

# **MONTARA GROUNDWATER EXPLORATION PROJECT**

## **Project Completion Report**

### ***ELEMENT 13***

### ***MONTARA GROUNDWATER EXPLORATION PROJECT (MONTARA WATER AND SANITARY DISTRICT)***

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## **EXECUTIVE SUMMARY**

### **Work Proposed**

The project consisted of drilling up to 2 test wells in the vicinity of the Montara Water and Sanitary District (MWSD) service area for the purposes of characterizing the various aquifers in terms of their optimal use for potable water supply. This data extends the regional groundwater assessment work already conducted by San Mateo County. The *San Mateo County Midcoast Aquifers: Literature and Data Review* (Balance Hydrologics, April 2002) and the *San Mateo County Midcoast Groundwater Study: Phase II* (Kleinfelder, February 2004) provided guidance as to where the most productive strata were located. Data from the test well program allow evaluation of the local aquifers in terms of their suitability for public and private potable water supply. A matrix of potential beneficial uses of the groundwater and desired characteristics for that use was constructed and the local aquifers ranked as to how close they meet the desired characteristics for a given beneficial use. The last step in the data analysis was to optimize the existing and projected groundwater levels for potable supply according to the results of the matrix analysis. Data collection of well water quality was conducted consistent with Groundwater Ambient Monitoring and Assessment (GAMA) Program protocols. There is no current GAMA monitoring in the Midcoast Region and data from the test wells could help establish a baseline for the area.

### **Work Completed**

The Project Assessment and Evaluation Plan (PAEP) outlined steps to enhance the MWSD potable water supply by characterizing local aquifers through groundwater exploration. The work outlined in the project work plan specified two test wells would be drilled.

The first well site was located near the intersection of Tierra Alta Street and Loma Vista Street. The well was drilled to a depth of 640 feet below ground surface (bgs), nearly 200 feet deeper than the depth initially thought to yield an adequate flow rate. Prior to drilling, it was believed the well could achieve a higher yield from the more shallow aquifer (between 250 to 400 bgs). When a higher yield was not discovered at this depth, the well was drilled to access the deeper aquifer, just beyond 640 bgs. However, at the final depth, the well still yielded only 2 gallons per minute (gpm) during a 1.5 hour air-lift test. The water quality analysis showed elevated levels of dissolved solids, chloride,

sodium and fluoride, exceeding Title 22 Drinking Water Requirements (see Table 1 below and Exhibit A).

<b>Table 1. Well Site No. 1 (Tierra Alta/Loma Vista ) Water Quality Analysis</b>				
<b>Parameter</b>	<b>Result</b>	<b>Units</b>	<b>Detection Limit</b>	<b>MCL</b>
Total Dissolved Solids (TDS)	1500	mg/L	10	1000
Chloride (Cl)	320	mg/L	1	250
Sodium (Na)	210	mg/L	0.5	–
Fluoride	1.7	mg/L	0.1	1

Balance Hydrologics, Inc., the Hydrologist/Geologist responsible for the analysis, stated in an April 2006 letter to MWSD that the well site was not recommended for a municipal well primarily because of the low yield. Balance Hydrologics further explained that the well may be feasible for a domestic well. However, San Mateo County requires a 2.5 gpm yield to permit a well for domestic use and the well will likely require treatment. The well was abandoned, back-filled with sand and gravel and sealed with 75 feet of cement. Inspection by San Mateo County staff occurred on February 27, 2008. The project was completed in April 2008. There will be no discharge to surface water or groundwater. This project included no design and construction, as the project was limited to exploratory drilling.

### **Deviations from Work Proposed**

It was determined that the original budgetary estimate was not adequate for the exploratory drilling of the second planned groundwater well. As stated above, the first well required additional drilling of 240 feet beyond the assumed depth of 400 bgs at a cost of \$40 to \$46 per linear foot depth (see Exhibit B). Additionally, the well was abandoned based on the recommendation of Balance Hydrologics due to the poor water quality and low yield. The abandonment of the test hole is a cost of \$7 per each linear foot (640 linear feet total). Both items are beyond the original estimate provided for this project.

Based on the limit of the original estimate and increased cost to drill the additional depth and abandon the well, the budget was completely expended on drilling of the Tierra Alta/Loma Vista Well Site. Thus, the project was limited to one well due to the exhaustion of the current budget.

### **Project Performance Monitoring**

The project was completed in April 2008. The well has been abandoned. Therefore there will be no need for a mechanism or process that allows for continued performance monitoring of the project as the project is complete.

## **Updates or Changes to the IRWM Plan**

No updates or changes are required per Element 13 Montara Groundwater Exploration Project.

## **REPORTS**

Due to the low yield of the test well the well was deemed infeasible for municipal water supply. The test well was abandoned following the analysis by Balance Hydrologics, Inc. The complete Balance Hydrologics is included in the 3<sup>rd</sup> Quarter Report (Exhibit C).

## **COST & DISPOSITION OF FUNDS INFORMATION**

### **Project Invoicing**

- February 10, 2009 – BACWA submitted Invoice No. 1 to DWR
  - Groundwater Optimization Project – Invoice No. 1 Total **\$42,100.00**
- October 9<sup>th</sup>, 2009 – DWR Check received by MWSD
  - Amount received from DWR – **\$33,390.00**

### **Final Funds Disbursement**

See Exhibit B Montara Groundwater Exploration Project No. 13 Grant Invoice 1.

### **Summary of Project Cost**

See Exhibit B Montara Groundwater Exploration Project No. 13 Grant Invoice 1 and Exhibit C Montara Groundwater Exploration Project No. 13 3<sup>rd</sup> Quarter Report.

## **Exhibit A**

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### **Montara Groundwater Exploration Project No. 13**

#### ***Summary of Field Measurements and Water Quality Analysis***

**Table 2. Summary of field measurements and water quality analyses,  
Montara Water and Sanitary District, San Mateo County, California**

<b>PARAMETER</b>	<b>UNITS</b>	<b>DETECTION LIMIT</b>	<b>MCL</b>	<b>Tierra Alta and Loma Vista, Moss Beach, CA</b>
<b>DESCRIPTORS</b>				
Sample I.D.				8020627-01
Assessors parcel number				037-071-090
Latitude, NAD83	degrees			N37.5314
Longitude, NAD83	degrees			W122.5099
Elevation, NGVD29	feet			234
Lab used				Soil Control
Sample collected by				gp
Sample filtering				yes
<b>FIELD MEASUREMENTS</b>				
Date	MM/DD/YY			9/22/2004
Time	HH:MM			15:15
Specific conductance (@ 25 C°)	umhos/cm			825
Conductance (@ field temp)	umhos/cm			730
Temperature	deg C			18.9
Air-lift test for 1.5 hours	gpm			2.0
<b>WATER QUALITY INDICATORS</b>				
Alkalinity (total)	mg/L CaCO3	1		130
Hardness (total)	mg/L CaCO3	5		190
pH	pH Units	0.1	10.6	8.3
Specific conductance (@ 25 C°)	umhos/cm	1	1600	1300
Total dissolved solids (TDS)	mg/L	10	1000	1500
<b>GENERAL MINERALS</b>				
Bicarbonate (as CaCO3)	mg/L	1		160
Calcium (Ca)	mg/L	0.5		31
Carbonate (as CaCO3)	mg/L	1	120	0
Chloride (Cl)	mg/L	1	250	320
Iron (Fe)	mg/L	0.05	0.3	0
Magnesium (Mg)	mg/L	0.5		27
Manganese (Mn)	mg/L	0.02	0.05	0.023
Potassium (K)	mg/L	0.5		8
Sodium (Na)	mg/L	0.5		210
Sulfate (SO4)	mg/L	1	250	40
<b>TITLE 22 PRIMARY STANDARDS, INORGANIC</b>				
Aluminum (Al)	mg/L	0.05	1	0
Antimony (Sb)	mg/L	0.006	0.006	0
Arsenic (As)	mg/L	0.002	0.010	0
Barium (Ba)	mg/L	0.1	1	0
Beryllium (Be)	mg/L	0.001	0.004	0
Cadmium (Cd)	mg/L	0.001	0.005	0
Chromium (Cr)	mg/L	0.001	0.05	0

PARAMETER	UNITS	DETECTION LIMIT	MCL	Tierra Alta and Loma Vista, Moss Beach, CA
Fluoride (F)	mg/L	0.1	1	1.7
Mercury (Hg)	mg/L	0.0002	0.002	0
Nickel (Ni)	mg/L	0.01	0.1	0
Nitrate as (NO3)	mg/L	1	45	4.6
Selenium (Se)	mg/L	0.005	0.05	0
Thallium (Tl)	mg/L	0.001	0.002	0
<b>OTHER CONSTITUENTS</b>				
Boron (B)	mg/L	0.1		0.18
Copper (Cu)	mg/L	0.05	1	0
Cyanide (total)	mg/L	0.1	0.2	0
Lead (Pb)	mg/L	0.005	0.015	0
MBAS (surfactants)	mg/L	0.025	0.5	0
Nitrite (as N)	mg/L	0.5		0
Sliver (Ag)	mg/L	0.01		0
Zinc (Zn)	mg/L	0.05	5	0
<b>LAB CHECK</b>				
Major Cations (Ca+Mg+K+Na+Fe+Mn)	meq/L	--	--	13.11
Major Anions (HCO3+CO3+Cl+SO4+F+NO3)	meq/L	--	--	13.22
Ion Balance (Cations/Anions)	--	--	--	0.99

#### NOTES

Observer key: mw = Mark Woysner; jp = Jason Parke; gp = Gustavo Porras; va = Vic Abadie

Lab results: 0 = not detected; blank value = not tested

MCL = Title 22 Maximum Contaminant Level as of June 12, 2003; the MCL of Lead is the Regulatory Action

**Exhibit B**

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**Montara Groundwater Exploration Project No. 13**

***Grant Invoice 1***



January 28, 2009

Mr. Brian Campbell  
East Bay Municipal Utility District  
375 11<sup>th</sup> Street, MS 808  
Oakland, CA 94607

**RE: Montara Groundwater Exploration Project No. 13 Grant Invoice No. 1**

Dear Mr. Campbell,

In accordance with your email correspondence dated January 28, 2009, please find enclosed Integrated Water Management Plan (IWMP) Department of Water Resources (DWR) Invoice No. 1 along with supporting documentation for Montara Groundwater Exploration Project No. 13. We respectfully request that the following amounts be applied to the total of Invoice No. 1. The following summary details Task No. 3 and 4 along with corresponding amounts.

Task No. 3

Balance Hydrologics, Inc. (Invoice # 207220-0208)	\$5,000.00
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Task No. 4

Maggiora Bros. Drilling, Inc. (Final Invoice # J08-040)	\$37,100.00
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Invoice No. 1 Total Expenditures	<b><u>\$42,100.00</u></b>
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We appreciate your continued assistance and attention to this project. Should you have any questions or wish to discuss the enclosed documents, please contact me at (415) 776-5800.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Tanya Yurovsky'.

Tanya Yurovsky, P.E.  
Principal  
SRT Consultants

Enclosure

cc: Clemens Haldwaser





# Balance Hydrologics, Inc.

841 Folger Ave. · Berkeley, CA 94710-2800

841 Folger Ave. · Berkeley, CA 94710-2800 · (510) 704-1000  
224 Walnut Ave., Ste. E · Santa Cruz, CA 95060-3836 · (831) 457-9900  
281 Nevada St. · Auburn, CA 95603-4617 · (530) 887-9988  
www.balancehydro.com · e-mail: mho@balancehydro.com

## Invoice

Montara Water & Sanitary District  
P.O. Box 370131  
8888 Cabrillo Highway  
Montara, CA 94037

RECEIVED  
MAR 6 2008  
BY: *GI*

Date	Invoice #
3/3/2008	207220-0208

*Prop 50 grant*

JOB DESCRIPTION
Drilling Loma Vista Site

P.O.#		
PROJ. MGR.	PROJECT NUMBER	
MRW	207220	
Hours	Rate	Amount
7.5	170.00	1,275.00
67	110.00	7,370.00
		8,645.00
		86.01
		343.36

Description
Principal Staff Professional
Professional Services Total
Reimbursable Expense:
141 miles 4x4 @ \$0.61/mile
592 miles @ \$0.58/mile
Main Activities:
1. Scheduling with Tim & Mark.
2. Pre-field planning with driller.
3. Site visit on 1/21 to mobilize driller.
4. Drilling site visits: 2/5, 2/6, 2/7, 2/11, 2/12, 2/14 & 2/15 – begin drilling to 105 feet and continue over course of site visits to drill to 320 feet below ground surface.
Billing Period: 12/16/07 to 2/16/08

**We're Moving! Effective 03/31/08**  
**Balance Hydrologics, Inc.**  
**800 Bancroft Way, Suite 101**  
**Berkeley, California 94710-2227**

PLEASE REMIT TO THE BERKELEY ADDRESS ABOVE.

Questions regarding progress of work may be directed to the Project Manager (initials above). Questions regarding billing and payment should be directed to the Accounts Manager @ (510)704-1000 x200. Questions regarding certificate of insurance should contact Rachel Boitano @ (510)704-1000 x245.

<b>TOTAL THIS INVOICE</b>	<b>\$9,074.37</b>
<i>Total Due as of Invoice Date</i>	<i>\$9,074.37</i>

Acc No.:

**MAGGIORA BROS. DRILLING, INC.**  
 DRILLING CONTRACTORS - PUMP SALES SERVICE  
 CALIFORNIA CONTACTORS'S LICENSE NO. 249957

Tel: (831) 724-1338  
 Tel: (800) 728-1480  
 Fax: (831) 724-3228

Corporate Office  
 595 Airport Blvd.  
 Watsonville, CA 95076

Customer PO#		<b>FINAL INVOICE</b>	Job #	71172-1
Date:	March 24, 2008	INVOICE #:	J08-040	
Customer:	Montara Water & Sanitation District	Contact:		
Mail address:	P.O. Box 370131	Phone:		
City, ST Zip:	Montara, CA 94037			

Owner of property:	Montara Water & Sanitation District	Phone:	
Owner 's address:	P.O. Box 370131		
	Montara, CA 94037		
Site Location:	Tierra Alta & Loma Vista, Moss Beach	Assessors parcel:	
Permit Agency:	San Mateo Co. Environmental Health	Permit Number:	WP6633

Item #	Drilling & Casing:	Diam. (in.)	Actual (ft.)	Unit Price	Per	Actual Item Price
1	Mobilization/demobilization (one charge per drilling rig)			\$2,500.00	ea.	\$2,500.00
2	Drilling permit	SAN MATEO	County	owner	ea.	owner
3	Exploratory drilling:					
	Type: Rotary	9	500	\$40.00	ft.	\$20,000.00
		9	140	\$46.00	ft.	\$6,440.00
	Borehole drilling			\$0.00	ft.	\$0.00
4	Hardrock hammer drill			\$0.00	ft.	\$0.00
5	Standby during e-log		1	\$250.00	hr.	\$250.00
6	Conductor casing	12	42	\$150.00	ft.	\$6,300.00
7	Borehole reaming:	17	0	\$50.00	ft.	\$0.00
8	Well casing installed:					
	Type: PVC	6	0	\$26.00	ft.	\$0.00
9	Screen installed:					
	Type: PVC	6	0	\$40.00	ft.	\$0.00
10	Gravel pack installed:					
	Type: Sand		0	\$12.00	ft.	\$0.00
11	Sanitary seal		0	\$0.00	ft.	\$0.00
	<b>Other Charges:</b>					
12	Water hauling cost		0	\$50.00	ea.	\$0.00
13	Water truck rental		0	\$95.00	hr.	\$0.00
14	Well development Type: Airlift		0	\$360.00	hr.	\$0.00
15	Test Pump Install & Removal		1	\$0.00	ea.	\$0.00
16	Test Pump Operation		72	\$0.00	hr.	\$0.00
17	Generator rental		0	\$0.00	day	\$0.00
18	Well disinfection (per treatment)			\$500.00	ea.	\$0.00
19	Abandonment of test hole		640	\$7.00	ft.	\$4,480.00
20	Stand-by time:			\$240.00	hr.	\$0.00
21	Hourly drilling rate (penetration rate < 8 ft./hr. for 2 hours)			\$320.00	hr.	\$0.00
22	Backhoe/Tractor rental (4 hr min)		0	\$95.00	hr.	\$0.00
23	Bentonite for mud drilling:		0	\$12.00	bag	\$0.00
24	Environmental bag		1	\$750.00	bag	\$750.00
25	Baker tank, 20,000 gals, Mob/Demob		0	\$4,000.00	ea.	\$0.00
26	Tank rental		0	\$50.00	day	\$0.00
27	Tank clean-up		0	\$1,500.00	ft.	\$0.00
TOTAL PRICE						\$40,720.00
Less: down payment						\$0.00
<b>BALANCE DUE</b>						<b>\$40,720.00</b>

**RECEIVED**  
 APR 1 2008  
 BY: *WTF*  
 Water Fund

**Exhibit C**

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**Montara Groundwater Exploration Project No. 13**

***3<sup>rd</sup> Quarter Report***

# **MONTARA GROUNDWATER EXPLORATION PROJECT**

## **3<sup>rd</sup> Quarter Report – October 2008**

### ***ELEMENT 13 – MONTARA GROUNDWATER EXPLORATION PROJECT (MONTARA WATER AND SANITARY DISTRICT)***

#### **PROJECT DESCRIPTION**

The project consists of drilling up to 2 test wells in the vicinity of the Montara Water and Sanitary District (MWSD) service area for the purposes of characterizing the various aquifers in terms of their optimal use for potable water supply. This data would extend the regional groundwater assessment work already conducted by San Mateo County. The *San Mateo County Midcoast Aquifers: Literature and Data Review* (Balance Hydrologics, April 2002) and the *San Mateo County Midcoast Groundwater Study: Phase II* (Kleinfelder, February 2004) provide guidance as to where the most productive strata are located. Data from the test well program will allow evaluation of the local aquifers in terms of their suitability for public and private potable water supply. A matrix of potential beneficial uses of the groundwater and desired characteristics for that use will be constructed. Uses such as standby firefighting supply, private residential supply, and public water system conjunctive use supply will be considered. Then the local aquifers will be ranked as to how close they meet the desired characteristics for a given beneficial use. The last step in the data analysis will be to optimize the existing and projected groundwater levels for potable supply according to the results of the matrix analysis. Data collection of well water quality will be conducted consistent with Groundwater Ambient Monitoring and Assessment (GAMA) Program protocols. There is no current GAMA monitoring in the Midcoast Region and data from the test wells would help establish a baseline for the area.

#### **PROJECT INFORMATION (Thru September 2008)**

##### **Legal Matters**

There are no legal matters as of September 2008.

##### **Engineering Matters**

- Borehole drilling completed Friday, February 21, 2008.
- Water quality sample collected February 21, 2008.
- Well abandoned and backfilled Monday, February 25, 2008.
- Well sealed and inspected Wednesday, February 27, 2008.
- Project completed.

##### **Environmental Matters**

- No environmental matters encountered through September 2008.

### **Status of permits, easements, rights-of-way and approvals**

- A San Mateo County subsurface drilling permit obtained December 2007.
- There are no other permits required.

### **Major accomplishments thru April 2008**

- Geotechnical drilling permit obtained.
- Borehole drilling completed February 22, 2008.
- Water Quality sample tested by Soil Control Labs determined elevated levels of dissolved solids, sodium, chloride, and fluoride.
- Borehole abandoned, backfilled, sealed and inspected by San Mateo County staff on February 27, 2008.
- Site not recommended for a municipal well due to low yield, by Balance Hydrologics, Inc. in April 16, 2008 correspondence to MWSD.

### **Ambient surface water and groundwater data submittals**

The well has been abandoned. There will be no discharge to surface water or groundwater.

### **Issues/concerns that affect the schedule or budget**

Project completed April 2008; therefore there are no issues or concerns that affect the schedule as of September 2008.

### **Differences between work performed and the work outlined in project work plan**

The work outlined in the project work plan specified two test wells would be drilled due to budgetary constraints only one test well was completed.

### **Project performance relative to the criteria established in the Project Assessment and Evaluation Plan (PAEP)**

The PAEP outlined steps to enhance MWSD's potable water supply by characterizing local aquifers through groundwater exploration. Due to budgetary restraints the exploration was limited to one well site located near the intersection of Tierra Alta Street and Loma Vista Street. This well yielded 2gpm with elevated levels of dissolved solids, sodium, chloride and fluoride. Balance Hydrologics, Inc. stated in an April 2006 letter to MWSD that the well site was not recommended for a municipal well primarily because of the low yield.

### **COST INFORMATION**

Task #4 cost was higher than anticipated due to the extended drilling period caused by heavy rains and wet soils, as stated in the April 16, 2008 letter to MWSD (Attachment 1). This increase was partially offset by lower costs for other tasks.

Task No.	Task Description	Initial Project Cost	Revised Project Cost	Total Costs Incurred as of Last Quarter	Costs Incurred this Quarter	Total Costs Incurred as of this Quarter
1	Direct Project Administration	\$900	\$0	\$0	\$0	\$0
2	Land Purchase/Easement	\$0	\$0	\$0	\$0	\$0
3	Planning / Design / Engineering / Environmental Documentation	\$10,000	\$1,415.00	\$1,415.00	\$0	\$1,415.00
4	Construction / Implementation / Environmental Mitigation/ Enhancement	\$36,600	\$65,976.84**	\$65,976.84**	\$0	\$65,976.84**
5	Construction Administration	\$500	\$0	\$0	\$0	\$0
6	Other Costs	NA	NA	NA	\$0	NA
7	Contingency	NA	NA	NA	\$0	NA
	TOTALS	\$48,000	\$67,391.84	\$67,391.84	\$0	\$67,391.84

\*\*See Attachment 2

### SCHEDULE INFORMATION

The project was completed as of April 2008.

### ANTICIPATED ACTIVITIES NEXT QUARTER

The project was completed as of April 2008.

#### Attachments:

1. Balance Hydrologics, Inc. letter to Montara Water and Sanitary District, April 16, 2008
2. Invoices:
  - Balance Hydrologics, Inc. Invoice # 207220-1207 dated December 27, 2007
  - Balance Hydrologics, Inc. Invoice # 207220-0208 dated March 3, 2008
  - Balance Hydrologics, Inc. Invoice # 207220-0308 dated April 1, 2008
  - Balance Hydrologics, Inc. Invoice # 207220-0408 dated May 9, 2008
  - Maggiora Bros. Drilling, Inc. Invoice # 71172-1 dated March 24, 2008

## ATTACHMENT 1



# Balance Hydrologics, Inc.

841 Folger Ave. • Berkeley, CA 94710-2800 • (510) 704-1000  
224 Walnut Ave., Ste. E • Santa Cruz, CA 95060-3836 • (831) 457-9900  
281 Nevada St. • Auburn, CA 95603-4617 • (530) 887-9988  
www.balancehydro.com • email: office@balancehydro.com

April 16, 2008

Mr. Clemens Heldmaier  
Montara Water and Sanitary District  
8888 Cabrillo Highway  
Montara, California 94037

**RE: Ground-water evaluation for municipal water supply at APN 037-071-090 at Tierra Alta Street and Loma Vista Street, Moss Beach, CA**

Dear Mr. Heldmaier:

You have asked us to evaluate subsurface conditions and the potential for a municipal water supply well on Montara Water and Sanitary District property APN 037-071-090, located at the intersection of Tierra Alta Street and Loma Vista Street in Moss Beach, California. The property is at an approximate elevation of 230 feet above sea, on marine terrace deposits identified as upper Pleistocene (Qt2) by Brabb and Pampeyan (1972). This hilly area of Moss Beach between Stetson Street and Montara Creek, on which the property is found, is part of the Upper Moss Beach ground-water sub-unit of Hecht and others (1989). It consists of about 40 feet marine terrace deposits underlain by Montara Mountain granitic rock, and ground-water storage was estimated at 210 acre-feet with a generally low transmissivity. Several faults splay across the area, related to the Denniston Creek fault and the regional Seal Cove fault (Pampeyan 1994), and related fracturing suggested a possible higher yield from a well drilled on site.

Drilling was conducted under a County geotechnical drilling permit rather than a County water well drilling permit because the former is consistent with your charge to us and proved simpler to permit. The permit, however, did require borehole abandonment, and not cased as a well (see attached permit).

### ***Drilling Activities and Ground-Water Findings***

Maggiora Bros. Drilling, Inc. (Watsonville) drilled the borehole using an air-rotary/hammer rig (Ingersoll Rand TH-60/HR 2.5). The rig was mobilized to the site on January 21, 2008 but drilling didn't start until February 7, 2008 due to heavy rains and wet soils. The attached site map (Figure 1) shows the location of the borehole. Table 1 is a daily log of the drilling activities.

Maggiora drilled to a depth of 45 feet below ground surface (bgs) with a 12 ¼-inch bit and installed 12-inch diameter steel conductor casing. From 45 to 105 feet depth an 8 ¾-inch rotary bit was used, and from 105 to the borehole's final depth of 640 feet a 6 ¼-inch hammer bit was used.

Mr. Clemens Heldmaier  
April 16, 2008  
Page 2

In general, the geologic section encountered during drilling was similar to those described in the logs for the other wells drilled in the general vicinity. The attached log (Figure 2) illustrates the borehole drilling history and shows the hydrogeologic observations taken during drilling. A 6-foot layer of soil was underlain by approximately 34 feet of marine terrace deposits, which lie unconformably over weathered granitic rock extending down to 75 feet. Below 75 feet, and to the borehole's final depth of 640 feet, we encountered relatively competent phaneritic granitic rock with abundant plagioclase feldspars. The apparent principal fracture encountered in this section (between 275 and 278 feet) was filled with sandy silty clay.

First water encountered during drilling was at 62 feet below ground surface. While drilling, flow rates from the well varied between 2 and 5 gallons per minute (gpm). After reaching the final depth of 640 feet bgs on February 22, 2008, an air-lift flow test was conducted in the open borehole for 1.5 hours that produced about 2 gallons per minute.

A water quality sample was collected at the end of the air-lift test and sent to Soil Control Labs (Watsonville), a state-certified laboratory, for analyses of general mineral and Title 22 inorganics. Results were generally similar to other near-coast wells such as the 900-foot Vallemar Bluffs well, located about 2000 feet to the southwest. Relative to other granitic wells in Montara, the borehole yielded elevated levels of dissolved solids, sodium, chloride, and fluoride. Results are shown in Table 2 and Figure 3. Comparably elevated chloride and dissolved solids levels have been reported for one or two nearby monitoring wells by San Mateo County Environmental Health (Hedlund 2003).

A geophysical log was also conducted to evaluate fracture densities and orientations (attached). However, the borehole sloughed at a depth of 265 feet bgs, limiting the depth of the geophysical log. Fracture dip and dip directions (a.k.a. discontinuities) were poorly populated but coarsely showed a population dip azimuth of north 03 degrees east and a magnitude of 58 degrees. It strikes north 87 degrees west.

The borehole was abandoned, backfilled with sand and gravel and sealed with 75 feet of cement. Inspection by San Mateo County staff occurred on February 27, 2008.

### ***Conclusions***

A borehole was drilled to 640 feet below ground surface and yielded 2 to 5 gpm while drilling and 2 gpm during a 1.5 hour air-lift test. Ground water was sampled from the borehole and concentrations of dissolved solids, sodium, chloride, and fluoride exceeded State Title 22 drinking water requirements. We have requested of the lab to re-test the sample because our field measurements of specific conductance (SC) were lower (825 umhos @ 25 C, as compared to 1300 umhos @ 25 C from the lab), and SC is as surrogate for total dissolved solids (TDS). In general, SC multiplied by 0.6 estimates TDS. Using our field measurement of SC, the TDS should be about 500 mg/L.

Although a completed and developed well may have slightly higher yields and slightly improved water quality, the site is not recommended for a municipal well primarily because of its low yield. The site may

Mr. Clemens Heldmaier  
April 16, 2008  
Page 3

be feasible for a domestic well, though. San Mateo County requires a 2.5 gpm yield to permit a well for domestic use. Water treatment, however, may be needed or desired.

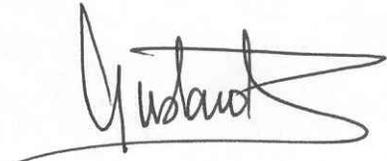
***Closure***

As with all subsurface analyses, we note that the values presented are estimates based on conditions actually encountered on site during drilling the borehole. Though the tests were conducted at a standard level of practice, more accurate tests could be conducted if the borehole was completed as a well.

If there are any follow-up questions regarding the above assessment or if there is a need to conduct more detailed analyses please give a call.

Sincerely,

BALANCE HYDROLOGICS, Inc. <sup>TM</sup>



Gustavo Porras  
Hydrologist/Geologist



Mark Woysner  
Principal Hydrologist/Hydrogeologist

*Reviewed by Barry Hecht, CHg 50*

Enclosures:    Tables 1 and 2  
                     Figures 1 through 3  
                     Appendices 1 and 2

Mr. Clemens Heldmaier  
April 16, 2008  
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***References***

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**Table 1. Log of drilling activities for borehole 2008-1 at Tierra Alta Street and Loma Vista Street, APN 037-071-090, Moss Beach, California**

Date	Activity
Monday, January 21, 2008	13:00 - Site visit: GP and MW meet with Clemens Heldmaier (MSWD) and Dave Perez (Maggiore) to select the location of the borehole.
Tuesday, January 22, 2008	8:00 - GP calls Mark Maggiore. They will not be drilling today or tomorrow.
Wednesday, January 23, 2008	No activity on project.
Thursday, January 24, 2008	8:00 - GP calls Mark Maggiore. They will not be drilling today or tomorrow.
Friday, January 25, 2008	Major storm throughout Bay Area
Saturday, January 26, 2008	
Sunday, January 27, 2008	
Monday, January 28, 2008	7:30 - GP calls Maggiore. Mike Maggiore tells him that they will not be drilling today because the ground is too wet at the site. Mike doesn't know when the mats will be available. GP left a message for Mark Maggiore requesting that information. Rain most of this week.
Tuesday, January 29, 2008	No activity on project.
Wednesday, January 30, 2008	No activity on project.
Thursday, January 31, 2008	No activity on project.
Friday, February 01, 2008	No activity on project.
Saturday, February 02, 2008	Significant rain storm overnight.
Sunday, February 03, 2008	No rain in forecast for the next week or so.
Monday, February 04, 2008	Call to Mark Maggiore: left a message asking when the mats will be available. GP did not get a call back today but he is told on the phone the next day by Maggiore secretary (?) that Mark Maggiore went today to Sacramento to buy the mats.
Tuesday, February 05, 2008	Installation of new mats to allow rig access to site. Borehole will be 10 ft. north of initially proposed location because rig mast needs clearance to avoid power lines. GP on site.
Wednesday, February 06, 2008	13:30 8.75" bit at start of exploratory borehole. 1 ft. bgs drill bit hits a large root. DP decides not to drill though it with 8.75" bit since it could deviate borehole away from vertical. CH was onsite at this time. Since DP does not have a larger bit onsite, we stop drilling at 13:45; will return tomorrow with a much larger bit to go through root. Silt fence was installed this afternoon following aborted attempt to drill. GP on site.
Thursday, February 07, 2008	<b>First drilling day:</b> 0 to 105 ft. GP on site. First water at 64 feet bgs. Flow at 71 feet bgs 0.5 gpm. Flow at 105 ft 2 gpm. Specific conductance 434 umhos at 19.9 C (480 umhos @ 25 C).
Friday, February 08, 2008	Ream hole with 12 inch bit down to 40 ft bgs. Begin installing conductor casing. Left for the day with 15 ft. of casing above ground. No drilling today. GP did not visit site.
Saturday, February 09, 2008	
Sunday, February 10, 2008	
Monday, February 11, 2008	Continue pushing conductor casing. Last 9 feet of casing are not going in. David decided to cut off the top of the casing and leave 2.5 of stick up. Contrary to expectations, no drilling today. GP on site.
Tuesday, February 12, 2008	11:15 re drilling back to 105 ft. 0 to 40 ft. = 12-inch bore; 40 to 45 ft. = 10-inch; 45 to 105 ft. = 8.75-inch; 105 ft. on = 6.25-inch bore. 14:20 drilling rate slows down; Measured flow is 2 gpm 14:45 DP decides to stop for the day to check on the bit. To do so, they need to trip up. GP leaves after drilling stops. Drilling today: 105 to 175 ft. GP on site. Flow at 175 ft 2 gpm. Specific conductance 665 umhos at 23.3 C (686 umhos @ 25 C).

Date	Activity
Wednesday, February 13, 2008	Drillers arrive as expected at 10am; they collect water from corner hydrant (Tierra Alta and Loma Vista); Grasses on the property are finally dry - no rain since 2/3/08. Bit was getting increasingly stuck yesterday, today DP will add small amounts of water to prevent this from happening again. 11:10 begin tripping back in; 12:00 noon start drilling from 175 ft. 13:50 Flow increased from 2 gpm to 5 gpm at 200 ft. bgs. Drilling today: 175 to 240 ft. GP on site. Flow at 240 ft 5 gpm. Specific conductance 510 umhos at 23.9 C (511 umhos @ 25).
Thursday, February 14, 2008	Environmental bag installed today: conductor casing stick up needs to be cut to accommodate flow diverter to bag. Drilling today: 0 ft. GP on site.
Friday, February 15, 2008	Trench was dug up to allow bag overflow to eventually go onto Tierra Alta street. Bag was placed to the north of rig to allow settling before it reaches street. . Tripping starts at 11:10 am. 12:35 water is first noticed to be percolating down through topsoil unto next door neighbor's driveway (max 0.3 gpm). More trenches are dug and this flowthrough stops in less than 1 hr (it did not go beyond the neighbor's yard unto the street). Started drilling at 240 ft. 11:55am. Drilling today: 240 to 320 ft. GP on site. Flow difficult to estimate. Specific conductance 804 umhos at 24 C (817 umhos @ 25).
Saturday, February 16, 2008	
Sunday, February 17, 2008	
Monday, February 18, 2008	President's Day holiday. No drilling today. GP did not visit site.
Tuesday, February 19, 2008	Rain expected for today -> Scattered showers all day; first rain since 2/3/08. Because we were drilling through harder material last Friday, we start the day by changing bit to 6" hammer (trip out-trip in). Diverter coupling to bag had rubber gaskets replaced prior to continued drilling. Back on bit at 13:40. Stopped for the day at 15:20 because the environmental bag needs to be better secured. Drilling today: 320 to 360 ft. GP on site.
Wednesday, February 20, 2008	No rain today. Back on bit at 10:45; stopped drilling for the day at 15:30. Drilling today: 360 to 480 ft. GP on site. Specific conductance 851 umhos at 22.8 C (883 umhos @ 25).
Thursday, February 21, 2008	Rain in the morning tapering off by noon; windy and cold. Back on bit at 10:45; stopped drilling for the day at 15:30. Slightly over 1 hour to drill from 485 to 500 ft. Drilling today: 480 to 580 ft. GP on site.
Friday, February 22, 2008	Back on bit at 11:20. Drilling today: 580 to 640 ft. <b>End of drilling.</b> Air lift test for 1.5 hours, 2 gpm, specific conductance 730 umhos at 18.9 C (825 umhos @ 25). Sampled and sent out by FedEx to Soil Control Labs. GP on site.
Saturday, February 23, 2008	Third (and biggest) storm in a series of three coming in every other day.
Sunday, February 24, 2008	
Monday, February 25, 2008	Optical Televiewer and Caliper tools run by NorCal Geophysics (Bill Henrich). Hole turns muddy at 257 ft. with a likely bridge at 262 ft. GP on site.
Tuesday, February 26, 2008	Well is abandoned and backfilled from 640 to 75 with sand and gravel. A 75 cement seal was poured form 75 feet up to the surface. GP did not visit site.
Wednesday, February 27, 2008	Well sealed and inspected. GP did not visit site.

Notes: (GP) is Gustavo Porras; (MW) is Mark Woyshner, Balance Hydrologics, Inc.  
 Conducted under the supervision of Barry Hecht, CHg 50, CEG 1245

**Table 2. Summary of field measurements and water quality analyses,  
Montara Water and Sanitary District, San Mateo County, California**

<b>PARAMETER</b>	<b>UNITS</b>	<b>DETECTION LIMIT</b>	<b>MCL</b>	<b>Tierra Alta and Loma Vista, Moss Beach, CA</b>
<b>DESCRIPTORS</b>				
Sample I.D.				8020627-01
Assessors parcel number				037-071-090
Latitude, NAD83	degrees			N37.5314
Longitude, NAD83	degrees			W122.5099
Elevation, NGVD29	feet			234
Lab used				Soil Control
Sample collected by				gp
Sample filtering				yes
<b>FIELD MEASUREMENTS</b>				
Date	MM/DD/YY			9/22/2004
Time	HH:MM			15:15
Specific conductance (@ 25 C°)	umhos/cm			825
Conductance (@ field temp)	umhos/cm			730
Temperature	deg C			18.9
Air-lift test for 1.5 hours	gpm			2.0
<b>WATER QUALITY INDICATORS</b>				
Alkalinity (total)	mg/L CaCO3	1		130
Hardness (total)	mg/L CaCO3	5		190
pH	pH Units	0.1	10.6	8.3
Specific conductance (@ 25 C°)	umhos/cm	1	1600	1300
Total dissolved solids (TDS)	mg/L	10	1000	1500
<b>GENERAL MINERALS</b>				
Bicarbonate (as CaCO3)	mg/L	1		160
Calcium (Ca)	mg/L	0.5		31
Carbonate (as CaCO3)	mg/L	1	120	0
Chloride (Cl)	mg/L	1	250	320
Iron (Fe)	mg/L	0.05	0.3	0
Magnesium (Mg)	mg/L	0.5		27
Manganese (Mn)	mg/L	0.02	0.05	0.023
Potassium (K)	mg/L	0.5		8
Sodium (Na)	mg/L	0.5		210
Sulfate (SO4)	mg/L	1	250	40
<b>TITLE 22 PRIMARY STANDARDS, INORGANIC</b>				
Aluminum (Al)	mg/L	0.05	1	0
Antimony (Sb)	mg/L	0.006	0.006	0
Arsenic (As)	mg/L	0.002	0.010	0
Barium (Ba)	mg/L	0.1	1	0
Beryllium (Be)	mg/L	0.001	0.004	0
Cadmium (Cd)	mg/L	0.001	0.005	0
Chromium (Cr)	mg/L	0.001	0.05	0

PARAMETER	UNITS	DETECTION LIMIT	MCL	Tierra Alta and Loma Vista, Moss Beach, CA
Fluoride (F)	mg/L	0.1	1	1.7
Mercury (Hg)	mg/L	0.0002	0.002	0
Nickel (Ni)	mg/L	0.01	0.1	0
Nitrate as (NO3)	mg/L	1	45	4.6
Selenium (Se)	mg/L	0.005	0.05	0
Thallium (Tl)	mg/L	0.001	0.002	0
<b>OTHER CONSTITUENTS</b>				
Boron (B)	mg/L	0.1		0.18
Copper (Cu)	mg/L	0.05	1	0
Cyanide (total)	mg/L	0.1	0.2	0
Lead (Pb)	mg/L	0.005	0.015	0
MBAS (surfactants)	mg/L	0.025	0.5	0
Nitrite (as N)	mg/L	0.5		0
Sliver (Ag)	mg/L	0.01		0
Zinc (Zn)	mg/L	0.05	5	0
<b>LAB CHECK</b>				
Major Cations (Ca+Mg+K+Na+Fe+Mn)	meq/L	--	--	13.11
Major Anions (HCO3+CO3+Cl+SO4+F+NO3)	meq/L	--	--	13.22
Ion Balance (Cations/Anions)	--	--	--	0.99

**NOTES**

Observer key: mw = Mark Woysner; jp = Jason Parke; gp = Gustavo Porras; va = Vic Abadie

Lab results: 0 = not detected; blank value = not tested

MCL = Title 22 Maximum Contaminant Level as of June 12, 2003; the MCL of Lead is the Regulatory Action

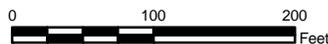


Source: USGS TerraServer, captured 2/27/04



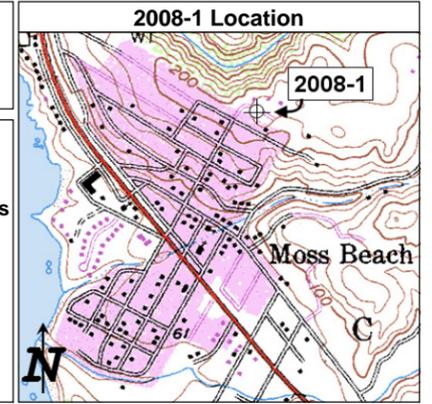
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**Figure 1. Borehole location on MWSD property APN 037-071-090  
Moss Beach, San Mateo County, California**



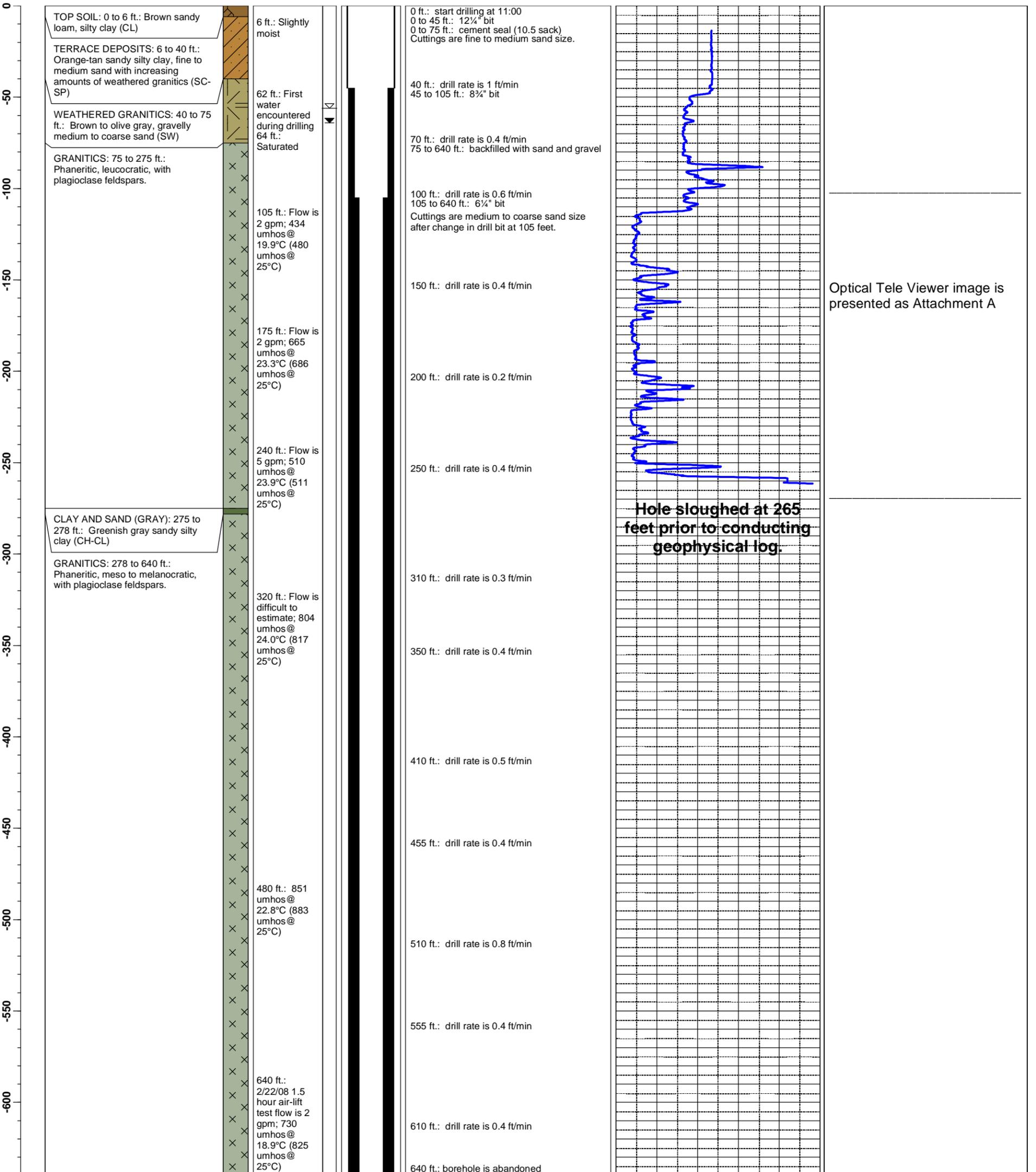
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**Figure 2: Geologic and geophysical logs for borehole 2008-1, APN 037-071-090, San Mateo County, California**

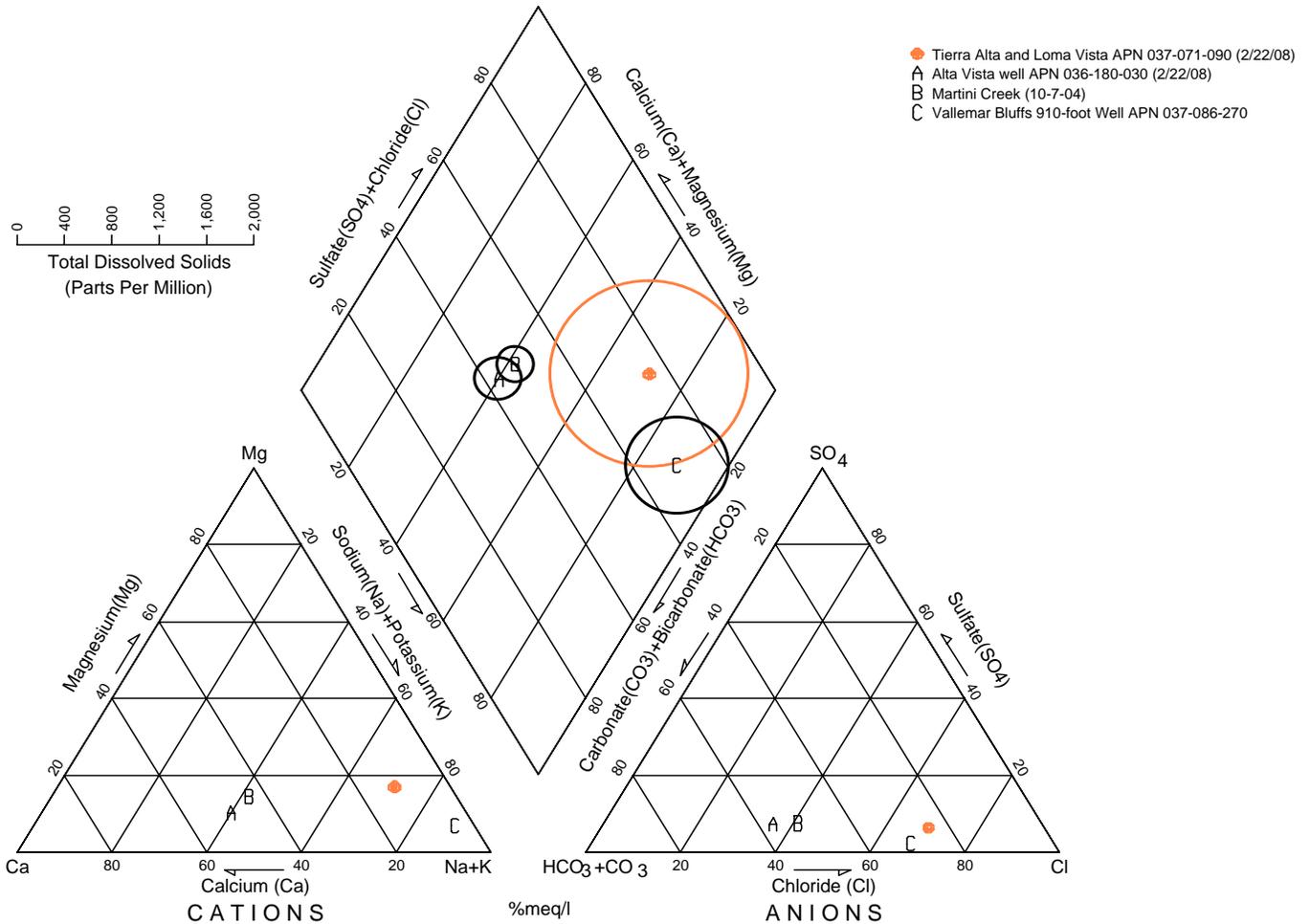


APN:	<b>037-071-090</b>	Driller:	<b>Maggiara Bros. Drilling, Inc.</b>
Location:	<b>Moss Beach, California</b>	Drilling rig:	<b>Ingersoll Rand TH-60/HR 2.5</b>
Latitude, Longitude:	<b>N37.5314°, W122.5099°, NAD83</b>	Drill bits:	<b>12 1/4" 0-45 ft bgs; 8 3/4" 45-105 ft bgs; 6 1/4" 105-640 ft bgs</b>
Ground surface elevation:	<b>234 feet (est.)</b>	<b>Cutting samples taken every 5 feet</b>	
Start drilling date:	<b>February 7, 2008</b>	Depth of borehole:	<b>640 feet</b>
Well completion date:	<b>Well sealed and inspected February 27, 2008</b>	Depth of casing:	<b>Not cased</b>
Borehole geologist:	<b>Gustavo Porras</b>	Diameter of casing:	<b>Not cased</b>
Geophysical log:	<b>Bill Henrich, Norcal Geophysics, February 25, 2008</b>		

Depth feet	Lithology	Hydrology	Borehole Diameter	Remarks	Caliper Inches	Optical Tele Viewer Amplitude (360° view)
					6	N E S W N
					16	



Tierra Alta and Loma Vista, Moss Beach  
San Mateo County, California

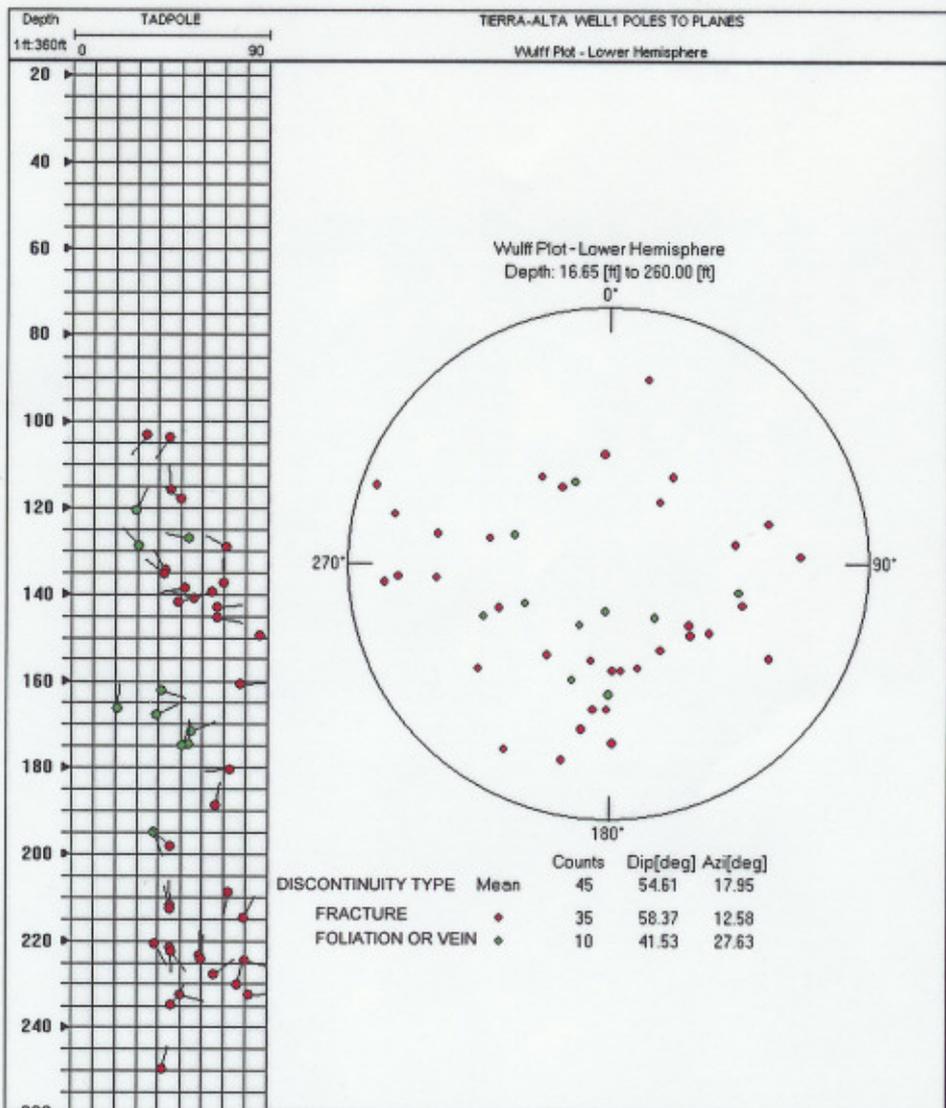


This diagram shows cations in the ternary graph on the left and anions on the right graph. The diamond graph in the center illustrates both cations and anions. Hardness dominated water plots to the left and top of the diamond graph, soft monovalent-salt dominated water to the right, and soft alkaline water towards the bottom. The radius of circle around the plotted points represents the concentration of dissolved solids, calibrated to the scale shown.



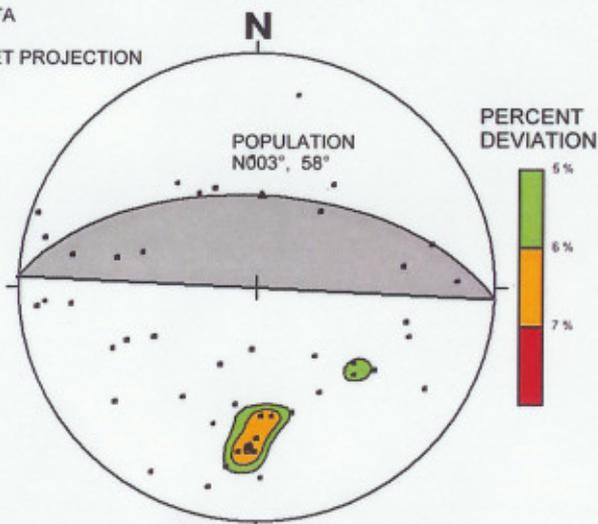
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**Figure 3.** Piper diagram illustrating the ionic signature of a water sample collected from a 640-foot deep borehole during an air-lift yield test. The sample is compared to regional well and surface waters, Moss Beach, San Mateo County, California.



### DERIVED DIP-DIP DIRECTION TREND OF ALL DISCONTINUITIES

TIERRA ALTA  
WELL 1  
STEREO NET PROJECTION



Lower hemisphere - TIERRA-ALTA-WELL-1g  
N=45 K=100.00 Sigma=0.850 Peak=6.70

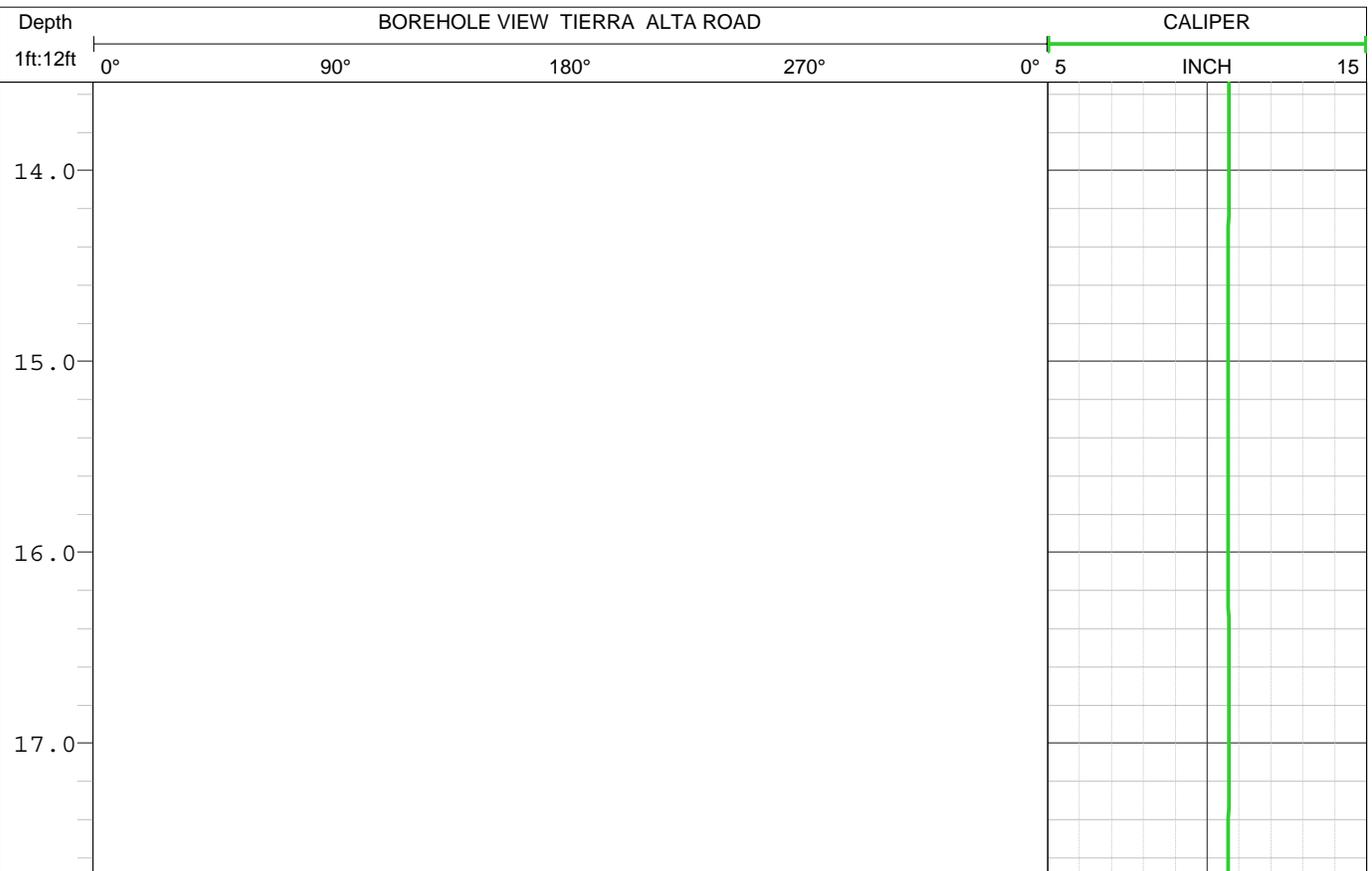


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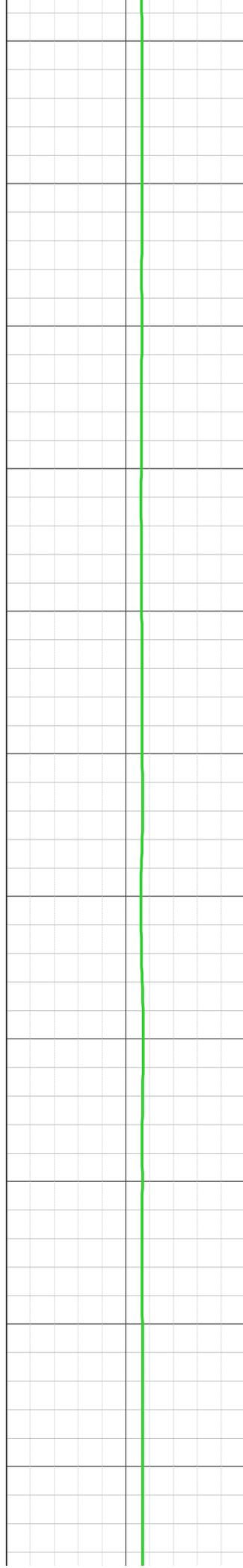
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LOCATION MOSS BEACH	SEC TWP RGE	OTHER SERVICES OPTV

PERMANENT DATUM	ELEVATION	NA	K.B.
LOG MEAS. FROM	GROUND SURFACE	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND SURFACE		G.L.
DATE	25 Feb 08	TYPE FLUID IN HOLE	WATER
RUN No	2 AND 3	SALINITY	
TYPE LOG	CALIPER OPTV	DENSITY	
DEPTH-DRILLER	600	LEVEL	53
DEPTH-LOGGER	262	MAX. REC. TEMP.	
BTM LOGGED INTERVAL	262		
TOP LOGGED INTERVAL	262		
OPERATING RIG TIME	4 hours		
RECORDED BY	W HENRICH		
WITNESSED BY	GUSTAVO		

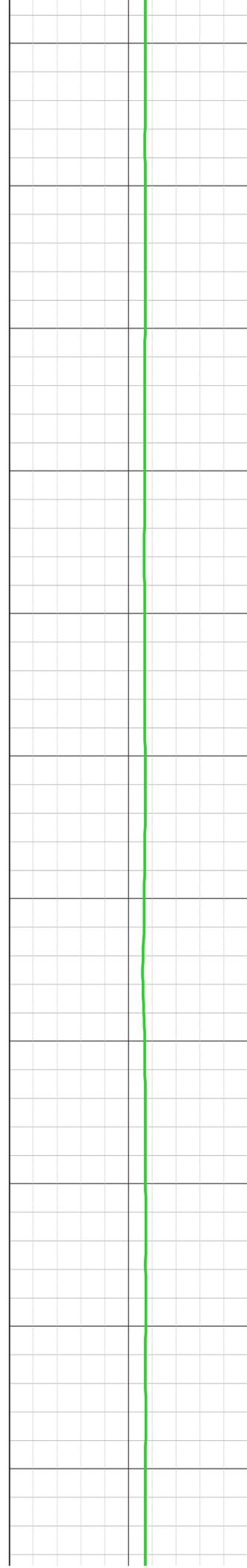
BOREHOLE RECORD		CASING RECORD					
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2	6.25	112	600				



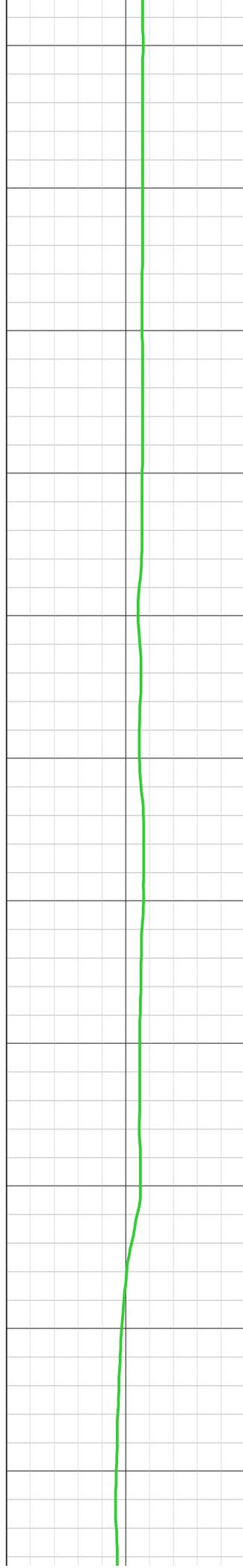
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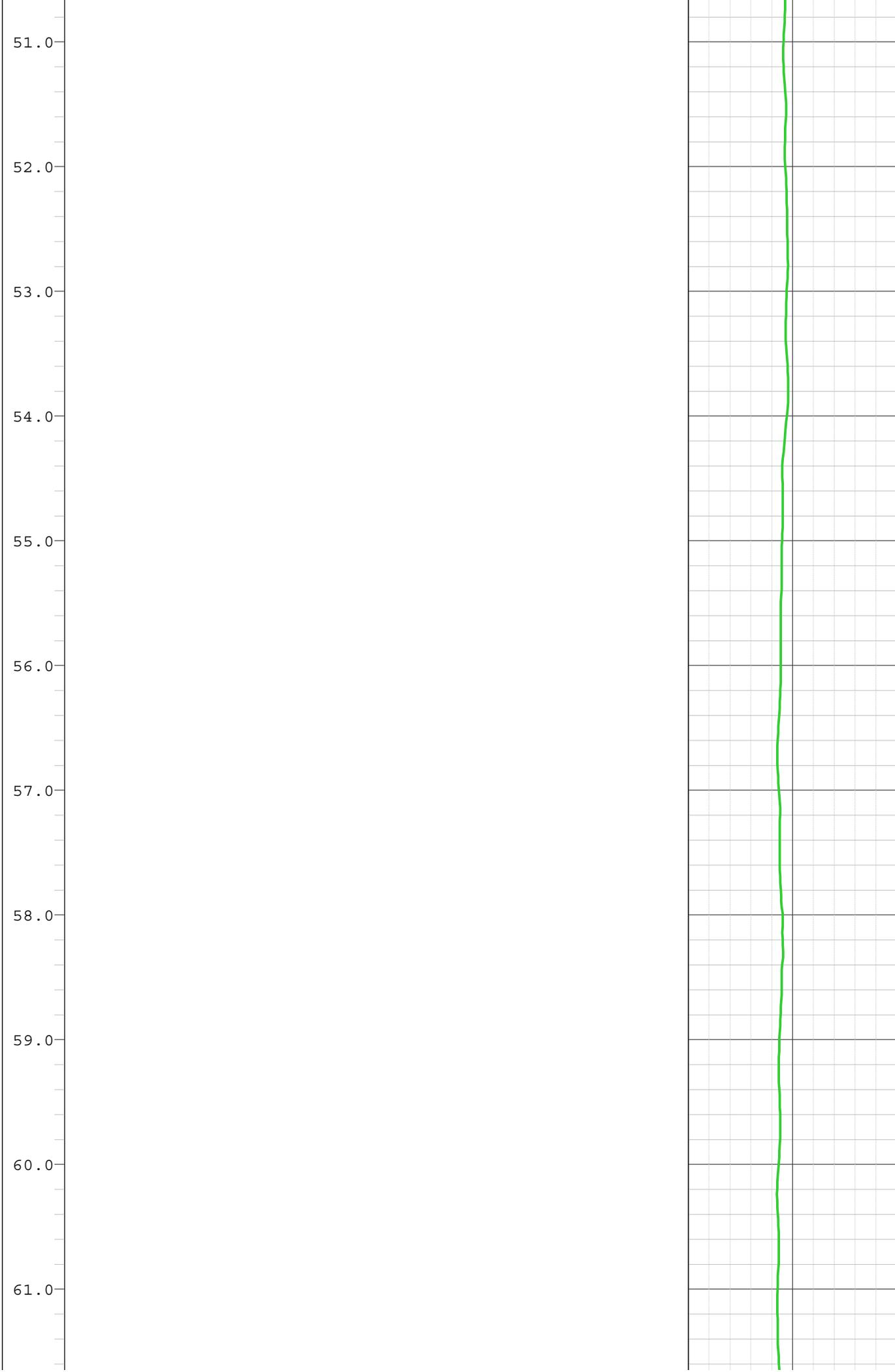


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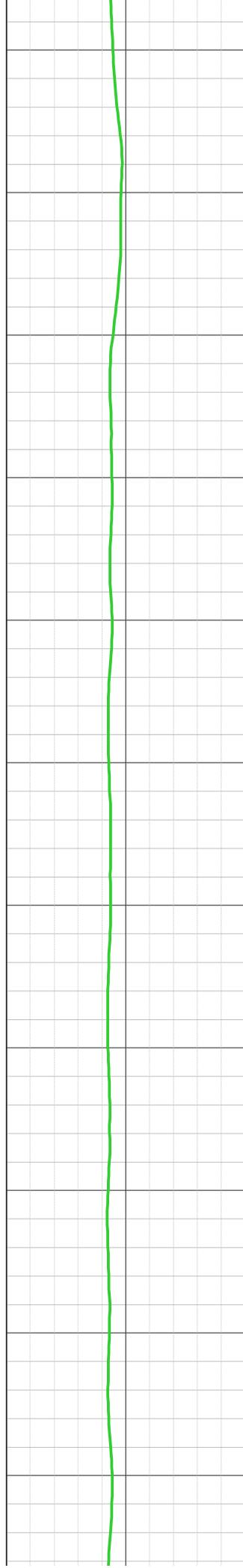


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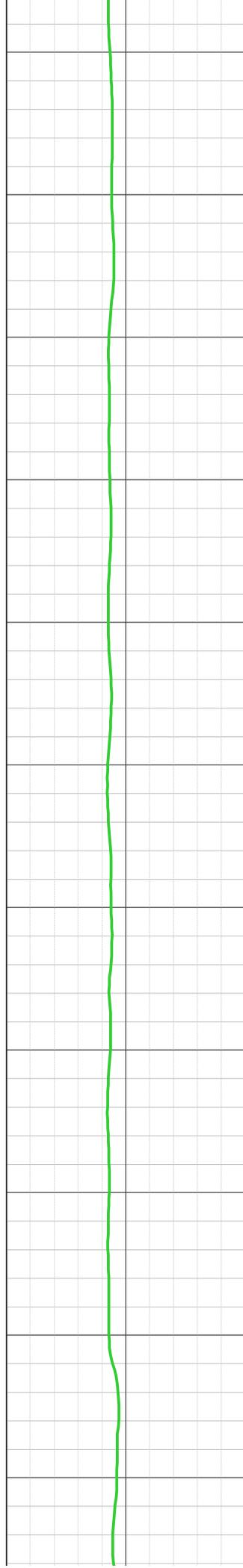




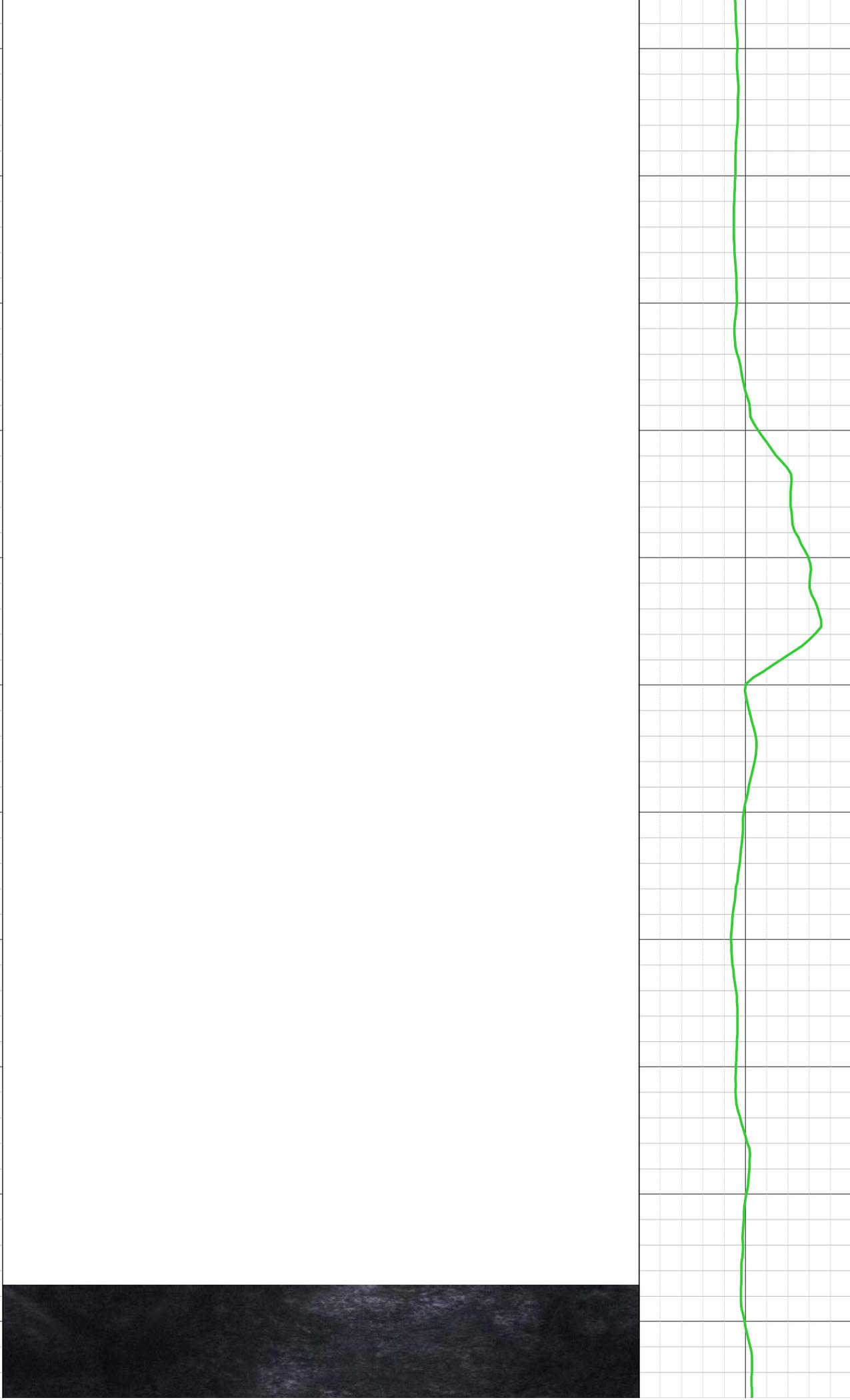
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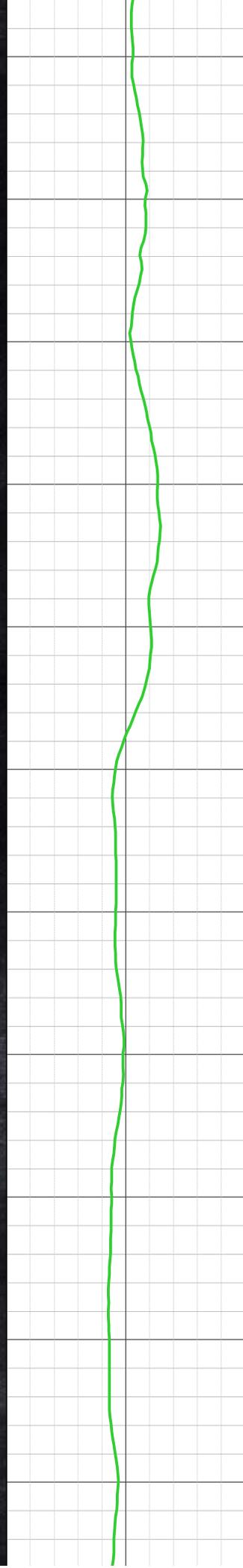
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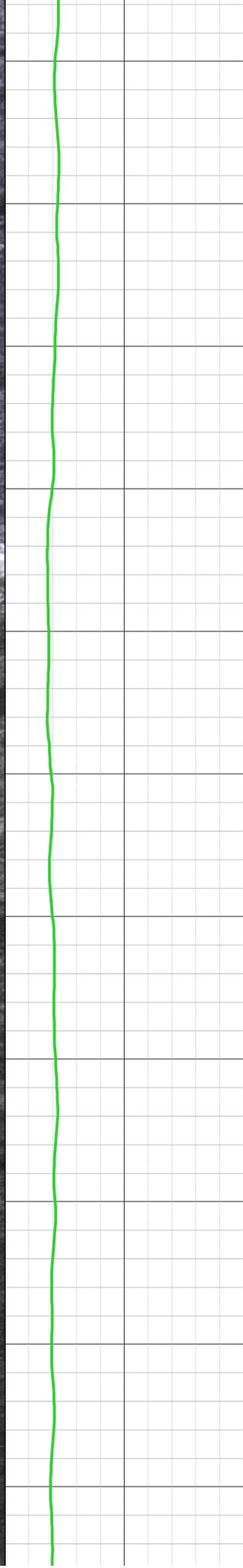
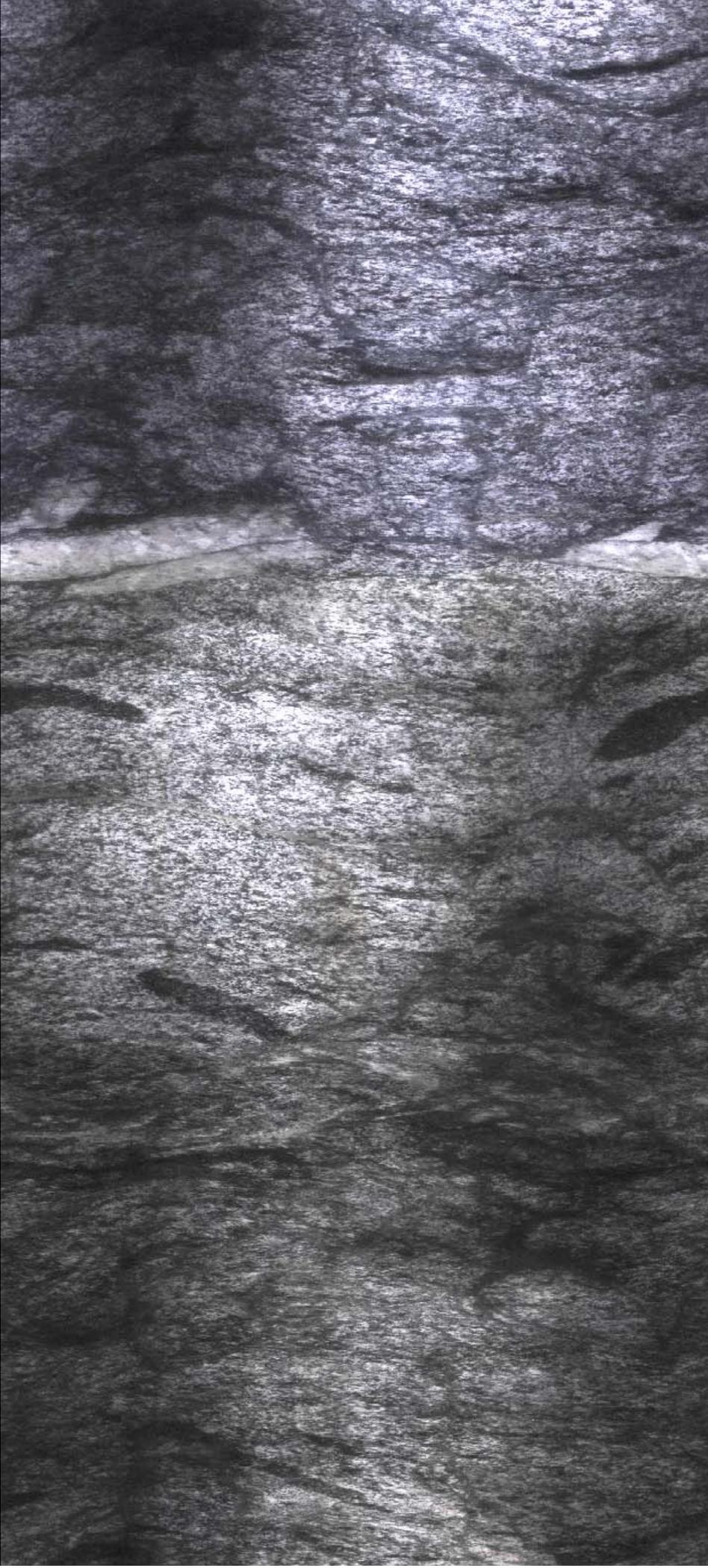


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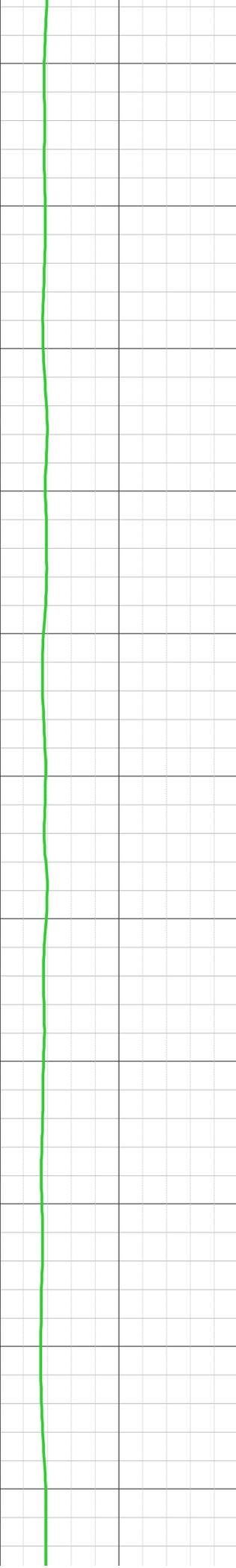




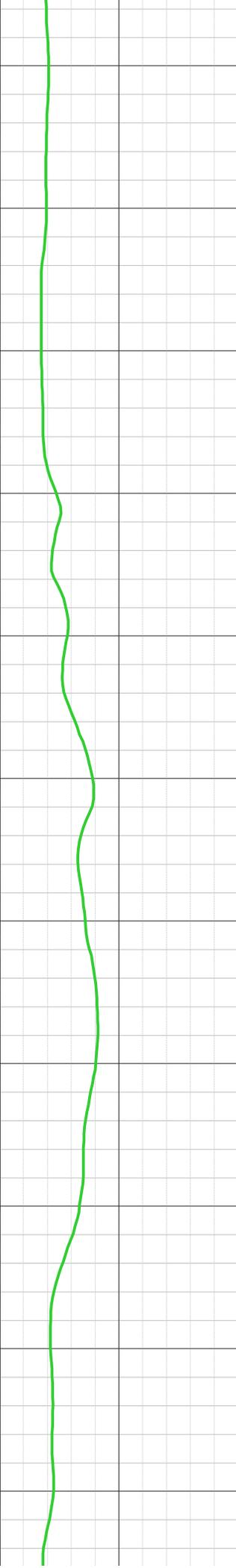
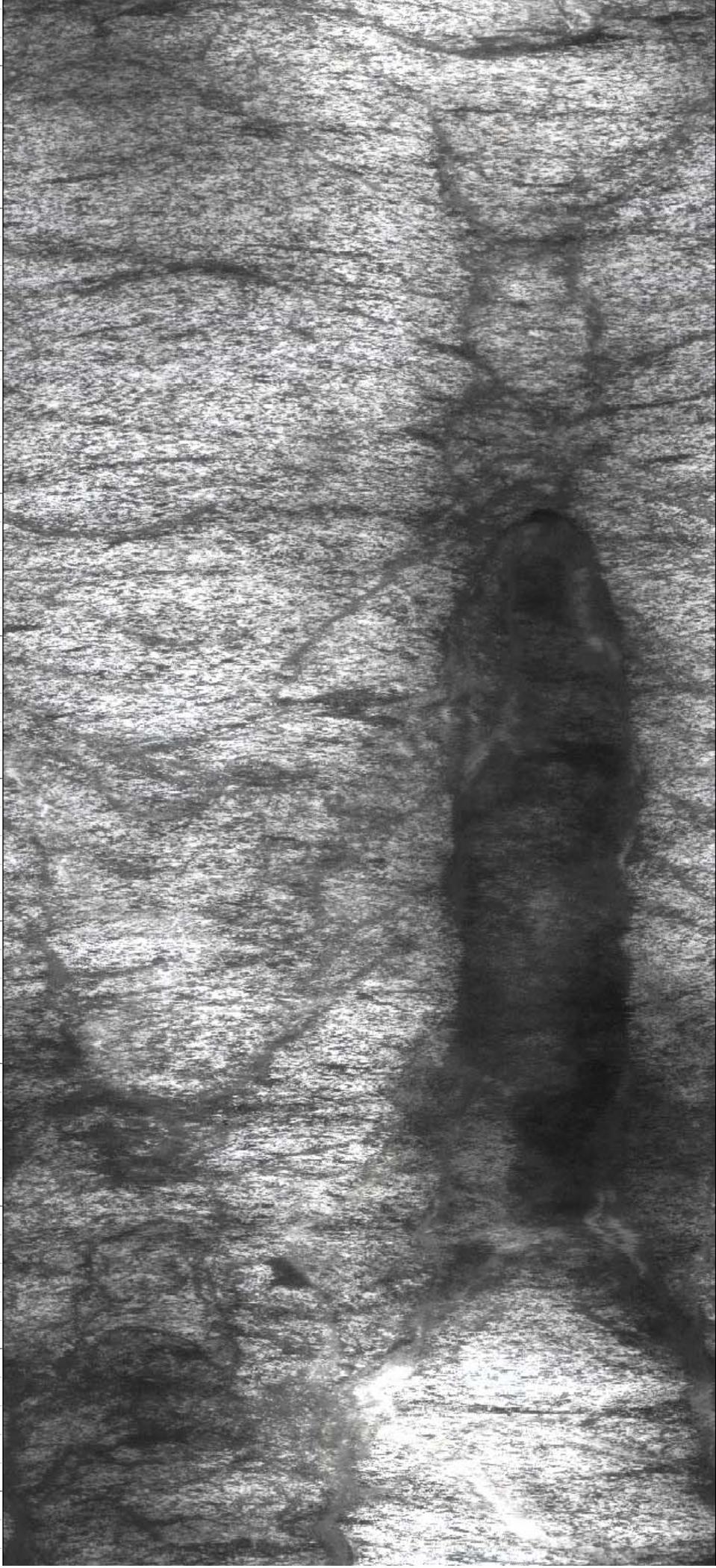
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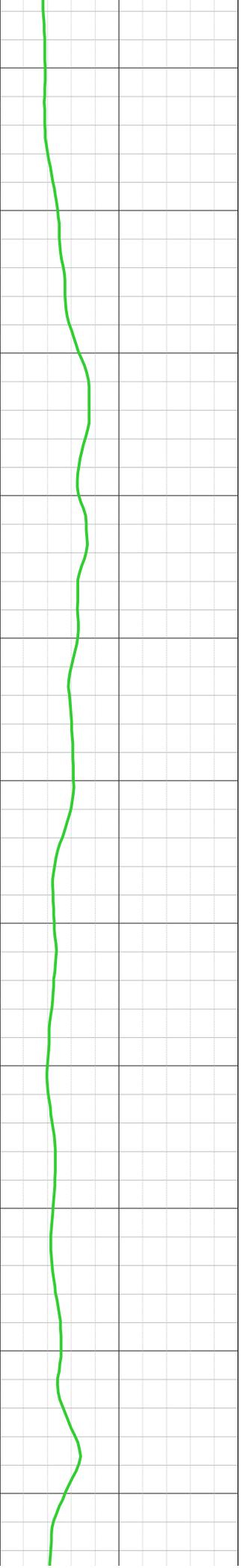
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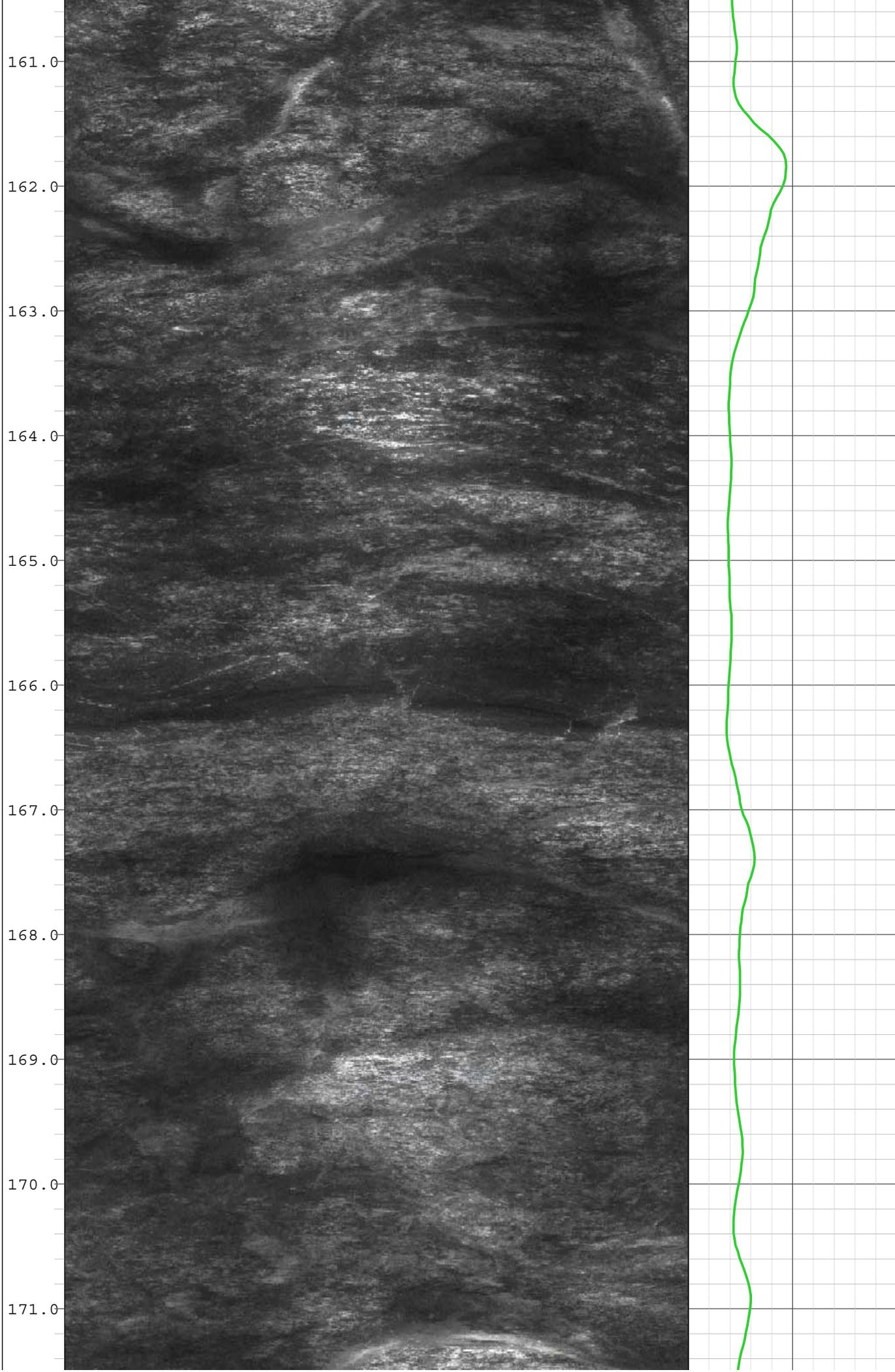


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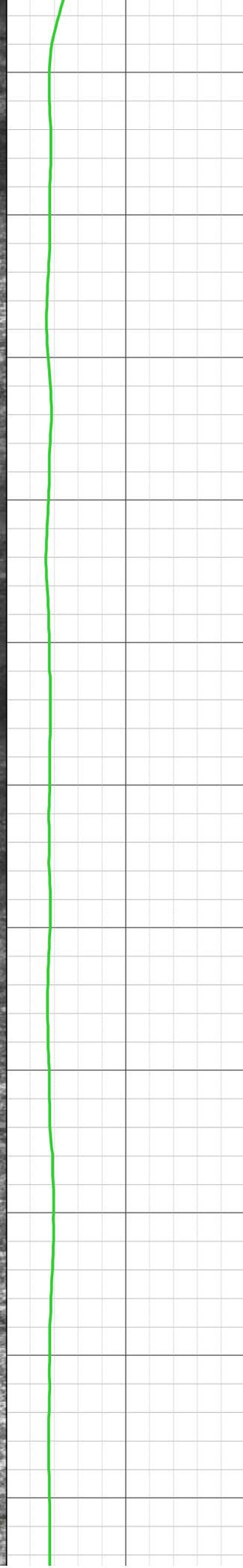
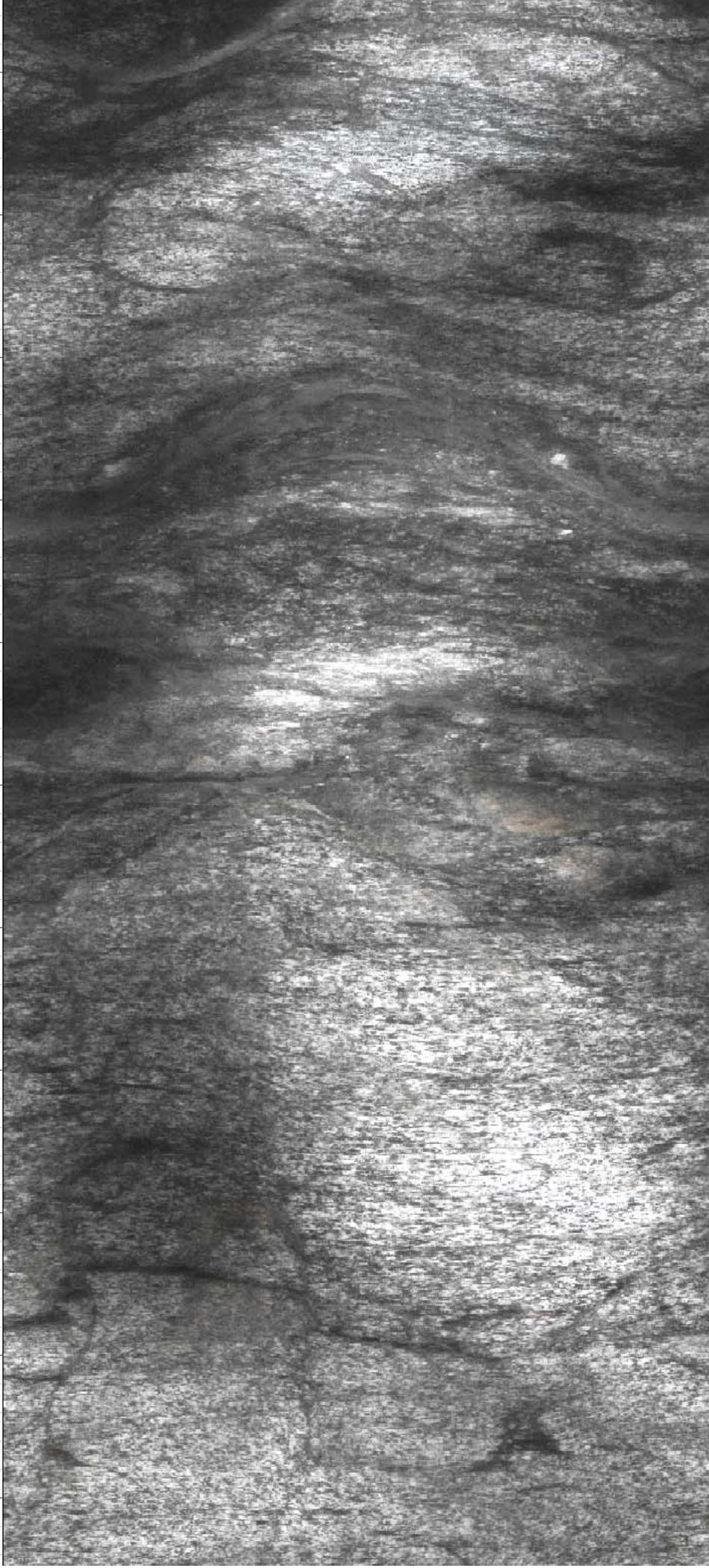


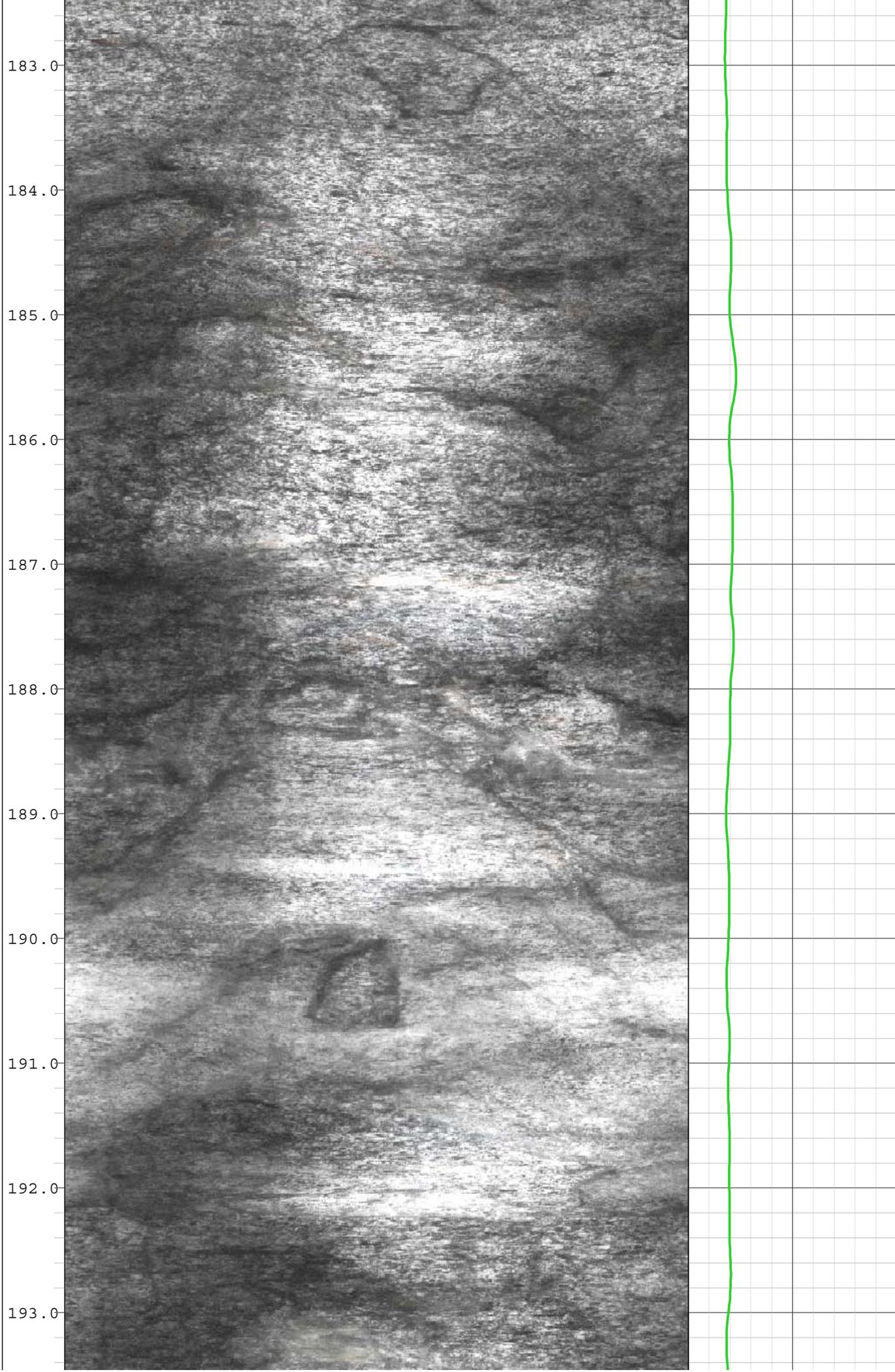
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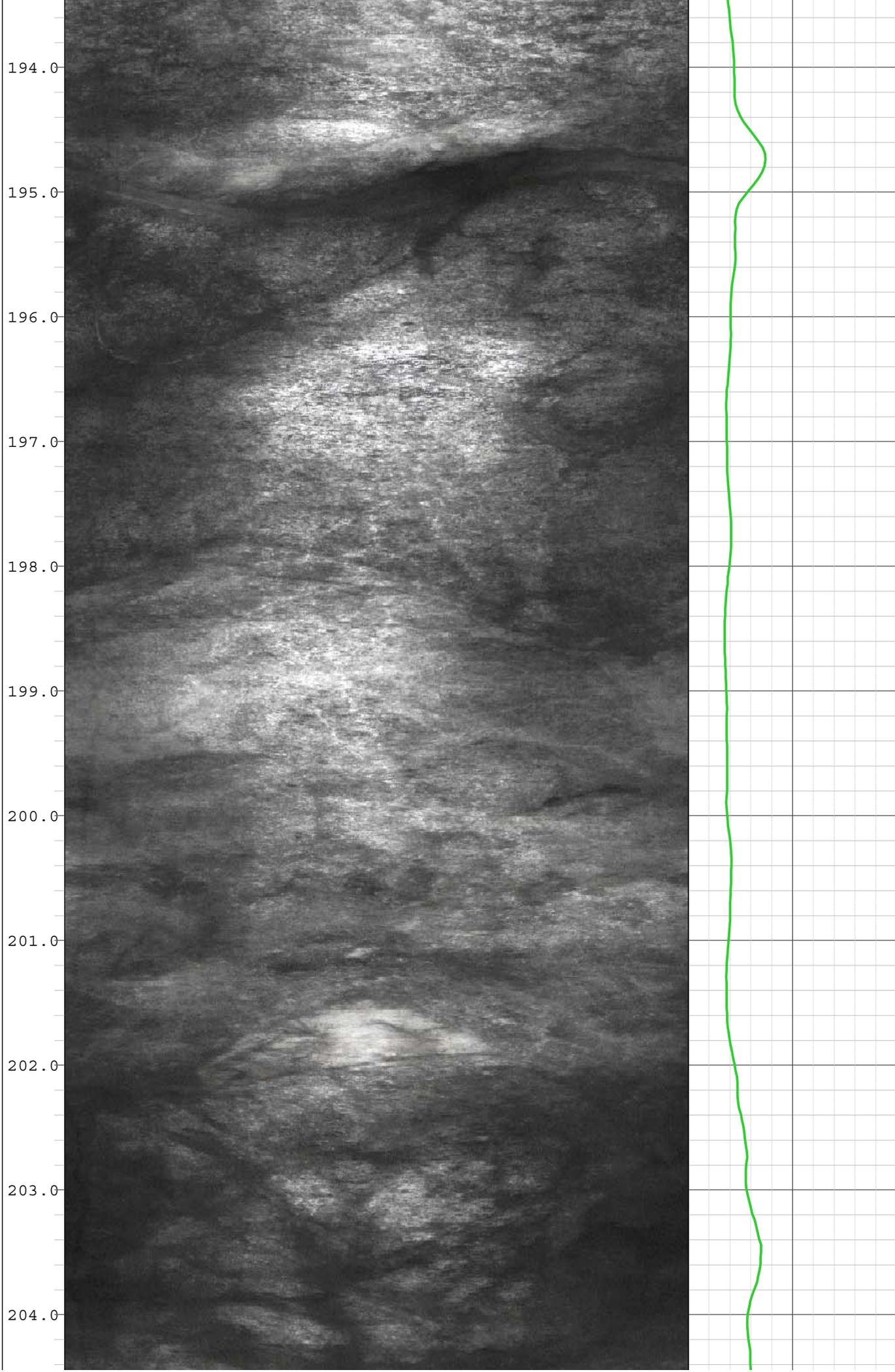


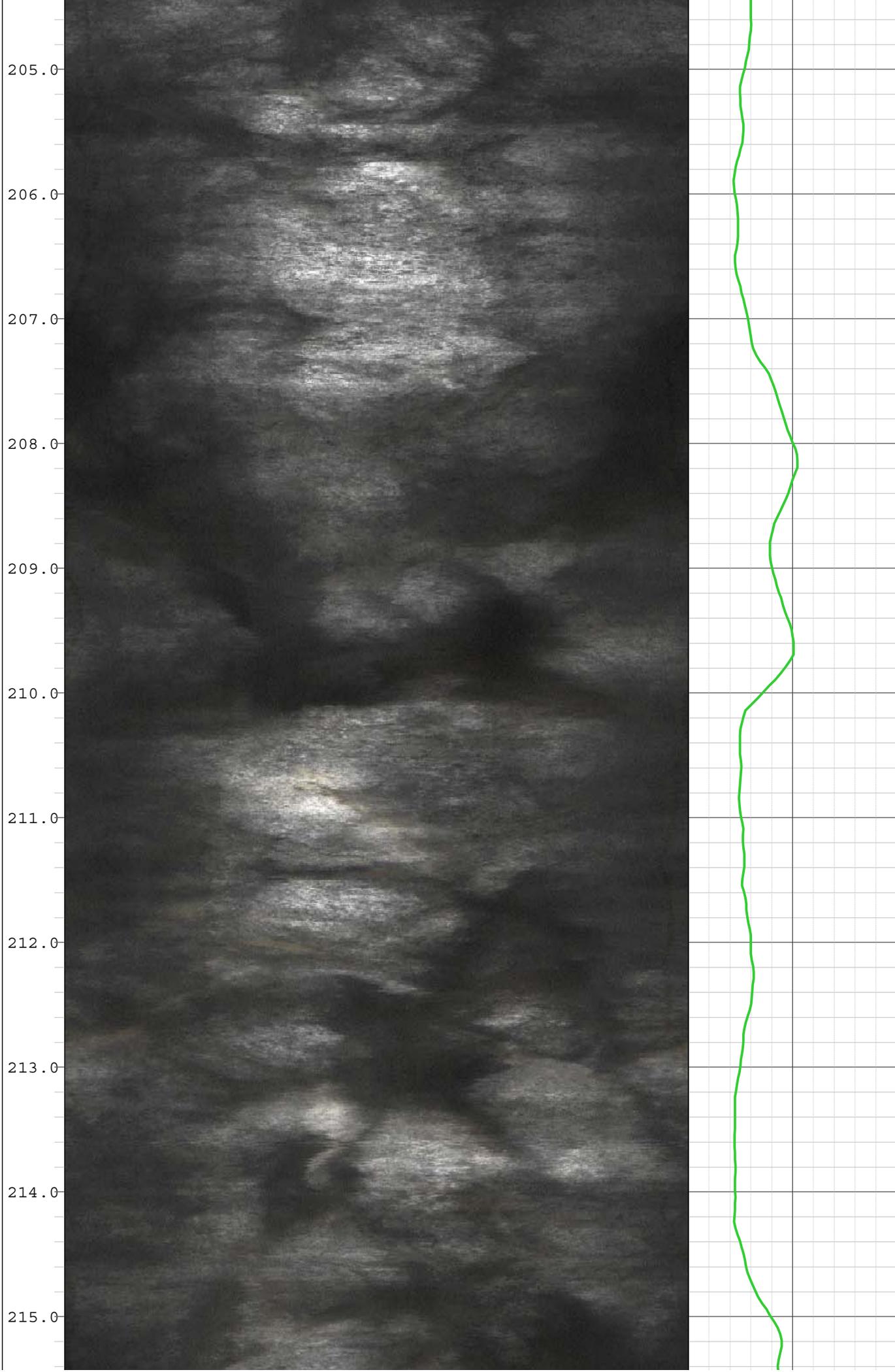


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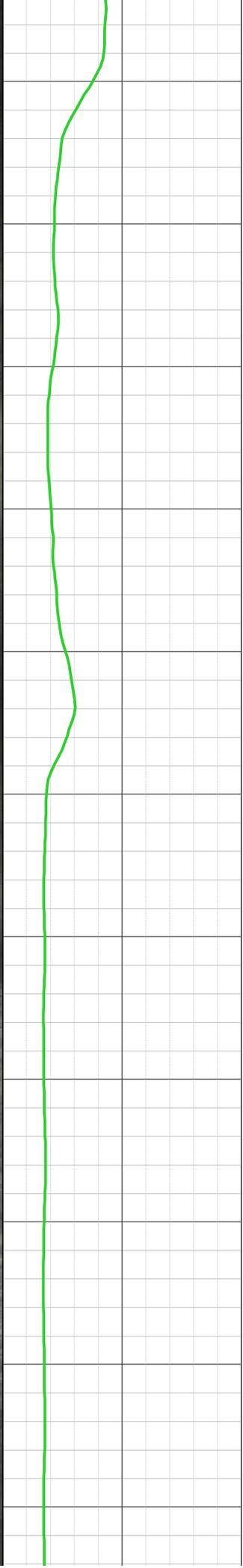




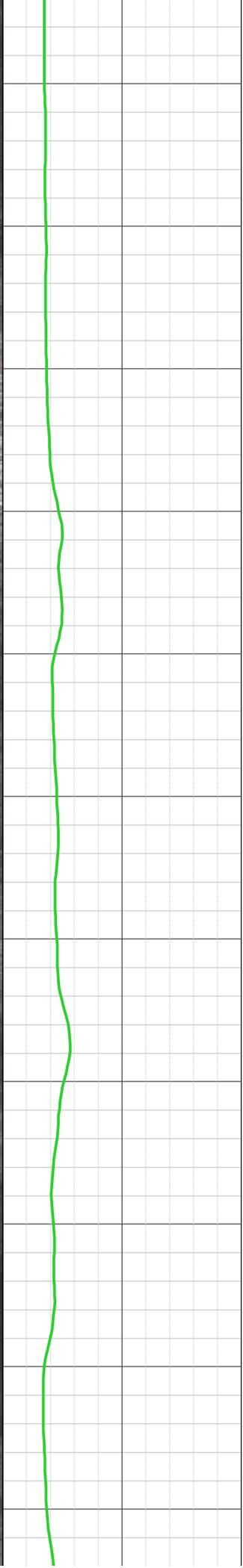




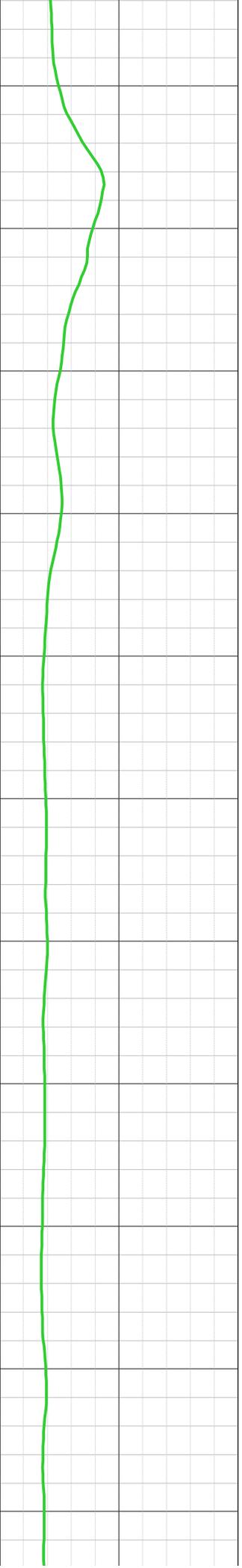
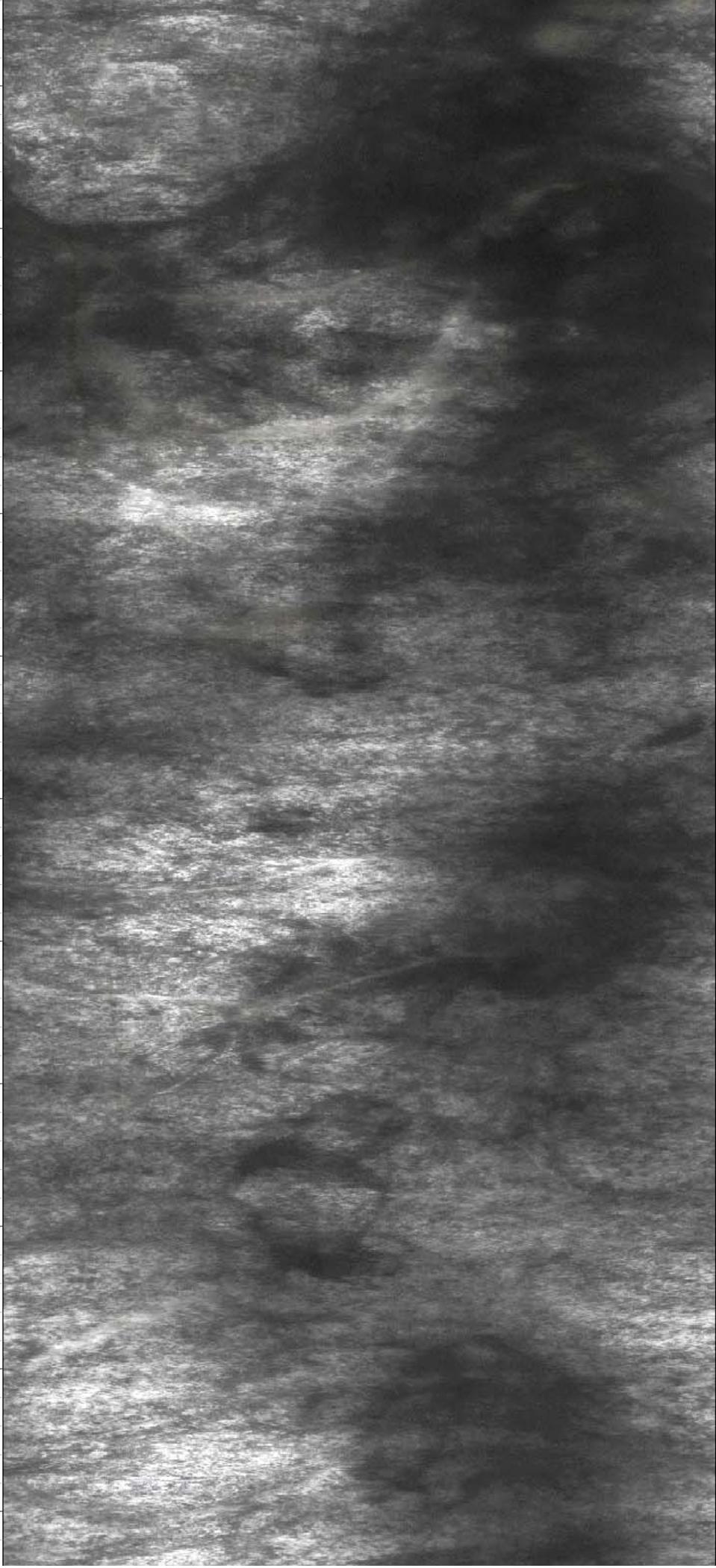
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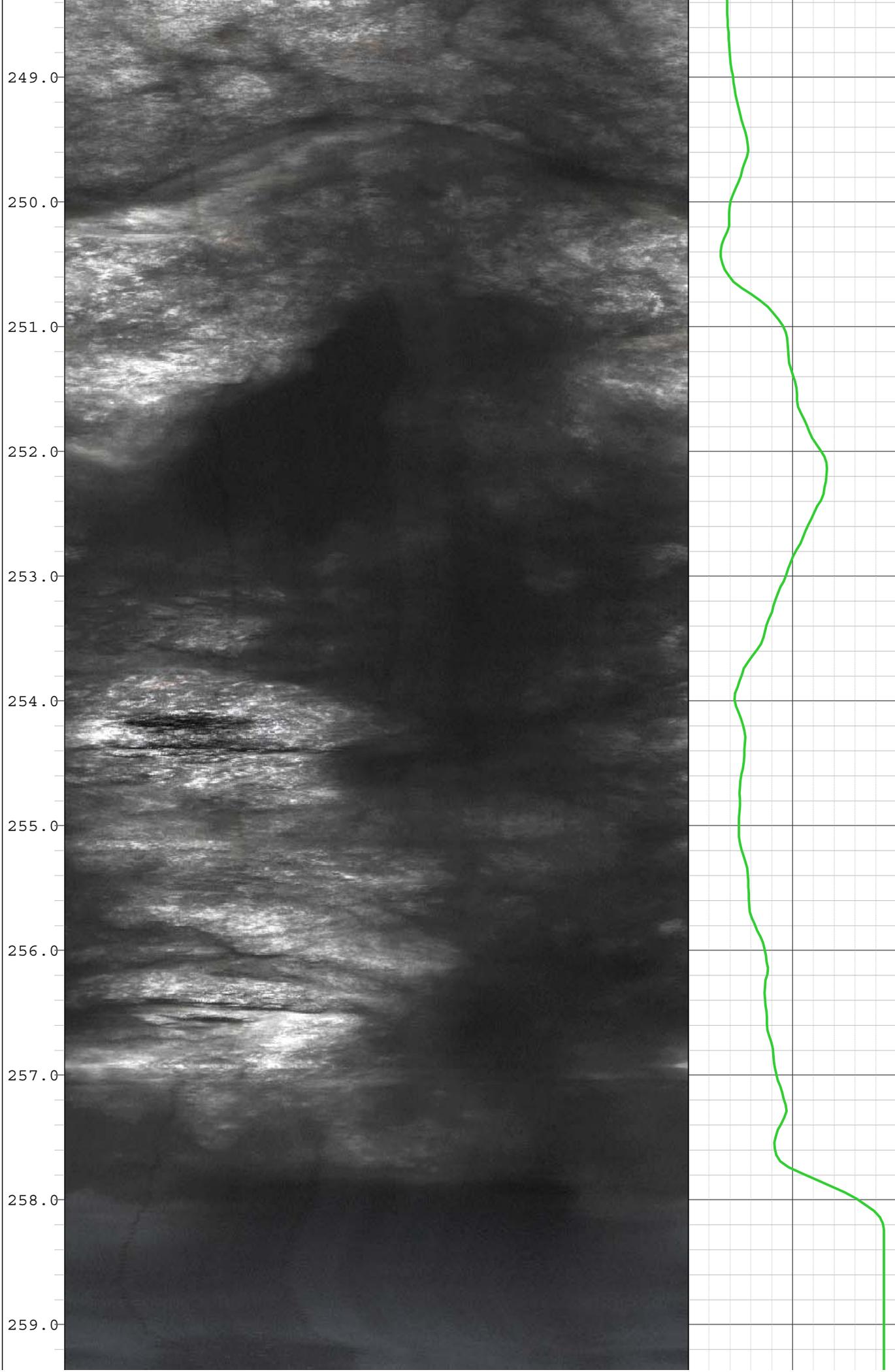


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# SOIL CONTROL LAB

42 HANGAR WAY  
WATSONVILLE  
CALIFORNIA  
95076  
USA

Balance Hydrologics Inc.  
841 Folger Avenue  
Berkeley, CA 94710-2800  
Attn: Mark Woysner

Work Order #: 8020627  
Reporting Date: March 30, 2008

Date Received: February 25, 2008  
Project # / Name: 207220 / MWSD  
Water System #: NA  
Sample Identification: 207220 TAGM & TAM (Filtered for metals), sampled 2/22/2008 12:00:00AM  
Sampler Name / Co.: Gustavo Porras / Balance Hydrologics  
Matrix: Water  
Laboratory #: 8020627-01

	Results	Units	RL	State Drinking Water Limits †	Analysis Method	Date Analyzed	Flags
<b>General Mineral</b>							
pH	8.3	pH Units	0.1	-	EPA 150.1	02/25/08	
Specific Conductance (EC)	1300	uS/cm	1.0	1600	EPA 120.1	02/25/08	
Hydroxide as OH	ND	mg/L	2.5	-	EPA 310.1	02/25/08	
Carbonate as CO3	ND	mg/L	2.5	-	EPA 310.1	02/25/08	
Bicarbonate as HCO3	160	mg/L	2.5	-	EPA 310.1	02/25/08	
Total Alkalinity as CaCO3	130	mg/L	2.5	-	EPA 310.1	02/25/08	
Hardness	190	mg/L	5.0	-	SM 2340 B	02/28/08	
* Total Dissolved Solids	1500	mg/L	20	1000	EPA 160.1	02/28/08	
Nitrate as NO3	4.6	mg/L	2.5	45	EPA 300.0	02/26/08	H-01
Chloride	320	mg/L	5.0	500	EPA 300.0	02/26/08	
Sulfate as SO4	40	mg/L	5.0	500	EPA 300.0	02/26/08	
* Fluoride	1.7	mg/L	0.50	1	EPA 300.0	02/26/08	
Total Calcium (Ca)	31	mg/L	0.50	-	EPA 200.7	02/28/08	
Total Magnesium (Mg)	27	mg/L	0.50	-	EPA 200.7	02/28/08	
Total Potassium (K)	8.0	mg/L	0.50	-	EPA 200.7	02/28/08	
Total Sodium (Na)	210	mg/L	2.5	-	EPA 200.7	02/28/08	
Total Iron (Fe)	ND	ug/L	50	300	EPA 200.7	02/28/08	
Total Manganese (Mn)	23	ug/L	20	50	EPA 200.7	02/28/08	
Total Copper (Cu)	ND	ug/L	50	1000	EPA 200.7	02/28/08	
Total Zinc (Zn)	ND	ug/L	50	5000	EPA 200.7	02/28/08	
<b>Inorganics</b>							
Total Arsenic (As)	ND	ug/L	2.0	10	EPA 200.8	03/06/08	
Total Barium (Ba)	ND	ug/L	100	1000	EPA 200.7	02/28/08	
Total Boron (B)	180	ug/L	100	-	EPA 200.7	02/28/08	

RL - are levels down to which we can quantify with reliability, a result below this level is reported as "ND" for Not Detected.

State Drinking Water Limits - as listed by California Administrative Code, Title 22.

\* - a \* in the left hand margin of the report means that particular constituent is above the California Drinking Water Limits.

# SOIL CONTROL LAB

42 HANGAR WAY  
WATSONVILLE  
CALIFORNIA  
95076  
USA

Balance Hydrologics Inc.  
841 Folger Avenue  
Berkeley, CA 94710-2800  
Attn: Mark Woyshner

Work Order #: 8020627  
Reporting Date: March 30, 2008

Date Received: February 25, 2008  
Project # / Name: 207220 / MWSD  
Water System #: NA  
Sample Identification: 207220 TAGM & TAM (Filtered for metals), sampled 2/22/2008 12:00:00AM  
Sampler Name / Co.: Gustavo Porras / Balance Hydrologics  
Matrix: Water  
Laboratory #: 8020627-01

	Results	Units	RL	State Drinking Water Limits 1	Analysis Method	Date Analyzed	Flags
<b>Inorganics</b>							
Total Cadmium (Cd)	ND	ug/L	1.0	5	EPA 200.8	03/06/08	
Total Chromium (Cr)	ND	ug/L	1.0	50	EPA 200.8	03/06/08	
Cyanide (total)	ND	ug/L	100	200	SM 4500-CN F	03/20/08	
Total Lead (Pb)	ND	ug/L	5.0	-	EPA 200.8	03/06/08	
Total Mercury (Hg)	ND	ug/L	1.0	2	EPA 245.1	03/07/08	
Total Selenium (Se)	ND	ug/L	5.0	50	EPA 200.8	03/06/08	
Total Silver (Ag)	ND	ug/L	10	100	EPA 200.7	02/28/08	
MBAS (Surfactants)	ND	mg/L	0.025	0.5	EPA 425.1	02/27/08	
Total Aluminum (Al)	ND	ug/L	50	1000	EPA 200.7	02/28/08	
Total Antimony (Sb)	ND	ug/L	6.0	6	EPA 200.8	03/06/08	
Total Beryllium (Be)	ND	ug/L	1.0	4	EPA 200.7	02/28/08	
Total Nickel (Ni)	ND	ug/L	10	100	EPA 200.7	02/28/08	
Total Thallium (Tl)	ND	ug/L	1.0	2	EPA 200.8	03/06/08	
Nitrite as N	ND	mg/L	0.50	-	EPA 300.0	02/26/08	H-01

RL - are levels down to which we can quantify with reliability, a result below this level is reported as "ND" for Not Detected.  
State Drinking Water Limits: - as listed by California Administrative Code, Title 22.  
\* - a \* in the left hand margin of the report means that particular constituent is above the California Drinking Water Limits.

*Mike Galloway*

## ATTACHMENT 2



# Balance Hydrologics, Inc.

841 Folger Ave. • Berkeley, CA 94710-2800 • (510) 704-1000  
 224 Walnut Ave., Ste. E • Santa Cruz, CA 95060-3836 • (831) 457-9900  
 281 Nevada St. • Auburn, CA 95603-4617 • (530) 887-9988  
 www.balancehydro.com • email: office@balancehydro.com

## Invoice

Montara Water & Sanitary District  
 P.O. Box 370131  
 8888 Cabrillo Highway  
 Montara, CA 94037

*UI*

Date	Invoice #
12/27/2007	207220-1207

*Water Fund*

JOB DESCRIPTION
Drilling Loma Vista Site

P.O.#	
PROJ. MGR.	PROJECT NUMBER
MRW	207220

Description	Hours	Rate	Amount
Principal	5.5	170.00	935.00
Professional Services Total			935.00
Reimbursable Expense:			
Subsurface drilling permit application (San Mateo County)		480.00	480.00
Main Activities:			
1. Emails and coordination with Maggiora to prepare scope.			
2. Prepare and submit permit application to Paresh at San Mateo County.			
3. Respond to question with Paresh.			
4. Receive County permit and call with Maggiora to organize drilling.			
Billing Period: 10/21/07 to 12/15/07			

PLEASE REMIT TO THE BERKELEY ADDRESS ABOVE.

### TOTAL THIS INVOICE

**\$1,415.00**

Questions regarding progress of work may be directed to the Project Manager (initials above). Questions regarding billing and payment should be directed to the Accounts Manager @ (510)704-1000 x200. Questions regarding certificate of insurance should contact Rachel Boitano @ (510)704-1000 x245.

*Total Due as of Invoice Date*

*\$1,415.00*

1/3/2008  
Inv. 207220-1207 Drilling Loma Vista Site 10420.50 1,415.00  
Inv. 206130-1207 MWSD: Gaging and Monitoring 8897.01 4,165.10

1006.00 Water Gen. Corporation 5,580.10





# Balance Hydrologics, Inc.

841 Folger Ave. · Berkeley, CA 94710-2800

841 Folger Ave. · Berkeley, CA 94710-2800 · (510) 704-1000  
224 Walnut Ave., Ste. E · Santa Cruz, CA 95060-3836 · (831) 457- 9900  
281 Nevada St. · Auburn, CA 95603-4617 · (530) 887-9988  
www.balancehydro.com · e-mail: mho@balancehydro.com

## Invoice

Montara Water & Sanitary District  
P.O. Box 370131  
8888 Cabrillo Highway  
Montara, CA 94037

RECEIVED  
MAR 6 2008  
BY: *GI*

Date	Invoice #
3/3/2008	207220-0208

*Prop 50 grant*

<b>JOB DESCRIPTION</b>
Drilling Loma Vista Site

P.O.#	
PROJ. MGR.	PROJECT NUMBER
MRW	207220

Description	P.O.#		
	Hours	Rate	Amount
Principal	7.5	170.00	1,275.00
Staff Professional	67	110.00	7,370.00
Professional Services Total			8,645.00
Reimbursable Expense:			
141 miles 4x4 @ \$0.61/mile			86.01
592 miles @ \$0.58/mile			343.36
Main Activities:			
1. Scheduling with Tim & Mark.			
2. Pre-field planning with driller.			
3. Site visit on 1/21 to mobilize driller.			
4. Drilling site visits: 2/5, 2/6, 2/7, 2/11, 2/12, 2/14 & 2/15 – begin drilling to 105 feet and continue over course of site visits to drill to 320 feet below ground surface.			
Billing Period: 12/16/07 to 2/16/08			

**We're Moving! Effective 03/31/08**  
**Balance Hydrologics, Inc.**  
**800 Bancroft Way, Suite 101**  
**Berkeley, California 94710-2227**

PLEASE REMIT TO THE BERKELEY ADDRESS ABOVE.

Questions regarding progress of work may be directed to the Project Manager (initials above). Questions regarding billing and payment should be directed to the Accounts Manager @ (510)704-1000 x200. Questions regarding certificate of insurance should contact Rachel Boitano @ (510)704-1000 x245.

<b>TOTAL THIS INVOICE</b>	<b>\$9,074.37</b>
<i>Total Due as of Invoice Date</i>	<i>\$9,074.37</i>

MONTARA WATER & SANITARY DISTRICT

WATER FUND ACCOUNT  
Balance Hydrologics

3/6/2008

6182

Inv. 206130-0108	> 8897.01	4,721.50
Inv. 206131-0108		2,740.00
Inv. 207220-0208	8880.00	9,074.37

1006.00 Water Gen. Gaging and Monitoring, Alta Vista Well Permitting

16,535.87





# Balance Hydrologics, Inc.

841 Folger Ave. · Berkeley, CA 94710-2800

841 Folger Ave. · Berkeley, CA 94710-2800 · (510) 704-1000  
224 Walnut Ave., Ste. E · Santa Cruz, CA 95060-3836 · (831) 457- 9900  
281 Nevada St. · Auburn, CA 95603-4617 · (530) 887-9988  
www.balancehydro.com · e-mail: mbo@balancehydro.com

*CH 4/8/08 Water*

## Invoice

Montara Water & Sanitary District  
P.O. Box 370131  
8888 Cabrillo Highway  
Montara, CA 94037

Date	Invoice #
4/1/2008	207220-0308

JOB DESCRIPTION
Drilling Loma Vista Site

P.O.#		
PROJ. MGR.	PROJECT NUMBER	
MRW	207220	
Hours	Rate	Amount
6	170.00	1,020.00
0.5	145.00	72.50
67	110.00	7,370.00
Professional Services Total		8,462.50
Reimbursable Expenses:		
334 miles @ \$0.58/mile - 5x		193.72
Ziplock bags, ice		12.02
Fedex -2x		91.03
Borehole Logging - Norcal Geophysical Consultants, Inc.		3,266.00

Description
Principal
Senior Professional
Staff Professional
Professional Services Total
Reimbursable Expenses:
334 miles @ \$0.58/mile - 5x
Ziplock bags, ice
Fedex -2x
Borehole Logging - Norcal Geophysical Consultants, Inc.
Main Activities:
1. Drilling site visits: 2/19, 2/20, 2/21, 2/22, 2/25 – drilling observation; completed borehole drilling to 660 feet below ground surface.
2. Work with NorCal Geophysical to log borehole.
3. Water quality sampling for Title 22 analytical results.
4. Preparation of boring log and memo report.
Billing Period: 2/17/08 to 3/15/08

**We're Moving! Effective 04/28/08**  
**Balance Hydrologics, Inc.**  
**800 Bancroft Way, Suite 101**  
**Berkeley, California 94710-2227**

PLEASE REMIT TO THE BERKELEY ADDRESS ABOVE.

Questions regarding progress of work may be directed to the Project Manager (initials above). Questions regarding billing and payment should be directed to the Accounts Manager @ (510)704-1000 x200. Questions regarding certificate of insurance should contact Rachel Boitano @ (510)704-1000 x245.

<b>TOTAL THIS INVOICE</b>	<b>\$12,025.27</b>
<i>Total Due as of Invoice Date</i>	<i>\$12,025.27</i>

**MONTARA WATER & SANITARY DISTRICT**

WATER GENERAL ACCOUNT  
Balance Hydrologics

5/1/2008

6267

6499.20

Inv. 207220-0308 Drilling Loma Vista Site  
Inv. 206131-0308 Alta Vista Well Permitting  
Inv. 206130-0308 Gaging and Monitoring

> 8897.01

12,025.27  
1,080.50  
55.00

1006.00 Water Gen. Billing Period 2/17-3/15 2008

13,160.77



CH 5/14/08



# Balance Hydrologics, Inc.

800 Bancroft Way, Suite 101 Berkeley, California 94710-2227  
 (510) 704-1000 • (510) 704-1001 fax  
 balancehydro.com • email: office@balancehydro.com  
 Berkeley • Auburn • Santa Cruz • San Rafael • Truckee

## Invoice

Montara Water & Sanitary District  
 P.O. Box 370131  
 8888 Cabrillo Highway  
 Montara, CA 94037

Date	Invoice #
5/9/2008	207220-0408

**JOB DESCRIPTION**  
 Drilling Loma Vista Site

P.O.#	
PROJ. MGR.	PROJECT NUMBER
MRW	207220

Description	Hours	Rate	Amount
Senior Principal	1.5	205.00	307.50
Principal	18	170.00	3,060.00
Staff Professional	4	110.00	440.00
Technical Typist	0.5	60.00	30.00
Professional Services Total			3,837.50
Reimbursable Expense:			
Lab analysis			319.70
Main Activities:			
1. Prepare final report and send to Clemens.			
2. Review water quality results.			
3. Conference call & email on 4/18 with Clemens.			
Billing Period: 3/16/08 to 4/19/08			

PLEASE REMIT TO THE BERKELEY ADDRESS ABOVE.

<b>TOTAL THIS INVOICE</b>	<b>\$4,157.20</b>
<i>Total Due as of Invoice Date</i>	<i>\$4,157.20</i>

Questions regarding progress of work may be directed to the Project Manager (initials above). Questions regarding billing and payment should be directed to the Accounts Manager @ (510)704-1000 x200. Questions regarding certificate of insurance should contact Rachel Boitano @ (510)704-1000 x245.

6/5/2008

6316

6311.00

Inv. 206131-0408 Alta Vista Well Permitting	8897.01	2,019.70
Inv. 207220-0408 Drilling Loma Vista Site	6433.00	4,157.20
Inv. 206130-0408 Gaging and Monitoring		1,031.48
Inv. 208055-0408 Alta Vista Real Time Rain Station		170.00
Inv. 205040-0508 General Services	6420.50	1,020.00
Inv. 206130-0508 Gaging and Monitoring	6311.00	6,310.60

1006.00 Water Gen.

14,708.98



Acc No.:

**MAGGIORA BROS. DRILLING, INC.**  
 DRILLING CONTRACTORS - PUMP SALES SERVICE  
 CALIFORNIA CONTACTORS'S LICENSE NO. 249957

Tel: (831) 724-1338  
 Tel: (800) 728-1480  
 Fax: (831) 724-3228

Corporate Office  
 595 Airport Blvd.  
 Watsonville, CA 95076

Customer PO#		<b>FINAL INVOICE</b>		Job #	71172-1
Date:	March 24, 2008	INVOICE #:	J08-040		
Customer:	Montara Water & Sanitation District	Contact:			
Mail address:	P.O. Box 370131	Phone:			
City, ST Zip:	Montara, CA 94037				

Owner of property:	Montara Water & Sanitation District	Phone:	
Owner 's address:	P.O. Box 370131		
	Montara, CA 94037		
Site Location:	Tierra Alta & Loma Vista, Moss Beach	Assessors parcel:	
Permit Agency:	San Mateo Co. Environmental Health	Permit Number:	WP6633

Item #	Drilling & Casing:	Diam. (in.)	Actual (ft.)	Unit Price	Per	Actual Item Price
1	Mobilization/demobilization (one charge per drilling rig)			\$2,500.00	ea.	\$2,500.00
2	Drilling permit	SAN MATEO	County	owner	ea.	owner
3	Exploratory drilling:					
	Type: Rotary	9	500	\$40.00	ft.	\$20,000.00
		9	140	\$46.00	ft.	\$6,440.00
	Borehole drilling			\$0.00	ft.	\$0.00
4	Hardrock hammer drill			\$0.00	ft.	\$0.00
5	Standby during e-log		1	\$250.00	hr.	\$250.00
6	Conductor casing	12	42	\$150.00	ft.	\$6,300.00
7	Borehole reaming:	17	0	\$50.00	ft.	\$0.00
8	Well casing installed:					
	Type: PVC	6	0	\$26.00	ft.	\$0.00
9	Screen installed:					
	Type: PVC	6	0	\$40.00	ft.	\$0.00
10	Gravel pack installed:					
	Type: Sand		0	\$12.00	ft.	\$0.00
11	Sanitary seal		0	\$0.00	ft.	\$0.00
	<b>Other Charges:</b>					
12	Water hauling cost		0	\$50.00	ea.	\$0.00
13	Water truck rental		0	\$95.00	hr.	\$0.00
14	Well development Type: Airlift		0	\$360.00	hr.	\$0.00
15	Test Pump Install & Removal		1	\$0.00	ea.	\$0.00
16	Test Pump Operation		72	\$0.00	hr.	\$0.00
17	Generator rental		0	\$0.00	day	\$0.00
18	Well disinfection (per treatment)			\$500.00	ea.	\$0.00
19	Abandonment of test hole		640	\$7.00	ft.	\$4,480.00
20	Stand-by time:			\$240.00	hr.	\$0.00
21	Hourly drilling rate (penetration rate < 8 ft./hr. for 2 hours)			\$320.00	hr.	\$0.00
22	Backhoe/Tractor rental (4 hr min)		0	\$95.00	hr.	\$0.00
23	Bentonite for mud drilling:		0	\$12.00	bag	\$0.00
24	Environmental bag		1	\$750.00	bag	\$750.00
25	Baker tank, 20,000 gals, Mob/Demob		0	\$4,000.00	ea.	\$0.00
26	Tank rental		0	\$50.00	day	\$0.00
27	Tank clean-up		0	\$1,500.00	ft.	\$0.00
TOTAL PRICE						\$40,720.00
Less: down payment						\$0.00
<b>BALANCE DUE</b>						<b>\$40,720.00</b>

**RECEIVED**  
 APR 1 2008  
 BY: *WTF*  
 Water Fund

WATER GENERAL ACCOUNT  
Maggiola Bros. Drilling, Inc.

4/3/2008

40,720.00

Exploratory Drilling

*6346.60*

1006.00 Water Gen. Tierra Alta & Loma Vista, Moss Beach

40,720.00