Midnite Mine Superfund Site
100 Percent Design

Appendix X – Remedial Design / Remedial Action Schedule

Disclaimer: This schedule represents the current anticipated sequence of remedial design/remedial action activities and estimated task durations. This schedule is subject to change based on the duration of Agency review of the remedial design, input from the selected remedial action contractor, and other external factors during the completion of the RD/RA process.

June 2015

Prepared for:

Dawn Mining Company
PO Box 250
Ford, Washington 990413

and

Newmont USA Limited
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X1.0 BACKGROUND 1

X2.0 ASSUMPTIONS 1

LIST OF ACRONYMS

BODR	Basis of Design Report
EPA	U.S. Environmental Protection Agency
RA	Remedial Action
RAWP	Remedial Action Work Plan
RD	Remedial Design

X1.0 BACKGROUND

The figure at the end of this appendix outlines the anticipated Remedial Action (RA) schedule as anticipated at the 100% remedial design (RD). This schedule was refined in the 90% Basis of Design Report (BODR) to include or clarify several activities discussed in the 90% BODR. The dates in the current schedule at the 100% design have been updated to depict the anticipated final design review and remedial action work plan (RAWP) preparation/submittal/approval processes. Once the RAWP is approved, the selected RA Contractor can mobilize to the Site and begin construction of the Selected Remedy.

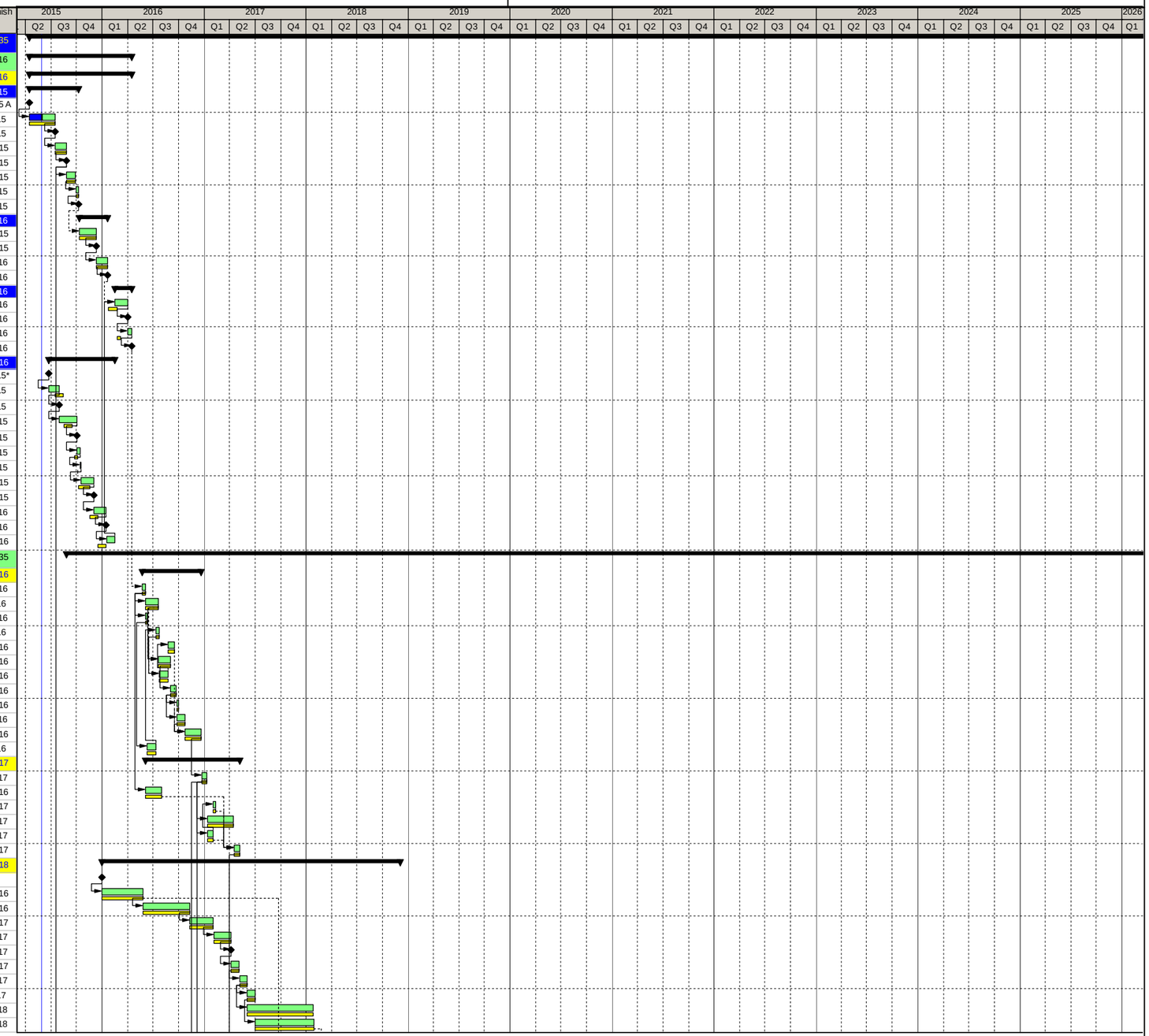
X2.0 ASSUMPTIONS

The 100% RD schedule is based on the following assumptions:

- The schedule is organized on a calendar-day basis (7 days per week). Work is anticipated to be on a one shift per day (10 hours per shift) basis, with critical activities (such as crushing of drain rock) conducted on a two shift per day basis. The calendar-day schedule includes time modifications in the activity durations to account for the actual number of shifts per week. This schedule is for purposes of estimating the project duration at this time, and actual work schedules will be coordinated and proposed by the selected Construction Contractor.
- The accuracy of the schedule decreases as activities are tracked from the beginning of construction through the end of construction. This means the schedule for activities in the 2015 and 2016 time period is more accurate than the schedule for activities near the end of construction (such as 2024).
- The schedule includes time for EPA review of subsequent documents. The time for permitting activities that can be conducted in parallel with the RA are not shown in the schedule.

The schedule follows the same format as that presented in Appendix X of the 90% BODR. The green bars (remaining work) represent the schedule for the 100% design.

Activity ID	Activity Name	Predecessors	Successors	Actual Start	Actual Finish
1011322b	**Midnite Mine Remedial Design/Remedial Action**			14-Apr-15 A	02-Aug-35
1011322b.01	**Midnite Mine - Remedial Design**			14-Apr-15 A	15-Apr-16
1011322b.01.01	**Design and Remedial Action Work Plan - Midnite Mine Remedy**			14-Apr-15 A	15-Apr-16
1011322b.01.01.01	**100% Design - Midnite Mine Remedy**			14-Apr-15 A	09-Oct-15
A0330	EPA Submits Comments on 90% Design to SDs		A0400		14-Apr-15 A
A0400	Prepare Midnite Mine 100% Design	A0330	A0410	15-Apr-15 A	15-Jul-15
A0410	Submit Midnite Mine 100% Design	A0400	A0420		15-Jul-15
A0420	EPA Reviews Midnite Mine 100% Design	A0410	A0430	16-Jul-15	26-Aug-15
A0430	EPA Submits Comments on 100% Design	A0420	A1900, A0440		26-Aug-15
A0440	SDs Prepare RTCs and Revised 100% Design	A0430	A0450	27-Aug-15	25-Sep-15
A0450	EPA Provides Final Review	A0440	A0460	28-Sep-15	09-Oct-15
A0460	EPA Approves Midnite Mine 100% Design	A0450	A0500		09-Oct-15
1011322b.01.01.02	**Midnite Mine Remedial Action Work Plan Preparation**			12-Oct-15	21-Jan-16
A0500	Prepare Draft Final RAWP	A0460	A0505	12-Oct-15*	10-Dec-15
A0505	Submit Draft Final RAWP	A0500	A0510		10-Dec-15
A0510	EPA Review of Draft Final RAWP	A0505	A0515	11-Dec-15	21-Jan-16
A0515	EPA Submits Comments on Draft Final RAWP	A0510	A0520		21-Jan-16
1011322b.01.01.03	**Selected CC and MWH Prepares Final RAWP**			15-Feb-16	15-Apr-16
A0520	Prepare Final RAWP	A0515, A0595	A0525	15-Feb-16	01-Apr-16
A0525	Submit Final RAWP	A0520	A0530		01-Apr-16
A0530	EPA Reviews Final RAWP	A0525	A0535	02-Apr-16	15-Apr-16
A0535	EPA Accepts Final RAWP	A0530	A0700		15-Apr-16
1011322b.01.01.04	**Settling Defendants (SDs) Procurement Process**			24-Jun-15	15-Feb-16
A0540	SDs Issue a Request for Information (RFI)		A0545		24-Jun-15*
A0545	Prospective Construction Contractors (CCs) Prepare Responses	A0540	A0550	24-Jun-15	31-Jul-15
A0550	CCs Submit RFI Response to SDs	A0545	A0555		31-Jul-15
A0555	SDs Review RFI Response	A0550	A0560	31-Jul-15	01-Oct-15
A0560	SDs Send Out a Request for Proposal (RFP)	A0555	A0565		01-Oct-15
A0565	CCs Review RFP and Prepare for Site Walk	A0560	A0570	01-Oct-15	14-Oct-15
A0570	SDs Conduct Site Walk	A0565	A0575	15-Oct-15	15-Oct-15
A0575	CCs Continue Preparing Proposals (Bids)	A0570	A0580	16-Oct-15	01-Dec-15
A0580	CCs Submit Proposals to SDs	A0575	A0585		01-Dec-15
A0585	SDs Review Proposals (Bids)	A0580	A0590	02-Dec-15	15-Jan-16
A0590	SDs Select CC	A0585	A0595		15-Jan-16
A0595	Contract Negotiations and Award	A0590	A0520	18-Jan-16	15-Feb-16
1011322b.02	**Midnite Mine - Remedial Action**			27-Aug-15	02-Aug-35
1011322b.02.01	**Site Preparation - Early Works**			24-May-16	21-Dec-16
A0700	Mobilization to WTP Site	A0535	A0710, A0720, A0810	24-May-16*	02-Jun-16
A0710	West Access Road, CSZ, and White Tail Creek Cleanup	A0700	A0750, A0740	03-Jun-16	20-Jul-16
A0720	Building Demolition and Disposal	A0700	A0740, A0790	03-Jun-16	09-Jun-16
A0730	Relocate South Topsoil Stockpiles	A0790	A0750	12-Jul-16	23-Jul-16
A0735	Relocate North Topsoil Stockpiles	A0750	A0780	25-Aug-16	14-Sep-16
A0740	Site Access Road Construction	A0720, A0710	A0760	21-Jul-16*	01-Sep-16
A0750	CSZ Site Grading	A0710, A0730	A0735	23-Jul-16	24-Aug-16
A0760	CSZ Utilities and Fencing	A0740	A0770, A0765	02-Sep-16	22-Sep-16
A0765	Mobillization to CSZ	A0760	A0780	23-Sep-16	29-Sep-16
A0770	CSZ Foundations and Paving	A0760	A0780	23-Sep-16	22-Oct-16
A0780	Installation of Contractor Facilities	A0735, A0770, A0765	A0800	23-Oct-16	21-Dec-16
A0790	Well Abandonment	A0720	A0730	10-Jun-16	12-Jul-16
1011322b.02.02	**Pit #4 Construction Preparation - Phase 1**			03-Jun-16	06-May-17
A0800	Mobilization	A0780	A1000, A0830, A1085, A0840	22-Dec-16	10-Jan-17
A0810	Pit #4 Wall Scaling and Ridge Grading	A0700	A0850	03-Jun-16	01-Aug-16
A0820	Develop Area 5 for Stockpiling	A0840	A0850	01-Feb-17	10-Feb-17
A0830	Pump Pit #4 Water to Pit #3	A0800	A0850	11-Jan-17	15-Apr-17
A0840	Develop Haul Roads - Pit #4 (Including tree removal)	A0800	A0850, A0820	11-Jan-17	31-Jan-17
A0850	Pit #4 Bottom Grading & Clean Out (includes Pit Scaling Material)	A0830, A0840, A0810, A0820	A1100	16-Apr-17	06-May-17
1011322b.02.03	**Final Design/Construction of WTP and Pipeline to Lake Roosevelt - Phase 1**			01-Jan-16	04-Dec-18
A0900	NPDES Permit Final		A0905	01-Jan-16*	
A0905	Prepare WTP 90% Design	A0900	A0910, A0960	01-Jan-16	26-May-16
A0910	EPA Review of 90% WTP Design	A0905	A0915	27-May-16	10-Nov-16
A0915	Prepare 100% WTP Design	A0910	A0920	11-Nov-16	02-Feb-17
A0920	EPA Reviews 100% WTP Design	A0915	A0925	03-Feb-17	06-Apr-17
A0925	EPA Approves 100% WTP Design	A0920	A0929		06-Apr-17
A0929	WTP Contract Negotiation and Execution	A0925	A0930	07-Apr-17	05-May-17
A0930	Mobilization of WTP Contractor	A0929	A0935, A0940	08-May-17	02-Jun-17
A0935	Pipeline - R/W Improvement and Stabilization	A0930	A0950	02-Jun-17	02-Jul-17
A0940	WTP Construction	A0930		02-Jun-17	24-Jan-18
A0950	Pipeline - Excavation, Laydown, Backfill	A0935	A0955	02-Jul-17	28-Jan-18



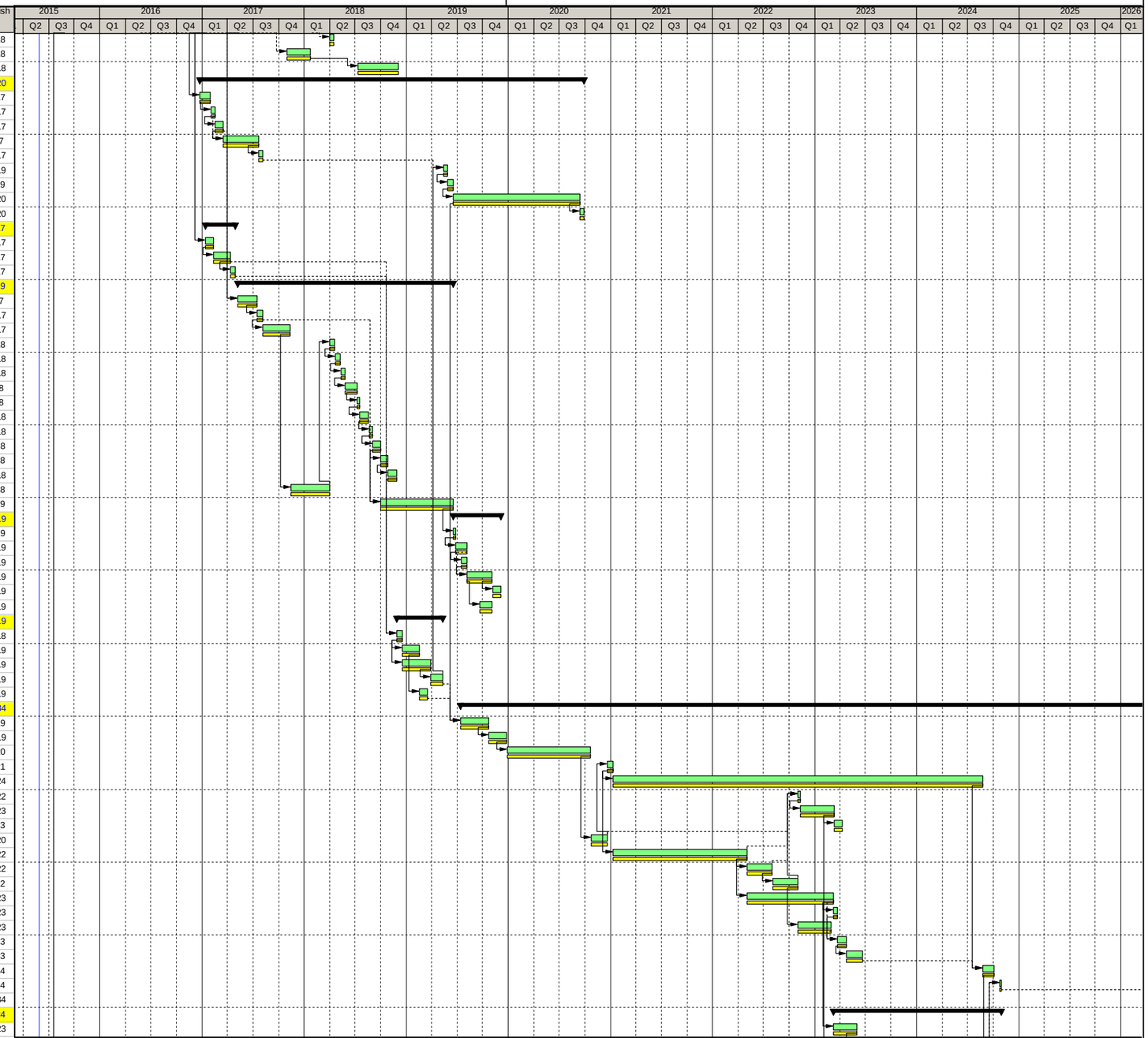
Completed Work
Remaining Work
Milestone
Summary
Project Baseline Bar

Midnite Mine Remedial Design/Remedial Action
Baseline Schedule

TASK filter: No WBS Summary.

(c) Primavera Systems, Inc.

Activity ID	Activity Name	Predecessors	Successors	Actual Start	Actual Finish
A0955	Pipeline - Marine Subcontractor Lay into Lake	A0950		01-Apr-18*	15-Apr-18
A0960	Winterization Design of Existing WTP - Optional	A0905	A0965	01-Nov-17*	23-Jan-18
A0965	Winterization Construction of Existing WTP - Optional	A0960		11-Jul-18	04-Dec-18
1011322b.02.04	**Modify Crushing - Two Set Ups - Phases 1 and 2**			22-Dec-16	28-Sep-20
A1000	Crusher Area - Move Ore Stockpile #7 to #6	A0800	A1010	22-Dec-16*	30-Jan-17
A1010	Crushing - Mobilization #1	A1000	A1020, A1030	31-Jan-17	14-Feb-17
A1020	Set Up Crusher & Test Run #1	A1010	A1030, A1100	15-Feb-17	16-Mar-17
A1030	Crushing Pit #4 Bottom Drain, Bedding	A1010, A1020	A1040	17-Mar-17	22-Jul-17
A1040	Crusher Demobilization #1	A1030	A1050	23-Jul-17	06-Aug-17
A1050	Crushing Mobilization #2	A1040, A1330	A1060	13-May-19	27-May-19
A1060	Set Up Crusher & Test Run #2	A1050	A1070	28-May-19	16-Jun-19
A1070	Crush Pit #3 Drain & Bedding	A1060	A1080, A1400	17-Jun-19	13-Sep-20
A1080	Crusher Final Demobilization	A1070		14-Sep-20	28-Sep-20
1011322b.02.05	**Alluvial Cutoff Trenches**			11-Jan-17	28-Apr-17
A1085	Mobilize Trench Contractor / Site Preparation	A0800	A1090	11-Jan-17*	09-Feb-17
A1090	Install Three Alluvial Cutoff Trenches	A1085	A1300, A1095	10-Feb-17	10-Apr-17
A1095	Install Monitoring Wells	A1090	A1300	11-Apr-17	28-Apr-17
1011322b.02.06	**Pit #4 Fill In - Phase 1**			07-May-17	18-Jun-19
A1100	Install Drain Rock / Bedding / Liner / Overliner	A0850, A1020	A1105	07-May-17	15-Jul-17
A1105	Slope Drains and Well Risers	A1100	A1110, A1180	16-Jul-17	04-Aug-17
A1110	Place Crushing Rejects in Pit 4	A1105	A1175	05-Aug-17	12-Nov-17
A1120	Rehandle Pit Floor & Scaling Material	A1175	A1125	03-Apr-18	20-Apr-18
A1125	Protore #1 to Pit #4	A1120	A1130	21-Apr-18	10-May-18
A1130	Protore #2 to Pit #4	A1125	A1135	11-May-18	25-May-18
A1135	Lime Protore #8 to Pit #4	A1130	A1140	26-May-18	09-Jul-18
A1140	Ore #3 to Pit #4	A1135	A1145	10-Jul-18	16-Jul-18
A1145	Protore #4 to Pit #4	A1140	A1150	17-Jul-18	19-Aug-18
A1150	Ore / Protore #5 to Pit #4	A1145	A1160	20-Aug-18	01-Sep-18
A1160	Ore #7 & Ore / Protore #8 to Pit #4	A1150	A1165, A1180	02-Sep-18	01-Oct-18
A1165	South Dump Pond Regrade and Debris to Pit #4	A1160	A1170	02-Oct-18	25-Oct-18
A1170	South Dump Pond Excavation to Pit #4	A1165	A1300	27-Oct-18	27-Nov-18
A1175	Pit #4 Overburden to Pit #4	A1110	A1120	13-Nov-17	02-Apr-18
A1180	Western Drainage Waste Rock to Pit #4	A1160, A1105	A1200	02-Oct-18	18-Jun-19
1011322b.02.07	**Pit #4 Cover - Phase 1**			19-Jun-19	04-Dec-19
A1200	Clean Haul Roads for Clean Cover, Topsoil	A1180	A1210	19-Jun-19	25-Jun-19
A1210	Geomembrane Cap	A1200	A1220, A1230	26-Jun-19	04-Aug-19
A1220	Preparation of Borrow Pit	A1210	A1230	17-Jul-19	06-Aug-19
A1230	Clean Cover & Topsoil, Downdrains & Channels	A1210, A1220	A1240, A1235	07-Aug-19	04-Nov-19
A1235	Install Permanent Influent Pipeline and Access Road from Pit 4	A1230		05-Nov-19	04-Dec-19
A1240	Pit #4 Revegetation (42.1 Acres)	A1230		21-Sep-19	04-Nov-19
1011322b.02.08	**Pit #3 Construction Preparation - Phase 2**			28-Nov-18	12-May-19
A1300	South Pond Liner and Spillway Installation	A1170, A1090, A1095	A1310, A1320	28-Nov-18*	18-Dec-18
A1310	SWPCC Installation Complete	A1300	A1340	19-Dec-18	16-Feb-19
A1320	Pit #3 Wall Scaling and Ridge Grading	A1300	A1330	19-Dec-18	28-Mar-19
A1330	Pit #3 Bottom Grading & Clean Out (includes pit scaling material)	A1320	A1400, A1050	29-Mar-19	12-May-19
A1340	Develop Pit #3 Haul Roads (includes tree removal)	A1310	A1400	17-Feb-19	18-Mar-19
1011322b.02.09	**Pit #3 Fill In - Phases 2 and 3**			15-Jul-19	29-Nov-34
A1400	Install Drain Rock / Bedding / Liner/ Overliner	A1330, A1340, A1070	A1405	15-Jul-19	22-Oct-19
A1405	Initial Slope Drains and Well Risers	A1400	A1410	23-Oct-19	26-Dec-19
A1410	Place Crushing Rejects in Pit 3	A1405	A1445	27-Dec-19	21-Oct-20
A1415	Rehandle Pit Floor & Scaling Material	A1445	A1420, A1450	21-Dec-20	09-Jan-21
A1420	Extend Slope Drains and Well Risers	A1415	A1490	10-Jan-21	23-Aug-24
A1430	Existing WTP Removal and Debris to Pit #3	A1450, A1460, A1445, A1455	A1435	01-Nov-22	10-Nov-22
A1435	East Waste Rock to Pit #3	A1430	A1440, A1595	11-Nov-22	10-Mar-23
A1440	Eastern Drainage Sediments to Pit #3	A1435		11-Mar-23	08-Apr-23
A1445	Hillside Foundation to Pit #3	A1410	A1415, A1430	22-Oct-20	20-Dec-20
A1450	Western Drainage and BPA Waste Rock to Pit #3	A1415	A1430, A1455, A1465	10-Jan-21	04-May-22
A1455	Western Drainage Sediments to Pit #3	A1450	A1460, A1430	05-May-22	02-Aug-22
A1460	Impacted Foundation Material to Pit #3	A1455	A1430, A1475	03-Aug-22	31-Oct-22
A1465	Cental Drainage Waste Rock to Pit #3	A1450	A1470, A1480, A1500	05-May-22	08-Mar-23
A1470	PCP Pond Removal #3	A1465	A1480	09-Mar-23	22-Mar-23
A1475	Construct Western Drainage Pond	A1460	A1480	01-Nov-22	28-Feb-23
A1480	South Dump Pond Removal to Pit #3	A1470, A1475, A1465	A1485	23-Mar-23	24-Apr-23
A1485	Central Drainage Sediments to Pit #3	A1480	A1490	25-Apr-23	20-Jun-23
A1490	Access Roads - Contaminated to Pit #3	A1485, A1420	A1530	24-Aug-24	02-Oct-24
A1495	Demo and Removal of Temporary Construction Support Facilities	A1530, A1550	A1496	24-Oct-24	30-Oct-24
A1496	West Pond Removal	A1495		27-Jul-34*	29-Nov-34
1011322b.02.10	**Cover - Phases 2 and 3**			09-Mar-23	29-Oct-24
A1500	Refine Pit #3 Cover Design	A1465	A1510	09-Mar-23	31-May-23



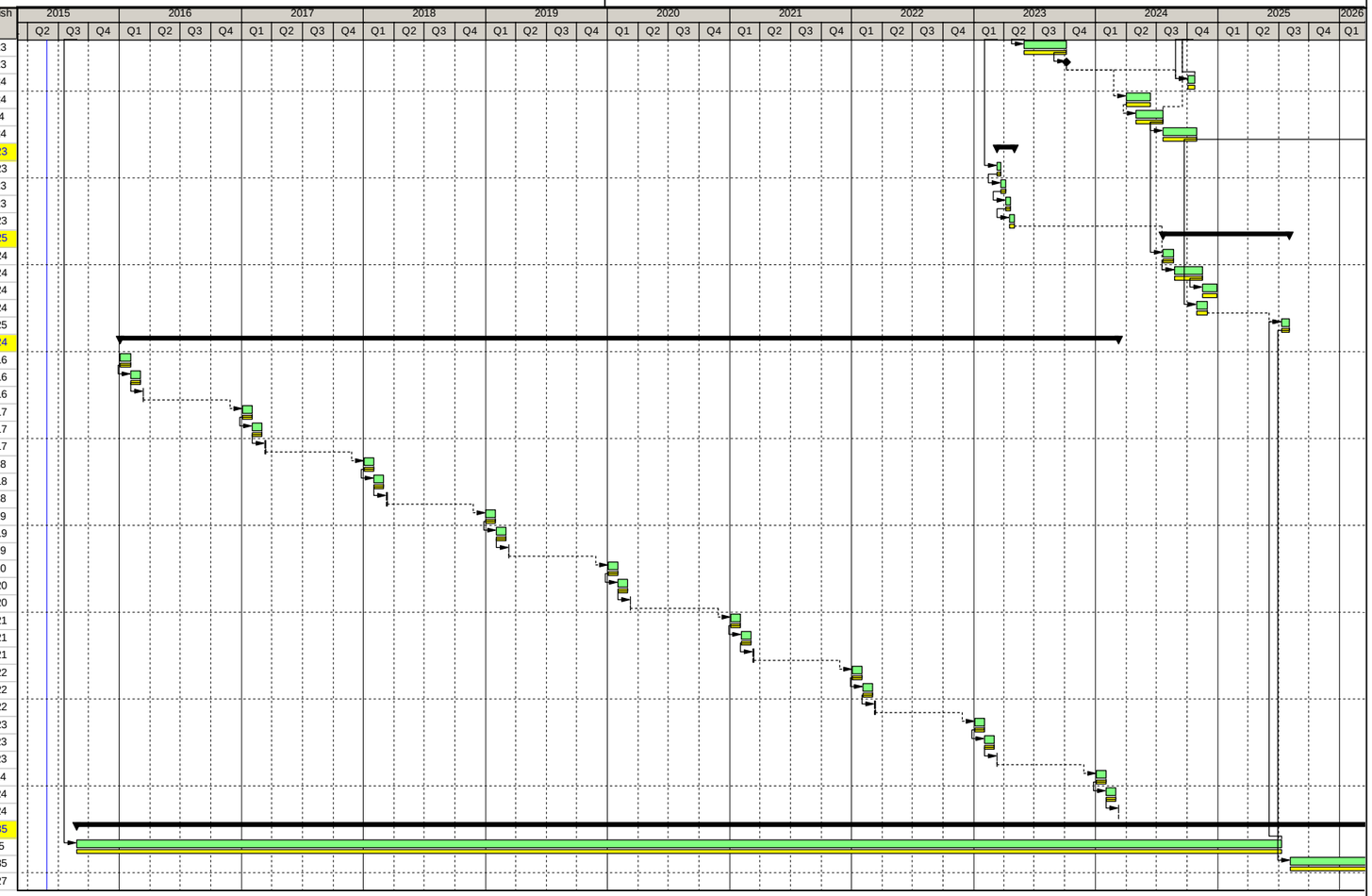
Completed Work
Remaining Work
Milestone
Summary
Project Baseline Bar

Midnite Mine Remedial Design/Remedial Action
Baseline Schedule

TASK filter: No WBS Summary.

(c) Primavera Systems, Inc.

Activity ID	Activity Name	Predecessors	Successors	Actual Start	Actual Finish
A1510	EPA Review of Refined Pit #3 Cover Design	A1500	A1520	01-Jun-23	04-Oct-23
A1520	EPA Approves Final Pit #3 Cover Design	A1510	A1530, A1540		04-Oct-23
A1530	Clean Haul Roads for Bedding, Clean Cover, Topsoil	A1490, A1520	A1495	03-Oct-24	23-Oct-24
A1540	Install Geomembrane Cap	A1520	A1550	01-Apr-24*	11-Jun-24
A1550	Install Clean Cover & Top Soil, Downdrains & Channels	A1540	A1560, A1700, A1495	01-May-24*	20-Jul-24
A1560	Pit #3 Revegetation (71.3 Acres)	A1550	A1730, A1920	21-Jul-24	29-Oct-24
1011322b.02.11	**Area 5 Cover - Phase 2**			13-Mar-23	01-May-23
A1595	Area 5 Regrading	A1435	A1600	13-Mar-23	24-Mar-23
A1600	Geomembrane Cap	A1595	A1610	24-Mar-23*	05-Apr-23
A1610	Clean Cover & Top Soil	A1600	A1620	05-Apr-23	20-Apr-23
A1620	Area 5 Revegetation (6.2 Acres)	A1610	A1710	19-Apr-23	01-May-23
1011322b.02.12	**Site Closeout - Phase 3**			21-Jul-24	01-Aug-25
A1700	Site Restoration Soil Cover	A1550	A1710	21-Jul-24	22-Aug-24
A1710	Remaining Site Restoration	A1700, A1620	A1720	23-Aug-24	14-Nov-24
A1720	Partial Demobilization (Large Equipment)	A1710		15-Nov-24	29-Dec-24
A1730	Remove Offices / Yard / Maintenance / Fuel Farm / Decon Facilities	A1560	A1750	30-Oct-24	29-Nov-24
A1750	Final Demobilization	A1900, A1730	A1910	11-Jul-25	01-Aug-25
1011322b.02.13	**Annual Remedial Action Monitoring Report and Adaptive Management Meetings**			04-Jan-16	10-Mar-24
A1800	Prepare and Submit 2015 Annual Monitoring in RA Report		A1805	04-Jan-16*	02-Feb-16
A1805	EPA/Tribe Reviews 2015 Annual RA Report Data/Findings	A1800	A1806	03-Feb-16	03-Mar-16
A1806	Annual RA Adaptive Management Meeting	A1805	A1810	11-Mar-16	12-Mar-16
A1810	Prepare and Submit 2016 Annual Monitoring in RA Report	A1806	A1815	03-Jan-17*	01-Feb-17
A1815	EPA/Tribe Reviews 2016 Annual RA Report Data/Findings	A1810	A1816	02-Feb-17	03-Mar-17
A1816	Annual RA Adaptive Management Meeting	A1815	A1820	11-Mar-17	12-Mar-17
A1820	Prepare and Submit 2017 Annual Monitoring in RA Report	A1816	A1825	02-Jan-18*	31-Jan-18
A1825	EPA/Tribe Reviews 2017 Annual RA Report Data/Findings	A1820	A1826	01-Feb-18	02-Mar-18
A1826	Annual RA Adaptive Management Meeting	A1825	A1830	10-Mar-18	11-Mar-18
A1830	Prepare and Submit 2018 Annual Monitoring in RA Report	A1826	A1835	02-Jan-19*	31-Jan-19
A1835	EPA/Tribe Reviews 2018 Annual RA Report Data/Findings	A1830	A1836	01-Feb-19	02-Mar-19
A1836	Annual RA Adaptive Management Meeting	A1835	A1840	10-Mar-19	11-Mar-19
A1840	Prepare and Submit 2019 Annual Monitoring in RA Report	A1836	A1845	02-Jan-20*	31-Jan-20
A1845	EPA/Tribe Reviews 2019 Annual RA Report Data/Findings	A1840	A1846	01-Feb-20	01-Mar-20
A1846	Annual RA Adaptive Management Meeting	A1845	A1850	09-Mar-20	10-Mar-20
A1850	Prepare and Submit 2020 Annual Monitoring in RA Report	A1846	A1855	04-Jan-21*	02-Feb-21
A1855	EPA/Tribe Reviews 2020 Annual RA Report Data/Findings	A1850	A1856	03-Feb-21	04-Mar-21
A1856	Annual RA Adaptive Management Meeting	A1855	A1860	12-Mar-21	13-Mar-21
A1860	Prepare and Submit 2021 Annual Monitoring in RA Report	A1856	A1865	03-Jan-22*	01-Feb-22
A1865	EPA/Tribe Reviews 2021 Annual RA Report Data/Findings	A1860	A1866	02-Feb-22	03-Mar-22
A1866	Annual RA Adaptive Management Meeting	A1865	A1870	11-Mar-22	12-Mar-22
A1870	Prepare and Submit 2022 Annual Monitoring in RA Report	A1866	A1875	03-Jan-23*	01-Feb-23
A1875	EPA/Tribe Reviews 2022 Annual RA Report Data/Findings	A1870	A1876	02-Feb-23	03-Mar-23
A1876	Annual RA Adaptive Management Meeting	A1875	A1880	11-Mar-23	12-Mar-23
A1880	Prepare and Submit 2023 Annual Monitoring in RA Report	A1876	A1885	02-Jan-24*	31-Jan-24
A1885	EPA/Tribe Reviews 2023 Annual RA Report Data/Findings	A1880	A1886	01-Feb-24	01-Mar-24
A1886	Annual RA Adaptive Management Meeting	A1885		09-Mar-24	10-Mar-24
1011322b.02.14	**Long-Term Monitoring and Maintenance**			27-Aug-15	02-Aug-35
A1900	Construction Operation, Monitoring, and Maintenance	A0430	A1750	27-Aug-15	11-Jul-25
A1910	Post-Construction Operation, Monitoring, and Maintenance	A1750		04-Aug-25	02-Aug-35
A1920	Install Permanent Site Fencing	A1560		18-Aug-27	21-Dec-27



Completed Work
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Midnite Mine Remedial Design/Remedial Action
Baseline Schedule

TASK filter: No WBS Summary.

(c) Primavera Systems, Inc.

Midnite Mine Superfund Site
100 Percent Design

Appendix Y – Blue Creek and Delta Assessment Work Plan

As of June 2015, the Blue Creek and Delta Assessment Work Plan approach and timing for submittal is under discussion with EPA and the Tribe. As a result, no change to the plan has been made from the previous versions and it is not provided herein.

June 2015

Prepared for:

Dawn Mining Company
PO Box 250
Ford, Washington 990413

and

Newmont USA Limited
6363 South Fiddler's Green Circle
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Prepared By:

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Midnite Mine Superfund Site
100 Percent Design

Appendix Z – Well Decommissioning Plan

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Figure Z-1 Pre-RA Well Locations and Planned Remediated Areas

Figure Z-2 Well Decommissioning Decision Diagram

ATTACHMENT

Attachment Z-1 Monitoring Well and Piezometer Completion Logs

LIST OF ACRONYMS

bgs	below ground surface
BODR	Basis of Design Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Company	Newmont USA Limited and Dawn Mining Company, LLC
EPA	U.S. Environmental Protection Agency
PE	Professional Engineer
RA	Remedial Action
RCW	Revised Code of Washington
Site	Midnite Mine Superfund Site
SMP	Site-wide Monitoring Plan
U.S.C.	United States Code
WAC	Washington Administrative Codes
WDP	Well Decommissioning Plan

Z1.0 INTRODUCTION

This Well Decommissioning Plan (WDP) presents the procedures for plugging or removing monitoring wells and piezometers during the remedial action (RA) at the Midnite Mine Superfund Site (Site) located in Wellpinit, Washington. This WDP is a component of the Midnite Mine Superfund Site Basis of Design Report (BODR), which presents the background and supporting information relevant to the Site and the planned RAs. The BODR contains the engineering drawings, plans, and specifications for the RA. The RA and the associated well decommissioning will be directed by Newmont USA, Limited and Dawn Mining Company, LLC, hereafter referred to as the Company.

Z1.1 WELL DECOMMISSIONING PURPOSE AND SCOPE

The monitoring wells and piezometers (hereafter collectively referred to as wells) listed in this WDP will be plugged or removed because they are no longer used for groundwater monitoring at the Site. Also, many of the wells scheduled for decommissioning are located within the mine area that will be physically altered during the RA (i.e., areas were mine wastes will be excavated and/or cover material will be placed).

Z1.2 WELL DECOMMISSIONING LOCATIONS AND WELL COMPLETION DETAILS

The locations of the wells that will be decommissioned and those that will remain for ongoing monitoring are shown on Figure Z-1. The available well completion documentation is included in Attachment Z-1. A summary of the available completion information for the wells scheduled to be decommissioned is presented on Table Z-1.

Z2.0 APPLICABLE WELL DECOMMISSIONING RULES AND REGULATIONS

The Site RA is governed by the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). As a result, no federal, state, or local permits are required for performing RA activities, as stipulated by CERCLA under 42 U.S.C. 9621(e)(1). However, the well decommissioning activities described herein will substantially comply with Washington Administrative Codes (WAC) regulations and policy, specifically WAC Chapter 173-160-460 for the decommissioning of resource protection wells.

WAC Chapter 173-160 (Minimum Standards for Construction and Maintenance of Wells) includes the following definitions that are relevant to this WDP:

Decommissioning - means to fill or plug a well so that it will not produce water, serve as a channel for movement of water or pollution, or allow the entry of pollutants into the well or aquifer(s).

Resource protection well - means a cased boring intended or used to collect subsurface information or to determine the existence or migration of pollutants within an underground formation. Resource protection wells include monitoring wells, observation wells, piezometers, spill response wells, remediation wells, environmental investigation wells, vapor extraction wells, ground source heat pump boring, grounding wells, and instrumentation wells.

Monitoring well - means a well designed to obtain a representative groundwater sample or designed to measure the water level elevations in either clean or contaminated water or soil.

Piezometer - means a well designed to measure water level elevation at a specific depth beneath the water table.

Grout - is a fluid mixture of cement, bentonite, and water used to seal the annular space around or between well casings, or to decommission wells.

Pressure grouting - is a method of forcing grout into specific portions of a well for sealing purposes.

Z2.1 LICENSED WELL OPERATOR/PROFESSIONAL ENGINEER

In accordance with WAC 173-162 (Regulation and Licensing of Well Contractors and Operators), a licensed resource protection well operator will perform all well decommissioning at the Site. A Company representative will supervise the licensed well operator. The licensed well operator will ensure that the decommissioning procedures and plugging materials comply with WAC 173-160 (Minimum Standards for Construction and Maintenance of Wells). Alternately, a Washington Professional Engineer (PE) may supervise the decommissioning activities in lieu of a licensed well operator as provided in Revised Code of Washington (RCW) 18.104.180.

Z3.0 WELL DECOMMISSIONING PROCEDURES

Figure Z-2 presents a decision diagram for the well decommissioning procedures. The majority of resource wells will be decommissioned in accordance with the procedures in WAC Chapter 173-160-460. The exceptions are resource wells that are completed in, but do not extend through the full depth of the mine wastes that will be excavated during the RA. The resource wells that are completed in but do not extend through the mine wastes will be excavated along with the mine wastes; and the excavated well materials will be consolidated along with the mine wastes in the mine pits. Resource wells that are completed outside of the mine wastes or wells that extend through the mine wastes and are completed in native material below the mine wastes will be decommissioned in accordance with the procedures in WAC Chapter 173-160-460 as described below prior to excavating the mine wastes. Resource wells with incomplete or nonexistent well completion information will be decommissioned in accordance with the procedures in WAC Chapter 173-160-460. The relevant portions of WAC Chapter 173-160-460 are presented below:

WAC 173-160-460

Decommissioning process for resource protection wells

(1) For resource protection wells and geotechnical soil borings that were not constructed in accordance with these regulations, or for which a drilling report required under this section is missing, remove all debris, accumulated sediment, equipment and obstructions from the well casing, except well screens and packers, and decommission in one of the following ways:

(a) Perforate the casing from the bottom to land surface and pressure grout the casing.

(i) Perforations shall be at least four equidistant cuts per row, and one row per foot. Each cut shall be at least one and one-half inches long.

(ii) Apply enough pressure to force the sealing material through the perforations, filling any voids on the outside of the casing.

(iii) The remainder of the casing shall be filled with neat cement grout, neat cement, or bentonite slurry; or

(b) Withdraw the casing and fill the bore hole with neat cement grout, neat cement, bentonite or bentonite slurry as the casing is being withdrawn.

(2) For resource protection wells and geotechnical soil borings that were constructed in accordance with these regulations, remove all debris, accumulated sediment, equipment and obstructions from the well casing, except well screens and packers and then decommission in one of the following ways:

> *(a) Wells with an inside casing diameter equal to or greater than one inch and constructed in accordance with these regulations as verified through a field examination and review of the drilling report shall be decommissioned by filling the casing from bottom to land surface with bentonite, bentonite slurry, neat cement grout, or neat cement.*
>
> *(b) Wells with an inside casing diameter less than one inch shall be decommissioned by pressure grouting the entire casing length with bentonite slurry, neat cement grout, or neat cement.*

The primary difference in the above procedures is that wells with incomplete or nonexistent well completion information require that the casing be perforated and pressure grouted. Table Z-1 indicates which wells do not have adequate well completion information, and therefore require that the casings be perforated as part of the decommissioning process. If field observations made when a well is decommissioned do not match the available completion documentation (i.e., if the measured casing diameter is different than shown on the log or the measured well depth is deeper than shown on the log), the well will be perforated and pressure grouted as a conservative measure.

As discussed in Section Z2.1, all well decommissioning activities will be performed by a licensed well operator, or will be decommissioned by a construction contractor under the supervision of a Washington PE. The following are the general well decommissioning procedures based on the available well completion documentation and location of the well with respect to the mine wastes:

Z3.1 WELLS COMPLETED IN MINE WASTES

Wells that are completed in mine wastes (as indicated on Table Z-1) will be decommissioned as follows:

- Measure total well depth.
- If total well depth is less than thickness of mine wastes, then excavate the well along with the mine wastes and consolidate the excavated materials in the mine pits. No grouting is necessary because the entire well will be removed and the location recontoured as part of the RA. (Note that the depth of mine waste is known at well locations that do not have completion details based on pre-mining topography and other nearby drilling logs.)

- If total well depth is greater than thickness of mine waste:
    - For wells where completion documentation indicates the well was properly constructed[1]:
        - Grout the section of well casing that extends from 10 feet above the bottom of the mine wastes to the bottom of the well.
        - Excavate the well materials along with the mine wastes and consolidate the excavated materials in the mine pits.
    - For wells where completion documentation is unavailable or indicates the well was not properly constructed[1]:
        - Perforate the section of well casing that extends from 10 feet above the bottom of the mine wastes to the bottom of the well.
        - Pressure grout the perforated section of casing.
        - Excavate the well materials along with the mine wastes and consolidate the excavated materials in the mine pits.

Z3.2 WELLS COMPLETED OUTSIDE OF THE MINE WASTES

Wells that are completed outside the mine wastes (as indicated on Table Z-1) will be decommissioned as follows:

- For wells where completion documentation indicates the well was properly constructed[1]:
    - Grout the well casing from the well bottom to 2 feet below ground surface (ft bgs).
    - Remove the surface completion and cut or break off the well casing at least 2 ft bgs.
    - Cover the remaining hole/depression with nearby native soils.
- For wells where completion documentation is unavailable or indicates the well was not properly constructed[1]:
    - Perforate the well casing from the well bottom to 2 ft bgs.

[1] "Properly constructed" means that the annular space between the bore hole and the permanent casing was sealed with bentonite, neat cement, or neat cement grout as described in WAC 173-160-450 (Well Sealing Requirements).

- Pressure grout the casing.
- Remove the surface completion and cut or break off the well casing at least 2 ft bgs.
- Cover the remaining hole/depression with nearby native soils.

Z4.0 SEQUENCING OF WELL DECOMMISSIONING ACTIVITIES

The well decommissioning activities will be begin where the Early Works RA construction phase activities are planned (see Figure Z-1). The intent is to decommission the monitoring wells in these areas of the Site before the earthwork activities begin. Because the remaining RA construction phases occur across all remaining areas of the Site, there is no specific sequencing for decommissioning the remaining wells after the wells in the Early Works area have been decommissioned.

Z5.0 HANDLING AND DISPOSAL OF WELL DECOMMISSIONING WASTES

Wastes generated during the well decommissioning activities (excavated well casings, protective surface casings, bollards, concrete pads) will be removed and stockpiled on Site for eventual disposal in the pits along with the mine wastes. These well decommissioning waste materials will be temporarily stockpiled in accordance with the *Staging/Temporary Stockpiling Plan* (contained in Appendix R of the BODR) pending placement in the pits.

Z6.0 DOCUMENTATION

Within 30 days of decommissioning a well, the licensed well operator or the PE who supervised the decommissioning will complete and submit a Resource Protection Well Report to the Construction Manager. The Construction Manager will prepare a Well Decommissioning Summary Report as part of the RA Completion Report for submittal to EPA and the Spokane Tribe of Indians. The Well Decommissioning Summary Report will document the decommissioned wells, decommissioning procedures, and unusual conditions or deviations from this plan.

TABLE

Table Z-1
Well Decommissioning Summary Table

Well/Piezo ID	Nothing	Easting	Elevation	Source of Coordinates	Well Completion Log Available?	Date Installed	Boring Depth (ft bgs)	Depth of Mine Waste at Well Location (ft)	Well Depth (ft bgs)	Screen Interval (ft bgs)	Diameter-Screen/ Casing Material	Gravel Pack Interval (ft bgs)	Annular Seal Interval (ft bgs)	Comments
BOM-89-1S	354,250.72	2,312,566.43	?	Riley, et al., 1991	yes[f]	Aug-89	505	110	140	110-120	2" PVC	105-135	0-105	1
BOM-89-1M	354,250.72	2,312,566.43	?	Riley, et al., 1991	yes[f]	Aug-89	505	110	180	155-165	2" PVC	150-175	0-105 and 135-150	1
BOM-89-1D	354,250.72	2,312,566.43	?	Riley, et al., 1991	yes[f]	Aug-89	505	110	505	435-445	2" PVC	415-505	0-105, 135-150, 175-415	1
BOM-89-2S	354,792.16	2,311,201.96	2876	Riley, et al., 1991	yes[f]	Aug-89	150	100	110	95-100	2" PVC	80-105	0-80	6
BOM-89-2D	354,792.16	2,311,201.96	2876	Riley, et al., 1991	yes[f]	Aug-89	150	100	145	130-135	2" PVC	120-150	105-120	6
BOM-89-3S	353,831.43	2,311,335.16	2812	Riley, et al., 1991	yes[f]	Aug-89	240	125	140	125-130	2" PVC	115-140	0-115	1
BOM-89-3M	353,831.43	2,311,335.16	2812	Riley, et al., 1991	yes[f]	Aug-89	240	125	175	160-165	2" PVC	155-175	0-115 and 140-155	1
BOM-89-3D	353,831.43	2,311,335.16	2812	Riley, et al., 1991	yes[f]	Aug-89	240	125	240	220-225	2" PVC	210-240	0-115, 140-155, 175-210	1
BOM-89-4S	353,540.50	2,311,585.24	2697	Riley, et al., 1991	yes[f]	Aug-89	200	82	85	75-80	2" PVC	60-85	0-60	1
BOM-89-4d	353,540.50	2,311,585.24	2697	Riley, et al., 1991	yes[f]	Aug-89	200	82	190	180-185	2" PVC	170-200	0-60 and 85-170	1
BOM-89-5s	355,591.21	2,312,558.11	?	Riley, et al., 1991	yes[f]	Aug-89	620	0	102	92-97	2" PVC	75-102	0-75	3
BOM-89-5m	355,591.21	2,312,558.11	?	Riley, et al., 1991	yes[f]	Aug-89	620	0	450	440-445	2" PVC	420-480	0-75 and 102-420	3
BOM-89-5d	355,591.21	2,312,558.11	?	Riley, et al., 1991	yes[f]	Aug-89	620	0	620	610-615	2" PVC	600-620	0-75, 102-420, 480-600	3
BOM-89-6	357348.61	2,310,535.98	?	Riley, et al., 1991	yes[f]	Aug-89	120	20	120	55-60	2" PVC	40-90 (?)	0-40 (?)	1
BOM-89-7	353,168.74	2,311,002.74	?	Riley, et al., 1991	yes[f]	Aug-89	130	70	130	110-115	2" PVC	80-120 (?)	0-80 (?)	1
BOM-89-8s	356,932.87	2,311,677.49	?	MGC, 2011b	yes[f]	Aug-89	265	80	97	72-82	2" PVC	70-98	0-70	1
BOM-89-8d	356,932.87	2,311,677.49	?	MGC, 2011b	yes[f]	Aug-89	265	80	167	144-154	2" PVC	135-170	98-135 and 170-265	1
BOM-89-9s	355,631.61	2,310,563.65	?	?	yes[f]	Aug-89	135	85	~90	~80-85	2" PVC	~70-90	0-70	5
BOM-89-9d	355,631.61	2,310,563.65	?	?	yes[f]	Aug-89	135	85	135	115-120	2" PVC	~120-135	0-120	1
BOM-89-10s	356,377.20	2,310,850.15	2957	Well Log	yes[f]	Aug-89	260	20	75	55-65	2" PVC	45-68	0-45	6
BOM-89-10d	356,377.20	2,310,850.15	2957	Well Log	yes[f]	Aug-89	260	20	260	115-125	2" PVC	95-260	0-45 and 68-95	6
BOM-89-11s	354,367.51	2,310,574.65	?	?	yes[f]	Aug-89	105	35	40	30-35	2" PVC	~25-30	0-25	1
BOM-89-11d	354,367.51	2,310,574.65	?	?	yes[f]	Aug-89	105	35	105	95-100	2" PVC	~90-105	0-25 and 30-90	1
BOM-89-12S	354,804.92	2,311,097.40	?	?	yes[f]	Aug-89	227	175	182	170-180	2" PVC	160-182	0-160	1
BOM-89-12D	354,804.92	2,311,097.40	?	?	yes[f]	Aug-89	227	175	227	200-220	2" PVC	195-225	0-160 and 182-195	1
BOM-13S	353,008.30	2,311,748.90	?	?	yes[i]	Aug-89	145	145	130	95-100	2" PVC	~90-100	0-90	5
BOM-13D	353,008.30	2,311,748.90	?	?	yes[i]	Aug-89	145	145	145	130-135	2" PVC	~125-145	0-90 and 100-125	5
BOM-14S	353,214.70	2,312,141.40	?	?	yes[i]	Aug-89	155	125	125	110-115	2" PVC	~105-115	0-105	5
BOM-14D	353,214.70	2,312,141.40	?	?	yes[i]	Aug-89	155	125	155	145-150	2" PVC	~140-155	0-105 and 115-140	1
BOM-15S	355,669.33	2,310,586.65	?	?	yes[f]	Aug-89	80	85	80	75-80	2" PVC	~70-80	0-70	5
BOM-89-16S	354,423.51	2,310,421.65	?	?	yes[e]	Aug-89	161	75	85	75-80	2" PVC	70-80	0-70	5
BOM-89-16D	354,423.51	2,310,421.65	?	?	yes[e]	Aug-89	161	75	161	135-140	2" PVC	130-161	0-70 and 80-130	
BOM-17	352,947.76	2,311,615.00	?	?	yes[f]	9/21/1994	162	145	154.15	144.5-149.5	2" PVC	139.5-154.5	0-139.5 and 154.5-160	1
MW-01	352,216.20	2,311,027.17	2409	Benthin and Associates, 2011 and SMI, 1999d	yes[g]	8/28/1998	12	0	12	2-12	2" PVC	1.5-12	0-1.5	6
MW-02	352,295.95	2,311,868.77	2432	Benthin and Associates, 2011 and SMI, 1999d	yes[g]	8/28/1998	17	0	17	7-17	2" PVC	7-17	0-7	6
MW-03	351,600.92	2,311,839.65	?	SMI, 1999d	yes[g]	8/28/1998	14	0	14	4-14	2" PVC	3-14	0-3	3
MW-04	351988.54	2313103.83	2373.5	SMI, 1999d	yes[g]	8/28/1998	20	0	20	10-20	2" PVC	8-20	0-8	6
MW-05	353,877.08	2,313,553.34	?	SMI, 1999d	yes[g]	8/28/1998	15	0	15	5-15	2" PVC	3-15	0-3	6
MW-06	354,898.92	2,313,777.65	?	SMI, 1999d	yes[g]	8/2/1998	22	0	22	22-Dec	2" PVC	22-Oct	0-10	3

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Well Decommissioning Summary Table

Well/Piezo ID	Nothing	Easting	Elevation	Source of Coordinates	Well Completion Log Available?	Date Installed	Boring Depth (ft bgs)	Depth of Mine Waste at Well Location (ft)	Well Depth (ft bgs)	Screen Interval (ft bgs)	Diameter-Screen/ Casing Material	Gravel Pack Interval (ft bgs)	Annular Seal Interval (ft bgs)	Comments
MWBA-01/ MWEHR-01	353,062.92	2,316,375.65	2395.7	URS, 2005	yes	9/24/1999	21	0	5-20	15	4" PVC	3-21	0-3	3
MWBC-01	348,538.91	2,311,855.75	?	URS, 2005	yes	10/26/2000	31.4	0	27.6	7.1-27.1	4" PVC	5-31.4	2-5	6
MWDB-01	353,548.53	2,311,615.84	?		yes	10/24/2000	305	33	301.3	167-187 197-217 241-261 and 291-301	4" PVC	157-303	0-157	3
MWCD-01	352,280.17	2,311,848.08	2432.1	Benthin and Associates, 2011	yes	10/8/1999	117	0	115	95-115	4" PVC	88-115	0-88	6
MWCD-02a[c]	351,084.67	2,312,008.15	2319.14	URS, 2005	yes	9/24/1999	116.8	0	98.5	78-98	4" PVC	70.8-116.8	0-70.8	6
MWCD-02b[c]	352,249.78	2,311,852.69	2427.7	Tetra Tech, 2010	yes	7/23/2010	33.5	0	33.41	8-33.4	4" PVC	5-33.5	0-5	6
MWCD-03	351,735.92	2,312,492.65	2495.7	URS, 2005	yes	10/9/1999	60	0	60	40-60	4" PVC	35-60	2-35	3
MWED-02	354,893.92	2,313,790.65	2649.4	URS, 2005	yes	10/8/1999	120	0	68	48-68	4" PVC	42-70 and 73-120	0-42 and 70-73	3
MWED-03	353,108.92	2,313,332.65	2467.7	URS, 2005	yes	9/26/1999	110.6	0	51.7	29.2-51.7	4" PVC	25.5-53.1 and 61.1-110.6	0-25.5 and 53.1-61.1	6
MWED-04	351,964.06	2,313,100.85	2371.74	URS, 2005	yes	9/22/1999	119.7	0	113.2	92.7-112.7	4" PVC	85.1-119.7	0-85.1	6
MWED-05	354,067.94	2,313,290.52	2591	URS, 2005	yes	10/9/1999	27.4	0	25.1	9.6-24.6	4" PVC	6.4-27.4	0-6.4	6
MWED-06	354,072.25	2,313,302.20	2590.9	URS, 2005	yes	10/9/1999	131	0	51.5	31-51	4" PVC	27.4-28.2 and 67.2-115	0-27.4 and 56.4-67.2	6
MWED-07	353,765.27	2,312,813.81	2608.9	Benthin and Associates, 2011	yes	10/1/1999	50.3	0	40.7	20.3-40.3	4" PVC	14.5-45.8	0-14.5 and 45.8-50.3	3
MWED-08	353,761.02	2,312,825.30	2609.7	Benthin and Associates, 2011	yes	9/30/1999	139.6	0	88.7	68.2-88.2	4" PVC	62.7-90.2 and 94.5-139.6	0-62.7 and 90.2-94.5	3
MWED-09	354,623.92	2,313,310.65	2705	URS, 2005	yes	9/29/1999	130.3	19	113.2	92.7-112.7	4" PVC	87.3-117	0-87.3 and 117-130.3	1
MWED-10	349,345.55	2,312,553.62	2133.8	URS, 2005	yes	9/23/1999	16	0	15	5-15	4" PVC	3-16	0-3	6
MWED-11	349,336.92	2,312,627.65	2128.2	URS, 2005	yes	10/11/1999	108.9	0	108.4	87.9-107.9	4" PVC	80-108.9	0-80	6
MWFW-01	352,989.92	2,309,379.65	2530.1	URS, 2005	yes	9/10/1999	31	0	30.4	15-30.4	4" PVC	12.8-31	0-12.8	6
MWFW-02	353,015.92	2,309,363.65	2529.7	URS, 2005	yes	9/14/1999	130.8	0	122.3	101.9-121.9	4" PVC	94.5-130.8	0-94.5	6
MWFW-03	354,126.92	2,309,424.65	2682.4	URS, 2005	yes	9/28/1999	35	1	34.5	14.5-34.5	4" PVC	13-35	2-13	3
MWFW-04	354,304.92	2,309,678.65	2703.5	URS, 2005	yes	9/30/1999	49	5	48	28-48	4" PVC	26-48	2-26	3
MWFW-05	353,906.92	2,309,649.65	2660.9	URS, 2005	yes	9/27/1999	36	6	35	15-35	4" PVC	13-36	1-13	3
MWHD-01	356,165.30	2,310,312.87	?	URS, 2005	yes[f]	8/1/1989	49.5	15	44.8	24.3-44.3	4" PVC	21.5-44.8	2-21.5	1
MWNE-01	358,056.90	2,312,721.52	3099.13	URS, 2005	yes	9/25/1999	66	0	59	39-59	4" PVC	35.3-62	0-35.3	6
MWNE-02	358,074.89	2,312,742.96	3099.63	URS, 2005	yes	9/28/1999	150.8	0	150.2	130.2-150.2	4" PVC	122.5-150.8	6-122.5	6
MWNE-03	357,026.40	2,312,207.59	3119.34	URS, 2005	yes	9/15/1999	137	0	136.5	116.5-136.5	4" PVC	108-118 and 134-136.5	6-108	6
MWNE-04	357,037.64	2,312,203.52	3120.33	URS, 2005	yes	9/24/1999	247	0	237.5	217.5-237.5	4" PVC	209.6-247	0-209.6	6
MWNE-05	355,143.92	2,313,591.65	2648.3	URS, 2005	yes	9/25/1999	22	0	20	5-20	4" PVC	3-22	0-3	3
MWNE-06	355,134.92	2,313,585.65	2648.1	URS, 2005	yes	10/7/1999	122	0	88	68-88	4" PVC	61.5-90 and 95-122	0 to 61.5 and 90-95	3
MWNE-07	355,965.18	2,312,369.50	2851.02	URS, 2005	yes	9/27/1999	89.9	0	88.8	63.3-83.3	4" PVC	57.6-89.9	0-57.6	6
MWNW-01	358,946.92	2,311,742.65	3424.7	URS, 2005	yes	9/11/1999	101	0	100	80-100	4" PVC	73-101	0-73	6
MWNW-02	358,673.92	2,310,680.65	3524.9	URS, 2005	yes	9/11/1999	206	0	200	180-200	4" PVC	172--206	0-172	6

Table Z-1
Well Decommissioning Summary Table

Well/Piezo ID	Nothing	Easting	Elevation	Source of Coordinates	Well Completion Log Available?	Date Installed	Boring Depth (ft bgs)	Depth of Mine Waste at Well Location (ft)	Well Depth (ft bgs)	Screen Interval (ft bgs)	Diameter-Screen/ Casing Material	Gravel Pack Interval (ft bgs)	Annular Seal Interval (ft bgs)	Comments
MWNW-03	357,905.92	2,309,918.65	3557.9	URS, 2005	yes	9/14/1999	120	0	117	97-117	4" PVC	91.2-120	0-90	6
MWNW-04	356,987.92	2,308,748.65	3494.3	URS, 2005	yes	9/16/1999	193.2	0	191	171-191	4" PVC	162-173	0-162	6
MWNW-06	359,614.92	2,312,821.65	3500.8	URS, 2005	yes	9/22/1999	180	0	177.5	157.5-177.5	4" PVC	150-180	0-150	3
MWNW-07	359,118.76	2,312,147.52	3433.1	URS, 2005	yes	9/10/1999	150	0	149.5	129.5-149.5	4" PVC	123-150	0-123	6
MWSW-01	351,871.92	2,310,100.65	2445.1	URS, 2005	yes	9/25/1999	27	0	25	10-25	4" PVC	8-27	1-8	3
MWSW-02	351,866.92	2,310,109.65	2444.9	URS, 2005	yes	9/12/1999	165	3	122	102-122	4" PVC	97-125 and 130-165	0-97 and 125-130	3
MWWD-01	352,190.31	2,311,041.00	2404.1	URS, 2005	yes	9/15/1999	119.6	0	93.9	73.4-93.4	4" PVC	63.5-113.4	0-60.3	6
MWWD-02a	351,531.92	2,310,867.65	2442.9	URS, 2005	yes	10/6/1999	104	0	70	50-70	4" PVC	41-71 and 76-104	0-41 and 71-76	3
MWWD-02b	352,180.40	2,311,042.57	2405.5	Tetra Tech, 2010	yes	7/27/2010	16.6	1	16.6	6.3-16.3	4" PVC	4.2-16.6	0-4.2	6
MWWD-03	351,679.92	2,311,548.65	2423.3	URS, 2005	yes	10/7/1999	56	0	55.5	35.5-55.5	4" PVC	31-56	2-31	3
GW-16	352,398.14	2,311,887.08	0	?	yes[h]	1979	35	55	35 (?)	25-35 (?)	?	?	?	2
GW-17	352,487.66	2,311,773.14	0	?	yes[h]	1979	70	55	70 (?)	60-70 (?)	?	?	?	2
GW-18	352,492.16	2,311,908.09	0	?	yes[h]	1979	95	75	95 (?)	80-95 (?)	?	?	?	2
GW-19	351,055.51	2,312,002.97	2318.9	?	yes[h]	6/10/1980	20	0	20 (?)	12-20(?)	4" PVC	?	?	6
GW-21	356,528.52	2,311,729.80	0	?	yes[h]	?	200	80	200 (?)	80-200 (?)	?	?	?	2
GW-22	355,111.92	2,313,623.65	0	SMI, 1999d	no	?	50	0	50?	24-50(?)	?	?	?	4
GW-23	353,053.01	2,309,413.90	0	?	yes[h]	1979	50	0	50 (?)	16-50 (?)	?	?	?	4
GW-24	354,187.46	2,309,823.89	0	?	no	?	?	0	?	?	?	?	?	4
GW-26	358,933.08	2,311,808.15	0	?	yes[h]	1979	150	0	150 (?)	17-150 (?)	?	?	?	4
GW-27	358,092.27	2,312,735.67	0	?	yes[h]	1979	100	10	100 (?)	20-100 (?)	4" PVC	?	?	4
GW-28	351,883.12	2,310,108.88	0	?	yes[h]	1979	100	0	100 (?)	20-100 (?)	?	?	?	4
GW-29	352,456.04	2,311,868.59	0	?	yes[h]	1979	66.5	>66	66.5 (?)	65.5-66.5 (?)	?	?	?	2
GW-31	349,429.36	2,312,470.24	0	?	no	?	9	0	9 (?)	4-9	4" PVC	?	?	4
GW-32	349,437.34	2,312,518.16	0	?	yes[h]	1979	18	0	18 (?)	13-18 (?)	4" PVC	?	?	4
GW-33	349,438.03	2,312,551.47	0	?	yes[h]	1980	9	0	9 (?)	4-9 (?)	4" PVC	?	?	4
GW-34	349,777.51	2,312,314.65	0	?	yes[h]	1980 (?)	12	0	12 (?)	7-12 (?)	4" PVC	?	?	4
GW-35	351,648.57	2,311,232.24	0	?	yes[h]	1980 (?)	18	0	18 (?)	13-18 (?)	4" PVC	?	?	4
GW-35a	351,650.16	2,311,220.53	2366.8	?	yes	10/1/1996	12.5	0	12.5	7.4-11.7	4" PVC	5.5-12.5	0-5.5	6
GW-36	351,599.75	2,311,839.57	2363.7	?	yes[h]	1979	32	0	32(?)	27-32(?)	4" PVC	?	?	4
GW-36a	351,566.94	2,311,856.41	2360.2	?	yes	10/3/1996	25	0	19.5	14.4-18.7	4" PVC	11.7-20.5	0-11.7 and 20.5-25	6
GW-37	350,708.19	2,312,403.69	?	?	yes[h]	1991(?)	9	0	9 (?)	4-9 (?)	4" PVC	?	?	4
GW-41	354,115.64	2,312,789.05	?	SMI, 1999a	yes[a]	10/15/1998	85	65	82.6	72.2-82.6	4" PVC	70-83.1	0-70 and 83.1-85	1
GW-41A	354,126.52	2,312,787.05	2703.6	SMI, 1999a	yes[a]	12/14/1998	88.8	58	81.9	66.5-81.9	4" PVC	63-84.7	0-63 and 84.7-88.8	1
GW-42	353,689.12	2,311,940.15	?	SMI, 1999a	yes[a]	10/14/1998	96	77	93.2	82.9-93.2	4" PVC	80.1-95.2	0-80.1 and 95.2-96	1
GW-43	353,560.32	2,311,600.45	?	SMI, 1999a	yes[a]	10/13/1998	97.5	85	92.9	82.6-92.9	4" PVC	75-92.6	0-75 and 92.6-97.5	1
GW-44	354,013.97	2,310,293.81	?	SMI, 1999a	yes[a]	11/6/1998	140.6	130	129.8	109.4-129.8	4" PVC	102.9-132.4	0-102.9 and 132.4-140.6	1

Table Z-1
Well Decommissioning Summary Table

Well/Piezo ID	Nothing	Easting	Elevation	Source of Coordinates	Well Completion Log Available?	Date Installed	Boring Depth (ft bgs)	Depth of Mine Waste at Well Location (ft)	Well Depth (ft bgs)	Screen Interval (ft bgs)	Diameter-Screen/ Casing Material	Gravel Pack Interval (ft bgs)	Annular Seal Interval (ft bgs)	Comments
GW-45	355,729.32	2,310,560.95	2902.2	SMI, 1999a	yes[a]	10/22/1998	87.1	71	81	75.7-81	4" PVC	73.3-82.4	0-73.3 and 82.4-87.1	1
GW-46	356,343.71	2,310,899.99	2971.9	SMI, 1999a	yes[a]	10/11/1998	45.4	25	40.8	30.5-40.8	4" PVC	26.3-41.8	0-26.3 and 41.8-45.4	1
GW-47	356,532.37	2,311,789.85	3017	SMI, 1999a	yes[a]	10/25/1998	104.7	91	92.4	77.1-92.4	4" PVC	73.1-94	0-73.1 and 94-104.7	1
GW-48	355,466.77	2,310,906.18	2951.9	SMI, 1999a	yes[a]	10/9/1998	29	25	22.9	12.6-22.9	4" PVC	8.4-24.3	0-8.4 and 24.3-29	5
GW-49	355,767.12	2,309,954.35	2876.2	SMI, 1999a	yes[a]	11/23/1998	15.1	4	13	7.7-13	4" PVC	6.3-13.5	0-6.3 and 13.5-15.1	1
GW-50	351,639.76	2,311,200.66	2367	SMI, 1999a	yes[a]	12/3/1998	70	0	70.2[b]	49.8-70.2	4" PVC	39.8-70	0-39.8	6
GW-51	351,553.26	2,311,911.18	2370.4	SMI, 1999a	yes[a]	12/2/1998	78.6	0	74.3	59.9-74.3	4" PVC	54.8-77.1	0-54.8 and 77.1-78.6	6
GW-52	355,283.22	2,310,807.05	2913.9	SMI, 1999a	yes[a]	11/22/1998	76.9	72	75	54.2-75	6" PVC	51.0-76.9	0-51	1
GW-53	354,799.57	2,311,078.61	2907.6	SMI, 1999a	yes[a]	12/11/1998	173.7	173	173.9[b]	133-173.9	6" PVC	125.6-173.7	0-125.6	6
GW-54	354,292.09	2,311,426.56	2785.4	SMI, 1999a	yes[a]	1/14/1999	138.1	128.5	129.8	88.9-129.8	6" PVC	65.9-132.1	0-65.9 and 132.1-138.1	6
GW-55	353,785.12	2,310,693.85	2734.3	SMI, 1999a	yes	10/29/1998	33.1	25	28	17.1-28	6" PVC	14.2-29.2	0-14.2 and 29.2-33.1	1
GW-56	354,053.72	2,311,458.95	2762.51	SMI, 1999b	no	?	97.25	125[k]	94.5	64-94 (?)	?	?	?	6
GW-57	354,364.82	2,311,449.45	2783.72	SMI, 1999b	no	?	195	125[k]	194.14	183.68-194.14	?	?	?	6
GW-58	354,764.01	2,311,129.97	2906.1	?	yes[c]	9/22/2000	176.5	173	173	145-173	6" PVC	140-173	0-140	6
ED-B1	353,784.40	2,312,779.30	2612.1	Benthin and Associates, 2011	yes	9/16/2011	60	20	32	22-32	2" PVC	19.75-32	0-19.75	3
MWP3-01	354,185.93	2,311,992.18	2689.6	?	yes	10/15/2000	130	25	127.5	107-127	4" PVC	97.2-128	2-97.2	1
MWP3-02	354,221.22	2,311,988.24	2689.5	?	yes	10/13/2000	320	25	289.5	269-289	4" PVC	258-299	2-258	1
MWP4-02	356,917.51	2,311,620.94	3062.3	?	yes	10/30/2000	298	88	173	152-172	4" PVC	135-173	2.5-135	1
PBC-01	352,268.71	2,311,850.43	2428.9	Tetra Tech, 2010	yes	7/13/2010	33.1	0	33.1	8.7-33.1	6" PVC	5.5-33.1	0-5.5	6
PBC-02	352,262.45	2,311,769.06	2431	Tetra Tech, 2010	yes	7/14/2010	18.9	0	18.9	5.5-18.9	6" PVC	5.5-18.9	0-5.5	6
PBC-03	352,293.88	2,311,900.44	2431.1	Tetra Tech, 2010	yes	7/22/2010	30.9	0	30.9	6.4-30.9	6" PVC	4.5-30.9	0-4.5	6
PBW-01	352,231.21	2,311,043.33	2408.6	Tetra Tech, 2010	yes	7/24/2010	15	0	14.9	4.8-14.9	6" PVC	3.6-15	0-3.6	6
PBW-02	352,197.84	2,311,022.98	2405.6	Tetra Tech, 2010	yes	7/25/2010	18.8	0	18.8	8.7-18.8	6" PVC	3.5-18.8	0-3.5	6
RP-PZ1	351,328.70	2,309,320.50	2429	Benthin and Associates, 2011	yes	9/10/2011	14	0	14	4.1-14.1	2" PVC	3-14	0.5-3	3
RP-PZ2	352,058.10	2,309,116.00	2471.9	Benthin and Associates, 2011	yes	9/10/2011	15	0	15	5.1-15.1	2" PVC	4-15	0.5-4	3
RP-PZ3	351,317.00	2,308,661.50	2398.8	Benthin and Associates, 2011	yes	9/10/2011	14	0	14.1	4.1-14.1	2" PVC	3-14	0.5-3	3
RP-PZ4	351,627.60	2,307,994.20	2440.4	Benthin and Associates, 2011	yes	9/11/2011	20	0	17.7	7.6-17.6	2" PVC	6.5-20	1-6.5	3
RP-PZ5	351,990.30	2,307,333.00	2434.9	Benthin and Associates, 2011	yes	9/11/2011	25	0	25.1	10.1-25.1	2" PVC	8-25	0.5-8	3
THSS-01	352,985.35	2,311,754.53	?	URS, 2002	yes	10/5/2000	147.5	141	141	121-141	1" PVC	118-141	3-118 and 141-147.5	1

Table Z-1
Well Decommissioning Summary Table

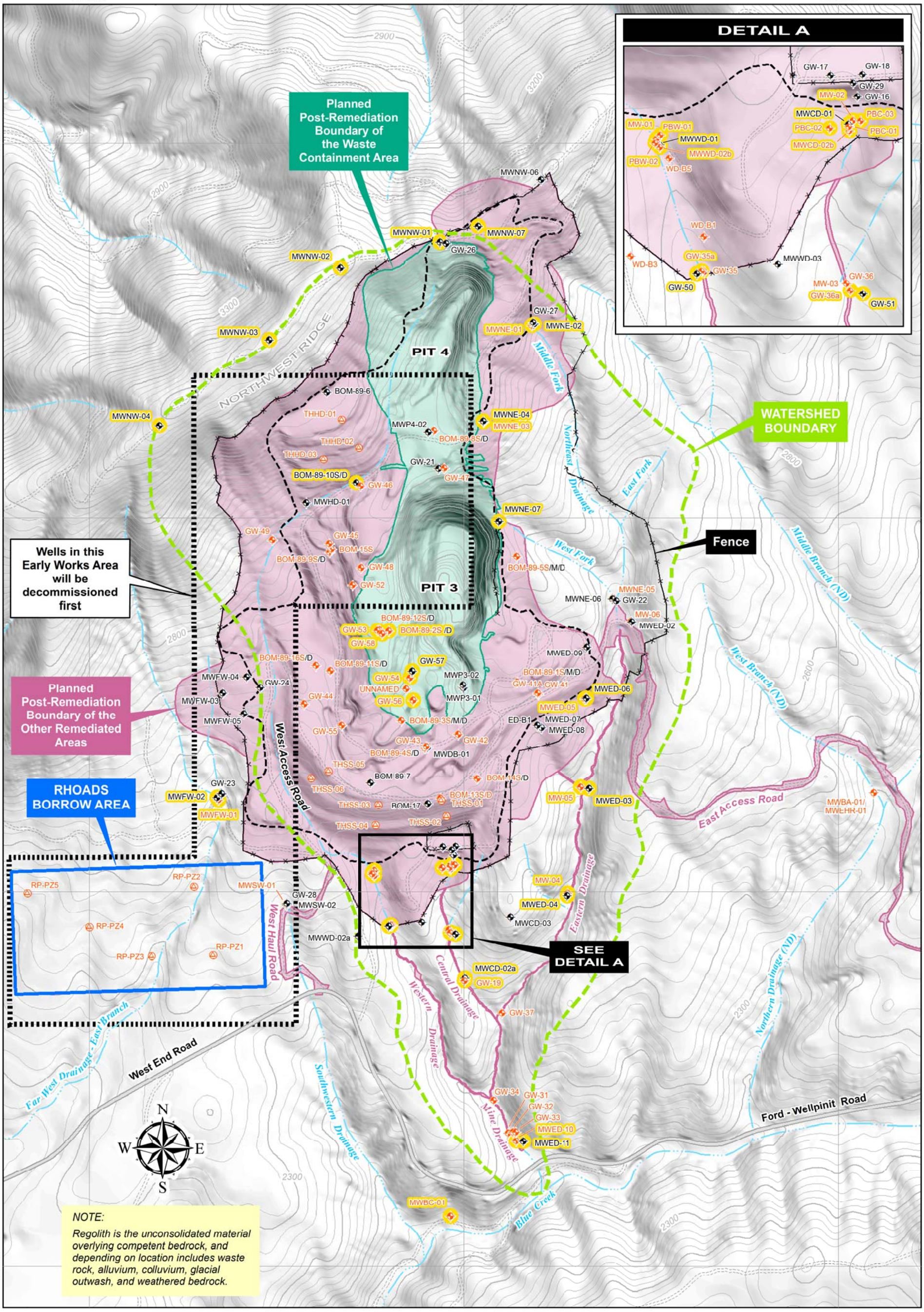
Well/Piezo ID	Nothing	Easting	Elevation	Source of Coordinates	Well Completion Log Available?	Date Installed	Boring Depth (ft bgs)	Depth of Mine Waste at Well Location (ft)	Well Depth (ft bgs)	Screen Interval (ft bgs)	Diameter-Screen/ Casing Material	Gravel Pack Interval (ft bgs)	Annular Seal Interval (ft bgs)	Comments
THSS-02	352,812.75	2,311,810.53	?	URS, 2002	yes	10/27/2000	92	88	84	64-84	1" PVC	60-88	4-60 and 88-92	5
THSS-03	352,932.71	2,311,084.71	?	URS, 2002	yes	10/12/2000	123	111	111	91-111	1" PVC	88-111	0-88 and 111-123	1
THSS-04	352,717.29	2,311,052.47	?	URS, 2002	yes	10/24/2000	101.5	89	89	69-89	1" PVC	67-89	5-67 and 89-101.5	1
THSS-05	353,292.33	2,310,549.64	?	URS, 2002	yes	10/10/2000	144	123	123	99-123	1" PVC	99-123	0-99 and 123-144	1
THSS-06	353,216.53	2,310,367.00	?	URS, 2002	yes	10/14/2000	77	>77	77	57-77	1" PVC	3-77	2-3	5
THHD-01	357,055.60	2,310,687.27	?	URS, 2002	yes	10/16/2000	99	97	97	77-97	1" PVC	72-97	2-72 and 97-99	1
THHD-02	356,756.03	2,310,876.14	?	URS, 2002	yes	10/23/2000	100.5	99	99	79-99	1" PVC	75-99	3-75 and 99-100.5	1
THHD-03	356,627.47	2,310,493.79	?	URS, 2002	yes	10/18/2000	102	90	90	70-90	1" PVC	67-90	3-67 and 90-102	1
WD-B1	351,798.10	2,311,229.30	2382.6	Benthin and Associates, 2011	yes	8/28/2011	50	0	30.3	20-30	2" PVC	18.8-30.8	0-18.8	3
WD-B3	351,716.00	2,310,918.00	2450	Benthin and Associates, 2011	yes	9/8/2011	40	0	25.3	5-25	2" PVC	4-27.3	0-4 and 27.3-40	3
WD-B5	352,133.50	2,311,081.10	2405.6	Benthin and Associates, 2011	yes	8/26/2011	41.5	0	20.3	10-20	2" PVC	8-20.3	0-8 and 20.3-41.5	3
UNNAMED	354,174.72	2,311,385.65		?	no	?	?	128.5[k]	?	?	?	?	?	2

1 Decommission well by gravity placement of grout from bottom to 10 feet above bottom of mine waste; excavate upper well casing along with mine wastes.
2 Decommission well by perforating casing and pressure grouting from bottom to 10 feet above bottom of mine waste; excavate upper well casing along with mine wastes.
3 Decommission well by gravity placement of grout from bottom to 2 feet below ground surface, cut off casing 2 feet below grade and backfill with clean fill.
4 Decommission well by perforating casing and pressure grouting from bottom to 2 feet below ground surface, cut off casing 2 feet below grade and backfill with clean fill.
5 Decommission well by excavating well materials along with mine wastes (total depth of well is ≤ depth of mine wastes).
6 Retain well for ongoing or future monitoring location.

? Information is not documented or is inferred from Well Completion Log or Ecology Well Report. Information provided for wells without well logs is taken from exisitng spreadsheet databases.
a Data compiled from summary tables and logs in the Midnite Mine Data Transmittal Report H-7 (Shepard Miller, 1999)
b Casing depth exceeds borehole depth because casing sank past borehole bottom.
c Available log shows "proposed" completion.
e Log prepared by Shepard Miller several years after well was installed based on Bureau of Mines (BOM) field notes.
f Source "Hydraulic Characterization of Midnite Mine, Wellpinit, WA: Summary of 1994 Field Season (BOM; May 2, 1996)
g Source "Midnite Mine Expanded Site Inspection Report, TDD: 97-07-0010, Contract 68-W6-0008, September 1998
h Source "Midnite Mine Reclamation Plan" (SMI, 1996)
i Source "Hydraulic Characterization of Midnite Mine, Wellpinit, WA: Summary of 1995 Field Season (BOM; May 2, 1996)
k Depth of mine waste based on nearby drilling log.

FIGURES

J:\Industrial Projects\MIDNITE MINE\Deliverables_Working Documents\Basis of Design Rpt\FIGURES_100 Percent\FIGURES\Fig Z-1_Midnite_Pre-RA Well Locs and Planned Remediated Areas_Dec2014.mxd 2 Jan 2015 DRAWN BY D. Severson



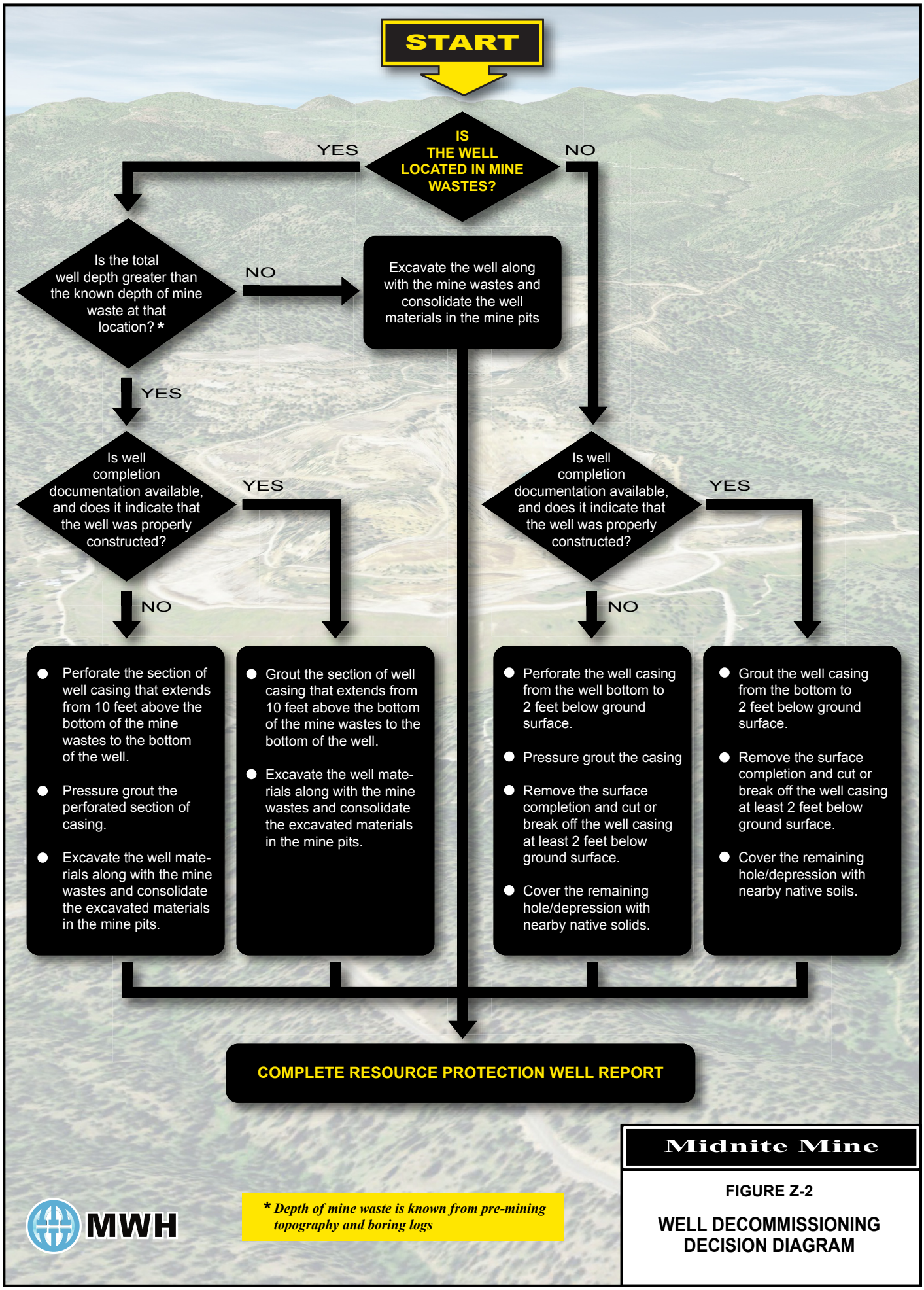
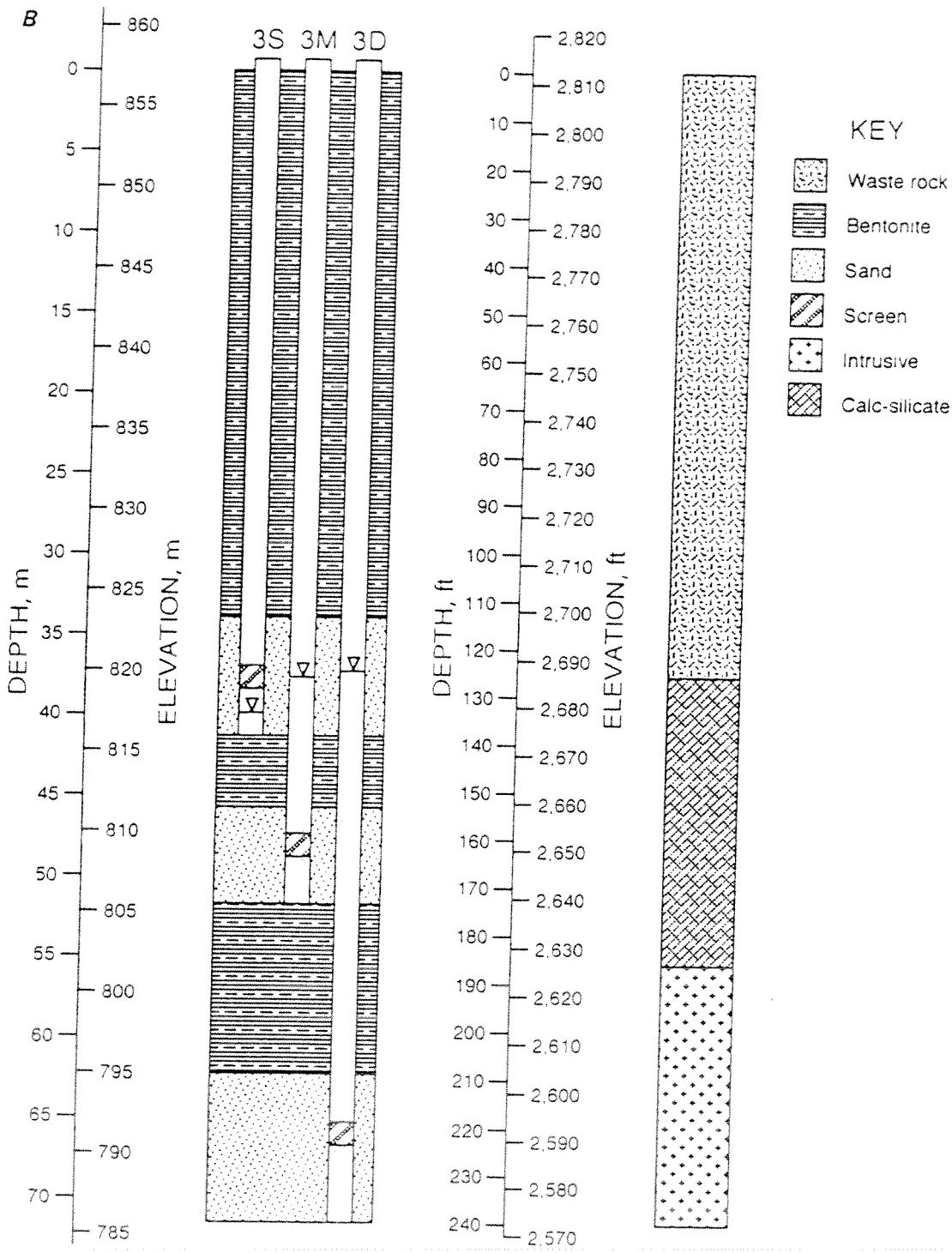


Fig Z-2_Well Decommissioning Decision Diagram_13Nov2013.ai 13 Nov 2013

Attachment Z-1

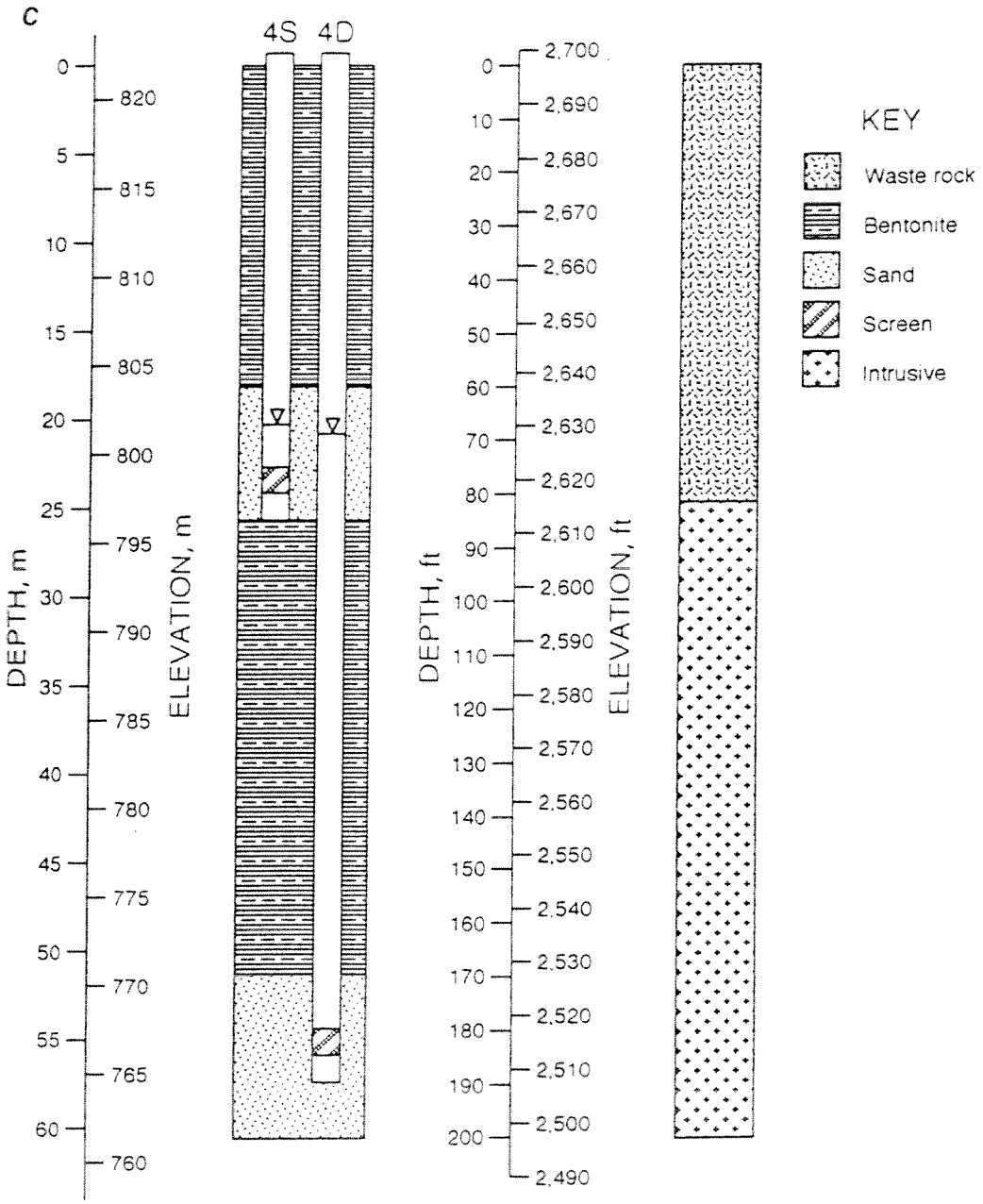
Monitoring Well and Piezometer Completion Logs

Figure 4—Continued



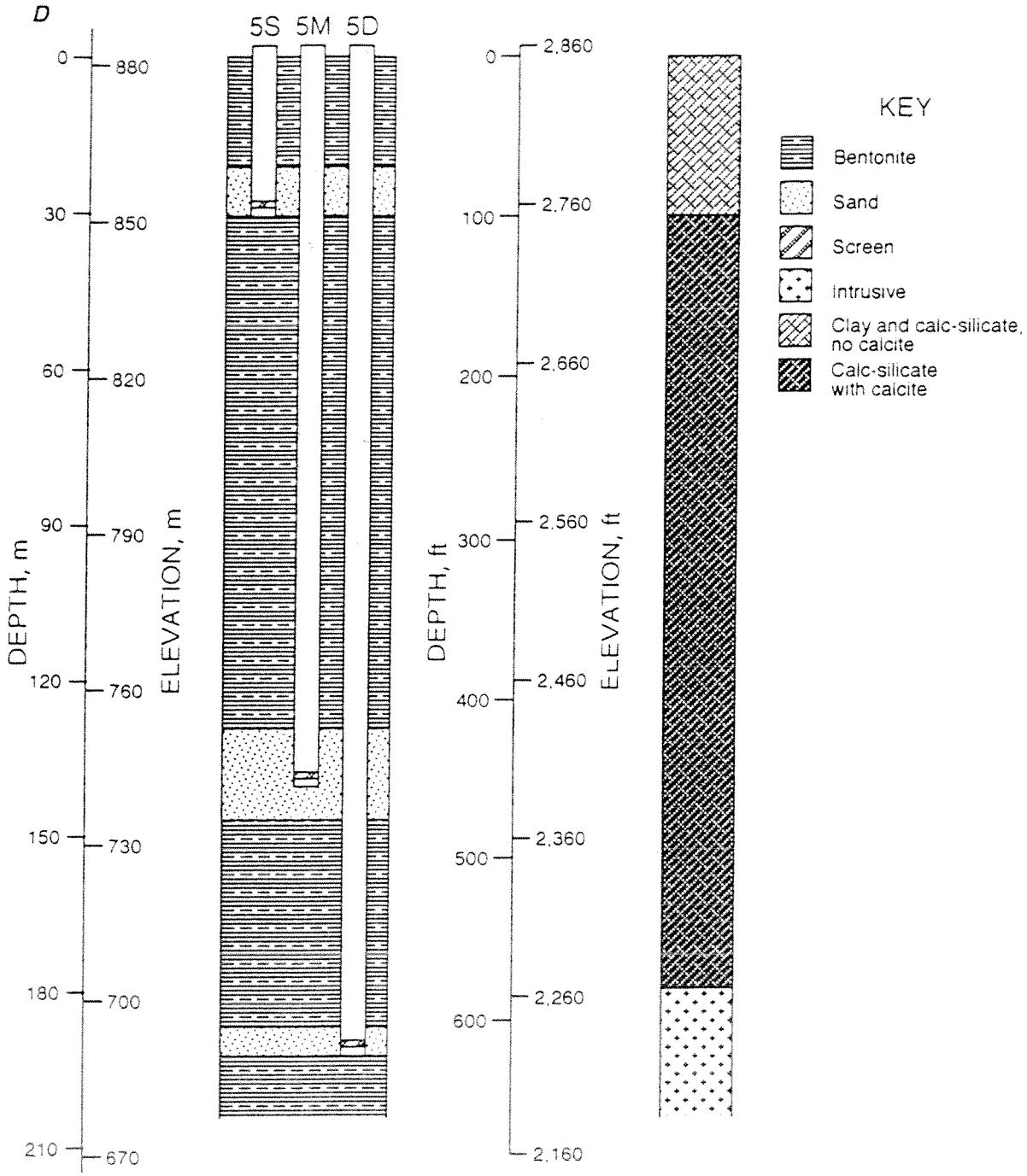
B, wells 3S, 3M and 3D.

Figure 4—Continued

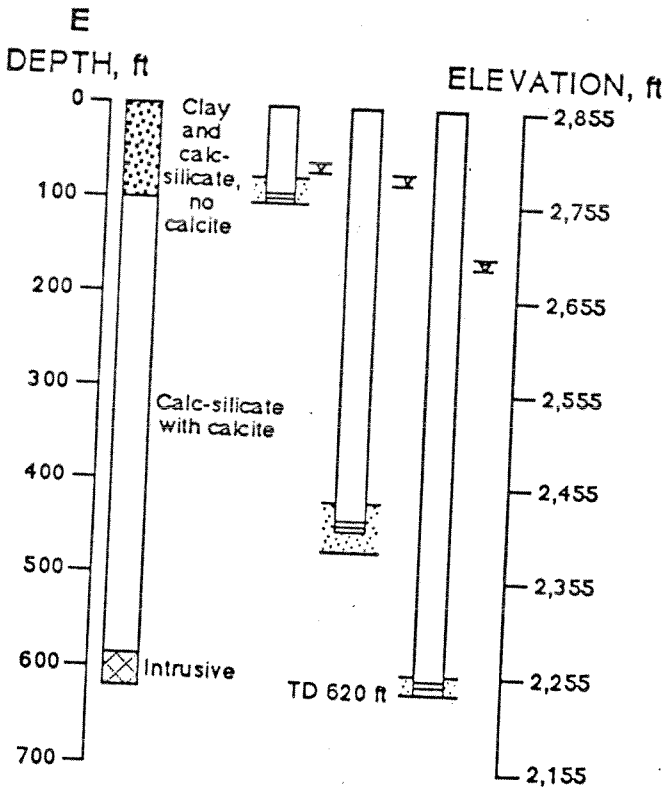


C, wells 4S and 4D.

Figure 4—Continued



D, wells 5S, 5M and 5D.



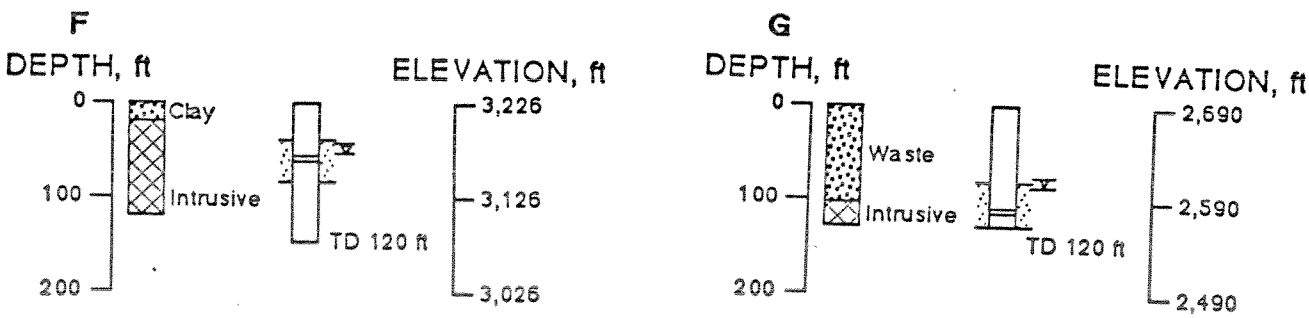
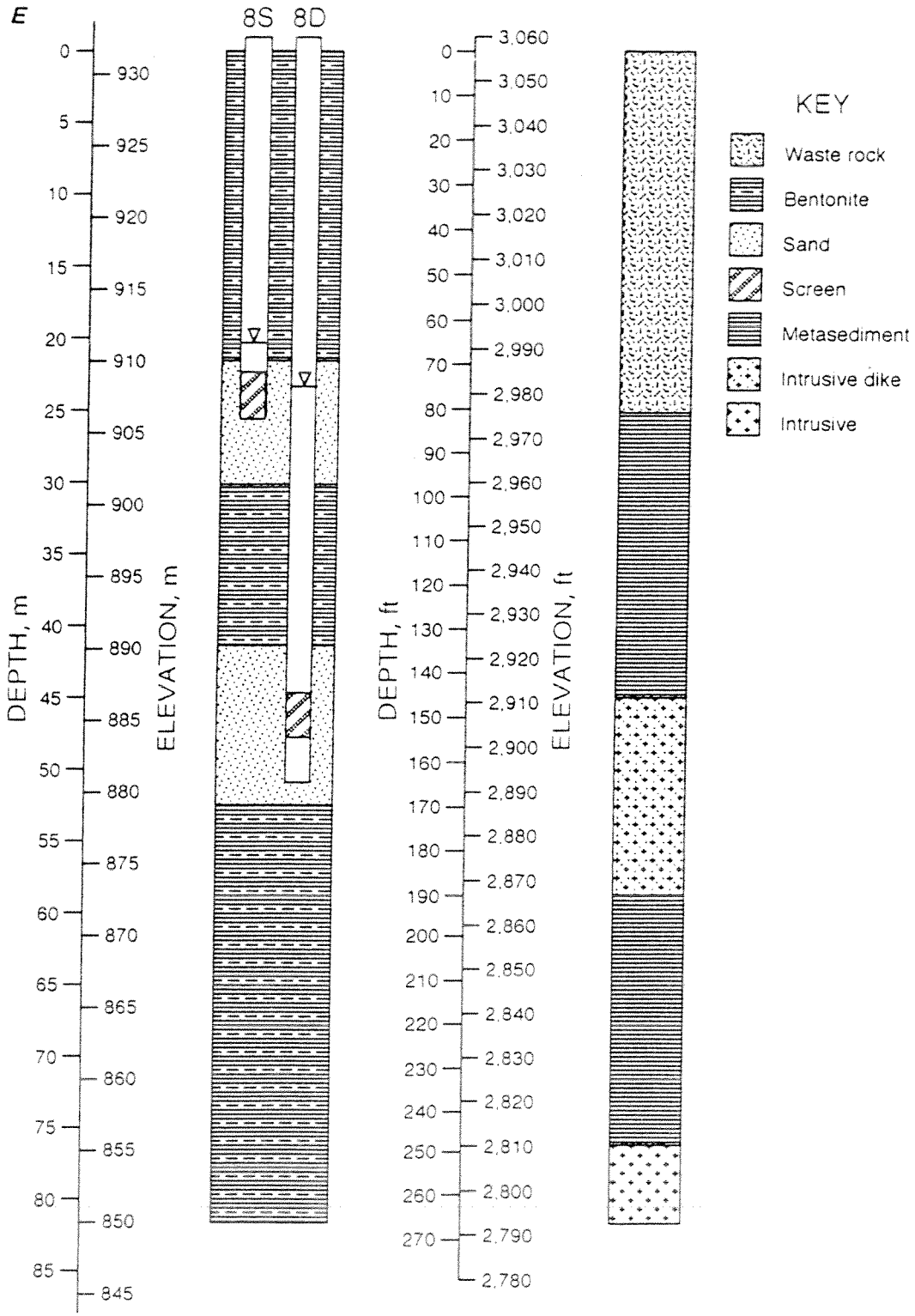


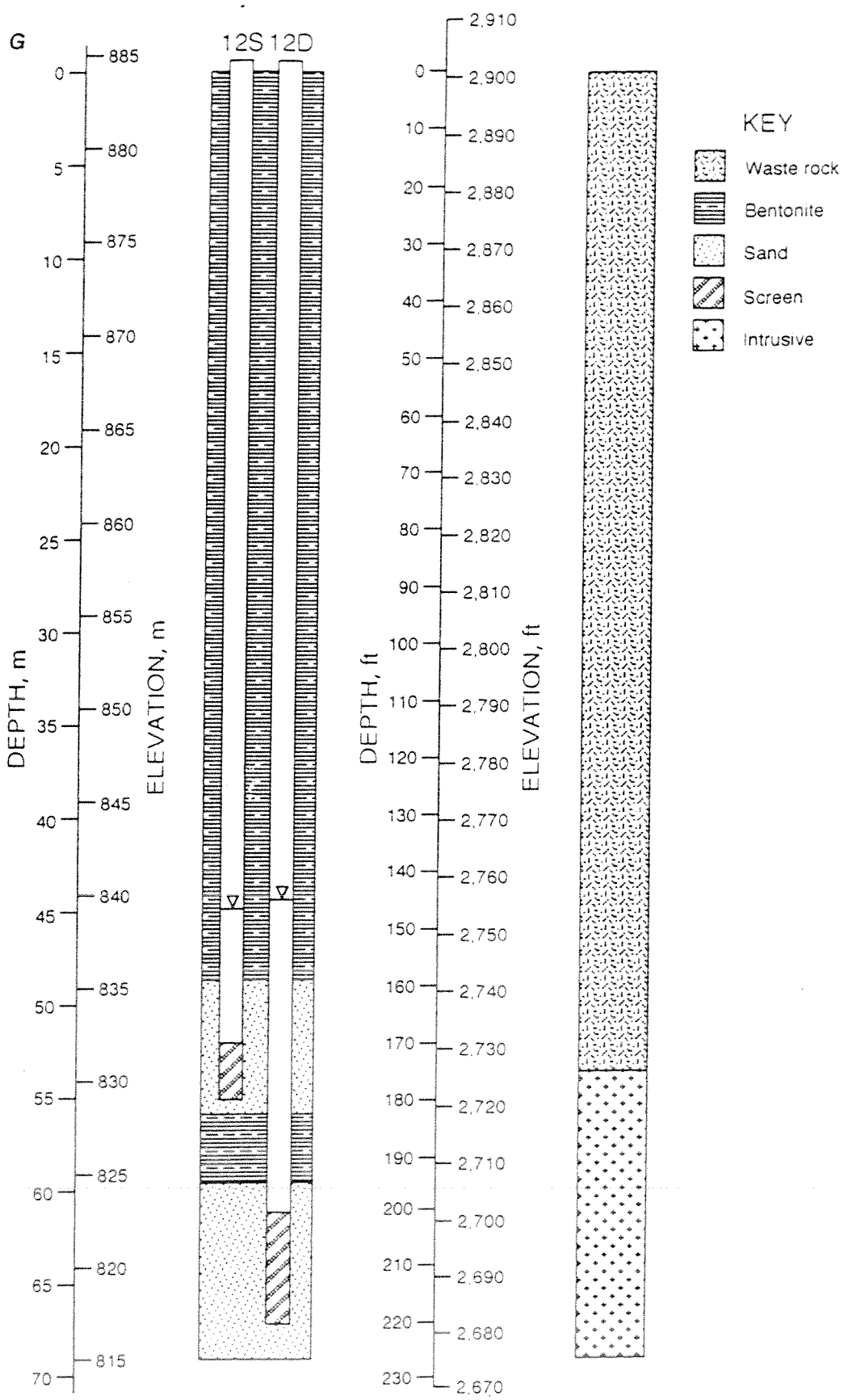
Figure 3. Monitor well completion details: Continued--
A, Well 89-1
B, Well 89-2
C, Well 89-3
D, Well 89-4
E, Well 89-5
F, Well 89-6
G, Well 89-7

Figure 4—Continued



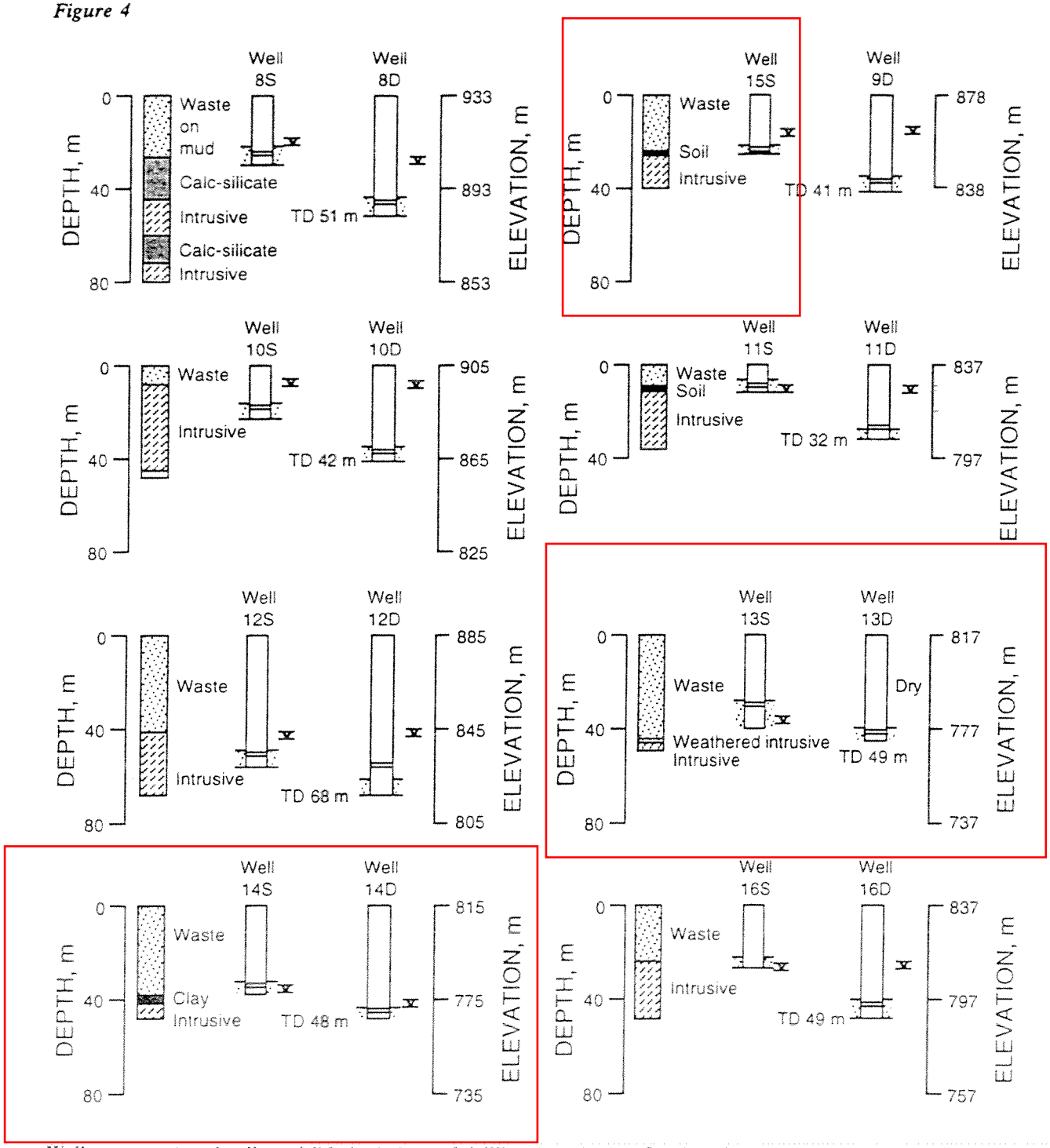
E, wells 8S and 8D.

Figure 4—Continued



G, wells 12S and 12D.

Figure 4

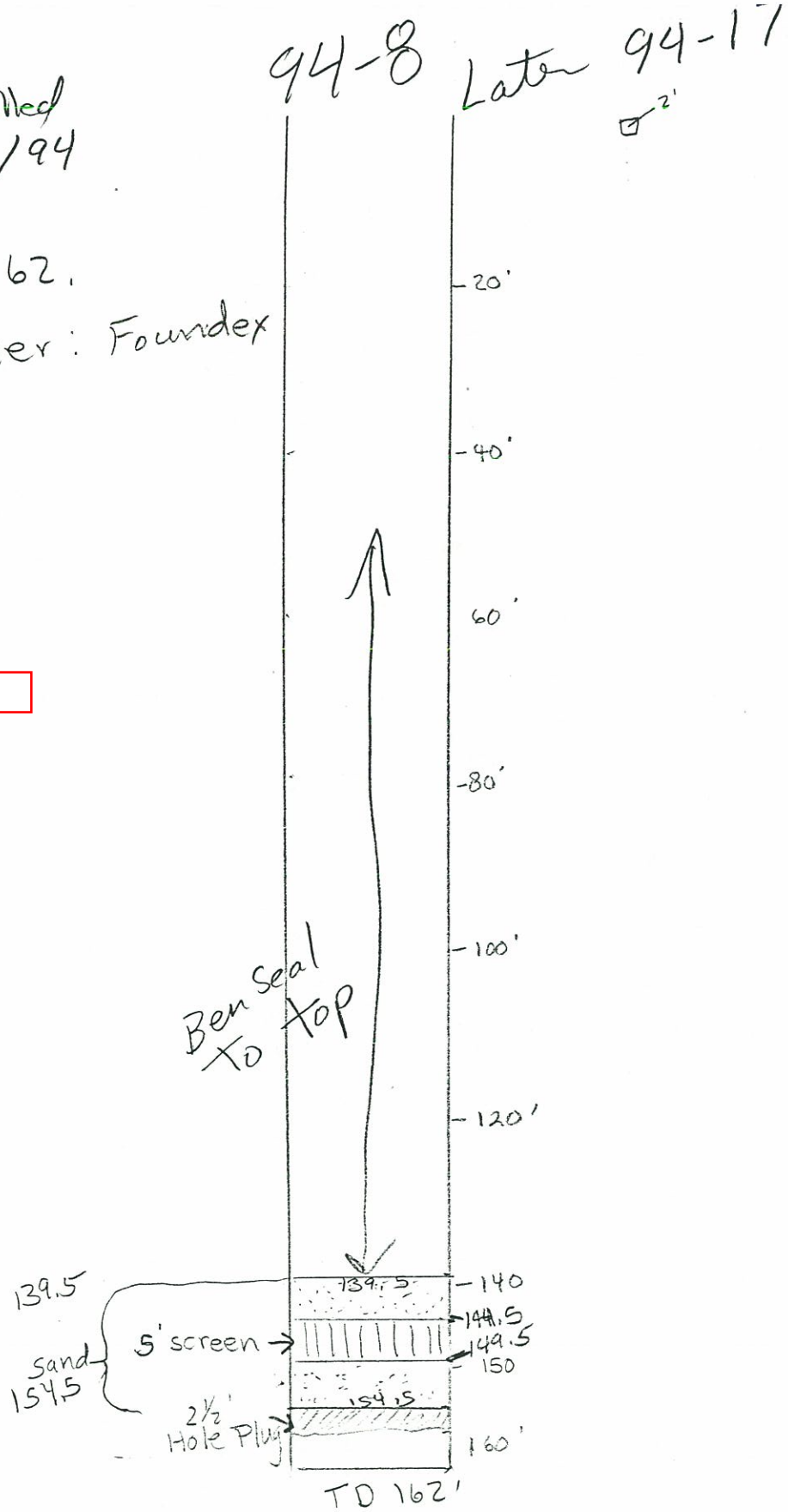


Well construction details and lithologic logs of drilling locations.—Continued

Drilled
9/21/94

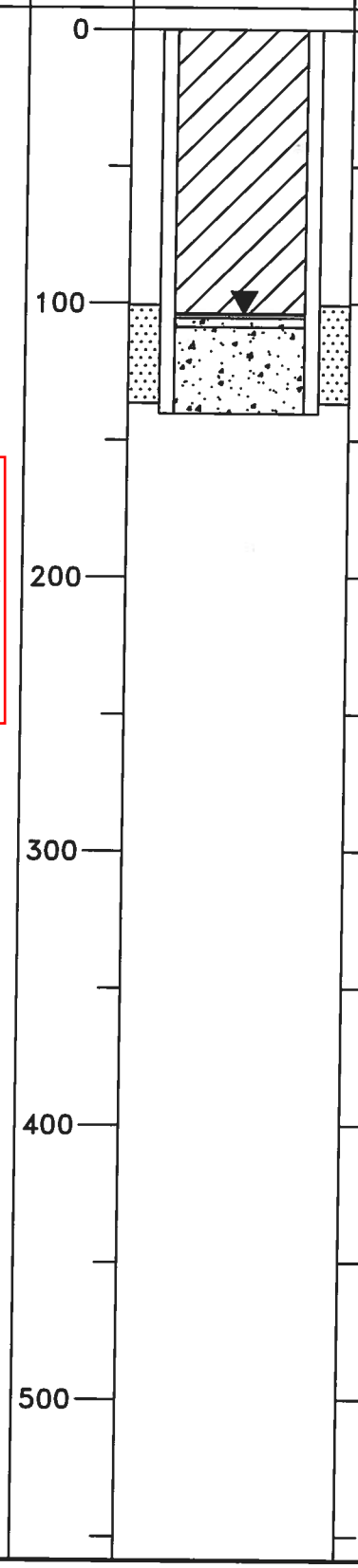
TD - 162.

Driller: Foundex



BOM-17

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2740'	0		2740	
				WASTE
WATER LEVEL 110'	100		2640	
				CALC–SILICATE
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).	200		2540	
	300		2440	
	400		2340	
	500		2240	

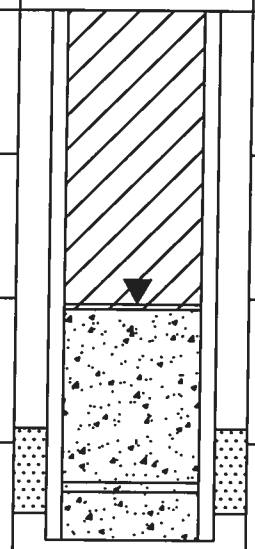


SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89–1S
(BOM–1)

Date:	JULY 1995
Project:	01–252
File:	BL\BOM–1

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2740'	0		2740	
				WASTE
WATER LEVEL 110'	100		2640	
				CALC–SILICATE
All BOM wells were sealed with Benseal™ between screened sections and Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).	200		2540	
	300		2440	
	400		2340	
	500		2240	

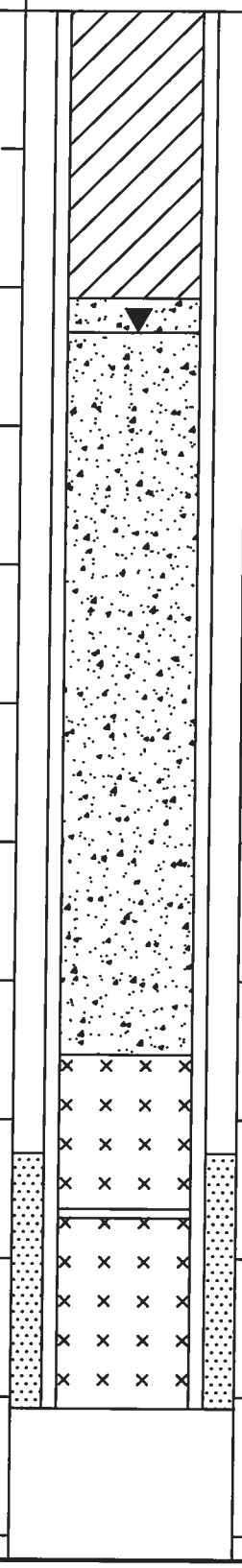


SHEPHERD MILLER
INCORPORATED

FIGURE
WELL LOG 89–1M
(BOM–1)

Date:	JULY 1995
Project:	01–252
File:	BL\BOM–1

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2740'	0		2740	WASTE
	100		2640	
WATER LEVEL 120'				CALC-SILICATE
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).	200		2540	
	300		2440	
	400		2340	INTRUSIVE
TOTAL DEPTH 505'	500		2240	

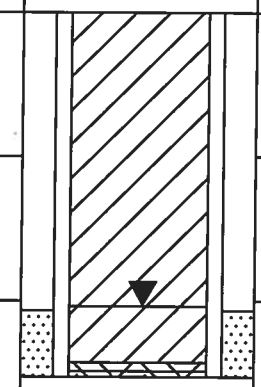


SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-1D
(BOM-1)

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-1

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2881'	0		2881	
				WASTE
WATER LEVEL 60'	66		2815	
				SOIL
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).				INTRUSIVE
	131		2749	
	197		2683	
	262		2617	
	328		2551	

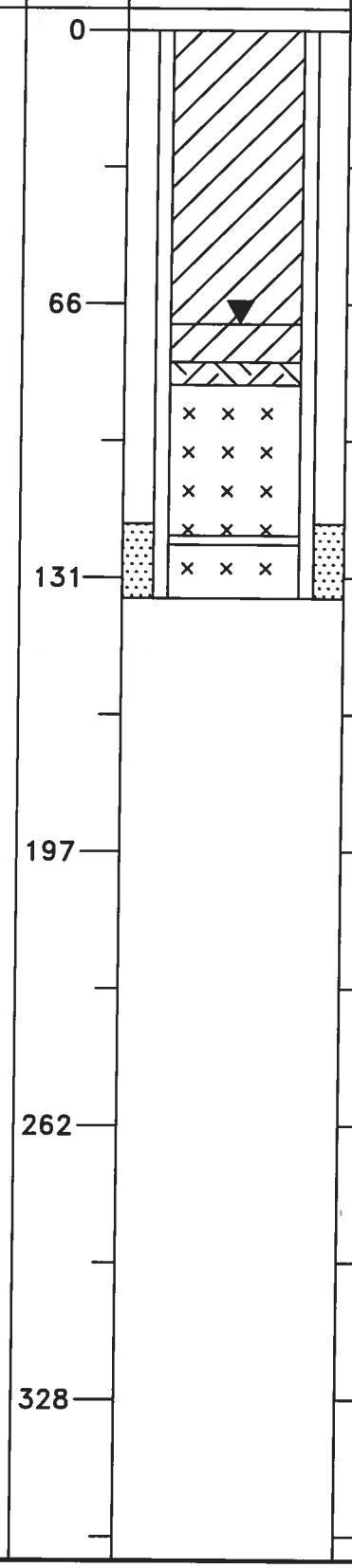


SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-9S
(BOM-9)

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-9

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2881'	0		2881	
				WASTE
WATER LEVEL 70'	66		2815	
				SOIL
				INTRUSIVE
TD 135'	131		2749	
	197		2683	
	262		2617	
	328		2551	



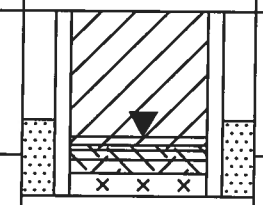
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).

SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-9D
(BOM-89

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-9

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2746'	0		2746	WASTE
WATER LEVEL 30'				SOIL
	66		2680	INTRUSIVE
	131		2615	
	197		2549	
	262		2484	
	328		2718	



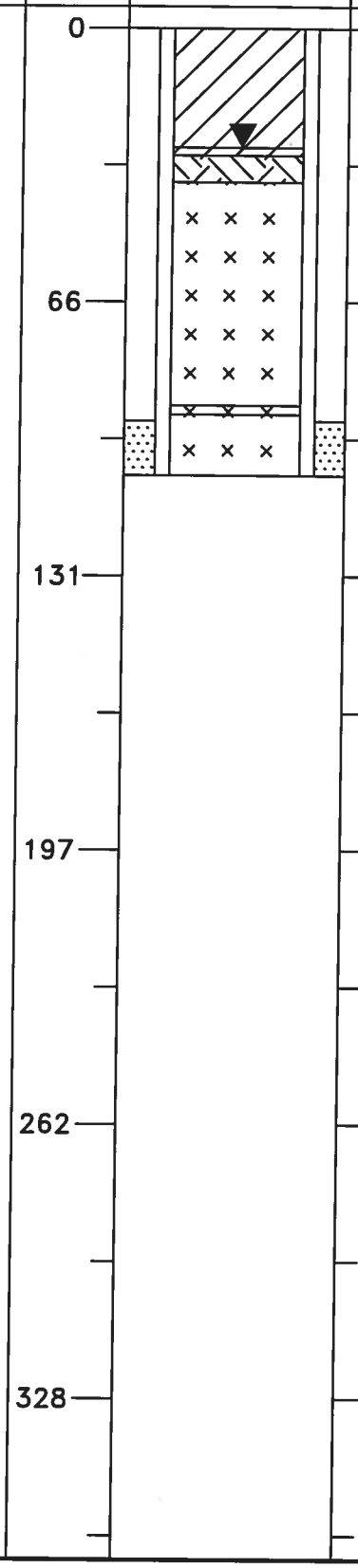
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).

SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-11S
(BOM-11)

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-11

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2746'	0		2746	WASTE
WATER LEVEL 30'				SOIL
	66		2680	INTRUSIVE
TD 105'				
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).	131		2615	
	197		2549	
	262		2484	
	328		2718	

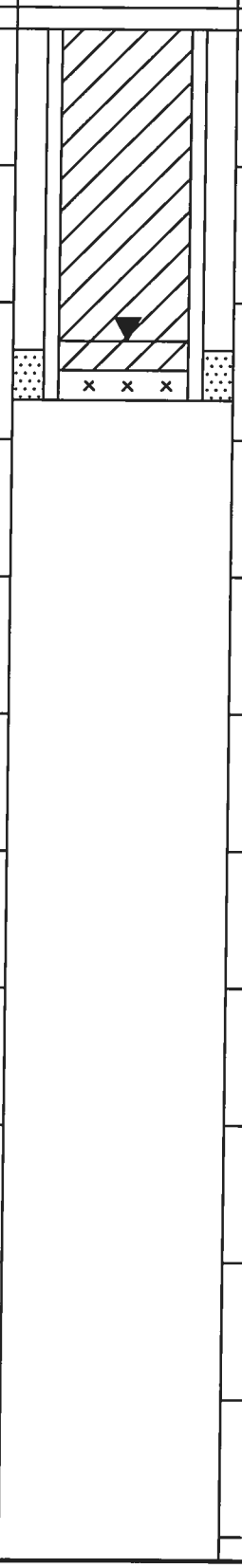


SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-11D
(BOM-11)

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-11

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2746'	0		2746	
				WASTE
	66		2680	
WATER LEVEL 70'				
				INTRUSIVE
All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).	131		2615	
	197		2549	
	262		2484	
	328		2718	

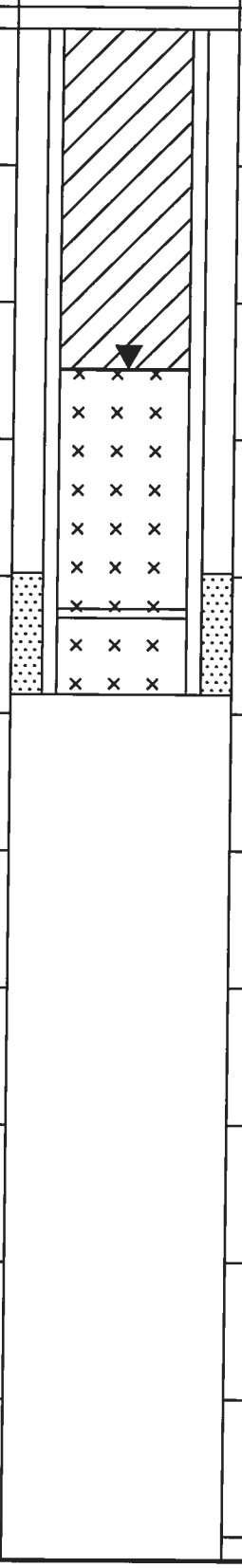


SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-16S
(BOM-16)

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-16

REMARKS	DEPTH (FT)	WELL LOG	ELEVATION (FT)	GEOLOGY
COLLAR ELEVATION 2746'	0		2746	
				WASTE
	66		2680	
WATER LEVEL 80'				
				INTRUSIVE
	131		2615	
TD 161'				
	197		2549	
	262		2484	
	328		2718	



All BOM wells were sealed with Benseal™ between screened sections, and with Benseal™ or bentonite slurry from the top of the shallowest sandpack to the surface (BOM, 1994).

SHEPHERD MILLER INCORPORATED

FIGURE
WELL LOG 89-16D
(BOM-16)

Date:	JULY 1995
Project:	01-252
File:	BL\BOM-16

MWH Americas, Inc.
2890 East Cottonwood Parkway, Suite 300
Salt Lake City, Utah 84121
Telephone: (801) 617-3200
Fax: (801) 617-4200

ED-B1

CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DRILLING DATE 9/16/2011 **COMPLETION DATE** 9/21/2011 **LOGGED BY** Bill Bragdon

DRILL METHOD HSA / Core **BOREHOLE DIAMETER** HSA 8 inch, 0 to 25 feet; Core 2.5 inch, 25 to EOB **DRILLING COMPANY** Ruen Drilliing

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Piezometer Completion
0.0	SS	3 6 6	67	NA	NA	NA	Silty clay to about 20 feet. Possible fill material. Silty clay (CL), brown (10YR 4/3), low to medium plasticity, soft to medium stiff, dry, few organics and roots, crumbles under strong finger pressure.		+1.8; Bentonite seal; 2 inch sch. 40 PVC
2.5	SS	3 4 4	73	NA	NA	NA	Grades to dark grayish brown (10YR 4/2) with white stringers and vugs of calcite, few organics, slightly moist at 4.0 feet.		
5.0	SS	1 4 4	93	NA	NA	NA	Grades to brown (7.5YR 4/5), very soft to soft, slightly moist, few roots, medium sand lenses (0.2 feet thick).		
7.5	SS	5 9 13	100	NA	NA	NA	Silty clay (CL), grades to reddish brown (5YR 4/4), medium plasticity, medium stiff to stiff, slightly moist, rock and brick (?) Fragments of medium sand size. Crumbles under moderate finger pressure.		
10.0									

(Continued Next Page)

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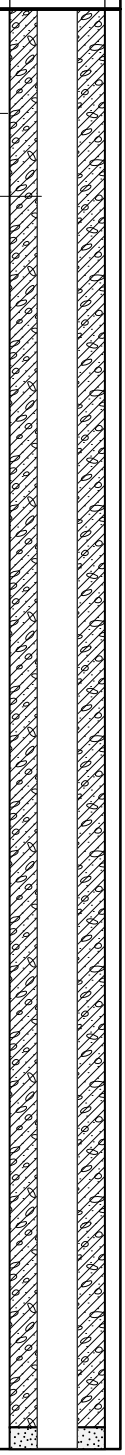
CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION
10.0	SS	2 5 8	100	NA	NA	NA	As above at 7.5 feet with decomposed roots and organics.
12.5	SS	4 6 9	100	NA	NA	NA	As above at 7.5 feet with no roots, trace medium sand, decrease in rock and brick fragments.
15.0	SS	5 8 10	100	NA	NA	NA	Silty clay (CL), brown (7.5YR 5/4), medium plasticity, medium stiff to stiff, dry to slightly moist with few sandy pockets, some mottling of pale brown (10YR 6/3).
17.5	SS	4 6 9	100	NA	NA	NA	As above at 7.5 feet with mottled appearance with roots and organics, primarily yellowish brown (10YR 5/4) with pale brown (10YR 6/3).
20.0							

GRAPHIC LOG

Piezometer Completion



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MWH Americas, Inc.
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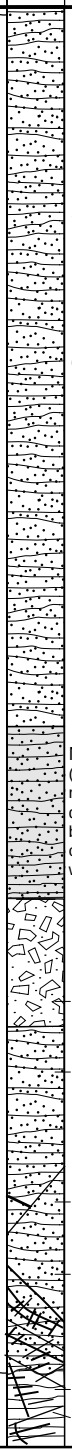
Salt Lake City, Utah 84121
Telephone: (801) 617-3200
Fax: (801) 617-4200

CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION
20.0							Weathered phyllite approximately 20 feet to approximately 29 feet.
	SS	21 46 49	100	NA	NA	NA	Decomposed (W9) phyllite with fine-grained sandy silt texture, crumbles under finger pressure, generally yellowish brown (7.5Y 6/3), non plastic to low placticity locally, dry to slightly moist where low plasticity. Moist to wet at 22 feet bgs.
22.5							.
25.0							Switched to HQ core in competent bedrock.
	SS	6 15 23	100	NA	NA	NA	Decomposed (W9) phyllite of silty fine-grained sand, grayish brown (2.5Y 5/2) grading to pale yellow (2.5Y 7/4) at 26 feet, non plastic where sandy, low plasticity where silty, dry to slightly moist, argillic waxy texture.
27.5	HQ Core		76	0	8 to 9	7	Decomposed (W9) phyllite with some coarse gravel size fragments, pale yellow (2.5Y 7/4), waxy texture, very soft (H7), grades to intensely weathered (W8).
					5	4	Phyllite from about 29 feet to EOB. Grades to fine-grained phyllite, generally light olive gray (5Y 6/2), medium hard (H4), moderately weathered (W5).
30.0							

GRAPHIC LOG



Fracture

10/20 silica sand

2 inch sch. 40 PVC

Water measured in HSA at 22 feet bgs during drilling

0.010 slot size

No Recovery (material likely removed during drilling by circulation water.)

Drilling induced rubble.

argillic matrix.

strong argillic alteration.

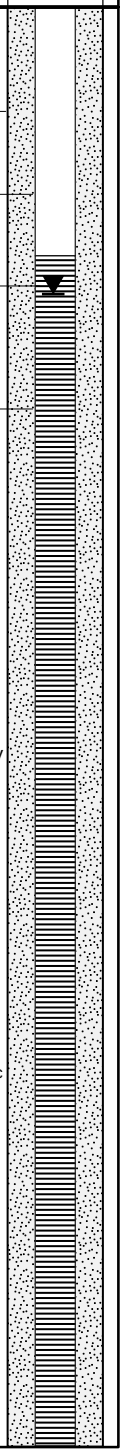
50º strong argillic alteration.

50º

70º

20º

Piezometer Completion



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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	Fracture
30.0								
	HQ Core		100	NA	5	4	Fine-grained phyllite, light olive gray (5Y 6/2), medium hard (H4) and moderately weathered (W5). V-wire transducer installed at 30.2 feet on 11/3/2011.	30º to 40° foliations. V-wire (installed at 30.2 feet (32 feet btoc) on 11/3/2011) rubble of coarse sand size. 2 inch PVC cap 1/2 quartz veining, broken to rubble, some argillic of pale yellow. 30º foliation. rubble. 50º 40º with weak FeOx.
32.5								
			65	0	5	4	Fine-grained phyllite with foliations 30 to 40 degrees, very fractured rubble locally grading to argillic alteration then no recovery at about 34.7 to 37 feet, moderate FeOx at 34.5 and 34.6 feet.	20º 10º 70º 40º 60º with moderate FeOx, argillic alteration, pale yellow. No Recovery (material likely removed during drilling by circulation water.)
35.0								
37.5								
			63	0	9	7	Grades to decomposed (W9), phyllite, pale olive (5Y 6/4) with some FeOx, quartz gravel of coarse-grained sand to coarse gravel size, trace manganese, pale yellow (5Y 7/4), argillic with some quartz gravel.	Drilling induced rubble of quartz gravel. Drilling induced rubble.
40.0								

(Continued Next Page)

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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture
40.0									
42.5	HQ Core		90	60	8	8	Fine to medium-grained phyllite, very intensely weathered (W8), soft (H8), pale yellow (5Y 7/4) grading to pale olive (5Y 6/3) at 42.5 feet, moderately weathered (W5) soft (H6) 42.7 to 43.8 feet, foliations at 30° to 40°.		10º with trace argillic. 60º 50º 60º with moderate FeOx.
					5	6			80º 10º 60º Drilling induced rubble. 60º argillic.
45.0									
			100	30	5	5	Grades to fine-grained phyllite with 40° to 60° foliations, some quartz veining along foliations, trace FeOx.		60º 70º rubble. 10º 60º
47.5									80º quartz veining. Trace rubble.
						4	Grades to gray (5/N) and moderately hard (H4).		10º 80º 60º
50.0									

(Continued Next Page)

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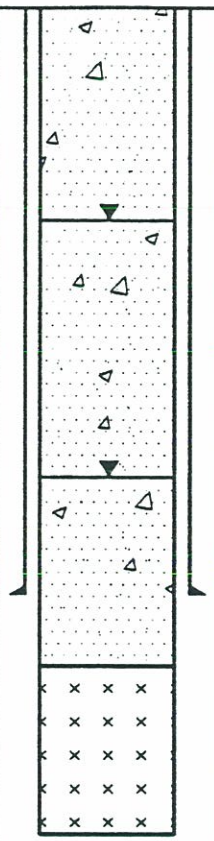
CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture
50.0									
	HQ Core		100	85	5	4	Very fine-grained phyllite with foliations 40° to 60°, very fractured 51 to 51.5 feet, moderate FeOx at 51.5 to 52.2 feet with some quartz veining, gray (5N).		20º 80º very fractured. 10º with moderate FeOx (0.2 inch). 50º
52.5									
			100	68	4	4	Fine-grained phyllite with foliations 40° to 60° with some quartz veining, gray (5N).		40º rubble. 70º 30º 40º 60º 60º
55.0									
			100	36	3	2	Fine-grained phyllite as above grading to slightly weathered (W3) and very hard (H2).		70º trace for FeOx. 10º 80º very fractured with trace of some FeOx. 60º rubble.
57.5									
			100	63	2	2 to 3	Fine-grained phyllite as with foliation 30° to 60°, slightly weathered to fresh (W2), hard (H3) to very hard (H2), very dark gray (3/N) quartz veining.		10º 70º 50º 80º
60.0									

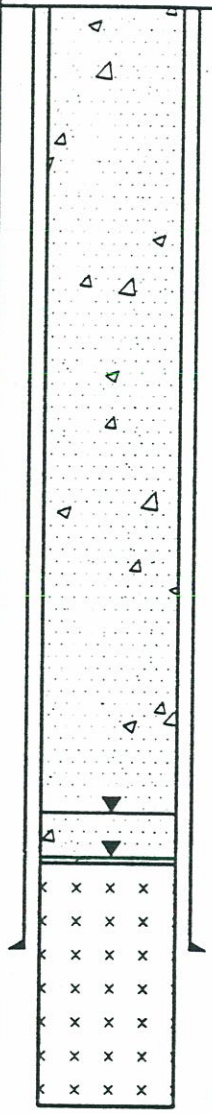
End of borehole at 60.0 feet.

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2458.97' N 7388.80 E 10775.76 TOTAL DEPTH = 35' WATER LEVEL 4/25/91 = 9.2' WATER LEVEL DURING 1979 DRILLING = 20' CASING SET AT 25'	4 8 12 16 20 24 28 32 36		CALC-SILICATE DAM FILL PORPHYRITIC QUARTZ MONZONITE

SMI
SHEPHERD MILLER, INC.

WELL LOG #16

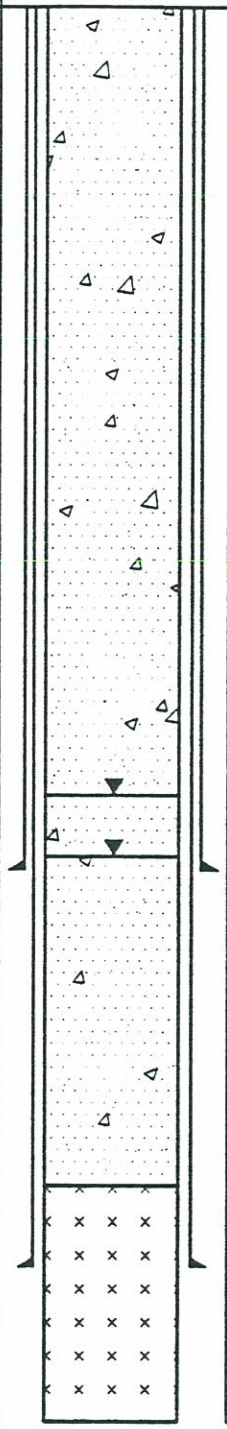
Date: JULY, 1991
Project: 252

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2503' N 7483 E 10,663.66 TOTAL DEPTH = 70'	6 12 18 24 30 36 42 48 54 60 66 72		CALC–SILICATE DAM FILL
WATER LEVEL 4/30/91 = 51.3' WATER LEVEL DURING 1979 DRILLING = 54.5' 5" CASING SET AT 60'			PORPHYRITIC QUARTZ MONZONITE

SMI
SHEPHERD MILLER, INC.

WELL LOG #17

Date: JULY, 1991
Project: 252

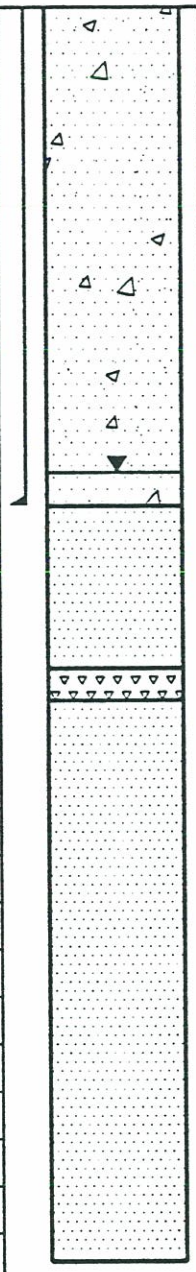
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2502.75' N 7482.92 E 10800.82 TOTAL DEPTH = 95'	6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96		CALC-SILICATE DAM FILL
WATER LEVEL 4/25/91 = 50.3' WATER LEVEL DURING 1979 DRILLING = 54.5' 6" CASING SET AT 55'			
5" CASING SET AT 80'			PORPHYRITIC QUARTZ MONZONITE

SMI
SHEPHERD MILLER, INC.

WELL LOG #18

Date: JULY, 1991
Project: 252

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 3021' N 11526 E 10797 TOTAL DEPTH = 200' WATER LEVEL 4/24/91 = 74.5'	15 30 45 60 75		0 – 80' FILL FROM PIT 3 STRIP ~ 50' FILL BECOMES MOIST
CASING SET AT 80'	90 105		AMPHIBOLITE DIKE
	120 135 150 165 180 195 210		80 – 200' QUARTZ MUSCOVITE SCHIST



SMI
SHEPHERD MILLER, INC.

WELL LOG #21

Date: JULY, 1991
Project: 252

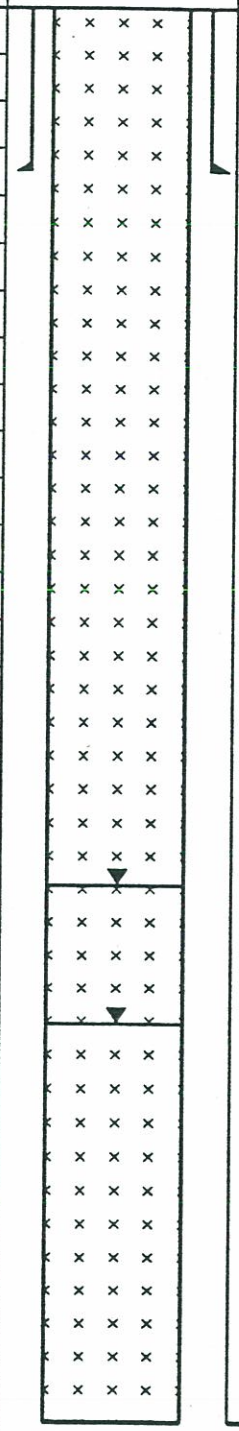
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2537.12' N 8135.6 E 8324.82 TOTAL DEPTH = 50' WATER LEVEL DURING 1979 DRILLING = 15.2' CASING SET AT 16'	5 10 15		0 – 30' WEATHERED GRANITE
WATER LEVEL 4/24/91 = 16.3'	20 25 30 35 40 45 50		PORPHYRITIC QUARTZ MONZONITE

SMI
SHEPHERD MILLER, INC.

WELL LOG #23

Date: JULY, 1991
Project: 252

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 3434' N 13929 E 10852 TOTAL DEPTH = 150'	10		0 – 10' LOOSE, BADLY WEATHERED
6" CASING SET AT 17'	20		
	30		
	40		
	50		
	60		
	70		
	80		PORPHYRITIC QUARTZ MONZONITE
WATER LEVEL 4/24/91 = 93.4'	90		END OF RUSTY ALTERATION
WATER LEVEL DURING 1979 DRILLING = 108'	100		
	110		
	120		
	130		
	140		
	150		
	160		



SMI
SHEPHERD MILLER, INC.

WELL LOG #26

Date: JULY, 1991
Project: 252

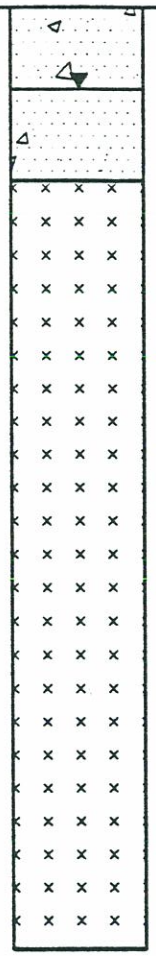
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 3110' N 13044 E 11859 TOTAL DEPTH = 100' WATER LEVEL 4/24/91 = 12.6'	10 20		0 – 10' SCHIST WITH SOME ORGANICS 10 – 15' BLACK SOIL WITH TAN CLAY AND ORGANICS
6" CASING SET AT 20'	30 40 50		15 – 40' TAN CLAY–LIMONITIC CALC–SILICATE MATERIAL
WATER LEVEL DURING 1979 DRILLING = 72'	60 70 80		40 – 81' DARK GRAY MICA SCHIST – GRAPHITIC CHLORITE ALTERATION PYRITE & QUARTZ STRINGERS
	90 100 110		CALC–SILICATE WITH ABUNDANT GARNETS

SMI
SHEPHERD MILLER, INC.

WELL LOG #27

Date: JULY, 1991
Project: 252

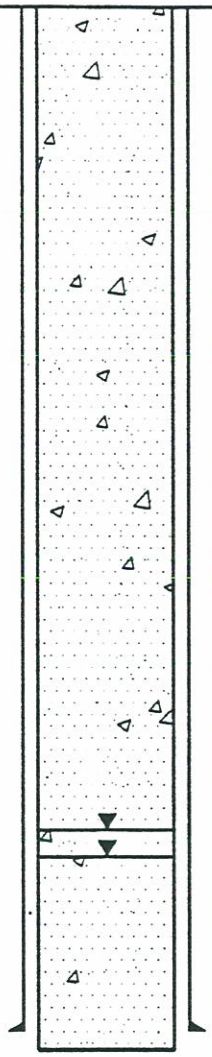
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
DOLLAR ELEVATION = 2456' N 6937.93 E 8980.07 TOTAL DEPTH = 100' WATER LEVEL 4/25/91 = 8.7'	10		0 – 6' FILL 6 – 10' BLACK ORGANIC SOIL 10 – 18' DECOMPOSED GRANITE
CASING SET AT 20'	20 30 40 50 60 70 80 90 100 110		PORPHYRITIC QUARTZ MONZONITE



SMI
SHEPHERD MILLER, INC.

WELL LOG #28

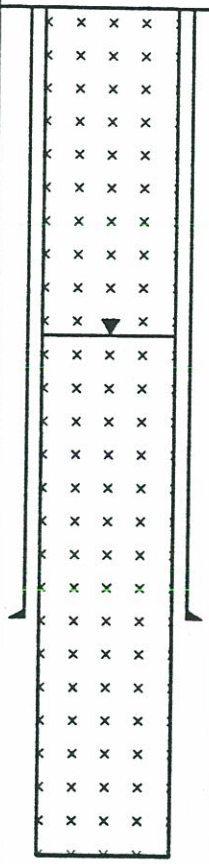
Date: JULY, 1991
Project: 252

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2503' N 7463.15 E 10785.96 TOTAL DEPTH = 66.5'	6 12 18 24 30 36 42 48 54 60 66		CALC-SILICATE DAM FILL
WATER LEVEL 4/25/91 = 52.8' WATER LEVEL DURING 1979 DRILLING = 54.5' CASING SET AT 65.5'			

SMI
SHEPHERD MILLER, INC.

WELL LOG #29

Date: JULY, 1991
Project: 252

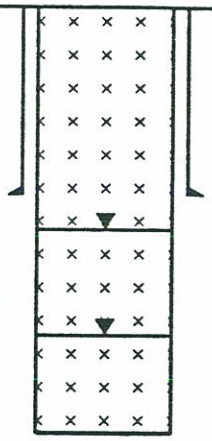
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2145.05' N 4322.6 E 11327.84 TOTAL DEPTH = 18' WATER LEVEL 4/25/91 = 7' CASING SET AT 13'	2 4 6 8 10 12		0 – 15' WEATHERED GRANITE PORPHYRITIC QUARTZ MONZONITE
5' SCREEN GRAVEL PACKED	14 16 18 20		

SMI
SHEPHERD MILLER, INC.

WELL LOG #32

Date: JULY, 1991
Project: 252

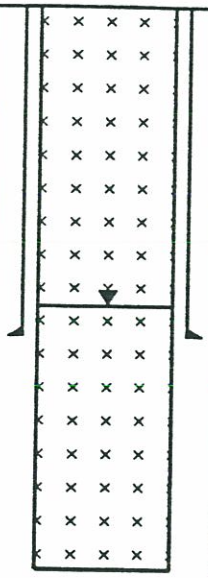
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2143.22' N 4336.45 E 11354.61 TOTAL DEPTH = 9' CASING SET AT 4'	2 4		0 – 4' WEATHERED GRANITE
5' SCREEN GRAVEL PACKED WATER LEVEL 4/25/91 = 4.8' WATER DURING 1980 DRILLING = 7'	6 8 10		PORPHYRITIC QUARTZ MONZONITE



SMI
SHEPHERD MILLER, INC.

WELL LOG #33

Date: JULY, 1991
Project: 252

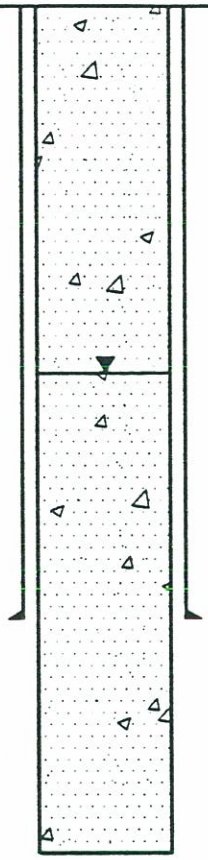
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
OLLAR ELEVATION = 2173.83' 4755.85 11106.17 TOTAL DEPTH = 12' WATER LEVEL 4/25/91 = 6.3' CASING SET AT 7'	2 4 6		0 – 8' WEATHERED GRANITE PORPHYRITIC QUARTZ MONZONITE
5' SCREEN GRAVEL PACKED	8 10 12		

SMI
SHEPHERD MILLER, INC.

WELL LOG #34

Date: JULY, 1991
Project: 252

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2369.01' N 6664.75 E 10094.03 TOTAL DEPTH = 18'	2 4 6		0 – 12' 'B' HORIZON
WATER LEVEL 4/25/91 = 7.8'	8 10		
CASING SET AT 13'	12		
5' SCREEN GRAVEL PACKED	14 16 18 20		12 – 18' 'C' HORIZON

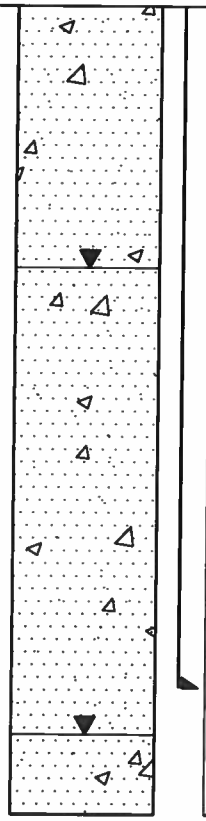


SMI
SHEPHERD MILLER, INC.

WELL LOG #35

Date: JULY, 1991
Project: 252

REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2371.88' N 6571.52 E 10724.63 TOTAL DEPTH = 32'	4		0 – 3.5' 'A' HORIZON
WATER LEVEL 4/25/91 = 10.2'	8		3.5 – 15' 'B' HORIZON
	12		
	16		
	20		
	24		15 – 32' 'C' HORIZON
CASING SET AT 27'			
5' SCREEN GRAVEL PACKED	28		
WATER LEVEL DURING 1979 DRILLING = 30'	32		



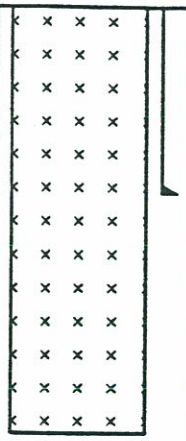
SMI
SHEPHERD MILLER, INC.

WELL LOG #36

Assumed that well was renamed GW-36

Date: JULY, 1991

Project: 252

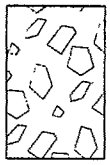
REMARKS	DEPTH (FT)	WELL LOG	GEOLOGY
COLLAR ELEVATION = 2261.29' N 5672.76 E 11210.8 TOTAL DEPTH = 9' CASING SET AT 4'	2 4 6 8 10		0 – 6' WEATHERED GRANITE PORPHYRITIC QUARTZ MONZONITE
5' SCREEN GRAVEL PACKED			

SMI
SHEPHERD MILLER, INC.

WELL LOG #37

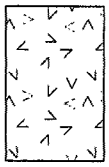
Date: JULY, 1991
Project: 252

STRATIGRAPHY LEGEND

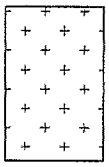


WASTE ROCK

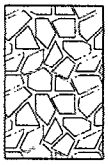
ALLUVIUM



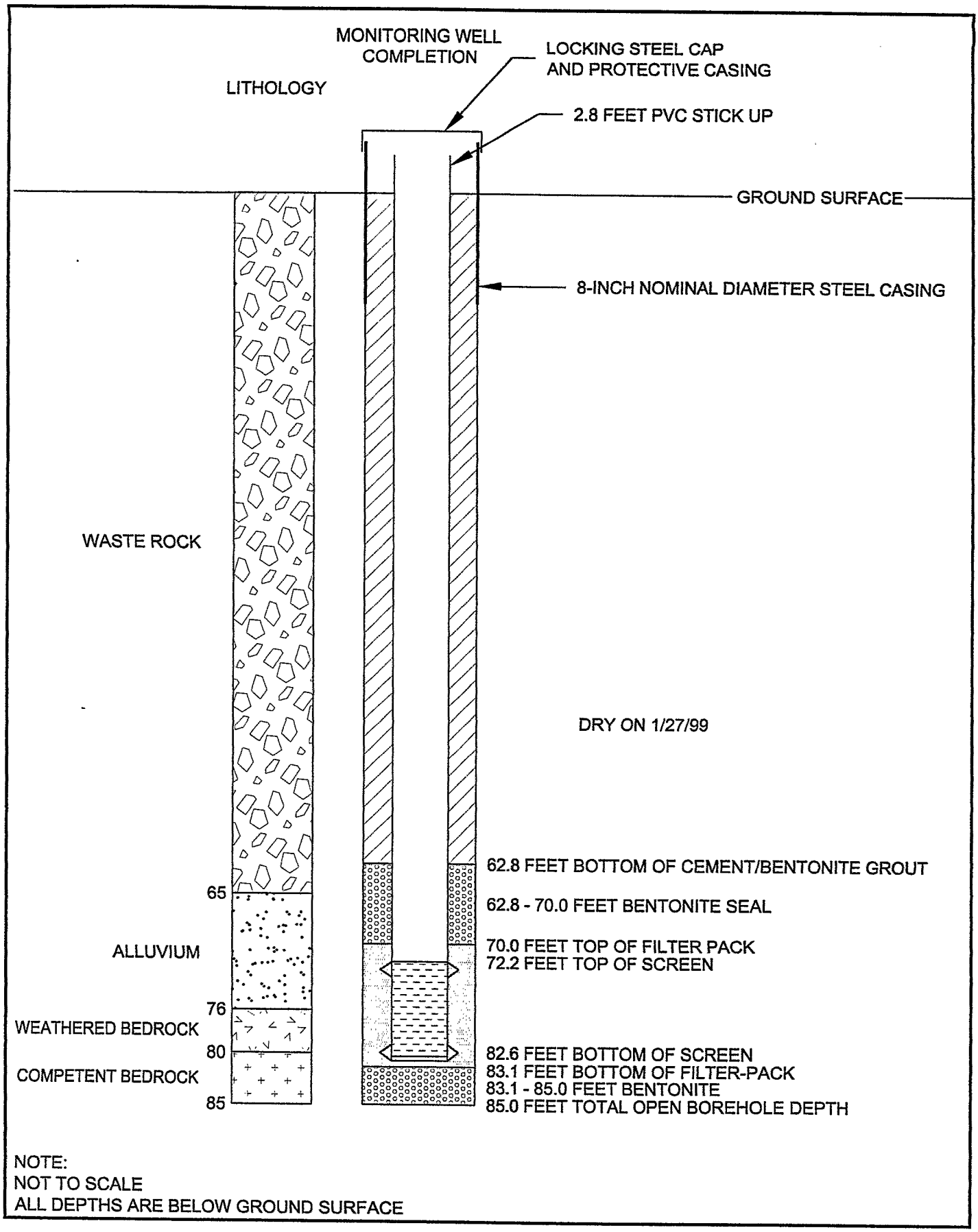
WEATHERED BEDROCK



COMPETENT BEDROCK



OVERBURDEN

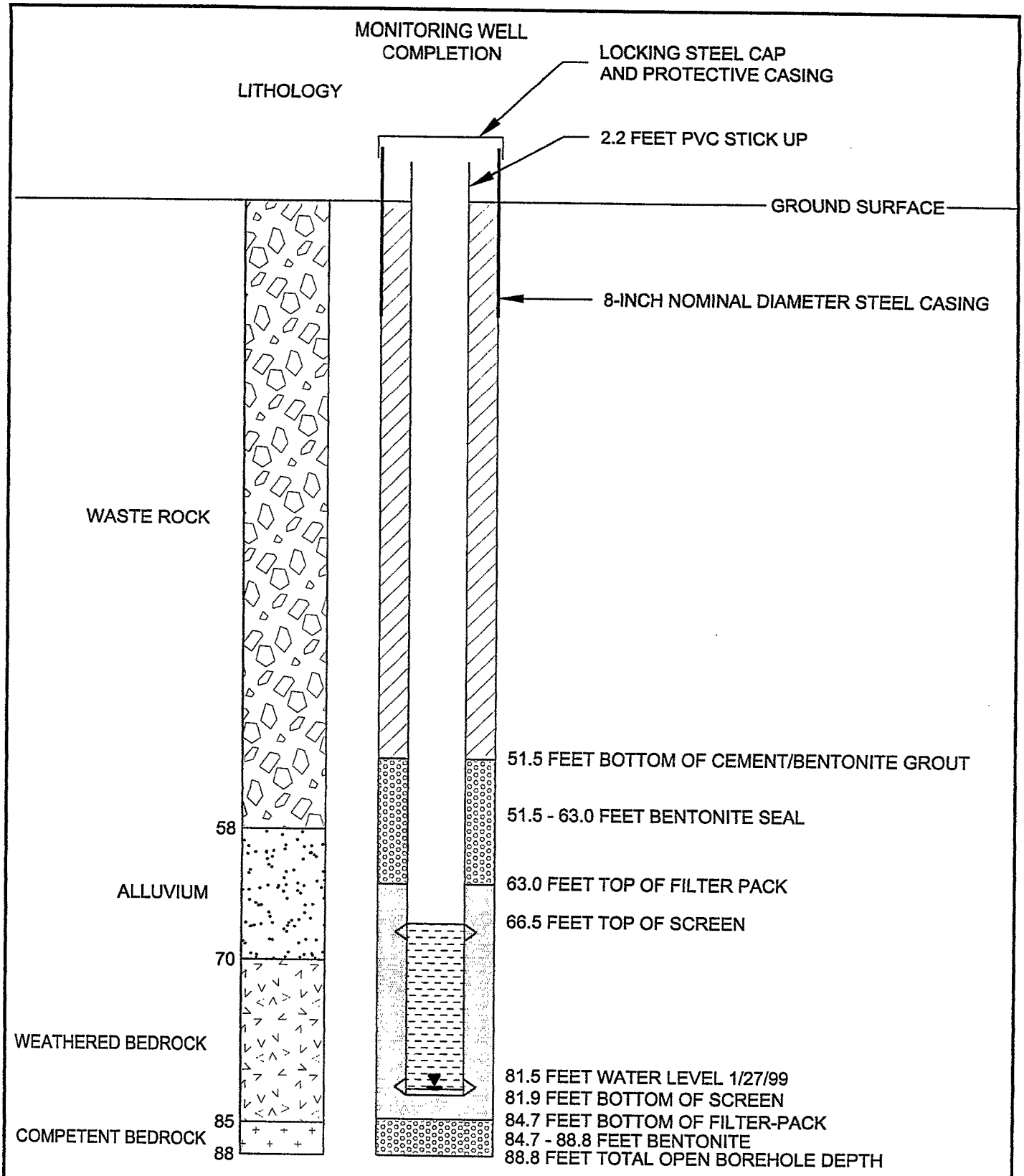


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-41

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW41.dwg

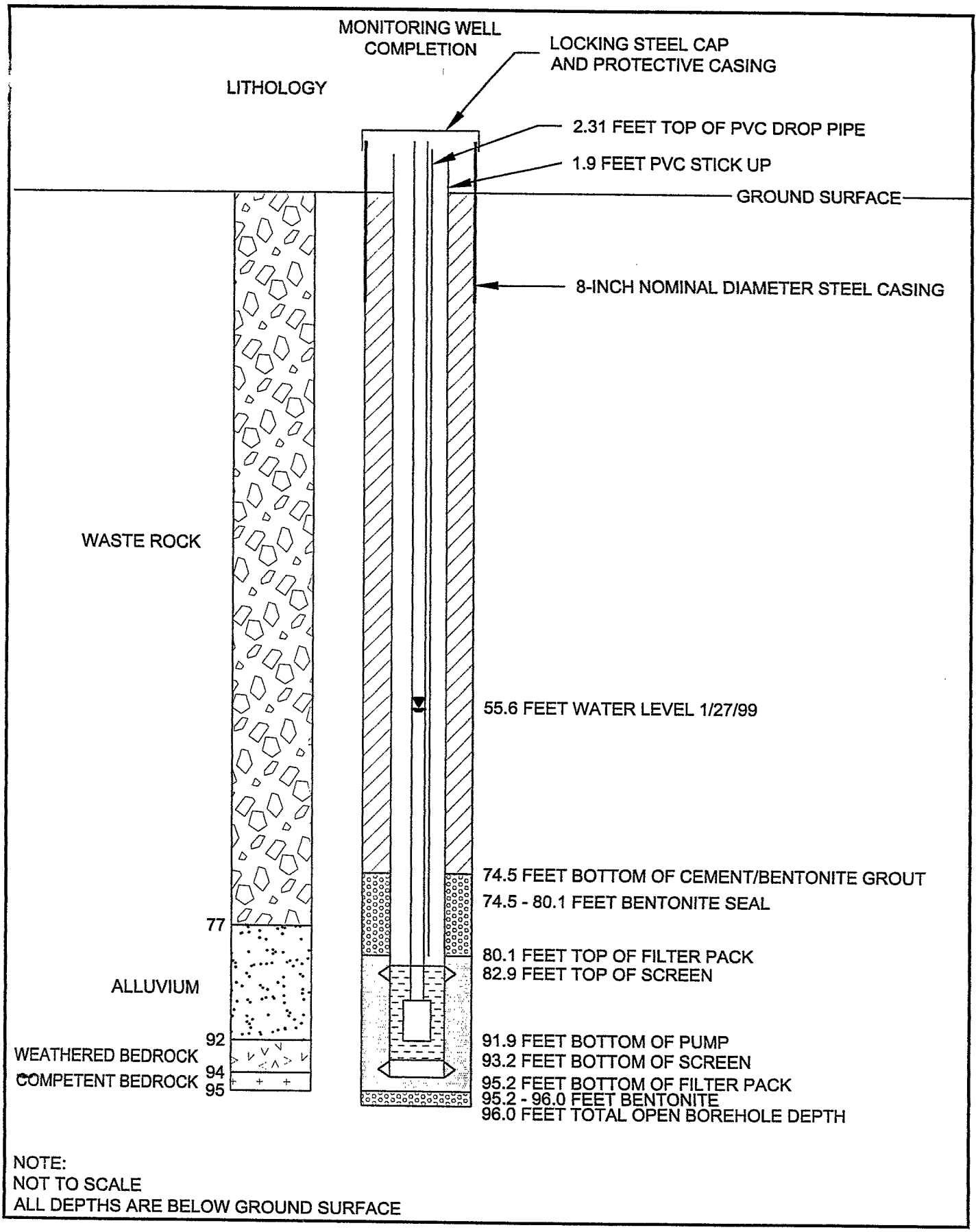


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-41A

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW41A.dwg

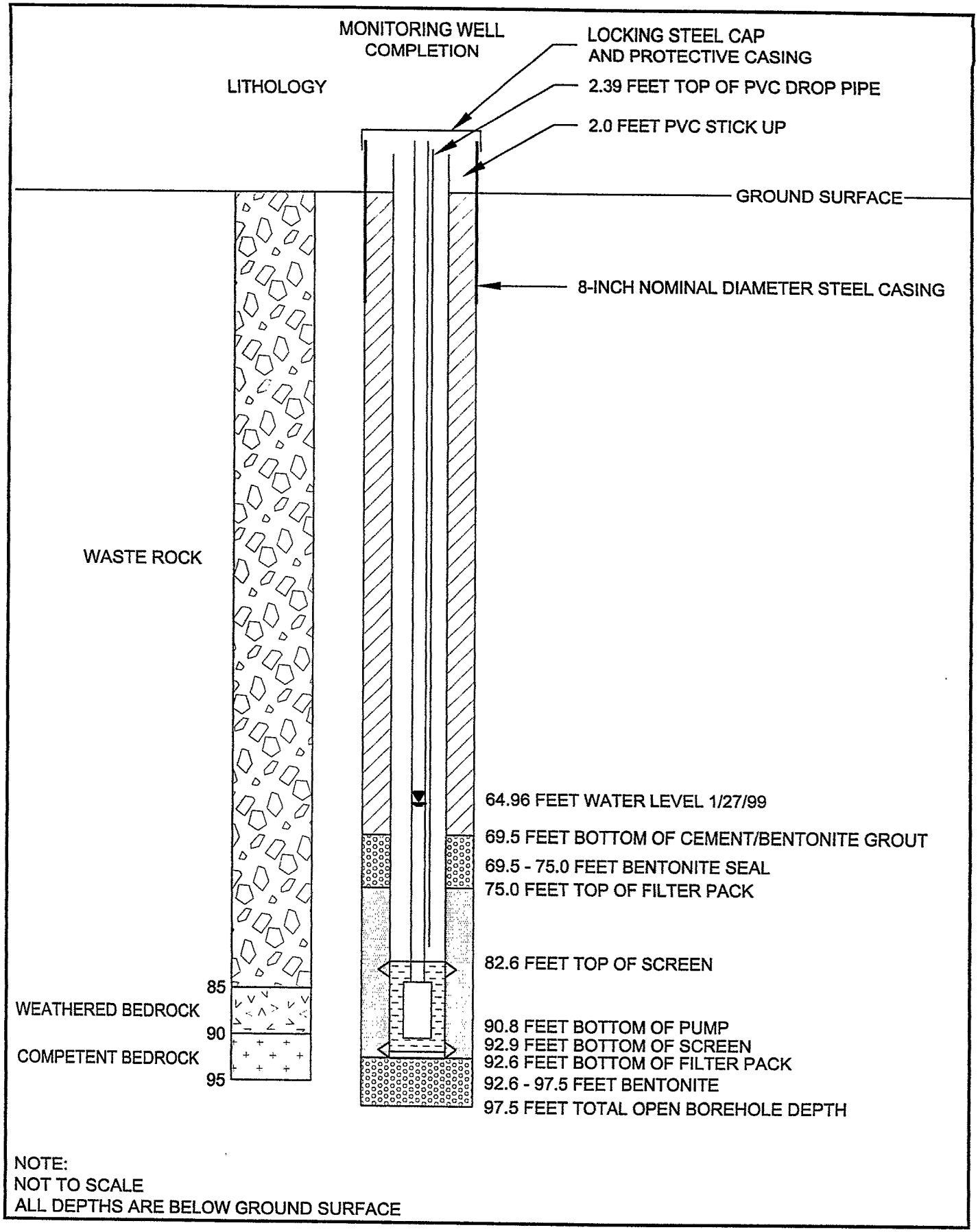


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-42

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW42.dwg

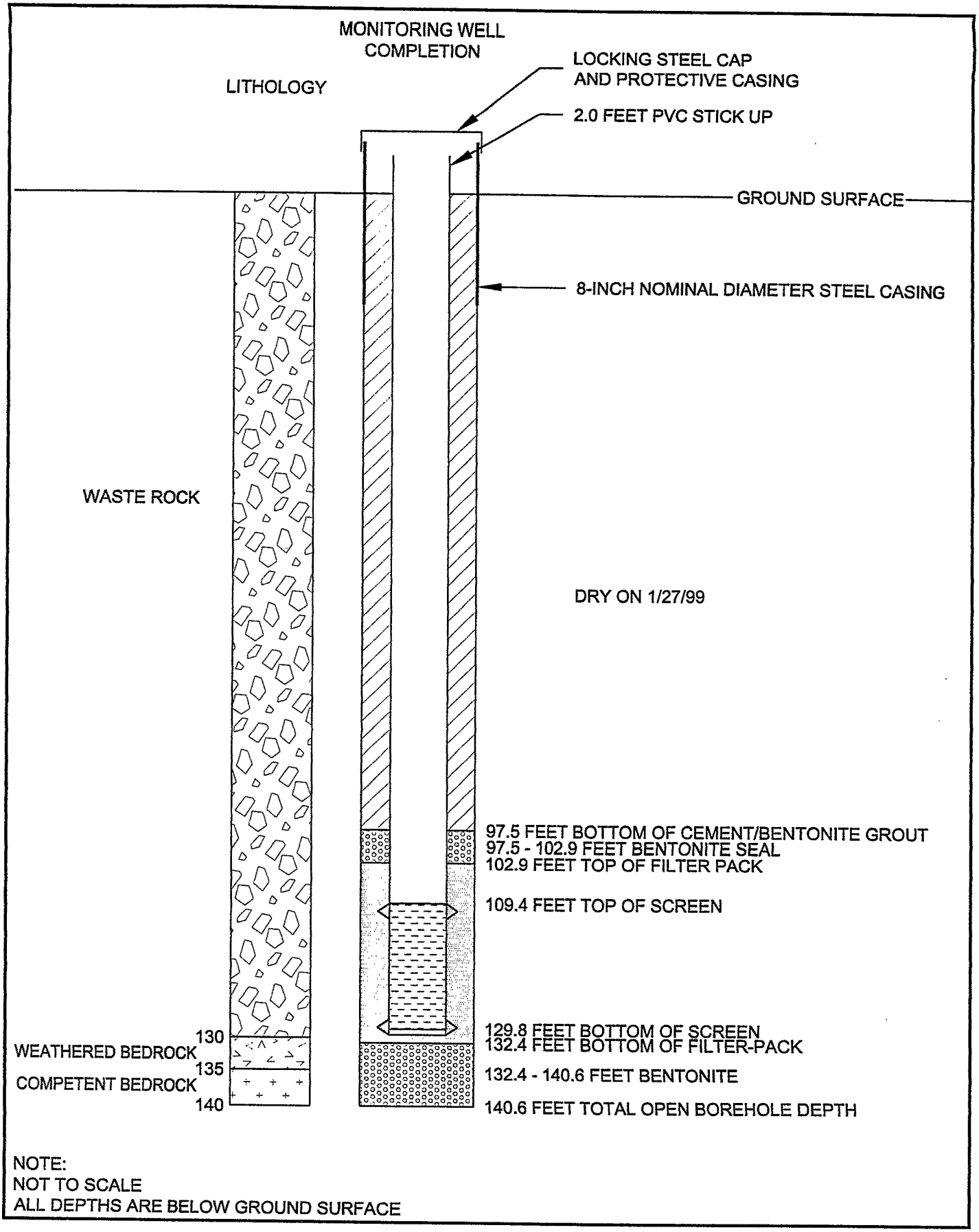


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-43

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW43.dwg

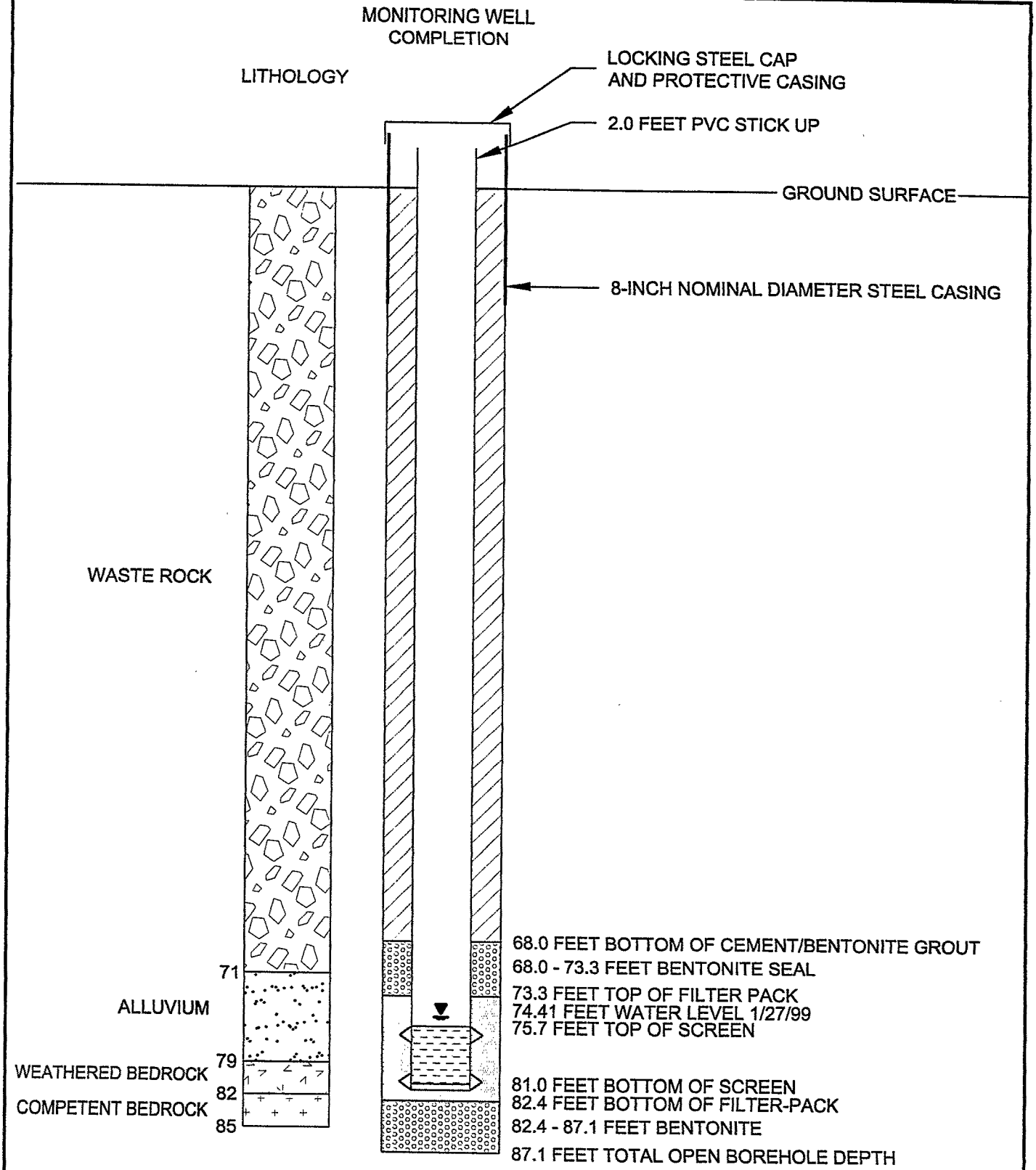


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-44

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW44.dwg

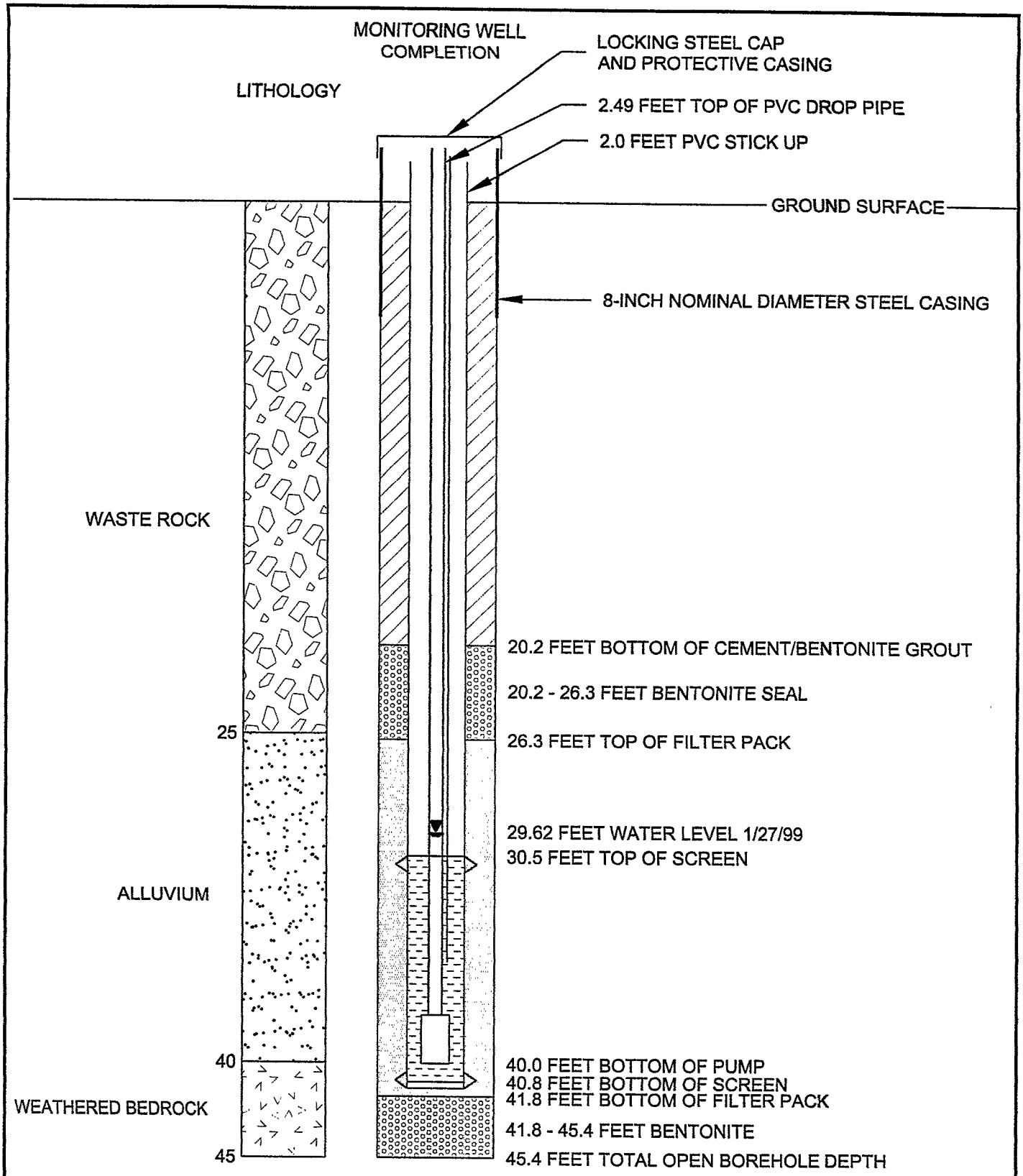


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-45

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW45.dwg

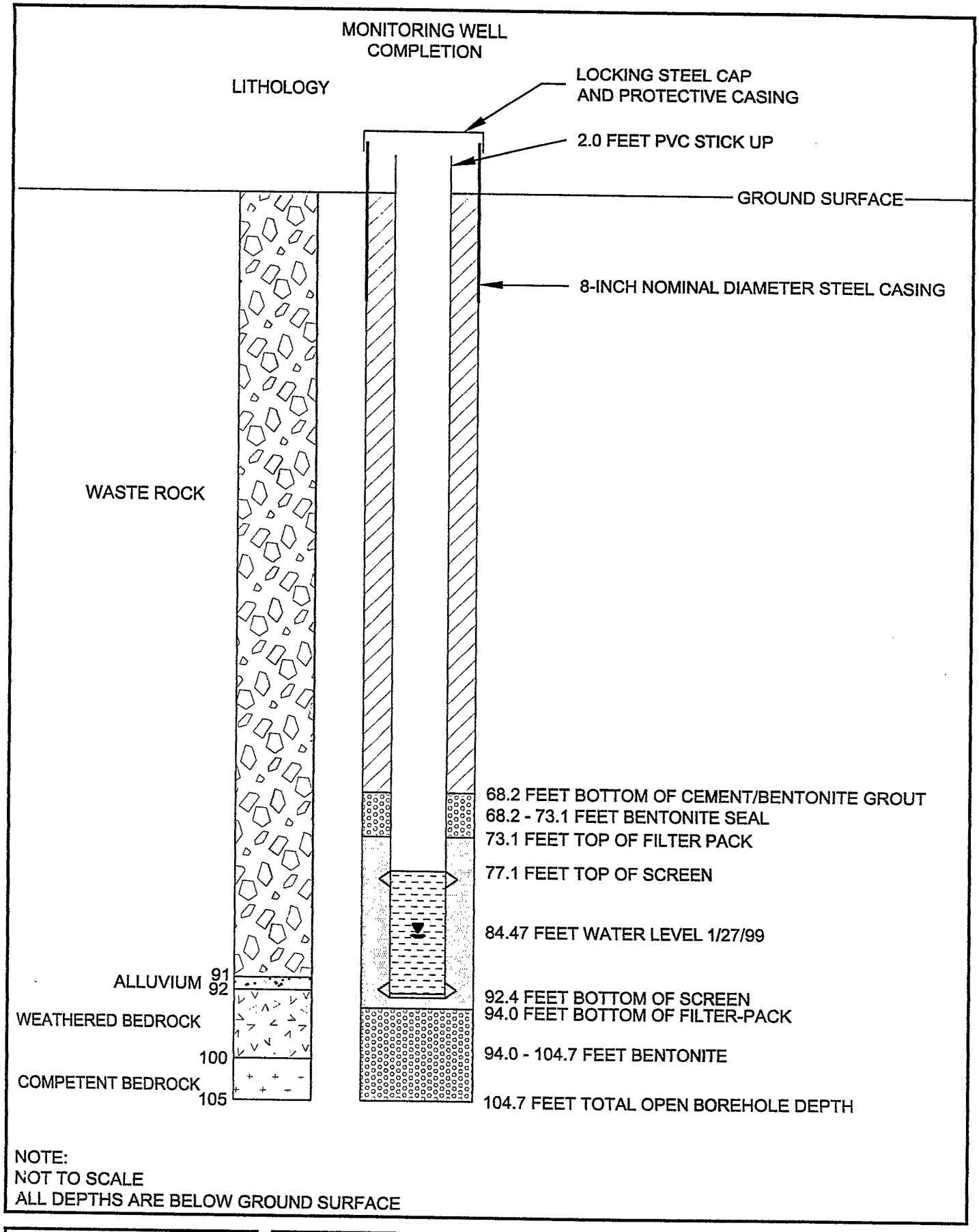


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-46

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW46.dwg

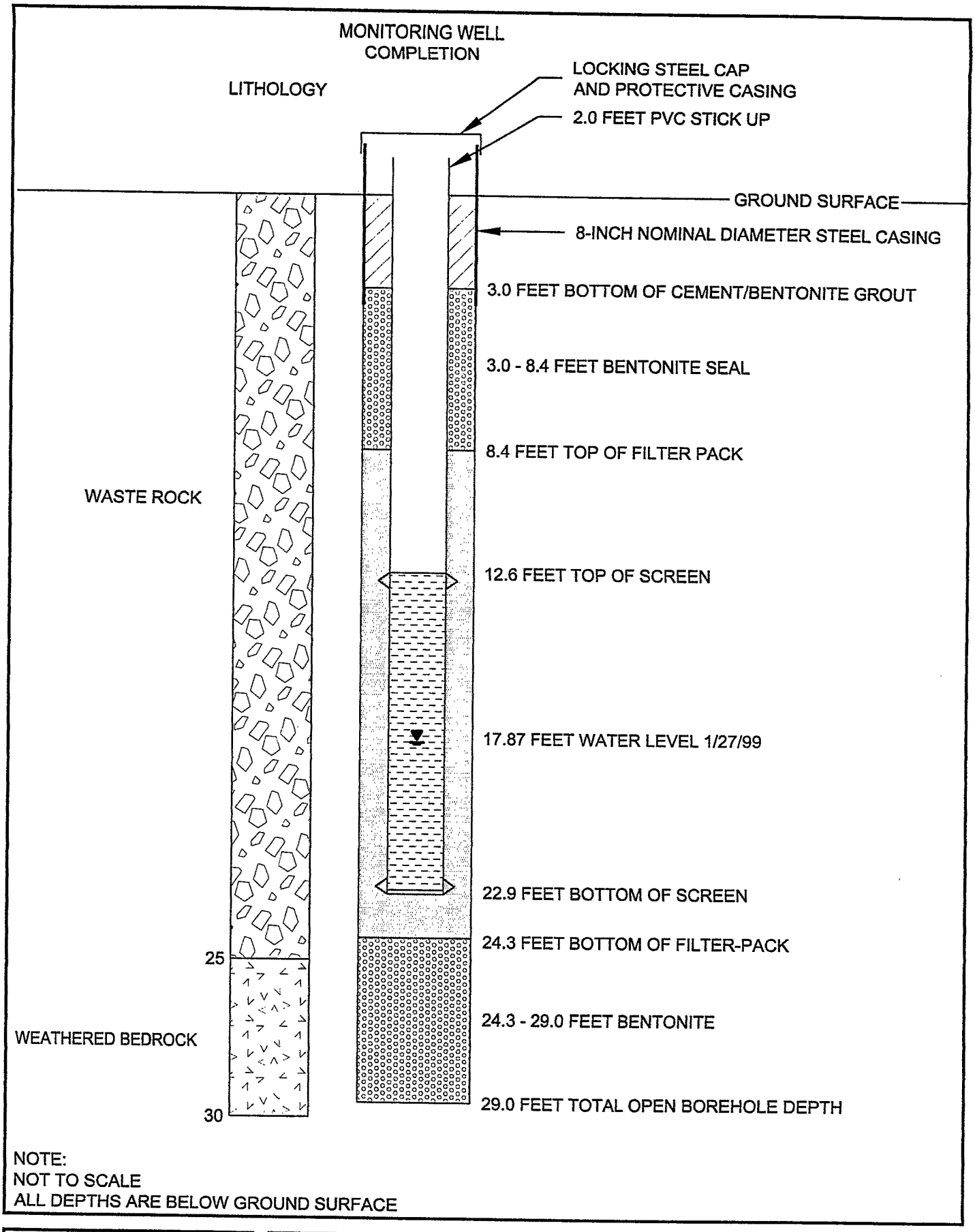


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-47

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW47.dwg

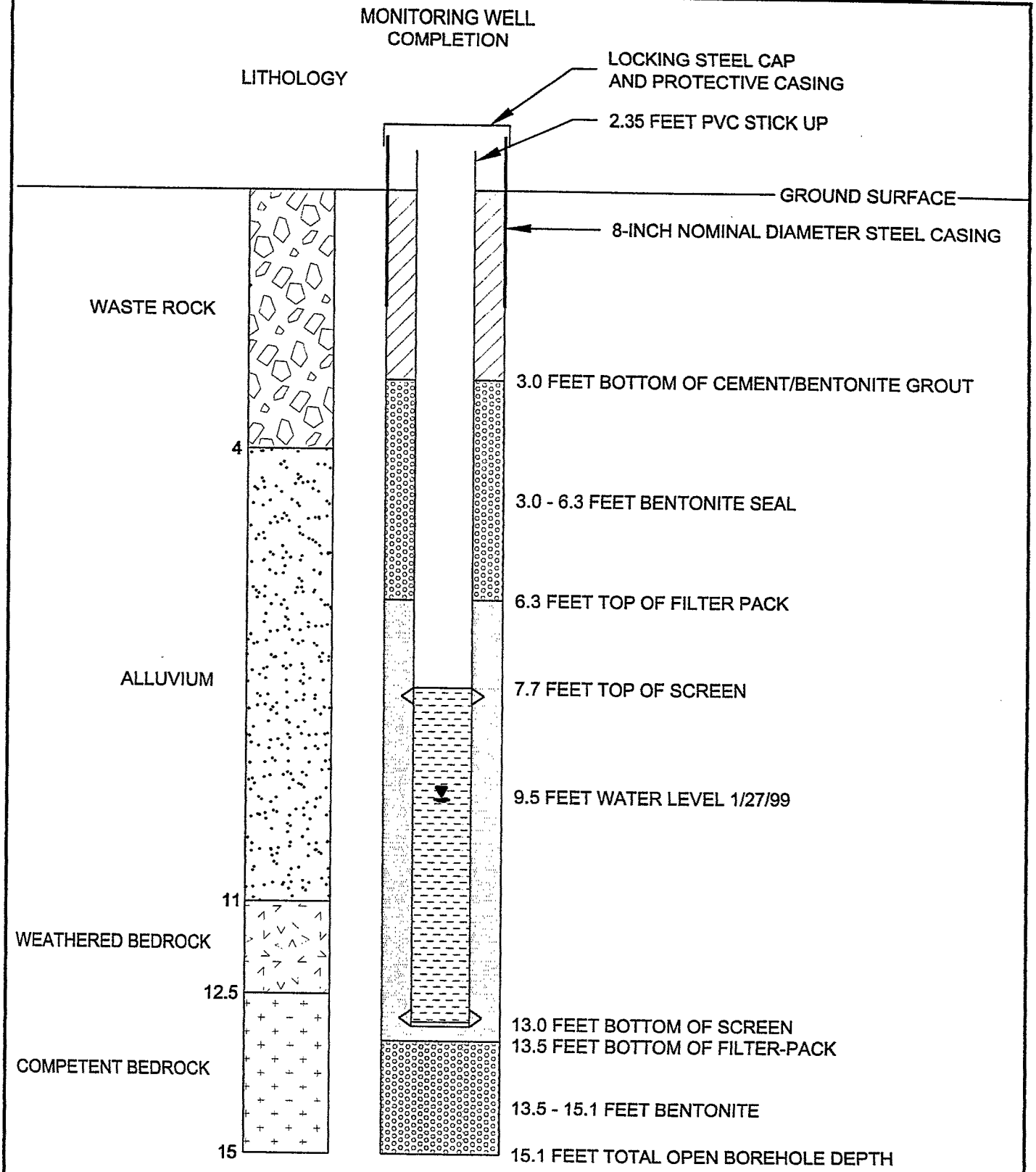


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-48

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW48.dwg

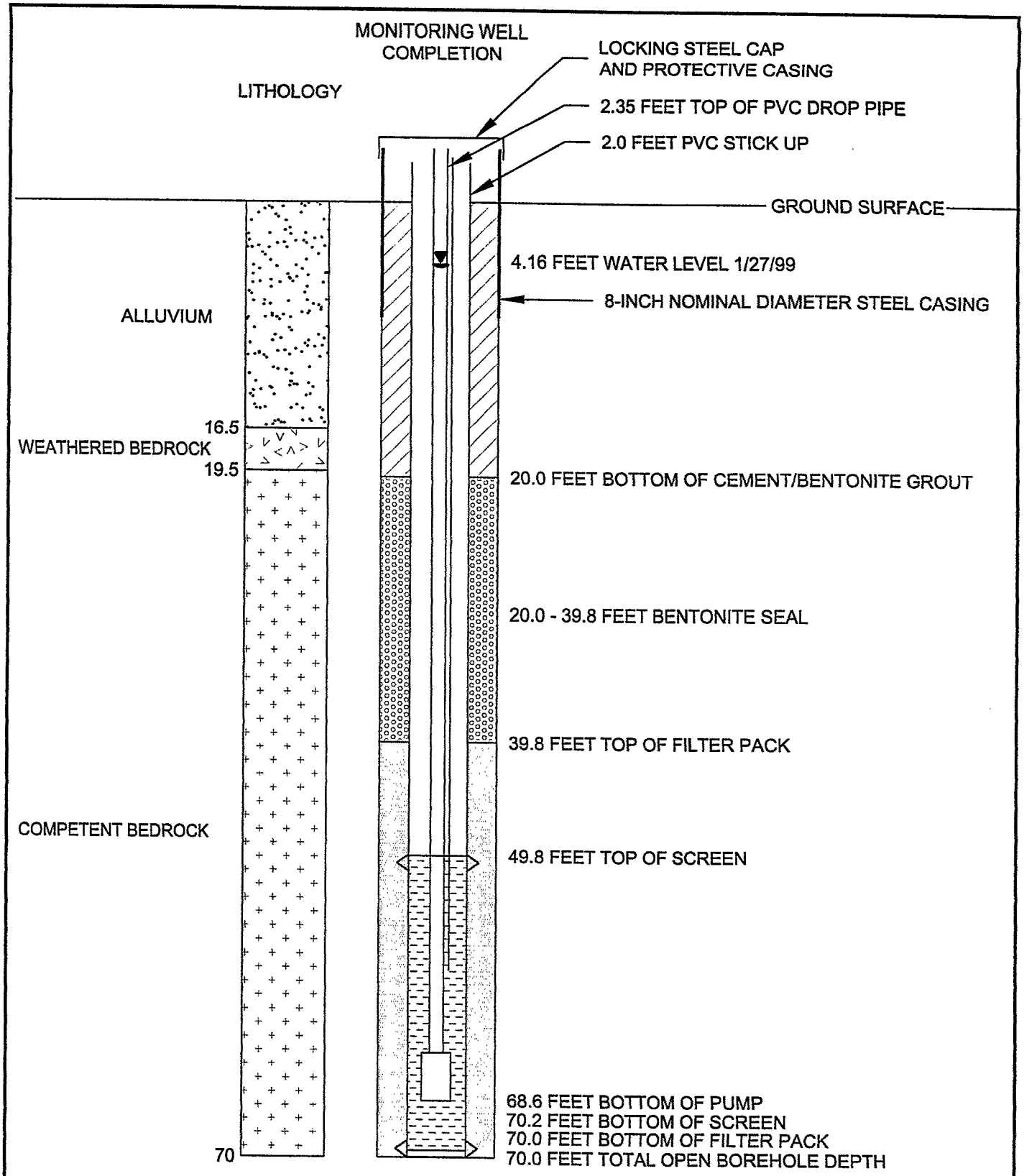


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-49

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW49.dwg

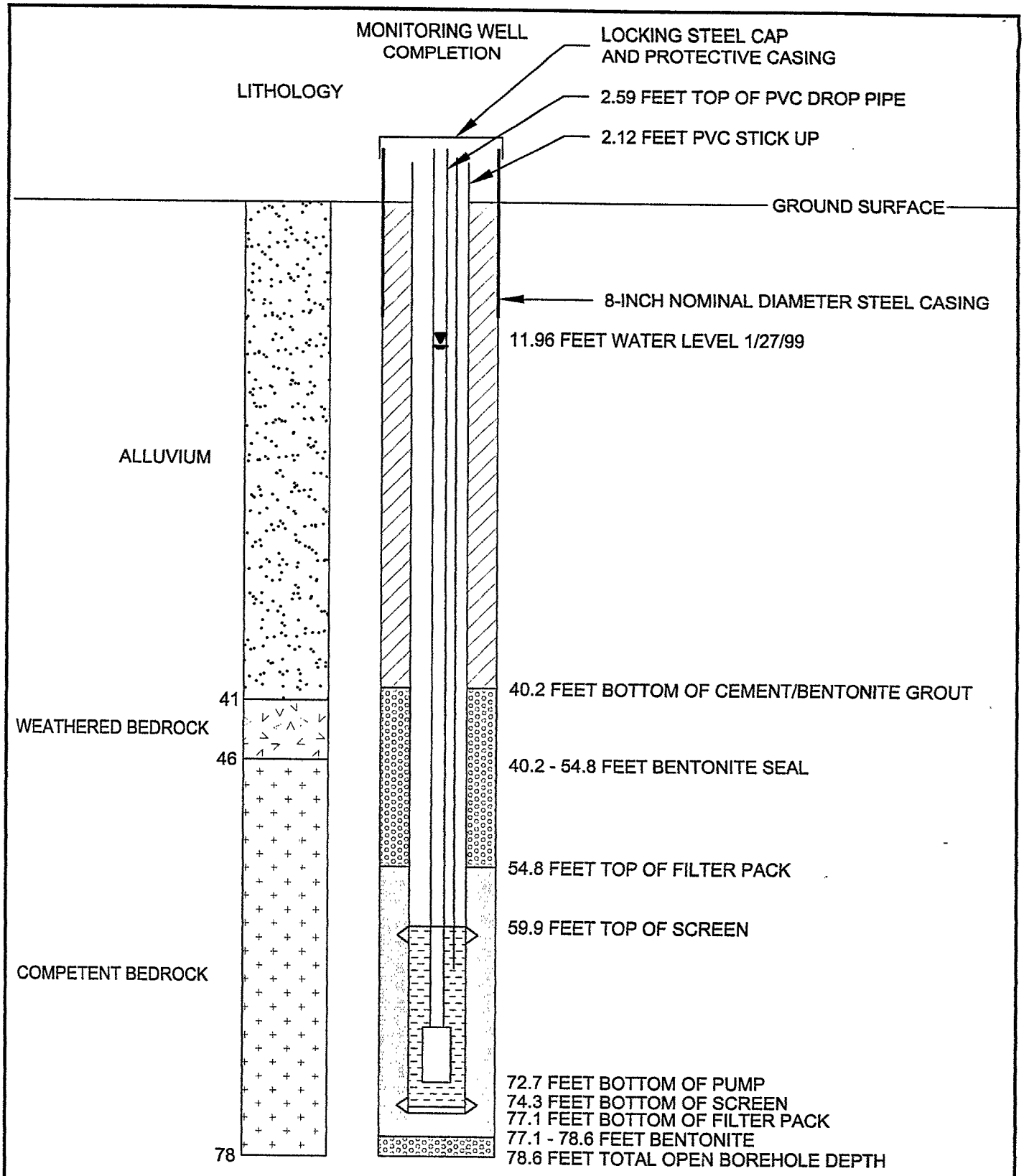


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-50

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW50.dwg

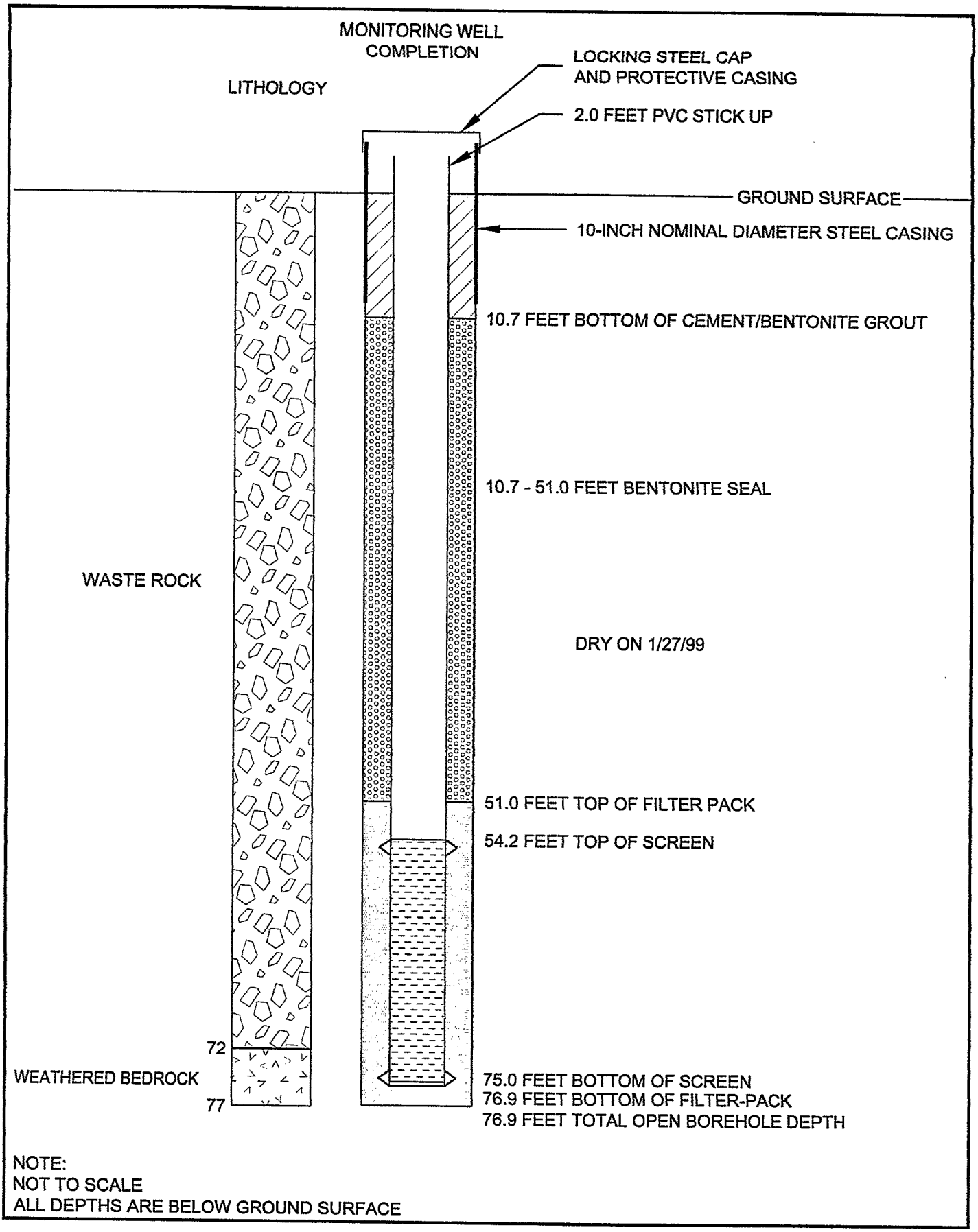


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-51

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW51.dwg

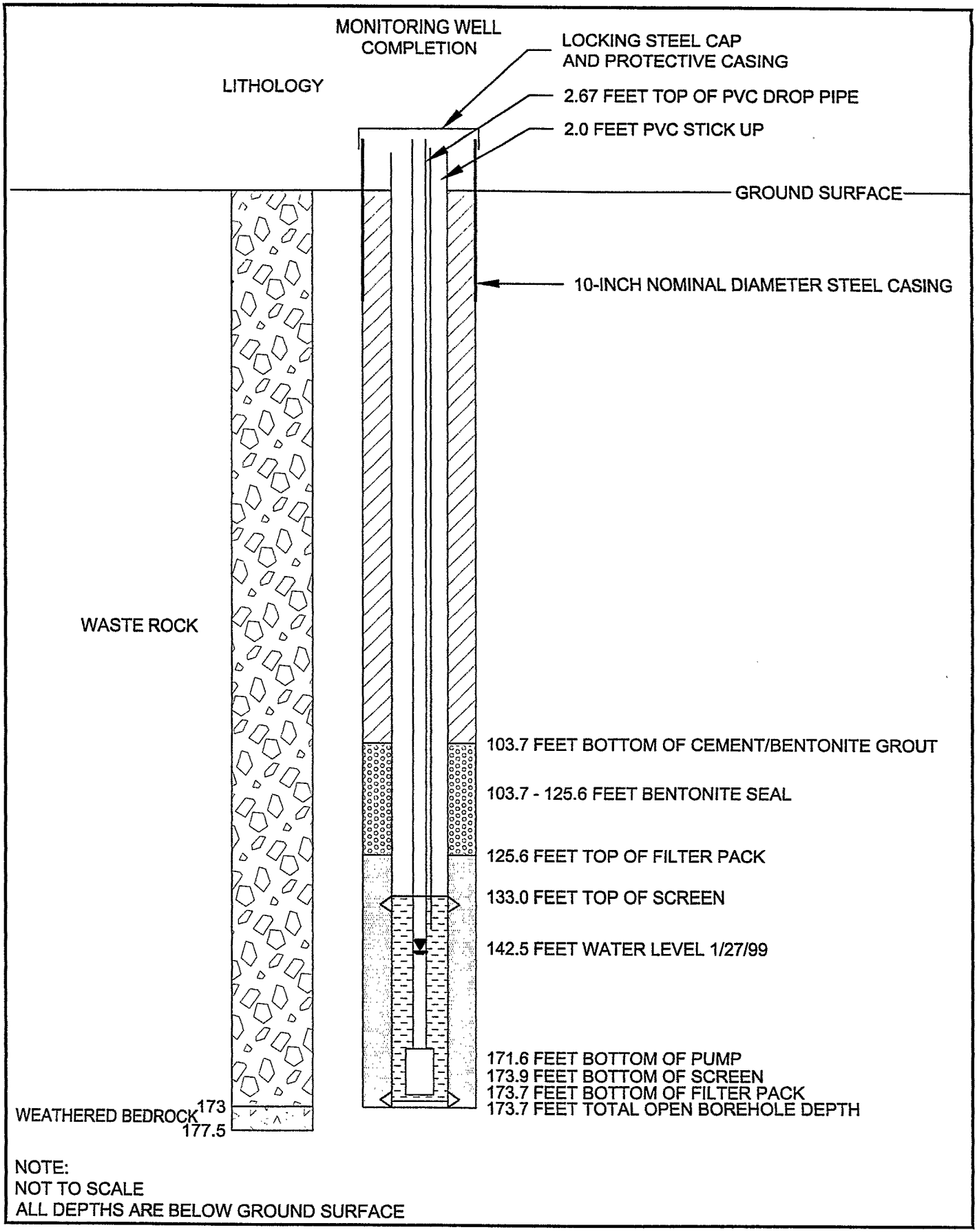


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-52

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW52.dwg

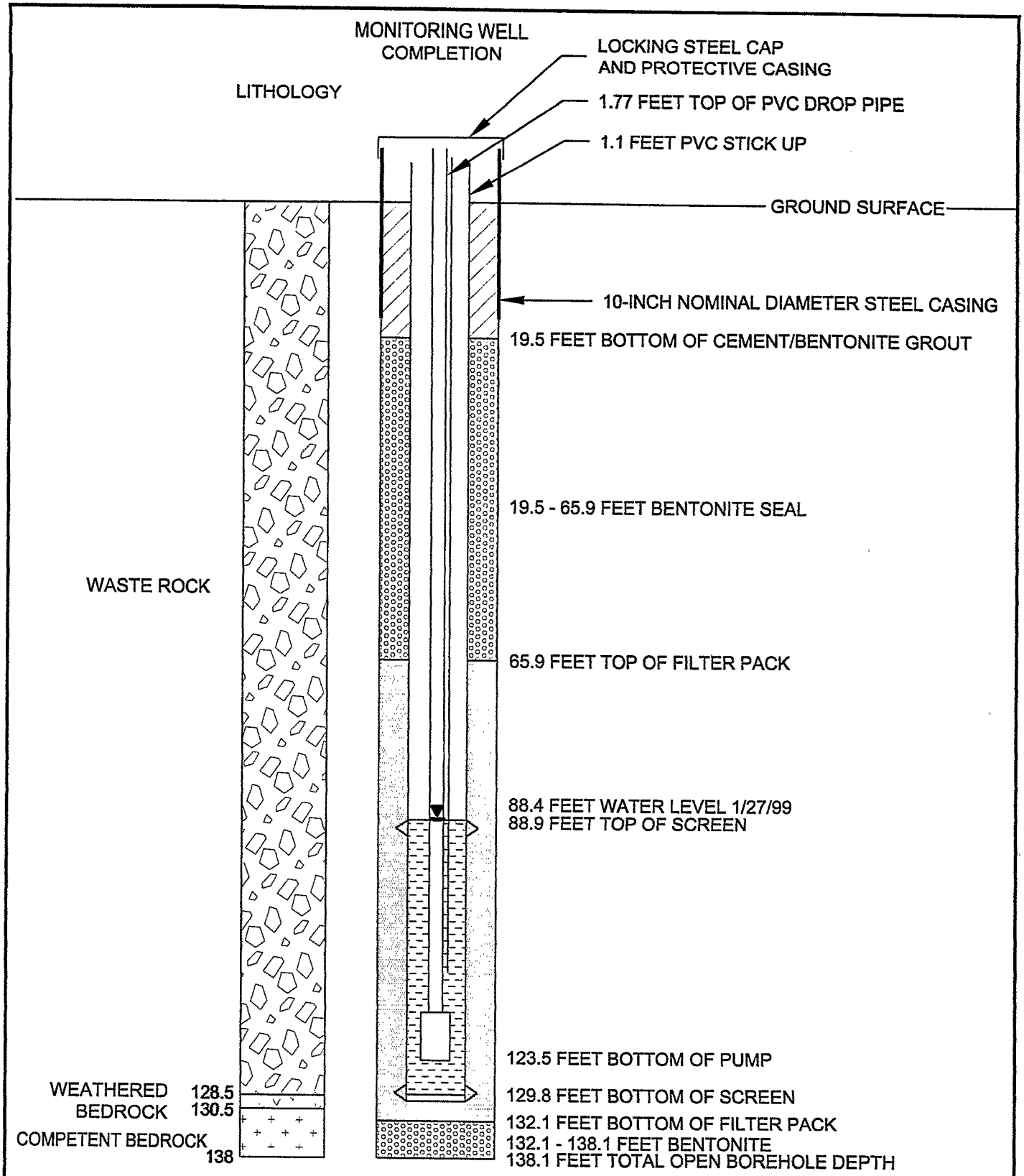


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER INCORPORATED

GW-53

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW53.dwg

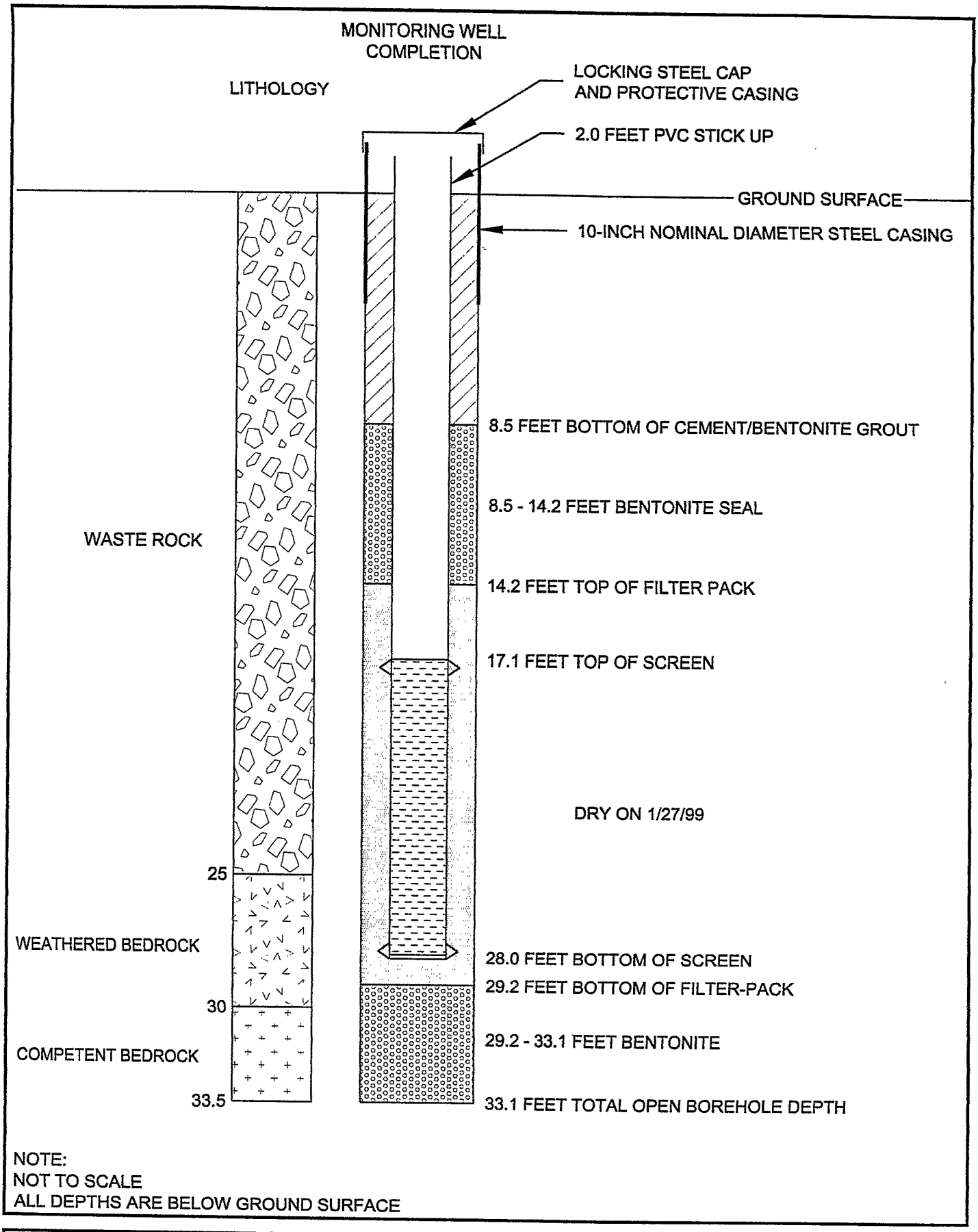


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

SHEPHERD MILLER
INCORPORATED

GW-54

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW54.dwg

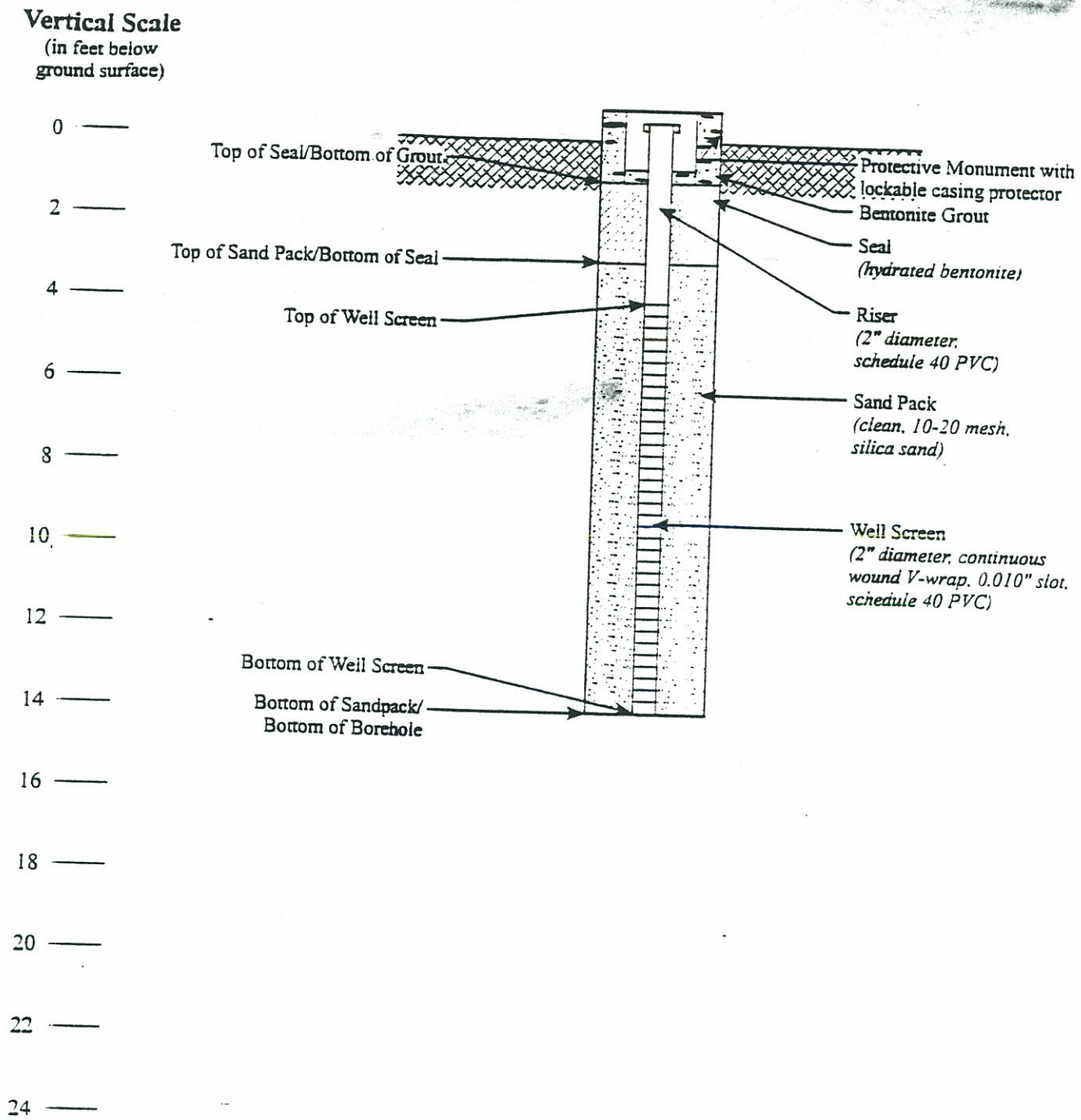


NOTE:
NOT TO SCALE
ALL DEPTHS ARE BELOW GROUND SURFACE

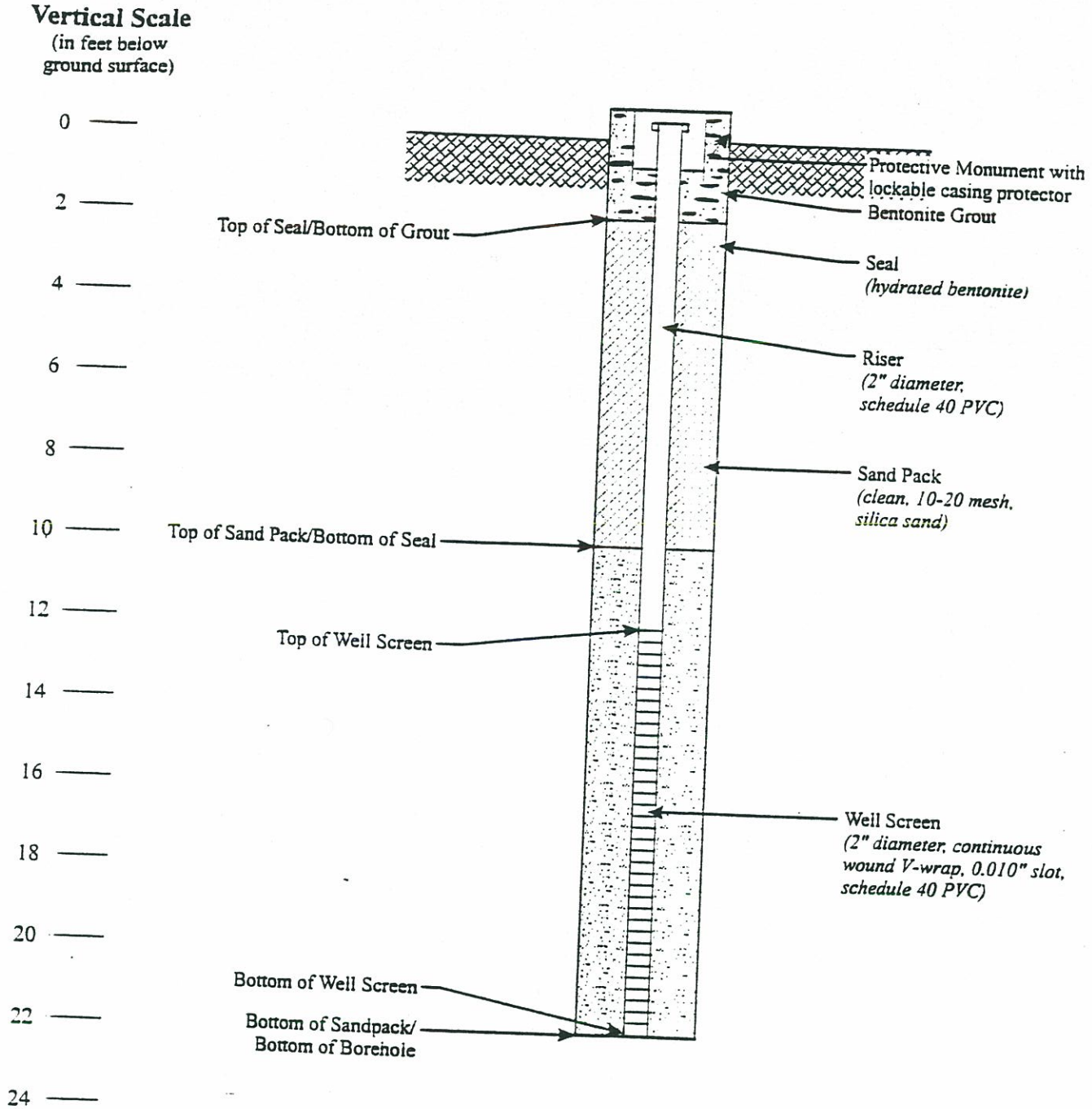
SHEPHERD MILLER
INCORPORATED

GW-55

Date:	MARCH 1999
Project:	01-252\T7
File:	LI-GW55.dwg



ecology and environment, inc. International Specialists in the Environment Anchorage, Alaska	MIDNITE MINE Wellpinit, Washington	MONITORING WELL MW-03			
	NOTE: Vertical Scale: 1/2" = 2' Horizontal Scale: None	Drawn: AES	DATE: 8/28/98	JOB NO. BG1001SRT0	Dwg.No. BG1001F16



ecology and environment, inc. International Specialists in the Environment Anchorage, Alaska	MIDNITE MINE Wellpinit, Washington	MONITORING WELL MW-06			
	NOTE: Vertical Scale: 1/2" = 2' Horizontal Scale: None	Drawn: AES	DATE: 8/28/98	JOB NO. BG1001SRT0	Dwg.No. BG1001F16

URS GREINER Woodward Clyde	Project Name: Phase 1A RI/FS	Log of Boring MWEHR-01 ~~MWBA-01~~ DKN
	Project Location: Midnite Mine	
	Project Number: 53F4001800.03	

Date(s) Drilled: 9/24/99	Logged By: R. MARTIN	Total Depth of Borehole (ft): 21'
Drilling Method: HOLLOW STEM AUGER	Diameter of Borehole (in): 10"	Ground Surface Elevation (ft-msl): 2395.69
Drill Rig Type: CME-75	Drilling Company: Cascade Drilling	Groundwater Elevation (ft-msl): 13.22 BGS
Driller's Name: SCOTT	Sampler Type: SPLIT SPOON	Checked By: DK Nicholson
Measuring Point Elevation (ft-msl): 2397.97 ~~GROUND SURFACE~~		
Locations / Comments: NARROW ROAD NORTH OF MAIN HWY South of East Haul Road		Northing: 353115 Easting: 2676245

Depth (ft-bgs)	SAMPLES Blows/Foot	Recovery (ft)	~~Pit Vapor~~	~~Penetrometer~~	Munsell Color	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS
1.5	50/6	50	10	X		SM		SILTY SAND, DRY, FINE SAND LT. BROWN	
5 6.5	9 15 16	100	20	X		SM		SILTY SAND, MOIST, F-M SAND DK. BROWN	
10 11.5	7 11 11	100	30	X		SM		SILTY SAND, WET, COARSE SAND GRAY W/ TREE ROOTS EVIDENT	DRILLER NOTES WET ON SHOE AT ≐ 10.5'
15 16.5	11 32 35	100	20	X		SP		POORLY GRADED SAND, WET COARSE SAND W/ FINE GRAVEL GRAY	
20 21.5	100/6"	80	40	X		SP		POORLY GRADED SAND, WET COARSE SAND, BROWN	
								TOTAL DEPTH OF BORING 21'	
25									
12									
14									

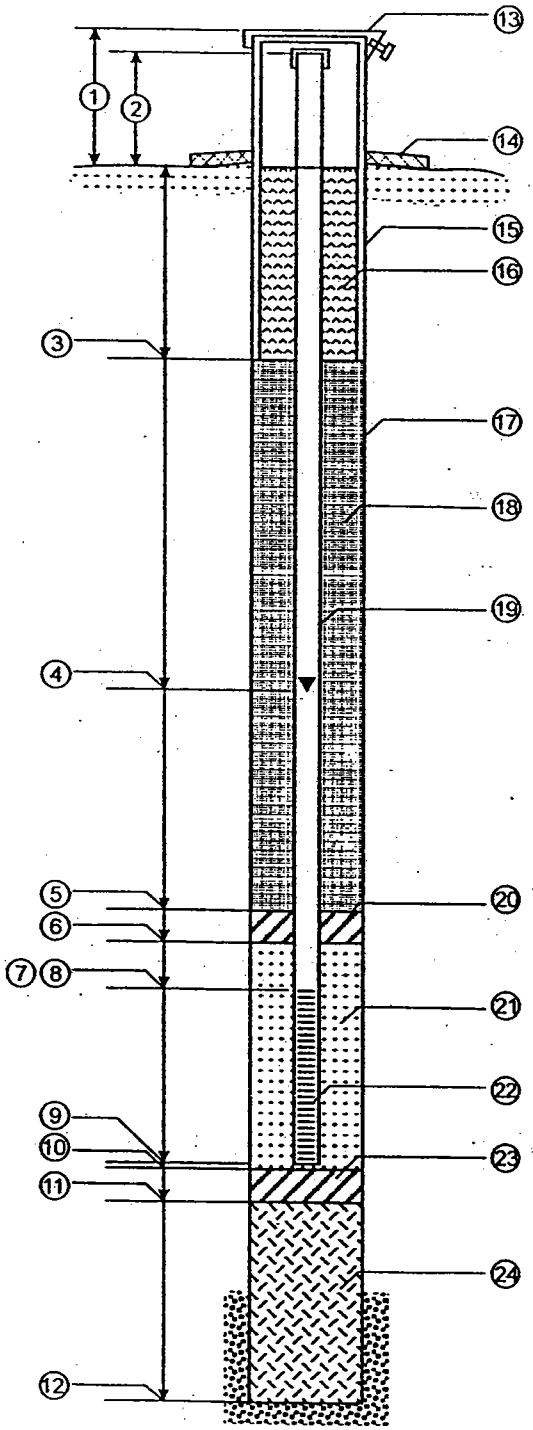
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	9/24/99 11:40
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
~~MWBA-01~~ MWEHR-01 DKN	South of East Haul Road	9/24/99 13:00

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM # 4	AUGER	2395.69 ft.msl	2397.97 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: _____ ft.
2. Stick-Up Well Casing Above Ground: ~~3~~ 2.28 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: _____ ft.
4. Depth to Initial Ground Water Surface Elevation: 13.22 ft.
5. Depth to Top of Top Seal: 1 ft.
6. Depth to Bottom of Top Seal: ~~4~~ 3 ft.
7. Depth to Top of Well Point or Screen: ~~3~~ 5 ft.
8. Total Length of Blank Casing: 5 ft.
9. Bottom Depth of Well Screen: 20 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 21 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: Steel Diameter: 8 in.
16. Type of Upper Seal: portland cement / concrete
17. Borehole Diameter: 10 in.
18. Type of Upper Backfill: bentonite chips
19. Type of Well Casing: PVC SCH 40 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 Diameter: 10 in.
22. Type of Screen Material: PVC SCH 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

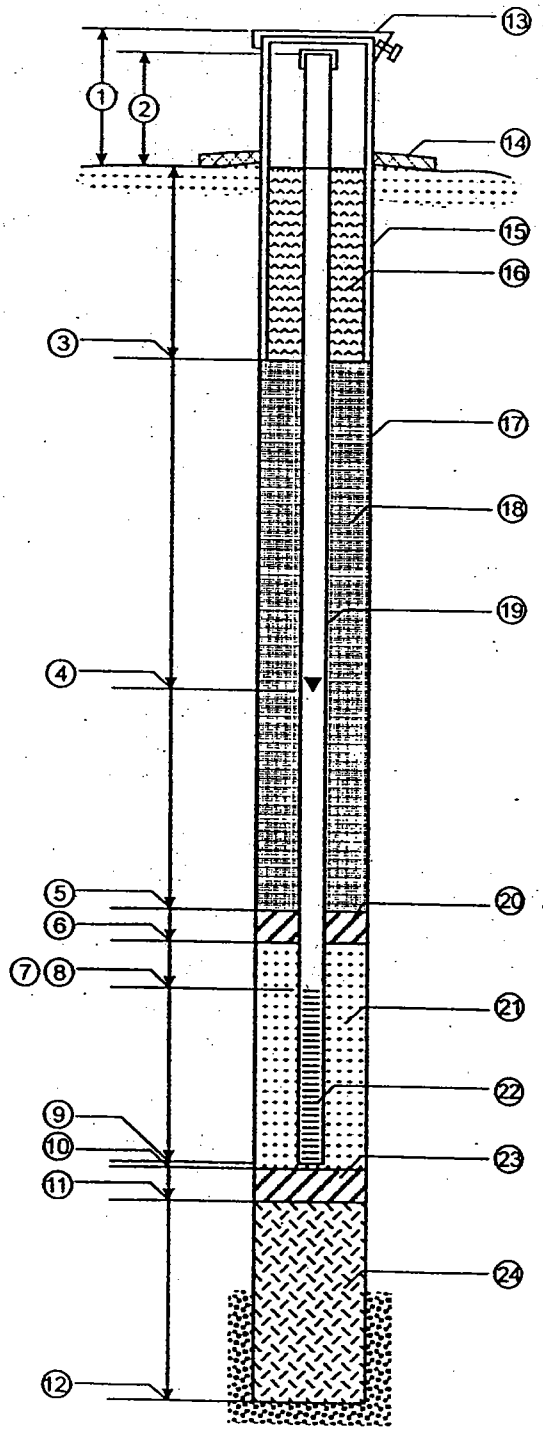
Recorded By	Date	Checked By	Date
[signature]	9/24/99	DK Nicholson	4/26/00

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03	Project Name: MIONITE MINE	Date/Time Started: 9/23/99 1310
Well/Borehole Number: MWBA-05	Well/Borehole Location: Tributary to Sand Creek	Date/Time Completed: 9/25/99 11:45
Installation Team: TEAM #4	Type of Drilling: AUGER	Ground Surface Elev.: 2790.95 ft.msl
		Top of Well Casing Elev.: 2793.48 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: _____ ft.
2. Stick-Up Well Casing Above Ground: 2.53 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: _____ ft.
4. Depth to Initial Ground Water Surface Elevation: _____ ft.
5. Depth to Top of Top Seal: 1 ft.
6. Depth to Bottom of Top Seal: 3 ft.
7. Depth to Top of Well Point or Screen: 5 ft.
8. Total Length of Blank Casing: 5 ft.
9. Bottom Depth of Well Screen: 20 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 22 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: steel Diameter: 8 in.
16. Type of Upper Seal: Concrete
17. Borehole Diameter: 10 in.
18. Type of Upper Backfill: bentonite chips
19. Type of Well Casing: PVC SCH 40 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10 X 20 Diameter: 10 in.
22. Type of Screen Material: PVC SCH 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

Recorded By	Date	Checked By	Date
[signature]	9/25/99	DK Nicholson	4/26/00

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

325467

RESOURCE PROTECTION WELL REPORT

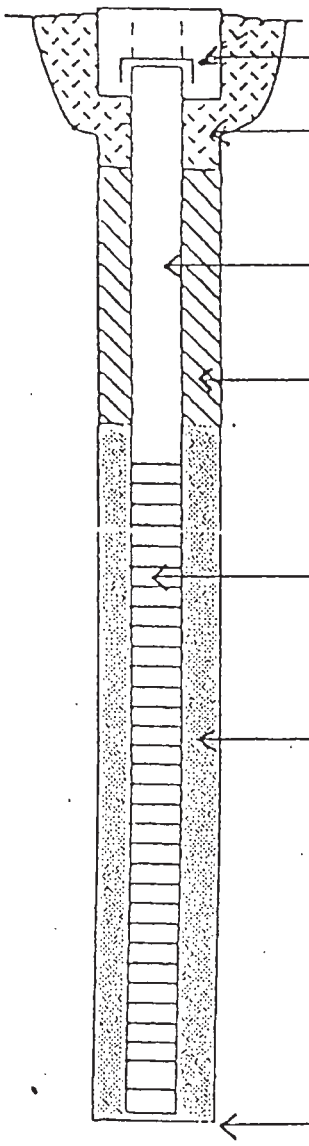
START CARD NO. R43798

PROJECT NAME: Midnite Mine
WELL IDENTIFICATION NO. MWCD03
DRILLING METHOD: Air Rotary or HSA
DRILLER: Todd Mecham
FIRM: Cascade Drilling, Inc.
SIGNATURE: [illegible]
CONSULTING FIRM: URSG
REPRESENTATIVE: Robin Hamlet

COUNTY: Stevens
LOCATION: NW1/4 NW1/4 Sec 13 Twn 25N R 37E
STREET ADDRESS OF WELL: 8 miles NW of Wellpinit WA
WATER LEVEL ELEVATION:
GROUND SURFACE ELEVATION: N/A
INSTALLED: 10/9/99
DEVELOPED: 10/9/99

Tribal Indian Land
No Fees Required
as per Dick Szymarek

AS-BUILT



WELL COVER

CONCRETE SURFACE SEAL
DEPTH = 1/ft

PVC BLANK 4 "x 50 '

BACKFILL 33 ft.
TYPE: Bentonite Chips

PVC SCREEN 4 "x 20 '
SLOT SIZE: .030

GRAVEL PACK 25 ft.
MATERIAL: 10/20 Cssi Sand

WELL DEPTH 60 ' "

FORMATION DESCRIPTION

0 - 1 ft.
Silty sand

1 - 47 ft.
Calc-Silicates (Bedrock)

47' - 51'
~~51 - 56~~ ft.
APAlite Dike

51 - 56
CALC-Silicates
(BedRock)

RECEIVED
JAN 24 2000
DEPARTMENT OF ECOLOGY
EASTERN REGIONAL OFFICE

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/89)

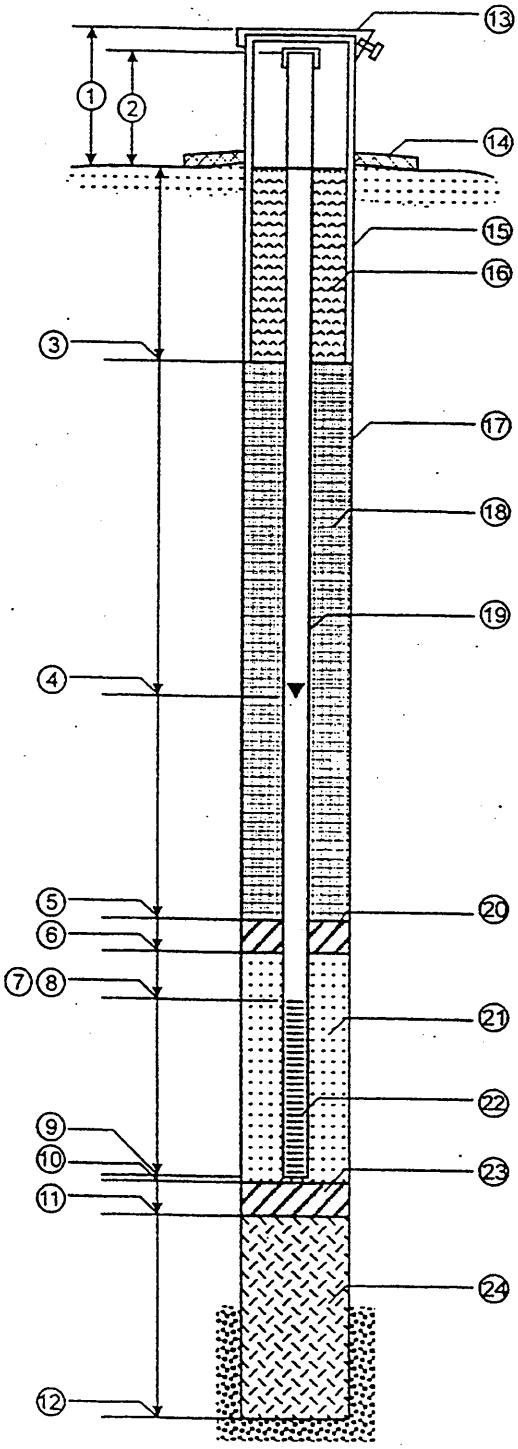
TD 66'

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03	Project Name: MIDNITE MINE PHASE IIA/IB	Date/Time Started: 10-15-00/17:20
Well/Borehole Number: MWDB-01	Well/Borehole Location: NORTH OF SOUTH SPOILS	Date/Time Completed: 10-24-00/13:45
Installation Team: R.LEININGER/CASCADE G.BROWN/CH2M HILL	Type of Drilling: AIR ROTARY/ CASING ADVANCE	Ground Surface Elev.: TBD ft.msl
		Top of Well Casing Elev.: TBD ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: TBD ft.
2. Stick-Up Well Casing Above Ground: TBD ft.
3. Depth to Bottom of Upper Seal/Protective Casing: TBD ft.
   SHALLOW WATER DURING DRILLING - 68.6' bgs
4. Depth to Initial Ground Water Surface Elevation: ~~82.3' bgs~~ ft.
   DEEP WELL COMPLETION ZONE
5. Depth to Top of Top Seal: 2.0' bgs ft.
6. Depth to Bottom of Top Seal: 157.5' bgs ft.
7. Depth to Top of Well ~~Point or~~ Screen: 167.0' bgs ft.
   SCREEN → 167-187', 197-217', 241-261', and 291-301'.
8. Total Length of Blank Casing: FROM G.S. 167' ft.
   CASING → 0-167', 187-197', 217-241', and 261-291'.
9. Bottom Depth of Well Screen: SEE ABOVE ft.
   WELL DEPTH W/ ENDCAP - 301.3' bgs
10. Depth to Top of Bottom Seal (If Installed): NA ft.
11. Depth to Bottom of Bottom Seal (If Installed): NA ft.
12. Depth of Borehole: 305' bgs ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: ~~TBD~~ steel Diameter: 8 in.
16. Type of Upper Seal: ~~WILL BE~~ CONCRETE
17. Borehole Diameter: 9¾" TO 86' THEN 8½" TO T.D. in.
18. Type of Upper Backfill: NA
19. Type of Well Casing: SCH. 80 PVC Diameter: 4 in.
    MEDIUM BENTONITE CHIPS → 135.8' - 157.5' + AT SURFACE (10' - 2')
20. Type of Top Seal (IF Installed): BENTONITE GROUT → 135.8' - NEAR SURFACE
    Type/Size of Gravel/Sand Pack 157.5' - 301.3'
21. Around Well Point or Screen: CSSI SAND Diameter: GRADE 10-20 in.
22. Type of Screen Material: SCH. 80-SLOTTED Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): NA
24. Type of Lower Backfill: FORMATION SLOUGH (301.3' - 305')

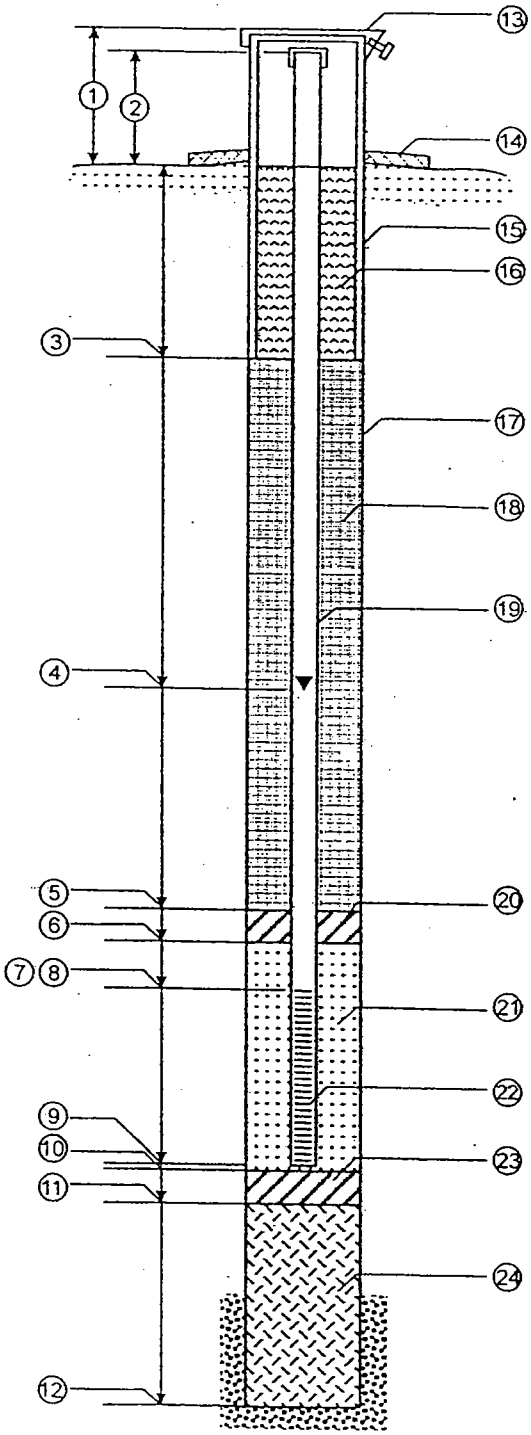
Recorded By	Date	Checked By	Date
Darrett Brown / CH2M HILL	10-24-00	David K Nicholson	11/12/01

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03.0500	Project Name: MIDNITE MINE	Date/Time Started: 10-7-99 / 1346
Well/Borehole Number: ~~MU NE-02~~ HBO 10-10-99 MU ED-02	Well/Borehole Location: Eastern Drainage	Date/Time Completed: 10-8-99 / 1300
Installation Team: RIG 1	Type of Drilling: AIR ROTARY	Ground Surface Elev.: 2649.42 ft.msl
Top of Well Casing Elev.: 2651.98 ft.msl		



1. Stick-Up of Protective Casing (If Any) Above Ground: 3.5 ft.
2. Stick-Up Well Casing Above Ground: 2.56' ~~2.98~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ft.
4. Depth to Initial Ground Water Surface Elevation: 11 ft.
5. Depth to Top of Top Seal: 37 ft.
6. Depth to Bottom of Top Seal: 42 ft.
7. Depth to Top of Well Point or Screen: 48 ft.
8. Total Length of Blank Casing: 48 ft.
9. Bottom Depth of Well Screen: 68 ft.
10. Depth to Top of Bottom Seal (If Installed): 70 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 73 ft.
12. Depth of Borehole: 120 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: ~~PORTLAND CEMENT~~ DKN Concrete
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: BENTONITE SLURRY
19. Type of Well Casing: Sch. 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): BENTONITE CHIPS / 20x40 SAND
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10 X 20 SAND Diameter: 4 in.
22. Type of Screen Material: Sch. 80 Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): BENTONITE CHIPS
24. Type of Lower Backfill: 10 X 20 SAND

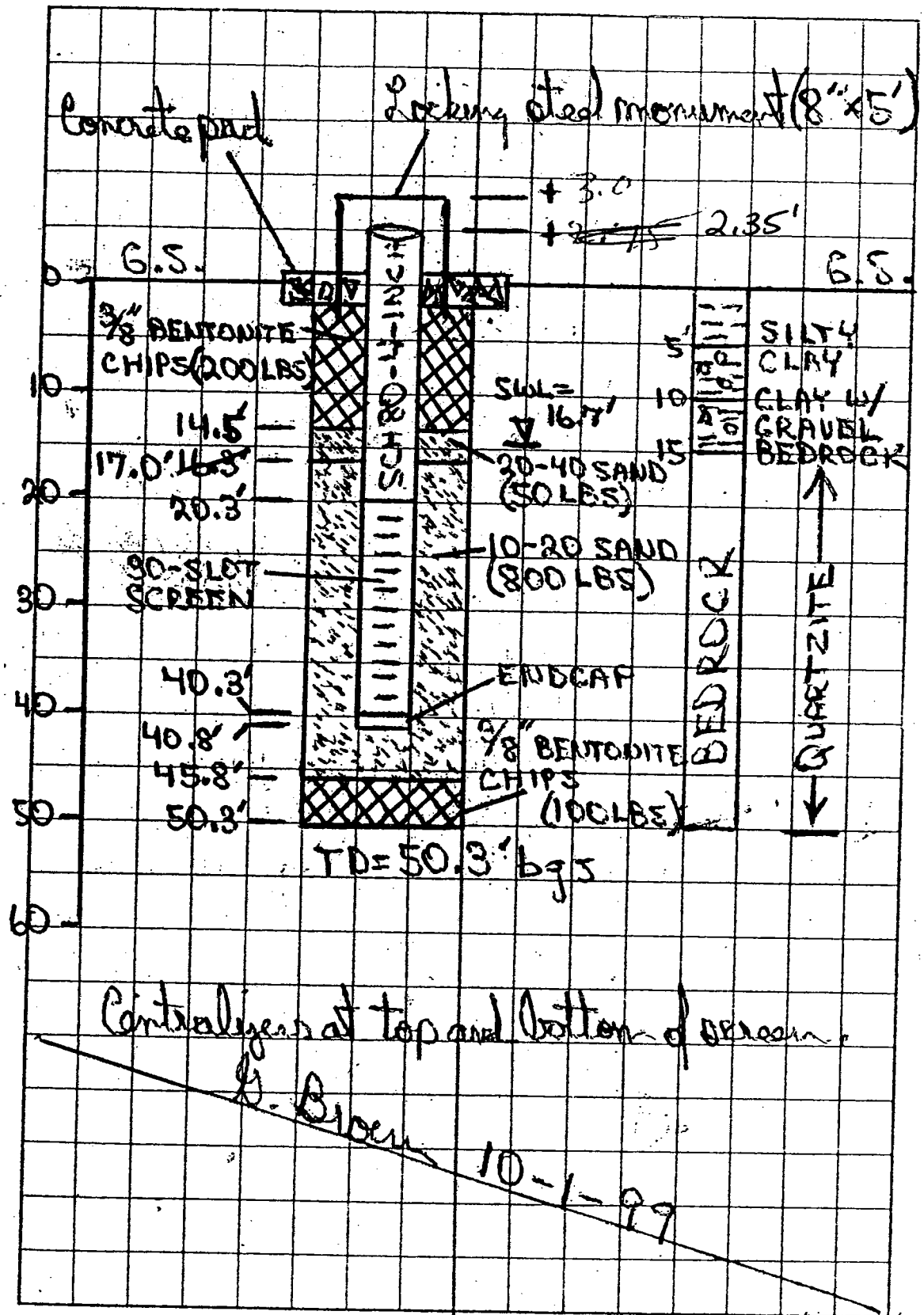
Recorded By	Date	Checked By	Date
[signature]	10-8-99	DK Nicholson	4/26/00

Eastern Drainage

Location MWED-07 Date 10-1-99 93

Project / Client T28N-R37E-SEC.12, SW¼, SE¼

WELL ED-07 COMPLETION DIAGRAM



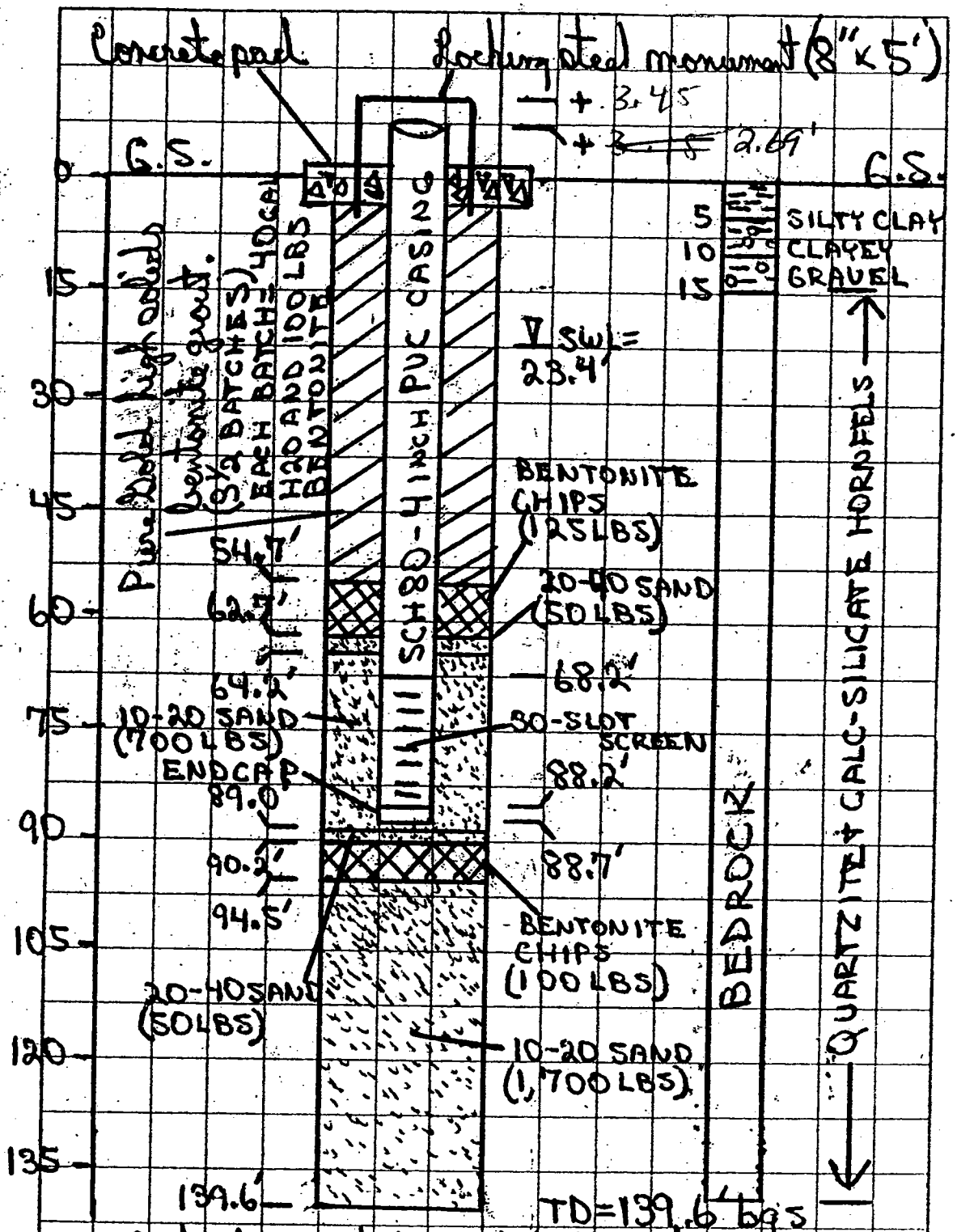
Checked by DK Nicholson 4/26/00

Eastern Drainage

Location MWED-08 Date 9-30-99

Project / Client T28N-R37E-SEC.12, SW1/4, SE1/4

WELL ED-08 COMPLETION DIAGRAM



Centralizers at top and bottom of screen and 20' up from top of screen. D. Brown 9-30-99

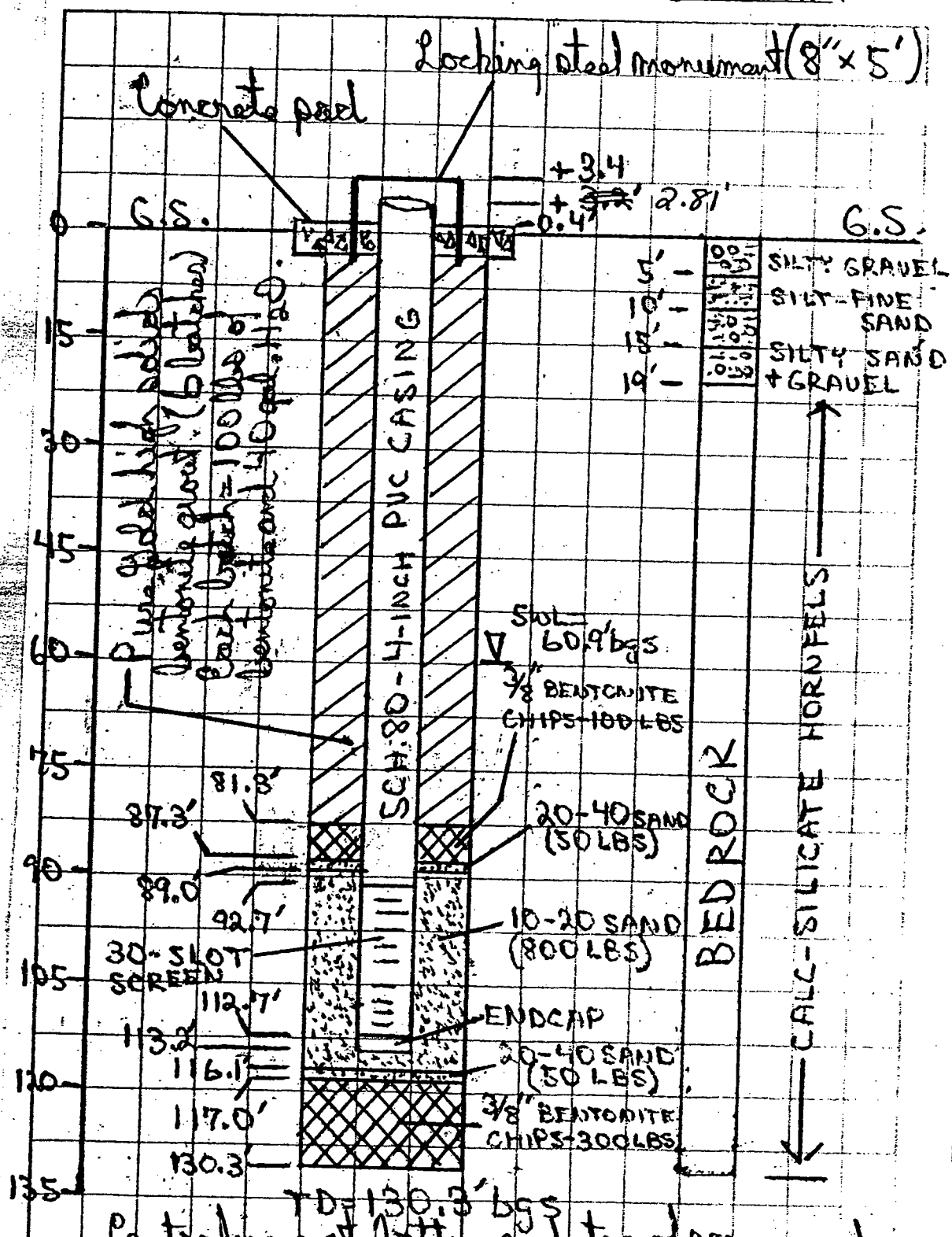
checked by DK Nicholson 4/26/00

Eastern Drainage

Location MWED-09 Date 9-29-99

Project / Client T28N-R37E-SEC12-NW1/4SE1/4

WELL ED-09 COMPLETION DIAGRAM



Centralizers at bottom and top of screen and 20' up from top of screen. D. Brown 9-29-99

checked by DK Nicholson 4/26/00

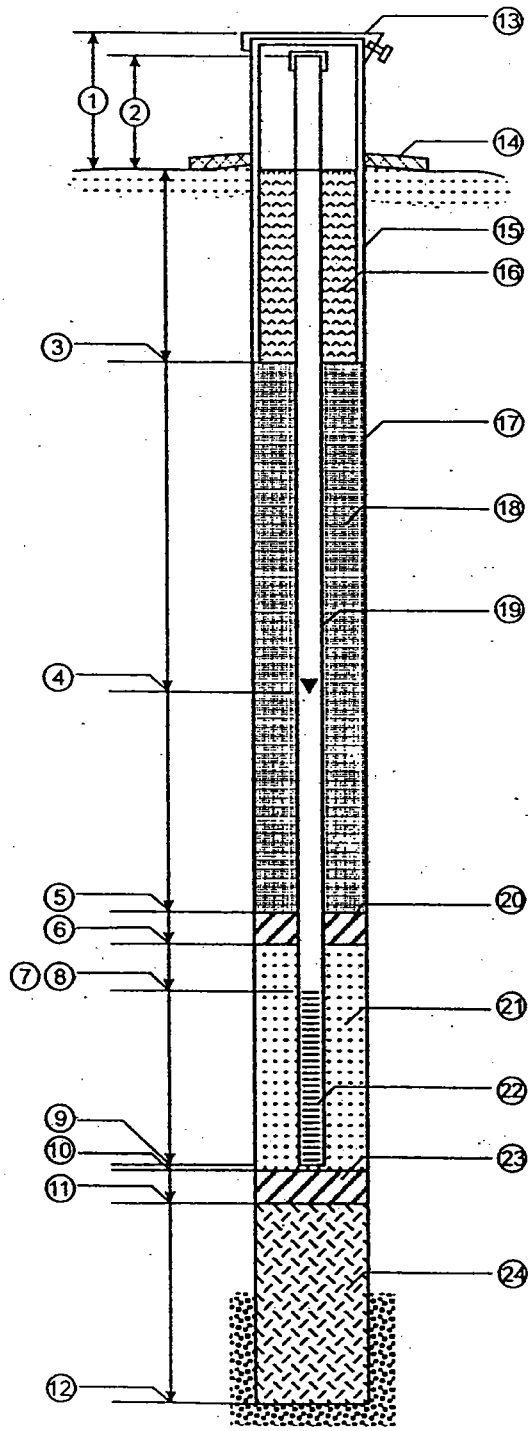
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	9/28/99 08:50
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWFW-03	Far West Drainage	9/28/99 13:40

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM #4	AIR ROTARY	2682.44 ft.msl	2684.63 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.9 ft.
2. Stick-Up Well Casing Above Ground: 2.21 ~~2.4~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 2 ft.
6. Depth to Bottom of Top Seal: 13 ft.
7. Depth to Top of Well Point or Screen: ~~15~~ 14.5 ft.
8. Total Length of Blank Casing: ~~15~~ 15 ft.
9. Bottom Depth of Well Screen: ~~35~~ 34.5 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 35 ~~35~~ ~~34.5~~ ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: steel Diameter: 8 in
16. Type of Upper Seal: concrete
17. Borehole Diameter: 8 in
18. Type of Upper Backfill: bentonite chips
19. Type of Well Casing: PVC SCH 80 Diameter: 4 in
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 Diameter: 8 in
22. Type of Screen Material: PVC SCH 80 Slot Size: 0.030 in
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

Recorded By	Date	Checked By	Date
[signature]	9/28/99	DK Nicholson	4/26/00

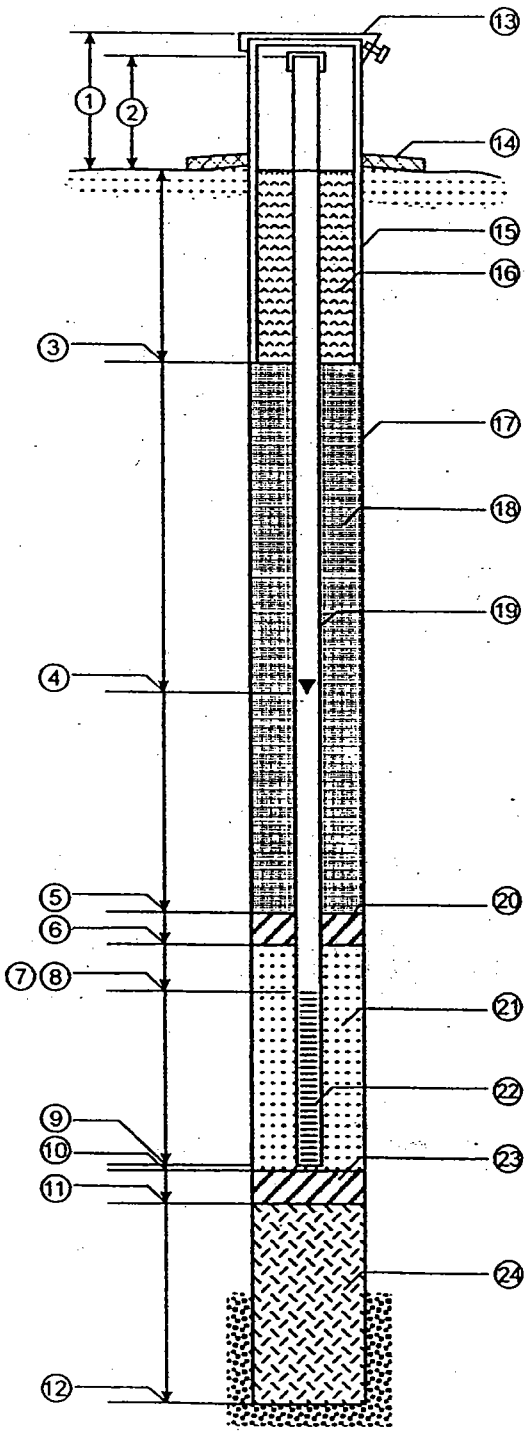
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	~~9/30/99~~ 9/28/99 15:00
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWFW-04	Far West Drainage	9/30/99 10:40

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM #4	AIR ROTARY	2703.45 ft.msl	2705.53 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.75 ft.
2. Stick-Up Well Casing Above Ground: 2.08 ~~2.40~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 2 ft.
6. Depth to Bottom of Top Seal: 26 ft.
7. Depth to Top of Well Point or Screen: 28 ft.
8. Total Length of Blank Casing: 28 ft.
9. Bottom Depth of Well Screen: 48 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 49 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: ~~PORTLAND~~ concrete
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: Cement/bentonite grout
19. Type of Well Casing: PVC SCH 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 Diameter: 8 in.
22. Type of Screen Material: PVC SCH 80 Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

Recorded By	Date	Checked By	Date
[signature]	9/30/99	DK Nicholson	4/26/00

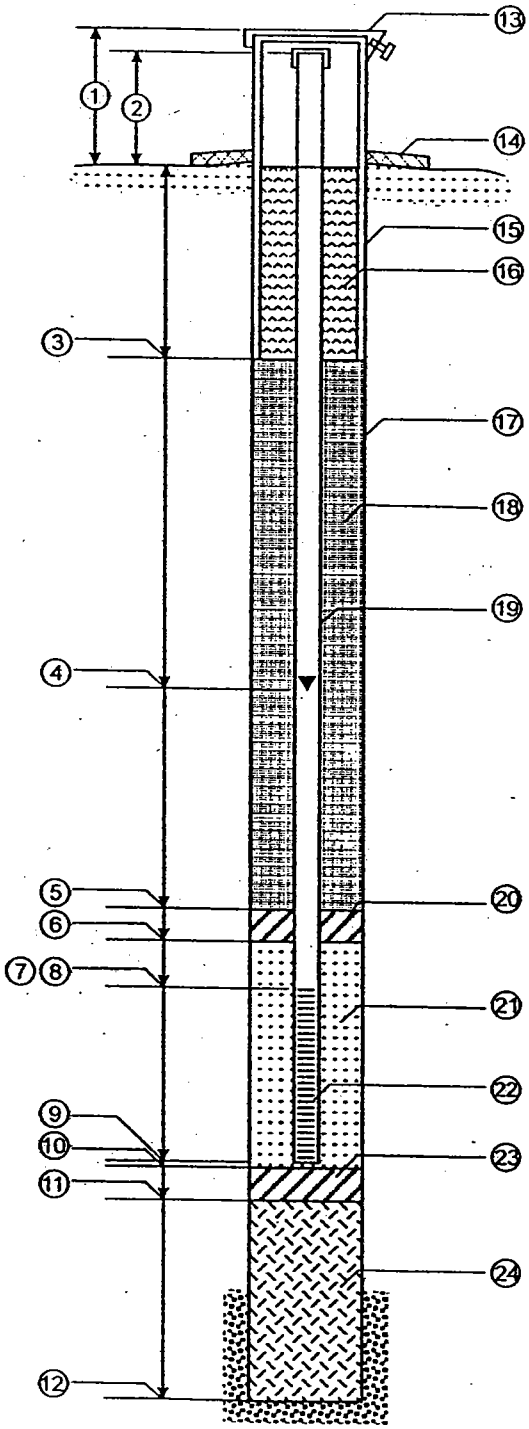
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIONITE MINE	9/27/99 12:20
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MW#W-05	For West Drainage near Core Shed	9/27/99 12:00

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM #4	~~AUGER~~ AIR ROTARY	2660.88 ft.msl	2662.93 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.8 ft.
2. Stick-Up Well Casing Above Ground: 2.05 ~~2.2~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 1 ft.
6. Depth to Bottom of Top Seal: 13 ft.
7. Depth to Top of Well Point or Screen: 15 ft.
8. Total Length of Blank Casing: 15 ft.
9. Bottom Depth of Well Screen: 35 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 36 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: Steel Diameter: 8 in.
16. Type of Upper Seal: Concrete
17. Borehole Diameter: ~~10~~ 8 in.
18. Type of Upper Backfill: Cement/bentonite grout
19. Type of Well Casing: PVC SCH 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 Diameter: ~~8~~ in.
22. Type of Screen Material: PVC SCH 80 Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

Recorded By	Date	Checked By	Date
[signature]	9/27/99	DK Nicholson	4/26/00

URS	Project Name: Phase 2A/1B RI/FS	Log of Boring MWHD-01
	Project Location: Midnite Mine	PAGE 1 OF 2
	Project Number: 53F4001800.03	

Date(s) Drilled	10-9-00	Logged By	GARRETT BROWN/CH2M HILL	Total Depth of Borehole (ft)	49.5' bgs
Drilling Method	AIR ROTARY	Diameter of Borehole (in)	9 3/4" / 8 1/2" (OPEN HOLE)	Ground Surface Elevation (ft-msl)	TBD
Drill Rig Type	SPEEDSTAR-30K	Drilling Company	CASCADE	Groundwater Elevation (ft-msl)	TBD
Driller's Name: R. LEDINGER	Sampler Type: CYCLONE GRAB SAMPLE	Checked By	DK Nicholson	Measuring Point Elevation (ft-msl)	TBD
Locations / Comments	SW 1/4, NW 1/4, SECTION 12, T28N, R37E			Northing / Easting	TBD

Depth (ft-bgs)	G.B. SAMPLES Blows/Foot	Recovery (ft)	PID (ppm)	Penetrometer (tsf)	Munsell Color	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS
								SWL in nearby existing well BOM-10 just to the east is at 25' bgs. At same elev. at G.S. as MWHD-01.	10-9-00 Started drilling at 11:10 Driving temporary surface casing.
5	GRAB				10YR-6/6	DECOMPOSED FILL ROCK		Waste rock (phyllite-schist) and silty clay - very dry, dusty, moderately decomposed, weathered iron-stained, brownish yellow. Relict bedding; muscovite + qtz.	1115 RAD=77uR/h Rapid drill speed soft.
10	GRAB							Phyllite-schist (waste rock) and silty clay - as above	1118 RAD=83uR/h Rapid drill speed
15	GRAB				10YR 4/4 TO GLEY1 4/N	BEDROCK		Phyllite-schist - dry, dusty, dark yellowish brown, decomposed, iron stained. Considerable presence of muscovite. Changing to dark gray at 18'.	1128 RAD=87uR/h Drill speed moderate. Started H_2O injection at 17' to control dust
20	GRAB				GLEY1 6/N TO 10YR 4/2			Phyllite-schist - wet from injection, moderately decomposed and iron stained. relict bedding, muscovite rock fragments angular and easy broken. Gray to dark grayish brown	11:43 RAD=63uR/h Moderate drill rate
25	GRAB							Phyllite-schist - as above. Still injecting water to lift cuttings. Matrix is very sticky.	1206 RAD=72uR/h 1209-1232 Down for repairs.
30	GRAB								

URS	Project Name:	Phase 2A/1B RI/FS	Log of Boring MWHD-01
	Project Location:	Midnite Mine	PAGE 2 OF 2
	Project Number:	53F4001800.03	

Depth (ft-bgs)	SAMPLES: Blows/Foot	Recovery (ft)	PID (ppm)	Penetrometer (tsf)	Munsell Color	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS
30	GRAB				GLEY1 6/N TO 10YR 4/2	BEDROCK	xxx xxx xxx xxx xxx xxx xxx	Phyllite-schist - wet from injection but noted increase in moisture, iron stained, weathered, moderately hard, relict bedding. Muscovite present. Shut off injected water.	1239 Slow to moderate drill speed. 1242-1308 Down for repairs.
35	GRAB							Phyllite-schist - as above, wet, no production; started injecting water again to lift cuttings. Cuttings matrix is sticky clay. Started drilling open hole below 36'.	1310 - After being down for 30 minutes blew 10 gallons of formation water. Sagged water at bottom and rising 0.02'/min.
40	GRAB							Phyllite-schist - as above, no water production. Poor return. Still injecting water to help lift cuttings.	1336; RAD=85uR/h Moderate slow drilling.
45	GRAB							Phyllite-schist - as above; wet from injection, no formation water production, iron stained weathered.	1352 RAD=76uR/h
50	GRAB				TD= 49.5' bgs			Phyllite-schist - wet from injection more competent and harder rock, less iron staining. Stopped drilling at 50' bgs. Circulated borehole for 5 minutes w/ injected water to clean up, blew clean, then tripped drill rods from hole. Sagged bottom at 49.5' bgs. WL at 46.7' and rising slowly. 1415 to 1630 - Completed well w/ Sch 80 - 4 inch PVC screen and casing. 6-inch end cap. Used 30 slot screen set 24.3-44.3'. 10-20 sand around screen. Bentonite chips placed above sand.	1357 RAD=74 uR/h
55									10/10/00 - 0755 - Final SWL in well day after completion is 31.56' bgs.
60									

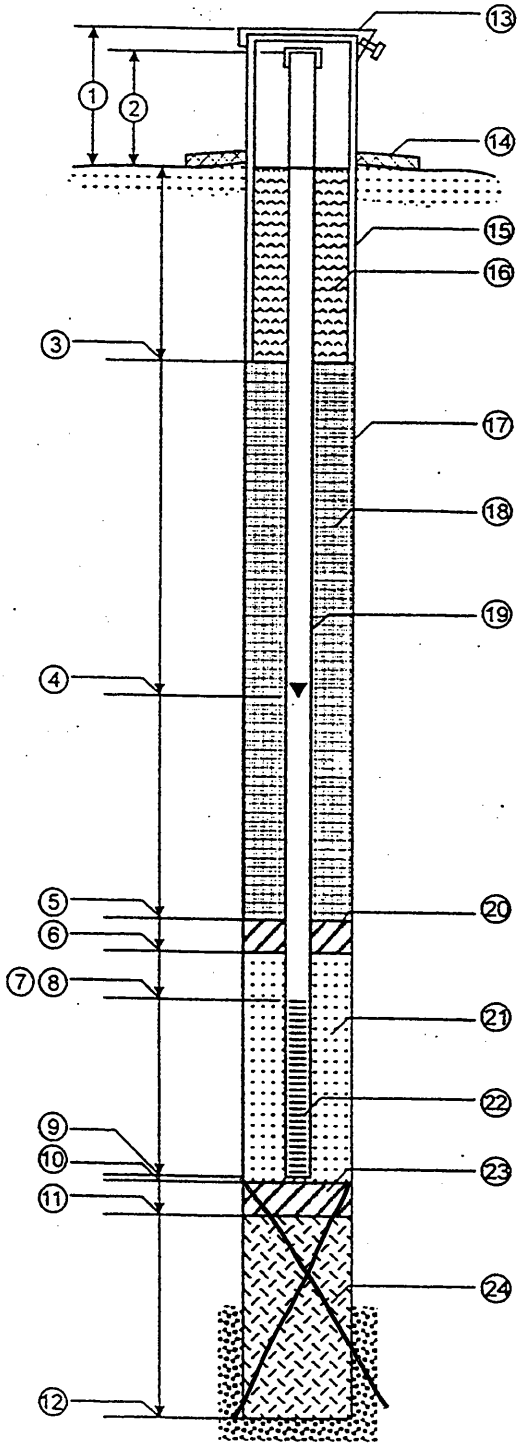
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE-PHASE IIA/IB	10/9/00 - 11:10
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWHD-01	HILLSIDE DUMP	10-9-00 - 16:30

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
R. LEININGER-CASCADE G. BROWN- CH2M HILL	AIR ROTARY/ CASING ADVANCE	TBD ft.msl	TBD ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: TBD ft.
2. Stick-Up Well Casing Above Ground: TBD ft.
3. Depth to Bottom of Upper Seal/Protective Casing: TBD ft.
4. Depth to Initial Ground Water Surface Elevation: 31.56' bgs ft.
5. Depth to Top of Top Seal: 2.0' bgs ft.
6. Depth to Bottom of Top Seal: 21.5' bgs ft.
7. Depth to Top of ~~Well Point or~~ Screen: 24.3' bgs ft.
8. Total Length of Blank Casing: FROM G.S. 24.3' ft.
9. Bottom Depth of Well Screen: 44.3' bgs ft.
   WELL DEPTH W/ ENDCAP - 44.8' bgs
10. Depth to Top of Bottom Seal (If Installed): NA ft.
11. Depth to Bottom of Bottom Seal (If Installed): NA ft.
12. Depth of Borehole: 49.5' bgs ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: ~~TBD~~ steel Diameter: 8 in.
16. Type of Upper Seal: ~~WILL BE~~ CONCRETE
17. Borehole Diameter: TO 36' → 9 3/4" / 8 1/2" AFTER in.
18. Type of Upper Backfill: NA
19. Type of Well Casing: SCH 80 - PVC Diameter: 4 in.
20. Type of Top Seal (IF Installed): DRY MEDIUM BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: CSSI SAND Diameter: 10-20 GRADE ~~in.~~
    SAND → 21.5' TO 49.5' bgs
22. Type of Screen Material: FACTORY SCH 80 - SLOTTED Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): NA
24. Type of Lower Backfill: NA

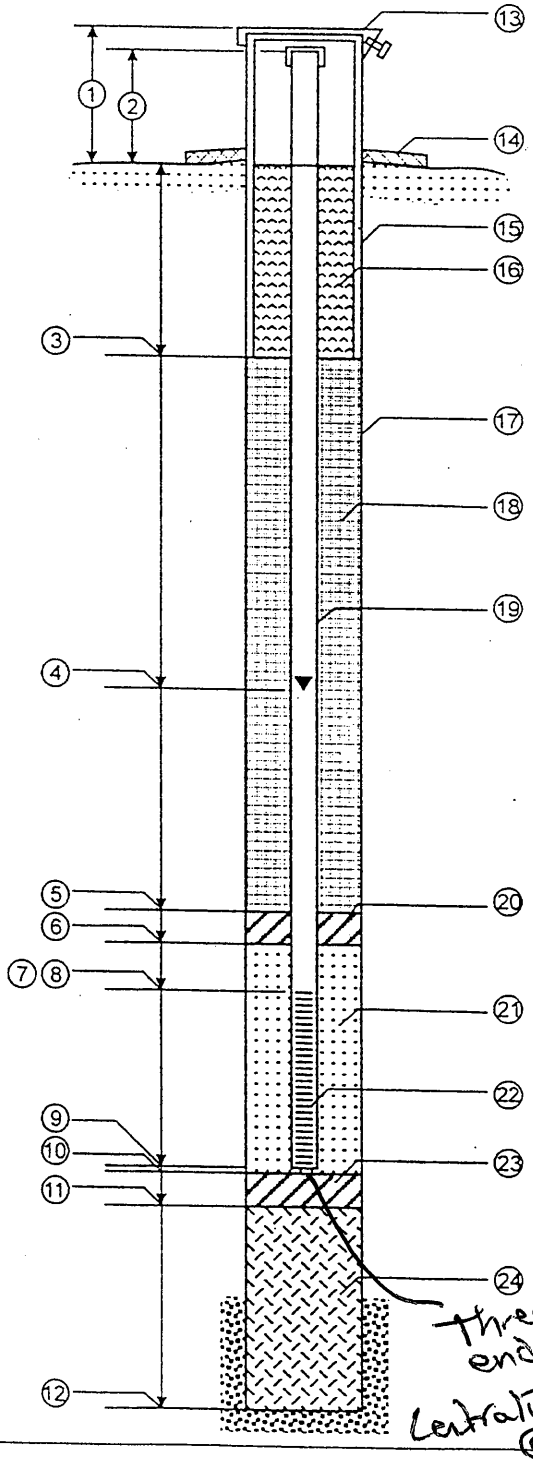
Recorded By	Date	Checked By	Date
Garrett Brown	10-9-00	David K Nicholson	11/12/01

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03	Project Name: Midnite Mine Phase 1A RI/FS	Date/Time Started: 9/28/99 1500
Well/Borehole Number: MW ND01	Well/Borehole Location: Head of northern drainage, east of Pit 4	Date/Time Completed: 9/30/99 1300
Installation Team: Cascade Drilling	Type of Drilling: Air rotary w/ 8" hammer bit, temp casing to 10'	Ground Surface Elev.: 3202.68 ft.msl
		Top of Well Casing Elev.: 3204.79 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 3.45 ft.
2. Stick-Up Well Casing Above Ground: 2.11' ~~2.6~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: — ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 6 ft.
6. Depth to Bottom of Top Seal: 50.2 ft.
7. Depth to Top of Well Point or Screen: 55 ft.
8. Total Length of Blank Casing: 55 ft.
9. Bottom Depth of Well Screen: 75 ft.
10. Depth to Top of Bottom Seal (If Installed): — ft.
11. Depth to Bottom of Bottom Seal (If Installed): — ft.
12. Depth of Borehole: ~~Tube installed~~ 76.8 bgs ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: Steel Diameter: 8 in.
16. Type of Upper Seal: ~~Portland cement w/bentonite~~ Concrete
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: cement/bentonite grout
19. Type of Well Casing: Sch 80 PVC Diameter: 4 in.
20. Type of Top Seal (IF Installed): bentonite chips (hydrated)
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: Colorado Silica ±10-20 Diameter: ____ in.
22. Type of Screen Material: Sch 80 4" PVC Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): —
24. Type of Lower Backfill: 10-20 sand

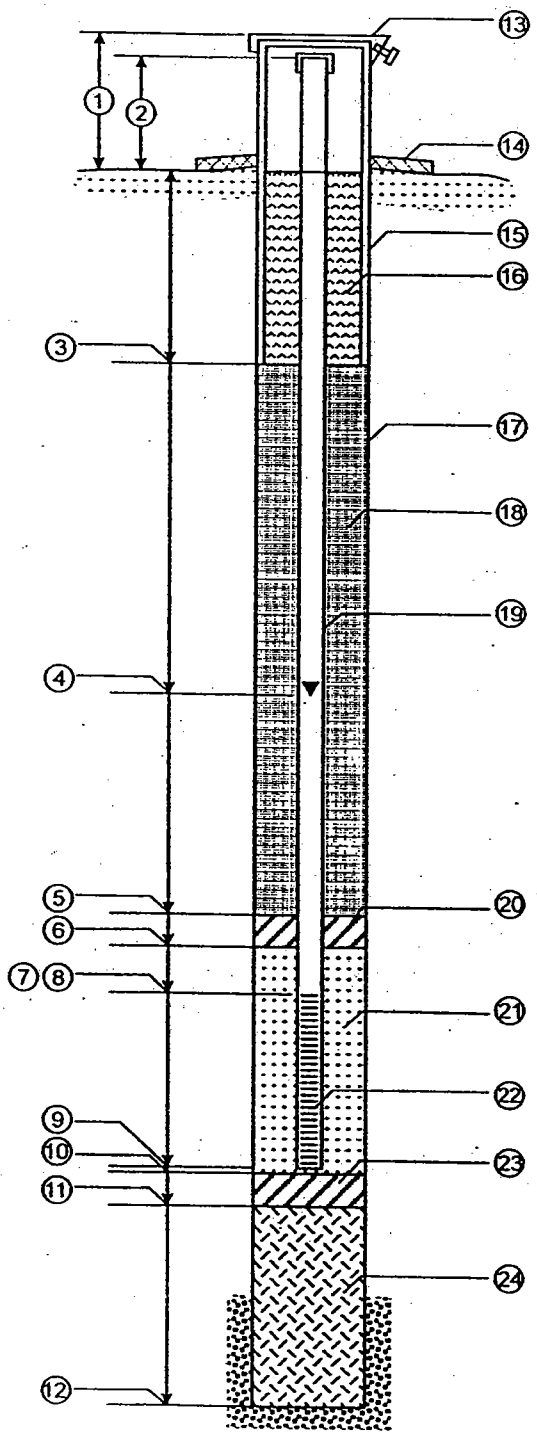
Recorded By:	Date:	Checked By: DK Nicholson	Date: 4/26/00

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03	Project Name: MIDNITE MINE	Date/Time Started: 9/25/99 14:15
Well/Borehole Number: MWNE-05	Well/Borehole Location: Eastern Drainage	Date/Time Completed: 9/25/99 16:00
Installation Team: TEAM #4	Type of Drilling: AUGER	Ground Surface Elev.: 2648.28 ft.msl
		Top of Well Casing Elev.: 2650.41 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.95 ft.
2. Stick-Up Well Casing Above Ground: 2.13' HG DKN 10-12-99 ~~3/25~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 1 ft.
6. Depth to Bottom of Top Seal: 3 ft.
7. Depth to Top of Well Point or Screen: 5 ft.
8. Total Length of Blank Casing: 5 ft.
9. Bottom Depth of Well Screen: 20 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 22 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: ~~PVC SCH 40~~ STEEL Diameter: 4 in.
16. Type of Upper Seal: ~~Portland~~ concrete
17. Borehole Diameter: 10 in.
18. Type of Upper Backfill: bentonite chips
19. Type of Well Casing: PVC SCH 40 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10x20 Diameter: 10 in.
22. Type of Screen Material: PVC SCH 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

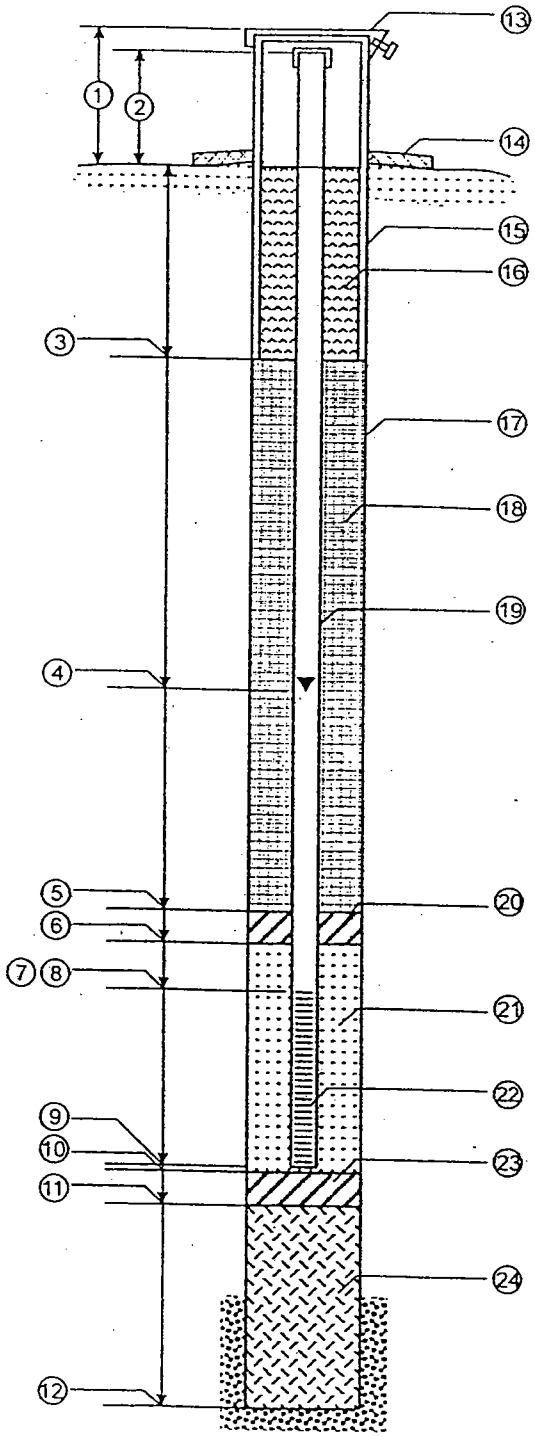
Recorded By	Date	Checked By	Date
[signature]	9/25/99	DK Nicholson	4/26/00

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800-03	Project Name: MIDNIGHT MINE	Date/Time Started: 9-30-99 / 1105
Well/Borehole Number: MWNE-06	Well/Borehole Location: Northeast Drainage	Date/Time Completed: 10-7-99 / 1100
Installation Team: R16 1	Type of Drilling: AIR ROTARY	Ground Surface Elev.: 2648.11 ft.msl
		Top of Well Casing Elev.: 2650.32 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 3.05 ft.
2. Stick-Up Well Casing Above Ground: 2.21' ~~2.7~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: 13' ft.
5. Depth to Top of Top Seal: 53 ft.
6. Depth to Bottom of Top Seal: 61.5' ft.
7. Depth to Top of Well Point or Screen: 68 ft.
8. Total Length of Blank Casing: 68 ft.
9. Bottom Depth of Well Screen: 88 ft.
10. Depth to Top of Bottom Seal (If Installed): 90 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 95 ft.
12. Depth of Borehole: 121'8" ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: ~~PORTLAND~~ Concrete
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: Cement/ BENTONITE SLURRY
19. Type of Well Casing: Sch. 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): BENTONITE CHIPS 20X40 SAND
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 SAND Diameter: 4 in.
22. Type of Screen Material: Sch. 80 Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): BENTONITE CHIPS
24. Type of Lower Backfill: 10X20 SAND

Recorded By	Date	Checked By	Date
[signature]	10-7-99	DK Nicholson	4/26/00

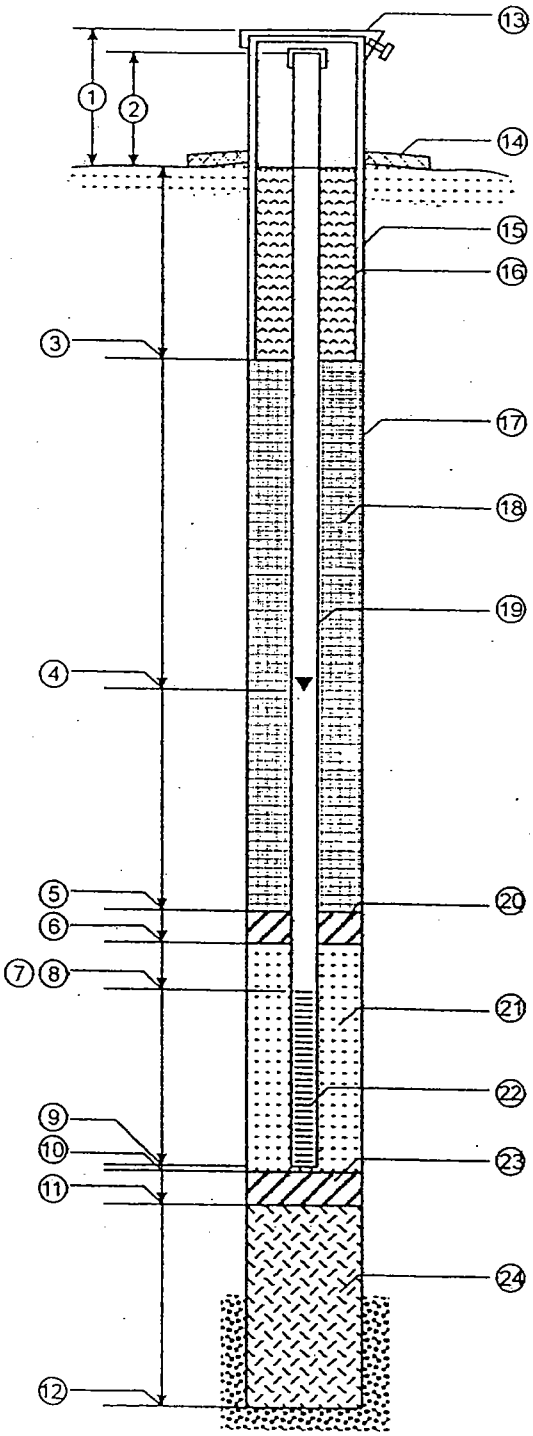
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	9-16-99 / 1700
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWNW06	Northwest Ridge	9-22-99 / 1430

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
R16.1	AIR ROTARY	3500.82 ft.msl	3503.45 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 3.5 ft.
2. Stick-Up Well Casing Above Ground: ~~3.2~~ 2.63 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: 57 ft.
4. Depth to Initial Ground Water Surface Elevation: * 137 ft.
5. Depth to Top of Top Seal: 143 ft.
6. Depth to Bottom of Top Seal: 150 ft.
7. Depth to Top of Well Point or Screen: ~~150.5~~ 152.5 ft.
8. Total Length of Blank Casing: 9-22-99 ~~150.5~~ 152.5 ft.
9. Bottom Depth of Well Screen: 177.5 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 180 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: PORTLAND CEMENT
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: BENTONITE SLURRY
19. Type of Well Casing: Sch. 80 PVC Diameter: 4 in.
20. Type of Top Seal (IF Installed): BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10/20 & 20/40 SAND Diameter: 4 in.
22. Type of Screen Material: Sch. 80 PVC Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

* 1st H2O BETWEEN 160 AND 170' bgs.

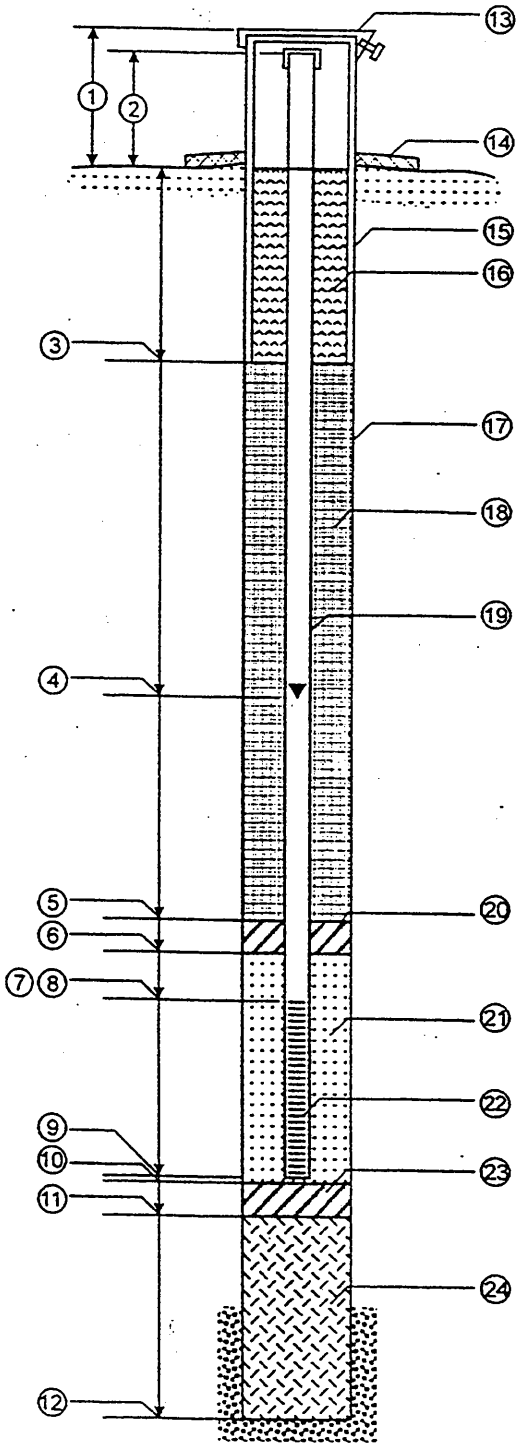
Recorded By	Date	Checked By	Date
[signature]	9-22-99	DK Nicholson	4/26/00

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03	Project Name: MIDNITE MINE PHASE IIA/IB	Date/Time Started: 10-14-00/09:05
Well/Borehole Number: MWP3-01	Well/Borehole Location: PIT 3 - SHALLOW DOWNGRADIENT	Date/Time Completed: 10-15-00/15:15
Installation Team: R.LEININGER/CASCADE G.BROWN/CH2MHILL	Type of Drilling: AIR ROTARY/ CASING ADVANCE	Ground Surface Elev.: TBD ft.msl; Top of Well Casing Elev.: TBD ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: TBD ft.
2. Stick-Up Well Casing Above Ground: TBD ft.
3. Depth to Bottom of Upper Seal/Protective Casing: TBD ft.
4. Depth to Initial Ground Water Surface Elevation: 33.9' bgs ft.
5. Depth to Top of Top Seal: 2.0' bgs ft.
6. Depth to Bottom of Top Seal: 97.2' bgs ft.
7. Depth to Top of Well ~~Point or~~ Screen: 107.0' bgs ft.
8. Total Length of Blank Casing: FROM G.S. 107' ft.
9. Bottom Depth of Well Screen: 127.0' bgs ft.
   WELL DEPTH WITH ENDCAP = 127.5' bgs
10. Depth to Top of Bottom Seal (If Installed): NA ft.
11. Depth to Bottom of Bottom Seal (If Installed): NA ft.
12. Depth of Borehole: 130' bgs ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: ~~TBD~~ steel Diameter: 8 in.
16. Type of Upper Seal: WILL BE CONCRETE
17. Borehole Diameter: 9 3/4" TO 27' THEN 8 1/2" TO T.D. in.
18. Type of Upper Backfill: NA
19. Type of Well Casing: SCH. 80 PVC Diameter: 4 in.
20. Type of Top Seal (IF Installed): MEDIUM BENTONITE CHIPS 2.0' TO 97.2' bgs
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 97.2' TO 128' bgs CSSI SAND GRADE 10-20 Diameter: ~~in.~~
22. Type of Screen Material: SCH. 80-SLOTTED Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): NA
24. Type of Lower Backfill: FORMATION SLOUGH → 128'-130' bgs

Recorded By	Date	Checked By	Date
Garrett Brown	10-15-00	David K Nicholson	11/12/01

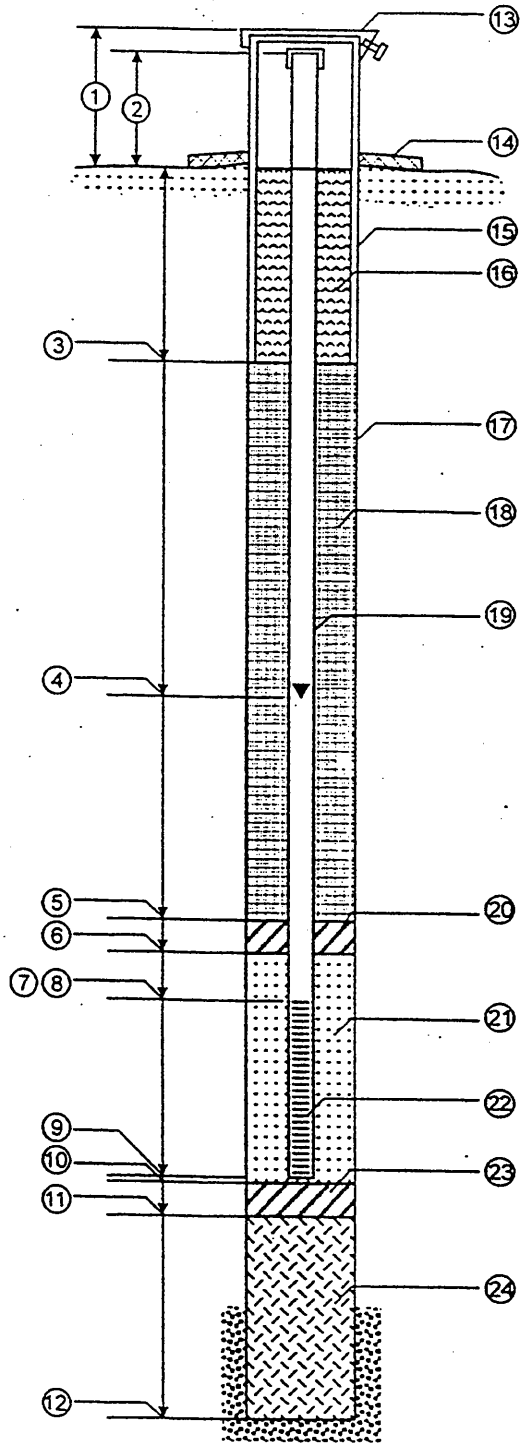
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE-PHASE IIA/IB	10/10/00 - 09:00
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWP3-02	DEEP PIT 3-DOWNGRADIENT	10/13/00-18:30

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
R.LEININGER/CASCADE G.BROWN/CH2M HILL	AIR ROTARY/ CASING ADVANCE	TBD ft.msl	TBD ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: TBD ft.
2. Stick-Up Well Casing Above Ground: TBD ft.
3. Depth to Bottom of Upper Seal/Protective Casing: TBD ft.
4. Depth to Initial Ground Water Surface Elevation: 36.7' bgs ft.
5. Depth to Top of Top Seal: 2.0' bgs ft.
6. Depth to Bottom of Top Seal: 258.0' bgs ft.
7. Depth to Top of ~~Well Point or~~ Screen: 269.0' bgs ft.
8. Total Length of Blank Casing: FROM G.S. 269' ft.
9. Bottom Depth of Well Screen: 289.0' bgs ft.
   WELL DEPTH WITH END CAP = 289.5' bgs
10. Depth to Top of Bottom Seal (If Installed): NA ft.
11. Depth to Bottom of Bottom Seal (If Installed): NA ft.
12. Depth of Borehole: 320' bgs ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: ~~PVC~~ steel Diameter: 8 in.
16. Type of Upper Seal: ~~WILL BE~~ CONCRETE
17. Borehole Diameter: 9¾" TO 27' THEN 8½" TO T.D. in.
18. Type of Upper Backfill: NA
19. Type of Well Casing: SCH. 80 PVC Diameter: 4 in.
    MEDIUM BENTONITE CHIPS → 2.0' TO 21.8' + 240.5' TO 258.0'
20. Type of Top Seal (IF Installed): BENTONITE GROUT → 21.5' TO 240.5'
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: CSSI SAND Diameter: GRADE 10-20 ~~in.~~
    10-20 SAND → 261.8' TO 299.0' bgs
    20-40 SAND → 258.0 TO 261.8' bgs
22. Type of Screen Material: ~~SCH. 80 SLOTTED~~ Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): NA
24. Type of Lower Backfill: FORMATION SLOUGH 299'-320' bgs

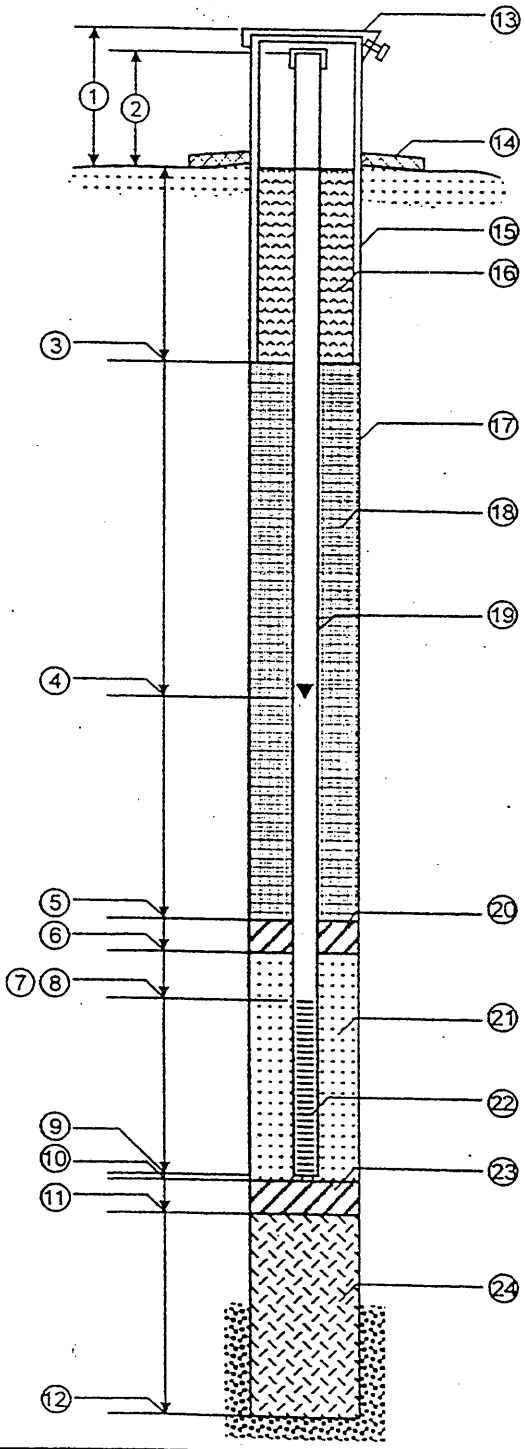
Recorded By	Date	Checked By	Date
Garrett Brown	10-13-00	David K Nicholson	11/12/01

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03 05200	Project Name: Midnite Mine	Date/Time Started: 10/30/00
Well/Borehole Number: MWP4-02	Well/Borehole Location: South of Pit 4 (Area 5)	Date/Time Completed:
Installation Team: Cascade Drilling	Type of Drilling: Air Rotary	Ground Surface Elev. ft.msl / Top of Well Casing Elev. ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: _____ ft.
2. Stick-Up Well Casing Above Ground: _____ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: _____ ft.
4. Depth to Initial Ground Water Surface Elevation: _____ ft.
5. Depth to Top of Top Seal: 2.5 ft.
6. Depth to Bottom of Top Seal: 135 ft.
7. Depth to Top of Well Point or Screen: 152 ft.
8. Total Length of Blank Casing: _____ ft.
9. Bottom Depth of Well Screen: 172 ft.
10. Depth to Top of Bottom Seal (If Installed): – ~~172~~ ft.
11. Depth to Bottom of Bottom Seal (If Installed): – ~~172 173~~ ft.
12. Depth of Borehole: 173 ft. TD is 298 ft bgs on drilling log.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: Steel Diameter: 8 in.
16. Type of Upper Seal: Concrete
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: 3/8" bentonite chips
19. Type of Well Casing: PVC Sch 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): 3/8" bentonite chips
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: Silica Sand Diameter: 10-20 in.
22. Type of Screen Material: PVC Sch 80 Slot Size: 0.02 in.
23. Type of Bottom Seal (If Installed): 3/8" ~~bentonite chips~~
24. Type of Lower Backfill: ~~sand~~ natural

Recorded By	Date	Checked By	Date
David K Nicholson	10/30/00	David K Nicholson	11/12/01

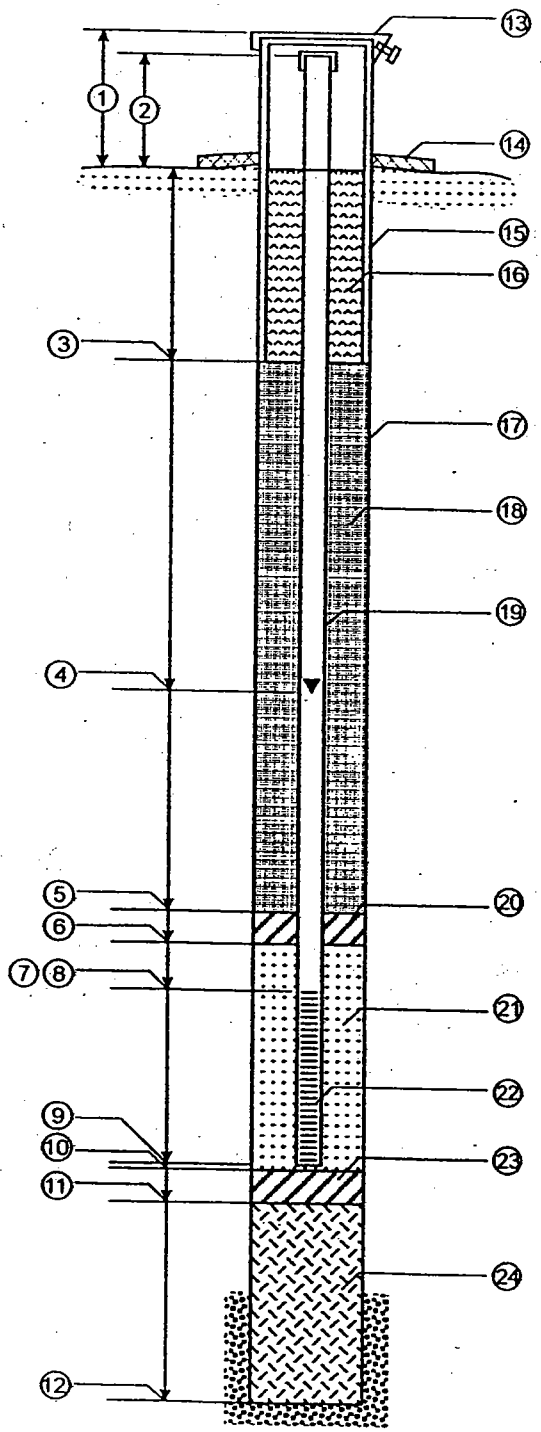
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDWITE MINE	~~9/25/99~~ 9/24/99 15:20
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWSW-01	MWSW-01	9/25/99 08:30

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM #4	AUGER	2445.13 ft.msl	2447.75 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.85 ft.
2. Stick-Up Well Casing Above Ground: 2.62 HW DKN ~~2.50~~ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 1 ft.
6. Depth to Bottom of Top Seal: 8 ft.
7. Depth to Top of Well Point or Screen: 10 ft.
8. Total Length of Blank Casing: 10 ft.
9. Bottom Depth of Well Screen: 25 ft.
10. Depth to Top of Bottom Seal (If Installed): — ft.
11. Depth to Bottom of Bottom Seal (If Installed): — ft.
12. Depth of Borehole: 27 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☐ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: Concrete
17. Borehole Diameter: 10 in.
18. Type of Upper Backfill: bentonite chips
19. Type of Well Casing: PVC SCH 40 Diameter: 4 in.
20. Type of Top Seal (IF Installed): ~~PURE GOLD BENTONITE CHIPS~~
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: COLORADO 10x20 Diameter: 10 in.
22. Type of Screen Material: PVC SCH 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

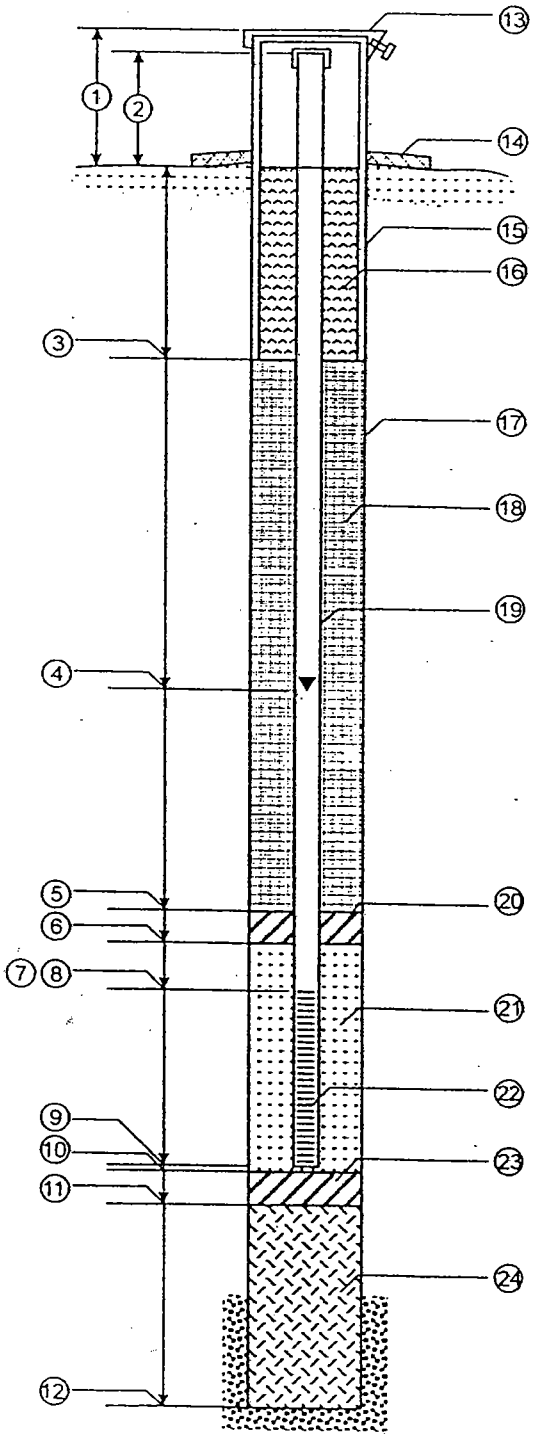
Recorded By	Date	Checked By	Date
[signature]	9/25/99	DK Nicholson	4/26/00

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number: 53F4001800.03	Project Name: Midnite Mine Phase 1A RI/FS	Date/Time Started: 9/10/99 15:00
Well/Borehole Number: MW SW02	Well/Borehole Location: Southwest Drainage	Date/Time Completed: 9/12/99 0800
Installation Team: Cascade Drilling	Type of Drilling: Air Rotary w/ ~~Gor~~ Down-hole hammer – 8 inch ID	Ground Surface Elev.: ~~2448~~ 2444.88 ft.msl
		Top of Well Casing Elev.: 2447.38 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 3.0 ft.
2. Stick-Up Well Casing Above Ground: ~~2.9~~ 2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: 6 ft.
4. Depth to Initial Ground Water Surface Elevation: 92.2 (set overnight) ft.
5. Depth to Top of Top Seal: 93 ft.
6. Depth to Bottom of Top Seal: 95 ft.
7. Depth to Top of Well Point or Screen: 102 ft.
8. Total Length of Blank Casing: 102 ft.
9. Bottom Depth of Well Screen: 122 ft.
10. Depth to Top of Bottom Seal (If Installed): 125 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 130 ft.
12. Depth of Borehole: ~~To be installed~~ 165 ft.
13. Protective Casing: [X] Yes [ ] No Locking Cap: [X] Yes [ ] No
14. Sanitary Seal: [X] Yes [ ] No ~~To be installed~~
15. Type of Protective Casing: Steel Diameter: 8 in.
16. Type of Upper Seal: ~~Cement/bentonite grout~~ DKN Concrete
17. Borehole Diameter: 8 (nominal) in.
18. Type of Upper Backfill: — cement/bentonite grout
19. Type of Well Casing: Sch 80 PVC Diameter: 4 in.
20. Type of Top Seal (IF Installed): bentonite chips (1 bag)
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10-20 Colorado Diameter: in.
22. Type of Screen Material: 30 slot Slot Size: 0.03 in.
23. Type of Bottom Seal (If Installed): bentonite chips
24. Type of Lower Backfill: 10-20 sand

Centralizers 22, 100, 122
Threaded bottom cap

Recorded By:	Date	Checked By:	Date
		DK Nicholson	4/26/00

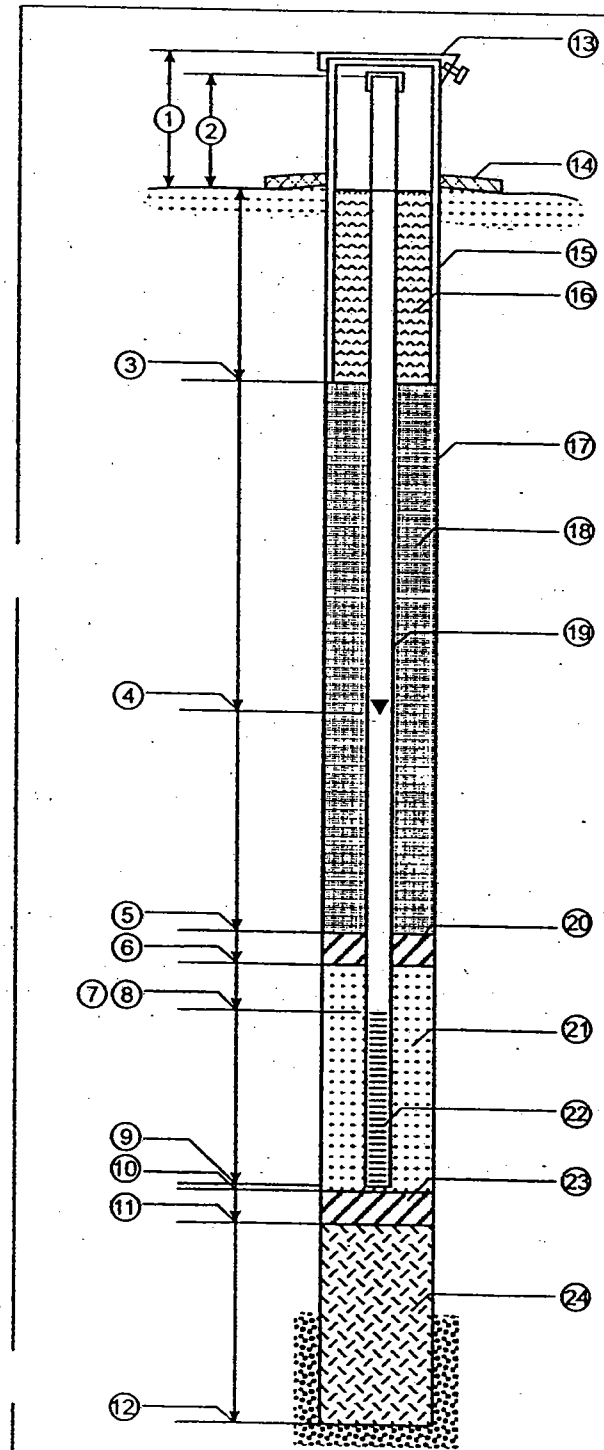
Note - Two wells were installed with the "MWWD-02" designation. This well was later designated "-02a"

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	~~10/6/99~~ 10/1/99 14:00
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWWD-02	Western Drainage	10/6/99 14:00

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM #3	AIR ROTARY	2442.94 ft.msl	2444.90 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.85 ft.
2. Stick-Up Well Casing Above Ground: HTEr 10-12-99 1.96' ~~30"~~ ~~2.45~~ DKN ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 0 ft.
6. Depth to Bottom of Top Seal: 41 ft.
7. Depth to Top of Well Point or Screen: 50 ft.
8. Total Length of Blank Casing: 50 ft.
9. Bottom Depth of Well Screen: 70 ft.
10. Depth to Top of Bottom Seal (If Installed): 71 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 76 ft.
12. Depth of Borehole: 104 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: ~~PORTLAND~~ concrete DKN
17. Borehole Diameter: ~~8~~ 10 in.
18. Type of Upper Backfill: cement/bentonite grout
19. Type of Well Casing: PVC SCH 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 Diameter: 8 in.
22. Type of Screen Material: PVC SCH 80 Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): bentonite chips
24. Type of Lower Backfill: 10/20 Silica sand

Recorded By	Date	Checked By	Date
[signature]	10/6/99	DK Nicholson	4/26/00

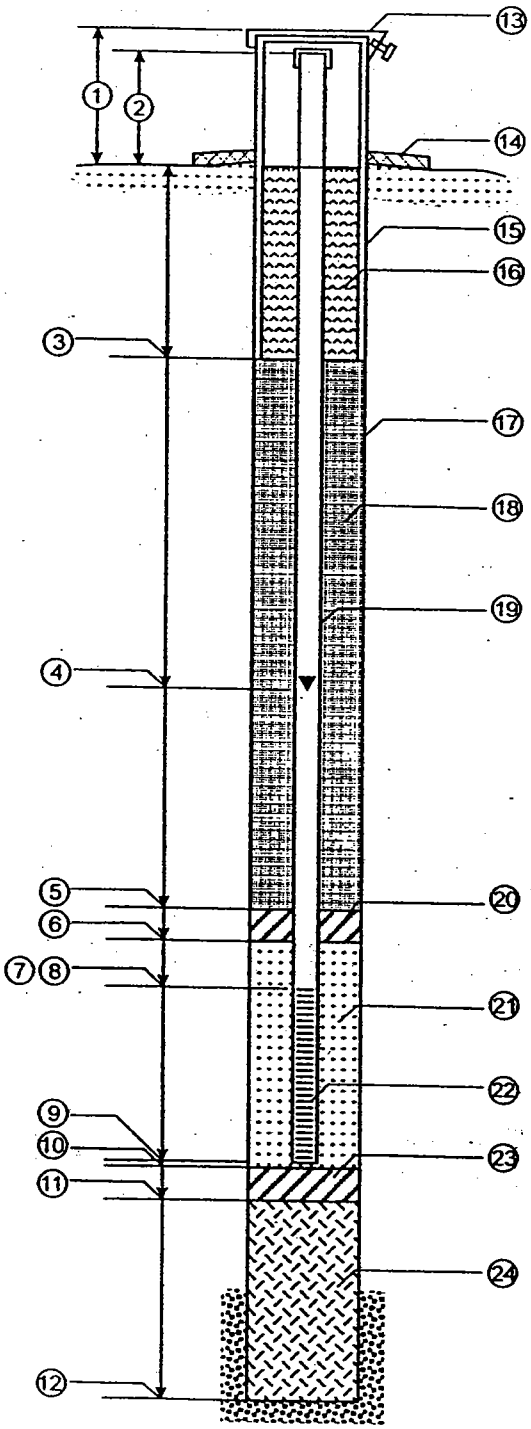
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	~~10/7/99~~ 10/6/99 17:1
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
MWWD-03	Western Drainage	10/7/99 13:30

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
TEAM #3	AIR ROTARY	2423.33 ft.msl	2425.26 ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 2.95 ft.
2. Stick-Up Well Casing Above Ground: HEs 1.93' ~~30"~~ ~~2.83~~ ft. 10-12-99 DKN
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: ____ ft.
5. Depth to Top of Top Seal: 2 ft.
6. Depth to Bottom of Top Seal: 31 ft.
7. Depth to Top of Well Point or Screen: ~~36~~ 35.5 ft.
8. Total Length of Blank Casing: 36 ft.
9. Bottom Depth of Well Screen: ~~56~~ 55.5 ft.
10. Depth to Top of Bottom Seal (If Installed): N/A ft.
11. Depth to Bottom of Bottom Seal (If Installed): N/A ft.
12. Depth of Borehole: 56 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 8 in.
16. Type of Upper Seal: ~~PORTLAND~~ Concrete DKN
17. Borehole Diameter: 8 in.
18. Type of Upper Backfill: cement / bentonite grout
19. Type of Well Casing: PVC SCH 80 Diameter: 4 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10X20 Diameter: 8 in.
22. Type of Screen Material: PVC SCH 80 Slot Size: 0.030 in.
23. Type of Bottom Seal (If Installed): N/A
24. Type of Lower Backfill: N/A

Recorded By	Date	Checked By	Date
[signature]	10/7/99	DK Nicholson	4/26/00

MONITORING WELL COMPLETION FORM

Project No: _____

Drilling Company: Ruen Drilling

Key Number NA

Protective Casing Top (ft ags): 3

Riser Top (Not applied to Flush Mount; ft ags): +2.5'

GROUND SURFACE

Concrete Bottom/Grout Top Depth (ft bgs): _____

Blank Casing Top Depth (Riser Bottom; ft bgs): NA

Protective Casing Depth (ft bgs): 3'

Grout Type: NA

Comments: HSA Refusal @ 14' bgs

Grout Bottom Depth (Seal Top Depth; ft bgs): 0.5

Seal Material: 3/8" Minus Granular Bentonite (Hyarated)

Top of Sand (seal bottom depth; ft bgs): 3'

Blank Casing Bottom (Screen Top; ft bgs): 4.1

Coarse Sand Size: 10/20

Slot Size: 0.010"

Screen Bottom (Foot Top; ft bgs): 14.1

Filter Pack Bottom (ft bgs): 14.0

Borehole Depth (ft bgs): 14.0

Foot/End Cap Bottom (Well Total Depth; ft bgs): 14.0

NOT TO SCALE

Loc ID/Well ID: BP-P31

Geologist: Bill Bragden

Date Construction Started: 9/10/11

Date Construction Completed: 9/10/11

LOC Type (i.e. Monitoring Well): Piezometer

Riser Material/Diameter: /

Blank Casing Material/Diameter: Sch 40 PVC, 2"

Screen Material/Diameter: Sch 40 PVC, 2"

Protective Casing Type: 4" Square Metal

Borehole Diameter: 7"

Above Ground Completion ☒ Flush Mount ☐

USCS Classification of Screened Interval: CL & Weathered Bedrock

MONITORING WELL COMPLETION FORM

Project No: _____

Drilling Company: Ruen Drilling

Key Number NA

3' Protective Casing Top (ft ags)

+2.5 Riser Top (Not applied to Flush Mount; ft ags)

GROUND SURFACE

Concrete Bottom/Grout Top Depth (ft bgs) _____

NA Blank Casing Top Depth (Riser Bottom; ft bgs)

2' Protective Casing Depth (ft bgs)

Grout Type NA

Comments: HSA Refusal @ 15' bgs

Grout Bottom Depth (Seal Top Depth; ft bgs) 0.5'

Seal Material 3/8" Minus Granular Bentonite (Hydrated)

Top of Sand (seal bottom depth; ft bgs) 4.0

5.1 Blank Casing Bottom (Screen Top; ft bgs)

Coarse Sand Size 10/20

0.010" Slot Size

15.1 Screen Bottom (Foot Top; ft bgs)

Filter Pack Bottom (ft bgs) 15.0

Borehole Depth (ft bgs) 15.0

15.0 Foot/End Cap Bottom (Well Total Depth; ft bgs)

NOT TO SCALE

Loc ID/Well ID RD-PZ 2

Geologist Bill Bragden

Date Construction Started 9/10/11

Date Construction Completed 9/10/11

LOC Type (i.e. Monitoring Well) Piezometer

Riser Material/Diameter _____

Blank Casing Material/Diameter Sch 40 PVC 2"

Screen Material/Diameter Sch 40 PVC, 2"

Protective Casing Type 4" Square metal

Borehole Diameter 8"

Above Ground Completion ☒ Flush Mount ☐

USCS Classification of Screened Interval _____

MONITORING WELL COMPLETION FORM

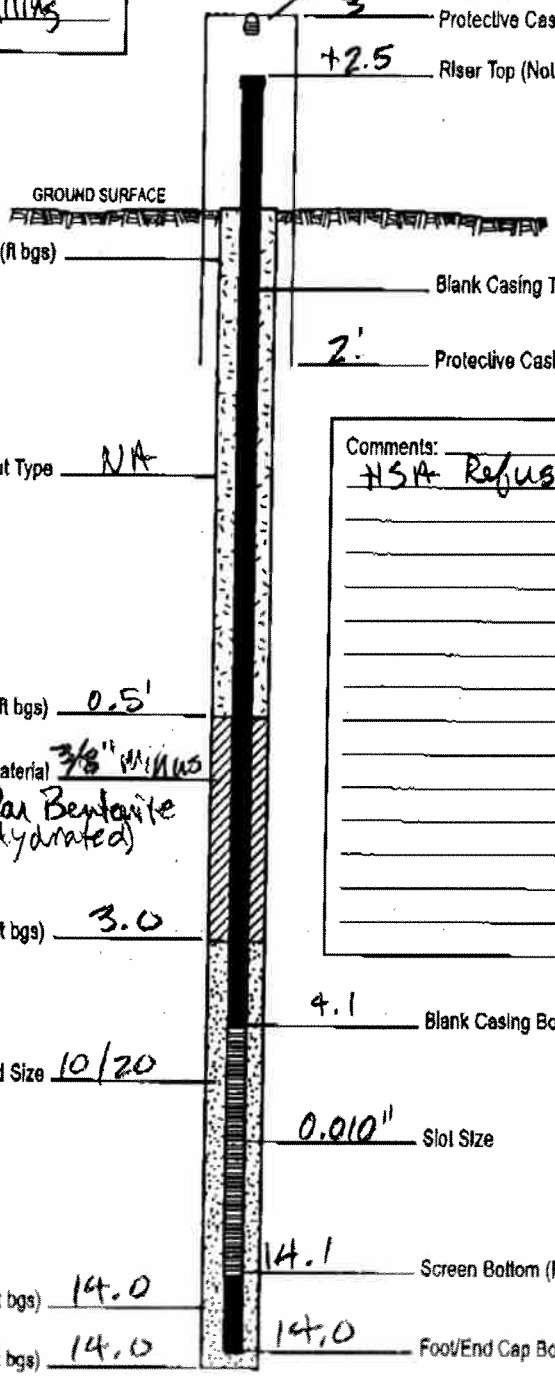
Project No: _____

Drilling Company: Ruen Drilling

Key Number NA

Protective Casing Top (ft ags): 3

Riser Top (Not applied to Flush Mount; ft ags): +2.5



Concrete Bottom/Grout Top Depth (ft bgs): _____

Blank Casing Top Depth (Riser Bottom; ft bgs): _____

Protective Casing Depth (ft bgs): 2'

Grout Type: NA

Grout Bottom Depth (Seal Top Depth; ft bgs): 0.5'

Seal Material: 3/8" Minus Granular Bentonite (Hydrated)

Top of Sand (seal bottom depth; ft bgs): 3.0

Blank Casing Bottom (Screen Top; ft bgs): 4.1

Coarse Sand Size: 10/20

Slot Size: 0.010"

Screen Bottom (Foot Top; ft bgs): 14.1

Filter Pack Bottom (ft bgs): 14.0

Borehole Depth (ft bgs): 14.0

Foot/End Cap Bottom (Well Total Depth; ft bgs): 14.0

Comments: HSA Refusal @ 14' bgs

NOT TO SCALE

Loc ID/Well ID: RP-P33

Geologist: Bill Bragoon

Date Construction Started: 9/10/11

Date Construction Completed: 9/10/11

LOC Type (i.e. Monitoring Well): Piezometer

Riser Material/Diameter: _____

Blank Casing Material/Diameter: Sch 40 PVC, 2"

Screen Material/Diameter: Sch 40 PVC, 2"

Protective Casing Type: 4" Square Metal

Borehole Diameter: 8"

Above Ground Completion [X] Flush Mount [ ]

USCS Classification of Screened Interval: _____

MONITORING WELL COMPLETION FORM

Project No: _____

Drilling Company: Ruen Drilling

Key Number NA

Protective Casing Top (ft ags): 3'

Riser Top (Not applied to Flush Mount; ft ags): +2.5

GROUND SURFACE

Concrete Bottom/Grout Top Depth (ft bgs): _____

Blank Casing Top Depth (Riser Bottom; ft bgs): _____

Protective Casing Depth (ft bgs): 2'

Grout Type: _____

Comments:
HSA Refusal @ ~21' bgs
3/8" Coated Pellets
21 to 17.8
10/20 Silica Sand 17.7 - 17.8

Grout Bottom Depth (Seal Top Depth; ft bgs): 1'

Seal Material: 3/8" Minus Granular Bentonite Hydrated

Top of Sand (seal bottom depth; ft bgs): 6.5'

Blank Casing Bottom (Screen Top; ft bgs): 7.6'

Coarse Sand Size: 10/20

Slot Size: 0.010"

Screen Bottom (Foot Top; ft bgs): 17.6

Filter Pack Bottom (ft bgs): 17.7

Foot/End Cap Bottom (Well Total Depth; ft bgs): 17.7

Borehole Depth (ft bgs): 20'

NOT TO SCALE

Loc ID/Well ID: RP-P34

Geologist: Bill Bragdon

Date Construction Started: 9/11/11

Date Construction Completed: 9/11/11

LOC Type (i.e. Monitoring Well): Piezometer

Riser Material/Diameter: /

Blank Casing Material/Diameter: Sch 40 PVC 2"

Screen Material/Diameter: Sch 40 PVC 2"

Protective Casing Type: 4" Square Metal

Borehole Diameter: 8"

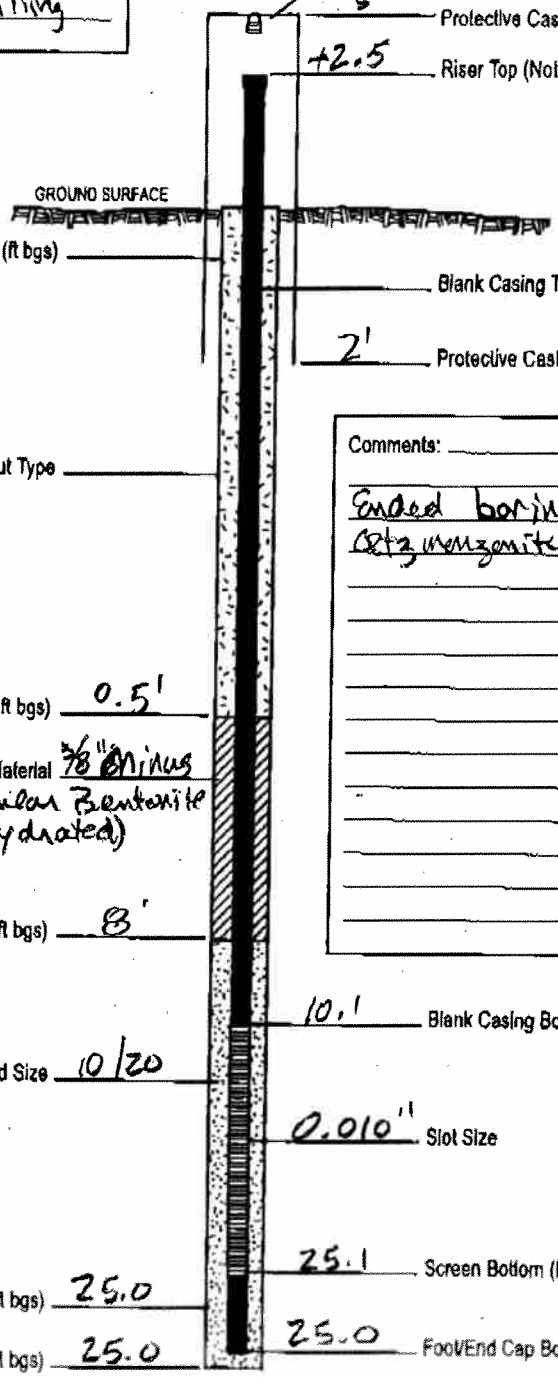
Above Ground Completion ☒ Flush Mount ☐

USCS Classification of Screened Interval: _____

MONITORING WELL COMPLETION FORM

Project No: _____

Drilling Company: Ruen Drilling



Key Number N/A

Protective Casing Top (ft ags)

+2.5 Riser Top (Not applied to Flush Mount; ft ags)

Concrete Bottom/Grout Top Depth (ft bgs)

Blank Casing Top Depth (Riser Bottom; ft bgs)

2' Protective Casing Depth (ft bgs)

Grout Type

Grout Bottom Depth (Seal Top Depth; ft bgs) 0.5'

Seal Material 3/8" Minus Granular Bentonite (Hydrated)

Top of Sand (seal bottom depth; ft bgs) 8'

10.1 Blank Casing Bottom (Screen Top; ft bgs)

Coarse Sand Size 10/20

0.010" Slot Size

25.1 Screen Bottom (Foot Top; ft bgs)

Filter Pack Bottom (ft bgs) 25.0

25.0 Foot/End Cap Bottom (Well Total Depth; ft bgs)

Borehole Depth (ft bgs) 25.0

Comments: Ended boring in decomposed Qtz monzonite bedrock.

NOT TO SCALE

Loc ID/Well ID RP-P35

Geologist Bill Brasdon

Date Construction Started 9/11/11

Date Construction Completed 9/11/11

LOC Type (i.e. Monitoring Well) Piezometer

Riser Material/Diameter /

Blank Casing Material/Diameter sch40 PVC 2"

Screen Material/Diameter sch40 PVC, 2"

Protective Casing Type 4" square metal

Borehole Diameter 8"

Above Ground Completion ☒ Flush Mount ☐

USCS Classification of Screened Interval _____

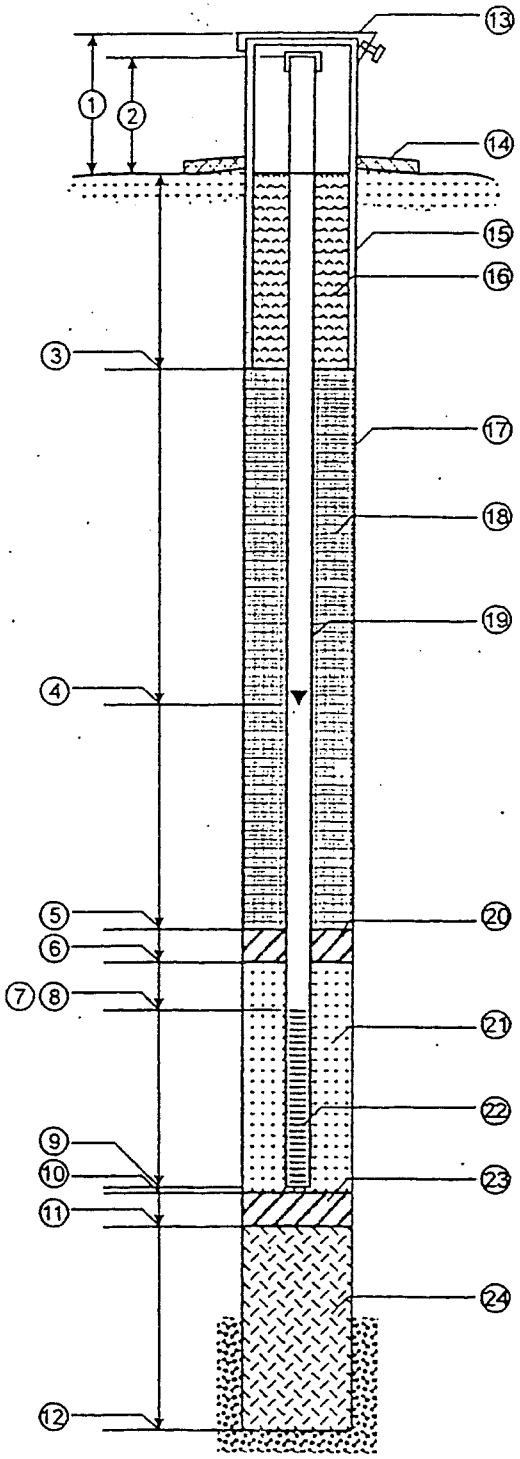
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	10/15/00 - 1000
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
THHD - 01	HILLSIDE DUMP - TOP	10/16/00 - 1200

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRILL - URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2 ft.
4. Depth to Initial Ground Water Surface Elevation: NONE ft.
5. Depth to Top of Top Seal: 2 ft.
6. Depth to Bottom of Top Seal: 72 ft.
7. Depth to Top of Well Point or Screen: 77 ft.
8. Total Length of Blank Casing: 80 ft.
9. Bottom Depth of Well Screen: 97 ft.
10. Depth to Top of Bottom Seal (If Installed): 97 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 99 ft.
12. Depth of Borehole: 99 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PURE GOLD MEDIUM BENTONITE CHIPS AND PURE GOLD GROUT
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD MEDIUM BENTONITE CHIPS
19. Type of Well Casing: PVC SCHED 40 Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD MEDIUM BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: CO SILICA SAND Diameter: 6 in.
22. Type of Screen Material: PVC SCED 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): PURE GOLD MED BENTONITE CHIPS
24. Type of Lower Backfill: PURE GOLD MEDIUM BENTONITE CHIPS

Recorded By	Date	Checked By	Date
CHRIS WILLIAMS	10/16/00	[illegible]	03/15/01

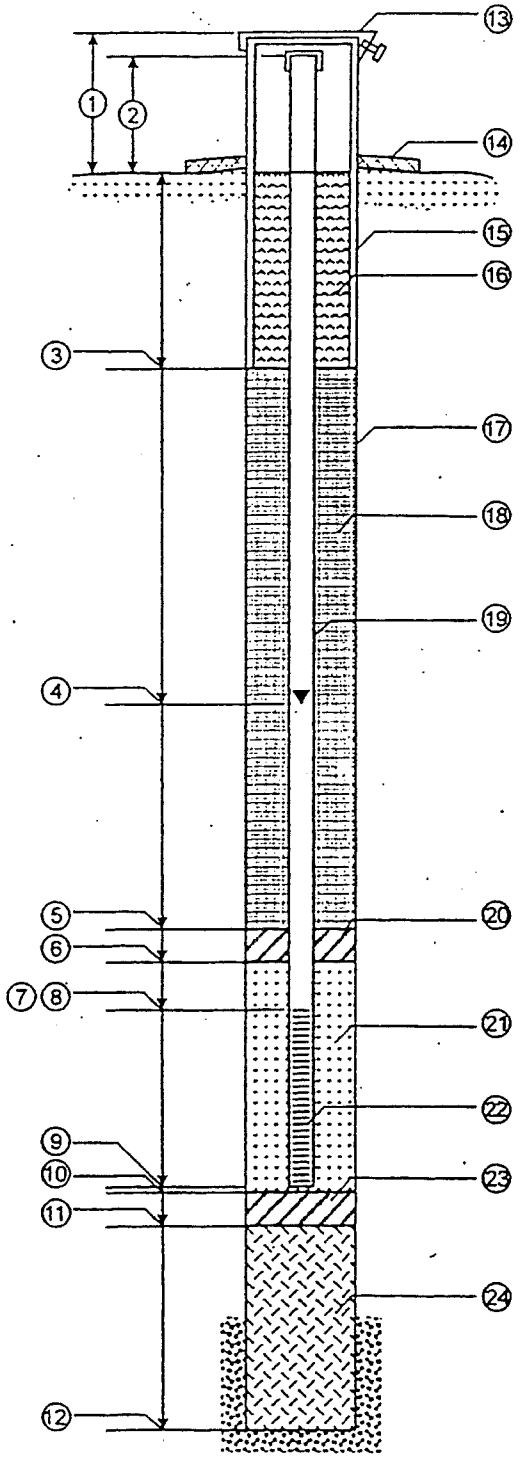
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	10/22/00 - 0730
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
THHD-02	HILLSIDE DUMP - 3RD BENCH CENTER	10/23/00 - 1400

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRLG & URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3.0 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2.0 ft.
4. Depth to Initial Ground Water Surface Elevation: ~99 ft.
5. Depth to Top of Top Seal: 3 ft.
6. Depth to Bottom of Top Seal: 7.5 ft.
7. Depth to Top of Well Point or Screen: 79 ft.
8. Total Length of Blank Casing: ~82 ft.
9. Bottom Depth of Well Screen: 99 ft.
10. Depth to Top of Bottom Seal (If Installed): 99.0 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 100.5 ft.
12. Depth of Borehole: 100.5 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PORTLAND CEMENT TYPE II/III
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD MED BENTONITE CHIPS
19. Type of Well Casing: PVC SCHED 40 Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD MED BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: WASHED PEA GRAVEL Diameter: 6 in.
22. Type of Screen Material: PVC SCHED 40 Slot Size: 0.01 in.
23. Type of Bottom Seal (If Installed): PURE GOLD MED BENTONITE CHIPS
24. Type of Lower Backfill: PURE GOLD MED BENTONITE CHIPS

Recorded By	Date	Checked By	Date
CARRIN WILLIAMS	10/22/00	[illegible]	03/15/01

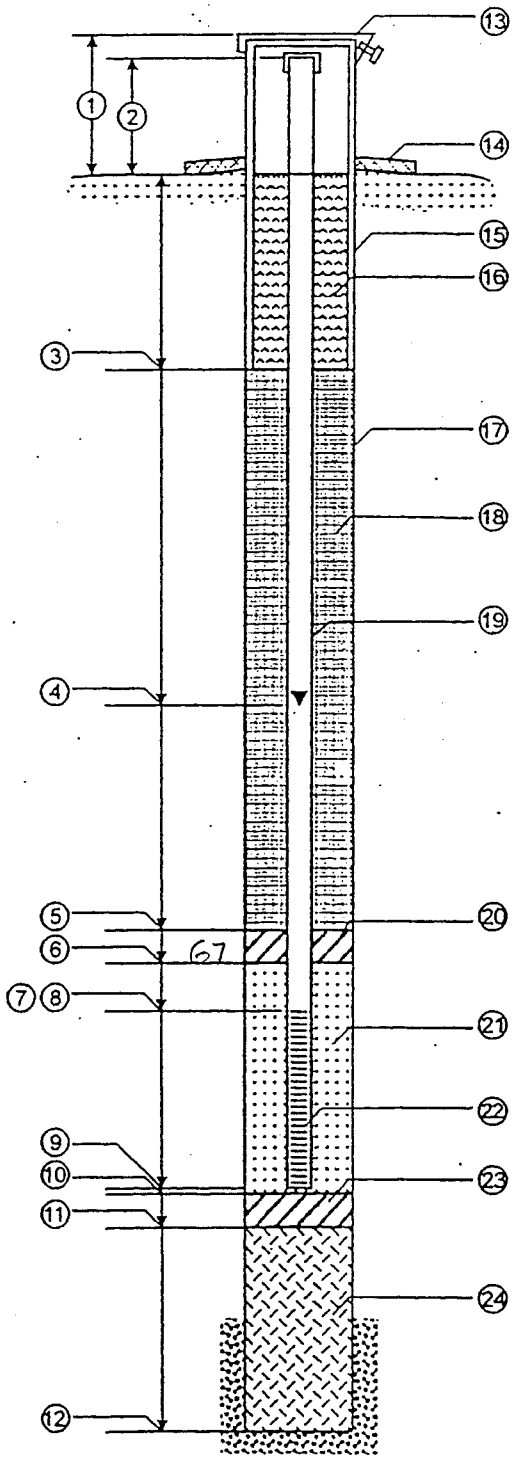
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIONITE MINE	10/16/00 - 1800
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
THHD-03	HILLSIDE DUMP - SOUTH END OF 3RD BENCH DOWN	10/18/00 - 1100

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRLG & URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3.0 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2.0 ft.
4. Depth to Initial Ground Water Surface Elevation: NONE ft.
5. Depth to Top of Top Seal: 3 ft.
6. Depth to Bottom of Top Seal: 67 ft.
7. Depth to Top of Well Point or Screen: 70 ft.
8. Total Length of Blank Casing: 73 ft.
9. Bottom Depth of Well Screen: 90 ft.
10. Depth to Top of Bottom Seal (If Installed): 90 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 102 ft.
12. Depth of Borehole: 102 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PURE GOLD BENTONITE MED CHIPS
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD BENTONITE GROUT & CHIPS
19. Type of Well Casing: PVC SCHED 40, FLUSH THREAD Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE MED CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: PEA GRAVEL Diameter: 6 in.
22. Type of Screen Material: PVC SCHED 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): PURE GOLD BENT MED CHIPS
24. Type of Lower Backfill: PURE GOLD BENTONITE MED CHIPS

Recorded By	Date	Checked By	Date
CHRIS WILLIAMS	10/17/00	[illegible]	03/15/01

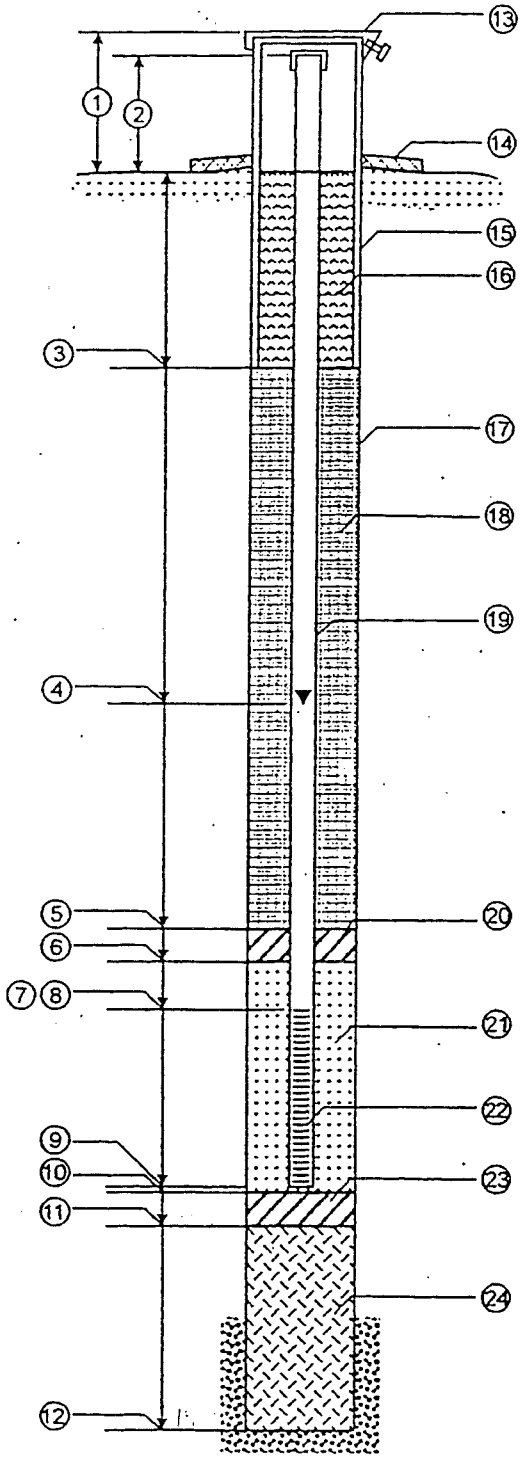
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F400 1800	MIDNITE MINE	10/4/00 - 1030
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
TH 55-01	SOUTH DUMP	10/5/00 - 1400

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRILL & URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2 ft.
4. Depth to Initial Ground Water Surface Elevation: NONE ft.
5. Depth to Top of Top Seal: ~3 ft.
6. Depth to Bottom of Top Seal: 118 ft.
7. Depth to Top of Well Point or Screen: 121 ft.
8. Total Length of Blank Casing: 123.5 ft.
9. Bottom Depth of Well Screen: 141 ft.
10. Depth to Top of Bottom Seal (If Installed): 141 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 147.5 ft.
12. Depth of Borehole: 147.5 ft.
13. Protective Casing: ☐ Yes ☒ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PORTLAND CEMENT TYPE II/III
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD MED BENTONITE CHIPS
19. Type of Well Casing: PVC SCHED 80 Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD MED BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: CSS 10-20 Diameter: 6 in.
22. Type of Screen Material: PVC SCHED 80 Slot Size: 0.01 in.
23. Type of Bottom Seal (If Installed): PURE GOLD MED BENTONITE CHIPS
24. Type of Lower Backfill: PURE GOLD MED BENTONITE CHIPS

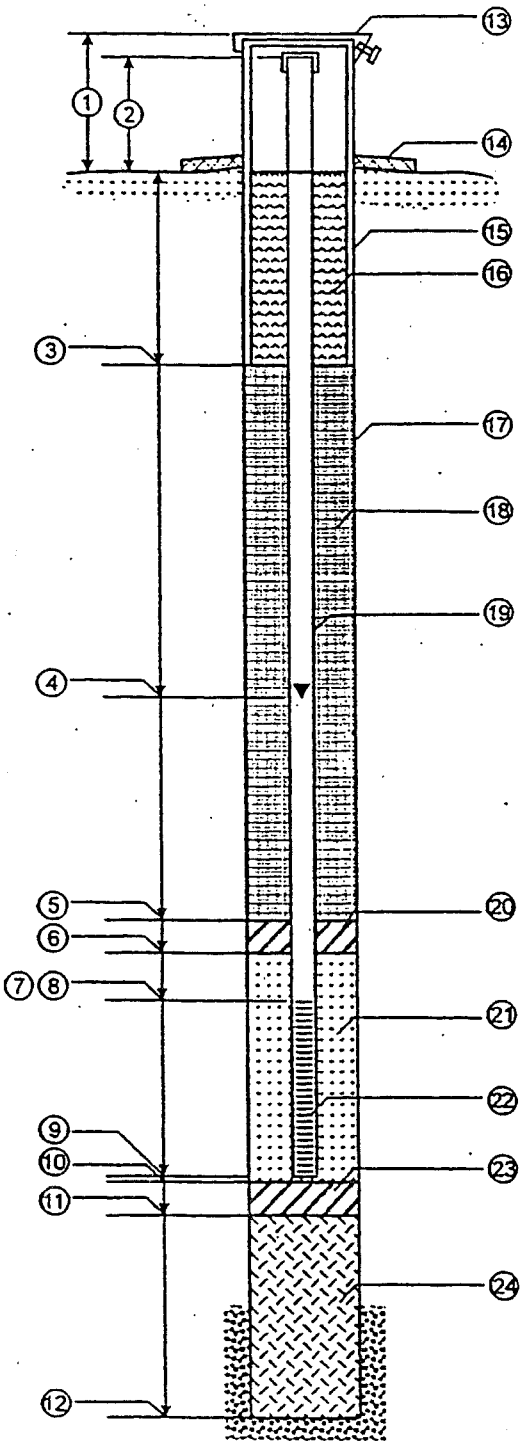
Recorded By	Date	Checked By	Date
CHRIS WILLIAMS	10/5/00	Mark Hart	3/15/01

URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Number: 53F4001800.03	Project Name: Midnite Mine	Date/Time Started: 10/25/00 0800
Well/Borehole Number: TMSS-02	Well/Borehole Location: South Spoils - above PCP	Date/Time Completed: 10/27/00
Installation Team: Great West Drilling	Type of Drilling: Becker Hammer	Ground Surface Elev. ft.msl / Top of Well Casing Elev. ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: 0.5 ft.
2. Stick-Up Well Casing Above Ground: ____ ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ____ ft.
4. Depth to Initial Ground Water Surface Elevation: 4.0 ft.
5. Depth to Top of Top Seal: 4.0 ft.
6. Depth to Bottom of Top Seal: 60 ft.
7. Depth to Top of Well Point or Screen: 64 ft.
8. Total Length of Blank Casing: ____ ft.
9. Bottom Depth of Well Screen: 84 ft.
10. Depth to Top of Bottom Seal (If Installed): 88 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 92 ft.
12. Depth of Borehole: 92 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☐ Yes ☒ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: steel Diameter: 4 in.
16. Type of Upper Seal: Pure Gold Med Bentonite Chips
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: —
19. Type of Well Casing: PVC Schd 40 Diameter: 1 in.
20. Type of Top Seal (IF Installed): —
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: Washed Pea Gravel Diameter: 3/8 in.
22. Type of Screen Material: PVC Scd 40 Slot Size: 0.01 in.
23. Type of Bottom Seal (If Installed): Pure Gold Med Bentonite Chips
24. Type of Lower Backfill: Pure Gold Med Bentonite Chips

Recorded By	Date	Checked By	Date
DK Nicholson	10/27/00	David K Nicholson	11/13/01

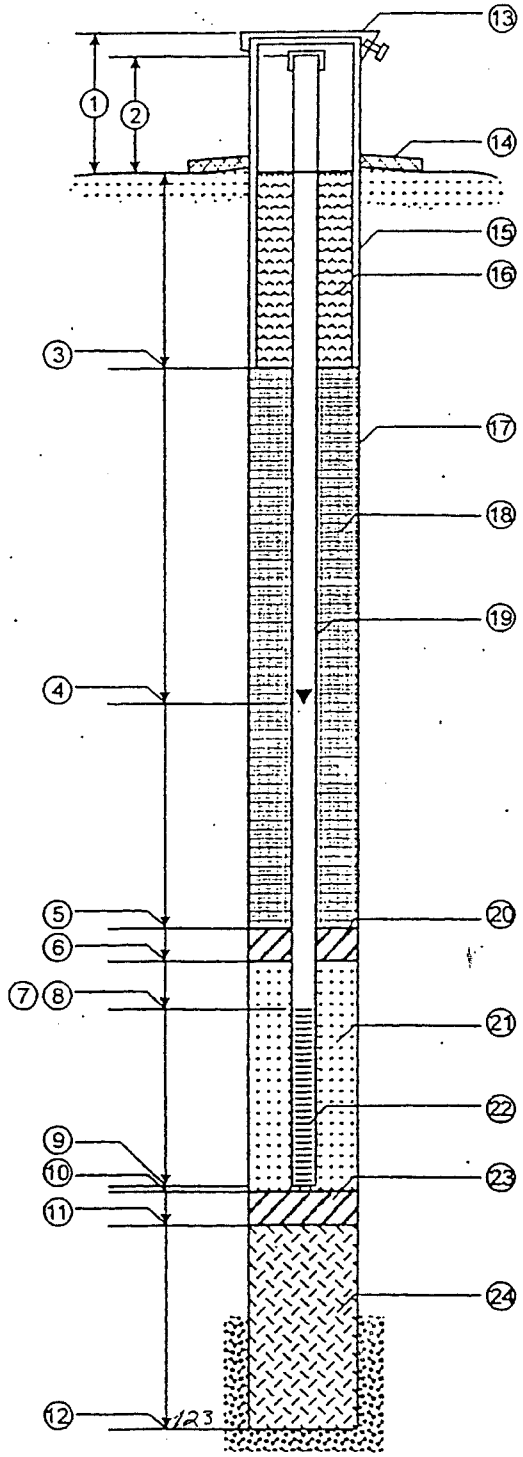
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE - GEOTECH PROGRAM	10/10/00 - 1530
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
TH55-03	SOUTH DUMP	10/12/00 - 0900

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRLG & URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3.0 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2.0 ft.
4. Depth to Initial Ground Water Surface Elevation: NA ft.
5. Depth to Top of Top Seal: 68 ft.
6. Depth to Bottom of Top Seal: 88 ft.
7. Depth to Top of Well Point or Screen: 91 ft.
8. Total Length of Blank Casing: ~93.5 ft.
9. Bottom Depth of Well Screen: 111 ft.
10. Depth to Top of Bottom Seal (If Installed): 111 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 123 ft.
12. Depth of Borehole: 123 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PURE GOLD MEDIUM BENTONITE CHIPS
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD BENTONITE GROUT & MED CHIPS
19. Type of Well Casing: PVC SCHED 80 Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD BENTONITE MED CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10-20 SILICA SAND Diameter: 1 in.
22. Type of Screen Material: PVC SCHED 80 Slot Size: 0.01 in.
23. Type of Bottom Seal (If Installed): PURE GOLD MED BENTONITE CHIPS
24. Type of Lower Backfill: PURE GOLD MEDIUM BENTONITE CHIPS 4.5 BAGS (LOST PART OF HOLE TO CAVING)

Recorded By	Date	Checked By	Date
CHRIS WILLIAMS	10/12/00	[illegible]	03/15/01

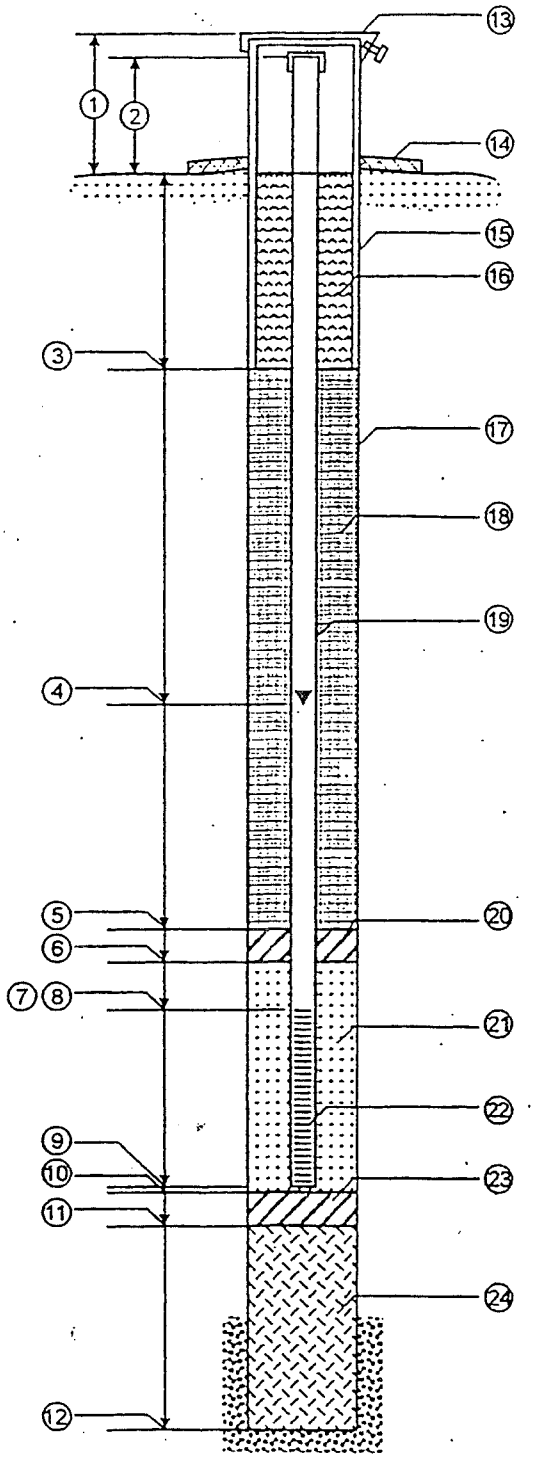
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F40.01800.03	Mionite Mine	10/23/00 - 1400
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
THSS - 04	South Spoils - Lower Bench Middle	10/24/00 - 1700

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
Great West Drlg	Becker Hammer	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2 ft.
4. Depth to Initial Ground Water Surface Elevation: None ft.
5. Depth to Top of Top Seal: 5 ft.
6. Depth to Bottom of Top Seal: 67 ft.
7. Depth to Top of Well Point or Screen: 69 ft.
8. Total Length of Blank Casing: ~91.5 ft.
9. Bottom Depth of Well Screen: 89 ft.
10. Depth to Top of Bottom Seal (If Installed): 89 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 101.5 ft.
12. Depth of Borehole: 101.5 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: Steel Diameter: 5 in.
16. Type of Upper Seal: Portland Cement Type II/III
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: Pure Gold Med Bentonite Chips & Grout
19. Type of Well Casing: PVC Sched 40 Diameter: 1 in.
20. Type of Top Seal (IF Installed): Pure Gold Bentonite Med Chips
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: CSS 10-20 Diameter: 6 in.
22. Type of Screen Material: PVC Sched 80 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): Pure Gold Med Bentonite Chips
24. Type of Lower Backfill: Pure Gold Med Bentonite Chips

Recorded By	Date	Checked By	Date
Chris Williams	10/24/00	[illegible]	03/15/01

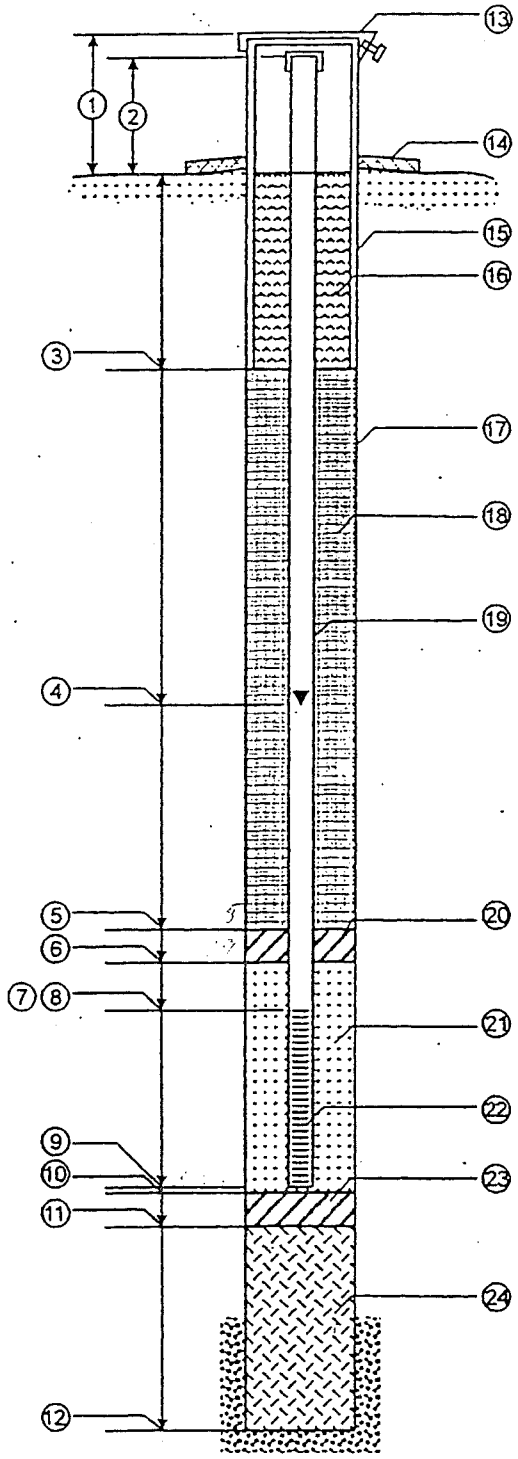
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIONITE MINE RI	10/9/00 0930
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
THSS-05		10/10/00 01430

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRILL & URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3 ft.
2. Stick-Up Well Casing Above Ground: ~2.5 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2 ft.
4. Depth to Initial Ground Water Surface Elevation: NONE ft.
5. Depth to Top of Top Seal: 85 ft.
6. Depth to Bottom of Top Seal: 99 ft.
7. Depth to Top of Well Point or Screen: 99 ft.
8. Total Length of Blank Casing: ~102 ft.
9. Bottom Depth of Well Screen: 123 ft.
10. Depth to Top of Bottom Seal (If Installed): 123 ft.
11. Depth to Bottom of Bottom Seal (If Installed): 144 ft.
12. Depth of Borehole: 144 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PORTLAND CEMENT TYPE II/III
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD BENTONITE GROUT & CHIPS
19. Type of Well Casing: PVC SCHED 40 Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD MED BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10-20 SIL SAND Diameter: 1 in.
22. Type of Screen Material: SCHED 40 PVC Slot Size: .1 in.
23. Type of Bottom Seal (If Installed): PURE GOLD MED BENTONITE CHIPS
24. Type of Lower Backfill: PURE GOLD MEDIUM BENTONITE CHIPS

Recorded By	Date	Checked By	Date
CHRIS WILLIAMS	10/10/00	Hugh Hall	03/15/01

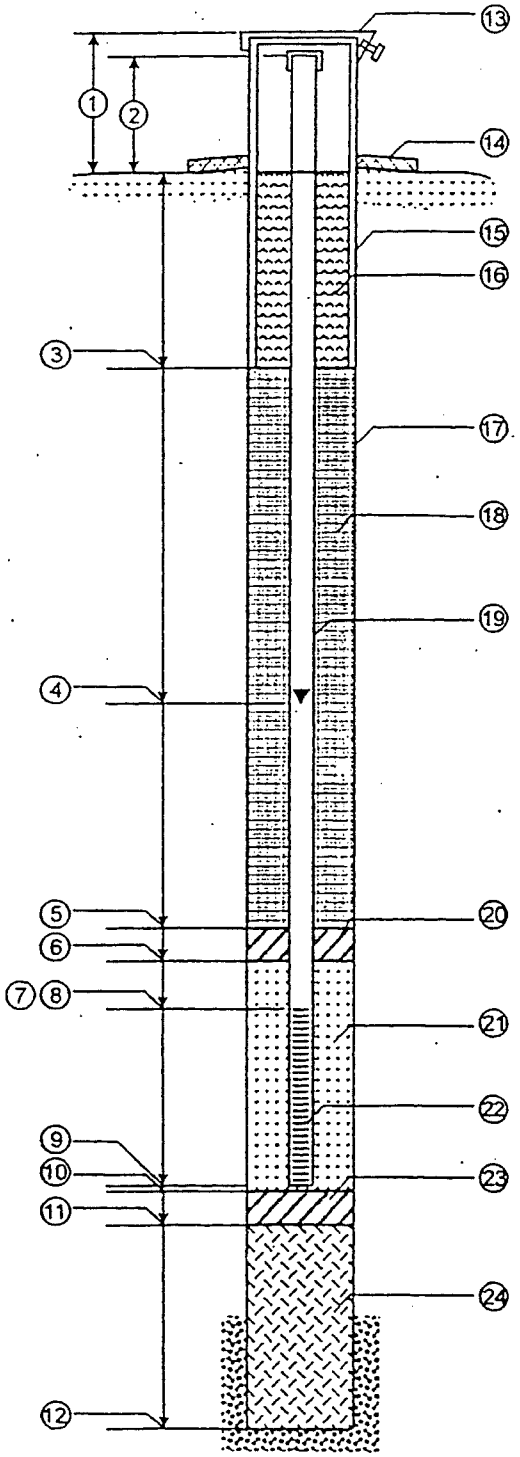
URS Greiner Woodward-Clyde

Monitoring Well Installation Log

Records Management Data

Project Number	Project Name	Date/Time Started
53F4001800.03	MIDNITE MINE	10/12/00 - 1230
Well/Borehole Number	**Well/Borehole Location**	**Date/Time Completed**
THSS-06	SOUTH DUMP - MIDDLE BENCH	10/14/00 - 1800

Installation Team	Type of Drilling	Ground Surface Elev.	Top of Well Casing Elev.
GREAT WEST DRILL - URS	BECKER HAMMER	ft.msl	ft.msl



1. Stick-Up of Protective Casing (If Any) Above Ground: ~3 ft.
2. Stick-Up Well Casing Above Ground: 2.8 ft.
3. Depth to Bottom of Upper Seal/Protective Casing: ~2 ft.
4. Depth to Initial Ground Water Surface Elevation: NONE ft.
5. Depth to Top of Top Seal: 3 ft.
6. Depth to Bottom of Top Seal: 3 ft.
7. Depth to Top of Well Point or Screen: 57 ft.
8. Total Length of Blank Casing: 59.8 ft.
9. Bottom Depth of Well Screen: 77 ft.
10. Depth to Top of Bottom Seal (If Installed): NA ft.
11. Depth to Bottom of Bottom Seal (If Installed): NA ft.
12. Depth of Borehole: 77 ft.
13. Protective Casing: ☒ Yes ☐ No Locking Cap: ☒ Yes ☐ No
14. Sanitary Seal: ☒ Yes ☐ No
15. Type of Protective Casing: STEEL Diameter: 5 in.
16. Type of Upper Seal: PORTLAND CEMENT TYPE II/III
17. Borehole Diameter: 6 in.
18. Type of Upper Backfill: PURE GOLD MEDIUM BENTONITE CHIPS AND PURE GOLD GROUT
19. Type of Well Casing: PVC SCHED 80 Diameter: 1 in.
20. Type of Top Seal (IF Installed): PURE GOLD MED BENTONITE CHIPS
21. Type/Size of Gravel/Sand Pack Around Well Point or Screen: 10-20 SILICA SAND Diameter: 6 in.
22. Type of Screen Material: PVC SCHED 40 Slot Size: 0.010 in.
23. Type of Bottom Seal (If Installed): NONE
24. Type of Lower Backfill: NONE

Recorded By	Date	Checked By	Date
CHRIS WILLIAMS	10/14/00	Mick Hart	03/15/01

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WD-B1

CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DRILLING DATE 8/28/2011 **COMPLETION DATE** 8/28/2011 **LOGGED BY** Bill Bragdon

DRILL METHOD HSA / Core **BOREHOLE DIAMETER** HSA 8 inch, 0 to 20.25 feet; Core 2.5 inch, 20.25 to EOB **DRILLING COMPANY** Ruen Drilliing

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture	Piezometer Completion
0.0	SS	3 7 7	87	NA	NA	NA	Silty clay to about 3 feet. Silty clay, dark yellowish brown (10YR 4/4), grades to very pale brown (10YR 7/3) at 0.8 feet with some medium sand, subangular, low plasticity, soft to medium stiff, dry, abundant roots and organics, organic odor.			+2.5; Bentonite seal; 2 inch sch. 40 PVC
2.5	SS	7 7 8	87	NA	NA	NA	Weathered quartz monzonite from about 3 to 20.5 feet bgs. As above at 0.8 feet with some coarse gravel-size decomposed quartz monzonite, increase in fine to coarse sand, low to medium placticity, dry.			
5.0	SS	7 6 7	100	NA	NA	NA	Silty clayey fine- to coarse-grained sand, light yellowish brown (10YR 6/4), low to medium placticity, medium stiff, slightly moist, decomposed size quartz monzonite, trace FeOx.			
7.5	SS	3 4 4	93	NA	NA	NA	Clayey fine- to medium-grained sand, yellowish brown (10YR 5/8), medium plasticity, soft, slightly moist. Decomposed quartz monzonite with feldspar up + 1/2, some FeOx locally.			
10.0							.			

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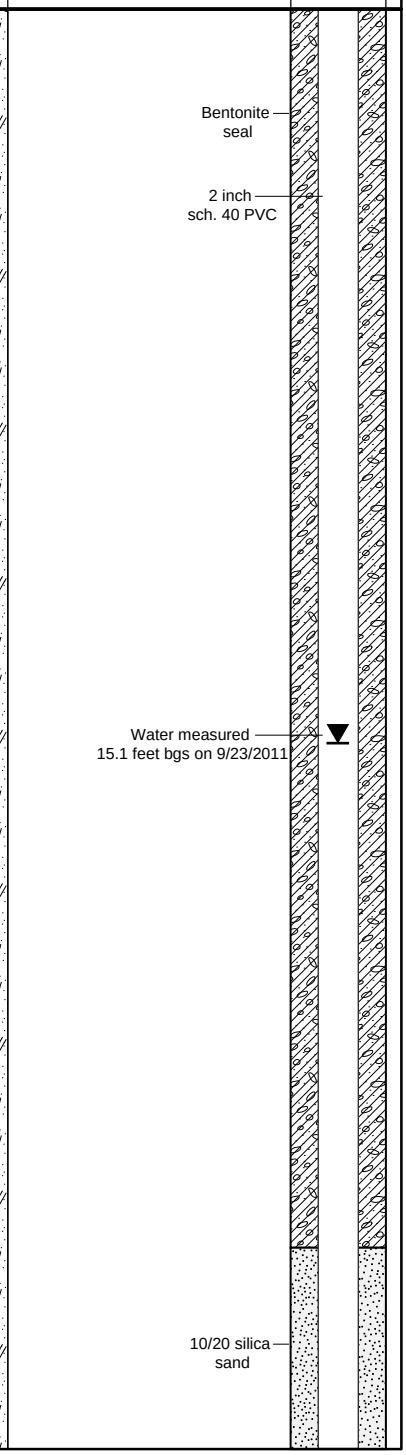
CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION
10.0	SS	5 6 6	100	NA	NA	NA	As above at 7.5 feet with feldspar crystals up to 1/2 inch, no FeOx, grades to medium stiff.
12.5	SS	5 5 5	100	NA	NA	NA	Clayey fine- to medium-grained sand, yellowish brown (10YR 5/8) grading to brown (7.5YR 5/4) at 13 feet, medium placticity, medium stiff, slightly moist ot moist, trace FeOx locally.
15.0	SS	28 50	100	NA	9	NA	Fine- to medium-grained decomposed (W9) quartz monzonite, brown (10YR 5/3), with FeOx of dark reddish brown (5YR 3/3), trace argillic alteration. Feldspar up to 1/2 inch, slightly moist to moist. 50 blows for 2 inches.
17.5	SS	50	100	NA	9	NA	As above at 15 feet, grading to wet. 50 blows for 4.5 inches.
20.0							

GRAPHIC LOG



Piezometer Completion

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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture	Piezometer Completion
20.0	SS						Practical HSA refusal. Switched to HQ 2.5 inch core.			
	HQ Core						Quartz monzonite from about 20.5 feet to EOB.			
			17	0	9	5 to 6	0.5 feet of recovery of coarse gravel, rubble of fine to coarse quartz monzonite, few coarse gravels, greenish gray (10GY 6/1) and reddish yellow (7.5YR 6/8), strong argillic alteration, decomposed (W9), moderately soft to soft (H5 to H6).		No Recovery (material likely removed during drilling by circulation water.).	
22.5									0.5 feet drilling-induced rubble.	
			0	0	NA	NA	No recovery.		No Recovery (material likely removed during drilling by circulation water.).	
25.0										
					9	6	Coarse-grained sand to coarse gravel size fragments of decomposed (W9) quartz monzonite, feldspar and quartz crystals, trace argillic coating on fragments.		Argillic (clay) and strong FeOx.	
27.5			94	74	9	3	Fine- to coarse-grained quartz monzonite, very intensely weathered (W8) to decomposed (W9), generally moderately soft (H5), FeOx and argillic alteration, some FeOx in healed fractures; 29 to 30 feet, grades to slightly weathered to fresh (W2) and moderately hard (H4) feldspar to 1 inch.		0º 0º 5º 5º 90º 90º 90º 0º healed 30º healed microfractures weak FeOx. 80º 5º 5º fine to medium sand, soft rubble, weak FeOx, moderate argillic. 70º 80º	
					2	4				
30.0									50º	

10/20 silica sand
2 inch sch. 40 PVC
0.010 slot size
V-wire (installed at 24.5 feet (27 feet btoc) on 11/3/2011)

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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

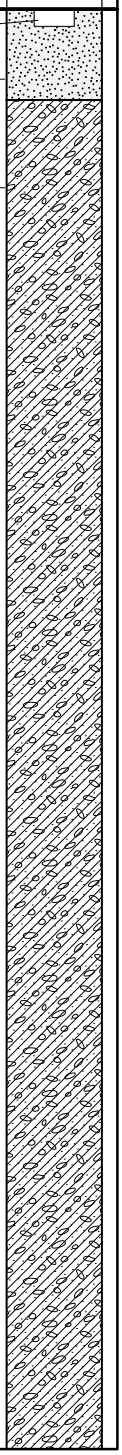
DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION
30.0							
	HQ Core		100	100	2	3	Grades to greenish gray (10GY 5/1) and light reddish brown (2.5YR 7/4), hard (H3) and slightly weathered (W2).
32.5							
			92	92	2	3	Grades to slightly weathered (W2) and hard (H3) with FeOx and trace argillic along fractures.
35.0							
37.5			100	100	2	3	Fine- to coarse-grained quartz monzonite with feldspar up to 1.5 inch, generally light reddish brown (2.5YR 7/4) and greenish gray (10GY 5/1), slightly weathered (W2) to fresh, hard (H3), no FeOx, trace thin argillic clay along fractures at 39.7 feet with trace of manganese.
40.0							

GRAPHIC LOG

Fracture

50º
80º with 0.1 to 0.2 inch argillic filling, trace manganese.
20º
80º
30º
60º
60º feldspar with healed fractures, weak FeOx, argillic.
40º
80º
85º sandy gravel.
10º
10º
30º
80º few healed fractures.
70º
10º trace argillic.
70º trace manganese.

Piezometer Completion



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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture	Piezometer Completion
40.0										
42.5	HQ Core		92	86	2	3	Quartz monzonite as above at 35 feet.		3/8-inch coated Bentonite pellets; 40º fractured to rubble, some manganese, no FeOx.; 40º; 80º healed fracture.; 50º; 0º; 0º; 80º; 80º	
45.0			96	96	2	2	Fine- to coarse-grained quartz monzonite, generally light reddish brown (2.5YR 7/4) and greenish gray (10GY 5/1) with feldspar up to 1 inch, trace argillic coating locally along fractures, slightly weathered to fresh (W2), very hard (H2).		20º; 40º; 80º; 30º argillic coating.	
47.5							Grades to hard (H3), horizontal fractures from about 47.5 to 50 feet.		20º; 90º; 80º; 80º; 90º; 90º; 30º with sandy filling 0.2. inch.	
50.0										

End of borehole at 50.0 feet.

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WD-B3

CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DRILLING DATE 9/8/2011 **COMPLETION DATE** 9/8/2011 **LOGGED BY** Bill Bragdon

DRILL METHOD HSA / Core **BOREHOLE DIAMETER** HSA 8 inch, 0 to 5 feet; Core 2.5 inch, 5 to EOB **DRILLING COMPANY** Ruen Drilliing

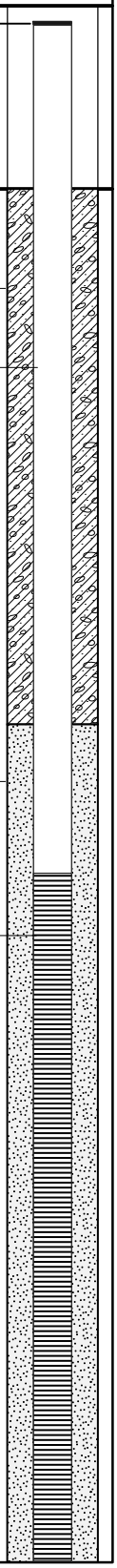
DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION
0.0	SS	20 50 50	100	NA	NA	NA	Sandy silt to about 2 feet. Fine to sandy silt (ML), pale brown (10YR 6/3), low plasticity, soft, dry. Quartz monzonite boulder, angular fragments.
2.5	SS	35 50	100	NA	NA	NA	Quartz monzonite from approximately 2 feet to EOB. Soft drilling 2 to 2.5 feet. Decomposed quartz monzonite, angular fragments, fine to medium-grained rock flour. 50 blows for 2 inches.
	SS	50	100	NA	NA	NA	Practical HSA refusal. 50 blows for 1 inch. Switched to HQ core.
5.0	HQ Core		100	100	3	3	Fine- to medium-grained quartz monzonite, light gray (2.5Y 7/2) and light grayish brown 2.5Y 7/3), slightly weathered (W3), hard (H3).
7.5					4	6 to 7	Grades to soft (H6) to very soft (H7) where argillic, moderately to slightly weathered (W4).
10.0							

GRAPHIC LOG

Fracture

70º
70º
70º
70º
70º
30º
70º
30º
0º
70º
70º
70º
70º
0º
Argillic alteration.
70º

Well Description



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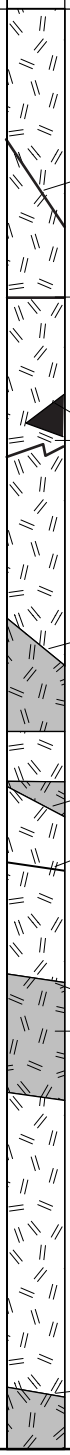
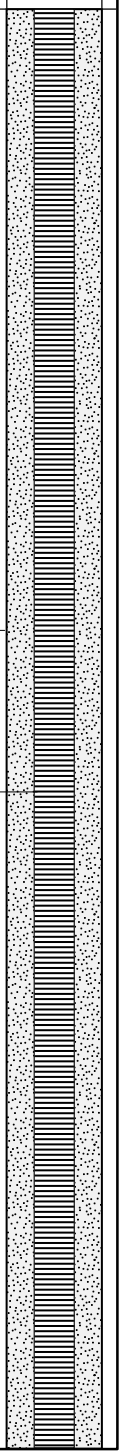
CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture	Well Description
10.0										
12.5	HQ Core		100	100	4	7	Fine- to medium-grained quartz monzonite, light gray (2.5Y 7/2), very soft (H7) and slightly weathered (W4).		60º FeOx. 0º 20º 0º FeOx. 40º	10/20 silica sand
15.0									30º argillic and FeOx. 8º	0.010 slot size
17.5			100	100	8	6	Grades to yellowish brown (10YR 6/8), strong argillic alteration, very intensely weathered (W8) and soft (H6).		8º Strong argillic and FeOx. 10º Strong argillic and FeOx.	
20.0										





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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

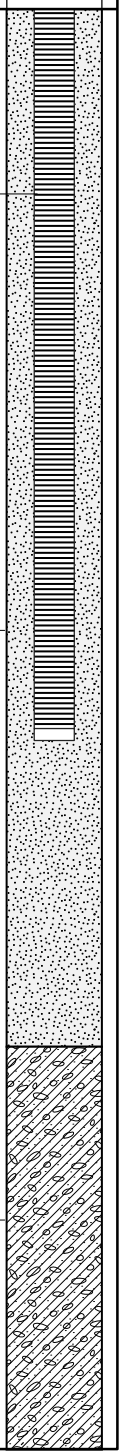
DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION
20.0							
22.5	HQ Core		92	92	7 to 9	6	Fine- to medium-grained quartz monzonite, generally pale yellow (2.5Y 8/4) with FeOx and argillic throughout. Locally very strong FeOx and argillic, generally soft (H6), intensely weathered (W7) to decomposed (W9) locally.
25.0							
27.5			100	100	5	4	Fine- to medium-grained quartz monzonite, moderately hard (H4), moderately weathered (W5), generally pale yellow (2.5Y 8/4). Grades to intensely weathered (W7) at 27 feet; grades to fine to coarse grained at 29 feet, grades to light olive brown (2.5Y 6/4).
30.0							

GRAPHIC LOG

Fracture

- Strong argillic and FeOx.
- 10º
- 10º strong argillic and FeOx.
- 10º
- 10º healed fractures with FeOx.
- 70º
- 70º
- 70º
- 70º
- 70º
- 60º
- 60º
- 70º
- 50º very fractured to 0.2 inch, fine sand and FeOx filling.
- 40º trace argillic.
- Strong FeOx.
- 50º
- 50º trace FeOx.
- 50º
- 85º trace argillic.

Well Description



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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	Fracture
30.0								
	HQ Core		96	96	5	5	Grades to moderately soft (H5).	40º with FeOx and trace of manganese. With FeOx. 3/8-inch coated Bentonite pellets
32.5								
							Argillic alteration is pale yellow (2.5Y 8/2).	40º with argillic alteration and fine to medium sand. 20º with strong argillic and FeOx. 40º with healed fractures and FeOx.
35.0								
			100	100	3	3	Grades to medium- to very coarse-grained quartz monzonite with feldpars up to 1.5 inch, generally 1/2 to 1 inch, slightly weathered (W3), hard (H3).	20º some argillic alteration of feldspar. 20º 70º healed with trace FeOx. 60º with strong FeOx. 60º with trace FeOx. 60º 60º with trace fine sand and weak FeOx. 70º
37.5								
							Quartz monzonite, grading to moderately hard.	80º with trace FeOx. 80º
40.0								

End of borehole at 40.0 feet.

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WD-B5

CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DRILLING DATE 8/26/2011 **COMPLETION DATE** 8/26/2011 **LOGGED BY** Bill Bragdon

DRILL METHOD HSA / Core **BOREHOLE DIAMETER** HSA 8 inch, 0 to 12.5 feet; Core 2.5 inch, 12.5 to EOB **DRILLING COMPANY** Ruen Drilliing

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture	Piezometer Completion
0.0	SS	10 8 5	80	NA	NA	NA	Silty gravel to about 2.5 feet. Silty fine gravel (GM) with some fine- to coarse-grained sand, pale yellowish (2.5Y 8/2), subangular to angular, non plastic, loose, dry, trace quartz crystals and mica.			+2.5 Bentonite seal 2 inch sch. 40 PVC
2.5							Clayey sand approximately 2.5 feet to approximately 6 feet.			
	SS	4 4 6	100	NA	NA	NA	Clayey fine- to medium-grained sand (SC), dark reddish brown (5Y3/2), subangular, low to medium plasticity, medium stiff, slightly moist, decrease in clay at 3.7 feet bgs, low plasticity.			
5.0										
	SS	4 2 2	100	NA	NA	NA	Clayey fine- to medium-grained sand (SC) with trace silt, few coarse gravels. Dark reddish brown (5Y 3/2), low to medium plasticity, medium stiff, slightly moist.			
							Silty clay approximately 6 feet to approximately 7.5 feet. Silty clay with trace to fine- to medium-grained sand (CL), very dark gray (5YR 3/1), medium plasticity, soft, moist to wet, few organic (roots), organic odor (weak). At 7.8 feet decomposed (W9) BR.			
7.5										
	CA	3 8	100	NA	NA	NA	Clayey sand approximately 7.5 feet to approximately 9 feet. Clayey fine- to coarse-grained sand (SC), very dark gray to black (5YR 2.5/1), medium plasticity, soft to medium stiff, wet, abundant roots, strong organic odor. Collected "A" and "B" brass liners.			Water measured 8.2 feet bgs on 9/23/2011 10/20 silica sand
	SS	2 1 1	100	NA	NA	NA	Sandy silt approximately 9 feet to approximately 10.5 feet. Fine- to medium-grained sandy silt (ML), brown (7.5YR 5/3), low plasticity, very soft, wet, organics (roots).			
10.0										

(Continued Next Page)

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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture	Piezometer Completion
10.0	CA	5 5	100	NA	NA	NA	Silty sand, approximately 10.5 feet to approximately 12.5 feet. Grades to silty fine- to coarse-grained sand (SM), brown (7.5YR 5/3), cobble at contact between ML and SM, low plasticity, medium stiff, wet. Brass liners not collected.		10/20 silica sand	2 inch sch. 40 PVC; 0.010 slot size
12.5	SS	3 5 7	100				As above with intensely weathered bedrock fragments of quartz monzonite, light red (2.5YR 7/8) and greenish black (5GY 2.5/1).			
	HQ Core		53	0	9	4	Switched to HQ core, competent bedrock. Quartz monzonite approximately 12.5 feet to approximately 30 feet. Decomposed (W9) fine-grained quartz monzonite with biotite and quartz crystals, light greenish gray (5GY 8/1) and pale red (10 R 7/4), moderately hard (H4), FeOx.		No Recovery (material likely removed during drilling by circulation water). 40º; Drilling induced rubble. 50º	
15.0									No Recovery (material likely removed during drilling by circulation water).	
17.5			28	NA	9	NA	Gravel fine-grained quartz monzonite as above. Decomposed (W9), quartz monzonite being removed as cuttings in circulation water.		Drilling induced rubble.	V-wire (installed at 16.5 feet (19 feet btoc) on 11/3/2011)
			0	0	NA	NA	No recovery.		No Recovery (material likely removed during drilling by circulation water).	
			75	0	3	4	Fine-grained quartz monzonite rubble.		Drilling induced rubble.	
20.0			0	0	NA	NA	No recovery		No Recovery (as above).	

(Continued Next Page)

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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	Fracture
20.0								
	HQ Core		66	0	9	4	Rubble recovery of 1.3 feet of decomposed (W9), moderately hard (H4), fine- to medium-grained quartz monzonite, brown (7.5YR 4/3).	No Recovery (material likely removed during drilling by circulation water). Drilling induced rubble.
			20	0	6	4	3 pieces of coarse gravel size quartz monzonite.	No Recovery (material likely removed during drilling by circulation water). Drilling induced rubble.
22.5								No Recovery (as above). Drilling induced rubble.
			100	60	6	4	Medium- to coarse-grained quartz monzonite, light reddish brown (5YR 6/3) and dark greenish gray (10GY 6/1), intensely to medium weathered (W6), moderate hard (H4).	80º; 50º; 40º highly fractured.
25.0								
			30	60	NA	NA	Quartz monzonite as above at 23 feet.	80º; 10º; 20º; 85º; 70º; 10º
27.5								
			100	37	4	4	Fine- to coarse-grained quartz monzonite as above at 23 feet.	0º with argillic alteration and trace FeOx.; 60º; 60º few vugs.; 5º; 0º; 10º
30.0								

GRAPHIC LOG

Piezometer Completion: 10/20 silica sand; 2 inch PVC cap; 3/8-inch coated Bentonite pellets

(Continued Next Page)

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CLIENT Newmont **PROJECT NAME** Storage Pond Investigation - 2011

DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture		Piezometer Completion
30.0											
	HQ Core		100	33	3	2	Fine- to medium-grained dacite (?) dike, bluish gray (10B 6/1) with abundant biotite and quartz crystals, very hard (H2), slightly weathered (W3).		0º contact. 30º rubble with weak FeOx on top. 80º 0º contact.		
							Quartz monzonite, approximately 32 feet to EOB.				
32.5									90º very fractured.		
			100	66	6	4	Medium- to coarse-grained quartz monzonite, light reddish brown (5YR 6/3) and dark greenish gray (10GY 6/1), intensely to medium weathered (W6), moderate hard (H4).		30º 40º 60º mechanical fractures. 30º	3/8-inch coated Bentonite pellets	
35.0											
			97	65	2	2	Fine- to medium-grained quartz monzonite, trace argillic clay along fractures, slightly weathered to fresh (W2), very hard (H2), fractures with no FeOx, light reddish brown (5YR 6/3) with dark greenish gray (10GY 6/1).		10º 10º 60º 0º trace argillic. 70º 5º 80º 80º 80º 80º 70º 5º No Recovery (material likely removed during drilling by circulation water).		
37.5											
40.0											

(Continued Next Page)

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DEPTH (ft)	Sample Method	Blow Counts	% Sample Recovery	% RQD	Weathering	Strength	MATERIAL DESCRIPTION	GRAPHIC LOG	Fracture		Piezometer Completion
40.0											
	HQ Core			NA	1	2	Medium- to coarse-grained quartz monzonite as above at 35 feet, fresh (W1), very hard (H2) to hard (H3).			3/8-inch coated Bentonite pellets	

End of borehole at 41.5 feet.

Midnite Mine Superfund Site
100 Percent Design

Appendix AA – Temporary Power Distribution and Submersible Dewatering Pump Controls

June 2015

Prepared for:

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TABLE

Table AA-1 – Existing and Temporary Power and Submersible Dewatering Pump Controls – Engineering Design Drawings 2

ATTACHMENT

Attachment AA-1 Power Line Design Criteria

LIST OF ACRONYMS

BODR	Basis of Design Report
CD	Consent Decree
CSZ	Construction Support Zone
EPA	Environmental Protection Agency
gpm	gallons per minute
GSR	green and sustainable remediation
NPDES	National Pollutant Discharge Elimination System
P&ID	process and instrumentation diagram
PS	Performance Standard
RA	Remedial Action
RD	Remedial Design
Site	Midnite Mine Superfund Site
SOW	Statement of Work
WTP	Water Treatment Plant

AA1.0 INTRODUCTION

Appendix AA to the Midnite Mine Superfund Site Basis of Design Report (BODR) summarizes the existing power distribution network at the Midnite Mine Superfund Site (Site) available for use by the Selected Contractor for delivery of temporary power to the Site during early phases of the Remedial Action (RA). Also included is a summary of the pump controls powered by the network during the various phases of the RA construction and following RA completion (when the Site is in its permanent configuration).

The final power distribution system design will be completed with design of the new Water Treatment Plant (WTP). The WTP design has been delayed because the National Pollutant Discharge Elimination System (NPDES) permit for discharge offsite has not been approved. As a result, on May 20, 2014, a letter was sent to the Environmental Protection Agency (EPA) requesting a delay in the design of the WTP. The WTP design delay was approved in a letter from EPA dated July 8, 2014. The power requirements for the WTP and associated power distribution will be finalized once the NPDES permit is issued. At that point, all the WTP equipment and their power requirements will be known and the line(s) can be appropriately sized for the final power distribution system design.

The next phase of the WTP design (the 90% design) also will include the design of the communication lines (e.g., fiber optic) from the permanent pump control panels to the WTP. It is envisioned that the permanent power distribution system and the communication lines will maintain the same routing/alignment and therefore will be designed in parallel during the 90% design of the WTP.

This appendix includes:

- A description of the Section 11 design drawings
- A discussion of how this appendix addresses the Consent Decree (CD) Performance Standards
- A discussion of the Temporary Power Distribution
- A summary of the Submersible Dewatering Pump Controls
- Green and Sustainable Remediation (GSR) considerations

The power line design criteria are included in Attachment AA-1.

AA2.0 PERFORMANCE STANDARDS

There are no specific performance standards defined in the CD SOW that apply to temporary power distribution at the Site. There are several performance standards that apply to pumps or conveyance systems for collection and treatment of impacted surface water and groundwater. However, none of these specifically recommend equipment (including pumps). These general dewatering performance standards are addressed in the RD and are summarized in various general and specific performance standards included in Table 4-6 of the BODR.

AA3.0 ENGINEERING DESIGN DRAWINGS

The engineering design drawings are contained in Volume II of the BODR. The drawings for the existing and temporary power and submersible pump controls are listed on Table AA-1:

Table AA-1 – Existing and Temporary Power and Submersible Dewatering Pump Controls – Engineering Design Drawings

Temporary Power	
11-1	EXISTING POWER LINE MIDNITE MINE SITE
11-2	PUMP SCHEDULE
Submersible Dewatering Pump Controls	
11-3	ELECTRICAL P&ID LEGEND
11-4	ELECTRICAL P&ID EXISTING STRUCTURES
11-5	ELECTRICAL PHASE 1 P&ID (START)
11-6	ELECTRICAL PHASE 2 P&ID (START)
11-7	ELECTRICAL PHASE 3 P&ID (START)
11-8	ELECTRICAL PHASE 3 P&ID (END)
11-9	ELECTRICAL P&ID END OF REMEDIAL ACTION
11-10	ELECTRICAL TYPICAL PLC PANEL LAYOUT
11-11	ELECTRICAL PLC AC/DC WIRING DIAGRAM
11-12	ELECTRICAL PLC ANALOG INPUT WIRING DIAGRAM
11-13	ELECTRICAL PLC DISCRETE I/O WIRING DIAGRAM
11-14	ELECTRICAL LEGEND AND NOTES
11-15	ELECTRICAL PANEL MOUNTING SKID DETAILS 1
11-16	ELECTRICAL PANEL MOUNTING SKID DETAILS 2
11-17	ELECTRICAL DUPLEX FVNR CONTROL SCHEMATIC
11-18	ELECTRICAL SIMPLEX FVNR CONTROL SCHEMATIC

AA4.0 TEMPORARY POWER DISTRIBUTION AND SUBMERSIBLE DEWATERING PUMP CONTROLS DESIGN

AA4.1 Temporary Power Distribution

Temporary power lines will be constructed to provide electricity to the existing WTP (and outbuildings where needed), associated dewatering pumps/controls, and the construction support zone (CSZ) throughout early phases of RA construction until the permanent power system is available near the end of Phase 1 of RA construction. Temporary power lines shall be used instead of gasoline- or diesel-powered generators wherever feasible to reduce air emissions. Prior to initiating Phase 1 construction, the Contractor will verify capacity of the existing power line to confirm it can meet the demand of the expected power equipment.

Specification Section 01515 (see Appendix K) – Temporary Distribution Line contains the specific requirements for the temporary power lines, references to standards, codes, best practices and industry specific requirements. The specification shall form the technical basis for the design, material procurement and construction of the temporary power lines.

The selected Contractor is responsible for coordination, design and installation of the temporary electrical distribution system at the Site. System changes needed to accommodate Contractor's remediation work will be performed by the Contractor to meet the Contractor's schedule and the project's power equipment needs.

AA4.2 Submersible Dewatering Pump Controls

Sheet 11-1 depicts the existing power lines at the Site and the existing pipelines and their functions. The existing infrastructure (power, pipelines, pumps, and controls) should be used initially to effectively dewater the Site. However, as earthworks progresses, new or repurposed power lines, pipelines, pumps, and controls will be needed to continue effective dewatering efforts. The influent pipes during RA construction will be temporary and relocated as necessary (see Appendix J). Site topography, the location of equalization ponds, the dewatering volume, and the depth of wells/sumps also will be in constant flux during construction, which may affect the head, flow, and/or required controls for the submersible dewatering pumps. These changing conditions mean intermediate pumps and controls design will be necessary as field conditions change. These are the sole responsibility of the Contractor.

The Contractor will be responsible for conveying water to the appropriate locations and maintaining the approved water levels in all locations throughout all phases of construction. The Contractor can use the existing pumping and control equipment. However, the Contractor is responsible for maintenance, modification, and/or replacement of the pumping equipment to meet evolving project needs throughout each phase of construction.

In an effort to assist the Contractor with this design and operation responsibility, the table in Sheet 11-2 is provided to identify:

- Pumps with pump numbers (note: only permanently installed pumps receive pump numbers).
- Existing pumps, pumps that will be installed during construction, and whether the pumps are temporary or permanent. For example the current dewatering pumps in Pits 3 and 4 are designated “temporary” because they will be removed after Pits 3 and 4 are dewatered. These pumps will be replaced by underdrain well pumps that are designated as the “permanent” dewatering well pumps in these locations.
- Changes anticipated during construction that may require a temporary pump be upgraded and reinstalled (e.g., the specified pump would not be able to handle the conditions experienced in every construction phase).
- Where each pump conveys water (see Description column).
- Estimated capacity (gpm), total design head, and HP for each pump.
- Motor drive, voltage, and phase for each pump.
- The estimated construction phase(s) when each pump will be operational (i.e., Phases 1, 2, 3, and beyond).
- The type of water level control required and the control level/range.
- Instrumentation requirements for each project phase.
- Miscellaneous notes.

In addition to Sheet 11-2, process and instrumentation diagrams (P&IDs) were developed for each major phase of the project existing structures (Sheet 11-4), start of Phase 1 after Early Works (Sheet 11-5), start of Phase 2 (Sheet 11-6), start of Phase 3 (Sheet 11-7), end of Phase 3 (Sheet 11-8), and the end of the remedial action (following removal of the West Pond - Sheet

11-9). These P&IDs specify pump power and control information (e.g., level controller type and location, flowmeter locations, etc.) to ensure the Contractor understands the dewatering pump control objectives for each phase of construction. However, it should be noted that beyond Phase 1 construction there are a number of variables that could change the P&IDs for necessary pump power and control information that cannot be anticipated. If this occurs, it will be the responsibility of the Contractor and/or Newmont to revise these P&IDs.

Pump control panels will move multiple times during the RA activities and therefore have been designed on skids. The permanent pump control panel design affixes the mobile, skid-mounted control panel to a concrete slab after the permanent location is ready. This approach minimizes construction materials, instrumentation, and waste generation.

AA5.0 GREEN AND SUSTAINABLE REMEDIATION CONSIDERATIONS

Below are green and sustainable remediation (GSR) considerations for Appendix AA – Temporary Power Distribution and Submersible Dewatering Pump Controls. GSR considerations were evaluated for: (1) Construction Materials (characteristics and manufacturing considerations), (2) Construction Methods, and (3) Low Impact/Sustainability measures undertaken during construction.

AA5.1 Construction Material Considerations

The Contractor will be able to re-use the temporary power distribution poles in different locations, assuming they meet the requirements of the specifications. This approach minimizes construction materials and waste generation.

The pump control panels during the RA activities will move multiple times and have been designed on skids, which will be permanently attached to a concrete slab after RA activities are complete. This approach minimizes construction materials, instrumentation, and waste generation.

AA5.2 Construction Methods

Project-wide GSR recommendations in Specification 01585 – Green and Sustainable Practices pertaining to the Temporary Power Distribution and the Submersible Dewatering Pump Controls will be followed (refer to BODR Section 4.5).

AA5.3 Low Impact Development/Sustainability

Allowing the Contractor to utilize the existing power, pumps, and control infrastructure, optimize the temporary power alignment, adjust the pump size for each operational scenario, and easily re-locate pump control panels throughout each construction phase will minimize Site disruption while maximizing the use of existing infrastructure.

The temporary power line performance specification directs the Contractor to use the temporary power line in lieu of generators wherever feasible, which reduces greenhouse gas emissions and diesel fuel usage at the Site during RA activities.

Attachment AA-1

Power Line Design Criteria

POWER LINE DESIGN CRITERIA

MWH®

Client: Newmont Corporation **Date:** 07/17/2014

Project: Midnite Mine **Job Number:** 1011322

MANAGER: V. DRAIN **OFFICE: SALT LAKE CITY, UT**

DEPARTMENT: TRANSMISSION AND DISTRIBUTION

This design criterion applies to all structures on this project.

DESIGN CODE: NESC

DESIGN CRITERIA

- Load Cases

Description	Weather case	Cable condition	Wire Vert. Load Factor	Wire and Struct. Wind Load Factor	Wire Tension Load Factor	Struct. Weight Load Factor	Strength Factor Steel Poles Tubular-Arms	Strength Factor Wood Poles	Strength Factor Concrete Poles Ultimate	Strength Factor Guys	Strength Factor Non- Tubular Arms	Strength Factor Braces	Strength Factor Insulators	Strength Factor Foundation
RULE 250B	NESC Heavy District Loading (250B)	Initial RS	1.5	2.5	1.65	1.5	1	0.65	1	0.9	0.65	0.65	1	1
RULE 250B Uplift	NESC Heavy District Loading (250B)	Initial RS	1	2.5	1.65	1	1	0.65	1	0.9	0.65	0.65	1	1
RULE 250C	NESC Extreme Wind (250C)	Initial RS	1	1	1	1	1	0.75	1	0.9	0.75	0.75	1	1
RULE 250D	NESC Concurrent Ice and Wind (250D)	Initial RS	1	1	1	1	1	0.75	1	0.9	0.75	0.75	1	1
RULE 277 Insulators	NESC Heavy District Loading (250B)	Initial RS	1	1	1	1							1	1
Extreme Ice	Extreme Ice	Initial RS	1	1	1	1	1	1	1	1	1	1	1	1
Uplift	Cold Uplift	Initial RS	1	1	1	1	1	1	1	1	1	1	1	1
RULE 261A	NESC Extreme Wind (250C)	Initial RS	1	1	1	1	1	0.75	1	0.9	0.75	0.75	1	1
RULE 250B (Broken Wire)	NESC Heavy District Loading (250B)	Initial RS	1.5	2.5	1.65	1.5	1	0.65	1	0.9	0.65	0.65	1	1
RULE 250C (Broken Wire)	NESC Extreme Wind (250C)	Initial RS	1	1	1	1	1	0.75	1	0.9	0.75	0.75	1	1
RULE 250D (Broken Wire)	NESC Concurrent Ice and Wind (250D)	Initial RS	1	1	1	1	1	0.75	1	0.9	0.75	0.75	1	1
Extreme Ice (Broken Wire)	Extreme Ice	Initial RS	1	1	1	1	1	1	1	1	1	1	1	1

- Weather Cases

Description	Air Density Factor (Q) (psf/mph^2)	Wind Velocity (mph)	Wind Pressure (psf)	Wire Ice Thickness (in)	Wire Ice Density (lbs/ft^3)	Wire Temp. (deg F)	Weather Load Factor	NESC Constant (lbs/ft)	Wire Wind Height Adjust Model	Wire Gust Response Factor
NESC Heavy District Loading (250B)	0.00256	39.5	4	0.5	57	0	1	0.3	None	1
NESC Extreme Wind (250C)	0.00256	90	20.7	0	0	60	1	0	NESC 2012	NESC 2012
NESC Concurrent Ice and Wind (250D)	0.00256	40	4.1	0.5	57	15	1	0	None	1
Extreme Ice	0.00256	0	0	0.5	57	30	1	0	None	1
Cold Uplift	0.00256	0	0	0	0	-20	1	0	None	1
Maximum Operating	0.00256	0	0	0	0	212	1	0	None	1
NESC Tension Limit (261H1b)	0.00256	0	0	0	0	0	1	0	None	1
NESC Blowout 6PSF	0.00256	48.4	6	0	0	60	1	0	None	1
No Wind (SWING 1)	0.00256	0	0	0	0	60	1	0	None	1
Moderate Wind (SWING 2)	0.00256	48.4	6	0	0	32	1	0	None	1
Moderate Wind (SWING 3)	0.00256	48.4	6	0	0	60	1	0	None	1
High Wind (SWING 4)	0.00256	90	20.7	0	0	60	1	0	None	1
GALLOPING (SWING)	0.00256	28.0	2	0.5	57	32	1	0	None	1
GALLOPING (SAG)	0.00256	0	0	0.5	57	32	1	0	None	1
-20 Deg F	0.00256	0	0	0	0	-20	1	0	None	1
0 Deg F	0.00256	0	0	0	0	0	1	0	None	1
30 Deg F	0.00256	0	0	0	0	30	1	0	None	1
32 Deg F & 1/2 Inch Ice	0.00256	0	0	0.5	57	32	1	0	None	1
60 Deg F	0.00256	0	0	0	0	60	1	0	None	1
90 Deg F	0.00256	0	0	0	0	90	1	0	None	1
120 Deg F	0.00256	0	0	0	0	120	1	0	None	1
167 Deg F	0.00256	0	0	0	0	167	1	0	None	1
212 Deg F	0.00256	0	0	0	0	212	1	0	None	1

- Wire Tension Limits

Weather case	Cable condition	% of Ultimate
NESC Heavy District Loading (250B)	Initial RS	60
NESC Extreme Wind (250C)	Initial RS	80
NESC Concurrent Ice and Wind (250D)	Initial RS	80
NESC Tension Limit (261H1b)	Initial RS	35
NESC Tension Limit (261H1b)	Creep RS	25
0 Deg F	Creep RS	14

- Weather Cases for Final after Creep and Load

Weather Case for Final after Creep
60 Deg F

Weather Cases for Final after Load
NESC Heavy District Loading (250B)
NESC Extreme Wind (250C)
NESC Concurrent Ice and Wind (250D)
Extreme Ice

- Clearances

  The NESC minimum clearance requirements shall be met including but not limited to the vertical clearances above ground and other obstacles, horizontal clearances from line conductors to objects, clearances between conductors and between conductors and overhead ground wire, and clearances of conductors from supporting structures.

DESIGN REFERENCES

NFPA 110 Emergency and Standby Power Systems

ATIS ANSI O5.1 (2008) Wood Poles -- Specifications & Dimensions

ANSI C29.1 (2002) Test Methods for Electric Power Insulators

AWPA A3 (2005) Standard Method for Determining Penetration of Preservatives and Fire Retardants

AWPA C1 (2003) All Timber Products - Preservative Treatment by Pressure Processes

AWPA C4 (2003) Poles - Preservative Treatment by Pressure Processes

AWPA T1 (2009) Use Category System: Processing and Treatment Standard

ASTM A123 (2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A153 (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A36/A36M (2008) Standard Specification for Carbon Structural Steel

ASTM A475 (2003; R 2009e1) Standard Specification for Zinc-Coated Steel Wire Strand

ASTM B1 (2001; R 2007) Standard Specification for Hard-Drawn Copper Wire

ASTM B2 (2008) Standard Specification for Medium-Hard-Drawn Copper Wire

ASTM B231 (2012) Standard Specification for Concentric-Lay-Stranded Aluminum 1350 Conductors

ASTM B232/B232M (2009) Standard Specification for Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR)

ASTM B3 (2001; R 2007) Standard Specification for Soft or Annealed Copper Wire

ASTM B8 (2011) Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

ASTM D 117 (2010) Standard Guide for Sampling, Test Methods, Specifications and Guide for Electrical Insulating Oils of Petroleum Origin

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