

RCD USP

**QUARTERLY GROUND WATER DATA REVIEW
SECOND QUARTER 1996**

**HECLA MINING COMPANY
DURITA SITE**

October 8, 1996

RCD USP



October 8, 1996

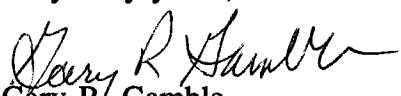
Mr. Wynne Eakins
Radiation Control Division (RCD-DO-B1)
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

RE: License Number 317-02, Durita Site - Second and Third Quarter 1996 Ground Water Monitoring Report

Dear Wynne:

Enclosed please find one copy of each of the above referenced reports. Please call with any questions.

Very truly yours,


Gary R. Gamble
Environmental Director - Metals Division

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OCT 10 1996
RADIATION CONTROL
DIVISION



HECLA MINING COMPANY
DURITA SITE

QUARTERLY GROUND WATER DATA REVIEW
SECOND QUARTER 1996

1.0 Introduction

The Ground Water Sampling Program was developed to provide specific procedures and an established schedule for the collection and evaluation of ground water quality data at the Durita Site. The program consists of the collection of ground water samples from the site ground water monitoring network on a quarterly basis. The samples are collected in accordance with the CDPHE approved Ground Water Compliance Monitoring Program (GWCMP), dated November 22, 1995. The ground water quality data base consists of monitoring data that have been collected on a quarterly or semi-annual basis since May 1991.

Quarterly data are screened for potentially erroneous observations through (1) a review of the field procedures used during sample collection, (2) analysis of trends with respect to historical data, and (3) identification and review of outlying data. The outlier test is used to statistically evaluate whether a new data value for an individual ground water monitoring parameter falls within the historical data distribution for that well at a specified level of confidence. The outlier evaluation involves the calculation of a t-statistic for each new value based on the historical data for each parameter for each well. The calculated t-statistic is compared to the tabulated t-statistic using a total confidence interval of 0.05 and n-1 degrees of freedom to evaluate the hypothesis that the new data value falls within the historical data distribution. Outlying data values are evaluated for possible transcription or analytical errors and may be revised upon re-analysis according to the procedures specified in the program.

This report is being generated past the 90 day due date as required by the GWMCP because of

difficulties getting the software package to work on Hecla's network version of D Base. The software was functional on October 3, 1996.

2.0 Ground Water Monitoring Network

The ground water monitoring network consists of seven wells (MW-8 through 14) which were installed in 1991 (Figure 1). The wells are screened in the uppermost water-bearing zone below the site and range in depth from approximately 10 to 50 feet below ground surface. Historically, ground water at the site flows in a north-northwesterly direction. Therefore, wells MW-8 and MW-14, located along the southern boundary of the site are up gradient of the site; wells MW-9 and MW-13, located along the western and eastern boundaries of the site, are cross-gradient to the site; and wells MW-10, MW-11, and MW-12, located on the northwestern and northern site boundaries, are down gradient of the site. Wells MW-11 and MW-12 are identified as point-of-compliance wells.

The wells are completed in either a thin (1.5 feet thick) fine-grained sandstone unit within the Mancos Formation (MW-11 and MW-12), or a stratigraphically lower transition zone between the Mancos and Dakota Formations consisting of interbedded sandstones and claystones (MW-8, MW-9, MW-10, MW-13, and MW-14). Well yields are estimated to be approximately one gallon per minute.

3.0 Review of Field and Laboratory Documentation

The samples for the second quarter were collected on April 4, 1996, by Miller Water Monitoring Service and hand delivered to ACZ laboratory in Steamboat Springs on April 5, 1996. The results of the inorganic and radiochemical analyses are summarized in Table 1. Parameters measured in the field by the sample collection personnel are summarized in Table 2. The analytical laboratory results for the second quarter 1996 are included as Attachment 1. Sample analyses were conducted within the appropriate sample holding times.

Generally, the ground water sampling record was completed satisfactorily, however, some information requested on the form was not completed. A letter was sent to the ground water sampling contractor specifying that all pertinent information must be entered on the form. This letter is included as Attachment 2. No readily apparent discrepancies with respect to proper sample preparation, sample handling, sample delivery, and the use of proper calibration standards and techniques were noted on the field sampling log which is included as Attachment 3.

The laboratory supplied COC and sample receipt forms was reviewed with no discrepancies identified. Copies of these forms are included as Attachments 4 and 5, respectively.

4.0 Evaluation of Water Levels

The ground water level elevation data collected during the second quarter 1996 are summarized in Table 2. Temporal graphs of all ground water elevation data collected are shown by well in Figures 2 through 8.

Water level elevations in all wells were consistent with the historical data collected. Well MW-14 returned to its historical level during the second quarter after demonstrating an elevation increase of 7.33 feet from the fourth quarter of 1995 to the first quarter 1996. This may indicate that the first quarter entry may have been a measurement or recording error.

A potentiometric surface map developed from the second quarter ground water elevation data is shown on Figure 1. As indicated, the ground water flow direction is generally to the north-northwest across the site, which is consistent with the historical ground water flow direction. The hydraulic gradient across the site indicated by the second quarter sampling is approximately 0.034 feet/foot.

5.0 Evaluation for Outlying Observations

There were four outliers identified by use of the two-sided student's t-test procedure as specified in the GWCMP. A brief discussion is provided below for each of the four outliers.

1. A total dissolved solids value of 3130 mg/l was obtained for well MW-13 (cross gradient well). The historical concentration range for this parameter at this well is 1654 mg/l to 2860 mg/l, with an average of 2082 mg/l.
2. A sulfate value of 1340 mg/l was also obtained for well MW-13. The historical concentration range for this parameter at this well is 2 mg/l to 1130 mg/l, with an average of 277 mg/l.
3. A sodium value of 1100 mg/l was also obtained for well MW-13. The historical concentration range for this parameter at this well is 755 mg/l to 991 mg/l, with an average of 839 mg/l.
4. A chloride value of 44 mg/l was obtained for well MW-14 (up gradient well). The historical concentration range for this parameter at this well is 30 mg/l to 37 mg/l, with an average of 33 mg/l.

Although the above data points were identified as outliers using the student's t-test, repeat analysis was not requested by the laboratory due to the length of time that has passed since the original laboratory analysis was conducted.

A brief discussion is provided for the four outliers identified during the first quarter.

1. The chloride value decreased from 24 mg/l in the first quarter to 22 mg/l in the second for well MW-8 (up gradient well).

2. The total dissolved solids value decreased from 5290 mg/l for the first quarter to 5080 mg/l for the second quarter for well MW-9 (cross gradient well).
3. The chloride value decreased from 40.0 mg/l for the first quarter to 34 mg/l for the second quarter at well MW-13 (cross gradient well).
4. The radium-226 activity of < 1 pCi/l was obtained at well MW-13 (cross gradient well) compared to a value of 4.3 ± 2.3 pCi/l for the first quarter.

6.0 QA/QC Summary

With the exception of those items noted in the previous sections of this report, the procedures for collection, preservation, delivery, and analysis were conducted in accordance with the GWCMP and the data collected during the second quarter 1996 is considered to be valid.

2nd QUARTER 1996

TABLE 1

Results of Laboratory Analyses of Groundwater Samples for Inorganic and Radiochemical Compounds

PARAMETERS	MONITOR WELL									
	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14			
pH	7.1	6.9	7.2	8.2	7.9	8.2	8.1			
Specific Conductance (umhos/cm)	2610	5360	4970	5630	4720	4180	4050			
Total Dissolved Solids (mg/l)	2180	5080	4130	4260	3640	3130	2680			
Bicarbonate (mg/l)	352	395	525	795	556	1130	1360			
Carbonate (mg/l)	<2	<2	<2	<2	<2	<2	<2			
Chloride (mg/l)	22	55	29	38	23	34	44			
Sulfate (mg/l)	1240	3130	3460	2360	2120	1340	780			
Arsenic, diss (mg/l)	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001			
Molybdenum, diss (mg/l)	<0.02	<0.05	<0.02	<0.05	<0.05	0.02	<0.02			
Selenium, diss (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001			
Sodium, diss (mg/l)	401	837	1110	1320	1210	1100	844			
Gross Alpha (pCi/l)	12±13	<16	30±26	17±25	<13	<12	17±20			
Gross Beta (pCi/l)	23±14	<29	30±26	<29	<22	<22	<22			
Radium 226 (pCi/l)	3.0±0.4	1.7±0.3	2.5±0.3	<1	<1	<1	<1			
Thorium 230 (pCi/l)	<1	1.1±0.7	1.4±1.1	<1	1.8±1.8	<1	1.2±1.0			
Uranium, Total (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.004			

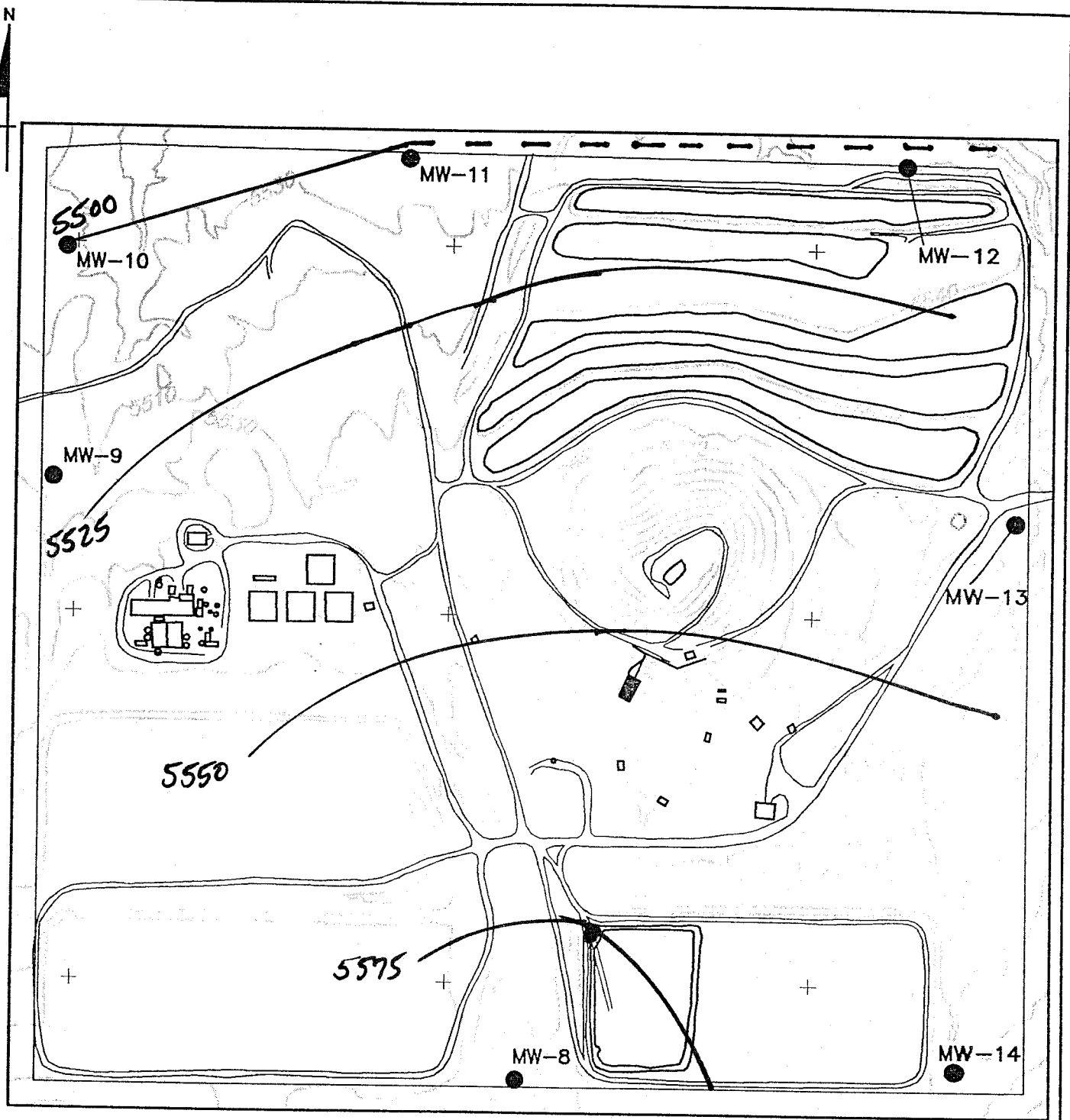
2nd QUARTER 1996

TABLE 2

Summary of Field Measurements

PARAMETERS	MONITOR WELL									
	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14			
pH	7.28	6.92	7.16	8.20	8.23	8.21	8.47			
Specific Conductance (umhos/cm)	2870	5810	5390	6150	5130	3940	4520			
Temperature (°C)	12.4	12.3	12.5	12.6	12.7	12.9	12.9			
Casing Elevation*	5599.26	5548.77	5533.95	5530.36	5532.81	5559.30	5608.76			
Depth to Water (feet)	11.28	31.35	34.08	28.30	30.09	13.58	49.56			
Water Level Elevation*	5587.98	5517.42	5499.87	5502.06	5502.72	5545.72	5559.20			

* Feet above mean sea level.



LEGEND:
● MW-8 MONITORING WELL LOCATION
— POTENTIOMETRIC SURFACE ELEVATION
- - - DASHED IN AREAS OF LIMITED DATA

SCALE
400 0 400 FEET

Figure 1 - Potentiometric Surface map 2nd Qtr 1996

DURITA SITE

Ground Water Level Elevations

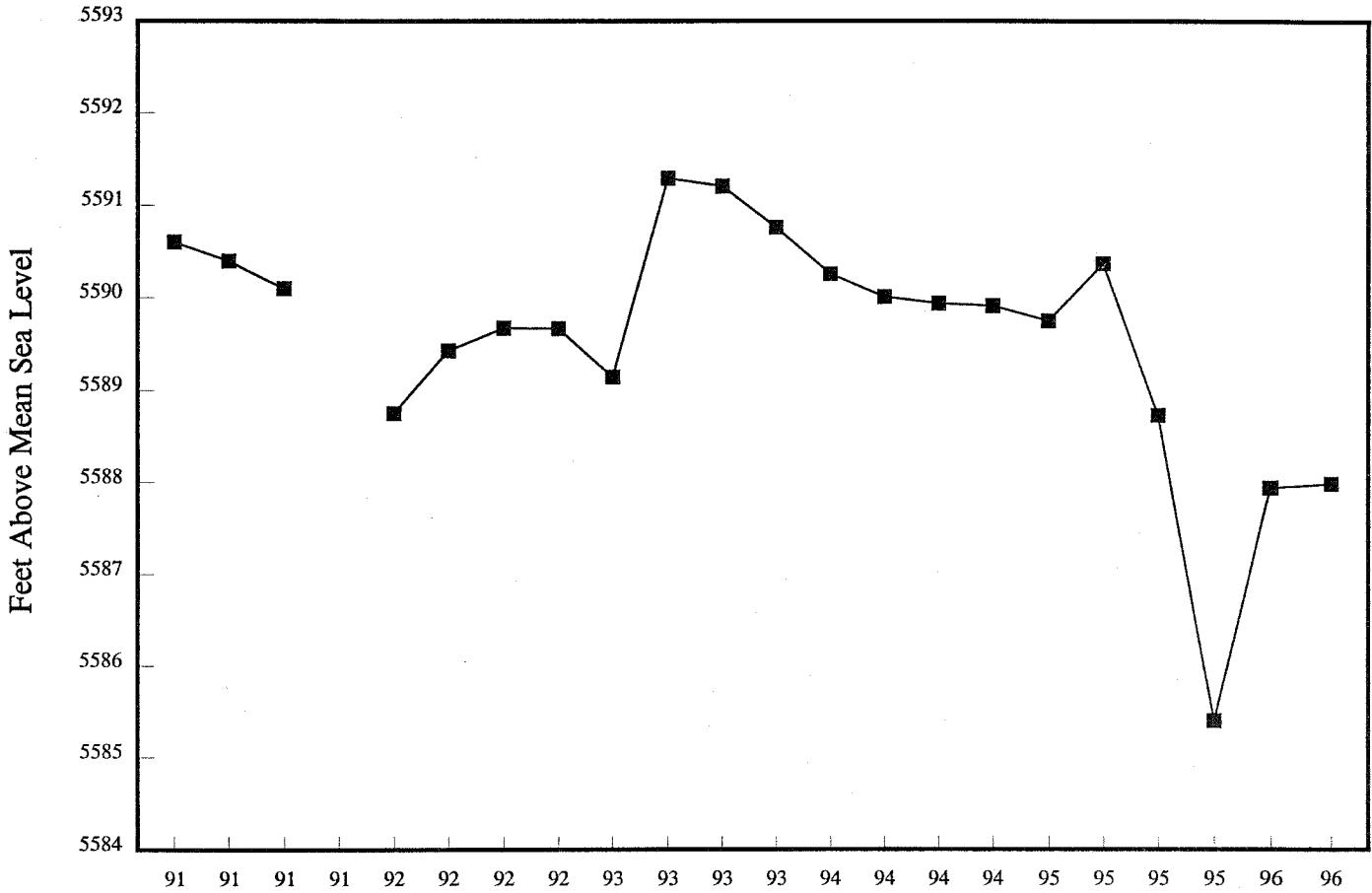


Figure 2 - Monitoring Well 8

DURITA SITE

Ground Water Level Elevations

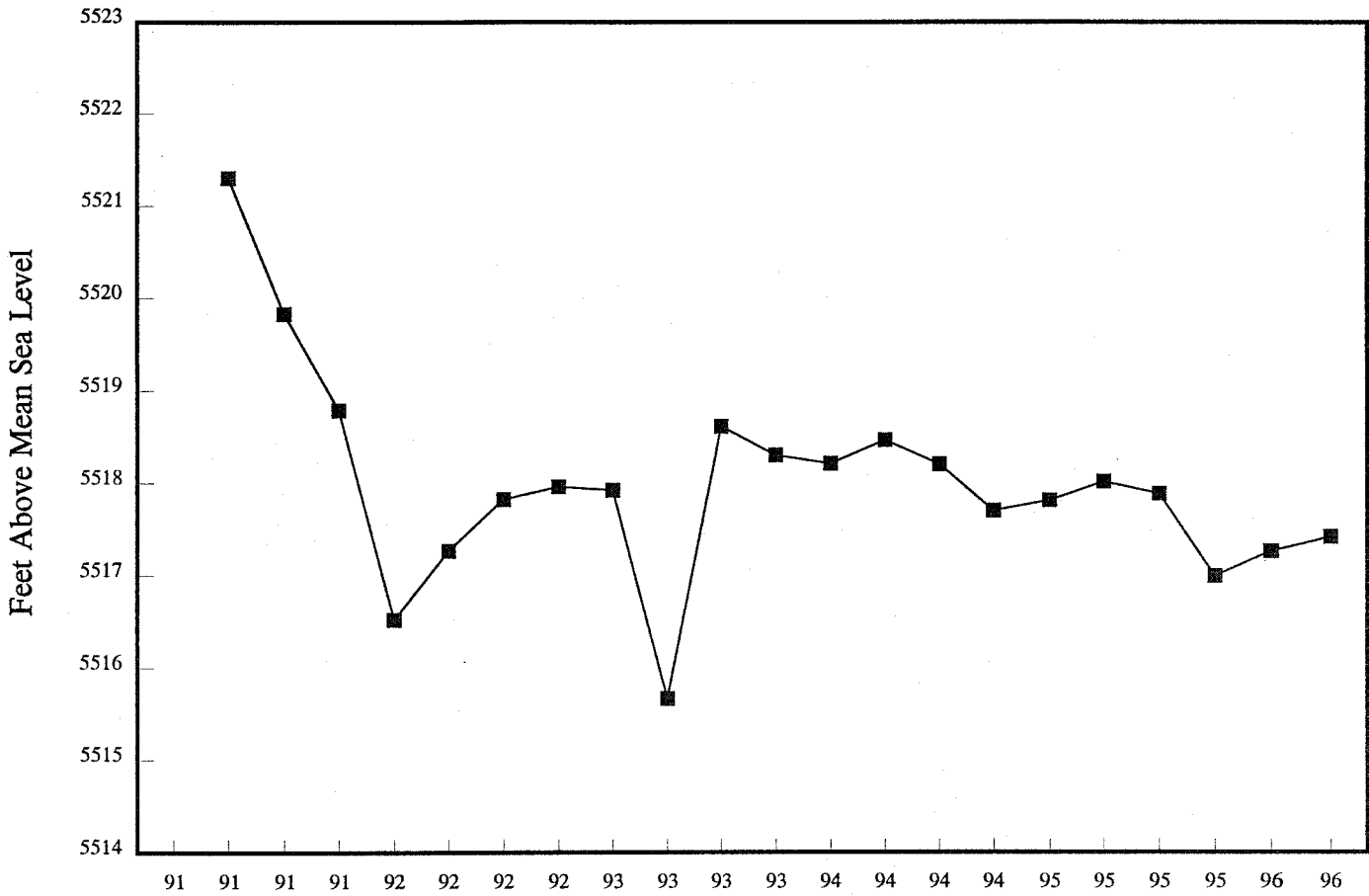


Figure 3 - Monitoring Well 9

DURITA SITE

Ground Water Level Elevations

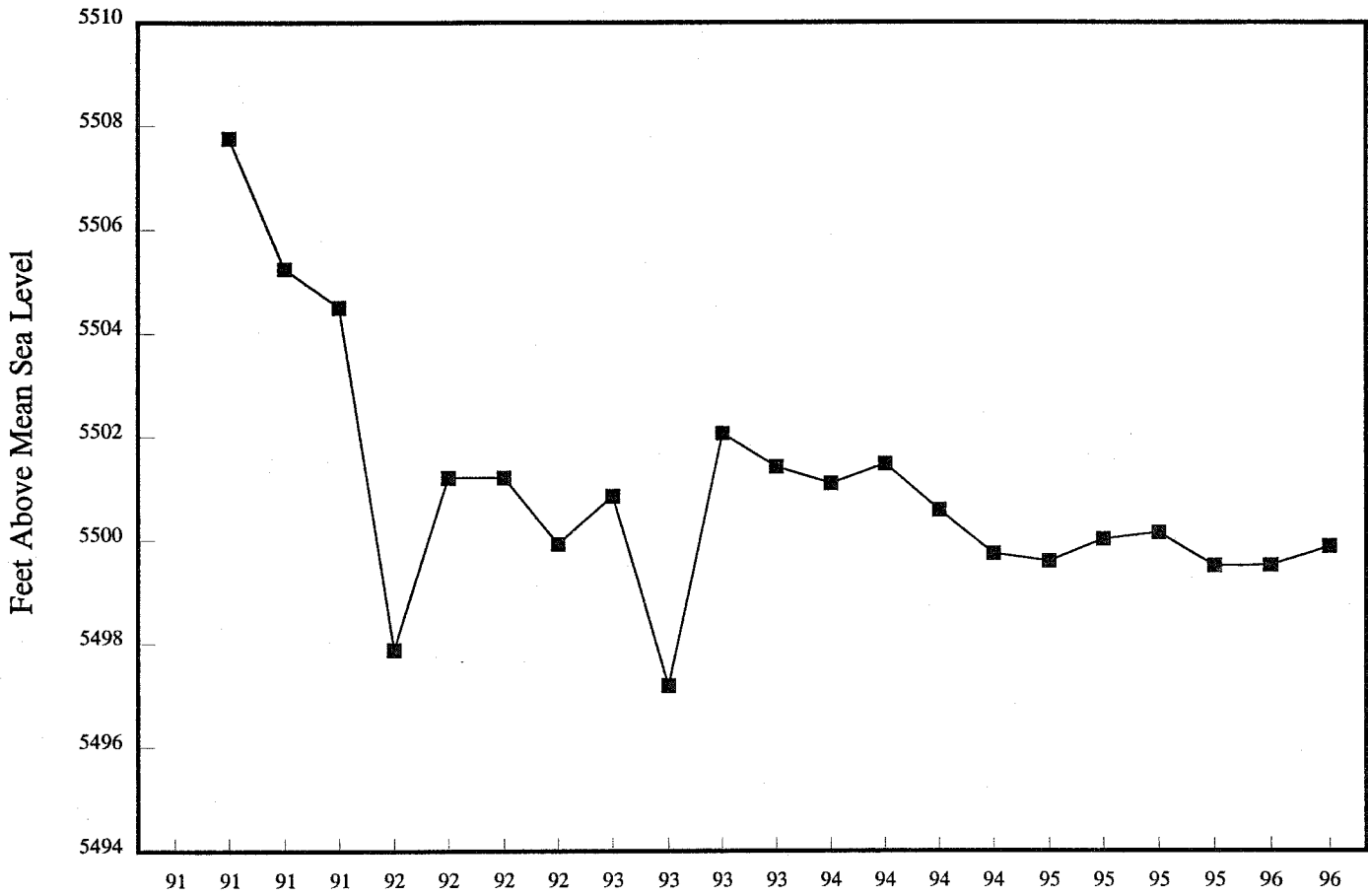


Figure 4 - Monitoring Well 10

DURITA SITE

Ground Water Level Elevations

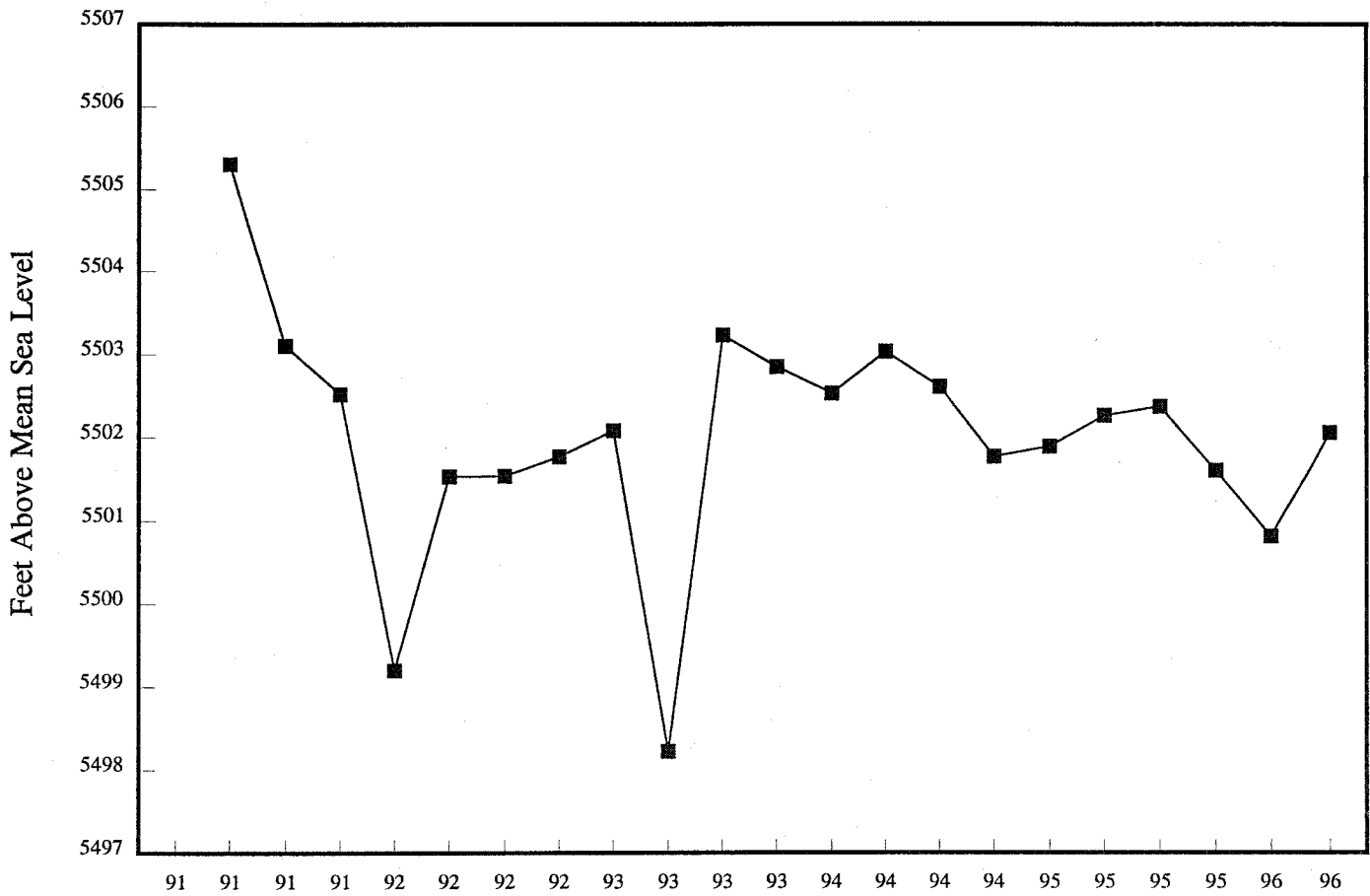


Figure 5 - Monitoring Well 11

DURITA SITE

Ground Water Level Elevations

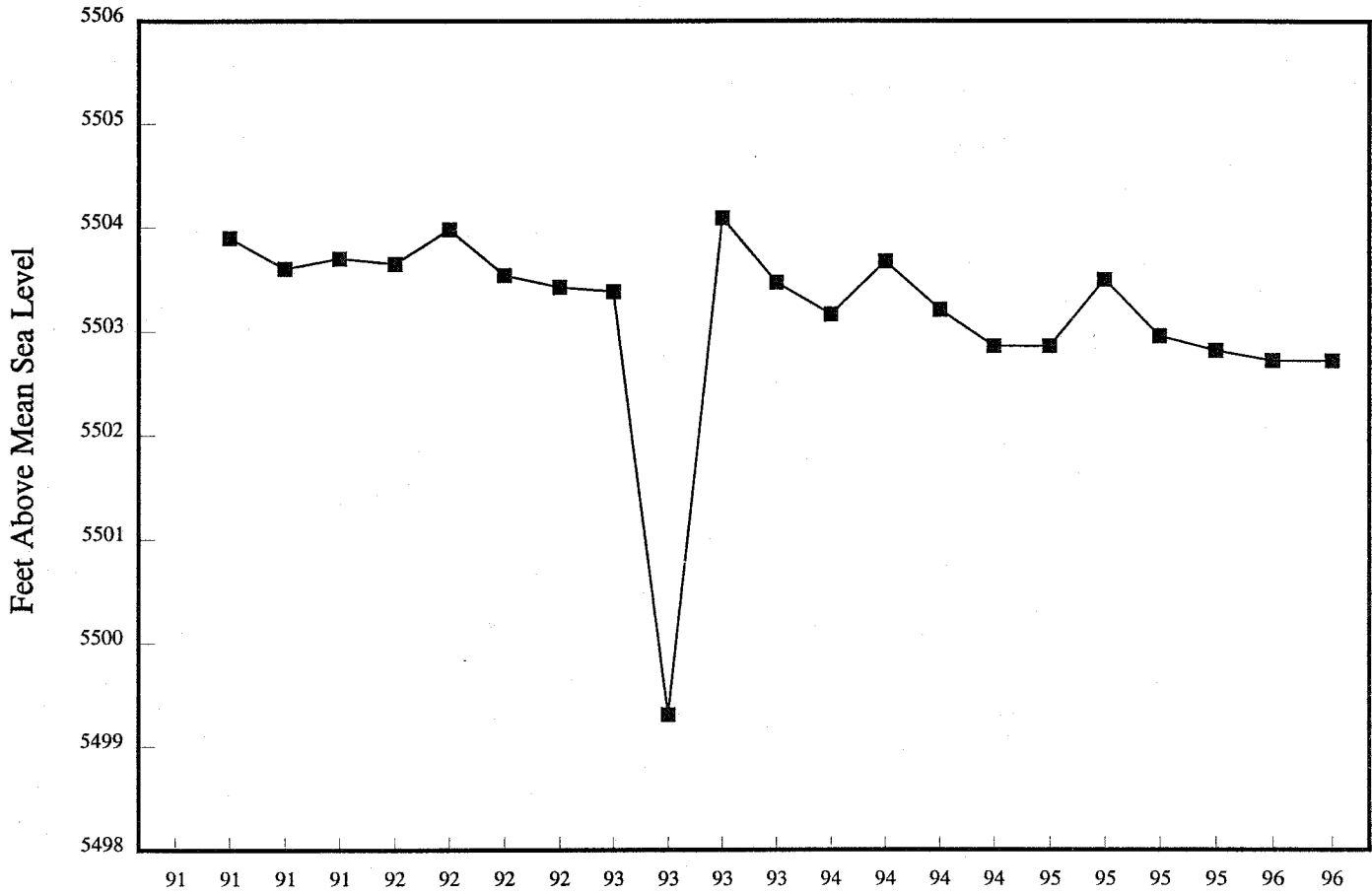


Figure 6 - Monitoring Well 12

DURITA SITE

Ground Water Level Elevations

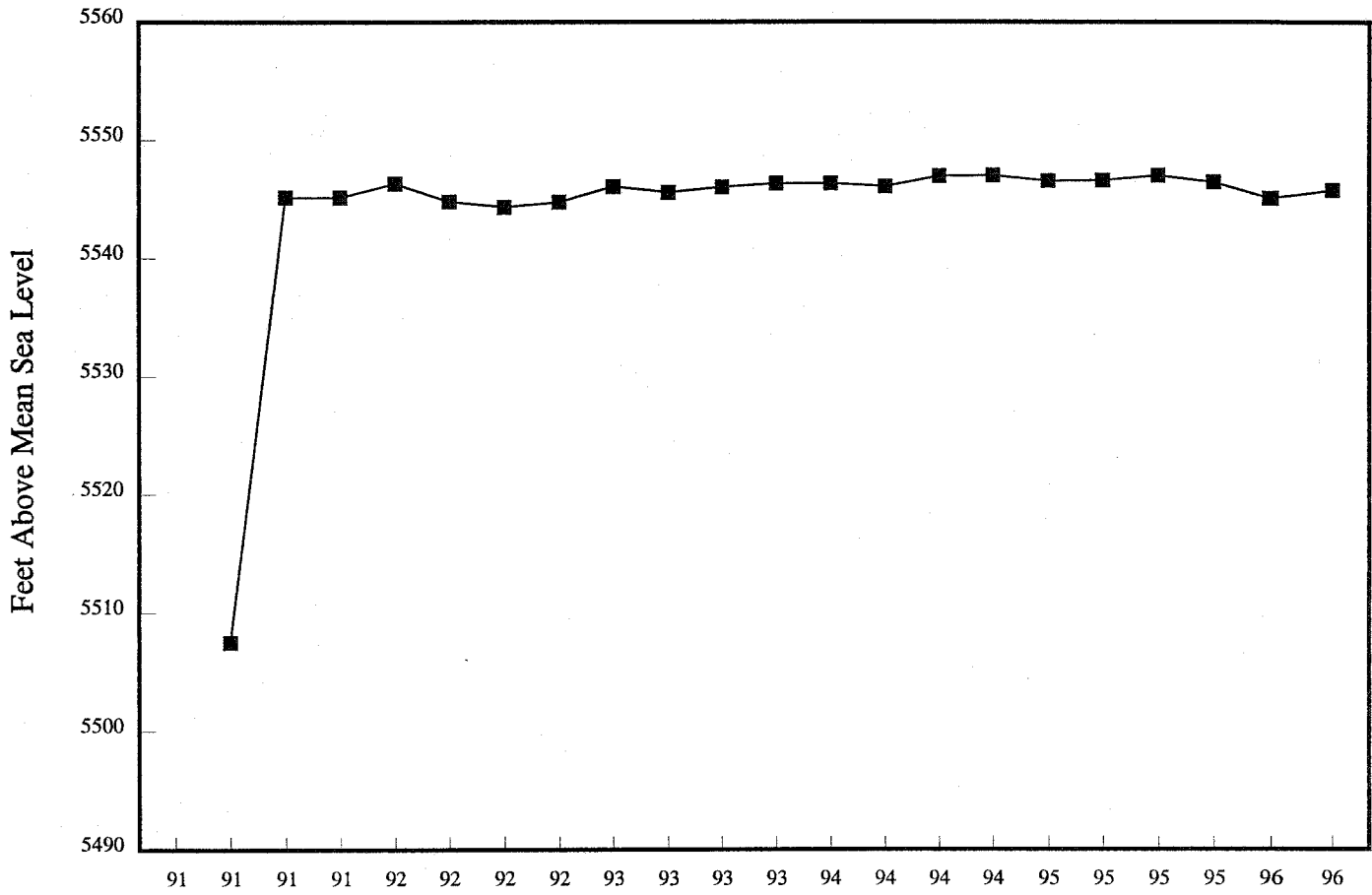


Figure 7 - Monitoring Well 13

DURITA SITE

Ground Water Level Elevations

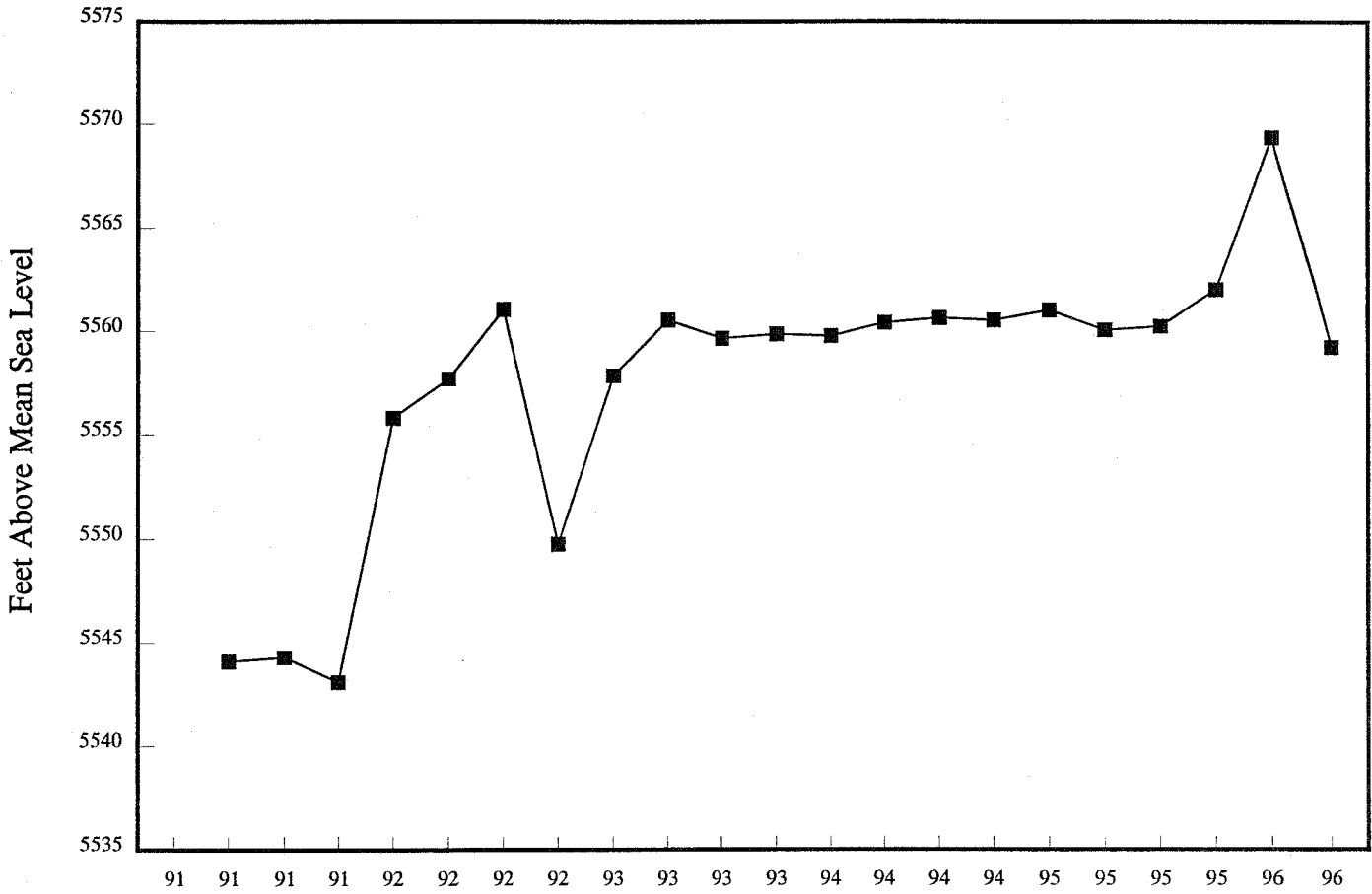


Figure 8 - Monitoring Well 14

Attachment 1
Analytical Reports

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Springs, CO 80487
 (800) 334-5493

Lab Sample ID: **L9194-04**
 Client Sample ID: **MW-8**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24569**

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414
 Gary Gamble

Date Sampled: **4/4/96 10:41**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: **Ground Water**

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA		U	mg/L	0.001	0.005	4/5/96	sh
Molybdenum, dissolved	M6010 ICP		U	mg/L	0.02	0.1	4/10/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride		U	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	401.0		mg/L	0.6	2	4/10/96	rs
Uranium, total	M6020 ICP-MS		U	mg/L	0.001	0.006	4/9/96	lej

Metals Prep

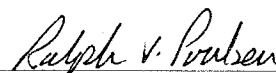
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		352		mg/L	2	10	4/5/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/5/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/5/96	ss
Total Alkalinity		352		mg/L	2	10	4/5/96	ss
Chloride	M325.2 - Colorimetric (RFA)	22		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	2610		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	7.1		units	0.1	0.1	4/5/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	2180		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	1240		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 390)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Spgs, CO 80487
 (800) 334-5493

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414

Lab Sample ID: **L9194-4**
 Client Sample ID: **MW-8**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**

Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error(+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310	12	13	B	pCi/L	8	40	9-Apr-96	lbe
Gross beta	EPA 9310	23	14	B	pCi/L	14	70	9-Apr-96	lbe
Ra226	EPA 9315	3.0	0.4	B	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506			U	pCi/L	1	5	10-Apr-96	lbe

Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected
 B = Concentration for analyte estimated between MDL and PQL
 PQL = Practical Quantitation Limit

Ralph V. Poulsen
 VP-Operations: Ralph Poulsen

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Springs, CO 80487
 (800) 334-5493

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414
 Gary Gamble

Lab Sample ID: **L9194-05**
 Client Sample ID: **MW-9**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24570**

Date Sampled: **4/4/96 10:00**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: **Ground Water**

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA		U	mg/L	0.001	0.005	4/5/96	sh
Molybdenum, dissolved	M6010 ICP		U	mg/L	0.05	0.3	4/10/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride		U	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	837		mg/L	2	5	4/10/96	rs
Uranium, total	M6020 ICP-MS		U	mg/L	0.001	0.006	4/9/96	lej

Metals Prep

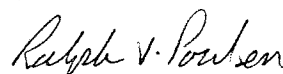
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		395		mg/L	2	10	4/5/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/5/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/5/96	ss
Total Alkalinity		395		mg/L	2	10	4/5/96	ss
Chloride	M325.2 - Colorimetric (RFA)	55		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	5360		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	6.9		units	0.1	0.1	4/5/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	5080		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	3130		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Spgs, CO 80487
 (800) 334-5493

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414

Lab Sample ID: **L9194-5**
 Client Sample ID: **MW-9**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**

Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error (+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310			U	pCi/L	16	80	9-Apr-96	lbe
Gross beta	EPA 9310			U	pCi/L	29	145	9-Apr-96	lbe
Ra226	EPA 9315	1.7	0.3	B	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506	1.1	0.7	B	pCi/L	1	5	10-Apr-96	lbe

Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected
 B = Concentration for analyte estimated between MDL and PQL
 PQL = Practical Quantitation Limit

Ralph P. Poulsen
 VP-Operations: Ralph Poulsen

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Springs, CO 80487
 (800) 334-5493

Lab Sample ID: **L9194-06**
 Client Sample ID: **MW-10**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24571**

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414
 Gary Gamble

Date Sampled: **4/4/96 09:25**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: **Ground Water**

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA		U	mg/L	0.001	0.005	4/5/96	sh
Molybdenum, dissolved	M6010 ICP		U	mg/L	0.02	0.1	4/10/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride		U	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	1110		mg/L	2	5	4/11/96	rs
Uranium, total	M6020 ICP-MS		U	mg/L	0.001	0.006	4/9/96	lcj

Metals Prep

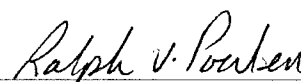
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		525		mg/L	2	10	4/6/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/6/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/6/96	ss
Total Alkalinity		525		mg/L	2	10	4/6/96	ss
Chloride	M325.2 - Colorimetric (RFA)	29		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	4970		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	7.2		units	0.1	0.1	4/6/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	4130		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	2460		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



Vice President of Operations: Ralph Poulsen

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Spgs, CO 80487
 (800) 334-5493

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414

Lab Sample ID: **L9194-6**
 Client Sample ID: **MW-10**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**

Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error (+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310	30	26	B	pCi/L	15	75	9-Apr-96	lbe
Gross beta	EPA 9310	30	26	B	pCi/L	28	140	9-Apr-96	lbe
Ra226	EPA 9315	2.5	0.3	B	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506	1.4	1.1	B	pCi/L	1	5	10-Apr-96	lbe

Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected
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 PQL = Practical Quantitation Limit

Ralph V. Poulsen
 VP-Operations: Ralph Poulsen

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Springs, CO 80487
 (800) 334-5493

Lab Sample ID: **L9194-07**
 Client Sample ID: **MW-11**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24572**

HECLA Mining Co.
 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414
 Gary Gamble

Date Sampled: **4/4/96 08:35**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: **Ground Water**

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA		U	mg/L	0.005	0.03	4/5/96	sh
Molybdenum, dissolved	M6010 ICP		U	mg/L	0.05	0.3	4/10/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride		U	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	1320		mg/L	2	5	4/10/96	rs
Uranium, total	M6020 ICP-MS		U	mg/L	0.001	0.006	4/9/96	lej

Metals Prep

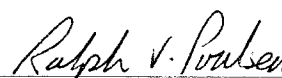
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		795		mg/L	2	10	4/6/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/6/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/6/96	ss
Total Alkalinity		795		mg/L	2	10	4/6/96	ss
Chloride	M325.2 - Colorimetric (RFA)	38		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	5630		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	8.2		units	0.1	0.1	4/6/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	4260		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	2360		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



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 6500 Mineral Dr. Box C-8000
 Coeur d'Alene, ID 83414

Lab Sample ID: **L9194-7**
 Client Sample ID: **MW-11**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**

Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error (+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310	17	25	B	pCi/L	16	80	9-Apr-96	lbe
Gross beta	EPA 9310			U	pCi/L	29	145	9-Apr-96	lbe
Ra226	EPA 9315			U	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506			U	pCi/L	1	5	10-Apr-96	lbe

Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected

B = Concentration for analyte estimated between MDL and PQL

PQL = Practical Quantitation Limit


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 Coeur d'Alene, ID 83414
 Gary Gamble

Lab Sample ID: **L9194-01**
 Client Sample ID: **MW-12**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24566**

Date Sampled: **4/4/96 08:00**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: **Ground Water**

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA		U	mg/L	0.001	0.005	4/5/96	sh
Molybdenum, dissolved	M6010 ICP		U	mg/L	0.05	0.3	4/11/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride		U	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	1210		mg/L	2	5	4/11/96	rs
Uranium, total	M6020 ICP-MS		U	mg/L	0.001	0.006	4/9/96	lej

Metals Prep

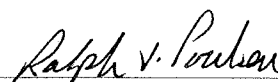
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		556		mg/L	2	10	4/5/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/5/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/5/96	ss
Total Alkalinity		556		mg/L	2	10	4/5/96	ss
Chloride	M325.2 - Colorimetric (RFA)	23		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	4720		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	7.9		units	0.1	0.1	4/5/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	3640		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	2120		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



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 Coeur d'Alene, ID 83414

Lab Sample ID: **L9194-1**
 Client Sample ID: **MW-12**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**
 Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error (+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310			U	pCi/L	13	65	9-Apr-96	lbe
Gross beta	EPA 9310			U	pCi/L	22	110	9-Apr-96	lbe
Ra226	EPA 9315			U	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506	1.8	1.8	B	pCi/L	1	5	10-Apr-96	lbe

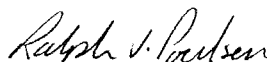
Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected

B = Concentration for analyte estimated between MDL and PQL

PQL = Practical Quantitation Limit


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 Coeur d'Alene, ID 83414
 Gary Gamble

Lab Sample ID: **L9194-03**
 Client Sample ID: **MW-13**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24568**

Date Sampled: **4/4/96 11:30**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: **Ground Water**

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA	0.004	B	mg/L	0.001	0.005	4/5/96	sh
Molybdenum, dissolved	M6010 ICP	0.02	B	mg/L	0.02	0.1	4/10/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride	0.004	B	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	1100		mg/L	2	5	4/11/96	rs
Uranium, total	M6020 ICP-MS	0.003	B	mg/L	0.001	0.006	4/9/96	lej

Metals Prep

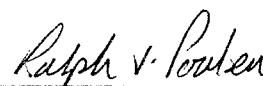
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		1130		mg/L	2	10	4/9/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/9/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/9/96	ss
Total Alkalinity		1130		mg/L	2	10	4/9/96	ss
Chloride	M325.2 - Colorimetric (RFA)	34		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	4180		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	8.2		units	0.1	0.1	4/5/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	3130		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	1340		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



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Lab Sample ID: **L9194-3**
 Client Sample ID: **MW-13**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**

Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error (+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310			U	pCi/L	12	60	9-Apr-96	lbe
Gross beta	EPA 9310			U	pCi/L	22	110	9-Apr-96	lbe
Ra226	EPA 9315			U	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506			U	pCi/L	1	5	10-Apr-96	lbe

Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected

B = Concentration for analyte estimated between MDL and PQL

PQL = Practical Quantitation Limit

Ralph V. Poulsen
 VP-Operations: Ralph Poulsen

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Lab Sample ID: **L9194-02**
 Client Sample ID: **MW-14**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RG24567**

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 Gary Gamble

Date Sampled: **4/4/96 12:10**
 Date Received: **4/5/96**
 Date Reported: **4/12/96**

Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Arsenic, dissolved	M7060 GFAA		U	mg/L	0.001	0.005	4/5/96	sh
Molybdenum, dissolved	M6010 ICP		U	mg/L	0.02	0.1	4/10/96	rs
Selenium, dissolved	SM 3500-Se C, AA-Hydride		U	mg/L	0.001	0.005	4/9/96	rd
Sodium, dissolved	M6010 ICP	844.0		mg/L	0.6	2	4/10/96	rs
Uranium, total	M6020 ICP-MS	0.004	B	mg/L	0.001	0.006	4/9/96	lej

Metals Prep

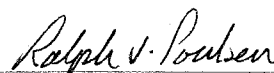
Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Digestion	M3015 ICP-MS						4/8/96	jaw

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	M2320B							
Bicarbonate as CaCO3		1360		mg/L	2	10	4/9/96	ss
Carbonate as CaCO3			U	mg/L	2	10	4/9/96	ss
Hydroxide as CaCO3			U	mg/L	2	10	4/9/96	ss
Total Alkalinity		1360		mg/L	2	10	4/9/96	ss
Chloride	M325.2 - Colorimetric (RFA)	44		mg/L	1	5	4/9/96	hm
Conductivity @25C	M9050 - Meter	4050		umhos/cm	1	10	4/6/96	jk
pH (lab)	M9040 - Electrometric	8.1		units	0.1	0.1	4/5/96	ss
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	2680		mg/L	10	20	4/5/96	sak
Sulfate	M375.3 - Gravimetric	780		mg/L	10	20	4/9/96	jk

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte was analyzed for but not detected at the indicated MDL
 B = Analyte concentration detected at a value between MDL and PQL
 PQL = Practical Quantitation Limit



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Lab Sample ID: **L9194-2**
 Client Sample ID: **MW-14**
 Client Project ID: **Hecla-Durita CO**
 ACZ Report ID: **RC1813**
 Date Sampled: **4/4/96**
 Date Received: **4/5/96**
 Date Reported: **4/22/96**

Att: Gary Gamble

Matrix: *water*

Radiochemistry

Parameter	EPA Method	Result	Error (+/-)	Qual	Units	MDL	PQL	Date	Analyst
Gross alpha	EPA 9310	17	20	B	pCi/L	12	60	9-Apr-96	lbe
Gross beta	EPA 9310			U	pCi/L	22	110	9-Apr-96	lbe
Ra226	EPA 9315			U	pCi/L	1	5	9-Apr-96	ch
Th230	ESM 4506	1.2	1.0	B	pCi/L	1	5	10-Apr-96	lbe

Remarks: Sample was diluted for gross alpha/beta analysis due to a high amount of total dissolved solids.

Inorganic Qualifiers (based on EPA CLP 3/90)

U = Analyte not detected
 B = Concentration for analyte estimated between MDL and PQL
 PQL = Practical Quantitation Limit

Ralph V. Poulsen
 VP-Operations: Ralph Poulsen

Attachment 2

Letter to Miller Water Monitoring



October 8, 1996

Mr. Al Miller
Miller Water Monitoring Service
P.O. Box 249
Steamboat Springs, Colorado 80477

Dear Al:

The ground water sampling record used for the Durita sampling program needs to be filled out as completely as possible. I am including some information concerning the construction of the wells and the current elevations of the caps. Also, there is a section for including the types and numbers of sample containers, preservatives used, and whether or not the sample was filtered that should be completed during each sampling event. If additional information is needed to complete the forms please let me know.

Very truly yours,

Gary R. Gamble
Environmental Director - Metals Division

**TABLE 2
ANALYTICAL PARAMETERS AND LABORATORY METHODS**

PARAMETER	FILTERING REQUIRED		PRESERVATIVE	SAMPLE CONTAINER	METHOD OF ANALYSIS	DETECTION LIMIT	HOLDING TIME
	YES	NO					
pH		X	None	1 - 250 ml plastic	EPA Method 150.1	0.1 units	Immediately
Specific Conductance					EPA Method 120.1	1.0 uhmos/cm	Immediately
Total Dissolved Solids					EPA Method 160.1, Gravimetric	2.0 mg/L	7 days
Bicarbonate					EPA Method 310.1, Titrimetric	1.0 mg/L	14 days
Carbonate	X		None	1 - 250 ml plastic	EPA Method 310.1, Titrimetric	1.0 mg/L	14 days
Chloride					EPA Method 325.2, Auto Ferrocyanide	1.0 mg/L	28 days
Sulfate					EPA Method 375.3, Gravimetric	4.0 mg/L	28 days
Arsenic					EPA Method 206.2, GFAA	0.001 mg/L	6 months
Molybdenum	X		HNO ₃ Acid	1 - 250 ml plastic	EPA Method 200.7, ICP	0.05 mg/L	6 months
Selenium					EPA Method 270.2, GFAA	0.005 mg/L	6 months
Sodium					EPA Method 200.7, ICP	1.0 mg/L	6 months
Gross Alpha/Beta					EPA Method 9310	0.2 pCi/L	6 months
Radium 226		X	HNO ₃ Acid	2 - gallon plastic	EPA Method 9315	0.2 pCi/L	6 months
Thorium 230					ESM 4506, USDOE App. D, Part 4	0.2 pCi/L	6 months
Uranium Natural					EPA Method 200.8, ICP-MS	0.001 pCi/L	6 months

2nd QUARTER 1996

TABLE 2

Summary of Field Measurements

PARAMETERS	MONITOR WELL													
	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14							
pH	7.28	6.92	7.16	8.20	8.23	8.21	8.47							
Specific Conductance (umhos/cm)	2870	5810	5390	6150	5130	3940	4520							
Temperature (°C)	12.4	12.3	12.5	12.6	12.7	12.9	12.9							
Casing Elevation*	5599.26	5548.77	5533.95	5530.36	5532.81	5559.30	5608.76							
Depth to Water (feet)	11.28	31.35	34.08	28.30	30.09	13.58	49.56							
Water Level Elevation*	5587.98	5517.42	5499.87	5502.06	5502.72	5545.72	5559.20							

* Feet above mean sea level.

MONITOR WELL INSTALLATION

This section describes the drilling, construction and development of seven wells (MW-3 through MW-14) at the Durita facility. These wells were installed due to the uncertainty regarding the integrity of the historical monitoring wells. The historical wells were drilled 1976 and have been sampled on a quarterly basis. The construction of these wells (MW-2 through MW-7) did not entail the installation of a sand pack or a surface seal, thereby raising questions regarding the integrity of the wells. The well locations for the historical wells and the monitor wells installed under this program are shown on Figure D2 along with the location of the historical wells. Several of the wells installed under this program were located near the historical wells in order to evaluate the integrity of the historical wells.

DRILLING PROCEDURES

The general drilling and sampling procedures are outlined in this section, and the variations from these general procedures are described in subsequent sections. Monitor wells MW-8 through MW-14 were drilled from April 23 to April 28, 1991. The boring logs for these wells are presented in _____. The wells were drilled by Ground Exploration, Inc. using a combination of hollow stem auger and air rotary techniques. A track-mounted CME drilling rig was utilized which was capable of drilling by either method. The 8-inch OD diameter hollow stem auger was utilized to drill through both unconsolidated soils and weathered bedrock, and an 8-inch diameter air rotary bit was utilized to drill the remainder of the well. Prior to switching between auger and air rotary methods, 12-inch OD augers were drilled through the unconsolidated soils in order to prevent sloughing when the 8-inch OD augers were removed and borehole was drilled with air rotary.

The total depth of the well was based on the requirement of screening the well in the first water-bearing zone. The wells were drilled approximately 15 feet below the top of the first water bearing-zone in order to allow the construction of a sand pack and a 10 feet well screen. The maximum depth drilled was 85 feet below ground surface.

A field engineer was present during all drilling activities in order to log the geologic conditions encountered. While drilling with the hollow stem auger, soil samples were collected on five-foot centers. Soil samples were also collected at depths determined by the field engineer in order to identify lithologic contacts. The samples were collected with a split-spoon sampler which was driven with a 140-pound hammer falling from a distance of 30 inches, in accordance with the standard penetration test. The number of blows required to drive the sampler a distance of 1.5 feet was recorded on the log. The soil sample was removed from the split-spoon and the core recovery was recorded. The field engineer logged the core in accordance with the Unified Soils Classification System (USCS). The cuttings from the auger were also logged in order to identify lithologic contacts. Split-spoon samples were not collected when drilling with the air rotary, but the cuttings were logged. The cuttings and the drilling rate were utilized in order to determine the geologic conditions and locations or lithologic contacts encountered while drilling with air rotary.

GEOLOGIC CONDITIONS ENCOUNTERED

The geologic conditions encountered in the well drilling are summarized in table form on the following page. The boring logs are included in this appendix. An average of 15 feet of alluvial/colluvial soils were encountered during drilling, and the thickness of the soils varied from 12 to 20 feet. The composition of these soils varied from sandy clays to clayey gravel. Several of the wells encountered coarse grain sizes up to cobbles in the soils.

The soils were underlain by the Mancos Formation, which predominantly consisted of shales and claystones. A sandstone layer was encountered in the Mancos Formation in all of the wells except for well MW-8 which is located along the south side of the property. This sandstone layer consisted of fine-grained sand particles, and the thickness of this layer varied from 1.5 feet to less than 1 foot. A zone of interbedded

sandstones and claystones was encountered during drilling at depths ranging from 35 feet in MW-8 to greater than 85 feet in MW-11. The sandstone layers within this zone were fine grained and averaged several feet thick. The interbedded sandstone zone was not encountered while drilling MW-11 to the total depth of 85 feet. The elevations of the interbedded sandstone zone are consistent with the overall geology of the basin. The elevations of the top of this zone indicate that the synclinal axis of the basin trends northwest to southeast across the north one-third of the site.

The first water-bearing zone was generally encountered in the interbedded sandstone zone. The Mancos sandstone zone was saturated in MW-11 and MW-12; however, this sandstone was not saturated in the other wells. MW-11 and MW-12 were drilled deeper than the Mancos sandstone in order to determine the depth of the interbedded sandstone zone across the facility. MW-12 encountered the interbedded sandstone zone, but the interbedded sandstone zone was not encountered in MW-11 to a depth of 85 feet.

MONITOR WELL CONSTRUCTION

The seven monitor wells were installed from April 24 through April 29, 1991 and were designed to monitor the first water-bearing zone. The well construction logs are included in this appendix for MW-8 through MW-14, and the well construction details are also summarized in this appendix. The monitor wells were constructed to monitor and sample the first water-bearing zone which consisted of either the Mancos sandstone or the interbedded sandstone zone.

The cuttings were blown out of the boreholes before the wells were installed with the air rotary bit. In order to remove the cuttings from the wells, approximately 20 to 60 gallons of water were added to the boreholes for each of the wells, except for MW-14. The water was required due to the low flow rates associated with the water-bearing zones. Water was not added to MW-14 because the flow from the first water-bearing zone did not saturate the cuttings. The added water was removed during the development of the wells.

The wells were constructed of 4-inch diameter PVC with a 10-foot screened interval of 0.020 slotted well screen. A filter sock was placed over the screened section to prevent fine-grained material from clogging the well screen. A protective metal casing was placed on top of the well and equipped with a locking cap.

The tops of the well screens were placed to correspond with the top of the first water-bearing zone. MW-11 and MW-12 were screened at the Mancos sandstone, and the remaining wells were screened in the interbedded sandstone zone. The boreholes for MW-11 and MW-12 were backfilled with cuttings and sand from their total depth to approximately two feet below the well screen.

A sand pack of 10-20 silica sand was placed between the well and the borehole from a few feet below the bottom of the well to the bentonite seal. The bentonite seal was located several feet above the top of the well screen, and the thickness of the bentonite seal in each well was greater than five feet, as shown on the well construction diagrams. The space between the well and the borehole was filled with cuttings and bentonite pellets from the bentonite seal to approximately five feet of the ground surface. A surface plug of a concrete grout was then placed in the ground surface.

WELL DEVELOPMENT

The wells were developed to purge the fines from the sand pack and the first water-bearing zone in the immediate vicinity of the well. The removal of cuttings with air rotary bit prior to installing the well removed most of the fines before the sand pack was installed. As a result the wells were pumped with a submersible pump until the water became clear, with the exception of MW-14. MW-14 was not developed because the recovery of the well was estimated not to be high enough to allow recovery in time to collect a sample based on the small amount of water encountered during drilling. The volume of water added to remove the cuttings was then pumped from the well. The well yields were estimated during the well development based on the recovery rates. The yields from MW-8 through MW-10 were approximately one gallon per minute (gpm), and the yields from MW-11 through MW-13 were well below one gpm.

GEOLOGIC CONDITIONS ENCOUNTERED FOR MONITORING WELLS.

Well	Depth to (ft)		Depth to Interbedded		Elevation of Interbedded		Depth of		Thickness of Mancos Sandstone (ft)
	Mancos Formation	Sandstone/Claystone	Zone (ft)	Sandstone/Claystone	Zone (ft MSL)	Sandstone/Claystone	Mancos Sandstone (ft)	Sandstone (ft)	
MW-8	15		35		5573		--		--
MW-9	15		43		5506		19		1.3
MW-10	12		56		5470		31 ²		<1
MW-11	15.3		>85		<5441		51 ²		<1
MW-12	14		50		5508		27.5		1.5
MW-13	14		63		5495		39		1.5
MW-14	20		75		5537		44		1

¹ Mancos Formation consisting primary of claystones and shales

² Sandy claystones encountered in wells MW-10 and MW-11 with harder drilling than claystones

WELL CONSTRUCTION SUMMARY FOR MONITOR WELLS AT DURITA SITE.

Well	Elevation of Ground (ft MSL)	Stickup of Casing (ft)	Depth of Well (ft)	Depth of Borehole (ft)	Screened Internal (ft)	Geological Zone Screened ¹
MW-8	5608	2.5 2.37	50	51	40-50	Km/Kd Transition ²
MW-9	5549	3.0 2.77	53	57	43-53	Km/Kd Transition
MW-10	5534	3.0 2.73	69	75	59-69	Km/Kd Transition
MW-11	5526	3.0 2.95	60.5	85	50.5-60.5	Km Sandstone
MW-12	5530	3.0 2.86	37	85	27-37	Km Sandstone
MW-13	5558	3.0 3.06	73	77	63-73	Km/Kd Transition
MW-14	5612	3.7 2.71	80	85	70-80	Km/Kd Transition

¹ Km - Mancos Formation consisting primarily of claystones and shales

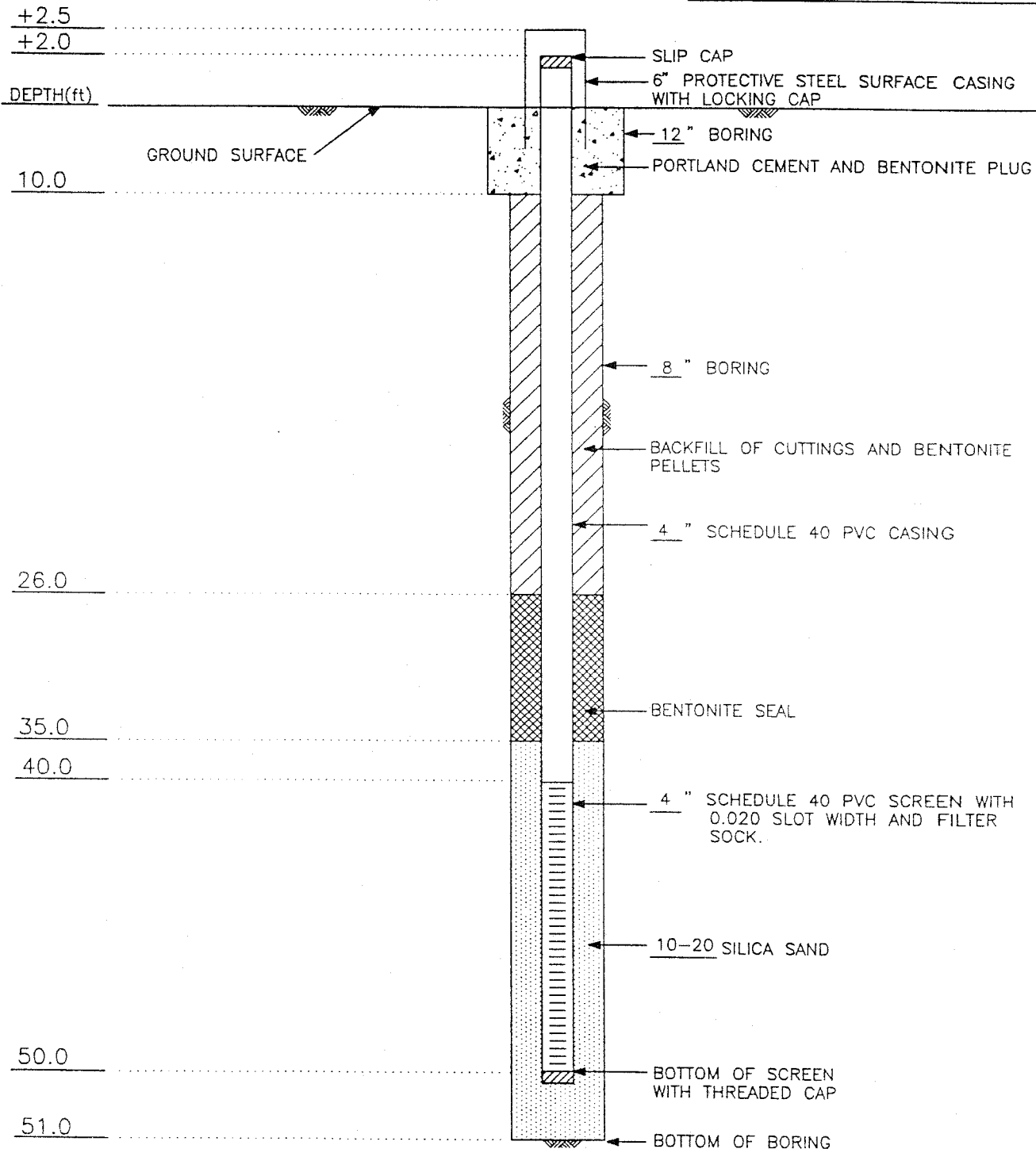
Kd - Dakota Formation consisting primarily of sandstones

² Km/Kd Transitional Zone consists of interbedded sandstones and sandy claystones

WELL MW-8

WELL COMPLETION DETAILS

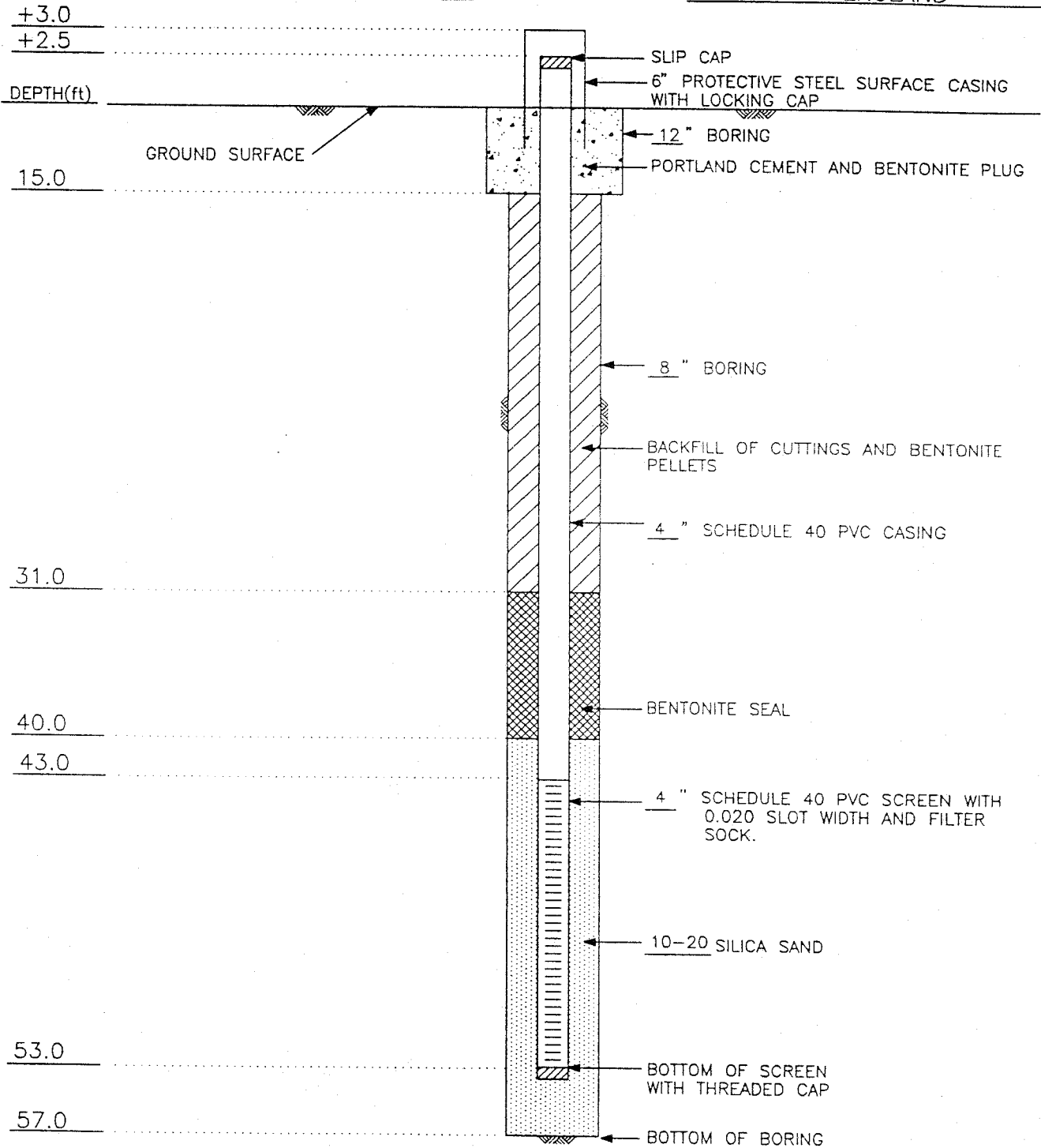
PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
DATE COMPLETED 04/26/91 DRILLING COMPANY GROUND EXPLORATION
LOCATION DURITA SITE, SOUTH SIDE FIELD ENGINEER JOHN ENGLAND



NOT TO SCALE

WELL MW-9 WELL COMPLETION DETAILS

PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
DATE COMPLETED 04/25/91 DRILLING COMPANY GROUND EXPLORATION
LOCATION DURITA SITE, WEST SIDE FIELD ENGINEER JOHN ENGLAND

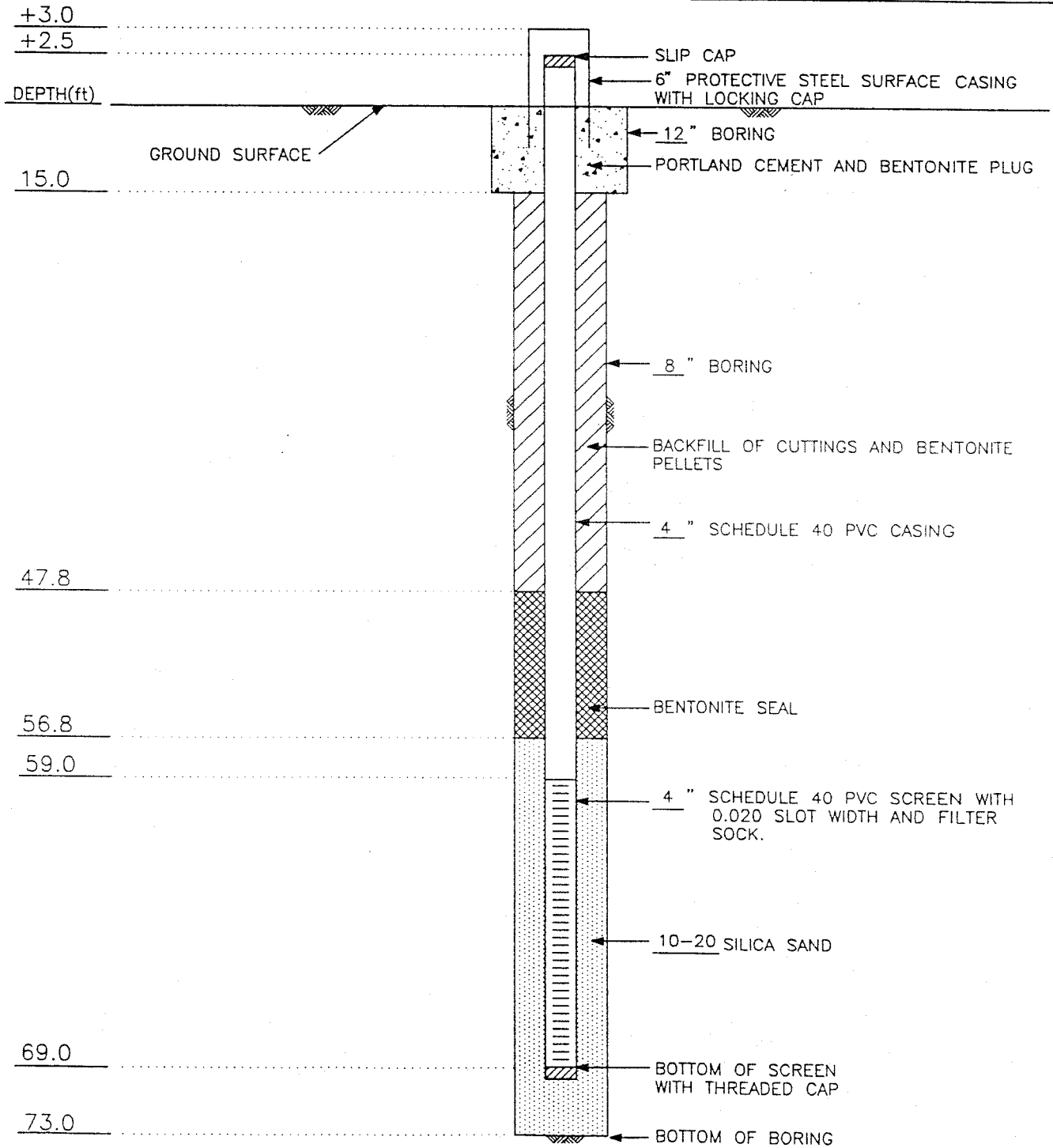


NOT TO SCALE

WELL MW-10

WELL COMPLETION DETAILS

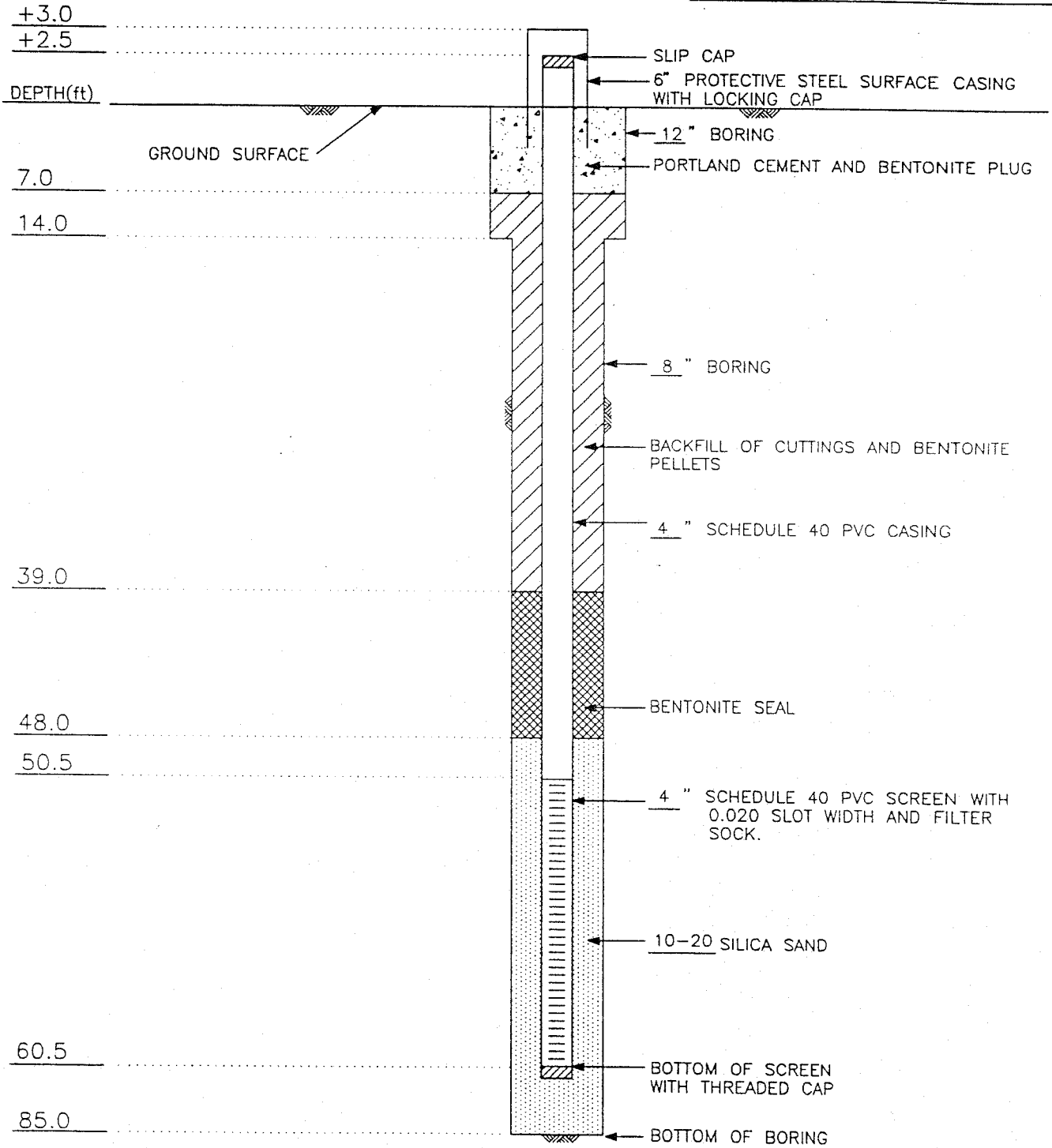
PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
 DATE COMPLETED 04/23/91 DRILLING COMPANY GROUND EXPLORATION
 LOCATION DURITA SITE, EAST SIDE FIELD ENGINEER JOHN ENGLAND



NOT TO SCALE

WELL MW-11 WELL COMPLETION DETAILS

PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
DATE COMPLETED 04/24/91 DRILLING COMPANY GROUND EXPLORATION
LOCATION DURITA SITE, NORTH SIDE FIELD ENGINEER JOHN ENGLAND

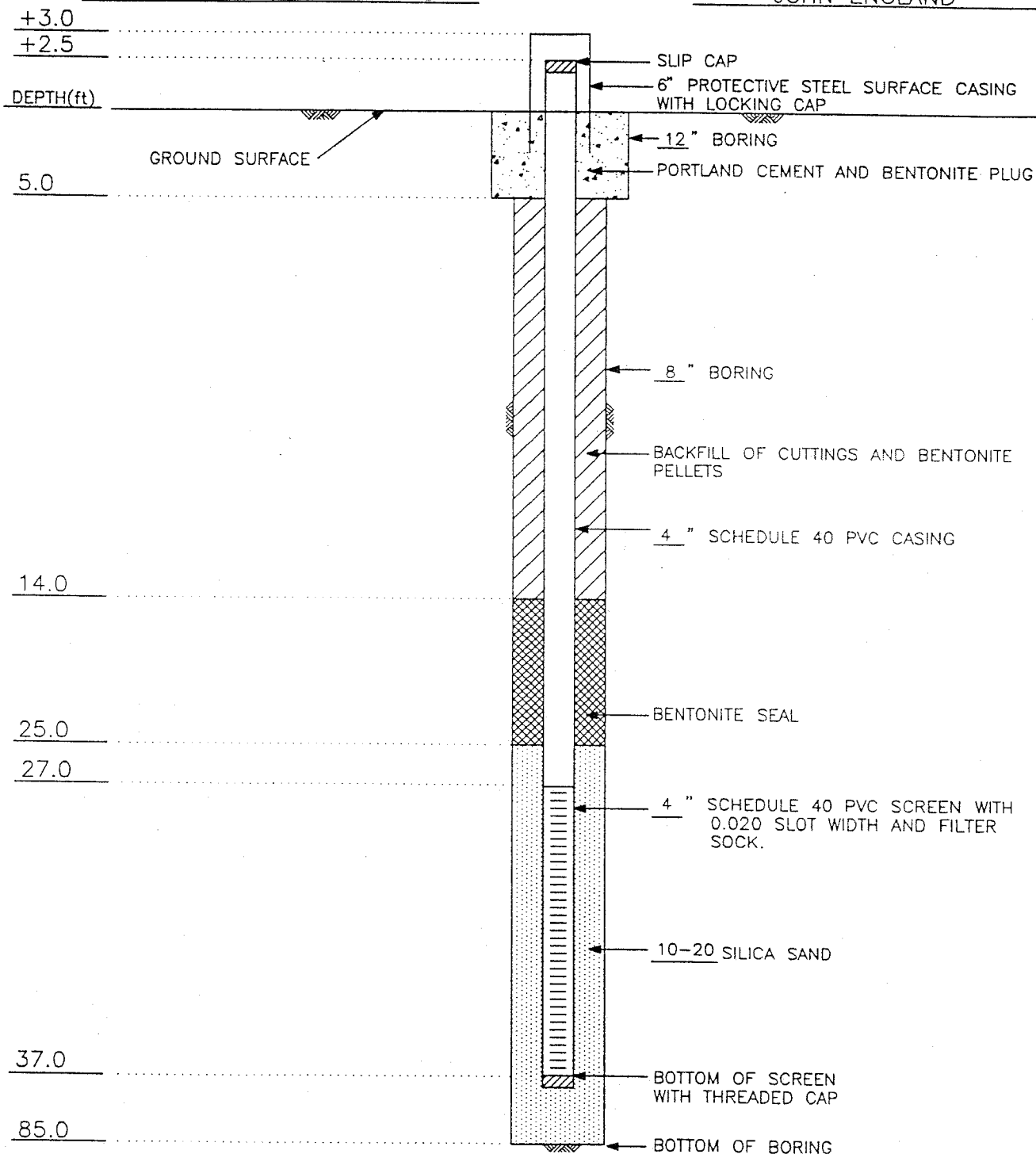


NOT TO SCALE

WELL MW-12

WELL COMPLETION DETAILS

PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
DATE COMPLETED 04/28/91 DRILLING COMPANY GROUND EXPLORATION
LOCATION DURITA SITE, NORTH SIDE FIELD ENGINEER JOHN ENGLAND

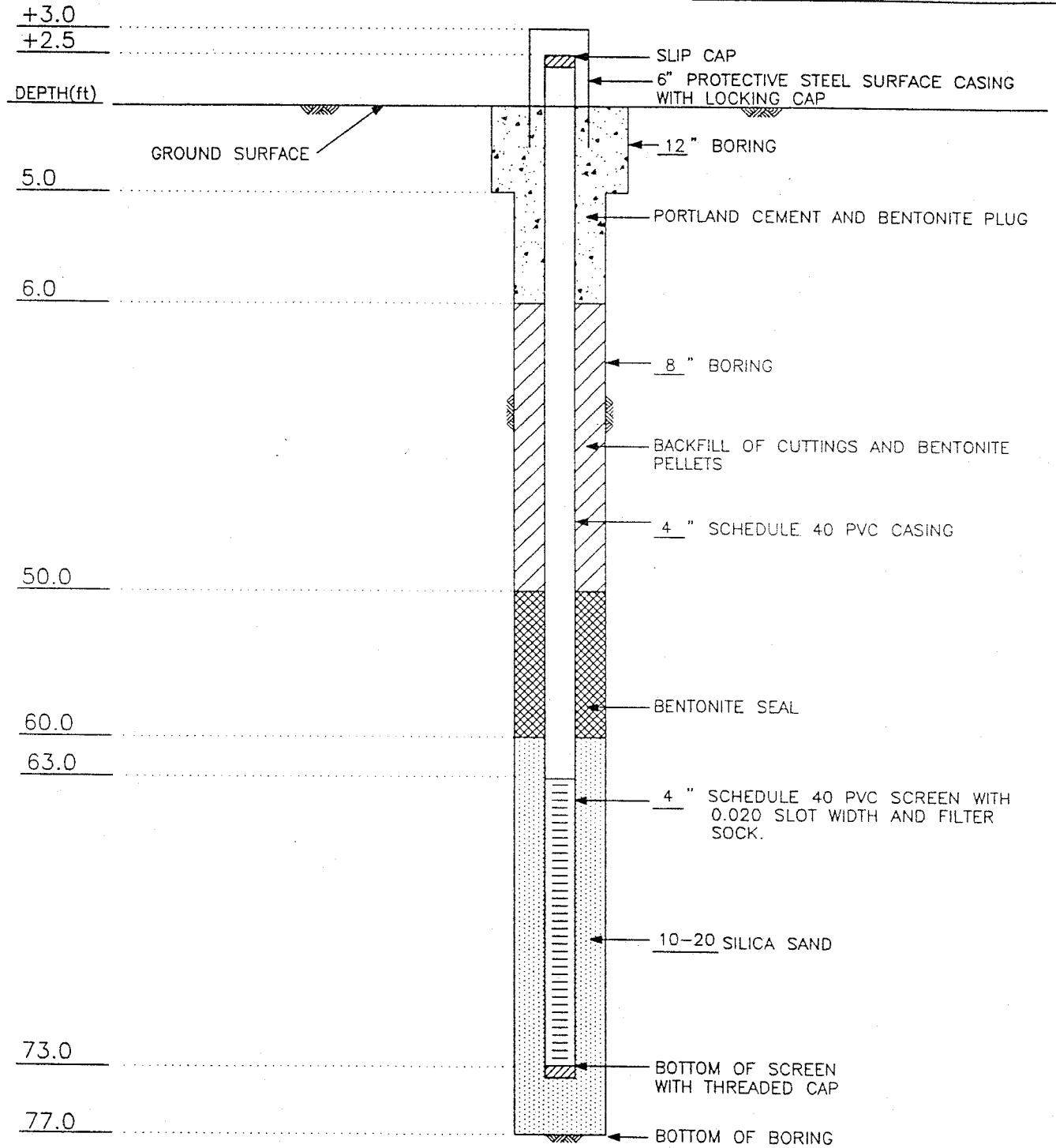


NOT TO SCALE

WELL MW-13

WELL COMPLETION DETAILS

PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
 DATE COMPLETED 04/28/91 DRILLING COMPANY GROUND EXPLORATION
 LOCATION DURITA SITE, EAST SIDE FIELD ENGINEER JOHN ENGLAND

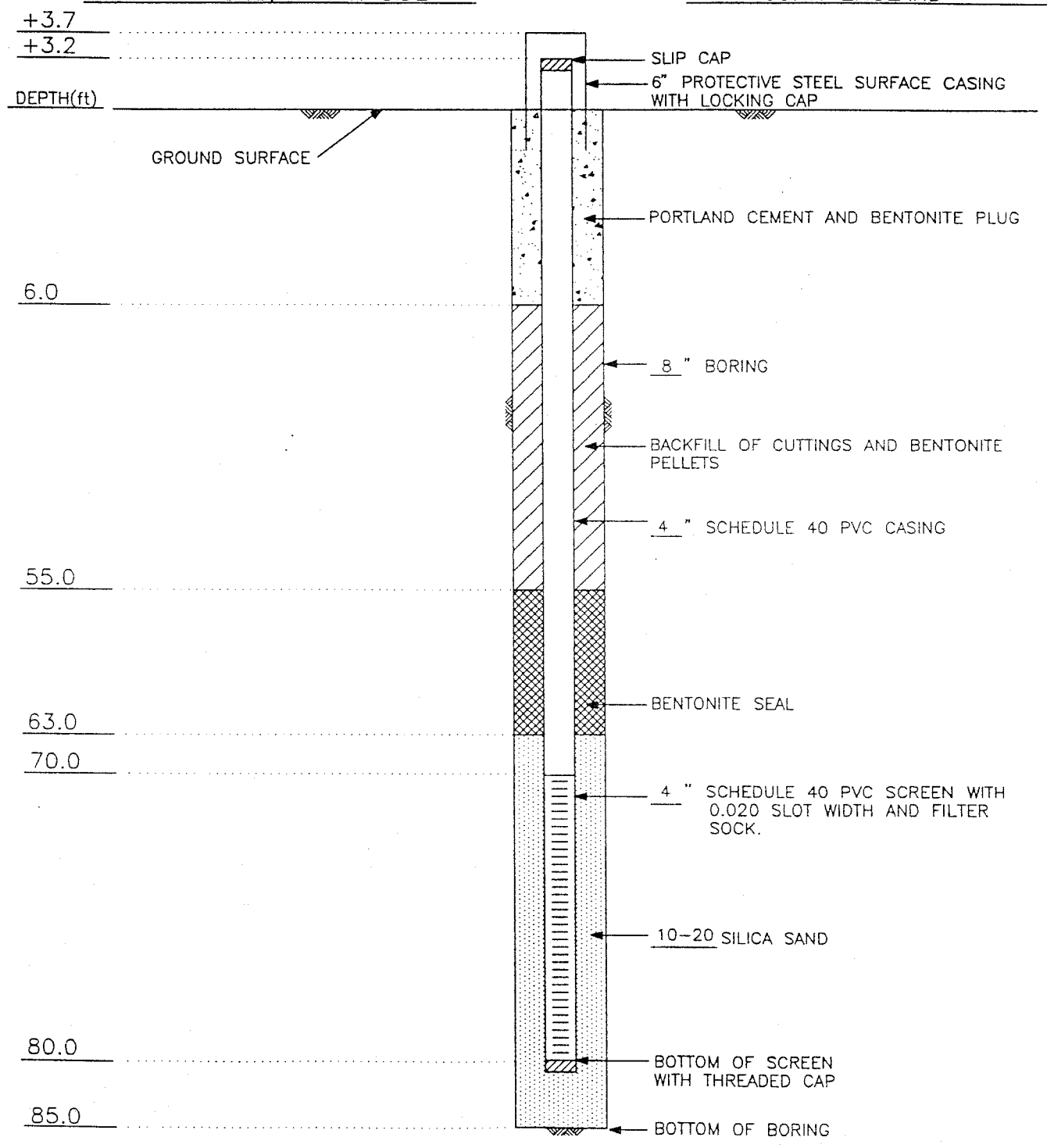


NOT TO SCALE

WELL MW-14

WELL COMPLETION DETAILS

PROJECT NAME HECLA - DURITA SITE DRILLING METHOD H. STEM AUGER/AIR ROTARY
 DATE COMPLETED 04/29/91 DRILLING COMPANY GROUND EXPLORATION
 LOCATION DURITA SITE, SOUTH SIDE FIELD ENGINEER JOHN ENGLAND



NOT TO SCALE

Attachment 3
Field Sampling Log

Casing Elev + stickup - water level = Water level Elev

WATER LEVEL MONITORING RECORD WELL NUMBER 4/4/96
 or DATE:

Project No: _____ Project Name: Heda Anita-Colo PAGE 1 of: 1

Weather Conditions: dry - Sunny/cloudy 50/50

Measuring Point of Well (MP): "V" mark on casing caps

Measuring Device: Actat electronic 150' well probe

Observations/Comments: _____

DATE or WELL	TIME	MP ELEVATION (feet, NGVD)	DEPTH TO WATER (feet below MR)	CONVERSIONS or CORRECTIONS (feet)	WATER LEVEL ELEVATION (feet, NGVD)	REMARKS	MEASURED BY
MW-8	1041	5599.26	11.28				Miller
MW-9	1000		31.35				↓
MW-10	0925		34.08				
MW-11	0835		28.30				
MW-12	0800		30.09				
MW-13	1130	5559.30	13.58				
MW-14	1210	5608.76	49.56				
<p>we need stickups of all wells + MP Elev of 9, 10, 11, 12</p> <p>if you want us to complete this form</p> <p style="text-align: center;">af</p>							

Measured by: Miller

Checked by: _____

Miller Water Monitor Service
 P.O. Box 249
 Steamboat Springs, CO
 80477

8

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER:

Project No: _____ Project Name: Hecla - Durita - Colo Date: 4/4/96

Sampling Location (well ID, etc.): MW - 8

Sampled by: Al & Mike Miller

Measuring Point (MP) of Well: "V" mark

Screened Interval (ft. BGL): _____

Filter Pack Interval (ft. BGL): _____

Casing Stick-Up/Down (ft.): _____

Starting Water Level (ft. BMP): 11.28

Total Depth (ft. BMP): 40 Water Column Height (ft.): 28.7

Casing Diameter (in. ID): 4 Multiplication Factor: 6528

Casing Volume (gal.): 18.7 2X: 37 3X: 56 4X: _____

Water Level (ft. BMP) at End of Purge: _____

Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: Alcano x 1/2 DI under pressure

Purging: hose down Sampling: three pumps

Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):

Water Level: actat 150' Thermometer: _____

pH Meter: YSI 3500 Field Calibration: _____

Conductivity Meter: SM #90K02528 Field Calibration: 4/05

Other: thermom Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data				Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductance (µmhos/cm)	Color	Turbidity & Sediment			
1010	1	1.8	12.6	7.46	2930	clear		39	casing has been	
1025	27		12.4	7.38	2880		sl		cut off	
1035	45		12.4	7.28	2880		sl			
1091	56		12.4	7.23	2870		sl Brn		Sample by pump	

SAMPLE INVENTORY *cond is temp corrected*

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): 39

Bottles Collected				Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
Time	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No. AL2 #03195

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Steamboat Springs, CO
80477

ABBREVIATIONS
BMP - below measuring point
ID - inside Diameter
EGL - below ground level
C - Celsius
gal. - gallons
gpm - gallons per minute
in. - inches

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER:

Project No: _____ Project Name: Neola-Durita Colo Date 4/2/96

Sampling Location (well ID, etc.): MW-9
Sampled by: Al & Mick Miller
Measuring Point (MP) of Well: "V" mark
Screened Interval (ft.BGL): _____
Filter Pack Interval (ft.BGL): _____
Casing Stick-Up/Down (ft.): _____

Starting Water Level (ft. BMP): 31.35
Total Depth (ft. BMP): 53 Water Column Height (ft.): 21.65
Casing Diameter (in. ID): 4 Multiplication Factor: .6528
Casing Volume (gal.): 14 2X: 28 3X: 42 4X: _____
Water Level (ft.BMP) at End of Purge: _____
Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):
Cleaning Equipment: Alconox & DI under pressure
Purging: hose down Sampling: Three pumps
Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):
Water Level: actat 150' ~~Therminator~~
pH Meter: YSI 3500 Field Calibration: Yes
Conductivity Meter: Ser # 90K0205 82 Field Calibration: Yes
Other: Ther Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data				Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductivity (µmhos/cm) @ Field Temp @ 25 °C.	Color	Turbidity & Sediment			
0930	1	1.4	10.8	8.07	5480	clear		51		
0940	14	1.4	11.9	7.07	5800					
0950	28	1.4	12.2	6.92	4740					
					5740					
1000	42	1.4	12.3	6.89	5810			51	Sampled by pump	

SAMPLE INVENTORY * Cond is temp corrected

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): 51

Time	Bottles Collected			Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No. ACC Lab # 03195

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80477

ABBREVIATIONS
BMP - below measuring point
BGL - below ground level
Cumul Vol. - Cumulative volume removed
ID - Inside Diameter
C - Celsius
gal - gallons
gpm - gallons per minute
in. - inches
GW Sample Form MAC/CAD Revised 9-8-95

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER:

Project No: _____ Project Name: Hecla - Durita - Colo Date: 4/9/96

Sampling Location (well ID, etc.): MW-10

Sampled by: al & mick miller

Measuring Point (MP) of Well: "V" mark

Screened Interval (ft.BGL): _____

Filter Pack Interval (ft.BGL): _____

Casing Stick-Up/Down (ft.): _____

Starting Water Level (ft. BMP): 34.08

Total Depth (ft. BMP): 69 Water Column Height (ft.): 399'

Casing Diameter (in. ID): 4 Multiplication Factor: .6528

Casing Volume (gal.): 228 2X: 45.6 3X: 69 4X: _____

Water Level (ft.BMP) at End of Purge: _____

Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: Alcano x 1/2 DI under pressure

Purging: hose down Sampling: three pumps

Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):

Water Level: acta 150' ~~Thermometer~~

pH Meter: YSI 3500 Field Calibration: _____

Conductivity Meter: Ser # 90K020588 Field Calibration: Yes

Other: Ther Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data				Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductance (µmhos/cm) @ Field Temp.	Color	Turbidity & Sediment			
0845	5	2	12.1	7.25	5310	St cloudy		67		
0900	30	2	12.1	7.30	5370					
0915	60	2	12.4	7.25	5380					
0925	70	2	12.5	7.16	5390	V	Unlight	67	Sample by pump	

SAMPLE INVENTORY Cond is Temp corrected

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): 67

Time	Bottles Collected			Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No. AL2 Labs # 03195

Miller Water Monitor Service
P.O. Box 249
Steamboat Springs, CO
80477

ABBREVIATIONS
BMP - below measuring point
BGL - below ground level
Cumul Vol. - Cumulative volume removed
ID - Inside Diameter
C - Celsius
gal - gallons
gpm - gallons per minute
in. - inches

11

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER:

Project No: _____ Project Name: Hecla Purite Colo Date: 4/4/96

Sampling Location (well ID, etc.): MW-11

Sampled by: Al & Mick Miller

Measuring Point (MP) of Well: "V" mark

Screened Interval (ft.BGL): _____

Filter Pack Interval (ft.BGL): _____

Casing Stick-Up/Down (ft.): _____

Starting Water Level (ft. BMP): 28.30

Total Depth (ft. BMP): 60 Water Column Height (ft.): 317

Casing Diameter (in. ID): 7 Multiplication Factor: 0.6528

Casing Volume (gal.): 20.8 2X: 41.7 3X: 62.54X

Water Level (ft. BMP) at End of Purge: _____

Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: Alconox & DI under pressure

Purging: with above Sampling: wash off Bailers

Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):

Water Level: actat 150' ~~Thermometer~~

pH Meter: YSI 3500 Field Calibration: _____

Conductivity Meter: Con 90K020588 Field Calibration: YOS

Other: Ther Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data				Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductivity (umhos/cm) @ Field Temp	@ 25 °C.	Color	Turbidity & Sediment		
0810		1	11.6	8.09			6060	clear slight	58	
0815	5	1	12.3	8.24			6100	elky		
0820	10	1	12.8	8.24			6100	elky		
										dried up
0835	25	1	12.6	8.20			6150	elky	58	Sampled w/bail

SAMPLE INVENTORY cond is Temp corrected

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): 58

Bottles Collected				Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
Time	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No. AC2 Labs # 03195

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Steamboat Springs, CO
80477

ABBREVIATIONS
BMP - below measuring point
SGL - below ground level
Cumul Vol. - Cumulative volume removed
ID - Inside Diameter
C - Celsius
gal - gallons
gpm - gallons per minute
in. - inches

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER:

Project No: _____ Project Name: Hocha Durita Colo Date: 4/4/96

Sampling Location (well ID, etc.): MW-12 Starting Water Level (ft. BMP): 30.09

Sampled by: Al & Mick Miller Total Depth (ft. BMP): 37 Water Column Height (ft.): 7

Measuring Point (MP) of Well: "V" mark Casing Diameter (in. ID): 4 Multiplication Factor: 0.6528

Screened Interval (ft. BGL): _____ Casing Volume (gal.): 4.6 2X: 9.1 3X: 13.7 4X: _____

Filter Pack Interval (ft. BGL): _____ Water Level (ft. BMP) at End of Purge: _____

Casing Stick-Up/Down (ft.): _____ Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):
 Cleaning Equipment: Alcanox 1/2 DI water under pressure
 Purging: with above Sampling: three pumps
 Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):
 Water Level: actat 150' ~~Thermometer~~
 pH Meter: YSI 3500 Field Calibration: _____
 Conductivity Meter: Ser # 90K020588 Field Calibration: YOS
~~Therm~~ Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data				Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductance (µmhos/cm) @ Field Temp	Color	Turbidity & Sediment			
0730		.5	12.1	8.61	4840	Sl Br.	Sl	36		
0740	5	.5	12.4	8.43	5080					
0750	10	.5	12.7	8.23	5130					
0800	14	.5						36	Sample thru Pump	

SAMPLE INVENTORY ~~cond~~ cond is temp corrected

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): 36

Time	Bottles Collected			Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No. ACC # 03195

Miller Water Monitor Service
 P.O. Box 249
 Steamboat Springs, CO
 80477

ABBREVIATIONS
 BMP - below measuring point
 BGL - below ground level
 Cumul Vol. - Cumulative volume removed
 ID - Inside Diameter
 C - Celsius
 gal - gallons
 gpm - gallons per minute
 in. - inches

13

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER:

Project No: _____ Project Name: Necla - Durita - Colo Date: 4/4/96

Sampling Location (well ID, etc.): MW-13 Starting Water Level (ft. BMP): 13.58

Sampled by: al & mich miller Total Depth (ft. BMP): 70 Water Column Height (ft.): 56.42

Measuring Point (MP) of Well: "V" mark Casing Diameter (in. ID): 4 Multiplication Factor: .6528

Screened Interval (ft. BGL): _____ Casing Volume (gal.): 36 2X: _____ 3X: _____ 4X: _____

Filter Pack Interval (ft. BGL): _____ Water Level (ft. BMP) at End of Purge: _____

Casing Stick-Up/Down (ft.): _____ Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):
 Cleaning Equipment: Alcanox 1/2 DI under pressure
 Purging: hose down Sampling: wash boiler
 Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):
 Water Level: Oetac 150' Thermometer: _____
 pH Meter: YSI 3500 Field Calibration: _____
 Conductivity Meter: ser # 90K020588 Field Calibration: Yes
 Other: Ther Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data				Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductance (µmhos/cm) @ Field Temp	Color	Turbidity & Sediment			
1100		1	13.0	8.36	3890	sl gray	Some Sed	67		
1110	10	1	12.6	8.19	4600					
1120	20	1	12.5	8.09	4160		Muddy			
1130	30	1	12.9	8.21	3940	✓		67	Sample w/boiler	

SAMPLE INVENTORY can & Temp corrected

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): _____

Time	Bottles Collected			Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No. AC2 Labs # 03195

Miller Water Monitor Service
 P.O. Box 249
 Steamboat Springs, CO
 80477

ABBREVIATIONS
 BMP - below measuring point
 BGL - below ground level
 Cumul Vol. - Cumulative volume removed
 ID - Inside Diameter
 C - Celsius
 gal - gallons
 gpm - gallons per minute
 in. - inches

GROUNDWATER SAMPLING RECORD

SAMPLE NUMBER: _____

Project No: _____ Project Name: Noela Durita Colo Date: 7/2/96

Sampling Location (well ID, etc.): MW-14 Starting Water Level (ft. BMP): 49.56

Sampled by: al & mich Miller Total Depth (ft. BMP): 67 Water Column Height (ft.): 17.99

Measuring Point (MP) of Well: "U" mark Casing Diameter (in. ID): 4 Multiplication Factor: .6528

Screened Interval (ft. BGL): _____ Casing Volume (gal.): 11.38 2X: 22.73 3X: 39 4X: _____

Filter Pack Interval (ft. BGL): _____ Water Level (ft. BMP) at End of Purge: _____

Casing Stick-Up/Down (ft.): _____ Total Depth (ft. BMP) at End of Purge: _____

QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: cleaner & DI under pressure

Purging: none done Sampling: by pump

Disposal of Discharged Water: on ground

INSTRUMENTS (indicate make, model, i.d.):

Water Level: actat 150' Thermometer: _____

pH Meter: YSI 3500 Field Calibration: _____

Conductivity Meter: _____ Field Calibration: yes

Other: Therm ser # 90KD20588 Field Calibration: _____

SAMPLING MEASUREMENTS

Date/Time	Purge Characteristics		Water Quality Data			Appearance		Intake Depth (ft. BMP)	Remarks
	Cumul. Vol. (gal)	Purge Rate (gpm)	Temp. (°C)	pH	Specific Conductance (µmhos/cm) @ Field Temp	Color	Turbidity & Sediment		
1146		1	12.3	8.13	4570	clean	65		
1150	10	1	12.7	8.06	4510				
1200	20	1	12.6	8.18	4500				
1210	34	1	12.9	8.14	4520		65	Sample by pump	

SAMPLE INVENTORY Cond is Temp corrected

Water Level (ft. BMP) Before Sampling: _____ Recovery %: _____ Sample Intake Depth (ft. BMP): 65

Bottles Collected				Filtration (Y/N)	Preservation (type)	Analysis	Remarks (quality control sample, other)
Time	Volume	Composition (glass, plastic)	Quantity				

Chain-of-Custody Record No ACC-# 03195

Miller Water Monitor Service
P.O. Box 249
Steamboat Springs, CO
80477

ABBREVIATIONS
BMP - below measuring point
BGL - below ground level
Cumul Vol. - cumulative volume removed
ID - Inside Diameter
C - Celsius
gal - gallons
gpm - gallons per minute
in. - inches

Attachment 4
Chain of Custody Form

CHAIN OF CUSTODY RECORD

ACZ Laboratories, Inc.
 30400 Downhill Drive
 Steamboat Springs, CO 80487
 (970) 879-6590 • (800) 334-5493

Project or P.O. #
Heda - Durita CO

Laboratory Sample Numbers (ACZ Use Only):

COC # 03195

Name to Appear on Report and Invoice:

Heda Mearns Co

cc: (Report) - (Invoice) to: (circle one or both)

Same

Box C-8000

Attn: *SARY GAMBIC* Tel: *203 764-4100*

Attn: *SARY GAMBIC* Tel: *203 764-4100*

Tel:

SAMPLE IDENTIFICATION	DATE	TIME	Shipped Via: FED X UPS Hand Other	Sample Matrix*	# of CONTAINERS	ANALYSES REQUESTED	REMARKS
MW-12	7/1/96	0800	SW	4		As Before Heda Payment on 1st time	(same as Jan. 85 (8435))
MW-14		1210					
MW-13		1130					
MW-8		1041					
MW-9		1010					
MW-10		0825					
MW-11		0835					

* Matrix Options: SW (Surface water) • GW (Ground water) • WW (Wastewater) • DW (Drinking water) • SL (Sludge) • SOIL • OIL • Other (Specify)

SAMPLE DISPOSAL OPTIONS - Please complete section A, or choose one option from sections B AND C.

Proper charges will be assessed.

(A) Long-term storage

Hold until _____ (date) for future analysis.

(B) If Sample is Non-Hazardous

- 1) Local Disposal
- 2) RCRA - Permitted Facility
- 3) Return to Client

(C) If Sample is Hazardous

- 1) RCRA-Permitted Facility
- 2) Return to Client

COMMENTS

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	PAGE #
<i>Ellen E Miller</i>	<i>7/1/96</i>	<i>0918</i>	<i>B. O...</i>	<i>4-5-96</i>	<i>0900</i>	OF

Attachment 5
Sample Receipt Form

SAMPLE RECEIPT FORM

CLIENT: HELLA DATE: 4-5-96
 PROJECT #: 29194

- 1) Does this project require special handling procedures such as CLP protocol? YES NO
- 2) Are the custody seals on the cooler intact? YES NO
- 3) Are the custody seals on the sample containers intact? YES NO
- 4) Is there a Chain of Custody (COC), or other directive shipping papers present? YES NO
- 5) Is the COC complete? YES NO
- 6) Is the COC in agreement with the samples received?
 Relinquished? Yes ___ No ___ Requested Analysis? Yes ___ No ___
 # of Samples: Yes ___ No ___ Sample ID: Yes ___ No ___
 Matrix: Yes ___ No ___ # of Containers: Yes ___ No ___
- 7) Is there enough sample for all requested analysis? YES NO
- 8) Are all samples within holding times for requested analysis? YES NO
- 9) Were all sample containers received intact? YES NO
- 10) Are samples requiring no headspace, headspace free? YES NO
- 11) Do the samples require a Foreign Soils Permit Label or quarantine? YES NO
- 12) Do samples require special disposal/hold considerations?
 Non-Hazardous: Yes ___ No ___ Hazardous: Yes ___ No ___ Hold: ___ months

Describe "NO" items (except #1, 11, & 12):

Was the client contacted? Yes ___ No ___
 If yes: Date: _____ Name of person contacted: _____
 Actions taken or client instructions: _____

 Signature: [Signature] Date: 4-5-96

SAMPLE RECEIPT FORM

CLIENT: HELLA DATE: 4-5-96
 PROJECT #: 29194 ANALYST: [Signature]

TEMPERATURE VERIFICATION SAMPLE CHECK (°C)

COOLER TEMP (°C)
 ID 2" to 6"

12/2	3

PRESERVATION CHECK (pH)

SAMPLE	R	G	Y	BG	O	T	P
	<2	<2	<2	<2	<2	>12	>12
01		1					
02		1					
03		1					
04		1					
05		1					
06		1					
07		1					

COMMENTS:

Attachment 6

Student's T-test Results and Descriptive Statistics

SAMPDATE	WELLNUM	PARAMETER	N	MEAN	STD_DEV	T	STUDENT_T	VALUE
4/96	MW-13	TOTAL DISSOLVED SOLIDS (mg/l)	21	2105	314.7	3.26	2.09	3130
4/96	MW-13	SULFATE (mg/l)	21	294.6	360.8	2.90	2.09	1340
4/96	MW-13	SODIUM (mg/l)	18	841.7	58.0	4.45	2.11	1100
4/96	MW-14	CHLORIDE (mg/l)	21	33.1	1.62	6.70	2.09	44.0

10/07/96

WELLNUM	PARAMETER	N	%HITS	MEAN	MEDIAN	MAX	MIN	STD_DEV	VARIANCE	SKEWNESS	KURTOSIS	STD_ERR	CV
MW-8	pH, FIELD (std. units)	16	100	7.30	7.29	7.90	6.96	0.27	0.071	0.82	0.62	0.067	3.66
MW-8	SPEC. COND., FIELD (umhos/cm)	16	100	2863	2860	3010	2800	57.4	3290	1.17	1.41	14.3	2.00
MW-8	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	2191	2151	3080	2050	212.3	45089	3.78	16.0	45.3	9.69
MW-8	BICARBONATE (mg/l)	18	100	356.8	352.0	386.0	342.0	12.5	155.3	1.22	0.78	2.94	3.49
MW-8	CARBONATE (mg/l)	16	63	4.88	2.50	36.0	0	8.98	80.7	3.11	10.8	2.25	184.2
MW-8	CHLORIDE (mg/l)	22	100	20.4	20.0	24.0	18.0	1.62	2.63	0.66	-0.20	0.35	7.95
MW-8	SULFATE (mg/l)	22	100	1249	1259	1323	1000	67.1	4497	-2.54	8.96	14.3	5.37
MW-8	SODIUM (mg/l)	19	100	413.6	415.0	480.0	357.0	25.8	667.5	0.49	2.33	5.93	6.25
MW-8	ARSENIC (mg/l)	19	5	0.0043	0.0030	0.050	0.0010	0.011	0.0001	4.36	19.0	0.0025	254.5
MW-8	MOLYBDENUM (mg/l)	19	0	0.023	0.025	0.050	0.0050	0.015	0.0002	0.51	-0.30	0.0035	67.2
MW-8	SELENIUM (mg/l)	18	0	0.0018	0.0018	0.0050	0.0005	0.0015	0.0000	0.97	0.29	0.0004	82.9
MW-8	URANIUM (mg/l)	19	42	0.0013	0.0005	0.0080	0.0001	0.0019	0.0000	2.58	7.90	0.0004	142.2
MW-8	GROSS ALPHA (pci/l)	19	NA	11.5	7.50	37.5	0	11.1	122.9	0.80	-0.016	2.54	96.0
MW-8	GROSS BETA (pci/l)	19	NA	19.5	18.0	80.0	0	17.6	309.6	2.30	7.65	4.04	90.1
MW-8	THORIUM-230 (pci/l)	19	NA	0.97	0.20	3.00	-0.20	1.12	1.26	0.59	-1.41	0.26	115.7
MW-8	RADIUM-226 (pci/l)	22	NA	1.50	1.15	5.30	0.40	1.08	1.18	2.19	6.44	0.23	72.3
MW-9	pH, FIELD (std. units)	16	100	7.02	6.98	7.31	6.73	0.18	0.032	0.51	-0.89	0.045	2.54
MW-9	SPEC. COND., FIELD (umhos/cm)	16	100	5649	5695	5930	5370	163.0	26585	-0.31	-0.87	40.8	2.89
MW-9	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	4923	4949	5290	4600	172.3	29690	-0.51	0.51	36.7	3.50
MW-9	BICARBONATE (mg/l)	18	100	389.1	381.5	471.0	360.0	24.3	589.5	2.43	7.62	5.72	6.24
MW-9	CARBONATE (mg/l)	16	63	3.38	0	24.0	0	6.02	36.3	2.95	10.1	1.51	178.4
MW-9	CHLORIDE (mg/l)	22	100	46.1	46.5	57.0	27.0	7.86	61.8	-0.61	0.089	1.68	17.0
MW-9	SULFATE (mg/l)	22	100	3121	3198	3430	2400	263.4	69399	-1.22	1.20	56.2	8.44
MW-9	SODIUM (mg/l)	19	100	797.9	787.0	896.0	655.0	59.3	3517	-0.47	0.50	13.6	7.43
MW-9	ARSENIC (mg/l)	19	5	0.0030	0.0020	0.025	0.0010	0.0054	0.0000	4.13	17.5	0.0012	180.7
MW-9	MOLYBDENUM (mg/l)	19	0	0.042	0.025	0.15	0.0050	0.052	0.0027	1.55	0.86	0.012	123.4
MW-9	SELENIUM (mg/l)	18	0	0.0029	0.0025	0.0050	0.0005	0.0016	0.0000	0.16	-0.74	0.0004	54.2
MW-9	URANIUM (mg/l)	22	73	0.0022	0.0010	0.010	0.0001	0.0028	0.0000	2.17	4.22	0.0006	128.0
MW-9	GROSS ALPHA (pci/l)	19	NA	19.3	16.0	67.5	0	21.4	457.1	0.77	-0.47	4.90	110.7
MW-9	GROSS BETA (pci/l)	19	NA	35.4	33.0	75.0	0	25.8	666.5	0.22	-1.34	5.92	73.0
MW-9	THORIUM-230 (pci/l)	19	NA	1.10	0.90	2.60	0	1.06	1.11	0.34	-1.67	0.24	96.0
MW-9	RADIUM-226 (pci/l)	22	NA	1.47	1.10	7.90	0.20	1.56	2.42	3.64	15.1	0.33	106.0
MW-10	pH, FIELD (std. units)	16	100	7.44	7.23	8.34	6.97	0.44	0.19	1.04	-0.26	0.11	5.91
MW-10	SPEC. COND., FIELD (umhos/cm)	16	100	5279	5315	5470	5040	136.1	18518	-0.45	-1.22	34.0	2.58
MW-10	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	4131	4108	4340	3968	95.5	9127	0.56	-0.22	20.4	2.31

10/07/96

WELLNUM	PARAMETER	N	%HITS	MEAN	MEDIAN	MAX	MIN	STD_DEV	VARIANCE	SKEWNESS	KURTOSIS	STD_ERR	CV
MW-10	BICARBONATE (mg/l)	18	100	510.5	509.5	548.0	446.0	23.8	566.9	-1.00	2.05	5.61	4.66
MW-10	CARBONATE (mg/l)	16	63	6.63	4.50	48.0	0	12.5	156.3	2.89	8.68	3.13	188.7
MW-10	CHLORIDE (mg/l)	22	100	45.4	34.5	150.0	29.0	27.8	775.2	3.09	10.1	5.94	61.3
MW-10	SULFATE (mg/l)	22	100	2694	2570	5000	2223	564.6	318762	3.63	14.4	120.4	21.0
MW-10	SODIUM (mg/l)	19	100	1010	1020	1300	484.0	172.0	29569	-1.31	4.33	39.4	17.0
MW-10	ARSENIC (mg/l)	19	26	0.0088	0.0030	0.050	0.0010	0.015	0.0002	2.50	5.28	0.0034	171.4
MW-10	MOLYBDENUM (mg/l)	19	0	0.025	0.025	0.10	0.0050	0.023	0.0005	2.11	6.06	0.0052	89.8
MW-10	SELENIUM (mg/l)	18	6	0.0087	0.0038	0.050	0.0010	0.013	0.0002	2.47	5.81	0.0031	150.0
MW-10	URANIUM (mg/l)	22	55	0.0015	0.0008	0.0060	0.0001	0.0017	0.0000	1.46	1.54	0.0004	115.4
MW-10	GROSS ALPHA (pCi/l)	19	NA	23.2	12.5	100.0	0	27.1	733.3	1.36	2.10	6.21	116.6
MW-10	GROSS BETA (pCi/l)	19	NA	33.0	24.0	210.0	0	46.1	2129	3.41	13.3	10.6	139.7
MW-10	THORIUM-230 (pCi/l)	19	NA	1.13	0.40	6.60	-0.20	1.64	2.70	2.22	6.22	0.38	145.6
MW-10	RADIUM-226 (pCi/l)	22	NA	2.22	1.95	10.0	0.50	1.98	3.92	3.08	11.8	0.42	89.1
MW-11	pH, FIELD (std. units)	16	100	8.17	8.18	8.80	7.42	0.36	0.13	-0.17	0.43	0.090	4.40
MW-11	SPEC. COND., FIELD (umhos/cm)	16	100	5968	6045	6230	5630	212.1	44993	-0.41	-1.45	53.0	3.55
MW-11	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	4231	4304	4580	3510	258.9	67029	-1.44	1.99	55.2	6.12
MW-11	BICARBONATE (mg/l)	18	100	733.4	760.5	795.0	512.0	69.2	4789	-2.18	5.56	16.3	9.44
MW-11	CARBONATE (mg/l)	16	63	51.4	24.0	312.0	0	79.9	6381	2.63	7.79	20.0	155.5
MW-11	CHLORIDE (mg/l)	22	100	41.5	42.5	45.0	34.0	3.05	9.31	-0.96	0.29	0.65	7.34
MW-11	SULFATE (mg/l)	22	100	2389	2457	2600	1790	223.6	50002	-1.37	1.13	47.7	9.36
MW-11	SODIUM (mg/l)	19	100	1371	1390	1540	1070	121.0	14647	-0.90	1.29	27.8	8.83
MW-11	ARSENIC (mg/l)	19	11	0.0086	0.0030	0.050	0.0010	0.015	0.0002	2.46	5.12	0.0035	175.5
MW-11	MOLYBDENUM (mg/l)	19	0	0.036	0.025	0.15	0.0050	0.042	0.0018	2.32	4.77	0.0097	119.4
MW-11	SELENIUM (mg/l)	18	0	0.010	0.0025	0.050	0.0005	0.016	0.0003	1.94	2.64	0.0038	155.5
MW-11	URANIUM (mg/l)	22	64	0.0015	0.0010	0.0050	0.0001	0.0013	0.0000	1.29	1.39	0.0003	86.4
MW-11	GROSS ALPHA (pCi/l)	19	NA	18.9	10.0	67.5	0	21.6	465.3	0.76	-0.52	4.95	113.9
MW-11	GROSS BETA (pCi/l)	19	NA	23.4	7.50	75.0	0	29.3	860.6	0.90	-0.90	6.73	125.5
MW-11	THORIUM-230 (pCi/l)	19	NA	1.06	0.50	3.10	-0.20	1.18	1.39	0.49	-1.60	0.27	111.4
MW-11	RADIUM-226 (pCi/l)	22	NA	1.10	0.55	2.50	0.20	0.96	0.92	0.70	-1.45	0.20	86.8
MW-12	pH, FIELD (std. units)	16	100	8.10	8.20	8.88	6.92	0.51	0.26	-1.02	0.87	0.13	6.24
MW-12	SPEC. COND., FIELD (umhos/cm)	16	100	5207	5215	5490	5020	155.2	24090	0.33	-1.04	38.8	2.98
MW-12	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	4009	3801	5980	3010	680.4	462936	1.41	2.26	145.1	17.0
MW-12	BICARBONATE (mg/l)	18	100	522.1	541.0	590.0	422.0	47.6	2268	-0.73	-0.52	11.2	9.12
MW-12	CARBONATE (mg/l)	16	75	19.3	9.50	72.0	0	22.1	489.4	1.47	1.15	5.53	114.9
MW-12	CHLORIDE (mg/l)	22	100	30.2	27.0	65.0	21.0	10.2	103.3	2.11	5.65	2.17	33.6
MW-12	SULFATE (mg/l)	22	100	2475	2374	3690	1893	444.2	197308	1.28	1.53	94.7	18.0

10/07/96

WELLNUM	PARAMETER	N	%HITS	MEAN	MEDIAN	MAX	MIN	STD_DEV	VARIANCE	SKEWNESS	KURTOSIS	STD_ERR	CV
MW-12	SODIUM (mg/l)	19	100	1183	1160	1510	753.0	158.4	25104	-0.46	2.20	36.3	13.4
MW-12	ARSENIC (mg/l)	19	5	0.010	0.0030	0.050	0.0010	0.018	0.0003	1.89	1.98	0.0041	172.9
MW-12	MOLYBDENUM (mg/l)	19	0	0.032	0.025	0.15	0.0050	0.037	0.0013	2.37	6.02	0.0084	114.7
MW-12	SELENIUM (mg/l)	18	0	0.012	0.0025	0.10	0.0005	0.025	0.0006	3.05	9.58	0.0059	214.0
MW-12	URANIUM (mg/l)	22	68	0.0022	0.0013	0.014	0.0001	0.0029	0.0000	3.65	15.2	0.0006	133.1
MW-12	GROSS ALPHA (pCi/l)	19	NA	15.7	11.4	55.0	0	17.2	295.4	0.91	-0.28	3.94	109.2
MW-12	GROSS BETA (pCi/l)	19	NA	24.3	20.0	57.5	0	22.8	518.2	0.22	-1.71	5.22	93.7
MW-12	THORIUM-230 (pCi/l)	19	NA	1.06	0.60	2.50	0	1.05	1.11	0.46	-1.65	0.24	99.8
MW-12	RADIUM-226 (pCi/l)	22	NA	1.09	0.50	2.50	0	1.00	1.00	0.60	-1.54	0.21	91.8
MW-13	pH, FIELD (std. units)	16	100	8.49	8.38	9.62	8.09	0.40	0.16	1.66	3.33	0.099	4.67
MW-13	SPEC. COND., FIELD (umhos/cm)	16	100	3461	3265	4340	2900	503.3	253353	0.68	-1.17	125.8	14.5
MW-13	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	2151	1983	3130	1654	377.0	142124	1.33	1.03	80.4	17.5
MW-13	BICARBONATE (mg/l)	18	100	1353	1480	1772	826.0	305.3	93194	-0.35	-1.45	72.0	22.6
MW-13	CARBONATE (mg/l)	16	75	216.3	101.0	892.0	0	296.5	87929	1.51	1.08	74.1	137.1
MW-13	CHLORIDE (mg/l)	22	100	33.1	33.0	42.0	25.0	3.77	14.2	0.11	1.57	0.80	11.4
MW-13	SULFATE (mg/l)	22	100	342.1	148.0	1340	2.00	416.7	173629	1.27	0.43	88.8	121.8
MW-13	SODIUM (mg/l)	19	100	855.3	854.0	1100	755.0	81.8	6690	1.66	3.60	18.8	9.56
MW-13	ARSENIC (mg/l)	19	16	0.0052	0.0020	0.050	0.0010	0.011	0.0001	3.88	15.7	0.0026	216.7
MW-13	MOLYBDENUM (mg/l)	19	16	0.025	0.025	0.080	0.0050	0.019	0.0004	1.53	3.28	0.0043	75.8
MW-13	SELENIUM (mg/l)	18	11	0.0045	0.0023	0.050	0.0005	0.011	0.0001	4.12	17.3	0.0027	252.8
MW-13	URANIUM (mg/l)	22	55	0.0030	0.0005	0.030	0.0001	0.0068	0.0000	3.53	13.0	0.0014	226.1
MW-13	GROSS ALPHA (pCi/l)	19	NA	11.3	3.00	50.0	0	14.7	217.5	1.26	0.92	3.38	130.6
MW-13	GROSS BETA (pCi/l)	19	NA	19.6	8.50	57.5	0	21.4	457.7	0.83	-0.98	4.91	109.1
MW-13	THORIUM-230 (pCi/l)	19	NA	0.96	0.30	2.50	-0.20	1.07	1.15	0.62	-1.46	0.25	112.1
MW-13	RADIUM-226 (pCi/l)	22	NA	1.07	0.50	4.30	0	1.20	1.44	1.23	0.74	0.26	112.2
MW-14	pH, FIELD (std. units)	16	100	8.26	8.27	8.71	7.94	0.25	0.061	0.43	-0.75	0.062	2.98
MW-14	SPEC. COND., FIELD (umhos/cm)	16	100	4199	4400	4550	3240	389.3	151580	-1.30	0.82	97.3	9.27
MW-14	TOTAL DISSOLVED SOLIDS (mg/l)	22	100	2799	2899	3520	2100	383.8	147272	-0.040	-0.33	81.8	13.7
MW-14	BICARBONATE (mg/l)	18	100	1033	1086	1360	396.0	210.1	44122	-1.94	4.88	49.5	20.3
MW-14	CARBONATE (mg/l)	16	69	152.6	80.0	956.0	0	258.0	66570	2.51	6.36	64.5	169.0
MW-14	CHLORIDE (mg/l)	22	100	33.6	33.0	44.0	30.0	2.80	7.86	2.55	8.79	0.60	8.34
MW-14	SULFATE (mg/l)	22	100	1174	1146	1890	735.0	327.6	107308	0.68	0.11	69.8	27.9
MW-14	SODIUM (mg/l)	19	100	1020	1000	1400	827.0	147.1	21635	1.16	1.52	33.7	14.4
MW-14	ARSENIC (mg/l)	19	37	0.015	0.0030	0.11	0.0010	0.027	0.0008	2.76	8.06	0.0063	186.2
MW-14	MOLYBDENUM (mg/l)	19	47	0.029	0.025	0.10	0.0050	0.019	0.0004	3.09	11.5	0.0044	64.4
MW-14	SELENIUM (mg/l)	18	0	0.0072	0.0025	0.050	0.0005	0.016	0.0002	2.66	5.82	0.0037	217.4

10/07/96

WELLNUM	PARAMETER	N	%HITS	MEAN	MEDIAN	MAX	MIN	STD_DEV	VARIANCE	SKEWNESS	KURTOSIS	STD_ERR	CV
MW-14	URANIUM (mg/l)	22	82	0.0055	0.0040	0.021	0.0004	0.0050	0.0000	1.91	3.67	0.0011	91.5
MW-14	GROSS ALPHA (pCi/l)	19	NA	20.1	17.0	50.0	0	17.0	288.9	0.46	-1.13	3.90	84.6
MW-14	GROSS BETA (pCi/l)	19	NA	22.6	19.8	57.5	0	21.4	459.7	0.44	-1.37	4.92	95.0
MW-14	THORIUM-230 (pCi/l)	19	NA	1.06	0.80	2.50	0	1.05	1.10	0.47	-1.62	0.24	99.0
MW-14	RADIUM-226 (pCi/l)	22	NA	1.16	0.55	2.90	0	1.05	1.10	0.52	-1.55	0.22	90.4