'	HARD, GRINDING DRILLING, DRILL BIT WAS PULLED AND FOUND TO BE COVERED IN WET SAND, SWITCHED TO AIR ROTARY
15			SP		14' – 17'	LIKELY SEMI-DECOMPOSED GRANITE ROCK, SLOW DRILLING, CUTTINGS ARE MOSTLY MEDIUM GRAINED SAND
20			GP		17' – 23'	GRAVEL WITH SAND, CUTTING ARE FAIRLY WELL-SORTED, UP TO 1 1/2" LONG, ~10% SAND
25			ML		23' – 26'	SILT AND SAND WITH CLAY, DRILLING IS SMOOTH, MINIMAL SAND, WATER IS MUDDY, REDDISH BROWN
						NOTE: WATER COMING OUT OF THE "SPRING" IN THE SIDE OF THE HILL HAS TURNED BROWN
30						

NOTES:

FIGURE 3

P:\008133.00-Plumas National Forest\BH-1.dwg J.M.B. 11/14/2008

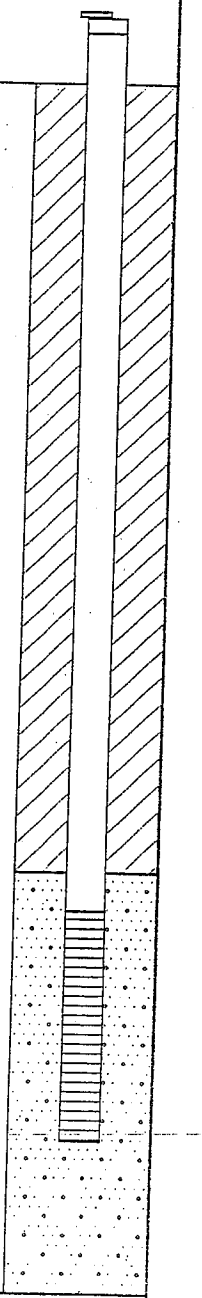
LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE : (530) 244-9703
FAX : (530) 244-5021

PROJECT: PLUMAS NATIONAL FOREST WALKER MINE	SHEET 1 OF 1
	BH #: BH-2
JOB #: 008133.00	DATE: 10/21/08
LOGGED BY: C. KLINESTEKER DRILLER:	
WELL CASING ELEVATION: N/A	
EQUIPMENT AND SPECIFICATIONS: CME-55 DRILL RIG WITH 7 5/8" AUGERS	

FIELD LOCATION OF WELL

DEPTH (FT)	SOIL SAMPLE LOCATION	BLOW COUNTS	SOIL GROUP USCS SYMBOL	LITHOLOGY PROFILE	DESCRIPTION
0			ML		0 – 2' COBBLES AND GRAVELS WITH FINES, VERY POORLY SORTED, SUB-ANGULAR CLASTS UP TO 8" LONG, MUDSTONE, FINES ARE DRY, SILT AND SAND, ~30% BY VOLUME
5			ML		2 – 7' SILT WITH GRAVEL, GRANULAR STRUCTURE, ~40% GRAVEL, ABUNDANT ORGANIC MATTER, GRAVEL IS SUB-ANGULAR UP TO 2" LONG, SILT IS MOIST, LOW TOUGHNESS AND PLASTICITY, BROWN
			ML		7 – 10' GRADES TO SILT WITH CLAY AND GRAVEL, 25% GRAVEL, 15% CLAY, MOIST, LOW TOUGHNESS, MEDIUM PLASTICITY, BROWN
10			GM		10 – 14' GRAVEL WITH FINES, ~65% MEDIUM GRAVEL, SUB-ROUNDED CLASTS, FINES APPEAR SAME AS DESCRIBED 7-10'
15			ML		14 – 20' SILT WITH SAND, ~60% SILT, ~15% CLAY, DENSE, WET, MEDIUM PLASTICITY, LOW TOUGHNESS, SATURATED AT ABOUT 15', LIGHT BROWN
20					
25	50		GRANITOID ROCK		20 – 33' DECOMPOSED ROCK, GRANITIC SEMI-DECOMPOSED MINERAL LENSES UP TO 1 CM LONG IN A FINE-GRAINED MATRIX, LENSES APPEAR TO BE QUARTZ, SOME BIOTITE, VERY TIGHT, MOIST
30					33' EASIER DRILLING HEAD @ 34', BEFORE AUGERS WERE PULLED = 18.5' BGS AFTER AUGERS WERE PULLED 32' OPEN HOLE, STATIC WATER LEVEL @ 10 BGS. NEXT MORNING, 10/22/08 STATIC WATER IS @ 17.5' BGS

WELL CONSTRUCTION



NOTES:

WELL CONSTRUCTION SYMBOLS

- SCH. 40, 2-INCH PVC SCREEN, 20-SLOT (0.020-INCH SLOTS)
- #8 SILICA SAND
- BENTONITE SEAL
- SAND-CEMENT SEAL

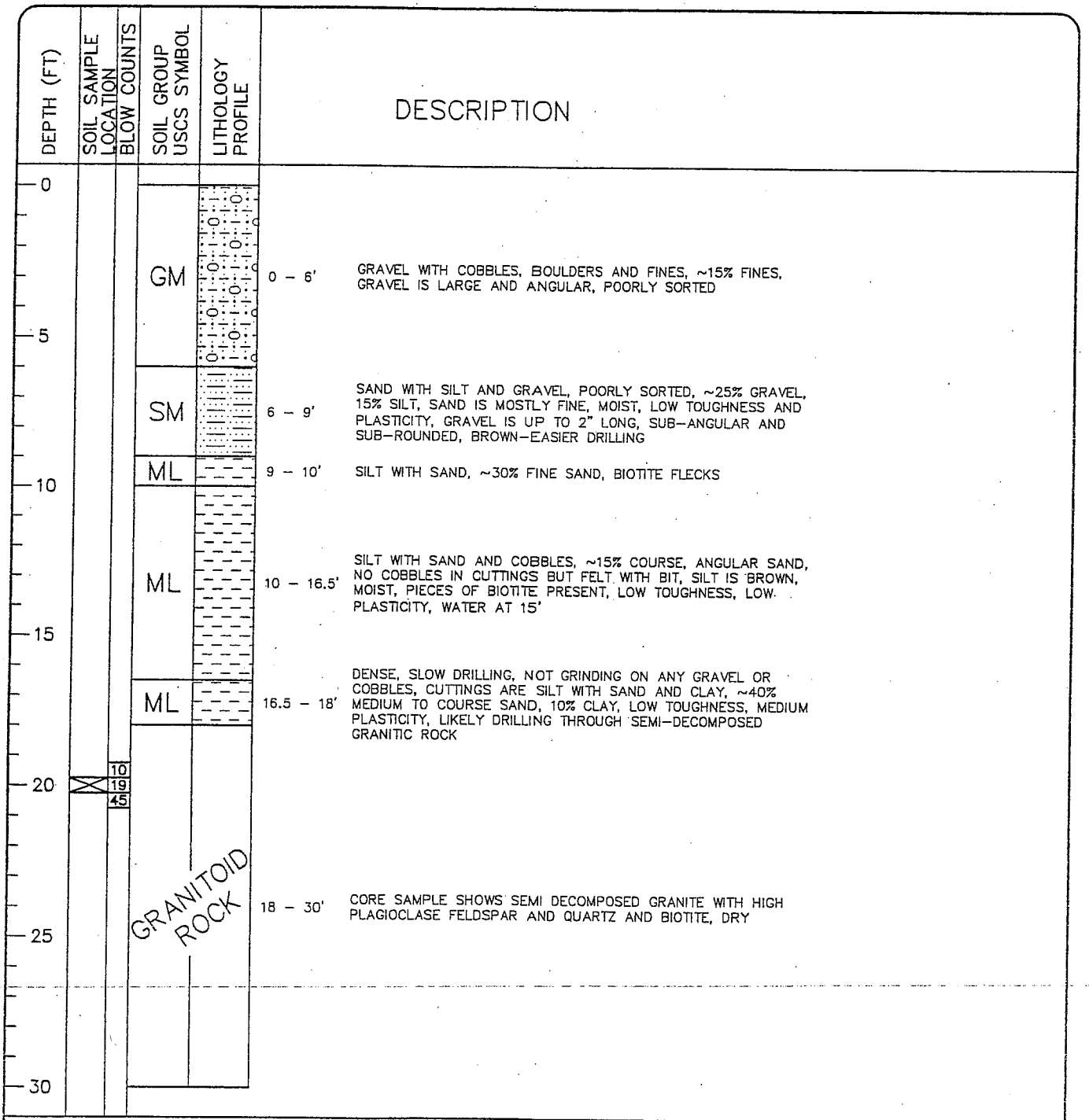
FIGURE 4

P:\008133.00-Plumas National Forest\BH-2.dwg J.M.B. 11/14/2008

LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE : (530) 244-9703
FAX : (530) 244-5021

PROJECT: PLUMAS NATIONAL FOREST WALKER MINE	SHEET 1 OF 1
	BH #: BH-3
JOB #: 008133.00	DATE: 10/22/08
LOGGED BY: C. KLINESTEKER DRILLER:	
WELL CASING ELEVATION: N/A	
EQUIPMENT AND SPECIFICATIONS: CME-55 DRILL RIG WITH 7 5/8" AUGERS	

FIELD LOCATION OF WELL



NOTES:

FIGURE 5

P:\008133.00-Plumas National Forest\BH-2.dwg J.M.B. 11/14/2008

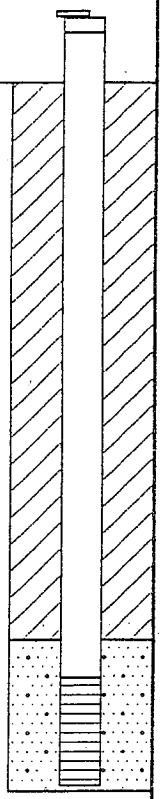
LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE : (530) 244-9703
FAX : (530) 244-5021

PROJECT: PLUMAS NATIONAL FOREST WALKER MINE	SHEET 1 OF 1
	BH #: BH-4
JOB #: 008133.00	DATE: 10/22/08
LOGGED BY: C. KLINESTEKER DRILLER:	
WELL CASING ELEVATION: N/A	
EQUIPMENT AND SPECIFICATIONS: CME-55 DRILL RIG WITH 7 5/8" AUGERS	

FIELD LOCATION OF WELL

DEPTH (FT)	SOIL SAMPLE LOCATION	BLOW COUNTS	SOIL GROUP USCS SYMBOL	LITHOLOGY PROFILE	DESCRIPTION
0			GM	0 – 8'	COBBLES AND GRAVELS WITH FINES, VERY POORLY SORTED, SUB-ANGULAR CLASTS UP TO 8" LONG, FINES ARE DRY, SILT AND SAND, ~30% BY VOLUME
5					
10			ML	8 – 13'	SILT WITH GRAVEL, GRANULAR STRUCTURE, ~40% GRAVEL, ABUNDANT ORGANIC MATTER, GRAVEL IS SUB-ANGULAR UP TO 2" LONG, SILT IS MOIST, LOW TOUGHNESS AND PLASTICITY, BROWN
15			GM	13 – 18'	GRAVEL WITH FINES AND COBBLES, ~65% MEDIUM GRAVEL, SUB-ROUNDED CLASTS
20					
25	X	50			
30					

WELL CONSTRUCTION



NOTES:

WELL CONSTRUCTION SYMBOLS

- SCH. 40, 2-INCH PVC SCREEN, 20-SLOT (0.020-INCH SLOTS)
- #8 SILICA SAND
- BENTONITE SEAL
- SAND-CEMENT SEAL

FIGURE 6

P:\008133.00-Plumas National Forest\BH-4.dwg J.M.B. 11/19/2008

LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE : (530) 244-9703
FAX : (530) 244-5021

PROJECT: PLUMAS NATIONAL FOREST WALKER MINE

SHEET: 1 OF 2

MW #: MW-1B

JOB #: 008133.00

DATE: 10/21/08

LOGGED BY: C. KLINESTEKER DRILLER:

WELL CASING ELEVATION: N/A

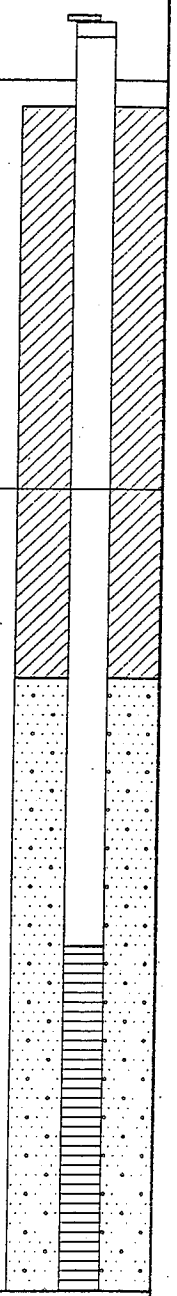
EQUIPMENT AND SPECIFICATIONS:
CME-55 DRILL RIG WITH 7 5/8" AUGERS

FIELD LOCATION OF WELL

DEPTH (FT)	SOIL SAMPLE LOCATION	BLOW COUNTS	SOIL GROUP USCS SYMBOL	LITHOLOGY PROFILE	DESCRIPTION
0			SP		0 – .5' SAND, FINE, WELL-SORTED, SOFT, DRY
			ML		.5 – 4' SILT WITH SAND, ~60% SILT, WET, YELLOWISH BROWN WITH GREY LENSES
5			SP		4 – 10' SAND, FINE, WELL-SORTED, SOFT, MOIST
10			ML		10 – 23' SILT WITH SAND, ~60% SILT, GREY, SATURATED, SOFT, LOW TOUGHNESS AND PLASTICITY
15					
20					
25			SP		23 – 35' SAND, FINE, 10% SILT, SOFT, WELL-SORTED
30					

DTW = 10' BGS

WELL CONSTRUCTION



NOTES:

WELL CONSTRUCTION SYMBOLS

- SCH. 40, 2-INCH PVC SCREEN, 20-SLOT (0.020-INCH SLOTS)
- #8 SILICA SAND
- BENTONITE SEAL
- SAND-CEMENT SEAL

FIGURE 7A

P:\008133.00-Plumas National Forest\MW-1B.dwg J.M.B. 11/14/2008

LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE : (530) 244-9703
FAX : (530) 244-5021

PROJECT: PLUMAS NATIONAL FOREST WALKER MINE	SHEET 2 OF 2
	MW #: MW-1B
JOB #: 008133.00	DATE: 10/21/08
LOGGED BY: C. KLINESTEKER DRILLER:	
WELL CASING ELEVATION: N/A	
EQUIPMENT AND SPECIFICATIONS: CME-55 DRILL RIG WITH 7 5/8" AUGERS	

FIELD LOCATION OF WELL

DEPTH (FT)	SOIL SAMPLE LOCATION	BLOW COUNTS	SOIL GROUP USCS SYMBOL	LITHOLOGY PROFILE	DESCRIPTION
30			SP		23 – 35' SAND, FINE, 10% SILT, SOFT, WELL-SORTED
35					
40					
45					
50					
55					
60					

PROBE SET @ 31' BGS

TOTAL DEPTH (35')

NOTES:

WELL CONSTRUCTION SYMBOLS

- SCH. 40, 2-INCH PVC SCREEN, 20-SLOT (0.020-INCH SLOTS)
- #8 SILICA SAND
- BENTONITE SEAL
- SAND-CEMENT SEAL

FIGURE 7B

P:\008133.00-Plumas National Forest\MW-1B.dwg J.M.B. 11/14/2008