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REPORT OF INSTALLATION AND SAMPLING OF MULTI-LEVEL MONITORING WELLS LMW-4 AND LMW-5

MAY 27, 2004

FINAL REPORT

Prepared for
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June 3, 2004

Mr. Gerard J. Thibeault
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California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
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Subject: Cleanup and Abatement Order 94-37 and Order 97-58
Report of Installation and Sampling of Multi-Level Monitoring Wells LMW-4 and LMW-5

Dear Mr. Thibeault:

Transmitted herewith is a copy of a report prepared by Earth Tech titled, "Report of Installation and Sampling of Multi-Level Monitoring Wells LMW-4 and LMW-5." This documents the results of work proposed in the September 27, 2002 *Task 3 Work Plan and Schedule Addendum, Phase1 Investigation of the Leading Edge of the Redlands Groundwater Plume* as modified by Lockheed Martin's October 22, 2003 letter to Regional Water Quality Control Board (RWQCB). The RWQCB approved these plans on October 30, 2003. The work was performed to complete certain requirements of Cleanup and Abatement Order 94-37 and Order 97-58.

If you have any questions regarding this report, please contact me at 818-0847-9901 or Bill Bath at 818-847-0272.

Sincerely,

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1.0 INTRODUCTION

This report summarizes the field activities and field and laboratory findings associated with the installation of two multi-port (multilevel) monitoring wells at the leading edge of the Redlands plumes in the Bunker Hill Basin. Plans for the monitoring wells were described in an addendum to the *Task 3 Work Plan and Schedule Addendum, Phase 1 Investigation of the Leading Edge of the Redlands Groundwater Plume*, which was submitted to the State of California Regional Water Quality Control Board (RWQCB) - Santa Ana Region on September 27, 2002 and modified by letter dated October 22, 2003. The Board approved the plans on October 30, 2003.

Objectives of the Two Multiport Wells. The objective of one of the multilevel monitoring wells (LMW-5) is to monitor the southwest extent of the perchlorate plume. The second new monitoring well (LMW-4) helps to monitor the perchlorate plume extent in the Gage well field and the City of Riverside Raub well field. LMW-4 will provide additional data to evaluate potential impacts to HSU 6, and provide early warning of potential impacts to the City of Riverside Raub and Warren wells.

The newly installed multi-port wells will also provide the capability to compare actual levels of perchlorate and TCE concentrations at given depths with the forecasted levels provided by the current groundwater model at those same depths. The sample results at these depths can be used to further refine and adjust the model.

Chronology Of Well Construction. Well permits for LMW-4 and LMW-5 were obtained on October 14, 2003. A San Bernardino County Flood Control District access permit was obtained on October 21, 2003. Thereafter, the installation activities proceeded as follows:

	LMW-4	LMW-5
Install conductor casing	10/24/03	10/24/03
Drill 12' diameter borehole	10/26/03 to 10/30/03	11/9/03 to 11/12/03
Run geophysical logs	10/30/03	11/12/03
Install outer casing	11/5/03 to 11/7/03	11/15/03 to 11/17/03
Develop well through screens	11/12/03 to 11/21/03	11/22/03 to 11/26/03 12/1/03 to 12/3/03
Install Westbay multi-port casing	12/3/03 to 12/7/03	12/8/03 to 12/12/03

	LMW-4	LMW-5
Develop well through sampling ports	12/8/03 to 12/12/03	12/13/03 to 12/16/03
Dispose cuttings	11/21/03	12/11/03
Dispose drilling fluids	1/15/04	1/16/04
Sample through sampling ports	1/20/04	1/21/04

Compliance With Board Orders. With the completion of the installation of these two multi-port wells, Lockheed Martin Corporation has completed the requirements for installation of multi-port wells as proposed as part of the *Perchlorate Work Plan and Schedule August 15, 1997.*

Organization Of This Report. The remainder of this report is divided into the following five sections:

- Section 2 provides the background for this work, including regulatory orders, technical objectives, and approach to site selection and well design;
- Section 3 details drilling procedures, construction and installation of well casing, development of screens, installation of the Westbay system, and secondary development through the Westbay system;
- Section 4 presents procedures followed for sample collection, and analytical results of development sampling and Westbay sampling;
- Section 5 provides the interpretations of the data obtained during the installation and sampling;
- Section 6 includes discussions and recommendations derived from the field activities.

2.0 BACKGROUND

2.1 CLEANUP ORDER COMPLIANCE

Lockheed Martin Corporation submitted the *Phase 1 Work Plan and Schedule, Investigation of the Leading Edge of the Redlands Groundwater Plume* to the RWQCB on June 10, 1994, in response to Cleanup and Abatement Order (CAO) 94-37, adopted on April 22, 1994.

As part of Task 2 of the Phase I Investigation, two multi-port monitoring wells (LMW-1 and LMW-2) were designed and installed between October 1996 and February 1997. The installation details of these two multi-port wells are described by HSI Geotrans (1997).

Both of these wells are located near Waterman Avenue, between Interstate 10 and the Santa Ana Wash. The locations were to (1) expand the understanding of the nature and extent of the leading edge of the Redlands TCE and perchlorate plumes and (2) provide monitoring points to provide detection of plume migration.

To complete its Order obligation to define the leading edge of the plume and the lateral and vertical extent of the plume, Lockheed Martin submitted the *Task 3 Work Plan and Schedule Addendum, Phase 1 Investigation of the Leading Edge of the Redlands Groundwater Plume* in August, 1997. The Task 3 Work Plan specified the installation and monitoring of additional multi-port wells, some of which were installed in 1998 (see further description below).

In April 1997, the State of California Department of Health Services (DHS) developed a modified method to test for perchlorate in water at a detection limit of 4 μg/L, which was significantly lower than the previous detection limit. After perchlorate was detected in the Bunker Hill Basin, the RWQCB adopted Cleanup and Abatement Order 97-58 in July 1997. In compliance with Cleanup and Abatement order 97-58, item 1, Lockheed Martin submitted a *Perchlorate Work Plan and Schedule* to the RWQCB on August 15, 1997.

The Perchlorate Work Plan and Schedule specified the installation and monitoring of the same multi-port wells as the August 1997 Task 3 Work Plan. Some of the multi-port wells (LMW-3, LMW-6 and LMW-7) were installed in early 1998. LMW-3 is located on the northern bank of the Santa Ana Wash, between the extensions of Richardson Street and Mountain View Avenue.

LMW-6 is located west of Richardson Street, about halfway between Lugonia and San Bernardino Avenues. LMW-7 is located along Mountain View Avenue, south of Interstate 10. The installation details of these three multi-port wells are contained in *TASK 3B TECHNICAL MEMORANDUM; PHASE I INVESTIGATION OF THE LEADING EDGE OF THE REDLANDS GROUNDWATER PLUME* (HSI GeoTrans, September 1998).

The 1998 sample results triggered a reconsideration of the location and design of the other multi-port wells specified in the August 1997 Task 3 Work Plan and August 1997 Perchlorate Work Plan and Schedule. These locations and designs were finalized in the *Task 3 Work Plan and Schedule Addendum, Phase 1 Investigation of the Leading Edge of the Redlands Groundwater Plume* (September, 2002) and October 22, 2003 letter from Lockheed Martin to the RWQCB. This report provides installation details and initial monitoring results for LMW-4 and LMW-5, which completes Lockheed Martin's obligations under Cleanup and Abatement Order 94-37, items 2 and 3c, and Cleanup and Abatement Order 97-58, item 2.

2.2 TECHNICAL OBJECTIVES OF MULTIPORT WELLS LMW-4 AND LMW-5

LMW-4 and LMW-5 were sited, designed and installed to complete the monitoring of the lateral and vertical extent of the Redlands perchlorate and TCE plumes at their leading edges. The specific locations and designs of the wells are intended to address the following technical objectives.

- Addressing data gaps at the leading edge of the plume to determine the horizontal extent of contamination.
- Understanding impacts on different aquifer layers by collecting depth-discrete geologic and hydrogeologic data.
- Supporting the groundwater flow and transport model by gathering data necessary to refine the flow and transport model.

2.3 SITING AND DESIGN OF LMW-4 and LMW-5.

Horizontal Well Location. Multilevel well LMW-5 is located near the leading edge of the perchlorate plume (at 6 ug/L) in Hydrostratigraphic Unit 2 (HSU 2). This well is as close as

possible to the Colton Narrows without being so close that the hydrostratigraphy would be complicated by the geologic structures associated with the San Jacinto Fault. Well LMW-5 is about 400 feet northeast of the trace of the San Jacinto fault to allow simple hydrostratigraphic correlations between LMW-5 and other wells in Bunker Hill Basin (Figure 2-1).

Well LMW-4 is located between the Gage and Raub well fields to assess the continuity of the perchlorate plume in this area. This area was also selected to confirm containment of the Redlands TCE plume at the Gage well field (i.e., there is discontinuity between the Redlands and Norton Air Force Base plumes). The location of LMW-4 is shown on Figure 2-1.

Secondary Well Location Considerations. An attempt was made to place the wells in public rights-of-way. Public rights-of-way are preferred because it is generally easier to obtain access for construction and to maintain an access agreement for sampling. Accordingly, LMW-4 was drilled in the San Bernardino Flood Control District's right-of-way in Santa Ana Wash south of Orange Show Road, and LMW-5 was placed in the Flood Control District's right-of-way along Santa Ana Wash east of E Street. The District issued access permits, which include long-term access for monitoring.

Other secondary well location factors were (1) ease of access for drilling equipment and material lay-down, and (2) avoiding environmental impacts. The locations selected both have relatively simple access and lay-down areas along Flood Control District maintenance roads. They are both outside of the stream channel, so there were no impacts to the wooded riparian habitat.

Vertical Well Screen Placement. Both wells are Westbay multi-port wells. Each well was designed to be deeper than 700 feet bgs and to be screened across HSUs 2 through 6. Both wells have two sampling ports in HSU-2, one port in HSU-3, two ports in HSU-4, one port in HSU-5, and two ports in HSU-6, thereby providing depth-discrete data for the major HSUs in the Bunker Hill Basin. Well LMW-5 has a third port in HSU-6 to assure vertical bounding of the perchlorate plume. The Westbay multi-port system was chosen as the best means to achieve this design for the following reasons:

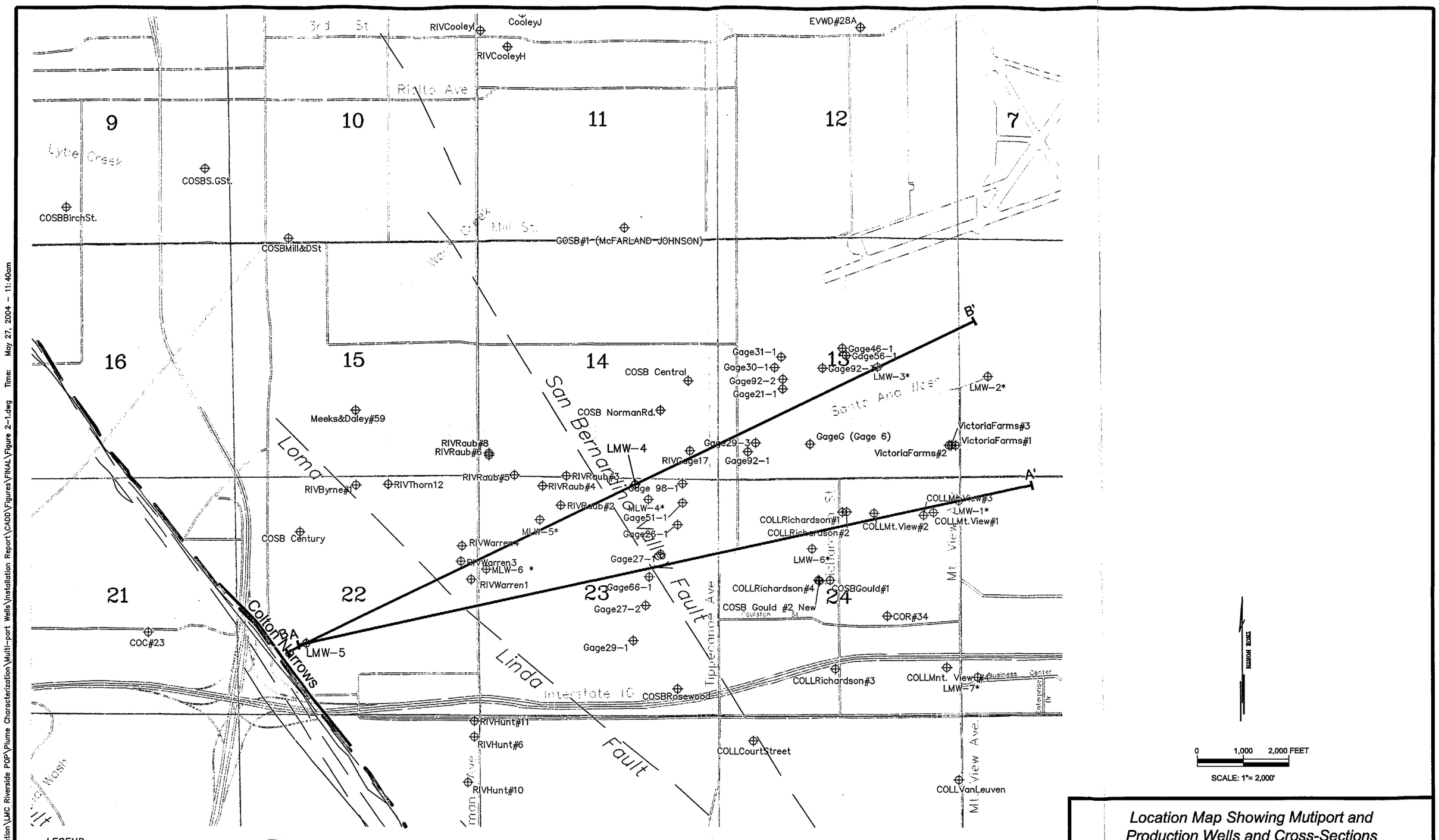
1. The multi-port system is one continuous casing screened (8 or 9 intervals) at the chosen depths, which simplifies installation and sampling.

2. Only one borehole needed to be drilled, therefore costs are minimized.

3. The smaller diameter borehole reduced the chances of a cave-in during drilling or setting the well. Since the risk of caving was reduced, it was possible to drill the holes without mud, thereby limiting the potential for introducing contaminants and expediting well development.

4. The Westbay multi-port system had been installed and used successfully on the previous five LMWs.

Screen intervals were planned to be approximately equidistant from each other and to lie well within the HSU contacts; that is, to provide distinct and valid samples from each HSU. Two sampling ports were planned in each of the aquifer units HSUs 2, 4 and 6 (Figure 2-3); these are the principal water bearing units in the basin. Aquitard units HSUs 3 and 5 have only one sampling port each, as they are less significant in the horizontal movement of groundwater. Table 2-1 shows the depths of screens in the LMWs.



LEGEND:

- Roads
- Creeks and wash areas
- Faults
- Approximate boundary of Bunker Hill Basin
- 12 Township/Range Section numbers
- A — A' Cross Section Location
- WELL ID Water Wells
- MLW-9* (Multiport Well With Zones)
- LMW-4 New Multiport Well Installations

Location Map Showing Mutiport and Production Wells and Cross-Sections

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EARTH TECH, A tyco INTERNATIONAL LTD. COMPANY	CHECKED: LC	FIGURE 2-1
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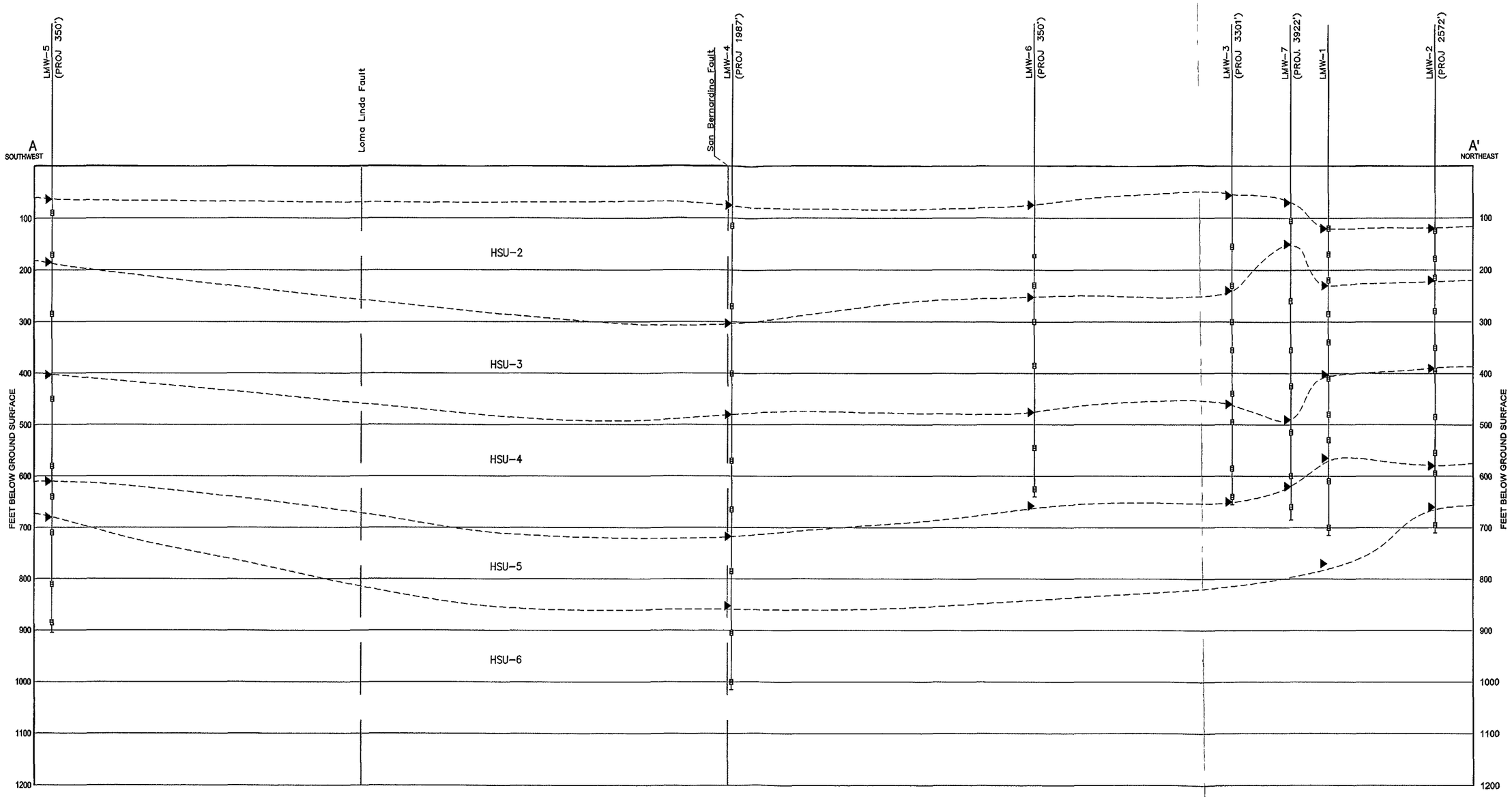
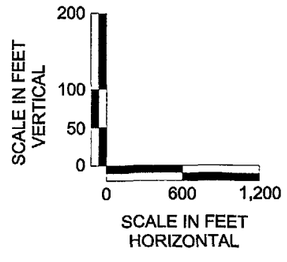


Legend:

- Well Location
- Screened Section
- Mapped Faults
- Approximate Hydrostratigraphic Unit (HSU) Boundary
- Geophysical Log Interpretation For HSU Boundary

Notes:

See Figure 2-1 for Cross Section Location



Cross-Section A-A' Showing Wells LMW-1 Thru LMW-7 with Screened Intervals and HSU Picks

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EARTH TECH
A Tyco Infrastructure Services Company

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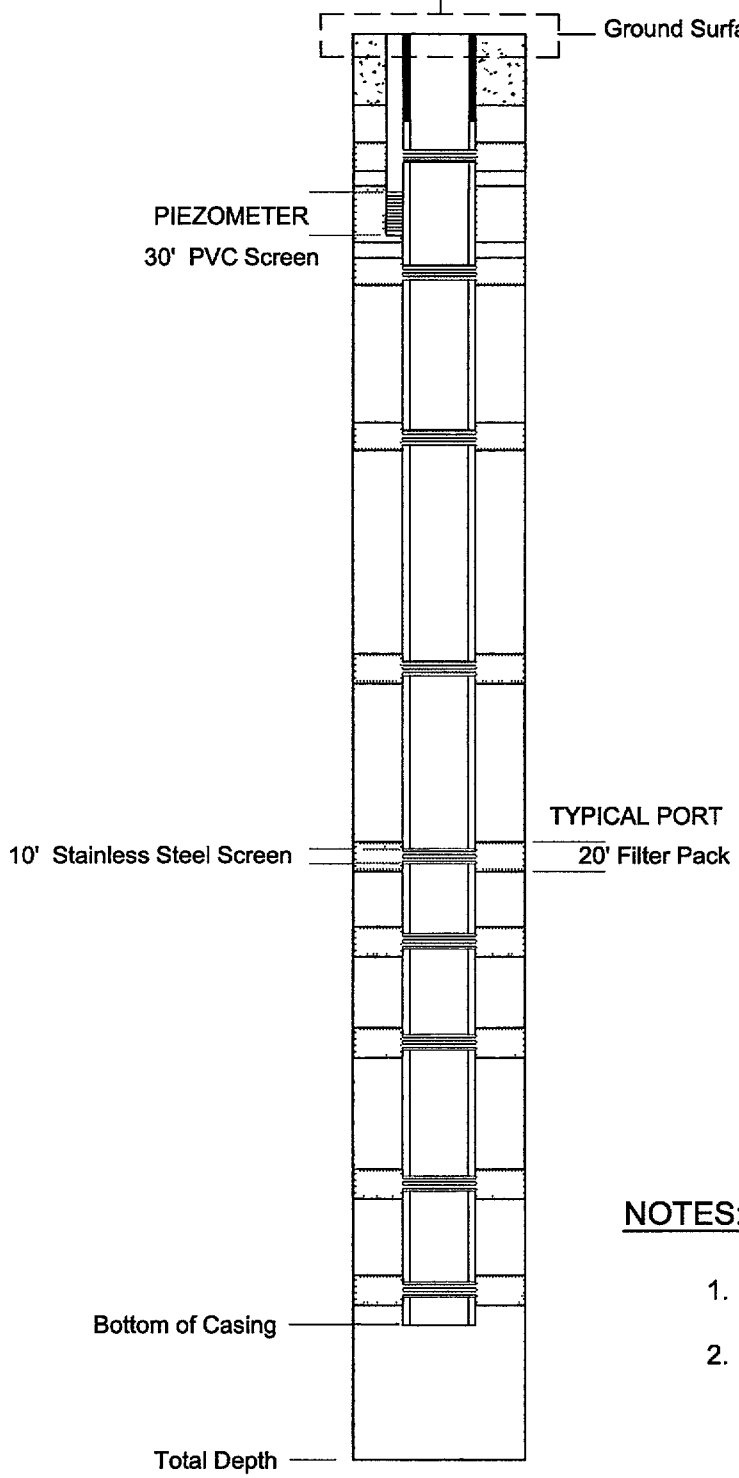
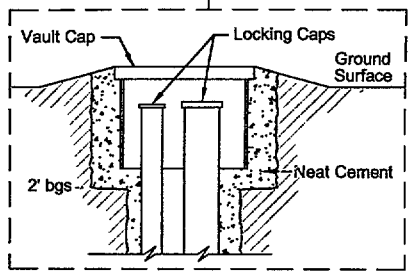
TYPICAL WELL





Typical Well Cap Detail

NOT TO SCALE

EXPLANATION

- Cement/Bentonite Grout
- 2/12 Lonestar Sand Pack
- Bentonite / 3 Lonestar Sand Slurry
- Stainless Steel .010 inch Continuous Wire Wrap Screen Section
- 4-inch Diameter Low Carbon Steel Casing
- 4-inch Diameter Stainless Steel Casing
- 2-Inch Diameter PVC Casing
- 2-Inch Diameter PVC Screen

NOTES:

1. All joints are flush threaded or flush welded.
2. Final screen depths were based on the depths of the specific HSU's as encountered in the borings so that the sampling screens are wholly within the target HSU.

Typical Well Completion

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EARTH TECH A Tyco Infrastructure Services Company	CHECKED:	AEM	FIGURE
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TABLE 2-1. HSU AND SCREEN DEPTHS FOR LMW MULTIPORT WELLS

		PREVIOUS MULITPORT WELLS					NEW MULTIPORT WELLS			
		AS-BUILT					PLANNED	AS-BUILT	PLANNED	AS-BUILT
		LMW-2	**LMW-1**	**LMW-7**	**LMW-3**	**LMW-6**	**LMW-4**		**LMW-5**	
HSU-2	Depth to Top of HSU	120	120	70	56	85		85		64
	PORT, PORT DEPTH (PORT ELEVATION)	Port 1, 125 (968); Port 2, 180 (913); Port 3, 215 (878)	Port 1, 120 (978); Port 2, 170 (928); Port 3, 220 (878)	Port 1, 105 (1008)	Port 1, 155 (917); Port 2, 230 (842)	Port 1, 175 (896); Port 2, 230 (841)	Port 1, 110-120; Port 2, 230-240	Port 1, 110 (914); Port 2, 265 (759)	Port 1, 100-110; Port 2, 160-170	Port 1,85 (898); Port 2, 165 (818)
HSU-3	Depth to Top of HSU	220	230	150	240	252		302		185
	PORT, PORT DEPTH (PORT ELEVATION)	Port 4, 280 (813); Port 5, 350 (743)	Port 4, 285 (813); Port 5, 340 (758)	Port 2, 260 (853); Port 3, 355 (758); Port 4, 425 (688)	Port 3, 300 (772); Port 4, 355 (717); Port 5, 440 (632)	Port 3, 300 (771); Port 4, 385 (686)	Port 3, 380-390	Port 3, 395 (629)	Port 3, 260-280	Port 3, 280 (703)
HSU-4	Depth to Top of HSU	390	401	490	460	475		480		402
	PORT, PORT DEPTH (PORT ELEVATION)	Port 6, 395 (698); Port 7, 485 (608); Port 8, 555 (538)	Port 6, 410 (688); Port 7, 480 (618); Port 8, 530 (568)	Port 5, 515 (598); Port 6, 600 (513)	Port 6, 495 (577); Port 7, 585 (487); Port 8, 640 (432)	Port 5, 545 (526); Port 6, 625 (446)	Port 4, 500-510; Port 5, 700-710	Port 4, 565 (459); Port 5, 660 (364)	Port 4, 360-370; Port 5, 460-470	Port 4, 445 (538) Port 5, 575 (408)
HSU-5	Depth to Top of HSU	580	565	620				718		610
	PORT, PORT DEPTH (PORT ELEVATION)	Port 9, 595 (498)	Port 9, 610 (488); Port 10, 700 (398)	Port 7, 670 (443)			Port 6, 770-780; Port 7, 835-845	Port 6, 780 (244)	Port 6, 520-530; Port 7, 620-630	Port 6, 635 (348)
HSU-6	Depth to Top of HSU	660						856		680
	PORT, PORT DEPTH (PORT ELEVATION)	Port 10, 695 (398) Port 10 is non-operable.					Port 8, 880-890	Port 7, 900 (124); Port 8, 995 (29)	Port 8, 680-690; Port 9, not planned	Port 7, 705 (278); Port 8, 805 (178); Port 9, 880 (103)

3.0 DRILLING, CONSTRUCTION AND INSTALLATION of WELLS

Two multi-port wells, LMW-4 and LMW-5, were installed to depths of 1015 and 905 feet below ground surface (bgs), respectively. LMW-4 was constructed with 8 monitoring ports and LMW-5 was constructed with 9 monitoring ports. The location of LMW-4 is on the southern levee of the Santa Ana River, approximately 2,000 feet west of Tippecanoe Avenue and approximately 1,500 feet south of Orange Show Road. The location of LMW-5 is on the southern levee of the Santa Ana River, approximately 700 feet east of South "E" Street. Drilling, construction, primary and secondary development, and initial sampling occurred between October 24, 2003 and January 21, 2004.

3.1 PLANNING AND SITE PREPARATION

Plans. The installation of LMW-4 and LMW-5 followed the Work Plan that was submitted by Lockheed Martin as an addendum to the *Task 3 Work Plan and Schedule Addendum, Phase 1 Investigation of the leading Edge of the Redlands Groundwater Plume.* The Work Plan was submitted to the RWQCB on September 27, 2002, and was approved on October 30, 2003.

Permits. Once the RWQCB approved the work plan, permits were obtained to install the two wells. Permits for well construction were obtained from the San Bernardino Department of Public Health, Division of Environmental Health Services on October 14, 2003. Both of the well locations are on property managed by the San Bernardino County Flood Control District (SBCFCD); therefore, encroachment permits were obtained from SBCFCD on October 21, 2003. The permits are presented in Appendix C.

Lockheed Martin Corporation submitted a Notice of Intent (NOI) to the CRWQCB – Santa Ana Region to discharge wastewater under the terms and conditions of Order No. R8-2003-0061 NPDES No. CAG998001. Authorization to discharge wastewater from LMW-4 was granted by a letter dated December 2, 2003, by Monitoring and Reporting Program No. R8-2003-0061-066. Authorization to discharge wastewater from LMW-5 was granted by a letter dated December 2, 2003, by Monitoring and Reporting Program No. R8-2003-0061-067.

Environmental Evaluation. An evaluation of environmental considerations was conducted during the planning stages for the well installations. The evaluation noted that the well locations

are near habitat of two threatened and endangered birds, notably the Southwest willow flycatcher, and the least Bell's vireo. The LMW-4 location did not impact these species because a sound wall was placed between the location of LMW-4 and the riparian habitat. The same effect of blocking drilling noise from the riparian habitat occurred at LMW-5 because an approximately 15-foot high levee is located between the drilling location and the Santa Ana Wash. Additionally, the drilling and construction schedule did not overlap with the nesting season for the two birds. Additional information on the environmental evaluation is presented in Appendix G.

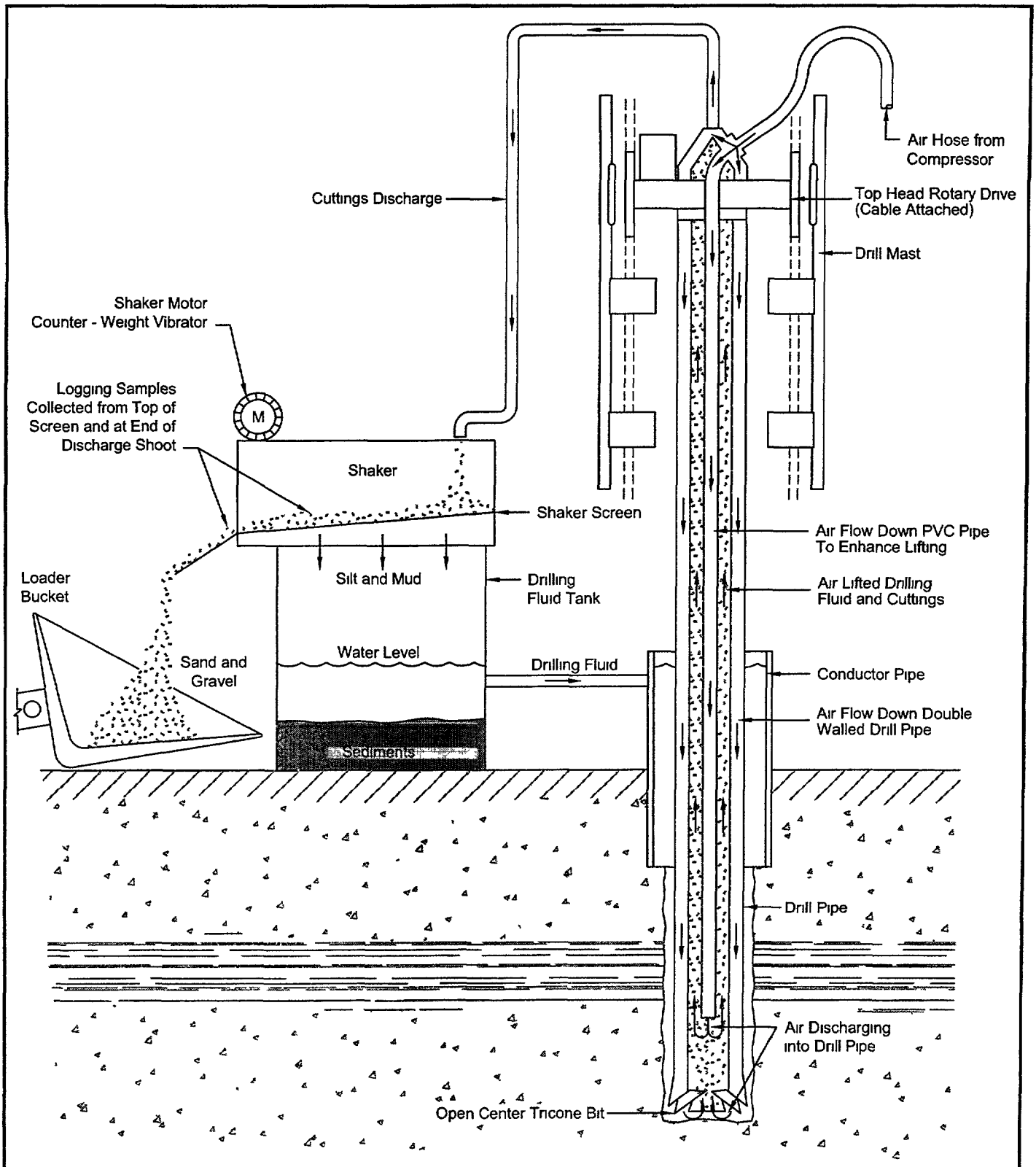
Site Preparation. Site preparation at the location of LMW-4 included installing a sound wall between the well location and the riparian habitat. The sound wall was 20 feet high and 200 feet long. The materials lay-down area was identified as a clear, level area near the borehole location, with only minor preparation necessary. Containment berms lined with plastic sheeting were placed under the drill rig, portable fuel tank and air compressor.

Site preparation at the location of LMW-5 included clearing dry grass and weeds. Minor leveling of the site was necessary for placement of the portable mud tank, and for the materials lay-down area. Containment berms lined with plastic sheathing were placed under the drill rig, portable fuel tank and air compressor.

3.2 DRILLING PROCEDURES

Conductor Casing. The upper thirty-five feet of each well location was advanced using a twenty-four inch diameter auger drill. A conductor casing was set inside the borehole and grouted into place. The conductor casing was connected to the portable drilling fluid tank, allowing constant flow of drilling fluids into the borehole. The conductor casing was cut off below the ground surface after the wells were completed.

Reverse Circulation Drilling. The remainder of each borehole was advanced using the fluid reverse circulation rotary drilling method, with a 12.25-inch diameter tri-cone roller bit. Drill cuttings were suspended in the drilling fluids and airlifted to the surface, where the cuttings were removed from the drilling fluids by means of a shale shaker (Figure 3-1). Samples for lithologic logging were obtained from the top of the shale shaker, while the suspended fines passed



Fluid Reverse - Circulation
Rotary Drilling Method

LOCKHEED MARTIN

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File. G \us\Lo... ...hCA\work\Remediation\LMC Riverside POP\Plume Characterization\Multi-port Wells\Installation Repor...ADD\Figures\Figure 3-1 dwg Time May 13, 2004 - 9 11am

through the shaker and returned to the portable mud tank, where they settled to the bottom of the tank.

The advantages of using reverse circulation for this project were as follows:

- Rapid drilling through both consolidated and unconsolidated formations
- Allows for continuous collection of cuttings
- Sufficient depth capabilities

Drift Survey. To insure the drilling of the borehole was to alignment specifications, the driller furnished and used a self-checking mechanical drift indicator to measure hole deflection. Drift indications were taken at approximately 100 feet intervals. The results indicated that drift from vertical was less than 0.5 of 1 degree throughout the drilling process.

Drilling Fluids. The drilling fluid for LMW-4 initially consisted of potable water. After total depth was reached, the borehole was not staying open satisfactorily, so hydrogel and Drispac Plus super gel (both are bentonite products) were added to the drilling fluid for borehole wall stability. Drilling fluid for LMW-5 consisted of potable water with the addition of hydrogel and Drispac Plus super gel.

Lithologic Logging. During drilling operations, lithologic samples were collected every five feet and logged on field forms. Information recorded on the field forms included material type, Unified Soil Classification System (USCS) designation, color (Munsell designation), moisture, stiffness (fine soils only), relative percentages of sand, gravel, silt and clay, plasticity of fines, and size range and angularity of sand and gravel. Lithologic logs are presented in boring logs in Appendix A.

While drilling LMW-4, lithologic logging indicated that the transition between HSU-5 and HSU-6 was deeper than anticipated (estimated at approximately 800 feet below ground surface, but actually was approximately 850 feet bgs). As a result, a decision was made to increase the total depth of the borehole from 910 feet bgs to 1070 feet bgs. The total depth of LMW-5 was increased from a proposed depth of 855 feet to an actual total depth of 950 feet, and the

number of sample ports was increased from eight to nine. The drillers advanced the boreholes an additional 15 feet to 30 feet beyond requested total depth.

3.3 GEOPHYSICAL LOGGING OF THE BOREHOLE

After the total depth of each borehole was reached, geophysical logging was done. The geophysical tests conducted in the boreholes included:

- resistivity (single point, 16-inch, 64-inch and Guard)
- spontaneous potential
- natural gamma
- caliper

The geophysical logs were used to correlate the stratigraphy between the boreholes, and to select upper and lower limits of hydrostratigraphic units. The geophysical logs were used to help determine the screen depths and HSU contacts for the final design of the wells.

The caliper logs were used to estimate the volumes of material to be used in the construction of the wells. Copies of the geophysical logs are presented in Appendix B.

3.4 FINAL WELL DESIGN CRITERIA

The initial targeted screen depths were chosen by studying the surrounding wells and projecting the known depths of the HSUs to the designated locations of LMW-4 and LMW-5. After reviewing the lithology and geophysical logs (long and short normal resistivity, lateral resistivity, gamma ray, spontaneous-potential, and caliper), the well screen depths were field-revised to suit the conditions encountered. Table 3-1 lists the final screen depths in feet bgs and elevation (MSL).

Interpretation of Logs. Immediately after the total drilling depth was reached, the boreholes were geophysical logged. Each geophysical log was printed and correlated with the lithology log to identify HSU contacts and finalize the well designs. The normal (long and short) and lateral resistivity logs provided the most useful information to pick the HSU contacts. These contacts were then compared to picks that had been made previously on the logs of LMWs-1,

TABLE 3-1. SCREEN INTERVALS AND HSU PICKS

	LMW-4		LMW-5	
	Depth (feet bgs)	Elevation (feet MSL)	Depth (feet bgs)	Elevation (feet MSL)
HSU-2 top	85	939	64	919
Port 1	105 to 115	919 to 909	80 to 90	903 to 893
Port 2	260 to 270	764 to 754	160 to 170	823 to 813
HSU-3 top	302	722	185	798
Port 3	390 to 400	644 to 624	275 to 285	708 to 698
HSU-4 top	480	544	402	581
Port 4	560 to 570	464 to 454	440 to 450	543 to 533
Port 5	655 to 665	369 to 359	570 to 580	413 to 403
HSU-5 top	718	306	610	373
Port 6	775 to 785	249 to 239	630 to 640	353 to 343
HSU-6 top	856	168	680	303
Port 7	895 to 905	129 to 119	700 to 710	283 to 273
Port 8	990 to 1000	34 to 24	800 to 810	183 to 173
Port 9	-	-	875 to 885	108 to 98

-2, -3, -6 and –7. Comparison of the geophysical logs to the lithology logs showed a direct correlation; in particular it was noted that as the fines increase, the resistivity also increases. Figure 3-2 shows a side-by-side correlation of the resistivity and lithology logs for wells LMW-4 and LMW-5. HSU picks and screened intervals are also included on Figure 3-2.

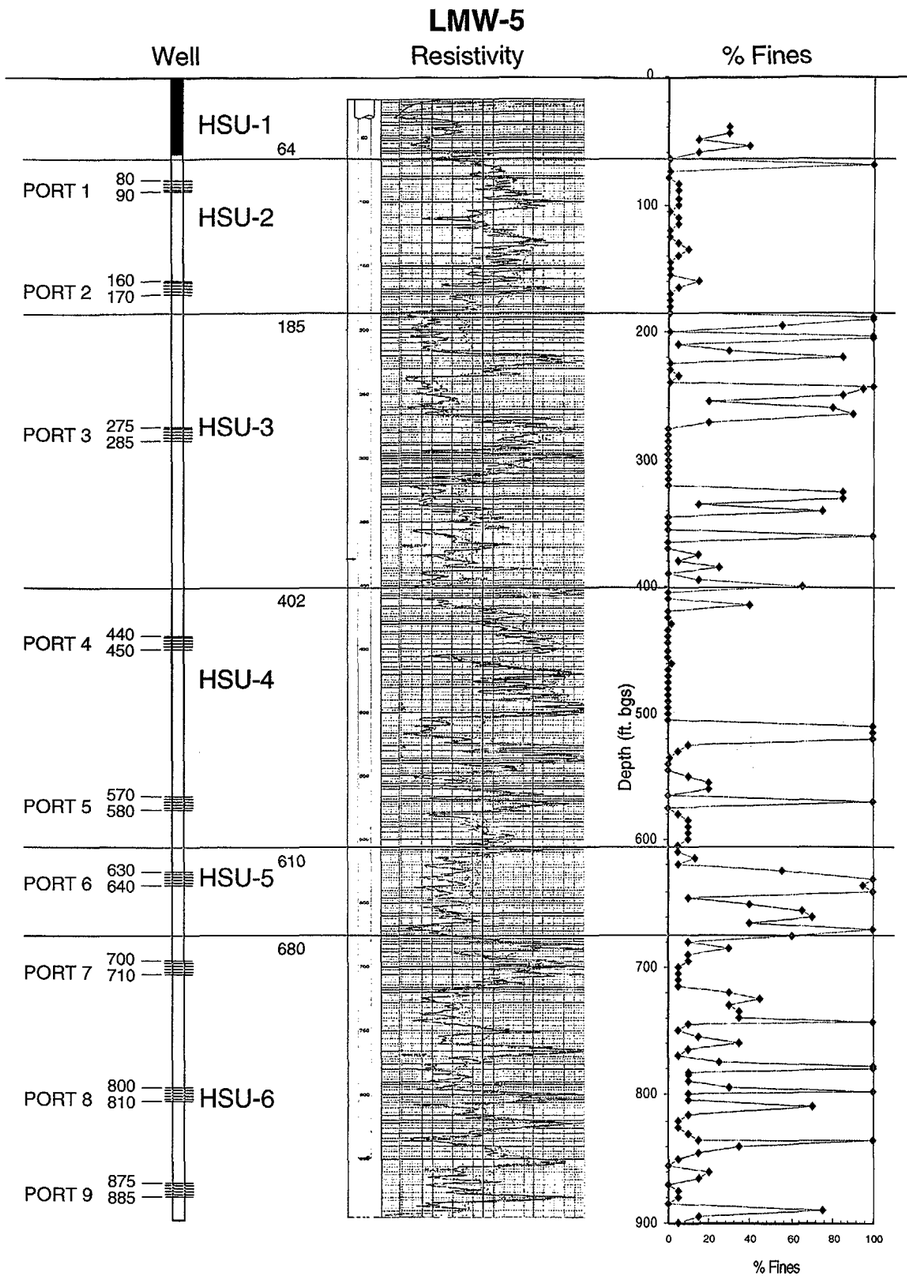
After each HSU was identified, screened intervals were chosen based on the apparent zone of highest porosity. Two screened intervals were placed in both HSU 2 and 4, two screened intervals were placed in HSU 6 in LMW-4, and three screened intervals were placed in HSU 6 in LMW-5. HSUs 3 and 5 are aquitards, and have only one screen interval placed within them.

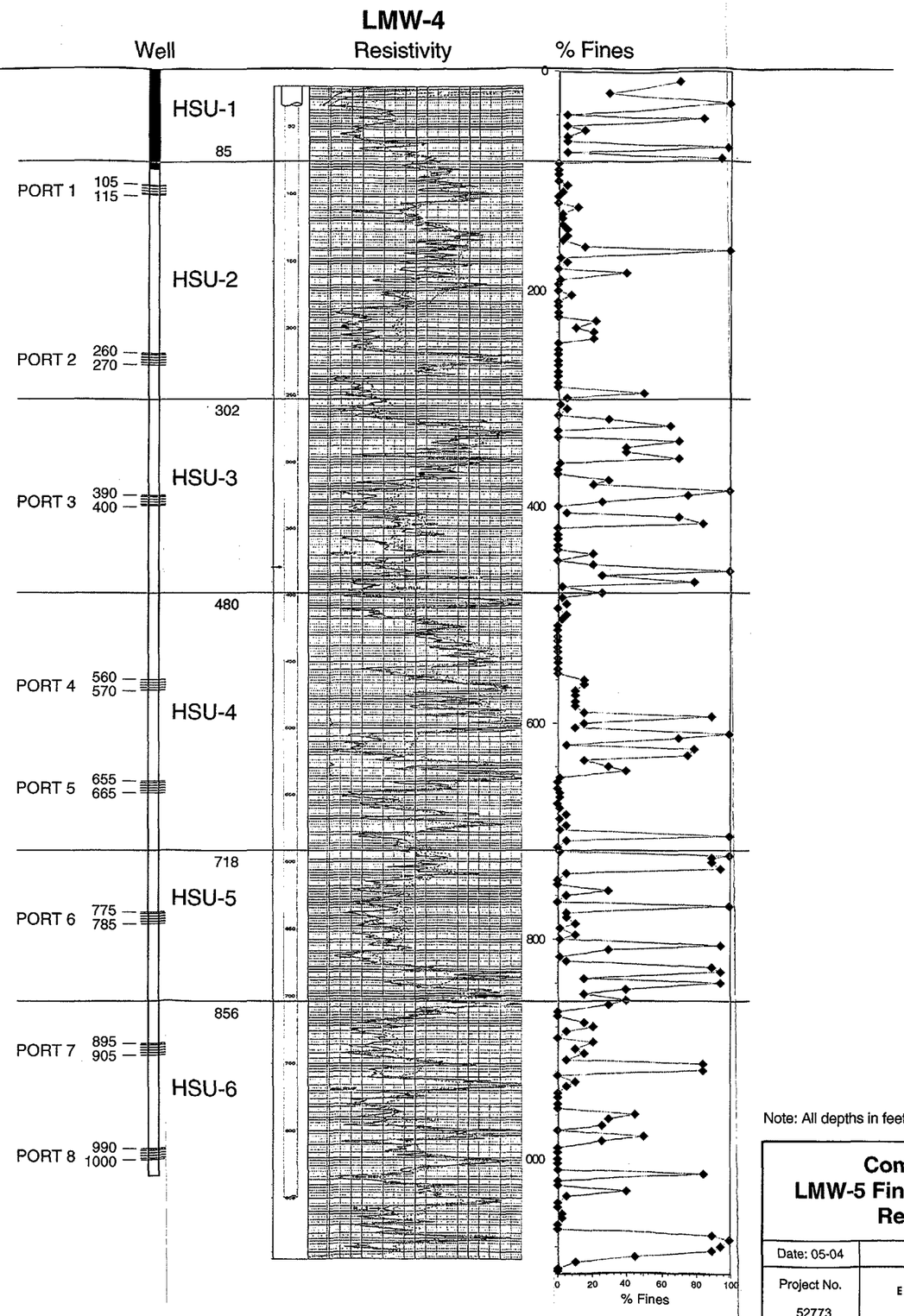
3.5 INSTALLATION AND DEVELOPMENT OF CASING AND SCREENS

Installation of Casing and Screens. Figure 3-3 illustrates the construction details and sample port locations for LMW-4 and LMW-5. LMW-4 contains a total of 8 sample ports ranging in depth from 110 feet to 995 feet below ground surface (bgs). LMW-5 has 9 ports ranging from 85 feet to 880 feet bgs. Sample ports are centered within each 10 foot screened interval and are separated by annular seals to prevent movement of groundwater between screened zones.

LMW-4 contains a total of 1015 feet of 4-inch diameter screen and casing, consisting of 90 feet of mild steel blank casing above the water table, 845 feet of type 304 stainless steel blank casing below the water table, and 80 feet of screen. The screen sections are 10 foot long, 0.010 slotted, continuous wrap, type 304 stainless steel screens for a total of 8 screens. LMW-5 contains 905 feet of 4-inch casing consisting of 60 feet of mild steel blank casing (above the water table), 755 feet of stainless steel blank casing (below the water table), and 9 stainless steel screens (90 feet total). Stainless steel centralizers were placed on the 4-inch diameter stainless steel blank casing to hold the casing in the center of the borehole during the fill operation.

Prior to installing the casing, clean water was circulated through a construction tremie pipe to the bottom of the well to clear silt and mud. All pieces of the 4-inch casing were numbered, measured and documented in the field logbook prior to installation.





Note: All depths in feet

Comparison of LMW-4 and LMW-5 Final Screen Depths, HSU Picks, Resistivity, and % Fines

Date: 05-04	Lockheed Martin	Figure
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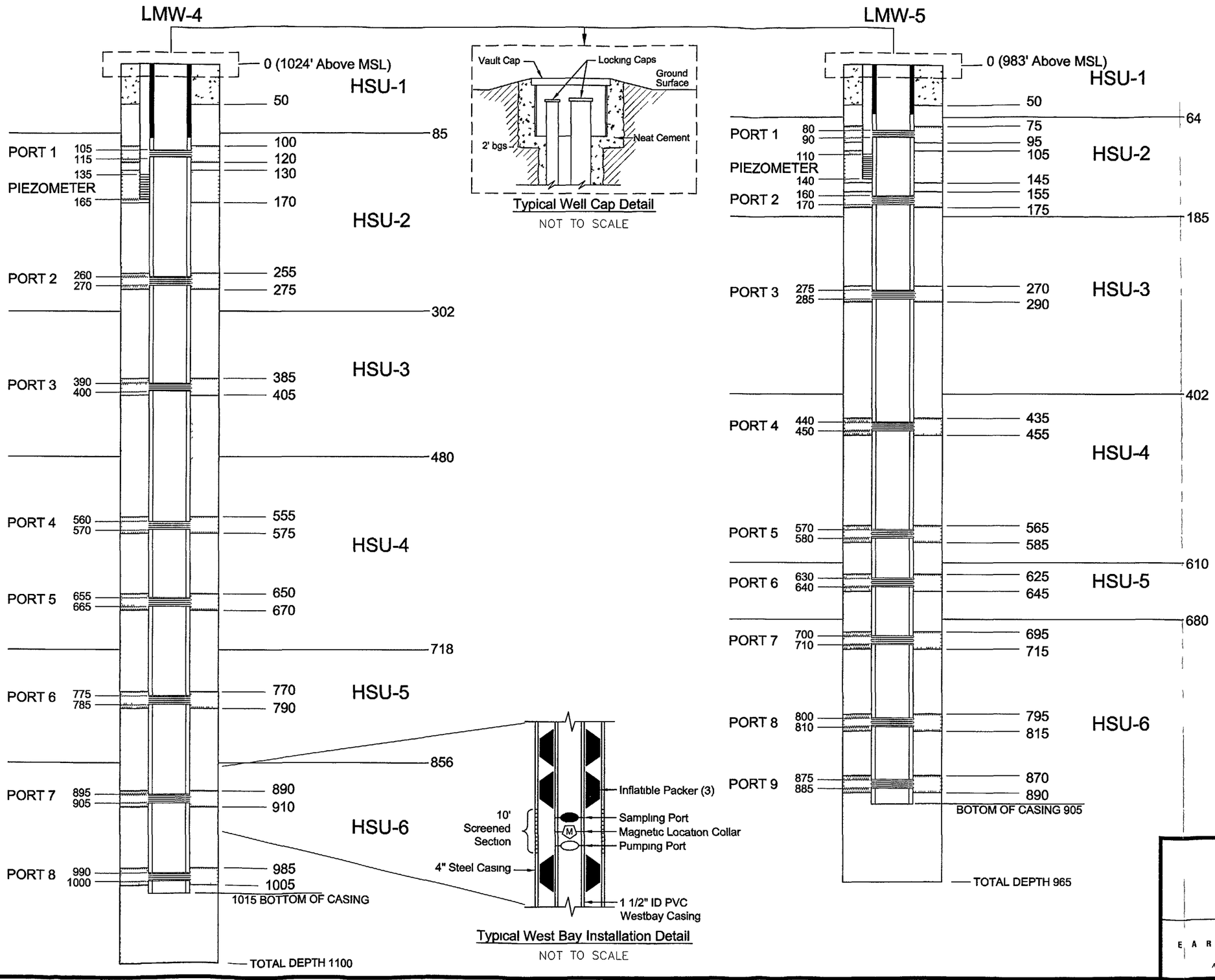

EXPLANATION

- Cement/Bentonite Grout
- 2/12 Lonestar Sand Pack
- Bentonite / 3 Lonestar Sand Slurry
- Stainless Steel .010 inch Continuous Wire Wrap Screen Section

HSU = Hydrostratigraphic Unit

- 4-inch Diameter Low Carbon Steel Casing Above Water Table
- 4-inch Diameter Stainless Steel Casing Below Water Table
- 2-Inch Diameter PVC Casing
- 2-Inch Diameter PVC Screen

NOTES:

1. All depths in feet
2. All joints in 4-inch diameter casing are flush threaded for LMW-4.
3. All joints in 4-inch diameter casing are welded slip joint for LMW-5.

LMW-4 and LMW-5
Well Construction Diagram

LOCKHEED MARTIN

EARTH TECH
A Tyco Infrastructure Services Company

CHECKED	AEM	FIGURE
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Initially, while adding new sections to LMW-4, a threaded plug was used as an attachment point to suspend the 4-inch casing in the borehole. During installation, the casing broke free of the threaded plug causing minor damage. The entire well string was recovered and inspected. All threaded ends and screen sections were replaced to insure the integrity of the well casing. The incident initiated a design change for LMW-5, utilizing slip joints rather than threaded joints. The slip joints were welded in place above the borehole during installation. A 2-foot section, added above each screen in addition to the threaded plug, allowed the use of a heavy duty collar to hold the casing in place during assembly.

Following installation of the 4-inch casing and during the filling of the annular space, a piezometer was nested outside the 4-inch casing. The piezometer consists of 2-inch diameter schedule 80 PVC pipe, with flush threaded construction. The piezometer extends to 165 feet bgs (below ground surface) in LMW-4 with 30 feet of slotted PVC screen, and 135 feet bgs in LMW-5 with 30 feet of screen. The piezometers allow groundwater elevations to be measured at each location without the use of the Westbay sampling equipment.

Filter Pack and Seal. Placement of the filter pack and seal began immediately following the assembly of the 4-inch diameter casing, while the well string remained suspended in the borehole, unsupported by the bottom of the hole. The annulus materials (filter pack, bentonite seal and cement grout) were placed through a tremie pipe. The free fall distance between the placed materials and the lower end of the construction tremie pipe remained no more than 5 feet during fill operations. The 5-foot maximum fall was a precaution to prevent a bridge or gap from forming. Volumes of sand, bentonite slurry, and cement/grout seal placed inside the annulus (calculated from bag count) exceeded the expected volume (calculated from caliper log measurements) for both wells.

The porous filter pack consists of Lonestar™ Silica Sand #2/#12 extending 5 feet above and below each screen interval. A bentonite slurry seals the annulus between the filter packs, extending at least 10 feet above and below the filter pack. The bentonite slurry consists of Bensil™, a fine granulated sodium bentonite (montmorillionite) clay; mixed 1 to 1 with Lonestar™ Silica Sand #3. The bentonite and sand were mixed while adding water at a trash pump, then pumped down the tremie.

A cement grout seal caps the uppermost bentonite layer starting from 50 feet below ground surface and ending 2 feet below ground surface. The cement grout consists of Type II Portland cement, with ASTM Designation C150, mixed with one bag of Bensil™ bentonite. Finally, a surface completion, set in Portland cement, brings the well to the surface. A 10 inch steel circular plate, bolted to the vault, allows access to the well and piezometer.

Primary Well Development. Primary well development began 5 days after the installation of the filter pack and seals. The purpose of the primary development was to remove suspended and settled materials from the casing, sump, filter pack and adjacent formation. Table 3-2 lists the dates, times, rates and volumes discharged from each screened interval.

The first stage of development consisted of mechanical swabbing and air lifting of the entire well to remove the bulk of the solids. The swab or surge block, mounted on a tremie pipe, consisted of two rubber-faced plungers, about 1/8 inch in diameter smaller than the inside screen diameter, separated by a 2-1/2 foot perforated steel pipe. The swab was sealed at the bottom, but included a bypass to allow flow from below the lower swab to pass to the area above the upper swab. However, the valve remained closed, allowing a vacuum to form during swabbing to surge water in and out through the screened intervals. Swabbing required a raising and lowering action of about 15 feet, 2 to 3 feet above and below each screened interval, for about 15 cycles lasting 10 to 15 minutes each. Following each swabbing cycle, air (injected through a 1 inch PVC pipe) was used to lift the water. Swabbing began from the uppermost screen downward, and continued until discharge water had sufficiently cleared of solids as measured in a graduated cone. Immediately following the swabbing operation in each well, bailing by air lifting, removed the accumulated silt and mud from the sump before the pumping stage of development.

During a second primary well development stage, each screened interval was pumped individually, using inflatable straddle packers to isolate the screens. Development by pumping began within a day after completion of the swabbing. The pump was mounted to the tremie pipe with one inflatable straddle packer below the pump and two packers above. Pumping continued until the physical parameters stabilized for at least 1 hour and turbidity reached a minimum, between 0 and 60 NTU (nephelometer turbidity units). During development,

TABLE 3-2. DEVELOPMENT TIMES AND FLOW RATES DURING PRIMARY DEVELOPMENT

Well – Port	Development Stage	Date	Time-hours	Flow rate
LMW-4				
LMW-4 Port 1	Air Lift	11/12/03	5.75	0.33 gal / min. (initially) increasing to 1.5 gal / min.
		11/13/03	9.5	
		11/14/03	2.5	
	Pumping	11/20/03	1.0	14 gal/min
LMW-4 Port 2	Air Lift	11/14/03	4.17	5.25 gal/ min to 7 gal/min
		11/17/03	2.0	12 gal/min
	Pumping	11/19/03	0.67	1.2L/min
		11/19/03	1.67	15 gal/min
LMW-4 Port 3	Air Lift	11/17/03	3.33	7 gal/min
	Pumping	11/20/03	6.5	10 to 15 gal/min
LMW-4 Port 4	Air Lift	11/17/03	1.0	7 gal/min
		11/18/03	.5	
	Pumping	11/20/03	1.5	14 gal/min
LMW-4 Port 5	Air Lift	11/17/03	1.0	7 gal/min
		11/18/03	.5	
	Pumping	11/20/03	1.5	14 gal/min
LMW-4 Port 6	Air Lift	11/18/03	2.33	7 gal/min
	Pumping	11/20/03	7.17	16 gal/min
LMW-4 Port 7	Air Lift	11/18/03	1.75	7 gal/min
	Pumping	11/21/03	8.25	13 gal/min
LMW-4 Port 8	Air Lift	11/18	4	7 gal/min
	Pumping	11/21/03	3.25	15 gal/min
LMW-5				
LMW-5 Port 1	Air Lift	11/22/03	7.67	7 gal/min
	Pumping	11/24/03	.58	14 gal/min
		11/25/03	1.17	
LMW-5 Port 2	Air Lift	11/22/03	3	7 gal/min
	Pumping	11/25/03	6.5	13 gal/min
LMW-5 Port 3	Air Lift	11/22/03	.67	9 gal/min
		11/23/03	2.0	
	Pumping	11/25/03	6.33	12 gal/min
LMW-5 Port 4	Air Lift	11/23/03	3.17	8 gal/min
	Pumping	11/25/03	7.17	16 gal/min
LMW-5 Port 5	Air Lift	11/23/03	4.5	7 gal/min
	Pumping	11/25/03	2.5	15 gal/min
		11/26/03	7.67	
LMW-5 Port 6	Air Lift	11/23/03	3.75	7 gal/min
	Pumping	12/01/03	10.0	15 gal/min
	Westbay – Secondary Development	12/14/03	3.57	1 gal/min
LMW-5 Port 7	Air Lift	11/23/03	4.5	7 gal/min
	Pumping	12/02/03	12.25	15 gal/min
LMW-5 Port 8	Air Lift	11/23/03	.25	7 gal/min
		11/24/03	4.5	
	Pumping	12/02/03	11.0	15 gal/min
		12/03/03	.33	
LMW-5 Port 9	Air Lift	11/24/03	5.25	7 gal/min
	Pumping	12/03/03	11.25	13 gal/min

discharge water was first collected in a trash tank and then was pumped and stored in 21,000-gallon Frac tanks. LMW-4 required two Frac tanks while 5 tanks were required for LMW-5.

Samples Taken at the End of Primary Development. After development of each screen was completed, and before the straddle packers were removed, groundwater samples were collected and analyzed. More details are contained in Section 4.1.

Video Logging of Developed Screens. Following well development and prior to the Westbay system installation, a color video survey scanned the entire well casing and screens. The video camera gave a down-hole view and a full circular side-scan view as the camera descended. The video included a digital depth record of the camera location to confirm depths of the screened intervals and adequacy of the development program. A color VHS videocassette was provided by the contractor, and photos of the well screens are provided in Appendix I.

Vertical Alignment Survey. A plumbness and alignment test was conducted on each well after primary development was complete. The test consisted of:

1. Lowering a 40-foot long "dummy" with true circumference of ½" less than the casing, to the full depth from the ground surface and withdrawing it. The test was successful if the dummy moved smoothly throughout the well.
2. The plumbness of the casing was verified by centering a cage in the top of the casing, and lowering the cage into the casing. The cage was one foot in length, with an outside diameter of ½" less than the inside diameter of the casing. The cage was lowered in 10-foot increments, with the direction and amount of cable movement measured at each stage using a template resting on top of the casing. The maximum deviation from vertical was within specified tolerances of less than 0.5 of 1 degree within the casing.

3.6 WESTBAY™ INSTALLATION AND SECONDARY DEVELOPMENT

Installation Procedures. Installation and quality control checking of the Westbay™ MP38 multi-port system was done in four days for each well. Two representatives from the Westbay Company constructed the systems on site by hand, with assistance from the drill crew.

Westbay generated MP Casing logs based on the screen depths of the previously installed wells. The Westbay™ system components consist of helix and sampling ports, purge ports, inflatable packers, magnetic couplers and blank sections (Figure 3-4 [photo]). Magnetic

couplers lie between the purge port and sampling port and trigger a magnetic sensor for down-hole positioning. The purge port lies below the magnetic coupler, while the helix and sample port lie above; each type of port requires a different tool to operate The different sections slip together and lock in place by a plastic pin through coupling joints.

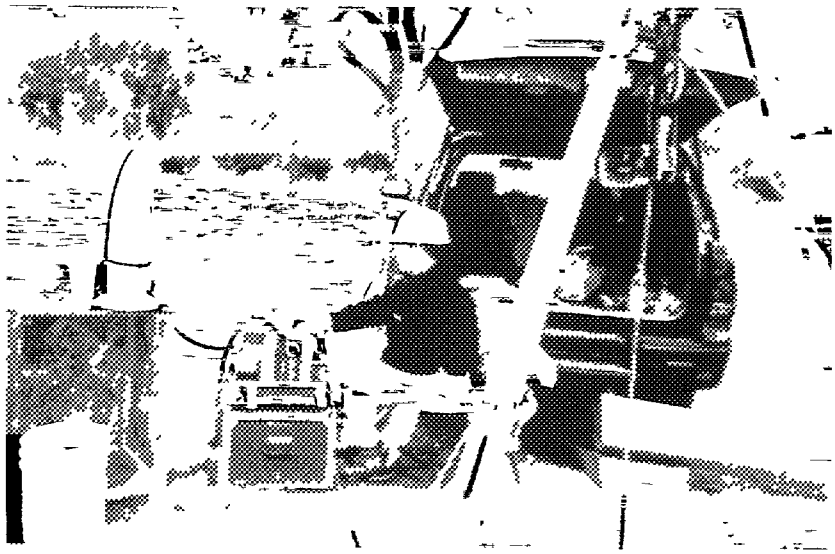
On the first day of installation, components were set out in the sequence indicated on the casing logs. Each component was numbered, starting with the lowermost section, and each component was thoroughly inspected. The second day consisted of assembling the components and lowering the assembly down the well as each component was added. Each casing joint was tested with a minimum internal hydraulic pressure of 150 psi for one minute to confirm hydraulic seals before lowering that section down the well.

Packer Inflation. The final step of installation consisted of inflating the MP System packers. Prior to inflating the packers, a pre-inflation pressure profile was performed to confirm the proper operation and position of the measurement ports and magnetic collars. The packers were inflated sequentially beginning at the bottom of the wells using potable water. The inflatable packers are positioned so that one packer is below the purge port and two packers are above the sampling port. The inflation procedure consisted of pumping water at high pressure into each packer until the pressure stabilized.

After inflation of the packers, fluid pressures were measured at each measurement port. This was done to verify that each port was properly isolated by the packers, and to check the in-situ formation pressure at each port location. The results of the Westbay installation Quality Assurance/Quality Control tests and checks are presented in Appendix J.

Secondary Development Through the Westbay System. Purging of the sampling intervals through the Westbay ports required training of the drilling crew by Westbay personnel. Table 3-3 lists the dates, times, flow rates and volumes of water purged from the Westbay System during the secondary development. Purging removed potable water added during Westbay system installation and water that may have mixed between hydrostratigraphic units after primary development Purging for the Westbay well used a 6-inch stroke, Wateria™ lift pump, lifting through 1 inch diameter plastic tubing inside the 2 inch Westbay well. A one-way check valve at the bottom of the plastic tubing was placed below the water level. Purging

Westbay Installation in progress. Installed Westbay section protruding above the well, undergoing pressure testing of Westbay casing joint. Blue sections are the inflatable packers, white sections are blank casing.



Westbay packer inflation in progress. Westbay personnel monitor volume and pressure of water pumped into packer

52773 03 03 LMC Multiport Well Install

Photos of Westbay Installation and Packer Inflation in Progress		
Date 04 04	Lockheed Martin	Figure 3-4
Project No 52773	EARTH TECH A Tetra Tech International Ltd. Company	

TABLE 3-3. DEVELOPMENT TIMES AND FLOW RATES DURING SECONDARY DEVELOPMENT (WESTBAY DEVELOPMENT)

Well - Port	Date	Time-hours	Flow rate
LMW-4			
LMW-4 Port 1	12/08/03	2.4	1 gal/min
LMW-4 Port 2	12/09/03	2.33	1 gal/min
LMW-4 Port 3	12/09/03	2.17	1 gal/min
LMW-4 Port 4	12/10/03	2.0	1 gal/min
LMW-4 Port 5	12/10/03	2.0	1 gal/min
LMW-4 Port 6	12/10/03	3.17	1 gal/min
LMW-4 Port 7	12/10/03	2.0	1 gal/min
LMW-4 Port 8	12/11/03	6.42	1 gal/min
LMW-5			
LMW-5 Port 1	12/13/03	2.17	1 gal/min
LMW-5 Port 2	12/13/03	1.5	1 gal/min
LMW-5 Port 3	12/13/03	2.0	1 gal/min
LMW-5 Port 4	12/13/03	2.0	1 gal/min
LMW-5 Port 5	12/14/03	3.28	1 gal/min
LMW-5 Port 6	12/14/03	3.57	1 gal/min
LMW-5 Port 7	12/14/03	1.0	1 gal/min
	12/15/03	2.17	
LMW-5 Port 8	12/15/03	3.5	1 gal/min
LMW-5 Port 9	12/16/03	4.0	1 gal/min

continued until the parameters of temperature, pH, turbidity, and electrical conductivity stabilized, at which time a sample was collected. Turbidity, the qualifying criterion, ranged from 0 to 5; except for port 8 in LMW-4, which, after about 6.42 hours of pumping, did not lower below 90 NTU.

3.7 WASTE MANAGEMENT

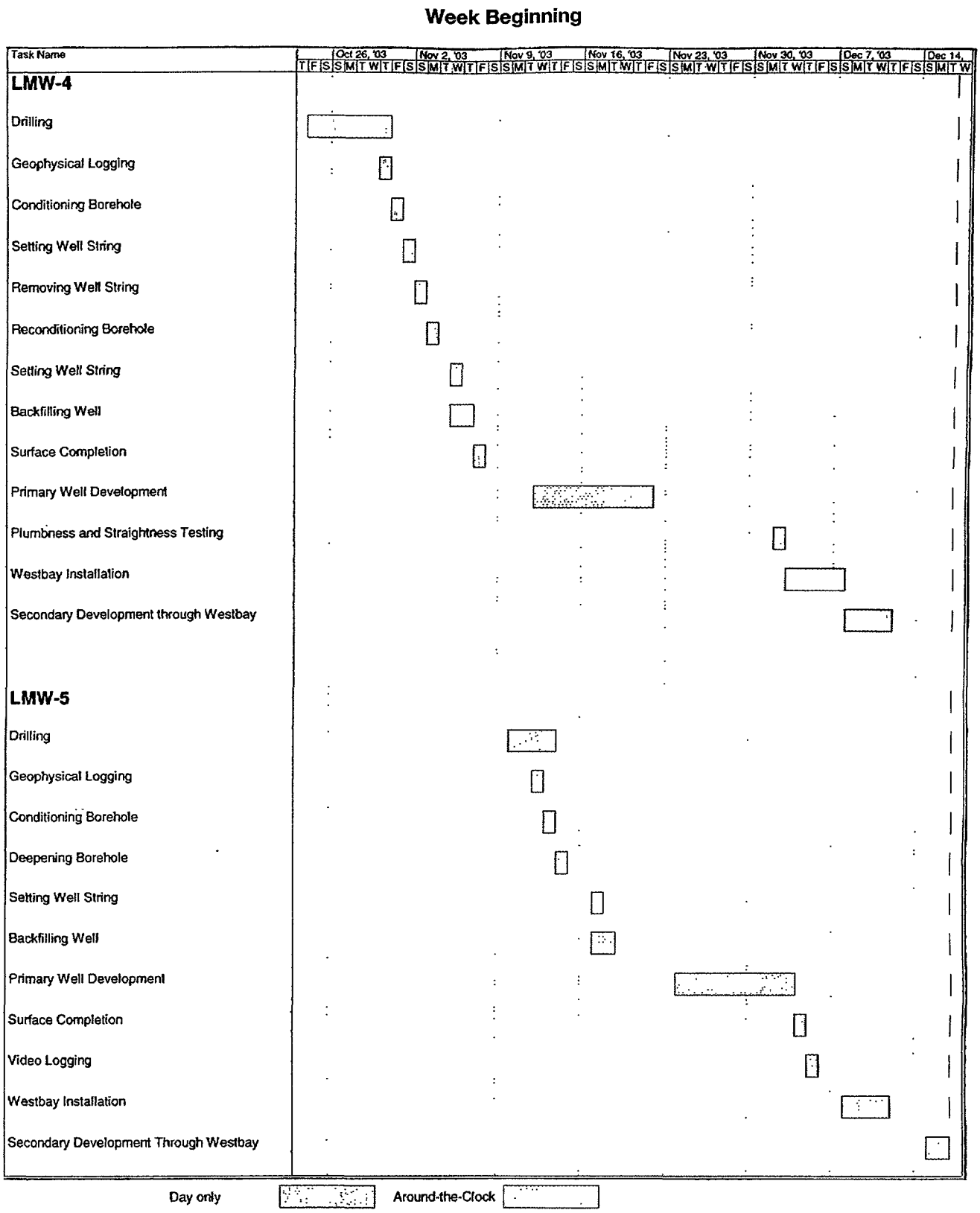
Storage, characterization and disposition of all the investigation-derived wastes that were accumulated as part of the installation of LMW-4 and LMW-5 was done in compliance with all applicable rules and regulations

Drilling fluid and soil cuttings were separated during drilling using a shale shaker mounted on the portable mud tank. The soil cuttings were stored in watertight 20 cubic yard roll-off bins. Cuttings were characterized for disposal by collecting representative soil samples from the storage containers (results are included in Appendix D). After analytical results were received, the cuttings and drilling mud were determined to be non-hazardous. Haz Mat Trans, Inc of San Bernardino, California transported the cuttings, under non-hazardous manifests, to Philadelphia Recycling Mine in Mira Loma, California. Copies of the waste manifests are included as Appendix E.

Well development produced groundwater and fine-grained formation materials. The water produced during the development and purging of the wells was stored in frac tanks. The water was sampled in accordance with the NPDES permit, and the sample results were in compliance for discharge into the Santa Ana Wash at both well locations (results are included in Appendix D). Discharge reports documenting volumes, dates, and analytical results (including results for VOCs, DBCP, oil and grease, and perchlorate) were submitted to the RWQCB in the NPDES permit reports.

3.8 CHRONOLOGY OF ACTIVITIES

The schedule in Figure 3-5 shows the time frame for the field work associated with the installation of LMW-4 and LMW-5. The items in red indicate when site activities were conducted on a twenty-four hour per day basis.



Time Frame for Field Work
LMW-4 and LMW-5

Date 4-04	Lockheed Martin	Figure
Project No. 52733	EARTH TECH A Tyco Infrastructure Services Company	3-5

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All the work conducted as part of the installation of LMW-4 and LMW-5 was in accordance with the *Health and Safety Plan; Multi-Port Well Installations; Lockheed Martin Corporation; Redlands Plume Characterization Project.* Daily safety meetings were conducted, and no accidents or injuries occurred during this project.

4.0 GROUNDWATER SAMPLING AND ANALYTICAL RESULTS

Groundwater samples were collected immediately after the primary development was completed for each screened interval of LMW-4 and LMW-5. Additional samples were collected after the Westbay multi-port system was installed and secondary development was completed. This section discusses the sampling procedures and analytical results, which are followed by a discussion of the occurrence of the TCE and perchlorate plume in the vicinity of LMW 4 and 5.

The first groundwater samples collected through LMW-4 and LMW-5 were taken directly through the screens (individually isolated) at the end of the development of each screen. Ultimately, certain analytical results from the first LMW-4 samples do not comport with the initial sampling through the LMW-4 Westbay ports several months later. The first sampling results for LMW-4 indicate low TCE and perchlorate concentrations, along with ubiquitous toluene; subsequent results for LMW-4 indicated higher TCE and perchlorate concentrations, and no toluene. It is interpreted that in spite of extensive development, the formation around LMW-4 still contained drilling water at the time of the first sampling. The initial LMW-5 results match the subsequent results from samples taken through the Westbay system.

4.1 SAMPLES TAKEN IMMEDIATELY AFTER DEVELOPMENT

Sampling Procedures. Groundwater samples were collected immediately after primary development was completed for each screened interval. Samples were collected from the discharge pipe of the pump that was used for development while the screened zone was still isolated by straddle packers. The pump discharge was slowed to a minimum flow rate prior to sample collection. The following sampling protocols were followed:

- Groundwater samples were collected when field parameters were stable and the screens had been properly developed. Field parameter measurements of pH, specific conductivity, temperature and turbidity were recorded.
- The samples collected for analysis of VOCs were preserved with HCL. The samples collected for analysis of cations were preserved with HNO3. The samples collected for other analytes were unpreserved.
- Samples were labeled and stored at approximately 4^0C in insulated coolers with containerized ice pending transfer to the project laboratory. Ten percent of the total

samples obtained were collected as QA/QC samples consisting of duplicates. A trip blank was included in each cooler that was delivered to the laboratory.

- Field data were recorded on appropriate field Purging/Sampling forms. Other field-related data not recorded on the Purging/Sampling Forms were recorded in a field notebook. Log entries in the field notebook were completed in accordance with Well Investigative Program (WIP) procedures.

Analytical Procedures. Collected samples were submitted under chain of custody to Del Mar Analytical in Irvine, California, a California-certified laboratory. Del Mar analyzed the submitted samples as follows:

- VOCs (by Method 601/602)
- perchlorate (by Method 314.0)
- anions including fluoride and bromide (by Method 300.0)
- cations (by Method 200.7)
- alkalinity (by Method 310.1)
- total dissolved solids (by Method 116.1).

Analytical Results. Sample results for trichloroethene (TCE), toluene, and perchlorate are given in Table 4-1.

All other results for VOCs were non-detect with the exception of chloromethane; this analyte was present in three samples in LMW-4 (in Ports 5, 6 and 7 at concentrations of 1.1, 3.3 and 3.4 ug/L respectively), and in one sample in LMW-5 (Port 5 at a concentration of 3.6 ug/L). Sample results for the anions and cations are given in Table 4-2.

TABLE 4-1. ANALYTICAL RESULTS FOR TOLUENE, TCE AND PERCHLORATE IN SAMPLES TAKEN IMMEDIATELY AFTER PRIMARY DEVELOPMENT (PRIOR TO WESTBAY INSTALLATION)

Sample Port	HSU	Toluene (µg/L)	TCE (µg/L)	Perchlorate (µg/L)
LMW-4, Port 1	2	15	0.7	ND (4.0)
LMW-4, Port 2	2	24	1.1	ND (4.0)
LMW-4, Port 3	3	3.7	0.73	ND (4.0)
LMW-4, Port 4	4	14	1.3	5.7
LMW-4, Port 5	4	15	1.2	5.9
LMW-4, Port 6	5	5.6	ND (0.5)	ND (4.0)
LMW-4, Port 7	6	4.4	ND (0.5)	ND (4.0)
LMW-4, Port 8	6	9.6	1.3	5.1
LMW-5, Port 1	2	12	ND (0.5)	8.0
LMW-5, Port 2	2	8.3	ND (0.5)	6.8
LMW-5, Port 3	3	6.8	ND (0.5)	ND (4.0)
LMW-5, Port 4	4	5.7	ND (0.5)	ND (4.0)
LMW-5, Port 5	4	5.5	ND (0.5)	ND (4.0)
LMW-5, Port 6	5	4.6	ND (0.5)	ND (4.0)
LMW-5, Port 7	6	4.5	ND (0.5)	ND (4.0)
LMW-5, Port 8	6	3.9	ND (0.5)	ND 4.0)
LMW-5, Port 9	6	3.4	ND (0.5)	ND (4.0)

Note: All other volatile organic compounds were non-detect except for chloromethane (up to 3.6 ug/L).

Results are questionable due to continuing presence of drilling fluid in samples collected after primary development was complete.

TABLE 4-2. ANALYTICAL RESULTS FOR ANIONS AND CATIONS IN SAMPLES TAKEN IMMEDIATELY AFTER PRIMARY DEVELOPMENT (mg/L)

	Calcium	Magnesium	Potassium	Sodium	Alkalinity	Bromide	Chloride	Fluoride	Nitrate (NO3)	Nitrate (NO2)	Orthophosphate	Sulfate	TDS
LMW-4													
Port 1	130	22	5.2	30	270	0	21	0	4.1	0	0	170	580
Port 2	110	18	4.6	33	240	0	19	0	12	0	0	130	490
Port 3	100	16	4.8	41	220	0	24	0	12	0	0	150	510
Port 4	98	16	4.3	32	230	0	19	0	15	0	0	120	460
Port 5	100	17	4.4	32	230	0	22	0	12	0	0	130	470
Port 6	55	7.2	3.8	48	150	0	20	0.58	7.8	0	0	90	320
Port 7	24	2.3	2.9	59	130	0	16	0	3.6	0	0	46	240
Port 8	100	18	4.4	31	240	0	19	0	12	0	0	130	470
LMW-5													
Port 1	68	21	3.7	95	310	0	72	0.65	28	0	0	210	830
Port 2	97	35	3.9	120	280	0	60	0.69	28	0	0	98	560
Port 3	55	10	4.1	65	180	0	30	0.71	6.9	0.81	0	92	370
Port 4	47	8.4	3.0	64	120	0	32	1.1	3.9	0	0	69	340
Port 5	14	1.1	1.2	130	120	0.51	100	8.5	1.1	0.69	0	15	400
Port 6	8.6	1.1	1.2	98	180	0	59	7.6	0.64	0.65	0	24	350
Port 7	9.6	0.89	1.1	110	120	0	110	7.1	0.77	0.78	0	26	380
Port 8	8.7	0.62	1.0	110	100	0.56	100	5.7	0.7	0	0	15	320
Port 9	7.3	0.89	0.87	94	100	0	72	5.7	0.81	0.52	0	27	340

4.2 INITIAL SAMPLING THROUGH THE WESTBAY SYSTEM

Sampling Procedures. Groundwater samples were collected on January 20 and 21, 2004 in accordance with the State of California Regional Water Quality Control Board – Los Angeles Region (LARWQCB) Well Investigation Program (WIP) standards. The procedures and protocols that were used during sampling of the two new multi-port wells through the multi-port system are as follows:

- Prior to sampling, the hydraulic head at the port was measured and recorded. Since each port has a different head (decreasing downward) this served as a way of checking that the packers were still adequately inflated to isolate each sampling zone. Measured heads are given in Table 4-3.
- Groundwater samples from the Westbay multi-port wells were collected with specialized equipment that fits into each sampling port. This is a micro-purge system requiring approximately 1.5 liters of water to be extracted for the sampling process. Field parameter measurements of pH, specific conductivity, temperature and turbidity of the water were recorded.
- The samples collected for analysis of VOCs were preserved with HCL. The samples collected for analysis of vanadium and arsenic were preserved with HNO3. The samples collected for other analytes were unpreserved.
- Samples were labeled and stored at approximately 4^0C in insulated coolers with containerized ice pending transfer to the project laboratory. Ten percent of the total samples obtained were collected as QA/QC samples consisting of duplicates. A trip blank was included in each cooler that was delivered to the laboratory.
- Field data were recorded on appropriate field forms including Purging/Sampling Forms and Westbay Instrument field forms. Other field-related data not recorded on the Purging/Sampling Forms were recorded in a field notebook.

Analytical Procedures. Collected samples were submitted under chain of custody to Del Mar Analytical in Irvine, California, a California-certified laboratory. Del Mar analyzed submitted samples for the following:

- VOCs (by Method 601/602)
- perchlorate (by Method 314.0)
- arsenic and vanadium (by Method 200.8)

TABLE 4-3. HEAD MEASUREMENTS IN INDIVIDUAL WESTBAY SAMPLING PORTS

Sample Port	Depth to Port (feet bgs)	Port Pressure (psi)	Water Level Elevation (msl)
LMW-4, Port 1; HSU 2	110	27.96	945.47
LMW-4, Port 2; HSU-2	265	95.04	945.22
LMW-4, Port 3; HSU-3	395	148.98	939.66
LMW-4, Port 4; HSU-4	565	220.61	934.91
LMW-4, Port 5; HSU-4	660	260.36	931.62
LMW-4, Port 6; HSU-5	780	311.88	930.47
LMW-4, Port 7; HSU-6	900	354.78	909.44
LMW-4, Port 8; HSU-6	995	395.80	909.08
LMW-5, Port 1; HSU-2	85	32.28	939.85
LMW-5, Port 2; HSU-2	165	66.91	939.74
LMW-5, Port 3; HSU-3	280	114.40	934.30
LMW-5, Port 4; HSU-4	445	185.45	933.21
LMW-5, Port 5: HSU-4	575	241.29	932.03
LMW-5, Port 6; HSU-5	635	267.04	931.44
LMW-5, Port 7; HSU-6	705	295.12	926.22
LMW-5, Port 8; HSU-6	805	338.18	925.56
LMW-5, Port 9; HSU-6	880	370.85	925.93

- fluoride (by Method 300.0)

Analytical Results. Laboratory results for TCE, perchlorate, arsenic, vanadium and fluoride are presented in Table 4-4. All other VOC results were non-detect.

Comparison With Results from Samples Taken Immediately After Development.

A comparison of the analytical results was made between the samples collected immediately after well development and the samples collected through the Westbay system. Toluene was present in all the samples collected after development, ranging in concentration from 3.4 ug/L in LMW-5, Port 9 to 24 ug/L in LMW-4, Port 2. No toluene was detected in any samples collected through the Westbay system at the reporting limit of 0.5 ug/L.

TCE and perchlorate concentrations were higher in samples collected through the Westbay system in two of the ports of LMW-4 (Ports 4 and 5, HSU 4). TCE results from ports 4 and 5 from samples after development were 1.3 and 1.2 ug/L, respectively; results for these same two ports through the Westbay system were 4.6 and 3.6 ug/L respectively. Perchlorate results from samples collected after development from these same two ports were 5.7 and 5.9 ug/L, while results for samples collected through the Westbay system were 28 and 45 ug/L.

A comparison of the results for TCE and perchlorate in LMW-5 for all nine ports showed consistency between the samples collected immediately after development and the samples collected through the Westbay system, with most results being non-detect at the reporting limit.

A stabilization period was needed for water in the vicinity of LMW-4 to equilibrate with normal groundwater conditions. This was necessary at LMW-4 because of the higher amount of drilling fluid used and lower amount of development water removed as compared to LMW-5.

TABLE 4-4. ANALYTICAL RESULTS FOR VOCS, PERCHLORATE, ARSENIC, VANADIUM AND FLUORIDE IN THE FIRST SAMPLES TAKEN THROUGH THE WESTBAY SAMPLING PORTS

Sample Port	TCE (ug/L)	Perchlorate (ug/L)	Arsenic (ug/L)	Vanadium (ug/L)	Fluoride (mg/L)
LMW-4, Port 1	0.76	ND (4.0)	ND (1.0)	4.6	0.62
LMW-4, Port 2	2.5	7.1	1.2	5.3	0.60
LMW-4, Port 3	ND (0.5)	4.7	ND (1.0)	5.5	0.86
LMW-4, Port 4	4.7	29	1.0	4.5	0.64
LMW-4, Port 5	3.6	45	1.1	4.7	0.70
LMW-4, Port 6	ND (0.5)	ND (4.0)	1.5	6.6	0.98
LMW-4, Port 7	1.3	4.5	1.2	5.4	0.65
LMW-4, Port 8	ND (0.5)	ND (4.0)	4.2	3.7	0.89
LMW-5, Port 1	ND (0.5)	5.8	1.4	7.4	0.57
LMW-5, Port 2	ND (0.5)	6.4	3.2	9.5	0.75
LMW-5, Port 3	ND (0.5)	ND (4.0)	5.2	4.1	0.60
LMW-5, Port 4	ND (0.5)	ND (4.0)	9.1	2.8	0.75
LMW-5, Port 5	ND (0.5)	ND (4.0)	42	6.5	1.2
LMW-5, Port 6	ND (0.5)	ND (4.0)	1600	2.9	2.20
LMW-5, Port 7	ND (0.5)	ND (4.0)	11	4.9	1.40
LMW-5, Port 8	ND (0.5)	ND 4.0)	83	5.9	1.3
LMW-5, Port 9	ND (0.5)	ND (4.0)	12	2.4	1.3

5.0 INTERPRETATIONS

The hydrogeologic and analytical findings have been interpreted with respect to the following four topics:

- Hydrostratigraphy. HSU's 1 through 6 are clearly identified in the geophysical and lithologic logs and are readily correlated between the two well sites, and with sites of other multilevel monitoring wells in the region.
- Vertical Groundwater Gradients. In both LMW-4 and LMW-5, the groundwater pressure decreases downward (i.e., exhibits the potential for downward vertical flow). This pattern seems to be consistent with downward gradients exhibited by other multiport wells in the vicinity of the Colton Narrows.
- Perchlorate Distribution. Perchlorate is encountered in both HSU-2 and HSU-4 at the location of LMW-4. At LMW-5, perchlorate is evident only in HSU-2.
- TCE Distribution. TCE was detected at the location of LMW-4 at several depths, but at concentrations below the MCL. It was not detected at LMW-5 at the reporting limit of 0.5 ug/L.

5.1 HYDROSTRATIGRAPHIC CORRELATION BETWEEN LMW-4 AND LMW-5 AND OTHER WELLS.

Sediments in the Bunker Hill Basin generally consist of unconsolidated alluvial fan deposits derived from the local San Gabriel and San Bernardino Mountains. Alluvial fan deposits interfinger with river-channel deposits, primarily from the Santa Ana River and Lytle Creek, and with freshwater marsh deposits associated with groundwater discharge near the Colton Narrows and San Jacinto Fault. In spite of the usually homogeneous nature of alluvial/fluvial deposits, it is nonetheless possible to discern distinct aquifer and aquitard layers that are traceable over a substantial area.

Basis for Correlations. A basin-wide hydrogeologic framework was first interpreted from driller's logs and water-level data for about 880 wells by Dutcher and Garrett (1963). Dutcher and Garrett divided the basin sediment into upper, middle, and lower zones. Each zone contains a fine-grained, less permeable hydrogeologic unit (aquitard) overlying a coarse-grained more permeable hydrogeologic unit (aquifer). Later, the upper, middle, and lower zones were categorized into hydrostratigraphic units (Geotrans, Inc., 1997), creating hydrostratigraphic unit

1 through 6 (HSU-1 to HSU-6). HSU-1, 3, and 5 are the aquitards, and HSU-2, 4, and 6 are the aquifers.

Figure 5-1 is a hydrostratigraphic column for the study area showing HSU-1 through 6. The data represented on the figure are specific to the vicinity of the study area. Approximate thickness, depth range (shallowest top to deepest bottom for each HSU), and lithology within the study area are shown. The depths of the HSUs are based on evaluation of geophysical logs from numerous wells. From those picks, a stratigraphic framework for the study area was derived, which serves as a basis for the data interpretation.

Continuity of Hydrostratigraphic Units Throughout the Vicinity. Continuity of the hydrostratigraphic units is reflective of erosional, depositional, and structural features through time. Changes include, thickening, thinning, down or up sloping or even possibly discontinuity of a HSU.

Figure 2-2, Section 2.3, demonstrates, in a cross-section paralleling Santa Ana Wash, the thickness changes of the HSUs across wells LMW-1 through LMW-7. Traversing from the northeast to the southwest, the HSUs are relatively thinner and shallower to the northeast. Toward the southwest, the units descend, and increase in thickness. At the location of the San Bernardino Fault, the units start to ascend, and HSU-5 appears to thin towards the southwest. Between the San Bernardino Fault and the San Jacinto Fault, structural deformation, in part, causes the units to thin, and slope upward or downward.

The hydrostratigraphy at the LMW-7 site departs somewhat from this pattern because LMW-7 is furthest away (south) from the cross-section line.

Based on this understanding, flow, and transport of contaminants in the vicinity of the Colton Narrows will be controlled by the geometry of the aquifers and confining layers as previously defined up-gradient.

HSU #	Approximate Thickness*	Depth Range*	Stratigraphic Column	Lithology[a]	General Description
1	50 - 140 ft.	0 to 140 ft.		Clayey Silt (ML) Silty Sand (SM) Sand (SP) Clay (CH)	*Fine-grained deposits.* May be replaced by river channel deposits where streams have eroded them away.
2	75 - 275 ft.	50 to 370 ft.		Sand (SW) Gravelly Sand (SW) Silty Clay (CL) Silty Sand (SM) Gravelly Sand (SW)	Consists of boulders, gravel, and sand near the base of the mountains and grades to finer grained sand, silt, and clay near the San Jacinto Fault.
3	125 - 345 ft.	145 to 545 ft.		Sand (SW) Clayey Sand (SC) Gravelly Sand (SW) Silty Sand (SM) Sandy Clay (MH) Silty Clay (CL)	Consists mostly of fine-grained layer. At the base of the mountains, it is course grained. Some sand and gravel layer are areally extensive and highly permeable.
4	125 - 215 ft.	365 to 725 ft.		Sand (SW) Gravelly Sand (SW) Silty Clayey Sand (SC) Gravelly Sand (SW)	Mostly well-sorted gravel and sand layers interbedded in places with silt and clay layers.
5	75 - 255 ft.	560 to 860 ft.		Clay (CH) Sitly Clay(CL) Sand (SW) Clayey Sand (SC)	Has a greater % of fine-grained sediments than does HSU-6.
6	?	655 ft. to ?		Gravelly Sand (SP) Silty Gravelly Sand (SP) Silty Sand (SM) Gravelly Sand (SP) Sand (SW)	Silty gravel and silty sand layers and interbedded with silt and clay layers.

Note: * Approximate thickness and depth range are based on data from the area of investigation (southwest corner of Bunker Hill Basin). Depth range in feet below ground surface.

? = Unknown value due to data not deep enough.

(a) Lithology taken from LMW-4 and LMW-5 well logs, with Unified Soil Classification System used for description.

Hydrostratigraphic Column

Date 05-04	Lockheed Martin	Figure
Project No. 52773	EARTH TECH A Tyco Infrastructure Services Company	5-1

52773.03.03

5.2 VERTICAL GROUNDWATER GRADIENTS NEAR THE EXIT FROM BUNKER HILL BASIN

Throughout much of Bunker Hill Basin, piezometric heads in the deeper aquifers are generally either the same or higher than heads in the overlying aquifers. Historically, vertical head gradients in the vicinity of Colton Narrows have been upward—hence the general references to this area as the "Pressure Zone". The present results indicate that the vertical gradient is consistently downward in the vicinity of Colton Narrows. A southwestward trend of lower potentiometric levels and increased downward head gradients likely is related to proximity of the City of Riverside's Gage, Raub, and Warren well fields to the Narrows and the LMW wells. These fields produce much of their water from HSUs 4 and 6.

The Riverside Highland Water Company's Bunker Hill Well Field (near LMW-5) is being pumped specifically to reduce water levels in the Pressure Zone in conjunction with the San Bernardino Valley Municipal Water District's program for lowering risks due to seismic liquefaction by lowering the water table. Historically, this area was swampy, due to upwelling groundwater. It is noteworthy that a substantial thickness of the upper soil at both LMW-4 and LMW-5 was noted to be gleyed (see the lithologic logs in Appendix A), indicating a long prehistory of swampy conditions as well.

The following observations document the influence of the various pumping centers on groundwater gradients:

- The Gage well field is likely contributing to the downward gradients in nearby monitoring wells MLW-4 and LMW-4, and to a lesser extent, up Santa Ana Wash at LMW-3 and LMW-2, and down the Wash at LMW-5.
- Eastward, away from the Gage field, monitoring wells LMW-6 and LMW-1 have higher water levels than the wells in closer proximity to the major pumping centers.
- Head elevations in LMW-4 and LMW-5 generally decrease with depth (Table 4-3). For LMW-4, vertical head elevations vary from 945 feet above MSL (mean sea level) at Port 1 to 909 feet above MSL at Port 8. Large differences in head elevation appear between Ports 2 through 5; a much higher gradient appears between Ports 6 and 7 than between Ports 2 thru 5.
- Head elevations at LMW-5 vary from 940 feet above MSL at Port 1 to 926 feet above MSL at Port 9. Two major steps occur in head pressure resulting in increased gradients between Ports 2 and 3, and between Ports 7 and 8. While hydraulic head elevation

generally decreases with depth, variations in head gradients do not appear systematic with depth.

Comparison with Vertical Gradients in Other Monitoring Wells in the Vicinity. Vertical head distributions for the multi-port wells included in Figure 5-2 show a systematic change from northeast to southwest. Water levels generally decrease toward the southwest, or down Santa Ana Wash toward the Colton Narrows.

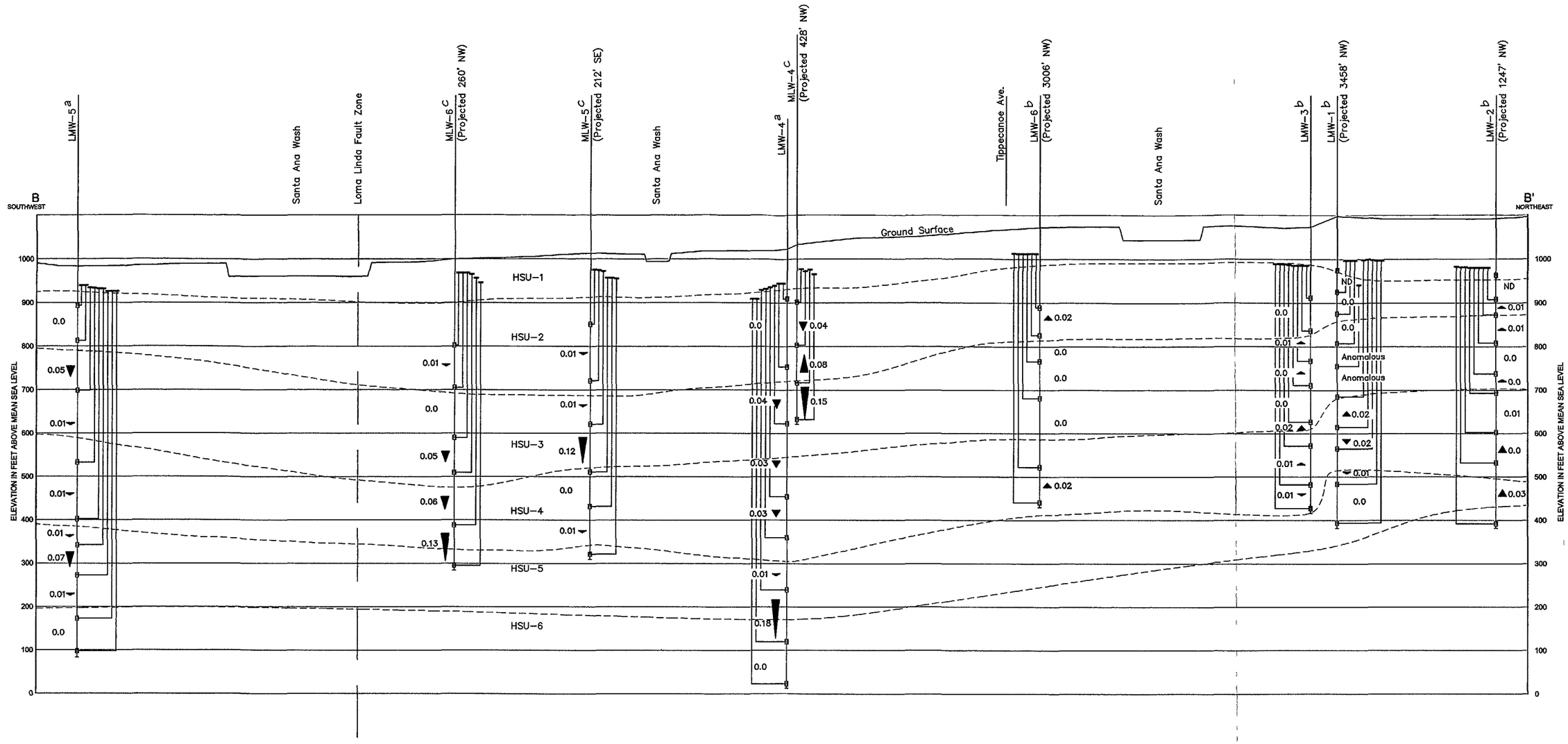
Beginning southwest of Tippecanoe Avenue, at the location of MLW-4 and LMW-4, the magnitudes of the downward vertical head gradients increase; wells southwest of Tippecanoe Avenue show greater downward head gradients compared with wells northeast of Tippecanoe.

5.3 DISTRIBUTIONS OF PERCHLORATE AND TCE

Perchlorate. Perchlorate concentrations—from samples taken through the Westbay ports—are shown in a northeast-southwest cross section in Figure 5-3. (The results from the samples taken after primary development of the screens are not used because the formation, particularly at LMW-4 appears to have still contained drilling fluids at the time of that sampling event [discussed in Section 4.1].) Generally, the perchlorate concentrations decrease down-gradient, from a high value of 100 ug/L at LMW-1, to 20 to 50 ug/L at LMWs 4, 6, 3, and 7, to less than 10 ug/L at LMW-5. Riverside Highland Water Company #2 and Riverside Warren #1 lie between LMW-5 and LMW-4, and have concentrations of 11 and 7 ug/L, respectively, as of December 1, 2003.

North of LMW-6, the highest concentrations occur throughout HSUs 2 through 5. From the location of LMW-6 southward, the core of the perchlorate plume (the highest concentrations) appears to be limited to HSU-4, but lower concentrations persist in HSUs 2 and 3. Farthest down-gradient, at LMW-5, the deep, HSU-4 and –5 perchlorate is absent, and the plume appears to be limited to HSUs 2 and 3.

The absence of perchlorate in the all but the uppermost two ports in LMW-5 indicates that the perchlorate has not reached the vicinity of the Narrows in the deeper HSUs. As was noted in Section 5.2, there is a downward vertical piezometric gradients that would cause groundwater to move from HSU to deeper aquifers. This would suggest that flow in HSU-4 is no longer to the



Legend:

Well Location

Screened Section

Mapped Faults

Approximate Hydrostratigraphic Unit (HSU) Boundary

0.05 ▼ Vertical Hydraulic Head Gradient Between Ports, Size Indicates Magnitude, Text Indicates Gradient (ft/ft)

Hydraulic Head Elevation (Water Level)

ND No data, Insufficient Water in Port

NOTES

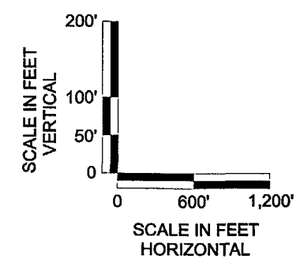
a Water Levels Taken January 2004

b Water Levels Taken June 2003

c Water Levels Taken January 2000

Notes:

See Figure 2-1 for Cross Section Location



VERTICAL HYDRAULIC GRADIENTS AND HEAD ELEVATIONS FOR LMW-4 AND LMW-5

LOCKHEED MARTIN

EARTH TECH
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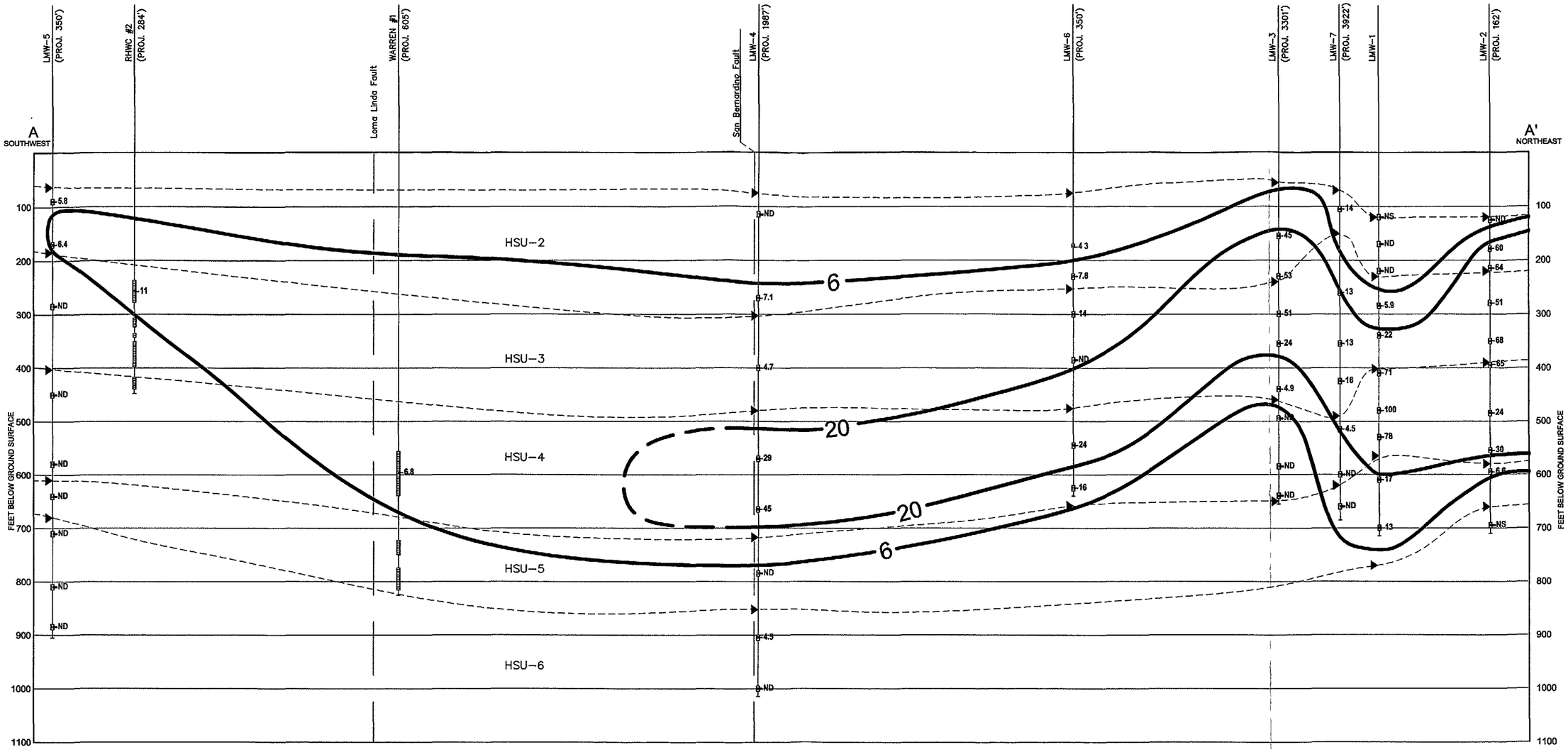
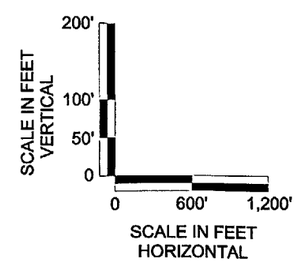


Legend:

- Well Location
- Screened Section
- 5.4 — Perchlorate µg/L Highest Value Between March, 2002 and January, 2004
- Perchlorate Contour in µg/L
- ND — Non Detected Above Method Detection Limit
- NS — Not Sampled
- Mapped Faults
- Approximate Hydrostratigraphic Unit (HSU) Boundary
- Geophysical Log Interpretation For HSU Boundary

Notes:

See Figure 2-1 for Cross Section Location



Perchlorate Concentrations on Cross-Section A-A'

LOCKHEED MARTIN

EARTH TECH
A Tyco Infrastructure Services Company

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DATE:	05/13/04	

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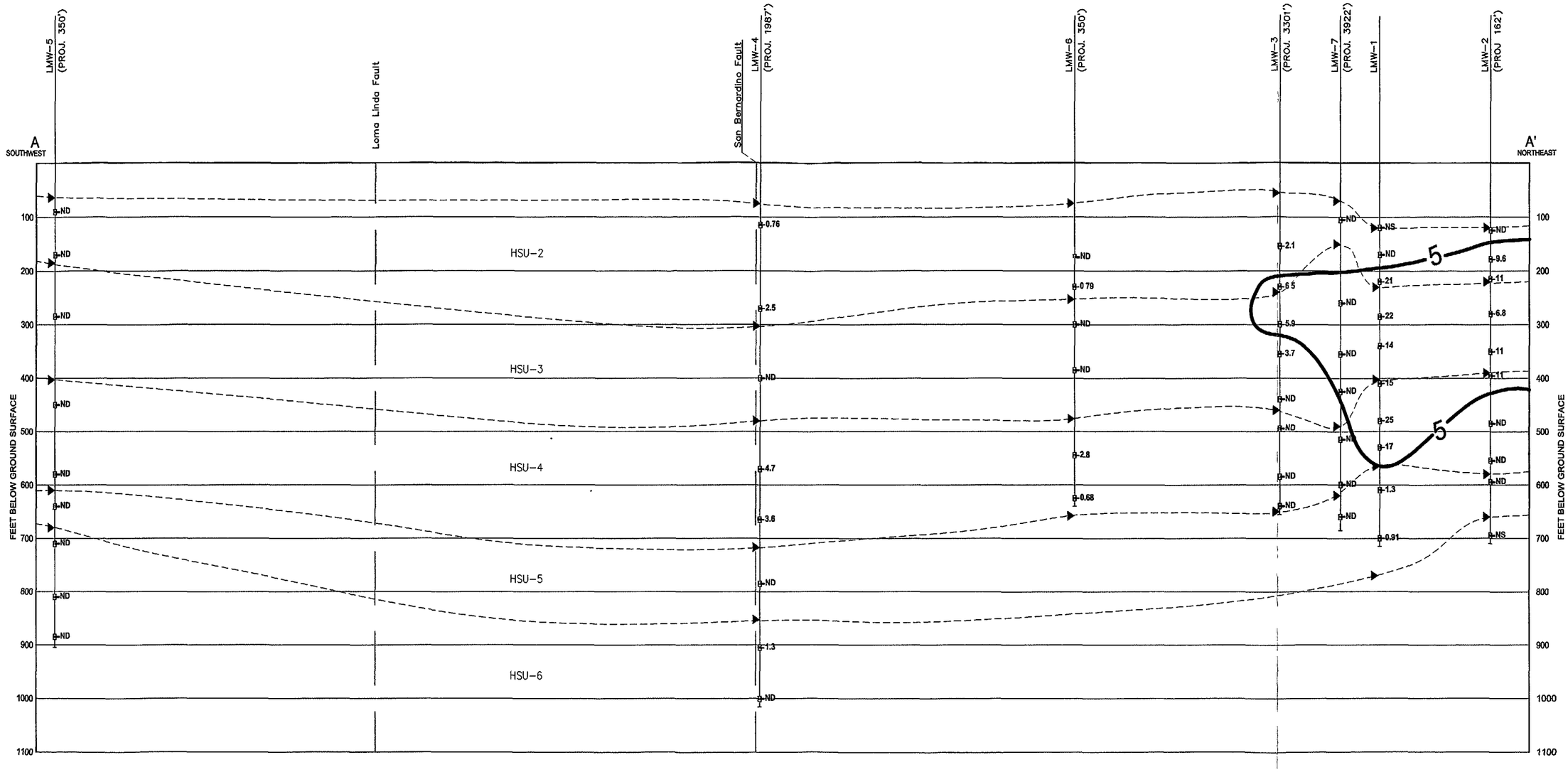
southwest, but may have reversed toward the northeast—toward the heavily pumped Gage and Raub well fields. Under such a scenario, the plume in HSU 4 simply cannot reach the vicinity of LMW-5, and may be being diluted at its leading edge by downward vertical flow from HSUs 2 and 3, above.

TCE. Current TCE concentrations range from a high of 25 µg/L in LMW-1, Port 7 to the lowest detected value of 0.76 µg/L in LMW-4, Port 1. TCE was not detected down gradient from LMW-4 in LMW-5. Figure 5-4 is a cross-section with TCE results labeled and contoured across the wells.

The TCE appears to be principally contained in HSU-2 through HSU-4, although in well LMW-1 TCE results are deeper and possibly derived from HSU-6. The only other result in or near HSU-6 is in well LMW-4 with a result of 1.3 µg/L. There was a non-detect on the screen intervals above and below which might suggest that LMW-4 Port 8 has not reached equilibrium with the formation.

On the line of the cross-section, TCE above the MCL is limited to the area north of LMW-6.

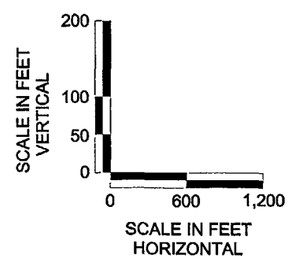


Legend:

- Well Location
- Screened Section
- 5.4 — TCE µg/L Highest Value Between March, 2002 to January, 2004
- TCE Contour in µg/L
- ND — Non Detected Above Method Detection Limit
- NS — Not Sampled
- Mapped Faults
- Approximate Hydrostratigraphic Unit (HSU) Boundary
- Geophysical Log Interpretation For HSU Boundary

Notes:

See Figure 2-1 for Cross Section Location



TCE Concentration on Cross-Section A-A'

LOCKHEED MARTIN

EARTH TECH
A Tyco Infrastructure Services Company

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PROJ.:	52773	
DATE:	05/13/04	

6.0 DISCUSSION AND RECOMMENDATIONS

6.1 DISCUSSION

Multi-port monitoring wells LMW-4 and LMW-5 were successfully installed at strategic locations at the leading edge of the Redlands perchlorate and TCE plumes. Sampling ports, equipped with Westbay micro-purge sampling systems were deployed at each of the targeted hydrostratigraphic intervals, the filter packs were developed, and the wells were sampled for perchlorate, VOCs and several other analytes.

The work was completed on schedule, in compliance with all permit requirements, and with no lost time due to accidents.

Field Findings. Two key findings of the field activities are as follows: fluoride (by Method 300.0)

- Stratigraphic Continuity. Stratigraphic information from the borings confirmed previous descriptions of the location and characteristics of the units.

- Downward Vertical Hydraulic Gradients. The vertical hydraulic gradients in LMW-4 and –5 are downward (i.e., piezometric heads are lower in the deeper units than in the shallower units). This comports with comparable observations at other multi-level wells in the vicinity, and confirms that the vertical hydraulic gradient is currently dominantly downward in the area before Colton Narrows that is referred to as the "Pressure Zone". Hence, it appears that vertical flow in the vicinity of Colton Narrows is not upward from the deeper units (as it has been historically), but may currently include a small component of downward vertical movement.

Analytical Findings. Three key findings of the analytical portion of the work are as follows:

- LMW-4 Sampling Results Immediately After Primary Well Development. The perchlorate and VOC concentrations in the samples that were collected immediately after the primary development of the well screens in LMW-4 do not match the results of the samples that were taken later through the multi-port sampling system. This mismatch, plus the presence of toluene, which is not a characteristic contaminant in this region, indicates that the formation around the well was still impacted by drilling fluids at the time of the first sampling. This problem did not occur at LMW-5, which required less make-up water during drilling and which had a longer period of development.

- TCE and Perchlorate Concentrations at LMW-4. TCE concentrations at LMW-4 are uniformly low and below the MCL. Since this well is situated directly between the Redlands Plume impacted Gage well field and the Norton Plume impacted Raub well

field, this strongly suggests that the Norton and Redland plumes are not co-mingled, and that the Gage well field is effective at capturing the Redlands TCE plume. Perchlorate concentrations in LMW-4 are above the Action Level, and are comparable to perchlorate concentrations in both the Gage and the Raub well fields.

- TCE and Perchlorate Concentrations at LMW-5. TCE was not measured in LMW-5, indicating that neither the Redlands TCE Plume nor the Norton TCE Plume extend this far down gradient. Perchlorate was measured at a low concentration above the AL only in HSU2 but is absent in the other HSUs. This conforms to analytical results from two nearby shallowly screened wells in the Riverside Highland Water Company's Bunker Hill well field.

6.2 RECOMMENDATIONS

The following recommendations are made with respect to the above findings:

1. LMW-4 and LMW-5 are ready to be integrated into Lockheed Martin's monitoring and sampling programs.

2. Semi-annual head measurements (without analytical sampling) of all of the LMWs would benefit our understanding of the hydraulic framework in the vicinity of the Colton Narrows and can assist in validating the groundwater flow model.

3. The LMWs are currently sampled annually in the middle of the high-demand pumping season. It would be beneficial to sample LMW-5 (specifically HSU-2) in the low-pumping months as well, particularly if the proximity of the Redlands perchlorate plume to the Colton Narrows is a concern.

7.0 LIST OF REFERENCES

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APPENDIX A

GINT LOGS

EARTH TECH

Borehole/Well Construction Log

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	**Borehole Number:**	**LMW-4**
Borehole Location. San Bernardino, California	*Northing:* 210871.248	*Easting:* 2222161.31	Sheet *1* of *32*
Drilling Agency: Beylik Drilling	Driller: Ernest/Willie/Chris		
Drilling Equipment: 1930-1940's WinterWeies	Date Started: 10/24/2003	Total Depth (feet)·	1105.0
Drilling Method: Reverse Circulation ARCH	Number of Samples: 0	Date Finished· 12/7/2003	Depth to Bedrock (feet) NA
Drilling Fluid: Water	Borehole Diameter (in): 12.75	Depth to Water (feet). *Drilling:* 0 00	*Static:* 0.00
Completion Information· Completed as a multiport monitoring well.		Elevation (feet MSL) : *Ground:* 1023.75	*Top of Casing:* NA
		Logged By: T Vespalec	Checked By: Matt Werner

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analyses: FID (ppm) Sample/Background	Field Analyses: PID (ppm) Sample/Background	Field Analyses: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM			
5													
10										ML	SANDY SILT(ML); Greenish Gray (Gley1-6/1), dry, firm; 70% low plasticity silt; 30% fine sand.		
15													
20										SC	CLAYEY SAND(SC); Light Greenish Gray (Gley1-7/1); dry; 70% medium to fine, subangular sand; 30% medium plasticity clay.		
25													
30													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 2 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
35										CH	SILTY CLAY(CH); Greenish Gray (Gley1-6/1); dry; firm; 60% high plasticity clay; 40% silt.		
40										SM	SAND(SM); Dark Gray (Gley1 4/N); moist; 95% fine sand; 5% silt		
45										ML	CLAYEY SILT(ML); Dark Greenish Gray (Gley1 4/5GY); moist, soft; 50% silt; 35% clay; 15% sand; trace fine, angular, rock fragment gravel.		Adjusted rig to 3rd gear.
50					1920					SM	SAND(SM); Very Dark Greenish Gray (Gley2 3/5BG); moist; 95% fine to medium sand; 5% silt.		10/25/2003
55										SM	SILTY SAND(SM); Dark Greenish Gray, (Gley1 4/5GB); moist; 85% fine sand; 15% silt.		
60										SM	Dark Gray (5Y 4/1); grading to 95% sand.		Possible diesel-like odor present-per driller.
65													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 3 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	Grading to 90% fine to medium sand; with 5% fine, angular gravel.		
70										CH	CLAY(CH); Dark Greenish Gray (Gley 1 4/10GY); wet, soft; 85% high plasticity clay; 15% silt; trace sand.		
75					2145					SM	SAND(SM); Olive Gray (5Y 5/2); moist; 95% fine sand; 5% silt.		10/25/2003
80										CH	CLAY(CH); Dark Greenish Gray (Gley 1 4/10GY); wet, soft; 90% high plasticity clay; 5% silt; 5% sand		
85										CH	Same As Above.		***Top of HSU-2 at 85' bgs.
90										SW	GRAVELLY SAND(SW); Brown (10YR 4/3); wet; 90% fine to coarse sand, 10% fine to coarse, subangular gravel.		
95										SW	Same As Above.		
100													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 4 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					0115					SW	SAND(SW); Brown (10YR 4/3); wet; 95% fine to coarse sand; 5% fine to coarse, subangular gravel.		10/26/2003
105										SM	SAND(SM); Brown (10YR 4/3); wet; 95% fine sand; 5% silt.		
110										SW	SAND(SW); Brown (10YR 4/3); wet; 80% fine sand; 15% medium to coarse sand; trace fine, angular gravel; trace fines.		
115										SP	GRAVELLY SAND(SP); Very Dark Grayish Brown (10YR 3/2); wet; 80% medium to coarse sand; 20% fine, angular to subangular gravel.		
120										SP	Same As Above.		
125					0252					SC	CLAYEY SAND(SC); Brown (10YR 4/3), wet, 85% fine to medium sand; 10% clay; trace fine, angular to subangular gravel		10/26/2003
130										SW	GRAVELLY SAND(SW); Very Dark Grayish Brown (10YR 3/2); wet; 80% fine to coarse sand; 15% fine to coarse, angular to subangular gravel; trace clay.		
135													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 5 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	Same As Above.		
140										SW	Same As Above.		
145										SM	GRAVELLY SAND(SM); Very Dark Gray (10YR 3/1); wet; 60% fine to coarse, subangular rock fragment sand; 35% fine, subangular rock fragment gravel; 5% silt.		
150					0505					SM	SAND(SM); Dark Grayish Brown (10YR 4/2); wet; 95% fine to medium, subangular rock fragment sand; 5% silt.		10/26/2003
155										SP	SAND(SP); Yellowish Brown (10YR 5/4); wet; 95% medium to coarse, subangular to angular rock fragment sand; trace fine subangular rock fragment gravel; trace silt		
160										SC	CLAYEY SAND(SC), Grayish Brown (10YR 5/2); wet, 85% fine to medium, subangular rock fragment sand; 15% low plasticity clay; trace fine gravel		
165										CH	SILTY CLAY(CH), Very Dark Gray (5Y 3/1); wet; very soft; 90% high plasticity clay, 10% micaceous silt.		
170													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 6 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	SAND(SP); Olive Brown (2.5Y 4/3), wet; 100% fine, micaeous sand; trace silt		
175					0800					SM	GRAVELLY SAND(SM); Olive Brown (2.5Y 4/3); wet; 55% fine, micaeous sand, 30% coarse; subangular rock fragment sand; 10% fine, subangular rock fragment gravel; 5% silt.		10/26/2003
180										SW	GRAVELLY SAND(SW); Dark Olive Brown (2.5Y 3/3); wet; 95% medium to coarse, subangular rock fragment sand, 5% fine, subangular rock fragment gravel.		
185										SC	CLAYEY SAND(SC); Dark Olive Brown (2.5Y 3/3); wet; 60% fine to medium, subangular rock fragment sand, 30% micaeous, black clay; 10% micaeous silt; (clay in clumps)		
190										SW	SAND(SW); Olive Brown (2.5Y 4/4); wet; 100% fine to coarse, subangular rock fragment sand, trace gravel and silt		
195										SW	GRAVELLY SAND(SW); Olive Brown (2.5 Y 4/4); wet; 65% fine to coarse, subangular rock fragment sand; 35% fine, subangular, mixed quartz-plagioclase granite and gabbro gravel.		
200					0956					SW	Dark Yellowish Brown (10YR 4/4); grading to 55% sand.		10/26/2003
205													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 7 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SC	CLAYEY SAND(SC); Dark Yellowish Brown (10YR 4/4); wet; 90% fine to coarse, subangular rock fragment sand; 10% medium plasticity clay; trace fine, subangular rock fragment gravel; trace silt.		
210										SW	GRAVELLY SAND(SW); Dark Olive Brown (2.5Y 3/3); wet; 55% fine to coarse, subangular rock fragment sand; 45% fine, subangular rock fragment gravel.		
215										SW	Same As Above.		
220										GW	SANDY GRAVEL(GW); Dark Brown (10YR 3/3); wet; 60% fine to medium, subangular rock fragment gravel; 40% fine to coarse, subangular rock fragment sand.		
225					1204					SW	GRAVELLY SAND(SW); Dark Yellowish Brown (10YR 3/6); wet; 75% medium to coarse, subangular rock fragment sand; 25% fine, subangular rock fragment gravel.		10/26/2003
230										SM	SILTY SAND(SM), Dark Yellowish Brown (10YR 4/4); wet; 70% fine to coarse, subangular rock fragment sand; 20% silt, 10% fine, subangular rock fragment gravel.		
235										SM	SILTY GRAVELLY SAND(SM), Dark Yellowish Brown (10YR 4/4); wet; 60% fine to coarse, subangular rock fragment sand; 30% fine, subangular rock fragment gravel; 10% silt.		
240													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 8 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Dark Yellowish Brown (10YR 4/6); wet; 80% fine sand; 20% silt.		
245										SC	CLAYEY SAND(SC); Dark Yellowish Brown (10YR 4/6), wet, 80% fine to coarse, subangular rock fragment sand; 20% medium plasticity clay.		
250					1315					SW	GRAVELLY SAND(SW); Yellowish Brown (10YR 5/8); wet; 70% fine to coarse, subangular to angular rock fragment sand, 30% fine, subrounded to subangular rock fragment gravel.		10/26/2003
255										SW	Dark Yellowish Brown (10YR 4/6); grading to 80% sand.		
260										SW	Grading to 70% sand.		
265										SW	Grading to fine to medium sand; fine, angular to subangular, mixed quartz/plagioclase/mafic/gabbro rock fragment gravel		
270										SW	Grading to 80% fine to coarse sand.		
275													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 9 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					1542					SW	Grading to 30% fine, subangular gravel.		10/26/2003
280										SW	Dark Brown (10YR 3/3); grading to 60% sand.		
285										SW	Yellowish Brown (10YR 5/4); grading to 40% fine to coarse, angular to subrounded gravel		
290										SW	Grading to Brown (7.5YR 5/3) sand; 20% fine, subangular gravel.		
295										CL	GRAVELLY SANDY CLAY(CL); Dark Grayish Brown (10YR 4/2); wet; soft, 50% medium plasticity clay; 30% fine to medium, subangular to subrounded sand; 20% fine to medium, subangular gravel.		
300					1730					SM	GRAVELLY SAND(SM); Brown (10YR 4/3); wet; 70% fine to coarse, subangular to subrounded sand; 20% fine, subangular gravel, 5% silt.		10/26/2003 ***Top of HSU-3 at 302' bgs.
305										SW	SAND(SW), Grayish Brown (10YR 5/2); wet; 90% fine to coarse, subangular to subrounded sand; 10% fine, subangular gravel; trace silt.		
310													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 10 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SAND(SM), Brown (10YR 4/3); wet; 95% fine, subangular to subrounded sand; 5% silt.		
315										GW	SANDY GRAVEL(GW); Brown (10YR 4/3); wet; 70% fine to medium, subangular gravel; 30% fine to coarse, subangular to subrounded sand.		
320										SC	CLAYEY SAND(SC); Brown (10YR 5/3); wet; 70% fine to medium, subangular to subrounded sand; 30% medium plasticity clay.		
325					0715					CH	SANDY CLAY(CH); Brown (10YR 5/3); wet; soft; 65% high plasticity clay; 35% fine to very fine sand; trace of coarse sand.		10/27/2003
330										SW	GRAVELLY SAND(SW); Light Yellowish Brown (10YR 6/4); wet; 85% fine to coarse, subangular to subrounded sand; 15% fine, subangular gravel		
335										SW	SAND(SW); Dark Grayish Brown (10YR 4/2); wet; 95% fine to coarse, subangular to subrounded sand; 5% fine, subangular gravel.		
340										CH	SANDY CLAY(CH); Dark Grayish Brown (10YR 4/2); wet; soft; 70% high plasticity clay; 30% fine to medium, subangular sand.		
345													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 11 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SC	CLAYEY SAND(SC); Yellowish Brown (10YR 5/4); wet; 60% fine to medium, subrounded sand; 40% medium plasticity clay.		
350					0755					SC	Color changes to Grayish Brown (10YR 5/2).		10/27/2003
355										CH	SANDY CLAY(CH); Grayish Brown (10YR 5/2); wet; stiff; 70% high plasticity clay; 30% fine to very fine sand.		
360										SW	GRAVELLY SAND(SW); Brown (10YR 5/3); wet; 80% fine to coarse, subrounded sand; 20% fine, subangular gravel; trace silt		
365										SW	Grading to Grayish Brown (10YR 5/2), subangular to subrounded sand, 15% fine, angular to subangular gravel with rock fragments.		
370										SW	Grading to Brown (10YR 5/3) sand; 30% fine, subangular to subrounded gravel.		
375					1010					SM	SILTY SAND(SM); Brown (10YR 5/3); wet; 70% fine to medium, subrounded sand; 30% silt.		10/27/2003
380													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name	LMC Multi-port Well Installation	Project Number	52773-03.03	Borehole Number:	LMW-4
Borehole Location	San Bernardino, California			Sheet	12 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	Grading to Pale Brown (10YR 6/3) sand; 10% silt.		
385										CH	SILTY CLAY(CH), Grayish Brown (10YR 5/2); wet, soft; 90% high plasticity clay; 10% micaeous silt.		
390										CH	SILTY SANDY CLAY(CH); Brown (10YR 5/3); wet; firm; 60% high plasticity clay; 25% fine sand, 15% micaeous silt.		
395										SM	SILTY SAND(SM), Light Yellowish Brown (10YR 6/4); wet; 75% fine to medium, subangular to subrounded sand, 25% silt		
400					1130					SP	GRAVELLY SAND(SP); Light Brownish Gray (10YR 6/2), wet; 65% medium to coarse, subangular to subrounded sand, 10% fine sand; 25% fine, angular to subrounded gravel.		10/27/2003
405										SM	SAND(SM); Light Brownish Gray (10YR 6/2); wet; 95% fine to coarse, subangular to subrounded sand, 5% silt.		
410										CH	SANDY CLAY(CH), Very Dark Gray (10YR 3/1); wet, stiff, 70% high plasticity clay; 30% fine to medium, subangular to subrounded sand.		
415													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 13 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										CH	SANDY SILTY CLAY(CH); Very Dark Gray (10YR 3/1); wet, stiff; 70% high plasticity clay; 15% silt; 15% fine sand.		
420										SW	GRAVELLY SAND(SW); Light brownish gray (10YR 6/2); wet; 85% fine to coarse, subangular to subrounded sand; 15% fine, subangular gravel.		
425					1305					SW	SAND(SW); Light Brownish Gray (10YR 6/2); wet; 100% fine to coarse, subrounded sand; trace silt.		10/27/2003
430										GP	SANDY GRAVEL(GP); Grayish Brown (10YR 5/2); wet; 60% fine to medium, angular to subrounded gravel; 40% medium to coarse, subangular to subrounded sand.		
435										SW	GRAVELLY SAND(SW); Light Yellowish Brown (10YR 6/4); wet; 65% fine to coarse, subangluar to subrounded sand; 35% fine, angular to subangular gravel.		
440										SW	Light Brownish Gray (10YR 6/2); grading to 85% sand.		
445										SM	SILTY SAND(SM); Brown (10YR 5/3); wet; 80% fine to medium, subangular to subrounded sand; 20% silt.		
450													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 14 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					1450					SW	SAND(SW); Light Brownish Gray (10YR 6/2); wet; 100% fine to coarse, subangular to subrounded sand.		10/27/2003
455										SM	SILTY SAND(SM); Dark Grayish Brown (10YR 4/2); wet; 80% very fine to medium, subangular to subrounded sand; 20% silt.		
460										CH	SILTY CLAY(CH); Grayish Brown (10YR 5/2); wet; firm; 70% high plasticity clay; 30% silt.		
465										SC	CLAYEY SAND(SC); Brown (10YR 4/3); wet; 75% fine sand; 20% high plasticity clay; 5% silt.		
470										CL	SITLY CLAY(CL), Olive Brown (2 5Y 4/3); wet; soft; 70% low plasticity clay; 20% silt; 10% very fine sand.		
475					1714					SP	SAND(SP); Brown (10YR 4/3); wet; 100% fine to medium sand; trace silt.		10/27/2003
480										SC	CLAYEY SAND(SC); Brown (10YR 4/3); wet; 75% fine to medium sand; 25% low plasticity clay.		***Top of HSU-4 at 480' bgs.
485													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number. 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 15 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	SAND(SW); Brown (10YR 5/3); wet; 100% fine to coarse sand; trace silt and clay.		
490										SC	CLAYEY SAND(SW) Brown (10YR 5/3); wet; 90% fine to coarse sand; 5% low plasticity clay; 5% fine, subangular gravel.		
495										SW	SAND(SW); Brown (10YR 5/3); wet; 100% fine to coarse sand; trace fine, subangular to angular gravel.		
500					1845					SC	CLAYEY SAND(SC); Brown (10YR 5/3); wet; 90% fine to coarse sand; 5% low plasticity clay; 5% fine, angular to subangular gravel.		10/27/2003
505										SW	SAND(SW); Brown (10YR 5/3); wet; 90% fine to medium sand; 10% coarse sand; trace fine, subangular gravel; trace clay		
510										SW	GRAVELLY SAND(SW); Brown (10YR 5/3); wet; 80% fine to coarse sand; 20% fine to coarse, subangular gravel.		
515										SW	Grading to 10% fine, subangular gravel		
520													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 16 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	SAND(SW); Brown (10YR 5/3); wet; 90% fine to medium sand; 10% coarse sand; trace fine to coarse, subangular gravel.		
525					2025					SW	Grading with trace coarse sand.		10/27/2003
530										SW	Grading to 90% fine to coarse sand; 10% fine, subangular gravel.		
535										SW	Same As Above.		
540										SW	Grading to 10% fine to coarse, angular gravel.		
													542-546, Hard drilling chatter intermittent; driller reports boulders likely.
545										SW	Grading to 95% fine to coarse, subangular rock fragment sand; 5% fine, angular rock fragment gravel.		
550					0447					SW	Grading to medium to coarse, quartz/plagioclase sand.		10/28/2003
555													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name	LMC Multi-port Well Installation	Project Number	52773-03 03	Borehole Number:	LMW-4
Borehole Location	San Bernardino, California			Sheet	17 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	Grading to Grayish Brown (10YR 5/2); fine to medium, rock fragment sand; trace fine rock fragment gravel.		557-568; Very hard drilling with heavy chatter and 2 inch lifting on drill head.
560										SC	CLAYEY SAND(SC); Grayish Brown (10YR 5/2); wet; 85% fine to coarse, angular to subangular, quartz/plagioclase sand, 10% medium plasticity clay, 5% silt; trace fine, subangular rock fragment gravel.		
565										SM	SILTY GRAVELLY SAND(SM); Brown (10YR 4/3); wet; 45% fine to coarse, angular to subangular, quartz/plagioclase sand, 40% fine, angular to subrounded, plagioclase rock fragment gravel; 15% silt.		
570										GM	SILTY SANDY GRAVEL(GM); Brown (10YR 4/3); wet; 60% fine, subangular, quartz/plagioclase gravel; 30% medium to coarse, angular to subangular, quartz/plagioclase sand; 10% silt		572-575, Hard drilling intermittent.
575					0722					SM	SILTY GRAVELLY SAND(SM); Dark Grayish Brown (10YR 4/2); wet, 50% coarse to very coarse, subangular, plagioclase sand, 40% fine, subangular, plagioclase/mafic gravel; 10% silt, trace clay		10/28/2003, 575-580; Hard drilling with chatter intermittent and 1/2 inch lift on drill head
580										GM	SILTY SANDY GRAVEL(GM), Dark Yellowish Brown (10YR 4/4); wet, 60% fine, angular to subangular, plagioclase/mafic gravel, 30% coarse to very coarse, angular to subangular, quartz/plagioclase sand; 10% silt, trace medium plasticity clay		
585										GM	Same As Above		
590										CL	SILTY CLAY(CL), Gray (10YR 5/1); wet, soft; 70% medium plasticity clay; 30% silt		

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 18 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY GRAVELLY SAND(SM); Brown (10YR 4/3); wet; 45% medium to very coarse, angular to subangular rock fragment sand; 40% fine, subangular rock fragment gravel; 10% silt; 5% clay.		Heavy chatter encountered.
595										CL	SILTY CLAY(CL); Dark Grayish Brown (10YR 4/2); wet; firm; 70% medium plasticity clay; 20% silt; 10% fine to coarse, subangular rock fragment sand; trace fine gravel; mica present.		
600					1000					SM	SILTY SAND(SM); Very Dark Grayish Brown (10YR 3/2); wet; 85% fine to coarse, angular, quartz/plagioclase/mafic sand; 15% silt; trace fine, subangular rock fragment gravel.		10/28/2003; Intermittent-medium chatter.
605										SM	Grading with 10% fine, subrounded rock fragment gravel.		605-615; Light intermittent chatter.
610										CL	CLAY(CL); Brown (10YR 4/3); wet; soft; 100% medium plasticity clay		
615										CL	SANDY CLAY(CL), Brown (10YR 4/3); wet; soft; 70% medium plasticity clay; 30% fine to medium, subangular rock fragment sand.		
620										SC	CLAYEY SAND(SC); Grayish Brown (10YR 5/2); wet; 95% fine to medium, subangular rock fragment sand; 5% medium plasticity clay.		Light Chatter.
625													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 19 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					1143					CL	SANDY CLAY(CL); Brown (10YR 4/3); wet; soft; 80% medium plasticity clay; 20% fine sand.		10/28/2003
630										CL	Grading to 25% fine to medium, rock fragment sand.		
635										SM	SILTY GRAVELLY SAND(SM); Dark Yellowish Brown (10YR 3/4); wet; 45% fine to coarse, angular to subangular, mixed mica, quartz/plagioclase/mafic sand; 40% fine, subangular, granitic rock fragment gravel; 15% silt.		
640										SC	CLAYEY SAND(SC); Red (2.5YR 4/8); wet; 60% fine to coarse, subangular, quartz-plagioclase sand; 30% medium plasticity clay; 10% fine, subrounded rock fragment gravel.		
645										SC	CLAYEY SAND(SC); Dark Yellowish Brown (10YR 4/4); wet, 60% fine to medium, subangular rock fragment sand; 40% medium plasticity clay; with stiff-red stained clay concretions.		
650					1304					SW	SAND(SW); Dark Yellowish Brown (10YR 4/6); wet; 100% fine to coarse, subangular rock fragment sand, trace clay.		10/28/2003 Hard drilling with chatter and 1/4 inch lift on drill head.
655										SW	GRAVELLY SAND(SW); Dark Yellowish Brown (10YR 3/4); wet; 90% fine to coarse, subangular rock fragment sand; 10% fine, subrounded rock fragment gravel.		Light, intermittent chatter.
660													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03 03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 20 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	Grading to 55%, Dark Brown (10YR 3/3) sand; with trace silt		
665										GW	SANDY GRAVEL(GW); Dark Brown (10YR 3/3); wet; 60% fine, subangular rock fragment gravel, 40% fine to coarse, subangular rock fragment sand; trace silt		
670										SW	GRAVELLY SAND(SW), Dark Brown (10YR 3/3); wet; 55% fine to coarse, subangular rock fragment sand; 45% fine to coarse, subangular rock fragment gravel, trace silt.		Moderate chatter with 1/4 inch lift on drill head
675					1550					SW	Grading to 40% fine, subangular gravel.		10/28/2003
680										SW	Same As Above.		Moderate chatter encountered.
685										SM	GRAVELLY SAND(SM), Grayish Brown (10YR 5/2); wet, 60% fine to coarse, subangular sand, 35% fine, gravel, 5% silt		
690										SW	GRAVELLY SAND(SW); Brown (10YR 4/3); wet, 70% fine to coarse, subangular to subrounded sand; 30% fine, subangular gravel; trace silt.		
695													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 21 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	GRAVELLY SAND(SM); Yellowish Brown (10YR 5/4); wet; 70% fine to coarse, subangular to subrounded sand; 25% fine, subangular gravel; 5% silt.		
700					1759					SW	GRAVELLY SAND(SW); Brown (10YR 4/3); wet; 60% fine to coarse, subangular to subrounded sand; 40% fine to medium, subangular gravel; trace of silt.		10/28/2003; Heavy chatter with 4 inch lift on drill head.
705										CH	CLAY(CH); Brown (10YR 5/3); wet; stiff; 90% high plasticity clay, 10% silt.		
710										SM	GRAVELLY SAND(SM); Brown (10YR 5/3); wet; 80% fine to coarse, subangular to subrounded sand; 15% fine, subangular gravel; 5% silt.		
715										SW	SAND(SW); Brown (10YR 5/3); wet; 95% fine to coarse, subangular to subrounded sand; 5% fine, subangular gravel.		***Top of HSU-5 at 718' bgs.
720										SP	SAND(SP); Grayish Brown (10YR 5/2); wet; 100% very fine to fine, subangular to subrounded sand; trace silt.		
										CH	CLAY(CH); Gray (10YR 5/1); wet; stiff, 100% high plasticity clay, trace silt.		
725					1958					CH	SILTY CLAY(CH); Gray (10YR 5/1); wet; firm; 60% high plasticity clay; 30% silt; 10% very fine to fine, subrounded to subangular sand.		10/28/2003
730													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 22 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										CH	Grayish Brown (10YR 5/2); grading to 50% clay; 10% very fine sand.		
735										CH	Dark Gray (10YR 4/1); grading to 80% clay; 5% sand.		
740										SM	SAND(SM); Dark Grayish Brown (10YR 4/2); wet; 95% very fine to fine, subangular to subrounded sand; 5% silt.		
745										SP	SAND(SP); Dark Grayish Brown (10YR 4/2); wet; 100% very fine to fine, subangular to subrounded sand.		Some clay cutting noticed before adding section 37.
750					2200					SP	Grading to Very Dark Grayish Brown (10YR 3/2), angular to subangular sand.		10/28/2003
755										SC	CLAYEY SAND(SC); Dark Grayish Brown (10YR 4/2); wet; 70% fine to medium, subangular to subrounded sand; 25% medium plasticity clay; 5% silt.		
760										SM	SAND(SM); Brown (10YR 4/3); wet; 95% fine to medium, subangular to subrounded sand; 5% silt; trace clay.		
765													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name	LMC Multi-port Well Installation	Project Number	52773-03.03	Borehole Number:	LMW-4
Borehole Location:	San Bernardino, California			Sheet	23 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	SAND(SW); Grayish Brown (10YR 5/2), wet; 100% fine to coarse, subangular to subrounded sand.		
770										ML	CLAYEY SILT(ML); Brown (10YR 4/3); wet; soft; 60% medium plasticity silt; 40% high plasticity clay; trace very fine sand.		
775					0005					SM	SAND(SM); Brown (10YR 5/3); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt; trace gravel.		10/29/2003
780										GM	SANDY GRAVEL(GM); Dark Yellowish Brown (10YR 4/4); wet, 60% fine to medium, subrounded to subangular gravel, 35% fine to coarse, subrounded to subangular sand; 5% silt.		Hitting boulders below 780.
785										SM	SAND(SM); Grayish Brown (10YR 5/2), wet; 90% very fine to medium, subangular to subrounded sand; 5% silt; 5% clay		
790										SP	SAND(SP), Grayish Brown (10YR 5/2); wet, 100% very fine to medium, subangular to subrounded sand; trace silt.		
795										SM	SAND(SM), Brown (10YR 4/3), wet, 90% very fine to medium, subangular to subrounded sand; 5% silt; 5% medium plasticity clay.		
800													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 24 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					0240					SW	SAND(SW); Dark Gray (10YR 4/1); wet, 100% fine to coarse, subangular to subrounded sand; trace silt.		10/29/2003
805										CH	CLAY(CH), Grayish Brown (10YR 5/2); wet; stiff; 85% high plasticity clay; 10% silt; 5% fine to coarse, subangular to subrounded sand.		Clay cutting noticed before adding section 40.
810										SC	CLAYEY SAND(SC); Brown (10YR 4/3); wet; 70% fine to coarse, subangular to subrounded sand; 25% high plasticity clay; 5% silt.		
815										SW	SAND(SW); Brown (10YR 5/3); wet; 100% fine to coarse, subangular to subrounded sand; trace silt.		
820										SM	SAND(SM); Brown (10YR 5/3); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt.		
825					0505					CH	SANDY CLAY(CH); Brown (10YR 5/3); wet; stiff; 80% high plasticity clay; 10% fine to medium sand; 10% silt.		10/29/2003
830										CH	SILTY CLAY(CH); Grayish Brown (10YR 5/2); wet; soft; 80% high plasticity clay; 15% silt; 5% fine sand.		
835													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 25 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Yellowish Brown (10YR 5/4); wet; 85% fine to coarse, subangular to subrounded sand; 15% silt.		
840										CH	CLAY(CH); Grayish Brown (10YR 5/2);wet; stiff; 80% high plasticity clay; 15% silt; 5% fine sand.		
845										SC	CLAYEY SAND(SC); Pale Brown (10YR 6/3);wet; 60% fine to coarse, subangular to subrounded sand; 30% high plasticity clay; 10% silt.		
850					0650					SM	SILTY SAND(SM); Grayish Brown; (10YR 5/2); wet; 85% fine to coarse, subangular to subrounded sand; 15% silt.		10/29/2003
855										SC	CLAYEY SAND(SC); Pale Brown (10YR 6/3); wet; 60% fine to coarse, subangular to subrounded sand; 30% high plasticity clay; 10% silt.		***Top of HSU-6 at 856' bgs.
860										SC	Grading with 5% fine, angular to subangular gravel; without silt.		
865										SW	GRAVELLY SAND(SW); Very Dark Grayish Brown (10YR 3/2); wet; 80% fine to coarse, subangular to subrounded, quartz sand, 20% fine, angular to subangular rock fragment gravel.		
870													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 26 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	GRAVELLY SAND(SP); Pale Brown (10YR 6/3); wet; 70% medium to very coarse, subangular to subrounded sand; 30% fine, subangular to subrounded rock fragment gravel.		
875					0950					SC	CLAYEY GRAVELLY SAND(SC); Light yellowish brown (10YR 6/4); wet; 60% medium to coarse, subangular sand, 25% fine, subangular to subrounded rock fragment gravel, 15% medium plasticity clay.		10/29/2003
880										SM	SILTY GRAVELLY SAND(SM); Dark Grayish Brown (10YR 4/2); wet; 60% very fine to medium, subrounded sand, 20% fine, subangular to subrounded gravel; 20% silt.		
885										SM	GRAVELLY SAND(SM), Grayish Brown (10YR 5/2); wet; 70% fine to very coarse, subangular to subrounded sand, 25% fine, angular to subangular rock fragment gravel, 5% silt		
890										SP	GRAVELLY SAND(SP); Pale Brown (10YR 6/3); wet, 70% medium to very coarse, subangular to subrounded sand; 30% fine, angular to subangular rock fragment gravel.		
895										SM	SILTY SAND(SM); Pale Brown (10YR 6/3); wet; 70% fine to coarse, subangular to subrounded sand, 20% silt; 10% fine, subangular gravel.		
900					1150					SM	GRAVELLY SAND(SM), Pale Brown (10YR 6/3); wet; 65% fine to coarse, subangular to subrounded sand; 25% fine, angular to subangular rock fragment gravel, 10% silt		10/29/2003
905													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 27 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Dark Gray (10YR 4/1); wet; 85% fine to coarse, subangular to subrounded sand; 15% silt.		
910										SM	SAND(SM); Dark Gray (10YR 4/1); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt.		
915										CL	SANDY CLAY(CL); Brown (10YR 4/3); wet; soft; 85% medium plasticity clay; 15% fine sand.		
920										ML	CLAYEY SILT(ML); Dark Grayish Brown (10YR 4/2); wet, soft; 65% medium plasticity silt; 20% medium plasticity clay; 15% fine sand.		
925					1410					SW	GRAVELLY SAND(SW); Grayish Brown (10YR 5/2); wet; 85% fine to coarse, subangular to subrounded sand; 15% fine, subangular to subrounded gravel.		10/29/2003
930										SM	SILTY SAND(SM); Brown (10YR 4/3); wet; 90% fine to medium, subrounded sand; 10% silt.		
935										SM	SAND(SM), Pale Brown (10YR 6/3); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt.		
940													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 28 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	SAND(SP); Brown (10YR 5/3); wet; 95% medium to coarse, subangular to subrounded sand; 5% fine, subangular to subrounded gravel.		
945										SW	SAND(SW); Grayish Brown (10YR 5/2); wet; 100% fine to coarse, subangular to subrounded sand.		
950					1655					SW	GRAVELLY SAND(SW), Brown (10YR 5/3), wet; 90% fine to coarse, subangular sand; 10% fine to coarse, subangular gravel.		10/29/2003
955										SW	SAND(SW); Brown (10YR 5/3); wet;100% fine to coarse, subangular sand; trace fine, subangular gravel.		
960										SC	CLAYEY SAND(SC); Dark Grayish Brown (10YR 4/2); wet; 55% fine to medium sand; 45% low plasticity clay.		
965										SC	Brown (10YR 4/3); grading to 70% sand.		
970										SC	Grading to 75% sand.		
975													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location San Bernardino, California		Sheet 29 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					1857					SW	GRAVELLY SAND(SW); Dark Gray (10YR 4/1); wet; 70% fine to coarse, subangular to angular sand; 30% fine to coarse, subangular to angular gravel.		10/29/2003
980										SM	CLAYEY SILTY SAND(SM); Olive Brown (2.5Y 4/3); wet;; 50% fine to medium sand; 25% silt, 25% low plasticity clay.		
985										SC	CLAYEY SAND(SC); Olive Brown (2 5Y 4/3); wet, 75% fine to coarse, subangular sand, 25% low plasticity clay, with lenses clay.		
990										SW	GRAVELLY SAND(SW); Very Dark Grayish Brown (10YR 3/2); wet, 90% fine to coarse, subangular sand; 10% fine, subangular gravel.		
995										SW	SAND(SW); Grayish Brown (10YR 5/2), wet, 85% fine to medium sand, 10% coarse, subangular sand, 5% fine, subangular gravel.		
1000					2046					SW	Same As Above.		10/29/2003
1005										SW	Same As Above.		
1010													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 30 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	Grading to 95%, fine to coarse, subangular sand.		
1015										ML	CLAYEY SILT(ML); Dark Grayish Brown (10YR 4/2); wet; soft; 60% low plasticity silt; 25% low plasticity clay; 15% fine to medium sand.		
1020										SW	GRAVELLY SAND(SW); Dark Gray (10YR 4/1); wet; 70% fine to coarse, subangular sand; 30% fine to coarse, subangular gravel.		
1025					2310					SW	SAND(SW); Brown (10YR 4/3); wet; 100% fine to coarse, subangular sand; trace fine, subangular gravel.		10/29/2003
1030										SC	CLAYEY SAND(SC); Grayish Brown (10YR 5/2); wet; 60% fine to coarse, subangular sand; 30% low plasticity clay; 10% silt.		
1035										SM	SAND(SM); Brown (10YR 4/3); wet; 90% fine to medium sand; 5% coarse, subangular sand; 5% silt.		
1040										SP	SAND(SP); Very Dark Grayish Brown (2.5Y 3/2); wet; 95% fine to medium sand, 5% coarse, subangular sand.		
1045													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number. 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 31 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	Brown (10YR 4/3); grading with trace coarse sand.		
1050					0121					SP	Same As Above.		10/30/2003
1055										SP	Dark Grayish Brown (10YR 4/2); grading with trace of silt; without coarse sand.		
1060										SP	Light Olive Brown (2.5Y 5/4); grading with trace coarse sand; without silt.		
1065										SP	Grading to 95% fine sand; 5% medium to coarse sand.		
1070										ML	CLAYEY SILT(ML); Very Dark Grayish Brown (10YR 3/2); wet; soft, 60% low plasticity silt; 30% low plasticity clay; 10% fine to medium sand.		
1075					0340					CL	SILTY CLAY(CL); Very Dark Grayish Brown (10YR 3/2); wet; soft; 65% low plasticity clay; 35% silt.		10/30/2003
1080													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-4
Borehole Location: San Bernardino, California		Sheet 32 of 32

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										CL	Grading with 5% fine to medium sand.		
1085										CL	Dark Grayish Brown (10YR 4/2); grading to 65% clay; 10% fine sand.		Drilling smooth, no chatter.
1090										SM	SILTY SAND(SM); Brown (10YR 4/3); wet; 55% fine to medium, subangular rock fragment sand; 40% silt; 5% medium plastiticy clay; trace coarse, subrounded sand.		
1095										SM	Dark Yellowish Brown (10YR 4/4); grading to 90% fine to coarse quartz/plagioclase sand; without clay.		
1100					0616					SW	GRAVELLY SAND(SW); Dark Yellowish Brown (10YR 4/4); wet; 55% fine to coarse, subangular, quartz/plagioclase rock fragment sand; 45% fine, subangular, quartz/plagioclase rock fragment gravel; trace medium gravel.		10/30/2003
										SW	SAND(SW); Light Olive Brown (2.5Y 5/3); wet; 100% fine to coarse, subangular rock fragment sand.		
1105													

EARTH TECH

Borehole/Well Construction Log

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	**Borehole Number:**	**LMW-5**
Borehole Location: San Bernardino, California	*Northing:* 207322.552	*Easting:* 2214900.688	Sheet *1* of *28*
Drilling Agency: Beylik Drilling	Driller: Ernest/Willie/Chris		
Drilling Equipment: 1930-1940's WinterWeies	Date Started: 11/9/2003	Total Depth (feet):	965.0
Drilling Method. Reverse Circulation ARCH	Number of Samples: 0	Date Finished: 12/12/2003	Depth to Bedrock (feet): NA
Drilling Fluid: Water	Borehole Diameter (in): 12.75	Depth to Water (feet): *Drilling:* 0.00	*Static:* 0.00
Completion Information: Completed as a multiport monitoring well.		Elevation (feet MSL): *Ground:* 983.09	*Top of Casing:* NA
		Logged By: T. Vespalec	Checked By: Matt Werner

Depth (feet)	Samples: Number	Type	Blow Count	Percent Recovery	Time	Field Analyses: FID (ppm) Sample/Background	PID (ppm) Sample/Background	Additional Tests	Log: Graphic	USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Dark Greenish Gray (Gley1 4/1); wet; 70% very fine to medium, subangular rock fragment sand; 30% silt.		
5													
10													
15													
20													
25													
30													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 2 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
35													
40													
45										SM	Same As Above.		
50					0944					SM	Brown (10YR 4/3); grading to 80% sand; with 5% coarse, subangular rock fragment sand.		11/9/2003
55										SC	SILTY CLAYEY SAND(SC); Very Dark Grayish Brown (10YR 3/2); wet, 60% fine sand; 30% high plasticity clay); 10% silt.		
60										SM	SILTY SAND(SM), Dark Bluish Gray (Gley 2 4/1); wet; 85% fine to medium, subangular rock fragment sand; 15% silt.		
65										SP	GRAVELLY SAND(SP); Yellowish Brown (10YR 5/4); wet; 75% fine to medium, subangular, quartz/potassium feldspar/rock fragment sand;		***Top of HSU-2 at 64' bgs.

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name LMC Multi-port Well Installation	Project Number 52773-03 03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 3 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
											25% fine, subangular rock fragmet gravel; trace silt.		
70										CL	SILTY CLAY(CH); Olive Brown (2.5Y 4/4); wet; very soft; 80% high plasticity clay; 20% silt; trace fine sand.		
75					1142					GP	SANDY GRAVEL(GP), Light Olive Brown (2.5Y 5/4), wet, 60% fine, subangular rock fragment gravel; 40% medium to very coarse, subangular rock fragment sand; trace silt		11/9/2003
80										GP	Grading to 45% fine to very coarse sand		81-82'; Drill chatter.
85										SM	GRAVELLY SAND(SM), Light Olive Brown (2.5Y 5/4); wet; 60% fine to very coarse, subangular, rock fragment sand, 35% fine, subangular, biotite/granite/rock fragment gravel; 5% silt.		85-90', Drill chatter.
90										SP	Olive Brown (2.5Y 4/3); grading to 75% sand; 20% rock fragment gravel.		
95										SM	Same As Above		Intermittent chatter with 1 inch lift on drill plate.
100													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 4 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					1532					GM	SANDY GRAVEL(GM); Dark Olive Brown (2.5Y 3/3); wet; 55% fine, subangular rock fragment gravel; 40% fine to very coarse, subangular rock fragment sand; 5% silt.		11/9/2003
105										GP	SANDY GRAVEL(GP); Dark Olive Brown (2.5Y 3/3); wet; 60% fine, subangular rock fragment gravel; 40% fine to very coarse, subangular rock fragment sand; trace silt.		
110										GC	SANDY GRAVEL(GC); Grayish Brown (2.5Y 5/2); wet, 65% fine to coarse, subangular rock fragment gravel; 30% fine to coarse, subangular to subrounded sand; 5% medium plasticity clay; trace silt.		
115										SM	GRAVELLY SAND(SM); Light Olive Brown (2.5Y 5/3); wet; 60% fine to coarse, subangular to subrounded sand; 35% fine to coarse, subangular gravel; 5% silt.		
120										GW	SANDY GRAVEL(GW); Light Olive Brown (2.5Y 5/3); wet, 70% fine to coarse, subangular gravel; 30% fine to coarse, subangular to subrounded sand; trace silt.		
125					1705					GW	Olive Brown (2.5Y 4/3); grading to 60% fine to medium gravel.		11/9/2003
130										SM	GRAVELLY SAND(SM); Dark Grayish Brown (2.5Y 4/2), wet, 65% fine to coarse, subangular to subrounded sand; 30% fine to coarse, subangular gravel; 5% silt		Drill chatter encountered.
135													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 5 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	Grading to 60% sand; with 5% clay.		
140										GM	SANDY GRAVEL(GM); Dark Grayish Brown (2.5Y 4/2); wet; 60% fine to coarse, subangular gravel; 35% fine to coarse, subangular to subrounded sand; 5% silt.		
145										GW	SANDY GRAVEL(GW); Dark Grayish Brown (2.5Y 4/2); wet; 55% fine to medium, subangular gravel; 35% fine to coarse, subangular to subrounded sand; trace silt.		Drill chatter encountered.
150					1905					GW	Very Dark Grayish Brown (10YR 3/2); grading to 60% fine to coarse, subangular to subrounded gravel.		11/9/2003
155										SM	GRAVELLY SAND(SM); Very Dark Grayish Brown (10YR 3/2); wet; 65% fine to coarse, subangular to subrounded sand; 30% fine, subangular to subrounded gravel; 5% silt.		
160										SM	Very Dark Gray (10YR 3/1); grading to sand; 35% fine to coarse, subangular gravel.		
165										SM	SAND(SM); Dark Gray (10YR 4/1), wet; 85% fine to coarse, subangular to subrounded sand; 10% fine, subangular gravel; 5% silt.		
170													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 6 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										GW	SANDY GRAVEL(GW); Dark Gray (2.5Y 4/1); wet; 70% fine to medium, subangular gravel; 30% fine to coarse, subangular to subrounded sand; trace silt.		
175					2130					SW	SAND(SW); Grayish Brown (2.5Y 5/2); wet; 90% fine to coarse, subangular to subrounded sand; 10% fine, subangular to subrounded gravel; trace silt.		11/9/2003
180										SW	GRAVELLY SAND(SW); Light Olive Brown (2.5Y 5/3); wet; 70% fine to coarse, subangular to subrounded sand; 30% fine, subangular gravel; trace silt.		
185										SW	Olive Brown (2.5Y 4/3); grading to 40% fine to medium gravel.		***Top of HSU-3 at 185' bgs.
190										CL	CLAY(CH); Dark Gray (2.5Y 4/1); wet; firm; 90% high plasticity clay; 5% silt, 5% fine, subangular to subrounded sand; trace gravel. Grading to stiff clay.		
195										CH	SANDY CLAY(CH); Very Dark Gray (5Y 3/1); wet; soft; 55% high plasticity clay; 45% fine to medium, subangular to subrounded sand, trace silt; trace fine gravel		
										SP	SAND(SP), Dark Gray (5Y 4/1); wet; 100% fine to medium, subangular sand; trace silt.		
200					2350					SC	CLAYEY SAND(SC); Very Dark Gray (5Y 3/1); wet; 70% fine to medium, subangular to subrounded sand, 25% high plasticity clay; 5% silt.		11/9/2003
										CH	CLAY(CH); Very Dark Gray (5Y 3/1); wet; stiff; 100% high plasticity clay; trace silt.		
205													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 7 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	SAND(SP); Very Dark Gray (5Y 3/1); wet; 95% very fine to fine, subangular to subrounded sand; 5% high plasticity clay.		
										CH	CLAY(CH); Very Dark Gray (5Y 3/1); wet; stiff; 100% high plasticity clay; trace silt.		
210										SM	SAND(SM); Very Dark Gray (5Y 3/1); wet; 95% very fine to fine, subangular to subrounded sand; 5% silt. Increase in silt.		
215										SM	SILTY SAND(SM); Black (2.5Y 2.5/1); wet; 70% fine to very fine, subangular, biotite sand; 30% silt.		
220										CH	SANDY SILTY CLAY(CH); Black (2.5Y 2.5/1), wet; soft; 55% high plasticity clay; 30% silt; 15% fine, subangular to subrounded sand.		
225					0145					GW	SANDY GRAVEL(GW); Dark Gray (2.5Y 4/1); wet; 60% fine, subangular gravel, 40% fine to coarse, subangular to subrounded sand; trace silt.		11/10/2003
230										GW	Grading to 70% fine to coarse, subangular to subrounded gravel.		
235										SW	SAND(SM); Grayish Brown (2 5Y 5/2); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt; trace fine gravel.		
240													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 8 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	GRAVELLY SAND(SW); Dark Grayish Brown (2.5Y 4/2), wet; 80% fine to coarse, subangular to subrounded sand; 20% fine, subangular gravel; trace silt.		
										CH	CLAY(CH); Black (2.5Y 2.5/1); wet; stiff; 100% high plasticity clay; trace sand.		
245										CH	Dark Greenish Gray (Gley1 4/1); grading to firm clay.		
250					0449					CH	SILTY CLAY(CH); Dark Greenish Gray (Gley1 4/1); wet; soft; 70% high plasticity clay; 15% silt; 15% fine sand.		11/10/2003
255										SM	SILTY SAND(SM); Gray (2.5Y 5/1); wet; 80% fine to coarse, subangular to subrounded sand; 20% silt.		
260										CH	SANDY SILTY CLAY(CH); Dark Greenish Gray (Gley1 4/1); wet; firm; 60% high plasticity clay; 20% silt; 20% fine sand.		
265										CH	CLAY(CH); Greenish Gray (Gley1 5/1); wet; firm; 90% high plasticity clay; 10% fine sand.		
270										SM	SILTY SAND(SM); Gray (5Y 5/1); wet; 75% fine to medium, subangular to subrounded sand; 20% silt; 5% fine, subangular gravel.		
275													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 9 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					0655					GW	SANDY GRAVEL(GW); Gray (2.5Y 5/1), wet; 60% fine, angular to subangular gravel; 40% fine to coarse, subangular to subrounded sand.		11/10/2003
280										GW	Light Brownish Gray (2.5Y 6/2); grading to 55% gravel.		
285										SW	GRAVELLY SAND(SW); Dark Gray (2.5Y 4/1); wet; 70% fine to coarse, subangular to subrounded sand, 30% fine, angular to subangular gravel		
290										GP	SANDY GRAVEL(GP); Dark Gray (2.5 Y 4/1); wet; 60% fine, angular to subangular gravel; 40% medium to coarse, subangular to subrounded sand.		
295										SW	GRAVELLY SAND(SW), Gray (2.5Y 5/1); wet; 75% fine to coarse, subangular to subrounded sand; 25% fine, angular to subangular rock fragment gravel		
300					0840					SP	GRAVELLY SAND(SP), Gray (2.5Y 5/1), wet; 75% medium to coarse, subangular to subrounded sand, 35% fine to coarse, angular to subangular rock fragment gravel		11/10/2003
305										SP	Dark Gray (2 5Y 4/1); grading to 25% fine, angular to subangular rock fragment gravel.		
310													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 10 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	Grading to 70% sand.		
315										SW	GRAVELLY SAND(SW); Dark Gray (2.5Y 4/1); wet; 70% fine to coarse, subangular to subrounded sand, 30% fine, angular to subangular rock fragment gravel.		
320										SW	Grading to 80% sand.		
325					0950					CH	SANDY CLAY(CH); Very Dark Gray (2.5Y 3/1); wet, firm; 85% high plasticity clay; 15% fine sand.		11/10/2003
330										ML	SANDY SILT(ML), Very Dark Gray (2.5Y 3/1), wet; stiff; 85% medium plasticity silt; 15% fine sand.		
335										SM	SILTY SAND(SM); Dark Gray (2.5Y 4/1), wet; 80% fine sand, 15% silt, 5% fine, subrounded gravel.		
340										ML	SANDY SILT(ML); Very Dark Gray (2 5Y 3/1); wet; stiff, 75% low plasticity silt, 25% fine sand		
345													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 11 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	SAND(SP); Gray (10YR 6/1); wet; 90% medium to coarse, subangular to subrounded sand; 10% fine, subangular to subrounded gravel.		
350					1056					SP	Gray (10YR 5/1); grading to 95% sand; subangular gravel.		11/10/2003
355										SP	GRAVELLY SAND(SP); Gray (10YR 5/1); wet; 85% medium to coarse, subangular to subrounded sand, 15% fine, angular to subangular gravel.		
360										CH	SILTY CLAY(CH); Greenish Gray (Gley1 5/1); wet, firm; 85% high plasticity clay; 15% silt; trace fine sand.		
365										SP	GRAVELLY SAND(SP); Gray (2.5Y 5/1); wet; 85% medium to coarse, subangular to subrounded sand; 15% fine, angular to subangular gravel.		
370										SP	Dark Gray (2.5Y 4/1); grading to 65% sand.		
375					1150					SM	SILTY SAND(SM), Gray (2.5Y 5/1); wet; 80% fine to medium, subrounded sand; 15% silt; 5% fine, subangular to subrounded gravel.		
380													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number. 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet *12* of *28*

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SP	SAND(SM); Gray (2.5Y 5/1); wet; 95% fine to medium, subangular to subrounded sand; 5% silt.		
385										SM	SILTY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 70% fine to medium, subangular to subrounded sand; 25% silt; 5% fine gravel.		
390										SP	GRAVELLY SAND(SP); Very Dark Gray (2.5Y 3/1); wet; 70% medium to coarse, subangular to subrounded sand; 30% fine, angular to subrounded gravel.		
395										SM	SILTY SAND(SM), Very Dark Gray (2.5Y 3/1); wet; 85% fine to medium, subangular to subrounded sand; 15% silt.		
400					1328					ML	SANDY SILT(ML); Very Dark Gray (5Y 3/1); wet, stiff; 65% medium plasticity silt; 35% fine sand.		11/10/2003 ***Top of HSU-4 at 402' bgs.
405										SW	SAND(SW); Very Dark Gray (Gley1 3/N), wet; 90% fine to coarse, angular to subangular, quartz/olivine/mica sand; 10% fine, angular to subangular gravel; trace angular shale fragments.		
410										SW	GRAVELLY SAND(SW); Very Dark Gray (Gley1 3/N); wet; 75% fine to coarse, angular to subangular, quartz/mica sand; 25% fine to coarse, angular to subangular rock fragment gravel.		
415													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number. 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 13 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Very Dark Greenish Gray (Gley1 3/5GY); wet; 60% fine sand; 30% silt; 10% low plasticity clay.		
420										SW	GRAVELLY SAND(SW); Very Dark Gray (Gley1 3/N); wet; 80% fine to coarse, angular to subangular, quartz/mica sand; 20% fine to coarse, subangular to angular rock fragment gravel.		
425					2115					SW	Grading to 75% sand.		11/10/2003
430										SP	SAND(SP), Dark Gray (Gley1 4/N), wet; 100% fine to medium sand; trace silt		
435										SW	SAND(SW); Dark Gray (Gley1 4/N), wet; 90% fine to coarse, angular to subangular, quartz/mica sand; 10% fine to coarse, subangular to angular rock fragment gravel.		
440										SW	GRAVELLY SAND(SW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular, quartz/mica sand; 35% fine to coarse, angular to subangular rock fragment gravel.		
445										SW	Grading to 55% sand		
450													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 14 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					2305					SW	Same As Above.		11/10/2003
455										GW	SANDY GRAVEL(GW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular gravel; 35% fine to coarse, angular to subangular sand.		
460										SP	SAND(SP); Dark Gray (Gley1 4/N); wet; 100% fine sand; trace silt.		
465										SW	GRAVELLY SAND(SW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular sand; 35% fine to coarse, angular to subangular rock fragment gravel.		
470										GW	SANDY GRAVEL(GW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular rock fragment gravel; 35% fine to coarse, angular to subangular sand.		
475					0130					SW	GRAVELLY SAND(SW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular sand; 35% fine to coarse, angular to subangular rock fragment gravel.		11/11/2003
480										SW	Same As Above		
485													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 15 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										GW	SANDY GRAVEL(GW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular rock fragment gravel; 35% fine to coarse, angular to subangular sand.		
490										GW	Same As Above.		
495										SW	GRAVELLY SAND(SW); Very Dark Gray (Gley1 3/N); wet; 65% fine to coarse, angular to subangular sand; 35% fine to coarse, angular to subangular rock fragment gravel.		
500					0330					SW	Same As Above.		11/11/2003
505										SW	SAND(SW); Very Dark Gray (Gley1 3/N); wet; 90% fine to coarse, angular to subangular sand; 10% fine, angular to subangular gravel.		
510										CL	SILTY CLAY(CL); Very Dark Greenish Gray (Gley2 3/1);wet; soft; 80% medium plasticity clay; 20% silt; trace fine sand.		
515										CL	Grading without sand.		
520													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 16 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										CL	Same As Above.		
525					0539					SM	SILTY SAND(SM); Very Dark Greenish Gray (Gley1 3/1); wet; 90% very fine to medium, subangular rock fragment sand; 10% silt.		11/11/2003
530										SW	SAND(SM); Dark Greenish Gray (Gley1 4/1); wet; 95% very fine to coarse, subangular rock fragment sand; 5% silt		530-535'; Light intermittent chatter.
535										SW	GRAVELLY SAND(SW); Dark Greenish Gray (Gley1 4/1); wet; 60% fine to very coarse, subangular rock fragment sand; 40% fine, subangular, quartz/rock fragment gravel; trace silt.		
540										SW	Grading to 65% sand.		
545										SW	Color changes to Grayish Brown (2.5Y 5/2).		Light chatter encountered.
550					0800					CL	SANDY GRAVELLY CLAY(CL); Greenish Black (Gley1 2.5/1); wet; soft; 70% medium plasticity clay; 20% fine, subangular, granite/rock fragment gravel; 10% medium to coarse, subangular, quartz/granite/rock fragment sand; trace silt.		11/11/2003
555													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 17 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Dark Greenish Gray (Gley1 4/1); wet; 80% very fine to medium, subangular rock fragment sand; 20% silt.		
560										SM	Grading to 15% silt; with 5% medium plasticity clay.		
565										SW	SAND(SW), Dark Greenish Gray (Gley1 4/1); wet; 100% fine to coarse, subangular rock fragment sand; trace clay and fine gravel.		
570										CL	SILTY CLAY(CL); Very Dark Greenish Gray (Gley1 3/1), wet, firm, 85% medium plasticity clay, 15% silt.		
575					0918					SW	GRAVELLY SAND(SW), Dark Gray (5Y 4/1); wet; 70% fine to very coarse, subangular, quartz/granite/rock fragment sand, 30% fine, subangular, quartz/granite gravel.		11/11/2003
580										GM	SANDY GRAVEL(GM), Dark Gray (5Y 4/1); wet; 60% fine, subangular, quartz/granite/rock fragment gravel, 35% fine to very coarse, subangular rock fragment sand; 5% silt.		
585										SM	SILTY SAND(SM), Dark Gray (5Y 4/1), wet, 90% very fine to medium, subangular rock fragment sand; 10% silt		
590													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet *18* of *28*

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	Grading with 10% coarse, subangular, quartz/granite/rock fragment sand; trace fine gravel.		
595										SM	Grading to 90% very fine to medium sand; grading without coarse sand and gravel.		
600					1102					SM	Grading to fine to very coarse sand; grading with trace fine gravel.		11/11/2003
605										SM	Grading without gravel.		
													Heavey chatter with 1/2 inch lift on drill plate.
610										SM	Grading to fine to medium sand.		***Top of HSU-5 at 610' bgs.
615										SM	Grading to 85% fine to coarse sand, with trace fine gravel.		
620										SM	Grading to 95% sand; grading without gravel.		
625													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet *19* of *28*

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					1218					CL	SANDY CLAY(CL), Very Dark Greenish Gray (Gley1 3/1); wet; soft; 55% medium plasticity clay; 45% very fine to medium sand; 5% silt.		11/11/2003
630										CL	SILTY CLAY; Very Dark Greenish Gray (Gley1 3/1); wet; soft, 85% medium plasticity clay; 15% silt, trace fine sand.		
635										CL	Grading to 80% clay; 5% very fine to fine sand		
640										CL	ORGANIC CLAY; Very Dark Greenish Gray (Gley1 3/1); wet, soft; medium dense; 45% high plasticity clay; 45% peat and wood, black to dark brown, wood fragments.		
645										SM	SILTY SAND(SM); Dark Gray (5Y 4/1); wet, 90% very fine to medium, subangular sand; 10% silt		
650					1417					SC	SILTY CLAYEY SAND(SC); Dark Gray (5Y 4/1); wet; 60% very fine to medium, subangular sand; 30% medium plasticity clay; 10% silt.		11/11/2003
655										CL	SANDY CLAY(CL); Dark Gray (5Y 4/1); wet; soft; 60% medium plasticity clay, 35% very fine to medium, subangular sand, 5% silt		
660													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 20 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										CL	Grading to 65% firm clay.		
665										SC	CLAYEY SAND(SC); Dark Olive Gray (5Y 3/2); wet; 60% fine to medium, subangular rock fragment sand, 30% medium plasticity clay; 10% silt.		
670										CL	SILTY CLAY(CL); Dark Gray (5Y 4/1); wet; firm; 80% low plasticity clay; 20% silt.		
675					1550					CL	Grading to 50% Very Dark Gray (5Y 3/1); firm; medium plasticity clay; with 40% very fine to fine sand		11/11/2003
680										SM	SILTY GRAVELLY SAND(SM); Dark Gray (2.5Y 4/1), wet; 65% fine to coarse, subangular to subrounded sand; 25% fine, subangular to subrounded gravel; 10% silt.		***Top of HSU-6 at 680' bgs.
685										SM	SILTY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 70% fine to course, subangular to subrounded sand; 25% silt; 5% high plasticity clay; trace fine gravel.		
690										SW	SILTY GRAVELLY SAND(SM); Dark Gray (2.5Y 4/1); wet; 55% fine to course, subangular to subrounded sand; 35% fine to medium, subangular gravel; 10% silt.		Slightly harder drilling encountered.
695													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet *21* of *28*

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	Same As Above.		
700					1758					GM	SANDY GRAVEL(GM); Very Dark Gray (2.5Y 3/1); wet; 60% fine to coarse, subangular gravel; 35% fine to coarse, subangular to subrounded sand; 5% silt.		11/11/2003
705										GM	Grading to 55% gravel.		
710										GM	Grading to 65% fine to medium gravel.		Slightly harder drilling encountered.
715										GM	Grading to 55% fine gravel.		
720										SM	SILTY SAND(SM); Very Dark Gray (5Y 3/1); wet; 70% fine to coarse, subangular to subrounded sand; 30% silt.		
725					2010					SC	SILTY CLAYEY SAND(SC); Black (5Y 2.5/1); wet; 55% fine to medium, subangular to subrounded sand; 30% high plasticity clay; 15% silt.		11/11/2003
730													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 22 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Very Dark Gray (5Y 3/1); wet; 70% fine to coarse, subangular to subrounded sand; 30% silt; trace clay.		
735										SM	CLAYEY SILTY SAND(SM); Black (5Y 2.5/1); wet; 65% fine to coarse, subangular to subrounded sand; 20% silt; 15% high plasticity clay.		
740										SM	Grading to 25% silt; 10% clay.		
										CH	CLAY(CH); Black (5Y 2.5/1); wet; firm; 100% high plasticity clay.		
745										SM	SILTY GRAVELLY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 70% fine to coarse, subangular to subrounded sand; 20% fine, subangular gravel; 10% silt.		
750					2121					SM	Dark Gray (2.5Y 4/1); grading to 60% sand; 35% subangular to subrounded gravel.		11/11/2003
755										SM	SILTY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 80% fine to coarse, subangular to subrounded sand; 15% silt; 5% fine, subangular gravel.		
760										SM	Grading to 65% very fine to fine sand; grading without gravel.		
765													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 23 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	GRAVELLY SAND(SM); Dark Gray (2.5Y 4/1); wet; 60% fine to coarse, subangular to subrounded sand; 30% fine, subangular to subrounded gravel; 10% silt.		
770										GM	SANDY GRAVEL(GM); Dark Gray (2.5Y 4/1); wet; 55% fine, angular to subangular gravel; 40% fine to coarse, subangular to subrounded sand; 5% silt.		
775					2323					SM	SILTY SAND(SM); Dark Gray (2.5Y 4/1); wet; 70% fine to coarse, subangular to subrounded sand; 25% silt; 5% fine, subangular gravel; trace of wood.		11/11/2003
										CL	SILTY CLAY(CL); Very Dark Gray (2.5Y 3/1); wet; firm; 70% medium plasticity clay; 30% silt.		
780										CH	CLAY(CH); Very Dark Gray (2.5Y 3/1); wet; firm; 95% high plasticity clay; 5% silt. Clay becomes very stiff.		
785										SM	SILTY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 90% very fine to fine, subangular to subrounded sand; 10% silt.		
790										SM	Grading to 85% fine to coarse sand; grading with 5% fine, subangular gravel.		
795										SM	Grading to 70% very fine to fine sand; without gravel.		
										CH	CLAY(CH); Dark Olive Brown (2.5Y 3/3); wet; firm; 95% high plasticity clay; 5% silt.		
800										SM	SILTY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 80% fine to medium, subangular sand; 20% silt.		

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 24 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
					0035					SW	GRAVELLY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 60% fine to coarse, subangular to subrounded sand; 30% fine, subangular gravel; 10% silt.		11/12/2003
805										SW	Grading to 80% sand; 10% gravel.		
810										ML	SANDY SILT(ML); Very Dark Gray (2.5Y 3/1); wet; soft; 60% medium plasticity silt; 30% very fine to fine, subangular to subrounded sand; 10% high plasticity clay.		
815										SM	SILTY SAND(SM); Very Dark Gray (2.5Y 3/1); wet; 90% fine to medium, subangular to subrounded sand; 10% silt.		
820										SM	GRAVELLY SAND(SM); Gray (2.5Y 5/1); wet; 80% fine to coarse, subangular to subrounded sand; 15% fine, subangular gravel; 5% silt.		
825					0157					SM	Grading to 65% sand; 30% angular to subrounded gravel.		11/12/2003
830										SM	Grading to 75% Dark Gray (5Y 4/1) sand; 15% subangular gravel.		
835													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number. 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 25 of 28

Depth (feet)	Samples: Number	Type	Blow Count	Percent Recovery	Time	Field Analysis: FID (ppm) Sample/Background	PID (ppm) Sample/Background	Additional Tests	Log: Graphic	USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Dark Gray (5Y 4/1); wet; 85% fine to coarse, subangular to subrounded sand; 15% silt.		
										CH	CLAY(CH);wet; very stiff; 100% high plasticity clay.		
840										SM	SILTY SAND(SM); Very Dark Gray (5Y 3/1); wet; 65% very fine to fine, subangular to subrounded sand; 35% silt.		
845										SM	Grading to 80% fine to coarse sand; grading with 5% fine, angular to subangular gravel.		
850					0356					SM	SAND(SM); Dark Gray (5Y 4/1); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt.		11/12/2003
855										SW	GRAVELLY SAND(SW); Dark Gray (5Y 4/1);wet; 80% fine to coarse, subangular to subrounded sand; 20% fine, angular to subangular gravel.		
860										SM	SILTY SAND(SM); Dark Gray (5Y 4/1); wet; 80% fine to medium, subangular to subrounded sand; 20% silt.		
865										SM	Gray (5Y 5/1); grading to 80% sand; grading with 5% fine, angular to subrounded gravel		
870													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number 52773-03 03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 26 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SW	GRAVELLY SAND(SW); Gray (5Y 5/1); wet; 80% fine to coarse, subangular to subrounded sand; 20% fine, angular to subangular gravel.		
875					0555					SM	SAND(SM); Dark Gray (5Y 4/1); wet; 95% fine to coarse, subangular to subrounded sand; 5% silt.		11/12/2003
880										SM	Color changes to Gray (5Y 5/1).		
885										SW	Grading without silt		
890										CL	SANDY CLAY(CL); Dark Gray (5Y 4/1); wet; stiff; 55% medium plasticity clay; 25% fine to medium, subangular to subrounded sand, 20% silt.		
895										SM	SILTY SAND(SM), Dark Gray (5Y 4/1); wet; 85% fine to medium, subrounded sand; 15% silt.		
900					0803					SM	SAND(SM), Gray (5Y 5/1), wet, 90% fine to coarse, subangular to subrounded sand; 5% fine, subangular gravel, 5% silt.		11/12/2003
905													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 27 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Dark Gray (Gley 1 4/N); wet; 75% fine to medium, subangular to subrounded sand; 25% silt.		
910										SW	SAND(SW); Gray (5Y 5/1); wet; 100% fine to coarse, subangular to subrounded sand.		
915										GC	SANDY CLAYEY GRAVEL(GC); Gray (5Y 6/1); wet; 60% fine, subangular to subrounded gravel; 25% high plasticity clay; 15% medium to coarse, subangular to subrounded sand.		
920										CL	SANDY CLAY(CL); Dark Gray (5Y 4/1); wet; frim; 75% medium plasticity clay; 25% fine, micaceous sand.		
925					0903					SW	SAND(SW); Gray (5Y 5/1); wet; 100% fine to coarse, subangular to subrounded sand; trace silt.		11/14/03
930										SW	GRAVELLY SAND(SW); Gray (5Y 5/1);wet; 85% fine to coarse, subangular to subrounded sand; 15% fine, subangular to subangular gravel; trace silt.		
935										SW	Grading to 80% micaceous sand, 20% fine, angular to subangular frock fracgment gravel.		
940													

EARTH TECH

Borehole/Well Construction Log (Continuation Sheet)

Project Name: LMC Multi-port Well Installation	Project Number: 52773-03.03	Borehole Number: LMW-5
Borehole Location: San Bernardino, California		Sheet 28 of 28

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Time	Field Analysis: FID (ppm) Sample/Background	Field Analysis: PID (ppm) Sample/Background	Field Analysis: Additional Tests	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Well Construction Diagram	Remarks
										SM	SILTY SAND(SM); Gray (5Y 5/1); wet, 80% fine to medium, subrounded micaceous sand; 20% silt.		
945										ML	SANDY SILT(ML), Very Dark Gray (5Y 3/1); wet; stiff; 75% medium plasticity silt; 25% fine sand.		
950					1029					SM	SILTY SAND(SM), Very Dark Gray (5Y 3/1); wet; 85% fine to medium, subrounded micaceous sand; 15% silt.		
955										SP	GRAVELLY SAND(SP); Gray (5Y 6/1); wet; 80% medium to coarse, subangular to subrounded sand; less than 10% fine sand, 20% fine, angular to subangular rock fragment gravel.		
960											SILTY GRAVELLY SAND(SM); Dark Gray (5Y 4/1); wet; 55% fine to coarse, subangular to subrounded sand, 25% fine, angular to subangular gravel; 20% silt		
965													

APPENDIX B

GEOPHYSICAL LOGS OF LMW-4 AND LMW-5

PARTIALLY SCANNED OVERSIZE ITEM(S)

See Document # 2051175
for partially scanned image(s).

For complete version of oversize document(s),
see paper copy.

APPENDIX C

PERMITS

California Regional Water Quality Control Board
Santa Ana Region

Terry Tamminen
Secretary for
Environmental
Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
(909) 782-4130 • Fax (909) 781-6288
http://www.swrcb.ca.gov/rwqcb8

Arnold Schwarzenegger
Governor

E. E. S. H.
DEPT/SITE: 48
COPIES TO: Baffs, Blackman Simpson

December 2, 2003

Thomas D. Blackman, Technical Project Manager
Lockheed Martin Corporation
2550 N. Hollywood Way, Suite 301
Burbank, CA 91505

WASTE DISCHARGE REQUIREMENTS, ORDER NO. R8-2003-0061, NPDES NO. CAG998001 (DE MINIMUS DISCHARGES), LOCKHEED MARTIN CORPORATION, MONITORING WELL LMW-4 (SOUTHERN LEVEE OF SANTA ANA RIVER, 1500 FEET SOUTHWEST OF ORANGE SHOW ROAD OVERCROSSING), SAN BERNARDINO, SAN BERNARDINO COUNTY

Dear Mr. Blackman:

On November 25, 2003, you submitted a complete Notice of Intent to discharge wastewater under the terms and conditions of the Regional Board's general permit, Order No. R8-2003-0061.

Effective immediately, you are authorized to discharge wastewater from this project under the terms and conditions of Order No. R8-2003-0061. Enclosed is Monitoring and Reporting Program No. R8-2003-0061-066, which specifies the frequency of sampling and the constituents to be monitored. Please note that modifications to the sampling frequency and constituents to be monitored can be considered on a case-by-case basis.

San Bernardino County Department of Public Works, Flood Control has requested that we have dischargers in San Bernardino County call Naresh Varma at (909) 387-7995 regarding local agency requirements for this discharge.

Order No. R8-2003-0061 will expire on August 1, 2008. If you wish to terminate coverage under this general permit prior to that time, please notify us immediately upon project completion so that we can rescind your authorization and avoid billing you an annual fee. If you have any questions regarding the permit or the monitoring and reporting program, please contact Najah Amin at (909) 320-6362.

Sincerely,

Gerard J. Thibeault
Executive Officer

Enclosures (2): Monitoring and Reporting Program No. R8-2003-0061-066

cc w/o enc: US EPA Permits Issuance Section (WTR-5) - Doug Eberhardt
State Water Resources Control Board, Division of Water Quality – Jim Maughan
San Bernardino County Department of Public Works, Flood Control – Naresh Varma

JIS/Lockheed4

California Regional Water Quality Control Board
Santa Ana Region

GENERAL WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES TO SURFACE WATERS THAT POSE AN INSIGNIFICANT (DE MINIMUS) THREAT TO WATER QUALITY

Monitoring and Reporting Program No. R8-2003-0061-066
NPDES No. CAG998001
for

Lockheed Martin Corporation, Monitoring Well LMW-4
San Bernardino County

A. MONITORING AND REPORTING REQUIREMENTS

Monitoring and reporting shall be in accordance with the following:

1. All monitoring reports, or information submitted to the Regional Board shall be signed and certified in accordance with 40 CFR 122.22.

2. All laboratory analyses shall be performed in accordance with test procedures under 40 CFR 136 (revised as of May 14, 1999) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA), unless otherwise specified in this monitoring and reporting program (M&RP). In addition, the Regional Board and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 CFR 136. Unless otherwise specified herein, organic pollutants shall be analyzed using EPA method 8260, as appropriate, and results shall be reported with ML or PQL and MDL.

3. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services or EPA or at laboratories approved by the Executive Officer of the Regional Board.

4. All analytical data shall be reported with method detection limits (MDLs) and with identification of either practical quantitation levels (PQLs) or limits of quantitation (LOQs).

5. Whenever the discharger monitors any pollutant more frequently than is required by this general permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.

6. The discharger shall deliver a copy of each monitoring report in the appropriate format to:

California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

7. The discharger may request a reduction in the constituents to be monitored and/or a reduction in monitoring frequency for a specific constituent(s) subject to the approval of the Executive Officer when the conditions stipulated in Provisions E.7. of this general permit are met.

8. The discharger shall assure that records of all monitoring information are maintained and accessible for a period of at least five years from the date of the sample, report, or application. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or by the request of the Board at any time. Records of monitoring information shall include:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling, and/or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used, including any modification to those methods;
   f. All sampling and analytical results, including
      1) Units of measurement used;
      2) Minimum reporting limit for the analysis (minimum level, practical quantitation level (PQL));
      3) Results less than the reporting limit but above the method detection limit (MDL);
      4) Data qualifiers and a description of the qualifiers;
      5) Quality control test results (and a written copy of the laboratory quality assurance plan);
      6) Dilution factors, if used; and
      7) Sample matrix type; and;
   g. All monitoring equipment calibration and maintenance records;
   h. All original strip charts from continuous monitoring devices;
   i. All data used to complete the application for this general permit; and,
   j. Copies of all reports required by this general permit.

9. Weekly samples shall be collected on a representative day of each week.

B. EFFLUENT MONITORING

1. A sampling station shall be established for the point of discharge where representative samples of the discharge can be obtained before the discharge mixes with the receiving waters.

2. The following shall constitute the effluent monitoring program:

Constituent	Type of Sample	Units	Minimum Frequency of Sampling and Analysis
Flow	---------	gpd	Daily
Oil and Grease	Grab	mg/l	During the first 30 minutes of each discharge and then weekly thereafter for continuous discharges
Total Residual Chlorine [1,2]	"	"	"
Total Suspended Solids [2]	"	"	"
Total Petroleum Hydrocarbons[3]	Grab	µg/l	"
Perchlorate	"	"	"
Volatile Organics Portion of the EPA Priority Pollutants (See Attachment "A")	Grab	µg/l	"
Total Dissolved Solids[2]	"	mg/l	Once annually at each discharge point
Total Inorganic Nitrogen[3]	"	"	"

C. REPORTING

1. Five days prior to any discharge from locations already reported, the discharger shall notify the Regional Board staff by phone or by a fax letter indicating the date and time of the proposed discharge.

2. Five days prior to any planned discharge[4] from locations not yet reported, the discharger shall notify the Regional Board staff by phone or by a fax letter indicating the following:

---

1 *Unless it is known that chlorine is not in the discharge*

2 *Not applicable if all wastewater will percolate prior to reaching receiving waters*

3 *Initially for new well developments. If TIN and TPH are present, continue monitoring.*

4 *For those unplanned discharges, as much prior notification as possible is required before any discharge is initiated.*

1) Specific type of the proposed wastewater discharge (see listing on Finding 1 of the Order);
2) The estimated average and maximum daily flow rates;
3) The frequency and duration of the discharge;
4) The affected receiving water(s);
5) A description of the proposed treatment system (if appropriate); and
6) A description of the path from the point of initial discharge to the ultimate location of discharge (fax a map if possible);

3. Monitoring reports shall be submitted by the 30th day of each month following the monitoring period. The monitoring reports shall cover the previous month's monitoring activities and shall include:

   a. The results of all laboratory analyses for constituents required to be monitored (see Section B. above),
   b. The daily flow data,
   c. A summary of the discharge activities (when and where discharge occurred, description of type of discharge, etc.) including a report detailing the discharger's compliance or noncompliance with the requirements of the general permit and discharge authorization letter, and
   d. For every item where the requirements of the general permit and discharge authorization letter are not met:

      1) A statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and
      2) A timetable for implementing the proposed actions.

   e. If no discharge occurs during the previous monitoring period, a letter to that effect shall be submitted in lieu of a monitoring report.

4. All reports shall be signed by a responsible officer or duly authorized representative of the discharger and shall be submitted under penalty of perjury.

Ordered by _____
Gerard J. Thibeault
Executive Officer

December 2, 2003

November 6, 2003

Mr. Jun Martirez
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside CA, 92501-3339

Subject: Application for Coverage Under General Permit for Well LMW-4
Cleanup and Abatement Order No. 94-37

Reference: Order No. R8-2003-0061, NPDES No. CAG 998001

Dear Mr. Martirez:

Enclosed please find a completed Notice of Intent Form, pursuant to the renewed general waste discharge requirements made effective August 22, 2003 by the CRWQCB-Santa Ana Region. Lockheed Martin is currently enrolled under General Permit Order No. 98-67 NPDES No. CAG998001 and wishes to be enrolled under the general permit referenced above. Per the Application Requirements in Section I of the General Permit referenced above, dischargers enrolled under the previous General Permit Order No. 98-67 are required only to provide an NOI for enrollment under the new permit. This NOI has been prepared for a specific proposed batch discharge corresponding to purged groundwater generated during well development of monitoring well LMW-4.

The location of Well LMW-4 is shown on Figure 1. The locations of nearby wells RIVRaub#2, RIVRaub#3, and RIVRaub#4 are also shown on Figure 1. These wells are shown because they provide groundwater quality data for the area around well LMW-4. Well LMW-4 is planned for installation in an effort to characterize a groundwater plume containing dissolved concentrations of perchlorate and trichloroethene (TCE). This well will be drilled to about 1,100 feet below ground surface (bgs) and well development will generate purged groundwater from various water bearing zones from about 100 to 1000 feet bgs at the well location. The available well data is for a water bearing zone from approximately 60 to 300 feet bgs. Table 1 shows the recent nearby groundwater data for the plume under investigation. Volatile organic compound (VOC) concentrations are below maximum contaminant levels (MCLs). Perchlorate concentrations in this upper water bearing zone range from 11 to 37 ug/l and exceed the California Department of Health Services action level of 4 ug/l. However, because the discharge water will encompass water from presumably lower concentrations in deeper water bearing zones,

on average, the discharges are anticipated to pose only an insignificant (de minimus) threat to water quality.

Prior to discharge, the water will be collected into an above-ground tank and sampled to ensure the discharged water meets applicable NPDES limits. The proposed discharge point is the ground surface in the vicinity of the well or dry portions of the Santa Ana River Wash (Figure 1) so that the water generated can percolate back into the aquifer where the groundwater originated. The discharge will consist of a one-time batch discharge of up to 80,000 gallons. The discharge will be observed so that the water does not leave the immediate area or cause erosion.

Please review the provided data and provide your approval to this application for discharge under the current NPDES general permit. Should you have any questions or concerns, please direct them to Tom Blackman at (818) 847-9901 or Bill Bath at (818) 847-0296.

Sincerely,

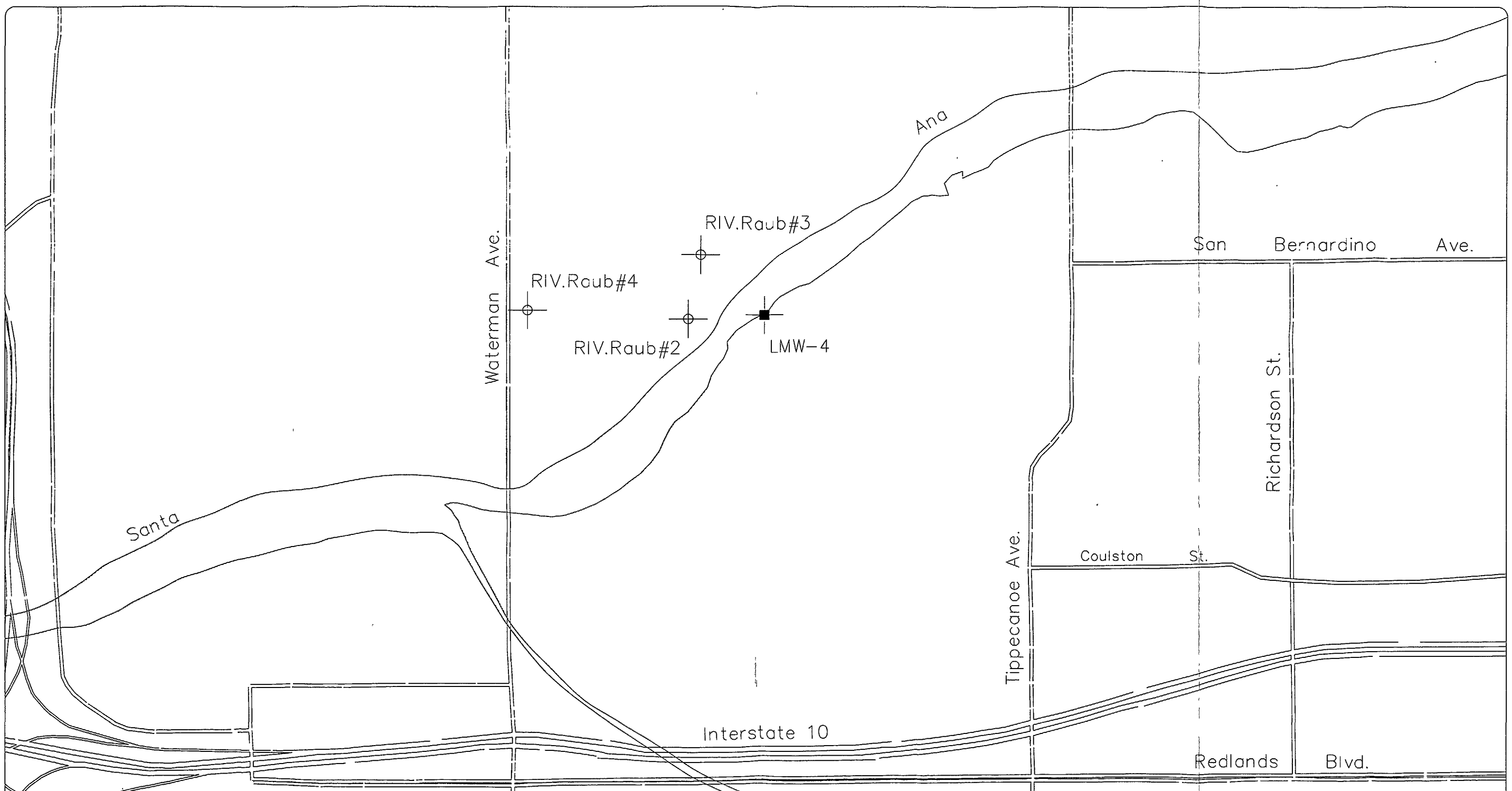
William Bath for

Thomas D. Blackman, R.G, C.HG.
Technical Project Manager

cc: Susan Beeson CRWQCB-Santa Ana Region

enc: NOI for General Order R8-2003-0061
Figure 1: LMW-4 and Adjacent Well Location Map
Table 1 Groundwater Data for Wells Near Well LMW-4 Location

bc: Burxxxxxxxx
Ron Helgerson
Matt Werner
Bob Simpson
Bill Bath



EXPLANATION

Proposed Well Locations

Well Locations

0 1,000' 2,000' 4,000'

SCALE IN FEET

NORTH

TITLE: LMW 4 and Adjacent Well Location Map

LOCATION: LOCKHEED MARTIN REDLANDS, CALIFORNIA

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

CHECKED:	Atonal Mares	FIGURE:
DRAFTED:	Jeffrey Waugen	1
PROJ.:	52773	
DATE:	6/28/02	

California Regional Water Quality Control Board
Santa Ana Region

NOTICE OF INTENT

TO COMPLY WITH THE TERMS AND CONDITIONS OF THE GENERAL PERMIT TO DISCHARGE WASTEWATER THAT POSE INSIGNIFICANT (DE MINIMUS) THREAT TO WATER QUALITY
(Order No. R8-2003-0061, NPDES No. CAG998001)

I. PERMITTEE *(Person/Agency Responsible for the Discharge)*

AGENCY/COMPANY Name: Lockheed Martin Corporation

Address: 2550 North Hollywood Way, Suite 301 Burbank CA 91505
Street *City* *State* *ZIP*

CONTACT Person: Thomas D. Blackman Phone: (818) 847-9901

II. FACILITY Name: Monitoring Well LMW-4

Location: Southern Levee of Santa Ana River, 1500 feet southwest of Orange Show Road Overcrossing, San Bernardino, CA
Street *City* *State* *ZIP*

CONTACT Person: Thomas D. Blackman Phone: (818) 847-9901

III. BILLING INFORMATION *(Where annual fee invoices should be sent)*

AGENCY/COMPANY Name: Lockheed Martin Corporation

Address: 2550 North Hollywood Way, Suite 301 Burbank CA 91505
Street *City* *State* *ZIP*

CONTACT Person: Thomas D. Blackman Phone: (818) 847-9901

IV. INDICATE EXISTING PERMIT NUMBER: *(if applicable)*

a. Individual Permit Order No. 93-49-041 NPDES No. CAG998001

b. General Permit Order No. 98-67 NPDES No. CAG998001

V. CERTIFICATION:

I certify under penalty of law that I am an authorized representative of the permittee and that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the permittee will comply with the terms and conditions stipulated in Order No. R8-2003-0061 including the monitoring and reporting program issued by the Executive Officer of the Regional Board.

Name and Official Title: Thomas D. Blackman, Technical Project Manager
(type or print)

Signature: William Bath for Thomas D. Blackman Date: 11/6/03

Remarks: *If changes to facility ownership and/or treatment processes were made after the issuance of the existing permit, please provide a description of such changes on another sheet and submit it with this Notice of Intent.*

Table 1
Groundwater Data for Wells
Near Well LMW-4 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
City of Riverside	RIVRaub#2	6/3/2003	Perchlorate	35	ug/l
City of Riverside	RIVRaub#2	9/3/2003	Perchlorate	21	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1,1,2-Tetrachloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1,1-Trichloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1,2,2-Tetrachloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1,2-Trichloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1-Dichloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,1-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2,3-Trichlorobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2,3-Trichloropropane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2,4-Trichlorobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2,4-Trimethylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2-Dibromo-3-chloropropane (DBCP)	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2-Dibromoethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2-Dichloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,2-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,3,5-Trimethylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,3-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,3-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	1,4-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	2,2-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	2-Chlorotoluene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	4-Chlorotoluene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Benzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Bromide	0	mg/l
City of Riverside	RIVRaub#2	9/4/2003	Bromobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Bromochloromethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Bromodichloromethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Bromoform	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Bromomethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Carbon tetrachloride	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Chlorobenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Chloroethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Chloroform	0	ug/l

Table 1
Groundwater Data for Wells
Near Well LMW-4 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
City of Riverside	RIVRaub#2	9/4/2003	Chloromethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	cis-1,2-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	cis-1,3-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Dibromochloromethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Dibromomethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Dichlorodifluoromethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Ethylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Hexachlorobutadiene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Isopropylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	m,p-Xylenes	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Methylene chloride	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Naphthalene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	n-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Nitrate(as NO3)	23	mg/l
City of Riverside	RIVRaub#2	9/4/2003	n-Propylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Orthophosphate	0	mg/l
City of Riverside	RIVRaub#2	9/4/2003	o-Xylene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Perchlorate	21	ug/l
City of Riverside	RIVRaub#2	9/4/2003	p-Isopropyltoluene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	sec-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Styrene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	tert-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Tetrachloroethene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Toluene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	trans-1,2-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	trans-1,3-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Trichloroethene	1.8	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Trichlorofluoromethane	0	ug/l
City of Riverside	RIVRaub#2	9/4/2003	Vinyl chloride	0	ug/l
City of Riverside	RIVRaub#2	10/7/2003	Perchlorate	37	ug/l
City of Riverside	RIVRaub#3	6/3/2003	Perchlorate	13	ug/l
City of Riverside	RIVRaub#3	7/2/2003	Perchlorate	12	ug/l
City of Riverside	RIVRaub#3	9/3/2003	Perchlorate	11	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,1,1,2-Tetrachloroethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,1,1-Trichloroethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,1,2,2-Tetrachloroethane	0	ug/l

Table 1
Groundwater Data for Wells
Near Well LMW-4 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
City of Riverside	RIVRaub#3	9/4/2003	1,1,2-Trichloroethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,1-Dichloroethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,1-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,1-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2,3-Trichlorobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2,3-Trichloropropane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2,4-Trichlorobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2,4-Trimethylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2-Dibromo-3-chloropropane (DBCP)	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2-Dibromoethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2-Dichloroethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,2-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,3,5-Trimethylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,3-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,3-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	1,4-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	2,2-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	2-Chlorotoluene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	4-Chlorotoluene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Benzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Bromide	0	mg/l
City of Riverside	RIVRaub#3	9/4/2003	Bromobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Bromochloromethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Bromodichloromethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Bromoform	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Bromomethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Carbon tetrachloride	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Chlorobenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Chloroethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Chloroform	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Chloromethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	cis-1,2-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	cis-1,3-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Dibromochloromethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Dibromomethane	0	ug/l

Table 1
Groundwater Data for Wells
Near Well LMW-4 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
City of Riverside	RIVRaub#3	9/4/2003	Dichlorodifluoromethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Ethylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Hexachlorobutadiene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Isopropylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	m,p-Xylenes	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Methylene chloride	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Naphthalene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	n-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Nitrate(as NO3)	37	mg/l
City of Riverside	RIVRaub#3	9/4/2003	Nitrate(as NO3)	38	mg/l
City of Riverside	RIVRaub#3	9/4/2003	n-Propylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Orthophosphate	0	mg/l
City of Riverside	RIVRaub#3	9/4/2003	o-Xylene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Perchlorate	12	ug/l
City of Riverside	RIVRaub#3	9/4/2003	p-Isopropyltoluene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	sec-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Styrene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	tert-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Tetrachloroethene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Toluene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	trans-1,2-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	trans-1,3-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Trichloroethene	0.74	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Trichloroethene	0.76	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Trichlorofluoromethane	0	ug/l
City of Riverside	RIVRaub#3	9/4/2003	Vinyl chloride	0	ug/l
City of Riverside	RIVRaub#4	7/2/2003	Perchlorate	17	ug/l
City of Riverside	RIVRaub#4	9/3/2003	Perchlorate	17	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1,1,2-Tetrachloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1,1-Trichloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1,2,2-Tetrachloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1,2-Trichloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1-Dichloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,1-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2,3-Trichlorobenzene	0	ug/l

Table 1
Groundwater Data for Wells
Near Well LMW-4 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
City of Riverside	RIVRaub#4	9/4/2003	1,2,3-Trichloropropane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2,4-Trichlorobenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2,4-Trimethylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2-Dibromo-3-chloropropane (DBCP)	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2-Dibromoethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2-Dichloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,2-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,3,5-Trimethylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,3-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,3-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	1,4-Dichlorobenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	2,2-Dichloropropane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	2-Chlorotoluene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	4-Chlorotoluene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Benzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Bromide	0	mg/l
City of Riverside	RIVRaub#4	9/4/2003	Bromobenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Bromochloromethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Bromodichloromethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Bromoform	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Bromomethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Carbon tetrachloride	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Chlorobenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Chloroethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Chloroform	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Chloromethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	cis-1,2-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	cis-1,3-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Dibromochloromethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Dibromomethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Dichlorodifluoromethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Ethylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Hexachlorobutadiene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Isopropylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	m,p-Xylenes	0	ug/l

Table 1
Groundwater Data for Wells
Near Well LMW-4 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
City of Riverside	RIVRaub#4	9/4/2003	Methylene chloride	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Naphthalene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	n-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Nitrate(as NO3)	39	mg/l
City of Riverside	RIVRaub#4	9/4/2003	n-Propylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Orthophosphate	0	mg/l
City of Riverside	RIVRaub#4	9/4/2003	o-Xylene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Perchlorate	15	ug/l
City of Riverside	RIVRaub#4	9/4/2003	p-Isopropyltoluene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	sec-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Styrene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	tert-Butylbenzene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Tetrachloroethene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Toluene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	trans-1,2-Dichloroethene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	trans-1,3-Dichloropropene	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Trichloroethene	1.2	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Trichlorofluoromethane	0	ug/l
City of Riverside	RIVRaub#4	9/4/2003	Vinyl chloride	0	ug/l

California Regional Water Quality Control Board
Santa Ana Region

Terry Tamminen
Secretary for Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
(909) 782-4130 • Fax (909) 781-6288
http //www swrcb ca gov/rwqcb8

Arnold Schwarzenegger
Governor

E. E. S. H.
DEPT/SITE: 48
COPIES TO: Bath, Blackmer, Simpson

December 2, 2003

Thomas D. Blackman, Technical Project Manager
Lockheed Martin Corporation
2550 N. Hollywood Way, Suite 301
Burbank, CA 91505

WASTE DISCHARGE REQUIREMENTS, ORDER NO. R8-2003-0061, NPDES NO. CAG998001 (DE MINIMUS DISCHARGES), LOCKHEED MARTIN CORPORATION, MONITORING WELL LMW-5 (SOUTHERN LEVEE OF SANTA ANA RIVER, 700 FEET EAST OF 'E' STREET OVERCROSSING), SAN BERNARDINO, SAN BERNARDINO COUNTY

Dear Mr. Blackman:

On November 25, 2003, you submitted a complete Notice of Intent to discharge wastewater under the terms and conditions of the Regional Board's general permit, Order No. R8-2003-0061.

Effective immediately, you are authorized to discharge wastewater from this project under the terms and conditions of Order No. R8-2003-0061. Enclosed is Monitoring and Reporting Program No. R8-2003-0061-067, which specifies the frequency of sampling and the constituents to be monitored. Please note that modifications to the sampling frequency and constituents to be monitored can be considered on a case-by-case basis.

San Bernardino County Department of Public Works, Flood Control has requested that we have dischargers in San Bernardino County call Naresh Varma at (909) 387-7995 regarding local agency requirements for this discharge.

Order No. R8-2003-0061 will expire on August 1, 2008. If you wish to terminate coverage under this general permit prior to that time, please notify us immediately upon project completion so that we can rescind your authorization and avoid billing you an annual fee. If you have any questions regarding the permit or the monitoring and reporting program, please contact Najah Amin at (909) 320-6362.

Sincerely,

Gerard J. Thibeault
Executive Officer

Enclosures (2): Monitoring and Reporting Program No. R8-2003-0061-067

cc w/o enc: US EPA Permits Issuance Section (WTR-5) - Doug Eberhardt
State Water Resources Control Board, Division of Water Quality – Jim Maughan
San Bernardino County Department of Public Works, Flood Control – Naresh Varma

JIS/Lockheed5

California Regional Water Quality Control Board
Santa Ana Region

GENERAL WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES TO SURFACE WATERS THAT POSE AN INSIGNIFICANT (DE MINIMUS) THREAT TO WATER QUALITY

Monitoring and Reporting Program No. R8-2003-0061-067
NPDES No. CAG998001
for

Lockheed Martin Corporation, Monitoring Well LMW-5
San Bernardino County

A. MONITORING AND REPORTING REQUIREMENTS

Monitoring and reporting shall be in accordance with the following:

1. All monitoring reports, or information submitted to the Regional Board shall be signed and certified in accordance with 40 CFR 122.22.

2. All laboratory analyses shall be performed in accordance with test procedures under 40 CFR 136 (revised as of May 14, 1999) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA), unless otherwise specified in this monitoring and reporting program (M&RP). In addition, the Regional Board and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 CFR 136. Unless otherwise specified herein, organic pollutants shall be analyzed using EPA method 8260, as appropriate, and results shall be reported with ML or PQL and MDL.

3. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services or EPA or at laboratories approved by the Executive Officer of the Regional Board.

4. All analytical data shall be reported with method detection limits (MDLs) and with identification of either practical quantitation levels (PQLs) or limits of quantitation (LOQs).

5. Whenever the discharger monitors any pollutant more frequently than is required by this general permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.

6. The discharger shall deliver a copy of each monitoring report in the appropriate format to:

California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

7. The discharger may request a reduction in the constituents to be monitored and/or a reduction in monitoring frequency for a specific constituent(s) subject to the approval of the Executive Officer when the conditions stipulated in Provisions E.7. of this general permit are met.

8. The discharger shall assure that records of all monitoring information are maintained and accessible for a period of at least five years from the date of the sample, report, or application. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or by the request of the Board at any time. Records of monitoring information shall include:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling, and/or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used, including any modification to those methods;
   f. All sampling and analytical results, including
      1) Units of measurement used;
      2) Minimum reporting limit for the analysis (minimum level, practical quantitation level (PQL));
      3) Results less than the reporting limit but above the method detection limit (MDL);
      4) Data qualifiers and a description of the qualifiers;
      5) Quality control test results (and a written copy of the laboratory quality assurance plan);
      6) Dilution factors, if used; and
      7) Sample matrix type; and;
   g. All monitoring equipment calibration and maintenance records;
   h. All original strip charts from continuous monitoring devices;
   i. All data used to complete the application for this general permit; and,
   j. Copies of all reports required by this general permit.

9. Weekly samples shall be collected on a representative day of each week.

B. EFFLUENT MONITORING

1. A sampling station shall be established for the point of discharge where representative samples of the discharge can be obtained before the discharge mixes with the receiving waters.

2. The following shall constitute the effluent monitoring program:

Constituent	Type of Sample	Units	Minimum Frequency of Sampling and Analysis
Flow	---------	gpd	Daily
Oil and Grease	Grab	mg/l	During the first 30 minutes of each discharge and then weekly thereafter for continuous discharges
Total Residual Chlorine [1,2]	"	"	"
Total Suspended Solids [2]	"	"	"
Total Petroleum Hydrocarbons[3]	Grab	µg/l	"
Perchlorate	"	"	"
Volatile Organics Portion of the EPA Priority Pollutants (See Attachment "A")	Grab	µg/l	"
Total Dissolved Solids[2]	"	mg/l	Once annually at each discharge point
Total Inorganic Nitrogen[3]	"	"	"

C. REPORTING

1. Five days prior to any discharge from locations already reported, the discharger shall notify the Regional Board staff by phone or by a fax letter indicating the date and time of the proposed discharge.

2. Five days prior to any planned discharge[4] from locations not yet reported, the discharger shall notify the Regional Board staff by phone or by a fax letter indicating the following:

---

1 *Unless it is known that chlorine is not in the discharge.*

2 *Not applicable if all wastewater will percolate prior to reaching receiving waters.*

3 *Initially for new well developments. If TIN and TPH are present, continue monitoring.*

4 *For those unplanned discharges, as much prior notification as possible is required before any discharge is initiated.*

1) Specific type of the proposed wastewater discharge (see listing on Finding 1 of the Order);
2) The estimated average and maximum daily flow rates;
3) The frequency and duration of the discharge;
4) The affected receiving water(s);
5) A description of the proposed treatment system (if appropriate); and
6) A description of the path from the point of initial discharge to the ultimate location of discharge (fax a map if possible);

3. Monitoring reports shall be submitted by the 30th day of each month following the monitoring period. The monitoring reports shall cover the previous month's monitoring activities and shall include:

   a. The results of all laboratory analyses for constituents required to be monitored (see Section B. above),
   b. The daily flow data,
   c. A summary of the discharge activities (when and where discharge occurred, description of type of discharge, etc.) including a report detailing the discharger's compliance or noncompliance with the requirements of the general permit and discharge authorization letter, and
   d. For every item where the requirements of the general permit and discharge authorization letter are not met:

      1) A statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and
      2) A timetable for implementing the proposed actions.

   e. If no discharge occurs during the previous monitoring period, a letter to that effect shall be submitted in lieu of a monitoring report.

4. All reports shall be signed by a responsible officer or duly authorized representative of the discharger and shall be submitted under penalty of perjury.

Ordered by _____
Gerard J. Thibeault
Executive Officer

December 2, 2003

November 6, 2003

Mr. Jun Martirez
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside CA, 92501-3339

Subject: Application for Coverage Under General Permit for Well LMW-5
Cleanup and Abatement Order4 94-37

Reference: Order No. R8-2003-0061, NPDES No. CAG 998001

Dear Mr. Martirez:

Enclosed please find a completed Notice of Intent Form, pursuant to the renewed general waste discharge requirements made effective August 22, 2003 by the CRWQCB-Santa Ana Region. Lockheed Martin is currently enrolled under General Permit Order No. 98-67 NPDES No. CAG998001 and wishes to be enrolled under the general permit referenced above. Per the Application Requirements in Section I of the General Permit referenced above, dischargers enrolled under the previous General Permit Order No. 98-67 are required only to provide an NOI for enrollment under the new permit. This NOI has been prepared for a specific proposed batch discharge corresponding to purged groundwater generated during well development of monitoring Well LMW-5.

The location of Well LMW-5 is shown on Figure 1. The locations of nearby wells are also shown on Figure 1. Well LMW-5 is planned for installation in an effort to characterize the leading edge of groundwater plume containing dissolved concentrations of perchlorate and trichloroethene (TCE). Because this will be installed to characterize the leading edge of the dissolved groundwater plume, discharge concentrations below the maximum contaminant level (MCL) of 5 micrograms per liter (ug/l) for TCE and below the California Department of Health Services action level of 4 ug/l for perchlorate are anticipated. Enclosed with this letter are groundwater data for nearby upgradient wells RHWC#5 and RHWC#18. This data shows that, on average, groundwater discharges from Well LMW-5 are likely to be below applicable MCLs and action levels.

Prior to discharge, the water will be collected into an above-ground tank and sampled to ensure the discharged water meets applicable NPDES limits. The proposed discharge point is the ground surface in the vicinity of the well or dry portions of the Santa Ana River Wash (Figure 1) so that the water generated can percolate back into the aquifer

where the groundwater originated. The discharge will consist of a one-time batch discharge of up to 160,000 gallons. The discharge will be observed so that the water does not leave the immediate area or cause erosion.

Please review the provided data and provide your approval to this application for discharge under the current NPDES general permit. Should you have any questions or concerns, please direct them to Tom Blackman at (818) 847-9901 or Bill Bath at (818) 847-0296.

Sincerely,

William Bath for

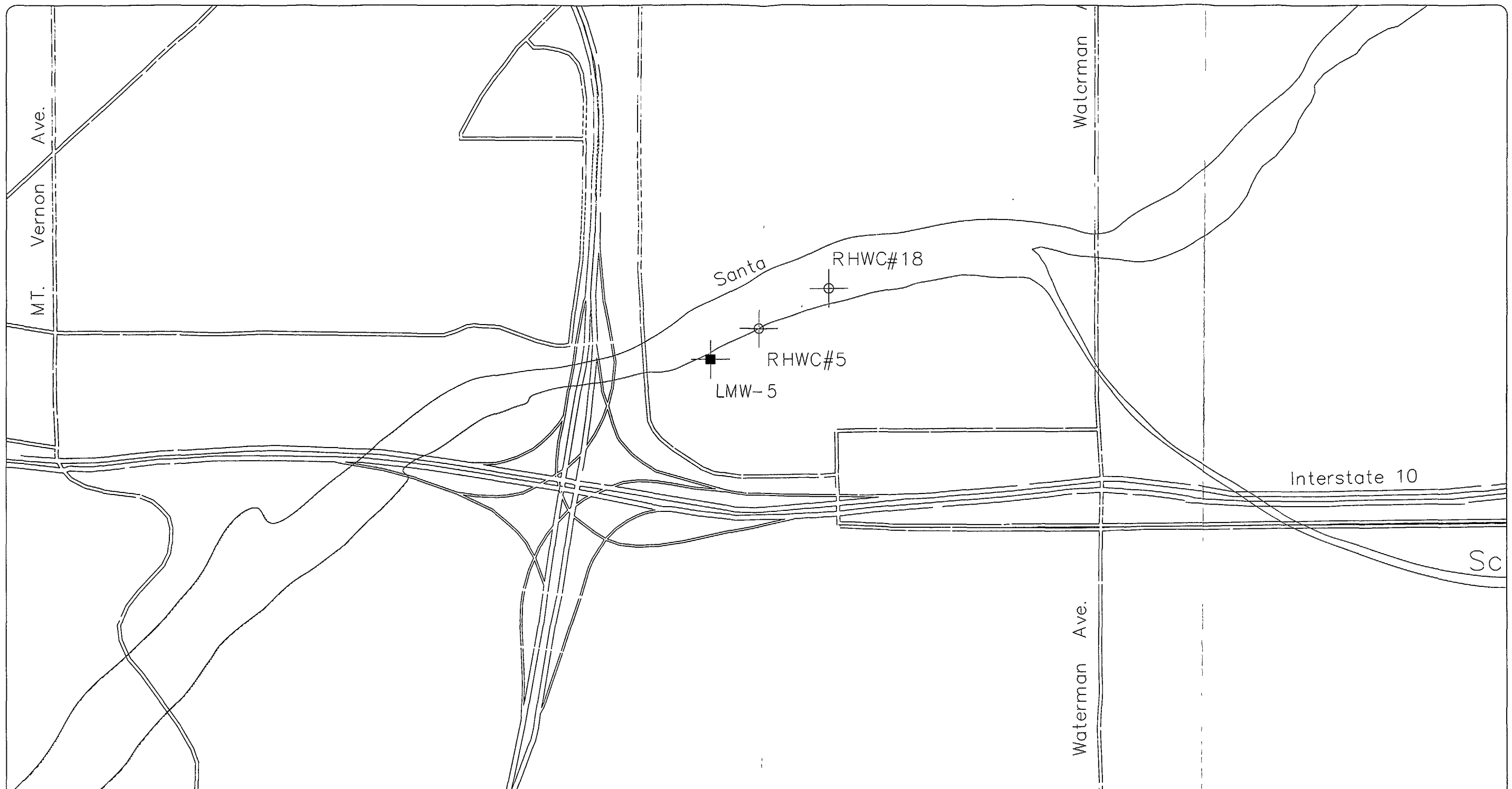
Thomas D. Blackman, R.G., C.HG
Technical Project Manager

cc: Susan Beeson CRWQCB-Santa Ana Region

enc: NOI for General Order R8-2003-0061
Figure 1: LMW-5 and Adjacent Well Location Map
Table 1 Groundwater Data for Wells Near Well LMW-5 Location

RECEIVED
NOV 15 2003

bc: Burxxxxxxxx
Ron Helgerson
Matt Werner
Bob Simpson
Bill Bath



EXPLANATION

Proposed Well Locations

Well Locations

0 1,000' 2,000' 4,000'

SCALE IN FEET

NORTH

TITLE: LMW 5 and Adjacent Wells Location Map

LOCATION: LOCKHEED MARTIN REDLANDS, CALIFORNIA

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

CHECKED:	Atonal Mares
DRAFTED:	Jeffrey Waugen
PROJ.:	52773
DATE:	6/28/02

FIGURE: 1

California Regional Water Quality Control Board
Santa Ana Region

NOTICE OF INTENT

TO COMPLY WITH THE TERMS AND CONDITIONS OF THE GENERAL PERMIT TO DISCHARGE WASTEWATER THAT POSE INSIGNIFICANT (DE MINIMUS) THREAT TO WATER QUALITY
(Order No. R8-2003-0061, NPDES No. CAG998001)

I. PERMITTEE *(Person/Agency Responsible for the Discharge)*

AGENCY/COMPANY Name: Lockheed Martin Corporation

Address: 2550 North Hollywood Way, Suite 301 Burbank CA 91505
Street *City* *State* *ZIP*

CONTACT Person: Thomas D. Blackman Phone: (818) 847-9901

II. FACILITY Name: Monitoring Well LMW-5

Location: Southern Levee of Santa Ana River, about 700 feet east of E street overcrossing, San Bernardino, CA
Street *City* *State* *ZIP*

CONTACT Person: Thomas D. Blackman Phone: (818) 847-9901

III. BILLING INFORMATION *(Where annual fee invoices should be sent)*

AGENCY/COMPANY Name: Lockheed Martin Corporation

Address: 2550 North Hollywood Way, Suite 301 Burbank CA 91505
Street *City* *State* *ZIP*

CONTACT Person: Thomas D. Blackman Phone: (818) 847-9901

IV. INDICATE EXISTING PERMIT NUMBER: *(if applicable)*

a. Individual Permit Order No. 93-49-041 NPDES No. CAG998001

b. General Permit Order No. 98-67 NPDES No. CAG998001

V. CERTIFICATION:

I certify under penalty of law that I am an authorized representative of the permittee and that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the permittee will comply with the terms and conditions stipulated in Order No. R8-2003-0061 including the monitoring and reporting program issued by the Executive Officer of the Regional Board.

Name and Official Title: Thomas D. Blackman, Technical Project Manager
(type or print)

Signature: William Bath for Thomas Blackman Date: 11/6/03

Remarks: *If changes to facility ownership and/or treatment processes were made after the issuance of the existing permit, please provide a description of such changes on another sheet and submit it with this Notice of Intent.*

Table
Groundwater Data for Wells
Near Well LMW-5 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
Riverside Highland Wtr Co.	RHWC#5	6/3/2003	Perchlorate	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	8/5/2003	Perchlorate	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1,1,2-Tetrachloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1,1-Trichloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1,2,2-Tetrachloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1,2-Trichloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1-Dichloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1-Dichloroethene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,1-Dichloropropene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2,3-Trichlorobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2,3-Trichloropropane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2,4-Trichlorobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2,4-Trimethylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2-Dibromo-3-chloropropane (DBCP)	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2-Dibromoethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2-Dichlorobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2-Dichloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,2-Dichloropropane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,3,5-Trimethylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,3-Dichlorobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,3-Dichloropropane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	1,4-Dichlorobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	2,2-Dichloropropane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	2-Chlorotoluene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	4-Chlorotoluene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Benzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Bromide	0	mg/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Bromobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Bromochloromethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Bromodichloromethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Bromoform	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Bromomethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Carbon tetrachloride	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Chlorobenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Chloroethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Chloroform	0	ug/l

Tab

Groundwater Data for Wells
Near Well LMW-5 Location

Well Owner	Well Name	Sampling Date	Compound	Result	Units
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Chloromethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	cis-1,2-Dichloroethene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	cis-1,3-Dichloropropene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Dibromochloromethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Dibromomethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Dichlorodifluoromethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Ethylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Hexachlorobutadiene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Isopropylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	m,p-Xylenes	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Methylene chloride	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Naphthalene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	n-Butylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	n-Propylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Orthophosphate	0	mg/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	o-Xylene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Perchlorate	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	p-Isopropyltoluene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	sec-Butylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Styrene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	tert-Butylbenzene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Tetrachloroethene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Toluene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	trans-1,2-Dichloroethene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	trans-1,3-Dichloropropene	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Trichloroethene	1.6	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Trichlorofluoromethane	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Vinyl chloride	0	ug/l
Riverside Highland Wtr Co.	RHWC#5	9/3/2003	Nitrate(as NO3)	2.4	mg/l
Riverside Highland Wtr Co.	RHWC#5	10/7/2003	Perchlorate	0	ug/l
Riverside Highlands Water Co.	RHWC#18	7/2/2003	Perchlorate	4.7	ug/l
Riverside Highlands Water Co.	RHWC#18	9/3/2003	Perchlorate	4	ug/l

San Bernardino County Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue - 2nd Floor, San Bernardino, CA 92415-0160

DO NOT FILL IN	
Permit Number	2003-10-0832
Expiration	04/17/04
FF	
FA	
SN	

WELL PERMIT
(Please Print)

Owner's Well No. LMW-4

DO NOT FILL IN	
Date	10/14/03
Amount $	212
Receipt Number	90309
Paid by	Earth Tech Inc.

1. OWNER: Name Lockheed Martin Corporation
   Mailing Address 2550 North Hollywood Way Suite 301
   City Burbank Zip 91505
   Site Address Southern Levee of Santa Ana River
   City San Bernardino Zip
   Telephone Number (818) 847-9901

2. WELL DRILLER: Beylik Drilling Inc. (Business Name)
   October 22, 2003 (Start Date) — December 19, 2003 (Completion Date)

3. WELL USE (*check*):
   ☐ Agricultural ☐ Horizontal ☐ Test
   ☐ Cathodic ☒ Monitoring/Observation ☐ Dairy
   ☐ Ind/Domestic ☐ Community/PWS/City ☐ Other

4. TYPE OF WORK (*check*):
   ☒ New ☐ Reconstruction ☐ Destruction

Items 6 through 9 to be estimated for new wells, exact for all other wells

5. ANNULAR SEAL: Seal Depth 50 ft.
   Furnished by: ☐ Owner ☒ Contractor
   ☐ Driven Conductor Dia. ____ in., Wall (Gage) ____
   ☒ Sealing Material Grout Thickness 600 in.

6. DEPTH OF WELL (feet):
   Proposed 910 Existing NA
   DIAMETER OF BORE (in.): 12

7. CASING INSTALLED:
   ☒ Steel ☐ Plastic ☐ Other

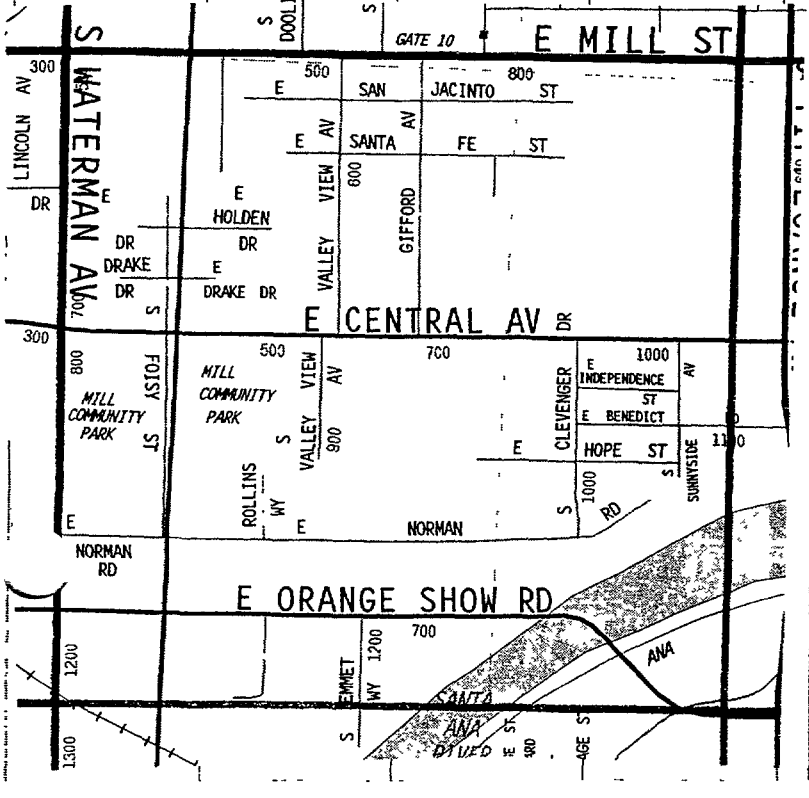
From (ft.)	To (ft.)	Dia. (in.)	Wall (Gage)
910	0	4	304

   Gravel Pack: ☐ Yes ☐ No
   From See Multiple Screen Intervals on Well Diagram

8. PERFORATIONS (*if applicable*):
   See Multiple Screen Intervals on Well Diagram

9. SEALED ZONES (*if applicable*):
   From See Multiple Screen Intervals on Well Diagram

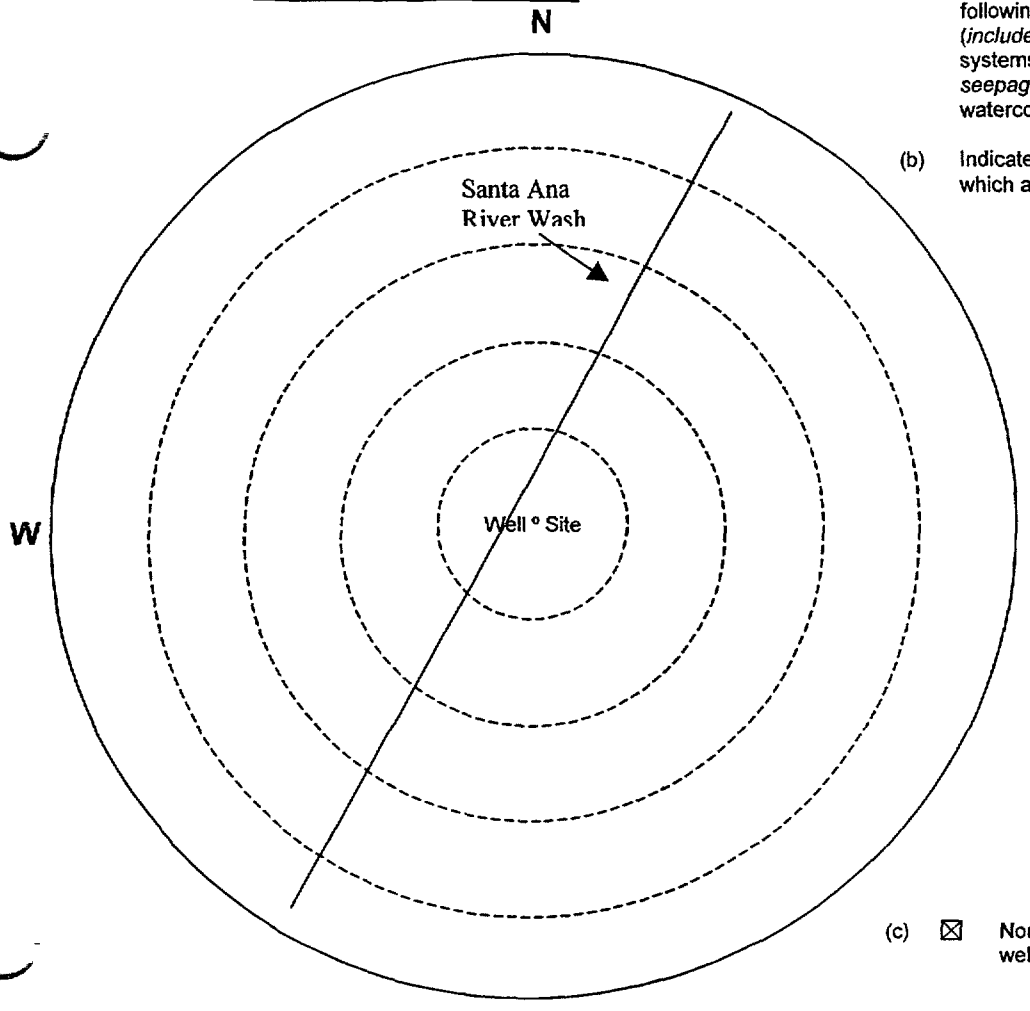
SECTION MAP – DO NOT FILL IN *Scale 1 inch - ¼ mile*



10. LOCATION INFORMATION 8-607; B4
    (a) Assessor's Parcel No. 0281-031-38-0000
    (b) Consulting Firm & Project Number:
    Earth Tech, Inc. 52773
    (c) Latitude and Longitude (If Known)
    Lat: 34 °, 4 ', 35.4 "N/S
    Long: 117 °, 16 ', 8.76 "E/W
    (d) Township:
    Tier 1S N/S Range 4W E/W Section ~~12~~ 14
    Map Info USGS 7.5 Minute San Bernardino Sheet

DO NOT FILL IN	
Seal	
Cap	
Check Valve	
Electricals	
Slab	
Tag	
Building & Safety Notified	

Assessor's Parcel No. 0281-031-38-0000



Scale: ½ inch = 100 feet

11. PLOT PLAN:

(a) In perspective to the well site, sketch and label the following items: well lot property lines, other wells (*include abandoned wells*), sewage disposal systems (*sewers, septic tanks, leaching fields, seepage pits, cesspools*), lakes and ponds, watercourses and animals or fowl kept.

(b) Indicate the distance, in **feet**, of any of the following which are within 500 ft. of the well site:

Other	—
Sewers	—
Septic tanks	—
Leaching fields	—
Seepage pits	—
Cesspools	—
Lakes and ponds	—
Watercourses	50
Animal or fowl kept	—

SEE ATTACHED TOPO MAP FOR WELL LOCATION

(c) ☒ None of the above are within 500 feet of the well site. Except for Santa Ana River Wash

12. I have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature John M. [illegible] Date 10/9/03

County Registration No. 30 California License No. 306291

DISPOSITON OF PERMIT
(For Department Use Only)

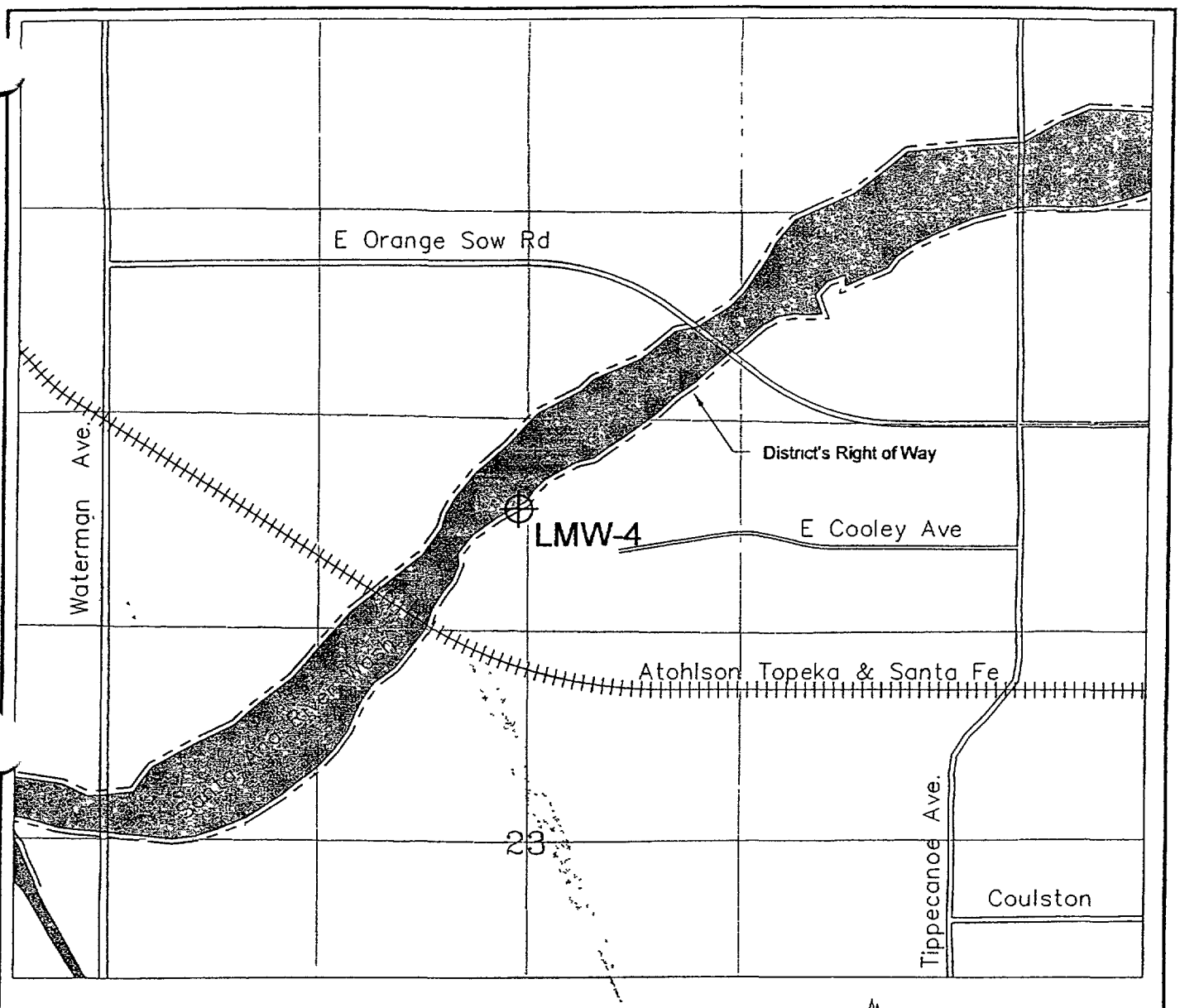
☐ Sent to Water Agency for review.
☐ Water Agency conditions or recommendations attached.
☒ Approved subject to the following:

A. ☒ Notify the Department, Safe Drinking Water Program, 909-387-4666, twenty-four (24) hours in advance to make an inspection of the following operations:
- ☐ Prior to sealing of the annular space or filling of the conductor casing.
- ☐ After installation of the surface protective slab and pumping equipment.
- ☐ *During destruction of wells, prior to pouring the sealing material.*

B. ☒ Submit to the Department, within thirty (30) days after completion of work, a copy of:
- ☒ Well Completion Report ☐ Bacterial Analysis ☐ Inorganic Chemical Analysis
- ☐ Radiological Analysis ☐ General Mineral ☐ Organic Chemical analysis ☐ General Physical

C. ☐ Submit a copy of the Well Completion Report to DWR within sixty (60) days of the completion of the well.

Comments



NORTH

0 250' 500' FEET

SCALE 1"= 500'

Notes:

1. Contractor Shall Clear Site for Underground Utilities Before Fieldwork Begins. All Underground Utilities Shall be Protected or Relocated as Specified. Contractor Shall Mark the Excavation Areas and Contact "Dig Alert" at Least Two Working Days Prior to Start of Excavation Activities

Underground Service Alert

Call TOLL FREE
1-800
227-2600

TWO WORKING DAYS BEFORE YOU DIG

1.	Bk C Blm	M30168
REV	PE SIGNATURE	PE#

Proposed Well Completion LMW-4
Santa Ana River, Southern Levee
West of Tippeconoe Avenue

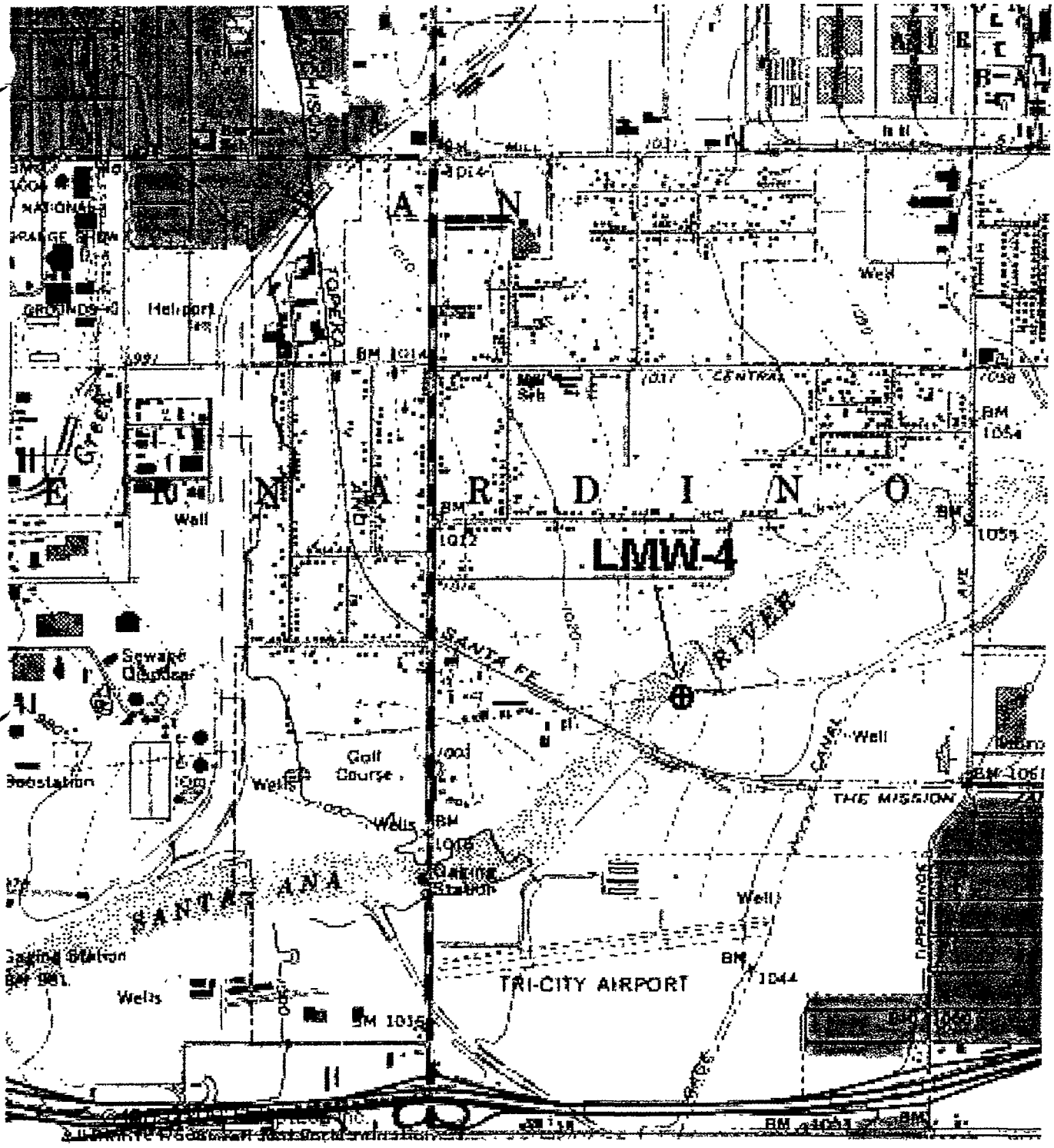
Contact Personnel:

Tom D. Blackman (818) 847-9901
Lockheed Martin Corp.

Matt Werner (562) 951-2274
Earth Tech Corp.

Date: 09-03	Lockeed Martin	Figure
Project No 52773	EARTH TECH A Tyco Infrastructure Services Company	1

File L:\LMC Rio POP\SWard\LMW 4 and 5\Figure 1.dwg Time Sep 09, 2003 - m



Well Location Map for LMW-4

Reference: USGS 7.5-Minute Quadrangle, South San Bernardino Sheet. Provided by www.maptech.com

N

Scale= 1:24000

County of San Bernardino - Human Services System
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SERVICES

RECEIPT FOR SERVICES

RECEIPT # - 40309

DATE 10/14/03 RECEIVED BY L. R

RECEIVED FROM Earth Tech Inc.

SUPERVISORIAL DISTRICT *(CIRCLE WHICH ONE)*

1 2 3 4 5

PAID BY

Cash —

Check 212.00

TOTAL $212.00

Check # 2187

DESCRIPTION Monitoring Well Permit
APN# 284-031-38

QTY	LOCATION	CATEGORY	ESTABLISHMENT NO.	PROGRAM & REVENUE	AMOUNT
1	80	466603	—	5200-9800	212.00

TOTAL $212.00

01-16858-611 Rev. 12/01
5100.008 H62

DISTRIBUTION: White - Customer Canary - FAS Green - FAS Pink - Office

San Bernardino County Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES
385 North Arrowhead Avenue - 2nd Floor, San Bernardino, CA 92415-0160

DO NOT FILL IN	
Permit Number	2003-10-0833
Expiration	04/17/04
FF	
FA	
SN	

WELL PERMIT
(Please Print)

Owner's Well No. LMW-5

DO NOT FILL IN	
Date	10/14/03
Amount $	210.00
Receipt Number	40308
Paid by	Earth Tech

1 OWNER: Name Lockheed Martin Corporation

Mailing Address 2550 North Hollywood Way Suite 301

City Burbank Zip 91505

Site Address Southern Levee of Santa Ana River

City San Bernardino Zip

Telephone Number (818) 847-9901

2. WELL DRILLER: Beylik Drilling Inc
Business Name

October 22, 2003 *Start Date* — December 19, 2003 *Completion Date*

3. WELL USE (*check*):

☐ Agricultural ☐ Horizontal ☐ Test
☐ Cathodic ☒ Monitoring/Observation ☐ Dairy
☐ Ind/Domestic ☐ Community/PWS/City ☐ Other

4 TYPE OF WORK (*check*):

☒ New ☐ Reconstruction ☐ Destruction

Items 6 through 9 to be estimated for new wells, exact for all other wells

5. ANNULAR SEAL: Seal Depth 50 ft.
Furnished by: ☐ Owner ☒ Contractor
☐ Driven Conductor Dia. ____ in., Wall (Gage) ____
☒ Sealing Material Grout Thickness 600 in.

6. DEPTH OF WELL (feet):
Proposed 855 Existing NA
DIAMETER OF BORE (in.): 12

7. CASING INSTALLED:
☒ Steel ☐ Plastic ☐ Other

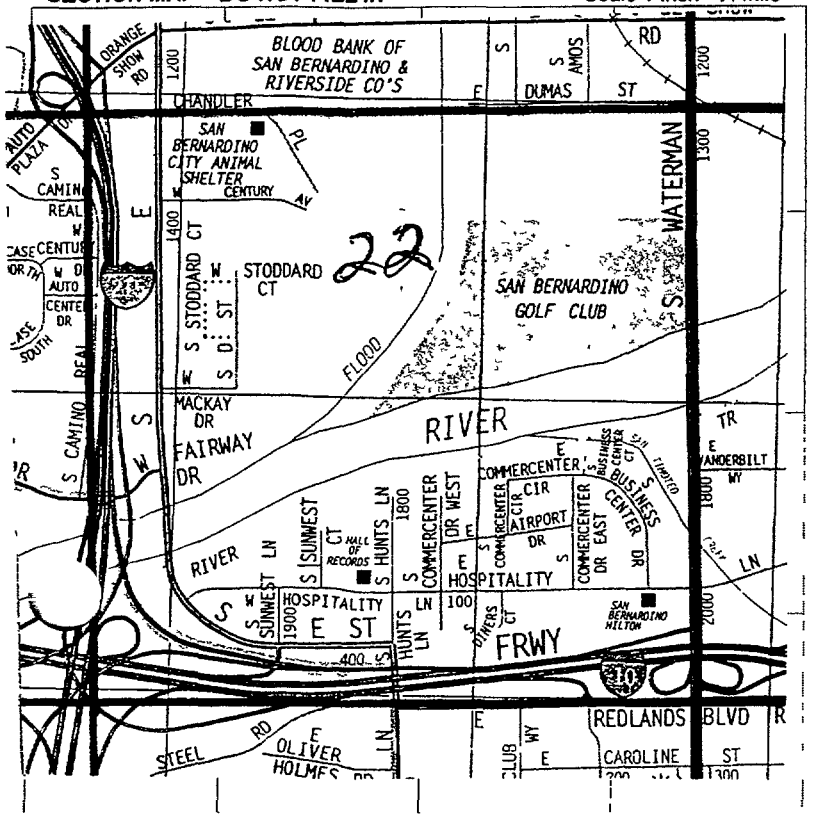
From (ft)	To (ft.)	Dia (in.)	Wall (Gage)
855	0	4	304

Gravel Pack ☒ Yes ☐ No
From See Multiple Screen Intervals on Well Diagram

8. PERFORATIONS (*if applicable*):
See Multiple Screen Intervals on Well Diagram

9. SEALED ZONES (*if applicable*)
From See Multiple Screen Intervals on Well Diagram

SECTION MAP – DO NOT FILL IN Scale 1 inch - ¼ mile



10 LOCATION INFORMATION 84 606 ; H6.

(a) Assessor's Parcel No 0141-363-02-0000

(b) Consulting Firm & Project Number:

Earth Tech, Inc. 52773

(c) Latitude and Longitude (If Known)

Lat 34 °, 4 ', 2.64 "N/S

Long 117 °, 17 ', 26.52 "E/W

(d) Township

Tier 1S N/S Range 4W E/W Section ~~12~~ 22

Map Info USGS 7.5 Minute San Bernardino Sheet

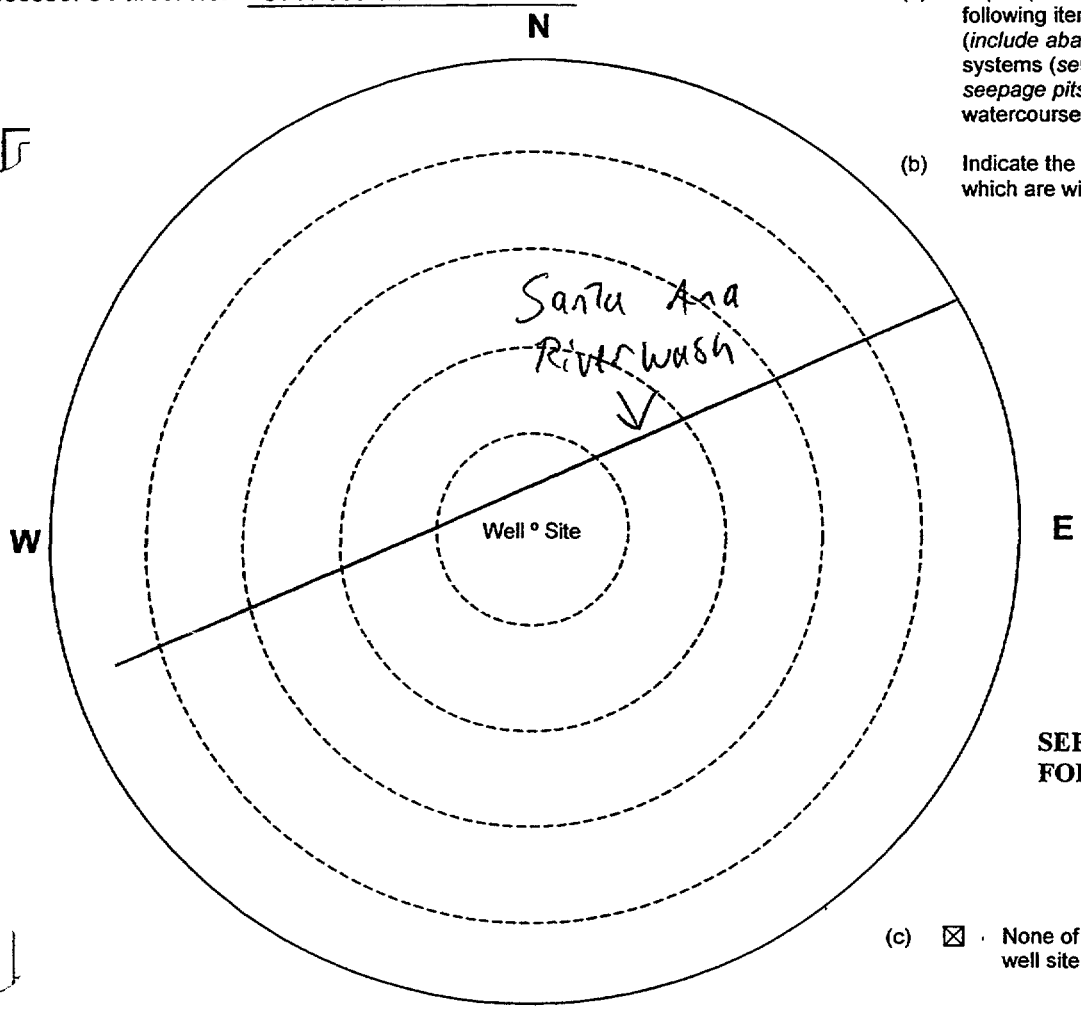
DO NOT FILL IN	
Seal	
Cap	
Check Valve	
Electricals	
Slab	
Tag	
Building & Safety Notified	

Assessor's Parcel No. 0141-363-02-000

11. PLOT PLAN:

(a) In perspective to the well site, sketch and label the following items: well lot property lines, other wells (*include abandoned wells*), sewage disposal systems (*sewers, septic tanks, leaching fields, seepage pits, cesspools*), lakes and ponds, watercourses and animals or fowl kept.

(b) Indicate the distance, in **feet**, of any of the following which are within 500 ft. of the well site:



Other	—
Sewers	—
Septic tanks	—
Leaching fields	—
Seepage pits	—
Cesspools	—
Lakes and ponds	—
Watercourses	50
Animal or fowl kept	—

SEE ATTACHED TOPO MAP FOR WELL LOCATION

(c) ☒ None of the above are within 500 feet of the well site. Except for Santa Ana River Wash

Scale: ½ inch = 100 feet

12. I have read this application and agree to comply with all laws regulating the type of work being performed.

C-57 Contractor's Signature John M. [illegible] Date 10/9/03

County Registration No. 30 California License No. 306291

DISPOSITON OF PERMIT

(For Department Use Only)

☐ Sent to Water Agency for review.

☐ Water Agency conditions or recommendations attached.

■ Approved subject to the following:

A. ■ Notify the Department, Safe Drinking Water Program, 909-387-4666, twenty-four (24) hours in advance to make an inspection of the following operations:

☐ Prior to sealing of the annular space or filling of the conductor casing.

☐ After installation of the surface protective slab and pumping equipment.

☐ During destruction of wells, prior to pouring the sealing material.

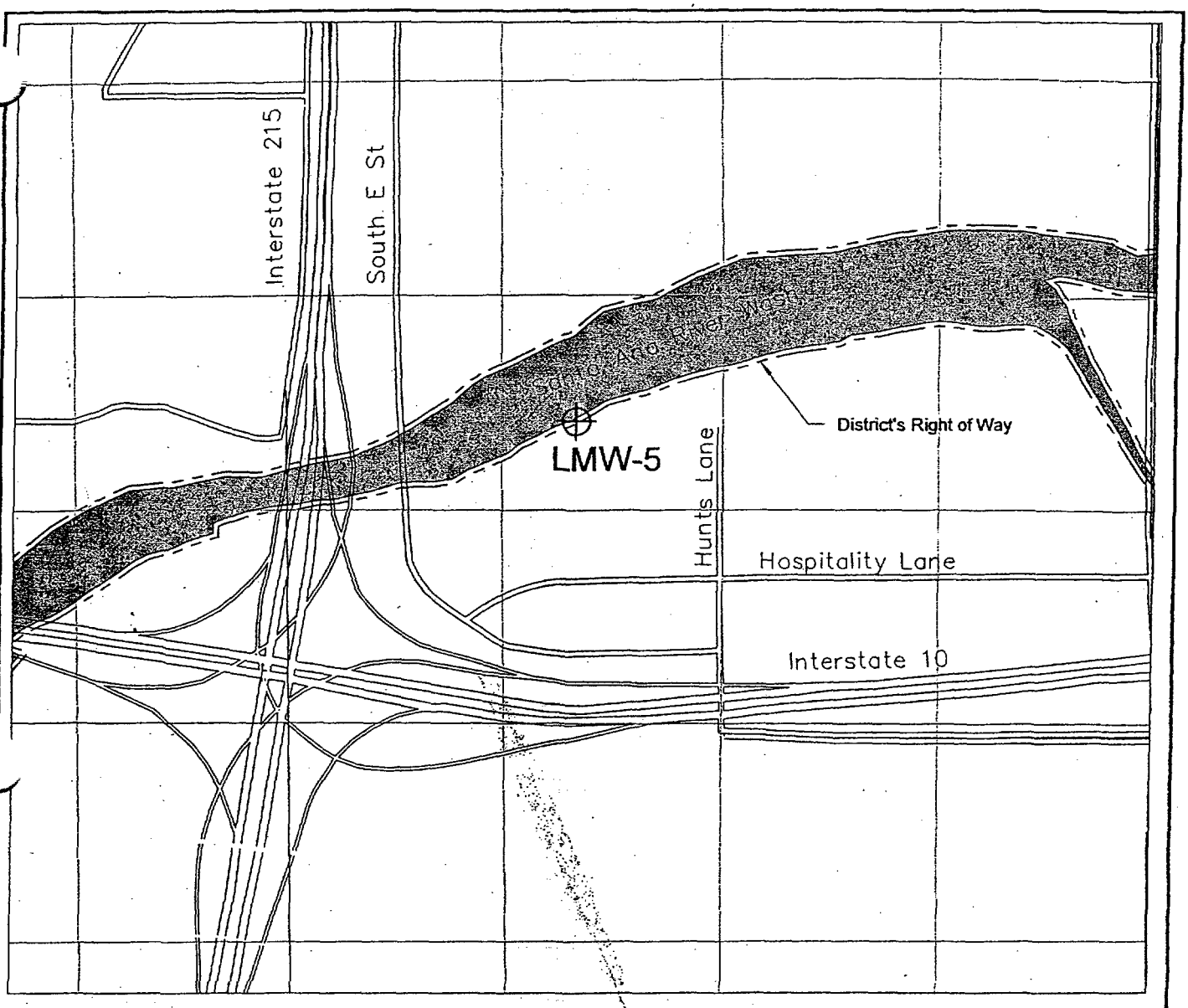
B. ■ Submit to the Department, within thirty (30) days after completion of work, a copy of:

☒ Well Completion Report ☐ Bacterial Analysis ☐ Inorganic Chemical Analysis

☐ Radiological Analysis ☐ General Mineral ☐ Organic Chemical analysis ☐ General Physical

C. ☐ Submit a copy of the Well Completion Report to DWR within sixty (60) days of the completion of the well.

Comments



NORTH

0 250' 500' FEET

SCALE: 1"= 500'

Notes:

1. Contractor Shall Clear Site for Underground Utilities Before Fieldwork Begins. All Underground Utilities Shall be Protected or Relocated as Specified. Contractor Shall Mark the Excavation Areas and Contact "Dig Alert" at Least Two Working Days Prior to Start of Excavation Activities.

Underground Service Alert

Call: TOLL FREE
1-800
227-2600

TWO WORKING DAYS BEFORE YOU DIG

1.	Pete C Blum	H30168
REV	PE SIGNATURE	PE#

Proposed Well Completion LMW-5
Santa Ana River, Southern Levee
East of South E Street

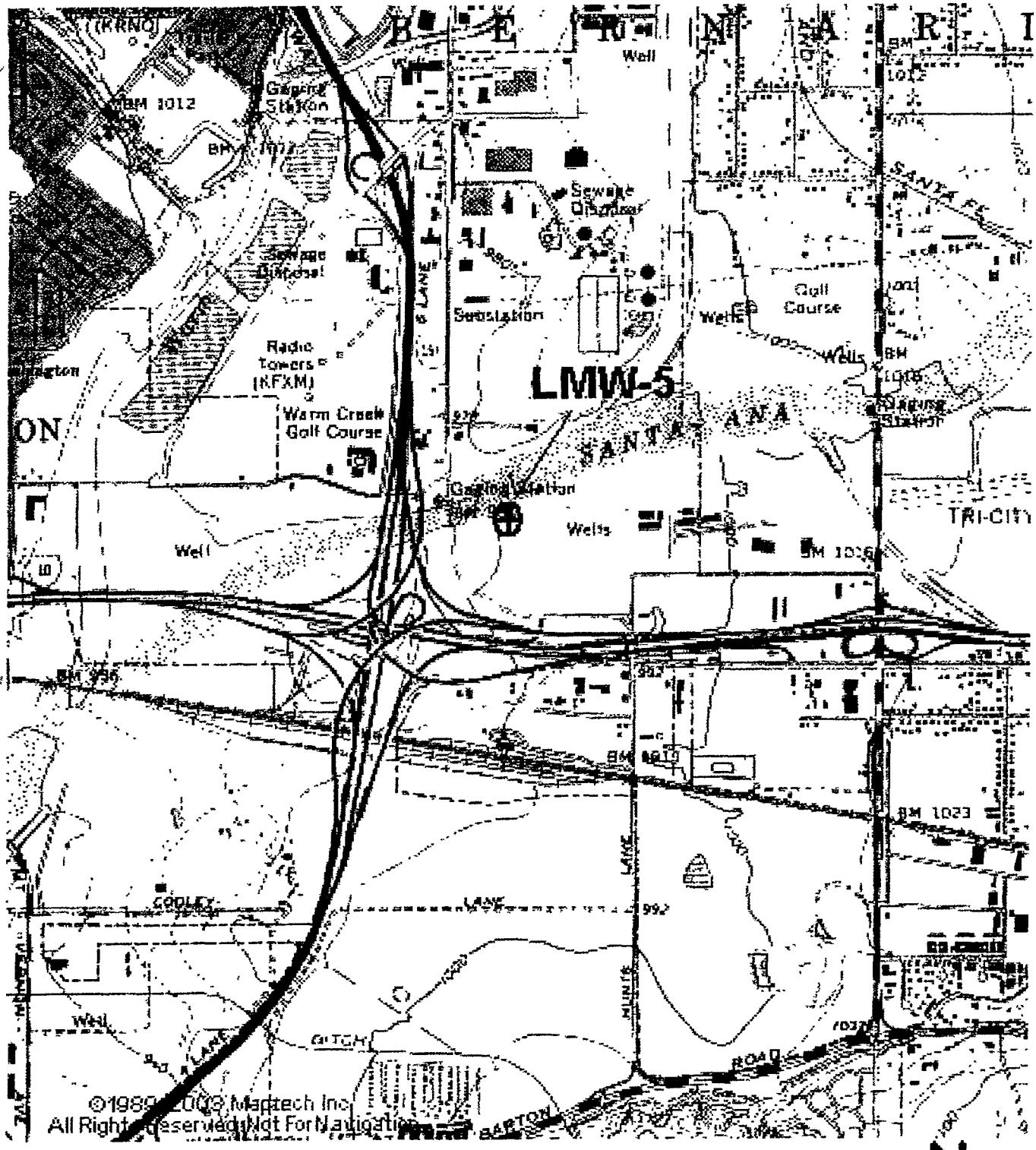
Contact Personnel:

Tom D. Blackman (818) 847-9901
Lockheed Martin Corp.

Matt Werner (562) 951-2274
Earth Tech Corp.

Date: 09-03	Lockeed Martin	Figure
Project No. 52773	EARTH TECH A tyco INTERNATIONAL LTD. COMPANY	3

File: L:\LMC R\...e POP\SWard\LMW 4 and 5\Figure 3.dwg Time: Sep 09, 2003 ...pm



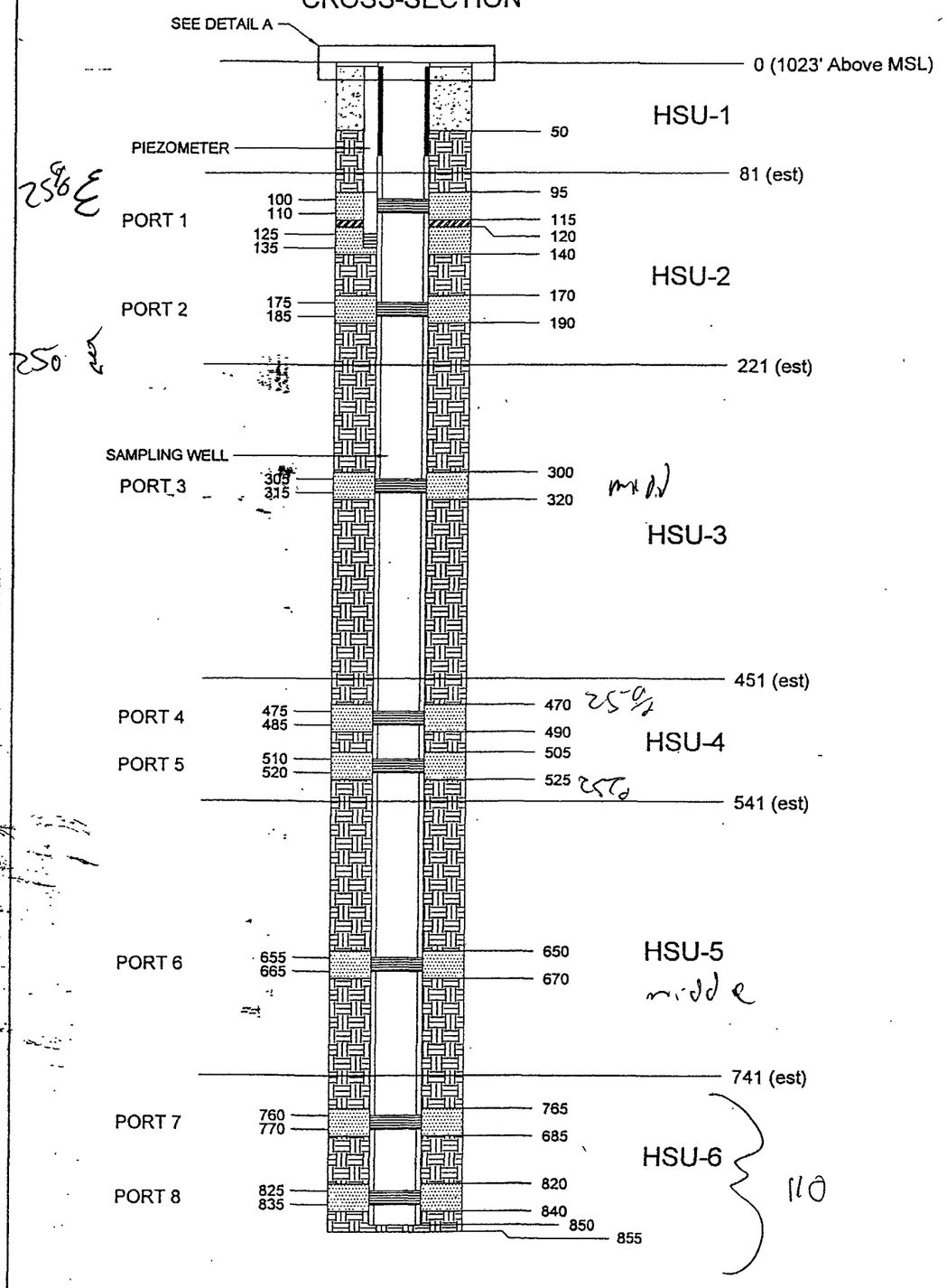
N

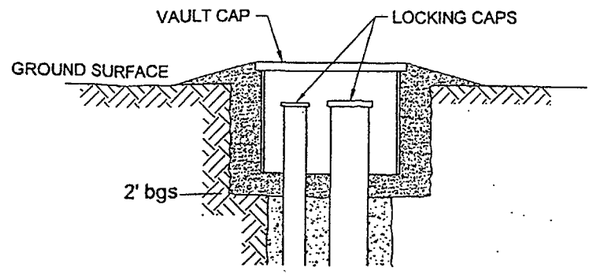
Well Location Map for LMW- 5

Reference: USGS 7.5-Minute Quadrangle, South San Bernardino Sheet. Provided by www.maptech.com

Scale= 1:24000

CROSS-SECTION





DETAIL A AND PROFILE OF SURFACE VAULT

LEGEND

- Concrete 560-B or C-3210
- Cement/Bentonite Grout
- 2/12 Lonestar Sand Pack
- Bentonite Slurry
- Stainless Steel .010 inch Continuous Wire Wrap Screen Section
- HSU — Hydrostratigraphic Unit
- 4-inch Diameter Low Carbon Steel Casing Above Water Table
- 4-inch Diameter Stainless Steel Casing Below Water Table
- 2-inch Diameter Schedule 80 PVC Casing
- 2-inch PVC Screen
- (est) — Estimated

NOTES:

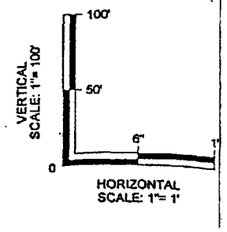
1. All Joints Are Flush Threaded.
2. Final Screen Depths with be Based on the Depths of the Specific HSU's as Encountered in the Borings so that the Sampling Screens are Wholly within the Target HSU.
3. Piezometric Water Levels in the Upper Most Aquifer, HSU-2, are Expected to be 100 to 120 ft BGS.
4. Vicinity Map is Shown on Figure 1.
5. Contractor Shall Clear Site for Underground Utilities Before Fieldwork Begins. All Underground Utilities Shall be Protected or Relocated as Specified. Contractor Shall Mark the Excavation Areas and Contact "Dig Alert" at Least Two Working Days Prior to Start of Excavation Activities.

Underground Service Alert
Call: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG

Contact Personnel:

Tom D. Blackman (818) 847-9901
Lockheed Martin Corp.

Matt Werner (562) 951-2274
Earth Tech Corp.



1.		M30168
REV	PE SIGNATURE	PE#

Proposed Well Completion LMW-5
Santa Ana River, Southern Levee
East of South E Street

Date: 09-03	Lockeed Martin	Figure
Project No. 52773	EARTH TECH — A tyco INTERNATIONAL LTD. COMPANY	4

File: L:\LMC Riverside POP\SWard\LMW 4 and 5\Figure 4.dwg Time: Sep 09, 2003 - 11:00am

County of San Bernardino - Human Services System
DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SERVICES

RECEIPT # - 40308

RECEIPT FOR SERVICES

DATE 10/14/03 RECEIVED BY J.R

RECEIVED FROM Earth tech Inc.

SUPERVISORIAL DISTRICT *(CIRCLE WHICH ONE)*

1 2 3 4 5

PAID BY

Cash —

Check 212.00

TOTAL $212.00

Check # 2182

DESCRIPTION Monitoring Well Permit
APN# 0141-363-02

QTY	LOCATION	CATEGORY	ESTABLISHMENT NO.	PROGRAM & REVENUE	AMOUNT
1	64	466603	—	5200-9800	212.00

TOTAL $212.00

01-16858-611 Rev. 12/01
5100.008.H62

DISTRIBUTION: White - Customer Canary - FAS Green - FAS Pink - Office

Inspection Phone:
(909 38 -8015

Inspection office shall be notified two working days prior to commencing permitted use. FAILURE TO OBTAIN INSPECTION SHALL BE CAUSE TO VOID THIS PERMIT.

San Bernardino County Flood Control District
825 East Third Street, Room 108
San Bernardino, CA 92415-0835
(909) 387-7995 - FAX (909) 387-8043

PERMIT

Permit Issued: October 21, 2003 **Permit Expires:** October 21, 2008 **File:** 3-101/2.04
Permit No: P-32003096

Permittee: Lockheed Martin Corporation
2550 North Hollywood Way, Suite 301
Burbank, CA 91505
Contact Phone: Thomas D. Blackman / (818) 847-9901
Project Manager

Filing Fee: $ 535.00
Annual Inspection Fee: $1,100.00
(Nonrefundable) TOTAL: $1,635.00

Permit Activity: Install, operate and maintain two water monitoring wells
Facility: Santa Ana River
Location: 1) East of "E" Street, and 2) west of Cooley Avenue
City/Community: City of San Bernardino

1. The two proposed water monitoring wells shall be in accordance with the Plans (Exhibit "A"), and the Standard and General Provisions, all of which are attached and made a part of this permit.

2. **AT LEAST 48 HOURS NOTICE SHALL BE GIVEN TO THE DISTRICT BEFORE STARTING ANY WORK UNDER THIS PERMIT.** Contact the District's inspector at (909) 387-8015; failure of notification is cause for revocation of this permit.

3. This permit, or a certified copy thereof, shall be kept at the job site throughout the period of operations within District right-of-way and shall be shown to any District Representative or any law enforcement officer upon demand. Exercise of this permit shall indicate acceptance of and agreement to comply with all provisions included herein. Violation of any provision shall be cause for immediate revocation of permit.

PERMITTEE'S ACCEPTANCE:
Signature by the Permittee or Permittee's Authorized Agent of this Permit shall indicate acceptance of all of the provisions of the permit.

[signature] 10/16/03
Permittee's Signature Date

THOMAS D. BLACKMAN
Print

TECHNICAL PROJECT MANAGER
Title

Fish and Game
FC Operations Supt
Inspector

DISTRICT APPROVAL:

Ken A. Miller
KEN A. MILLER
Flood Control Engineer

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 5

To Greg Deason	From G. Kim
Co.	Co.
Dept.	Phone #
Fax # 858 536 5620	Fax #

STANDARD PROVISIONS

1. **The term of this permit is for five years.** The District will coordinate an extension(s) to the permit term upon receipt of a completed **Flood Control Permit amendment application** at least thirty days prior to the expiration date. Said extensions will not be unreasonably withheld.

2. No revisions to the approved plans shall be made during construction without review, written approval and/or permit amendment from the District.

3. No floatable materials or stockpiling shall be maintained in the river area, and equipment shall be kept out of the river except when in use during working hours.

4. The existing access gates shall be locked after hours and on weekends by interlocking Permittee's lock with the District's lock to allow District access.

5. The proposed activity within District right-of-way shall be in compliance with all City ordinances for noise and operating hours.

6. **An annual inspection fee shall be due on the anniversary date of this permit. The annual inspection fee shall be in accordance with the District's Schedule of Fees Ordinance in effect on the anniversary.**

7. All existing asphalt or concrete surfacing removed for the installation of the two water monitoring wells shall be sawcut at the removal limits. Any settlement in the future shall be maintained by the Permittee.

8. Backfill in all areas having flood control facilities shall be similar to the existing material and shall not contain organic material, broken concrete or pavement, or other material unsuitable for compaction. All backfill shall be compacted to at least ninety percent (90%) relative density as determined by ASTM test Method D-1557, Method C and certified evidence thereof submitted. Compaction tests shall be performed at locations specified and to the satisfaction of the District.

9. All construction and material testing for facilities constructed within District right-of-way will be performed by the Permittee and/or Permittee's authorized agent and certified evidence thereof shall be furnished to the District at the Permittee's expense.

10. The Permittee will submit "Record Drawings" at the time of the final inspection.

11. Concrete for rock inlet and outlet structures, bottom controls, splash pad and other proposed structures shall be 560-B or C-3250.

12. Concrete mix designs shall be submitted to the District for review and approval at least 72 hours prior to concrete placement within District right-of-way.

13. All reinforcing steel shall conform to the requirements of ASTM A-615 and shall be Grade 60.

14. The exact location of the two water monitoring wells shall be field coordinated with the District's inspector prior to installation.

15. A modified concrete apron, attached herewith as Exhibit "B", shall be required around all above ground structures.

16. At such time when the wells are no longer in use, the wells shall be capped per San Bernardino County Department of Public Health and State regulations.

17. The two monitoring wells shall be adequately marked with above ground markers per District's S.P. 204, attached herewith as Exhibit "C" at intervals determined in the field by the District.

GENERAL PROVISIONS

1. Exercise of this permit, by Permittee or Permittee's authorized agent, shall indicate acceptance of all of the provisions of this permit. Permittee shall make all contractors doing work on this project familiar with all of the requirements of this permit. Violation of any provisions of this permit shall be cause for immediate revocation of the permit.

2. INSURANCE - This permit shall not become valid until the Certificate of Insurance has been completed by your contractor's insurance company and approved by the Flood Control District. If the permit activity is to be completed by Permittee's forces, the Certificate of Insurance shall be completed by Permittee's insurance company and approved by the Flood Control District.

3. The Permittee shall indemnify and hold the District and all officers, employees and agents of said public body free and harmless from any and every claim, demand or action for damages, or injury to any person or persons or property of any kind whatsoever, and any cost or expense in connection therewith, and agrees to defend the Flood Control District, the County of San Bernardino, and all officers, employees and agents of said public body against any claims or demands which may arise out of or result from Permittee's construction, operation, use or activities on District right-of-way.

4. A copy of this permit will be sent to the State Department of Fish and Game, who may require a permit for this type of activity. It is the responsibility of the Permittee to obtain any required permits and approvals prior to starting any activity authorized in the permit. State Department of Fish and Game may be contacted at the address below.

   Department of Fish and Game
   Attn: Environmental Services
   330 Golden Shore Drive, Suite 50
   Long Beach, CA 90802
   (562) 590-5126

   A completely executed copy of the State Department of Fish and Game permit shall be kept at the permit site at all times while work is being performed. Permittee shall make all contractors doing work on this project familiar with all of the requirements of the State Department of Fish and Game permit.

5. Prior to beginning any activity authorized in this permit, the Permittee and/or Permittee's authorized agent, shall notify Underground Service Alert (USA) at 1-800-422-4133 at least 48 hours in advance to coordinate the permit activity on District right-of-way.

6. In accepting this permit, the Permittee agrees to replace any existing improvements which may include but not be limited to access road pavement, irrigation pipelines, chain link fencing and landscaping with acceptable products, installed to size, line and grade as the existing products removed and as approved by the District.

7. Work done in the absence of prescribed inspection may be required to be removed and replaced under the proper inspection, the entire cost of removal and replacement, including the cost of all materials used in the work thus removed, shall be borne by the Permittee, regardless of whether the work removed is found to be defective or not. Work covered up without the authority of the District, shall upon order of the District, be uncovered to the extent required and the Permittee shall bear the entire cost of performing all the work and furnishing all the equipment and material necessary for the removal and subsequent replacement of the covering, as directed by the District.

8. Should installation or maintenance activities be required during the period October 15 to April 15, work shall be undertaken within a 5-day clear weather forecast. Permittee shall maintain and provide for a flood watch when storm conditions threaten, and have personnel and equipment available on a 24-hour schedule and provide the District with the names and after-hours phone numbers of responsible supervisory personnel.

9. Any survey monuments which will be disturbed or destroyed shall be located, referenced and a corner record filed with the County Surveyor prior to the start of construction. The monuments shall be reset in a surface of the new construction, with a suitable monument box placed thereon, or set with permanent witness monuments. A corner record shall be filed with the County Surveyor for reset of monuments and evidence submitted prior to finalizing the permit. All work shall be performed under the direction of a licensed land surveyor or registered civil engineer at the expense of the Permittee.

10. Access to the District's levees, channels and patrol roads shall remain open and free to vehicular traffic at all times. Alternate access to the facilities shall be provided when existing access is severed or impaired. Permittee must prevent the public or unauthorized persons from entering the construction area or the District's right-of-way.

11. The Permittee shall perform, at Permittee's own expense, all construction surveying and engineering necessary to control construction to limits defined in the Plans and Exhibit "A". The construction surveying and engineering will be performed to the District's satisfaction.

12. Permittee shall, at all times, exercise proper dust control and dust abatement.

13. At any time during the life of this permit, the District may revise, modify or add provisions to this permit as may be required to meet the flood control, water conservation and safety responsibilities of the District.

14. The location of any temporary construction roadways or ramps which the Permittee may wish to build within District right-of-way shall be subject to the approval of the District. Roads shall be constructed so as to wash out during any anticipated flows.

15. This permit is valid only to the extent of the Flood Control District's jurisdiction. Permits or other approvals required by other cognizant agencies or underlying fee owners of District easement lands shall be the responsibility of the Permittee. Nothing contained in this permit shall be construed as a relinquishment of any rights now held by the Flood Control District.

16. If the Permittee should refuse or neglect to comply with the provisions of the permit, or the orders of the District, the District may have such provisions or orders carried out by others at the expense of the Permittee.

17. If the Permittee fails to comply with any obligation contained herein, Permittee shall be liable to the District for any administrative expenses and attorney's fees incurred in obtaining compliance with this permit and any such expenses and fees incurred in processing any action for damages or for any other remedies permitted by law.

18. No part of the activities authorized under this permit shall be accepted in phases. All work within District right-of-way must be completed prior to District acceptance of improvements within District right-of-way.

19. At the completion of the construction activities, the area shall be cleaned, graded and dressed to the satisfaction of the District. A joint inspection (Permittee/District), shall be made to determine if the work has been completed in accordance with permit requirements.

20. This permit is valid only for the purpose specified herein. All proposed changes shall be submitted, in writing, for District review and approval.

21. Activities under this Permit are subject to any instructions of the Flood Control Engineer or his representative. ALL INSTRUCTIONS MUST BE STRICTLY OBSERVED.

22. District activities shall take precedence at all times and, when any work or activity must be performed to carry out the functions and purposes of the District, Permittee must allow same to be done without interference.

23. Any damage caused to District facilities or structures by reason of the exercise of the Permit shall be repaired at the cost of the Permittee to the satisfaction of the District. Permittee will be billed for the actual cost to the District should Permittee neglect to make such repairs promptly.

24. Any District right-of-way monuments that are removed, disturbed, or destroyed as a result of activity under permit will be replaced by the District. Permittee will be billed and agrees to immediately pay all costs of such replacement.

25. Unless otherwise specified herein, this permit is subject to all prior permits, agreements, easements, privileges or other rights whether recorded or unrecorded, in the area specified in this permit. Permittee shall make his own arrangements with holders of such prior rights.

26. The permitted activities shall be in accordance with:

a. The San Bernardino County Department of Public Works, Transportation and Flood Control Standard Specifications, available at the Department of Public Works, 825 E. Third Street, San Bernardino, California; and

b. a applicable provisions of the "Construction and Safety Orders" issued by the State Division of Industrial Safety and "Manual of Accident Prevention in Construction" issued by the Associated General Contractors, Inc.

27. All work associated with the activities authorized under this permit shall conform with all Cal-OSHA requirements. Prior to any shoring activity, the Permittee or Permittee's authorized agent shall submit shoring plans, signed and approved by a registered engineer, and copies of required permits.

28. It shall be the responsibility of the Permittee and/or the Permittee's authorized agent to insure that all personnel performing work authorized under this permit are adequately trained and have appropriate safety gear and equipment before entering any confined space.

29. The Permittee shall comply with the District's Stormwater Ordinance 3588 and all applicable National Pollutant Discharge Elimination System (NPDES) requirements to reduce or eliminate pollution of stormwater discharges into waters of the United States. In this regard, the Permittee shall utilize best management practices in the operation and storage of equipment, machinery, fuels, etc., to prevent any pollutants from being discharged into any storm drain and/or channel systems. In addition, pollutants (including sediment) generated as a result of the activity authorized by this permit shall not be discharged into the drainage system.

30. Should future activities of the Corps of Engineers and/or the District so require, the Permittee shall, at Permittee's expense, relocate all or any part of the subject works as so required.

31. The District will consider time extensions to the permit upon receipt of a written request from the Permittee 30 days prior to expiration.

32. The area disturbed by permitted activities shall be kept to minimum and shall be limited to that area actually being worked.

33. No nuisance shall be allowed on any of the premises and the Permittee shall exercise diligence in precluding any trespassing operations in the area by patrolling or installing barriers to deter unauthorized access when the premises are not supervised.

34. Any unauthorized structure or portions thereof placed on District right-of-way or which affect District structures, must be removed by Permittee without cost to the District.

35. Violation of any provision contained therein, without written consent of the District, shall be cause for immediate revocation of this permit after written notice to the Permittee of any violation not remedied within 30 days following said written notice.

36. Upon cancellation or revocation of this permit, for any cause whatsoever, Permittee shall immediately cease all activities authorized hereunder, shall restore District right-of-way, structures and facilities to the satisfaction of the District, and shall vacate the District's premises. Should Permittee neglect to restore the premises, structures and facilities to a condition satisfactory to the District, the District will perform such work and Permittee agrees to reimburse the District for all actual costs of work performed.

37. If the permit term is extended, an annual inspection fee shall be due each year on the anniversary date of the permit. The annual inspection fee shall be based on the District's current Schedule of Fees Ordinance in effect on the anniversary date of the permit.

38. It is expressly understood that the area involved under this permit is subject to inundation from storm, flood and/or conservation flows at any time, and that the District shall not, in any way, be obligated to afford protection against said flows, or to assume any cost for damages. The District reserves the right to divert any storm or flood flows upon any land under this permit any time, and no diversion of such shall be made by the Permittee without the consent of the District.

39. All concrete shall conform to Section 201-1 of the Standard Specification for Public Works Construction, latest edition, unless otherwise specified in this permit. Curing compound shall conform to the provisions of Section 201-4.1 of the Standard Specifications for Public Works Construction, latest edition, Type 1-clear or translucent with red fugitive dye.

Rev 12/00

APPENDIX D

ANALYTICAL OF WASTE (CUTTINGS AND DRILLING FLUID) PROFILING

CHEMICAL CONSULTANTS

SOLID SAMPLE CHAIN-OF-CUSTODY

CLIENT: BEYLIK DRILLING DATE SAMPLED: 10-30-03

PROJECT: SANTA ANA RIVER TIME SAMPLED: 1139

SAMPLED BY: Jim Kimura

LOG NUMBER	SAMPLE TYPE	TESTING/SAMPLING INFORMATION
S-10150	SOIL	A COMPOSITE OF 4 BINS
		(3 SMALL SAMPLES FROM EACH BIN)
		Well # LMW-4
		NOTE: LAB pH = 7.4

FIELD NOTES:

LMW-4 10-30-03 @ 1139
FROM THE ~~BOX~~ FOLLOWING BINS; 103L, 154L, 140L, & 152L

NUMBER OF SAMPLES/CONTAINERS 1 SAMPLE CONTAINERS G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES (NO)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]	[signature]	10-30	1340	

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING , INC.
555 S. Harbor Blvd.
La Habra, Ca 90631

DATE: October 30, 2003
LOG NUMBER: S-10150
DATE RECEIVED: 11/3/2003
PO#:: Kennedy
JOB #:

PROJECT: San Bernadino-Santa Ana River
CHAIN OF CUSTODY #: DATE-BIN # (110303-103L/154L/140L/152L)
SAMPLE: Composite soil sample from four (4) roll-off bins

ANALYTES	RESULTS TTLC (mg/kg)	METHOD DETECTION LIMITS (mg/kg)	RESULTS STLC (mg/L)	STLC Regulatory Limits (mg/L)	RESULTS TCLP (mg/L)	TCLP Regulatory Limits (mg/L)	METHOD NO.
ANTIMONY	<0.1	0.1	N.A.	15	N.A	N.A	AES0029
ARSENIC	<1.0	1	N.A.	5.0	N.A	5.0	Std. 3114B
BARIUM	23.8	0.5	N.A.	100.0	N.A	100.0	AES0029
BERYLLIUM	<0.5	0.5	N.A.	0.8	N.A	N.A	AES0029
CADMIUM	<0.5	0.5	N.A.	1.0	N.A	1.0	AES0029
CHROMIUM	<0.5	0.5	N.A.	5.0	N.A	5.0	AES0029
COBALT	<0.5	0.5	N.A.	80.0	N.A	N.A	AES0029
COPPER	1.52	0.5	N.A.	25.0	N.A	N.A	AES0029
LEAD	1.6	1	N.A.	5.0	N.A	5.0	AES0029
MERCURY	<0.05	0.05	N.A.	0.2	N.A	0.2	Std. 3112B
MOLYBDENUM	<0.5	0.5	N.A.	350.0	N.A	N.A	AES0029
NICKEL	0.61	0.5	N.A.	20.0	N.A	N.A	AES0029
SELENIUM	<5.0	5	N.A.	1.0	N.A	1.0	AES0029
SILVER	<0.5	0.5	N.A.	5.0	N.A	5.0	AES0029
THALLIUM	<5.0	5	N.A.	7.0	N.A	N.A	AES0029
VANADIUM	<0.5	0.5	N.A.	24.0	N.A	N.A	AES0029
ZINC	2.8	1.5	N.A.	250.0	N.A	N.A	AES0029

Samples were collected and composited from bins: 103L, 154L, 140L and 152L

ANALYTES	RESULTS	Reporting Limit	Method No.
TRPH	<2	2 mg/kg	EPA 418.1
pH	7.4	2-14 units	EPA 150.1

Three (3) discrete samples, from each bin, were collected and then composited into one sample.

Beylik Drilling, Inc.
Log Number: S-10150
November 3, 2003

EPA 8010	RESULTS	DETECTION LIMITS	TEST METHODS
1,1 Dichloroethane	< 10	10 ug/l	EPA 8010
1,2 Dichloromethane	<10	10 ug/l	EPA 8010
Chloroethane	<10	10 ug/l	EPA 8010
Chloromethane	<10	10 ug/l	EPA 8010
Bromomethane	<10	10 ug/l	EPA 8010
Vinyl Chloride	<10	10 ug/l	EPA 8010
Methylene Chloride	<10	10 ug/l	EPA 8010
Vinyl Chloride	<10	10 ug/l	EPA 8010
Trans1,2-Dichloroethylene	< 25	10 ug/l	EPA 8010
1,1-Dichloroethene	< 10	10 ug/l	EPA 8010
Chloroform	< 5.0	10 ug/l	EPA 8010
1,1,1-Trichloroethane	< 5.0	5.0 ug/l	EPA 8010
Carbon Tetrachloride	< 5.0	5.0 ug/l	EPA 8010
Trichloroethylene	< 5.0	5.0 ug/l	EPA 8010
1,2-Dichloropropane	< 50	50 ug/l	EPA 8010
Dichlorobromomethane	< 5.0	5.0 ug/l	EPA 8010
Trans1,3-Dichloropropene	< 5.0	5.0 ug/l	EPA 8010
CIS 1,3-Dichloropropene	< 5.0	5.0 ug/l	EPA 8010
1,1,2-Trichloroethane	< 10	10 ug/l	EPA 8010
Tetrachloroethylene	< 5.0	5.0 ug/l	EPA 8010
Dibromochloromethane	< 5.0	5.0 ug/l	EPA 8010
Chlorobenzene	< 20	20 ug/l	EPA 8010
Bromoform	< 10	10 ug/l	EPA 8010
1,1,2,2-Tetrachloroethane	< 10	10 ug/l	EPA 8010
1,3-Dichlorobenzene	< 10	10 ug/l	EPA 8010
1,4-Dichlorobenzene	< 10	10 ug/l	EPA 8010
1,2-Dichlorobenzene	< 10	10 ug/l	EPA 8010

Date Anaylzed: 10/31/2003
Analyst: LK

EPA 8020	RESULTS	DETECTION LIMITS	TEST METHOD
Benzene	< 0.50	0.50 ug/l	EPA 8020
Toluene	< 0.50	0.50 ug/l	EPA 8020
Ethylbenzene	< 0.50	0.50 ug/l	EPA 8020
Total Xylenes	<0.50	0.50 ug/l	EPA 8020
1,2-Dichlorobenzene	< 0.50	0.50 ug/l	EPA 8020
1,3-Dichlorobenzene	< 0.50	0.50 ug/l	EPA 8020
1,4-Dichlorobenzene	< 0.50	0.50 ug/l	EPA 8020
Methyl Tertiary Butyl Ether	< 0.50	0.50 ug/l	EPA 8020

Date Anaylzed: 10/31/2003
Analyst: LK

Respectfully Submitted:

Chemical Consultants

enclosure: Chain-of-Custody
z:\Data\2003\Folders\BeylikRpts\S-10150

CHEMICAL CONSULTANTS

SAMPLE CHAIN-OF-CUSTODY

CLIENT: BEYLIK

DATE SAMPLED: 18 NOV 03

PROJECT:

TIME SAMPLED: 1251 - 1320

SAMPLED BY: Jim Kimura

JOB #: Well # LMW-5

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY # (Identified as date - bin #)	pH	TESTING/COMMENT
S-10173	SOIL	11-18-03 HMT 211L-94513		COMPOSITE
	SOIL	11-18-03 HMT 204L-94503		
	SOIL	11-18-03 148L	7.7	
	SOIL	11-18-03 HMT 212L-94517		

NOTES:

WELL # LMW-5, SANTA ANA RIVER, SOUTHERN LEVEE

NUMBER OF SAMPLES/CONTAINERS 1

SAMPLE CONTAINERS G

METHOD OF SHIPPING COLD

INSPECTOR PRESENT DURING SAMPLING YES (NO)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]	[signature]	11-18-03	1414	See attached

Revised 4/03

CHEMICAL CONSULTANTS

RECEIVED
DEC 09 2003
BEYLIK DRILLING INC.

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING , INC.
555 S. Harbor Blvd.
La Habra, Ca 90631

DATE: November 24, 2003
LOG NUMBER: S-10173
DATE RECEIVED: 11/18/2003
PO#:: 04-03297
JOB #: Well #LMW-5

PROJECT: San Bernadino-Santa Ana River
CHAIN OF CUSTODY #: See attached
SAMPLE: Composite soil sample from four (4) roll-off bins

ANALYTES	RESULTS TTLC (mg/kg)	METHOD DETECTION LIMITS (mg/kg)	RESULTS STLC (mg/L)	STLC Regulatory Limits (mg/L)	RESULTS TCLP (mg/L)	TCLP Regulatory Limits (mg/L)	METHOD NO.
ANTIMONY	<0.1	0.1	N.A.	15	N.A	N.A	AES0029
ARSENIC	<1.0	1	N.A.	5.0	N.A	5.0	Std. 3114B
BARIUM	39.4	0.5	N.A.	100.0	N.A	100.0	AES0029
BERYLLIUM	<0.5	0.5	N.A.	0.8	N.A	N.A	AES0029
CADMIUM	<0.5	0.5	N.A.	1.0	N.A	1.0	AES0029
CHROMIUM	<0.5	0.5	N.A.	5.0	N.A	5.0	AES0029
COBALT	<0.5	0.5	N.A.	80.0	N.A	N.A	AES0029
COPPER	3.2	0.5	N.A.	25.0	N.A	N.A	AES0029
LEAD	1.8	1	N.A.	5.0	N.A	5.0	AES0029
MERCURY	<0.05	0.05	N.A.	0.2	N.A	0.2	Std. 3112B
MOLYBDENUM	<0.5	0.5	N.A.	350.0	N.A	N.A	AES0029
NICKEL	0.72	0.5	N.A.	20.0	N.A	N.A	AES0029
SELENIUM	<5.0	5	N.A.	1.0	N.A	1.0	AES0029
SILVER	<0.5	0.5	N.A.	5.0	N.A	5.0	AES0029
THALLIUM	<5.0	5	N.A.	7.0	N.A	N.A	AES0029
VANADIUM	<0.5	0.5	N.A.	24.0	N.A	N.A	AES0029
ZINC	4.1	1.5	N.A.	250.0	N.A	N.A	AES0029

Samples were collected and composited from the following roll-off bins:
HMT 211.L-94513; HMT 204L-94503; 148L & HMT 212L-94517

ANALYTES	RESULTS	Reporting Limit	Method No.
TRPH	<2	2 mg/kg	EPA 418.1
pH	7.5	2-14 units	EPA 150.1

Three (3) discrete samples, from each bin, were collected and then composited into one sample.

Z:Data/2003/Folders/Beylik/Rpts/S-10173

EPA 8010	RESULTS	DETECTION LIMITS	TEST METHODS
1,1 Dichloroethane	< 10	10 ug/l	EPA 8010
1,2 Dichloromethane	<10	10 ug/l	EPA 8010
Chloroethane	<10	10 ug/l	EPA 8010
Chloromethane	<10	10 ug/l	EPA 8010
Bromomethane	<10	10 ug/l	EPA 8010
Vinyl Chloride	<10	10 ug/l	EPA 8010
Methylene Chloride	<10	10 ug/l	EPA 8010
Vinyl Chloride	<10	10 ug/l	EPA 8010
Trans1,2-Dichloroethylene	< 25	10 ug/l	EPA 8010
1,1-Dichloroethene	< 10	10 ug/l	EPA 8010
Chloroform	< 5.0	10 ug/l	EPA 8010
1,1,1-Trichloroethane	< 5.0	5.0 ug/l	EPA 8010
Carbon Tetrachloride	< 5.0	5.0 ug/l	EPA 8010
Trichloroethylene	< 5.0	5.0 ug/l	EPA 8010
1,2-Dichloropropane	< 50	50 ug/l	EPA 8010
Dichlorobromomethane	< 5.0	5.0 ug/l	EPA 8010
Trans1,3-Dichloropropene	< 5.0	5.0 ug/l	EPA 8010
CIS 1,3-Dichloropropene	< 5.0	5.0 ug/l	EPA 8010
1,1,2-Trichloroethane	< 10	10 ug/l	EPA 8010
Tetrachloroethylene	< 5.0	5.0 ug/l	EPA 8010
Dibromochloromethane	< 5.0	5.0 ug/l	EPA 8010
Chlorobenzene	< 20	20 ug/l	EPA 8010
Bromoform	< 10	10 ug/l	EPA 8010
1,1,2,2-Tetrachloroethane	< 10	10 ug/l	EPA 8010
1,3-Dichlorobenzene	< 10	10 ug/l	EPA 8010
1,4-Dichlorobenzene	< 10	10 ug/l	EPA 8010
1,2-Dichlorobenzene	< 10	10 ug/l	EPA 8010

Date Anaylzed: 11/21/2003
Analyst: LK

EPA 8020	RESULTS	DETECTION LIMITS	TEST METHOD
Benzene	< 0.50	0.50 ug/l	EPA 8020
Toluene	< 0.50	0.50 ug/l	EPA 8020
Ethylbenzene	< 0.50	0.50 ug/l	EPA 8020
Total Xylenes	<0.50	0.50 ug/l	EPA 8020
1,2-Dichlorobenzene	< 0.50	0.50 ug/l	EPA 8020
1,3-Dichlorobenzene	< 0.50	0.50 ug/l	EPA 8020
1,4-Dichlorobenzene	< 0.50	0.50 ug/l	EPA 8020
Methyl Tertiary Butyl Ether	< 0.50	0.50 ug/l	EPA 8020

Date Anaylzed: 11/20/2003
Analyst: LK

Respectfully Submitted:

Chemical Consultants

enclosure: Chain-of-Custody
z:\Data\2003\Folders\BeylikRpts\S-10173

BEYLIK DRILLING, INC.

555 S. Harbor Blvd. • La Habra • California 90631 • (714) 870-5360 • (562) 691-0903 • FAX (562) 690-9192
WATER WELL DRILLING • MONITORING WELLS • WELL AND PUMP REPAIR • TEST HOLES

February 18, 2004

Mr. Greg Delson
Earth Tech
9675 Business Park Ave.
San Diego, CA 92131

Subject: **Lab Reports LM4 & LM5**
Beylik Job #: 41326

Dear Greg,

Enclosed please find the lab reports for fluids generated at LM4 & LM5.

If you have any questions or need additional information, please contact us.

Sincerely,

John M. Kennedy

John M. Kennedy
Division Manager

41326 Lab Reports doc

CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10193
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:

SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9075

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	8.3	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	16.5	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	388	10 mg/l	EPA 160.1
NITROGEN[2]	0.16	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BEYLIK DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1250

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
JW-1093	WATER	121203-LT9075	8.3	

FIELD & SAMPLING NOTES

H2O IS ~~[illegible]~~ YELLOW IN COLOR AND IS SLIPPERY

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES (NO)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]	[signature]	1559	12-12	[illegible]

Revised 3-03

CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10194
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:
SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9061

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	8.2	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	19.7	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	592	10 mg/l	EPA 160.1
NITROGEN[2]	0.22	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BEYLIK DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1315

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-OF-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
HW-10199	WATER	121203 LT9061	8.0	

FIELD & SAMPLING NOTES

H2O. IS SLIGHTLY YELLOW IN COLOR

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
		12-12	1555	See attached

Revised 3-03

CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10195
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:

SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9079

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	7.7	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	12.5	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	566	10 mg/l	EPA 160.1
NITROGEN[2]	0.17	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BEYLIK DATE SAMPLED: 12-12-03

PROJECT: LMIV-5 TIME SAMPLED: 1340

SAMPLED BY: _____ JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
JH-10195	WATER	121203-LT9079	7.7	

FIELD & SAMPLING NOTES

H2O IS CLEAR

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
		12-12	15 56	

Revised 3-03

CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10196
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:
SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9078

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	8.0	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	22.7	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	883	10 mg/l	EPA 160.1
NITROGEN[2]	0.33	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BEYLIK DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1350

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
IL-10196	WATER	121203-LT9078	8.0	

FIELD & SAMPLING NOTES

H2O IS SLIGHTLY YELLOW IN COLOR

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES (NO)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]	[signature]	12/12	1557	See attach

Revised 3-03

CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10197
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:
SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9017

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	8.2	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	38.4	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	466	10 mg/l	EPA 160.1
NITROGEN[2]	0.17	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BEYUK DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1405

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
IW-10197	WATER	121203 LT9017	8.2	

FIELD & SAMPLING NOTES

H2O IS YELLOW IN COLOR

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING COU INSPECTOR PRESENT DURING SAMPLING YES (NO)

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]	[signature]	12-12	1557	[signature]

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CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10198
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:

SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9077

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	7.7	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	10.7	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	578	10 mg/l	EPA 160.1
NITROGEN[2]	<0.1	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BETUK DATE SAMPLED: 12-12-03

PROJECT: LMW-4 TIME SAMPLED: 1430

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
TW-10198	WATER	121203-LT9077	7.7	

FIELD & SAMPLING NOTES

H2O IS CLEAR IN COLOR

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/6 ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
		12-12	1558	

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CHEMICAL CONSULTANTS

1135 CENTRE DR, UNIT F WALNUT CA 91789
909-595-7473 FAX 909-595-7474
DHS Certification: #1227
LACSD Certification: 10111

A REPORT PREPARED FOR:
BEYLIK DRILLING, INC.
555 S. Harbor Blvd.
La Habra, CA 90631
PROJECT: LMW #4 & #5, Baker Tanks

DATE: 12/19/03
LOG NUMBER: IW-10199
SAMPLE RECEIVED: 12/12/03
CUSTOMER P.O.: Kennedy
JOB NUMBER: LMW-5

SAMPLING DATA:
SAMPLE TAKEN: ..... 12-12-03, see attached Chain of Custody
SAMPLING LOCATION(S):..... San Bernardino, Santa Ana River location
TYPE OF SAMPLE: ..... Grab sample
SAMPLED BY:..... Chemical Consultants
BAKER TANK NUMBER.....LT-9076

CONSTITUENTS	RESULTS	METHOD DETECTION LIMIT	TEST METHODS
pH	7.5	2-14 Units	EPA 150.1
OIL & GREASE	<2	2 mg/l	STD. 5520B
RESIDUAL CHLORINE	<0.05	0.05 mg/l	STD4500-CL-G
TSS[1]	8.7	1 mg/l	EPA 160.2
TPH	<0.05	0.05 mg/l	EPA 8015 MOD
PERCHLORATE	See Attached		
VOC's	See Attached		
TDS	394	10 mg/l	EPA 160.1
NITROGEN[2]	<0.1	0.1 mg/l	EPA 351.3

TSS[1] : Total suspended solids
Nitrogen[2]: Nitrate-nitrogen plus nitrite-nitrogen

Respectfully Submitted

Chemical Consultants

enclosure: chain of custody

CHEMICAL CONSULTANTS

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: BEYUK DATE SAMPLED: 12-12-03

PROJECT: LMW-4 TIME SAMPLED: 1440

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
IW-10199	WATER	121203-LT9076	7.5	

FIELD & SAMPLING NOTES

H2O IS CLEAR IN COLOR

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
		12-12	1600	

Revised 3-03

Weck Laboratories, Inc.
Environmental and Analytical Services - Since 1964

Report Date: Friday, December 19, 2003
Received Date: Friday, December 12, 2003
Received Time: 5:08 pm

Turnaround Time: 5 days

Client: Chemical Consultants
1135 Centre Drive, Suite F
Industry, CA 91789

Phone: (909) 595-7473
FAX: -

Attn: Jeff Jolicoeur

Project:

P.O.#:

Certificate of Analysis

Baker Tank LT-9075

Work Order No: 3121237-01 **Sample ID:** IW-10193 **Matrix:** Water
Sampled By: Client **Sampled:** 12/12/03 12:50 **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
loroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
richlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/15/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Chloroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Trichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/15/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
trans-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
romoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
m-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401

14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Certificate of Analysis

Work Order No: 3121237-01 **Sample ID: IW-10193** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 12:50** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/15/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/15/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*85.6 %*		*69-141*	*EPA 624*	*12/14/03*	*12/15/03*	*rt*	*W312401*
Surrogate: 4-Bromofluorobenzene			*99.4 %*		*78-133*	*EPA 624*	*12/14/03*	*12/15/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*106 %*		*86-123*	*EPA 624*	*12/14/03*	*12/15/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol		S-04	*4.37 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5		S-04	*2.88 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol		S-04	*5.90 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	ND		ug/l	1	3.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

Baker Tank LT-9061

Work Order No: 3121237-02 **Sample ID: IW-10194** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 13:15** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
loroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401

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www.wecklabs.com

Certificate of Analysis

Work Order No: 3121237-02 **Sample ID: IW-10194** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 13:15** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*85.8 %*		*69-141*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: 4-Bromofluorobenzene			*101 %*		*78-133*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*106 %*		*86-123*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol			*36.7 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5			*25.0 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol			*56.0 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	ND		ug/l	2	6.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

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Certificate of Analysis

BAKER TANK LT-9079

Work Order No: 3121237-03 **Sample ID: IW-10195** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 13:40** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
ichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
m-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*85.4 %*		*69-141*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: 4-Bromofluorobenzene			*101 %*		*78-133*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*106 %*		*86-123*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389

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Work Order No: 3121237-03 **Sample ID: IW-10195** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 13:40** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol			*33.2 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5			*22.3 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol			*59.5 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	4.9		ug/l	1	3.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

Baker Tank LT-9018

'/ork Order No: 3121237-04 **Sample ID: IW-10196** **Matrix: Water**
mpled By: Client **Sampled: 12/12/03 13:50** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
'ns-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401

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Work Order No: 3121237-04 **Sample ID: IW-10196** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 13:50** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
m-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*85.2 %*		*69-141*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: 4-Bromofluorobenzene			*102 %*		*78-133*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*105 %*		*86-123*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol			*31.2 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5			*21.2 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol			*59.0 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	**6.7**		ug/l	1	3.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

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Baker Tank LT-9017

Work Order No: 3121237-05 **Sample ID: IW-10197** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 14:05** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Chloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Trichlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/15/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Chloroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
ichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/15/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
trans-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Bromoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
1,1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
m-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/15/03	rt	W312401
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/15/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/15/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*84.4 %*		*69-141*	*EPA 624*	*12/14/03*	*12/15/03*	*rt*	*W312401*
Surrogate. 4-Bromofluorobenzene			*101 %*		*78-133*	*EPA 624*	*12/14/03*	*12/15/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*106 %*		*86-123*	*EPA 624*	*12/14/03*	*12/15/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389

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Work Order No: 3121237-05 **Sample ID: IW-10197** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 14:05** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol			*38.4 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5			*25.8 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol			*58.5 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	ND		ug/l	1	3.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

Baker Tank LT-9017

'ork Order No: 3121237-06 **Sample ID: IW-10198** **Matrix: Water**
.mpled By: Client **Sampled: 12/12/03 14:30** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
ans-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
,1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401

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Work Order No: 3121237-06 **Sample ID: IW-10198** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 14:30** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
m-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*85.8 %*		*69-141*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: 4-Bromofluorobenzene			*99.2 %*		*78-133*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*106 %*		*86-123*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol			*36.0 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5			*24.5 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol			*53.0 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	**3.6**		ug/l	1	3.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

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Baker Tank LT-9076

Work Order No: 3121237-07 **Sample ID: IW-10199** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 14:40** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
Chloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Vinyl chloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromomethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichlorofluoromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Methylene chloride	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,2-Dichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chloroform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,1-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Carbon tetrachloride	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Benzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Trichloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,2-Dichloropropane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromodichloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
2-Chloroethylvinyl ether	ND		ug/l	1	5.0	EPA 624	12/14/03	12/14/03	rt	W312401
cis-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Toluene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
trans-1,3-Dichloropropene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2-Trichloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Tetrachloroethene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Dibromochloromethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Chlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Ethylbenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Bromoform	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
1,1,2,2-Tetrachloroethane	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
m-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
p-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
o-Dichlorobenzene	ND		ug/l	1	1.0	EPA 624	12/14/03	12/14/03	rt	W312401
Acrolein	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Acrylonitrile	ND		ug/l	1	10	EPA 624	12/14/03	12/14/03	rt	W312401
Surrogate: 1,2-Dichloroethane-d4			*86.0 %*		*69-141*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: 4-Bromofluorobenzene			*102 %*		*78-133*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Surrogate: Toluene-d8			*106 %*		*86-123*	*EPA 624*	*12/14/03*	*12/14/03*	*rt*	*W312401*
Phenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Chlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
3 & 4-Methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2-Nitrophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dimethylphenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389

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Work Order No: 3121237-07 **Sample ID: IW-10199** **Matrix: Water**
Sampled By: Client **Sampled: 12/12/03 14:40** **Sample Note:**

Analyte	Result	Qualifiers	Units	Dilution	Reporting Limit	Method	Prepared	Analyzed		Batch
2,4-Dichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Chloro-3-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,6-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4,5-Trichlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
2,4-Dinitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4-Nitrophenol	ND		ug/l	1	2.0	EPA 8270C	12/15/03	12/17/03		W312389
4,6-Dinitro-2-methylphenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Pentachlorophenol	ND		ug/l	1	1.0	EPA 8270C	12/15/03	12/17/03		W312389
Surrogate: 2-Fluorophenol			*42.5 %*		*23-80*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: Phenol-d5			*27.9 %*		*20-61*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Surrogate: 2,4,6-Tribromophenol			*73.0 %*		*26-114*	*EPA 8270C*	*12/15/03*	*12/17/03*		*W312389*
Perchlorate	**3.4**		ug/l	1	3.0	EPA 314.0	12/18/03	12/18/03	hp	W312486

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Authorized Signature

ELAP # 1132
LACSD # 10143

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Notes:
The Chain of Custody document is part of the analytical report.
Any remaining sample(s) for testing will be disposed of one month from the final report date unless other arrangements are made in advance.
All results are expressed on wet weight basis unless otherwise specified.
ND=Not detected, below the reporting limit.
Sub=Subcontracted analysis, original report enclosed.

Flags for Data Qualifiers:
S-04 = The surrogate recovery for this sample is outside of established control limits due to possible sample matrix effect.

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Report Date: Friday, December 19, 2003
Received Date: Friday, December 12, 2003
Received Time: 5:08 pm

Turnaround Time: 5 days

Client: Chemical Consultants
1135 Centre Drive, Suite F
Industry, CA 91789

Phone: (909) 595-7473
FAX: -

Attn: Jeff Jolicoeur

Project:

P.O.#:

Quality Control Report

Weck Laboratories, Inc

Perchlorate by EPA 314.0 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312486 - EPA 314.0, dir. inj.									
Blank (W312486-BLK1)					Prepared & Analyzed: 12/18/03				
Perchlorate		ND		ug/l					
LCS (W312486-BS1)					Prepared & Analyzed: 12/18/03				
Perchlorate		21.0		ug/l	20.0	105	85-115		
Matrix Spike (W312486-MS1)		Source: 3121631-01			Prepared & Analyzed: 12/18/03				
Perchlorate	8.7	30.4		ug/l	20.0	108	80-120		
Matrix Spike Dup (W312486-MSD1)		Source: 3121631-01			Prepared & Analyzed: 12/18/03				
Perchlorate	8.7	31.5		ug/l	20.0	114	80-120	3.55	15

Weck Laboratories, Inc

Purgeables by EPA Method 624 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312401 - EPA 624 P&T									
Blank (W312401-BLK1)					Prepared & Analyzed: 12/14/03				
Chloromethane		ND		ug/l					
Vinyl chloride		ND		ug/l					
Bromomethane		ND		ug/l					
Chloroethane		ND		ug/l					
Trichlorofluoromethane		ND		ug/l					
1,1-Dichloroethene		ND		ug/l					
Methylene chloride		ND		ug/l					
trans-1,2-Dichloroethene		ND		ug/l					
1,1-Dichloroethane		ND		ug/l					

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Quality Control Report

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Purgeables by EPA Method 624 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312401 - EPA 624 P&T									
Blank (W312401-BLK1)					Prepared & Analyzed: 12/14/03				
Chloroform		ND		ug/l					
1,1,1-Trichloroethane		ND		ug/l					
Carbon tetrachloride		ND		ug/l					
Benzene		ND		ug/l					
1,2-Dichloroethane		ND		ug/l					
Trichloroethene		ND		ug/l					
1,2-Dichloropropane		ND		ug/l					
Bromodichloromethane		ND		ug/l					
2-Chloroethylvinyl ether		ND		ug/l					
cis-1,3-Dichloropropene		ND		ug/l					
Toluene		ND		ug/l					
ns-1,3-Dichloropropene		ND		ug/l					
,2-Trichloroethane		ND		ug/l					
Tetrachloroethene		ND		ug/l					
Dibromochloromethane		ND		ug/l					
Chlorobenzene		ND		ug/l					
Ethylbenzene		ND		ug/l					
Bromoform		ND		ug/l					
1,1,2,2-Tetrachloroethane		ND		ug/l					
m-Dichlorobenzene		ND		ug/l					
p-Dichlorobenzene		ND		ug/l					
o-Dichlorobenzene		ND		ug/l					
Acrolein		ND		ug/l					
Acrylonitrile		ND		ug/l					
Surrogate: 1,2-Dichloroethane-d4		*42.7*		ug/l	*50.0*	*85.4*	*69-141*		
Surrogate: 4-Bromofluorobenzene		*51.2*		ug/l	*50.0*	*102*	*78-133*		
Surrogate: Toluene-d8		*53.3*		ug/l	*50.0*	*107*	*86-123*		
LCS (W312401-BS1)					Prepared & Analyzed: 12/14/03				
Chloromethane		57.0		ug/l	50.0	114	2-273		
Vinyl chloride		54.1		ug/l	50.0	108	2-251		
Bromomethane		40.8		ug/l	50.0	81.6	2-242		
Chloroethane		45.8		ug/l	50.0	91.6	14-230		
Trichlorofluoromethane		58.0		ug/l	50.0	116	17-181		
1,1-Dichloroethene		54.4		ug/l	50.0	109	2-234		
Methylene chloride		51.5		ug/l	50.0	103	10-221		
ns-1,2-Dichloroethene		53.6		ug/l	50.0	107	54-156		
-Dichloroethane		55.5		ug/l	50.0	111	59-155		
Chloroform		53.4		ug/l	50.0	107	51-138		
1,1,1-Trichloroethane		58.6		ug/l	50.0	117	52-162		
Carbon tetrachloride		62.1		ug/l	50.0	124	70-140		

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Quality Control Report

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Purgeables by EPA Method 624 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312401 - EPA 624 P&T									
LCS (W312401-BS1)					Prepared & Analyzed: 12/14/03				
Benzene		50.8		ug/l	50.0	102	37-151		
1,2-Dichloroethane		54.4		ug/l	50.0	109	49-155		
Trichloroethene		52.1		ug/l	50.0	104	71-157		
1,2-Dichloropropane		53.2		ug/l	50.0	106	2-210		
Bromodichloromethane		58.0		ug/l	50.0	116	35-155		
2-Chloroethylvinyl ether		57.4		ug/l	50.0	115	10-305		
cis-1,3-Dichloropropene		59.7		ug/l	50.0	119	2-227		
Toluene		47.3		ug/l	50.0	94.6	47-150		
trans-1,3-Dichloropropene		58.1		ug/l	50.0	116	17-183		
1,1,2-Trichloroethane		53.7		ug/l	50.0	107	52-150		
Tetrachloroethene		54.0		ug/l	50.0	108	64-148		
bromochloromethane		61.1		ug/l	50.0	122	53-149		
alorobenzene		46.2		ug/l	50.0	92.4	37-160		
Ethylbenzene		44.4		ug/l	50.0	88.8	37-162		
Bromoform		58.8		ug/l	50.0	118	45-169		
1,1,2,2-Tetrachloroethane		46.5		ug/l	50.0	93.0	46-157		
m-Dichlorobenzene		43.8		ug/l	50.0	87.6	59-156		
p-Dichlorobenzene		41.0		ug/l	50.0	82.0	18-190		
o-Dichlorobenzene		43.2		ug/l	50.0	86.4	18-190		
Acrolein		34.0		ug/l	50.0	68.0	60-140		
Acrylonitrile		58.2		ug/l	50.0	116	60-140		
Surrogate: 1,2-Dichloroethane-d4			*42.4*	ug/l	*50.0*	*84.8*	*69-141*		
Surrogate: 4-Bromofluorobenzene			*53.6*	ug/l	*50.0*	*107*	*78-133*		
Surrogate: Toluene-d8			*53.1*	ug/l	*50.0*	*106*	*86-123*		
LCS Dup (W312401-BSD1)					Prepared & Analyzed: 12/14/03				
Chloromethane		59.1		ug/l	50.0	118	2-273	3.62	30
Vinyl chloride		52.7		ug/l	50.0	105	2-251	2.62	30
Bromomethane		40.3		ug/l	50.0	80.6	2-242	1.23	30
Chloroethane		44.7		ug/l	50.0	89.4	14-230	2.43	30
Trichlorofluoromethane		56.6		ug/l	50.0	113	17-181	2.44	30
1,1-Dichloroethene		53.1		ug/l	50.0	106	2-234	2.42	30
Methylene chloride		51.1		ug/l	50.0	102	10-221	0.780	30
trans-1,2-Dichloroethene		51.7		ug/l	50.0	103	54-156	3.61	30
1,1-Dichloroethane		53.8		ug/l	50.0	108	59-155	3.11	30
Chloroform		52.4		ug/l	50.0	105	51-138	1.89	30
1,1-Trichloroethane		56.8		ug/l	50.0	114	52-162	3.12	30
arbon tetrachloride		61.5		ug/l	50.0	123	70-140	0.971	30
Benzene		50.0		ug/l	50.0	100	37-151	1.59	30
1,2-Dichloroethane		53.3		ug/l	50.0	107	49-155	2.04	30
Trichloroethene		51.1		ug/l	50.0	102	71-157	1.94	30

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Quality Control Report

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Purgeables by EPA Method 624 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312401 - EPA 624 P&T									
LCS Dup (W312401-BSD1)					Prepared & Analyzed: 12/14/03				
1,2-Dichloropropane		52.1		ug/l	50.0	104	2-210	2.09	30
Bromodichloromethane		57.3		ug/l	50.0	115	35-155	1.21	30
2-Chloroethylvinyl ether		57.9		ug/l	50.0	116	10-305	0.867	30
cis-1,3-Dichloropropene		59.0		ug/l	50.0	118	2-227	1.18	30
Toluene		46.5		ug/l	50.0	93.0	47-150	1.71	30
trans-1,3-Dichloropropene		57.9		ug/l	50.0	116	17-183	0.345	30
1,1,2-Trichloroethane		53.8		ug/l	50.0	108	52-150	0.186	30
Tetrachloroethene		53.5		ug/l	50.0	107	64-148	0.930	30
Dibromochloromethane		61.1		ug/l	50.0	122	53-149	0.00	30
Chlorobenzene		45.5		ug/l	50.0	91.0	37-160	1.53	30
Ethylbenzene		44.0		ug/l	50.0	88.0	37-162	0.905	30
omoform		59.4		ug/l	50.0	119	45-169	1.02	30
,2,2-Tetrachloroethane		46.1		ug/l	50.0	92.2	46-157	0.864	30
m-Dichlorobenzene		43.2		ug/l	50.0	86.4	59-156	1.38	30
p-Dichlorobenzene		40.0		ug/l	50.0	80.0	18-190	2.47	30
o-Dichlorobenzene		42.5		ug/l	50.0	85.0	18-190	1.63	30
Acrolein		36.1		ug/l	50.0	72.2	60-140	5.99	30
Acrylonitrile		61.2		ug/l	50.0	122	60-140	5.03	30
Surrogate: 1,2-Dichloroethane-d4			*41.9*	ug/l	*50.0*	*83.8*	*69-141*		
Surrogate: 4-Bromofluorobenzene			*54.0*	ug/l	*50.0*	*108*	*78-133*		
Surrogate: Toluene-d8			*52.9*	ug/l	*50.0*	*106*	*86-123*		
Matrix Spike (W312401-MS1)		**Source: 3121237-03**			Prepared: 12/14/03 Analyzed: 12/15/03				
Chloromethane	ND	60.0		ug/l	50.0	120	2-273		
Vinyl chloride	ND	57.8		ug/l	50.0	116	2-251		
Bromomethane	ND	44.1		ug/l	50.0	88.2	2-242		
Chloroethane	ND	46.5		ug/l	50.0	93.0	14-230		
Trichlorofluoromethane	ND	63.9		ug/l	50.0	128	17-181		
1,1-Dichloroethene	ND	58.7		ug/l	50.0	117	2-234		
Methylene chloride	ND	52.2		ug/l	50.0	104	10-221		
trans-1,2-Dichloroethene	ND	56.1		ug/l	50.0	112	54-156		
1,1-Dichloroethane	ND	58.2		ug/l	50.0	116	59-155		
Chloroform	ND	57.1		ug/l	50.0	114	51-138		
1,1,1-Trichloroethane	ND	63.0		ug/l	50.0	126	52-162		
Carbon tetrachloride	ND	68.9		ug/l	50.0	138	70-140		
Benzene	ND	53.4		ug/l	50.0	107	37-151		
-Dichloroethane	ND	55.1		ug/l	50.0	110	49-155		
chloroethene	ND	55.1		ug/l	50.0	110	71-157		
1,2-Dichloropropane	ND	54.3		ug/l	50.0	109	2-210		
Bromodichloromethane	ND	59.9		ug/l	50.0	120	35-155		
2-Chloroethylvinyl ether	ND	58.3		ug/l	50.0	117	10-305		

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Quality Control Report

Weck Laboratories, Inc

Purgeables by EPA Method 624 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312401 - EPA 624 P&T									
Matrix Spike (W312401-MS1)		**Source: 3121237-03**			Prepared: 12/14/03		Analyzed: 12/15/03		
cis-1,3-Dichloropropene	ND	60.8		ug/l	50.0	122	2-227		
Toluene	ND	49.0		ug/l	50.0	98.0	47-150		
trans-1,3-Dichloropropene	ND	58.9		ug/l	50.0	118	17-183		
1,1,2-Trichloroethane	ND	54.0		ug/l	50.0	108	52-150		
Tetrachloroethene	ND	59.4		ug/l	50.0	119	64-148		
Dibromochloromethane	ND	62.0		ug/l	50.0	124	53-149		
Chlorobenzene	ND	46.8		ug/l	50.0	93.6	37-160		
Ethylbenzene	ND	45.3		ug/l	50.0	90.6	37-162		
Bromoform	ND	58.9		ug/l	50.0	118	45-169		
1,1,2,2-Tetrachloroethane	ND	45.4		ug/l	50.0	90.8	46-157		
m-Dichlorobenzene	ND	44.5		ug/l	50.0	89.0	59-156		
Dichlorobenzene	ND	42.8		ug/l	50.0	85.6	18-190		
Dichlorobenzene	ND	44.2		ug/l	50.0	88.4	18-190		
Acrolein	ND	31.2		ug/l	50.0	62.4	60-140		
Acrylonitrile	ND	56.3		ug/l	50.0	113	60-140		
Surrogate: 1,2-Dichloroethane-d4		*42.1*		ug/l	*50.0*	*84.2*	*69-141*		
Surrogate: 4-Bromofluorobenzene		*51.6*		ug/l	*50.0*	*103*	*78-133*		
Surrogate: Toluene-d8		*52.3*		ug/l	*50.0*	*105*	*86-123*		
Matrix Spike Dup (W312401-MSD1)		**Source: 3121237-03**			Prepared: 12/14/03		Analyzed: 12/15/03		
Chloromethane	ND	58.3		ug/l	50.0	117	2-273	2.87	30
Vinyl chloride	ND	55.1		ug/l	50.0	110	2-251	4.78	30
Bromomethane	ND	43.8		ug/l	50.0	87.6	2-242	0.683	30
Chloroethane	ND	43.7		ug/l	50.0	87.4	14-230	6.21	30
Trichlorofluoromethane	ND	61.4		ug/l	50.0	123	17-181	3.99	30
1,1-Dichloroethene	ND	56.8		ug/l	50.0	114	2-234	3.29	30
Methylene chloride	ND	51.0		ug/l	50.0	102	10-221	2.33	30
trans-1,2-Dichloroethene	ND	54.8		ug/l	50.0	110	54-156	2.34	30
1,1-Dichloroethane	ND	56.4		ug/l	50.0	113	59-155	3.14	30
Chloroform	ND	54.8		ug/l	50.0	110	51-138	4.11	30
1,1,1-Trichloroethane	ND	61.2		ug/l	50.0	122	52-162	2.90	30
Carbon tetrachloride	ND	65.7		ug/l	50.0	131	70-140	4.75	30
Benzene	ND	52.4		ug/l	50.0	105	37-151	1.89	30
1,2-Dichloroethane	ND	54.7		ug/l	50.0	109	49-155	0.729	30
Trichloroethene	ND	53.8		ug/l	50.0	108	71-157	2.39	30
1,2-Dichloropropane	ND	53.3		ug/l	50.0	107	2-210	1.86	30
omodichloromethane	ND	59.3		ug/l	50.0	119	35-155	1.01	30
Chloroethylvinyl ether	ND	59.4		ug/l	50.0	119	10-305	1.87	30
cis-1,3-Dichloropropene	ND	60.4		ug/l	50.0	121	2-227	0.660	30
Toluene	ND	48.0		ug/l	50.0	96.0	47-150	2.06	30
trans-1,3-Dichloropropene	ND	58.4		ug/l	50.0	117	17-183	0.853	30

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Quality Control Report

Weck Laboratories, Inc

Purgeables by EPA Method 624 - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312401 - EPA 624 P&T									
Matrix Spike Dup (W312401-MSD1)		**Source: 3121237-03**			Prepared: 12/14/03		Analyzed: 12/15/03		
1,1,2-Trichloroethane	ND	54.2		ug/l	50.0	108	52-150	0.370	30
Tetrachloroethene	ND	58.1		ug/l	50.0	116	64-148	2.21	30
Dibromochloromethane	ND	60.6		ug/l	50.0	121	53-149	2.28	30
Chlorobenzene	ND	46.9		ug/l	50.0	93.8	37-160	0.213	30
Ethylbenzene	ND	45.0		ug/l	50.0	90.0	37-162	0.664	30
Bromoform	ND	59.0		ug/l	50.0	118	45-169	0.170	30
1,1,2,2-Tetrachloroethane	ND	44.7		ug/l	50.0	89.4	46-157	1 55	30
m-Dichlorobenzene	ND	45.2		ug/l	50.0	90.4	59-156	1.56	30
p-Dichlorobenzene	ND	40.5		ug/l	50.0	81.0	18-190	5.52	30
o-Dichlorobenzene	ND	43.9		ug/l	50.0	87.8	18-190	0.681	30
Acrolein	ND	31.8		ug/l	50.0	63.6	60-140	1.90	30
·rylonitrile	ND	56.6		ug/l	50.0	113	60-140	0.531	30
irrogate: 1,2-Dichloroethane-d4		*42.3*		ug/l	*50.0*	*84.6*	*69-141*		
Surrogate: 4-Bromofluorobenzene		*53.4*		ug/l	*50.0*	*107*	*78-133*		
Surrogate: Toluene-d8		*52.7*		ug/l	*50.0*	*105*	*86-123*		

Weck Laboratories, Inc

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312389 - 3510C									
Blank (W312389-BLK1)					Prepared: 12/15/03		Analyzed: 12/17/03		
Phenol		ND		ug/l					
2-Chlorophenol		ND		ug/l					
2-Methylphenol		ND		ug/l					
3 & 4-Methylphenol		ND		ug/l					
2-Nitrophenol		ND		ug/l					
2,4-Dimethylphenol		ND		ug/l					
2,4-Dichlorophenol		ND		ug/l					
4-Chloro-3-methylphenol		ND		ug/l					
2,4,6-Trichlorophenol		ND		ug/l					
2,4,5-Trichlorophenol		ND		ug/l					
2,4-Dinitrophenol		ND		ug/l					
' -Nitrophenol		ND		ug/l					
,-Dinitro-2-methylphenol		ND		ug/l					
Pentachlorophenol		ND		ug/l					
Surrogate: 2-Fluorophenol		*86.2*		ug/l	*200*	*43.1*	*23-80*		
Surrogate: Phenol-d5		*58.3*		ug/l	*200*	*29.2*	*20-61*		
Surrogate· 2,4,6-Tribromophenol		*152*		ug/l	*200*	*76.0*	*26-114*		

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Quality Control Report

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Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Analyte	Sample Result	QC Result	Qualifier	Units	Spike Level	%REC	%REC Limits	RPD	RPD Limit
Batch W312389 - 3510C									
LCS (W312389-BS1)					Prepared: 12/15/03		Analyzed: 12/17/03		
Phenol		14.2		ug/l	50.0	28.4	10-130		
2-Chlorophenol		33.6		ug/l	50.0	67.2	10-130		
2-Methylphenol		36.6		ug/l	50.0	73.2	10-130		
3 & 4-Methylphenol		34.7		ug/l	50.0	69.4	10-130		
2-Nitrophenol		39.0		ug/l	50.0	78.0	10-130		
2,4-Dimethylphenol		29.8		ug/l	50.0	59.6	10-130		
2,4-Dichlorophenol		41.3		ug/l	50.0	82.6	10-130		
4-Chloro-3-methylphenol		39.1		ug/l	50.0	78.2	10-130		
2,4,6-Trichlorophenol		40.2		ug/l	50.0	80.4	10-130		
2,4,5-Trichlorophenol		39.5		ug/l	50.0	79.0	10-130		
2,4-Dinitrophenol		17.2		ug/l	50.0	34.4	10-130		
Nitrophenol		14.1		ug/l	50.0	28.2	10-130		
,6-Dinitro-2-methylphenol		26.4		ug/l	50.0	52.8	10-130		
Pentachlorophenol		26.3		ug/l	50.0	52.6	10-130		
Surrogate: 2-Fluorophenol		*91.7*		ug/l	*200*	*45.8*	*23-80*		
Surrogate: Phenol-d5		*61.4*		ug/l	*200*	*30.7*	*20-61*		
Surrogate: 2,4,6-Tribromophenol		*167*		ug/l	*200*	*83.5*	*26-114*		
LCS Dup (W312389-BSD1)					Prepared: 12/15/03		Analyzed: 12/17/03		
Phenol		13.6		ug/l	50.0	27.2	10-130	4.32	30
2-Chlorophenol		32.2		ug/l	50.0	64.4	10-130	4.26	30
2-Methylphenol		35.0		ug/l	50.0	70.0	10-130	4.47	30
3 & 4-Methylphenol		33.0		ug/l	50.0	66.0	10-130	5.02	30
2-Nitrophenol		37.2		ug/l	50.0	74.4	10-130	4.72	30
2,4-Dimethylphenol		29.0		ug/l	50.0	58.0	10-130	2.72	30
2,4-Dichlorophenol		39.3		ug/l	50.0	78.6	10-130	4.96	30
4-Chloro-3-methylphenol		37.4		ug/l	50.0	74.8	10-130	4.44	30
2,4,6-Trichlorophenol		38.6		ug/l	50.0	77.2	10-130	4.06	30
2,4,5-Trichlorophenol		37.8		ug/l	50.0	75.6	10-130	4.40	30
2,4-Dinitrophenol		17.4		ug/l	50.0	34.8	10-130	1.16	30
4-Nitrophenol		13.6		ug/l	50.0	27.2	10-130	3.61	30
4,6-Dinitro-2-methylphenol		26.7		ug/l	50.0	53.4	10-130	1.13	30
Pentachlorophenol		25.5		ug/l	50.0	51.0	10-130	3.09	30
Surrogate: 2-Fluorophenol		*87.9*		ug/l	*200*	*44.0*	*23-80*		
Surrogate: Phenol-d5		*58.6*		ug/l	*200*	*29.3*	*20-61*		
Surrogate: 2,4,6-Tribromophenol		*173*		ug/l	*200*	*86.5*	*26-114*		

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Quality Control Report

Notes:
The Chain of Custody document is part of the analytical report.
Any remaining sample(s) for testing will be disposed of one month from the final report date unless other arrangements are made in advance.
All results are expressed on wet weight basis unless otherwise specified.
ND=Not detected, below the reporting limit.
Sub=Subcontracted analysis, original report enclosed.

Flags for Data Qualifiers:

S-04 = The surrogate recovery for this sample is outside of established control limits due to possible sample matrix effect.

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3121237 (1-7)

CHEMICAL CONSULTANTS

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DHS Certification: #1227
LACSD Certification: 10111

December 12, 2003

Attn.: Jayna Kostura
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14859 E. Clark Avenue
City of Industry, CA 91745

Enclosed are (7) samples of wastewater, Chemical Consultants Log Number's IW-10193, 10194, 10195, 10196, 10197, 10198 and 10199. Please analyze each 40 ml VOC vial using EPA Method 624, the 1 quart amber bottle for Phenols, EPA Method ~~8040~~, low 8270 level detection limit and the 1 pint plastic bottle for Perchlorates on a RUSH, 5 day turn-around basis. The samples were collected on 12-12-03.

Please let me know the price so I can have a check cut.

If you require additional information, please contact me at 909-595-7473.

Sincerely,

Chemical Consultants

Tax ID Number
95-2916363

Z:\Data\Ofc Admin\Weck Ltrs

3121237 (1-7)

CHEMICAL CONSULTANTS

COF

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1250

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
JW-1093	WATER	121203-LT9075		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO SC

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]	[signature]	1559	12-12	
[signature]	[signature]	12-12	1704	

Revised 3-03

3121237(1-7)

CHEMICAL CONSULTANTS

COPY

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1315

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
HW-10199	WATER	121203-LT9061		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO

SC

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
		12-12	1555	
		12-12	1704	

Revised 3-03

3121237(1-7)

CHEMICAL CONSULTANTS

COPY

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1340

SAMPLED BY: _____ JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
JW-10195	WATER	121203-LT9079		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO 5°C

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
		12-12	1556	
		12-12	1705	

Revised 3-03

3121237(1-7)

CHEMICAL CONSULTANTS

COPY

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1350

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
IU-10196	WATER	121203-LT9078		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES (NO)

5°C

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[illegible]		12/12	1557	
[illegible]	[illegible]	12-12	1705	

Revised 3-03

3121237(1-7)

CHEMICAL CONSULTANTS

COPY

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-5 TIME SAMPLED: 1405

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
IW-10197	WATER	121203 LT9017		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING LOW INSPECTOR PRESENT DURING SAMPLING YES (NO)

5°C

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]		12-12	1557	
[signature]	[signature]	12-12	1705	

Revised 3-03

3121237(1-7)

CHEMICAL CONSULTANTS

COPY

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-4 TIME SAMPLED: 1430

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
TW-10198	WATER	121203-LT9077		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/6 ON-SITE PRESERVATION YES NO

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES NO SC

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]		12-12	1559	
[signature]	[signature]	12-12	1705	

Revised 3-03

3121237(1-7

CHEMICAL CONSULTANTS

COPY

LIQUID
SAMPLE CHAIN-OF-CUSTODY
WELL DEVELOPMENT

CLIENT: _____ DATE SAMPLED: 12-12-03

PROJECT: LMW-4 TIME SAMPLED: 1440

SAMPLED BY: Jim Kimura JOB NUMBER: _____

LOG NUMBER	SAMPLE TYPE	CHAIN-0F-CUSTODY NUMBER (Date – Well#-Time)	pH	TESTING/COMMENTS
JW-10199	WATER	121203-LT9076		

FIELD & SAMPLING NOTES

NUMBER OF SAMPLES/CONTAINERS 6 SAMPLE CONTAINERS P/G ON-SITE PRESERVATION YES (NO)

METHOD OF SHIPPING COLD INSPECTOR PRESENT DURING SAMPLING YES (NO) 5°C

RELINQUISHED BY	RECEIVED BY	DATE	TIME	TESTING/COMMENTS
[signature]		12-12	1600	
[signature]	[signature]	12-12	1705	

Revised 3-03

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St, Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

LABORATORY REPORT

Prepared For: Earth Tech - Long Beach
100 W. Broadway, Suite 240
Long Beach, CA 90802
Attention: Liles Cobb

Project: LMC
WSCP, 52773-0303

Sampled: 01/02/04
Received: 01/02/04
Issued: 01/06/04

NELAP #01108CA CA ELAP #1197

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of Del Mar Analytical and its client. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
INA0027-01	LMW-5-TANK-LT9061	Water

Mar Analytical, Irvine
Jim Hatfield For Patty Mata
Project Manager

Del Mar Analytical

2852 Alton Ave., Irvine CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (949) 370-1046
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2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

Earth Tech - Long Beach
100 W. Broadway, Suite 240
Long Beach, CA 90802
Attention: Liles Cobb

Project ID: LMC
WSCP, 52773-0303
Report Number: INA0027

Sampled: 01/02/04
Received: 01/02/04

INORGANICS

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: INA0027-01 (LMW-5-TANK-LT9061 - Water)									
Reporting Units: ug/l									
Perchlorate	EPA 314.0	4A05038	0.80	4.0	ND	1	01/05/04	01/05/04	

l Mar Analytical, Irvine
m Hatfield For Patty Mata
Project Manager

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2520 E. Sunset Rd #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

Earth Tech - Long Beach
100 W. Broadway, Suite 240
Long Beach, CA 90802
Attention: Liles Cobb

Project ID: LMC
WSCP, 52773-0303
Report Number: INA0027

Sampled: 01/02/04
Received: 01/02/04

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 4A05038 Extracted: 01/05/04											
Blank Analyzed: 01/05/04 (4A05038-BLK1)											
Perchlorate	ND	4.0	0.80	ug/l							
LCS Analyzed: 01/05/04 (4A05038-BS1)											
Perchlorate	46.8	4.0	0.80	ug/l	50.0		94	85-115			
Matrix Spike Analyzed: 01/05/04 (4A05038-MS1)						**Source: INA0053-01**					
Perchlorate	48.9	4.0	0.80	ug/l	50.0	ND	98	80-120			
Matrix Spike Dup Analyzed: 01/05/04 (4A05038-MSD1)						**Source: INA0053-01**					
rchlorate	49.7	4.0	0.80	ug/l	50.0	ND	99	80-120	2	20	

l Mar Analytical, Irvine
m Hatfield For Patty Mata
Project Manager

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Earth Tech - Long Beach
100 W Broadway, Suite 240
Long Beach, CA 90802
Attention: Liles Cobb

Project ID: LMC
WSCP, 52773-0303
Report Number: INA0027

Sampled: 01/02/04
Received. 01/02/04

DATA QUALIFIERS AND DEFINITIONS

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified

RPD Relative Percent Difference

Mar Analytical, Irvine
Hatfield For Patty Mata
Project Manager

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

Earth Tech - Long Beach
100 W. Broadway, Suite 240
Long Beach, CA 90802
Attention: Liles Cobb

Project ID: LMC
WSCP, 52773-0303
Report Number: INA0027

Sampled: 01/02/04
Received: 01/02/04

Certification Summary

Del Mar Analytical, Irvine

Method	Matrix	NELAP	CA
EPA 314.0	Water	N/A	X

NV and NELAP provide analyte specific accreditations. Analyte specific information for Del Mar Analytical may be obtained by contacting the laboratory or visiting our website at www.dmalabs.com.

Mar Analytical, Irvine
n Hatfield For Patty Mata
Project Manager

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16525 Sherman Way, Suite C-11, Van Nuys, CA 92406 (818) 779-1844 FAX (818) 779-1843
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (619) 505-9596 FAX (619) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851

DETECTION LIMIT 2 ppb INA0027

CHAIN OF CUSTODY FORM

Quote No.: _____ Page: 1 of 1

Client Name: EARTH TECH
Address: 100 W BROADWAY STE 214
City: LONG BEACH State: CA Zip: 90245
Tel: (562) 951-2159 Fax: 562 951-2026
P.O./Project Number: 52773 03 03
Project Name: LMC MULTIPOINT WELLS
Project Manager: CILES COBB 562-951-2159
Sampler(s) (signature): ATONAL MARES

Sample I.D.	Matrix	Date Sampled	Time	Preservation	Number of Containers	Type of Containers	8015 (Gas) — 8020 (BTEX) / MTBE (8020) / 8015/8020/MTBE	8015 (Diesel) / simulated distillation / fuel fingerprint	Oil & Grease - EPA 413.2	TRPH - EPA 418.1	EPA 8010 / EPA 8010/8020	EPA 8270	Title 22 Metals EPA 6010/7000 / +Cr VI	EPA 8260 / + MTBE / + Oxygenates / MTBE only	Lead	pH	PERCHLORATE 314.0
LMCW-S-TANK-LT9001	W	1/2/04	0745	None	3	40ml											X
LMCW-S-TANK-LT9001	W	1/2/04	0745	None	1	40ml	E	X TRA			TO	BE	USED	IF	REQ'D		X
DETECTION LIMIT		TO	BE		2		PPB										
ATTN: PATTY MATA																	
PLEASE EXPIDITE ANALYSIS																	
REQUEST RESULTS BY MONDAY							JAN 5, 2004										

Relinquished by:	Date/Time:	Received by:	Date/Time:
Atonal Mares	1/2/04 940	M. Salazar	1/2/04 940
M. Salazar	1-2-04 1030	Connie Chen	1-2-04 1030
Connie Chen	1-2-04 1425	Received in Lab by:	1-02-04 1425

Remarks:

Turnaround Time: (check one): Same Day ___ 72 hours ___ 24 Hours X 5 Days ___ 48 Hours ___ Standard ___

Sample Integrity: Intact: ✓ On Ice 5°C

Note. By relinquishing samples to Del Mar Analytical, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project Payment for services is due within 30 days from the date of the invoice. Sample(s) will be disposed of after 30 days.

COC-GT

APPENDIX E

WASTE MANIFESTS

NON HAZARDOUS WASTE MANIFEST

GENERATOR

ORANGE SHOW ROAD & SANTA ANA RIVER BOTTOM

NAME

ADDRESS

San Bernardino, CA

CITY, STATE ZIP

PHONE

EPA NUMBER:

35477

MANIFEST NUMBER

[illegible]

DATE

[illegible]

QUANTITY

LIST COMPONENTS: %

A. drilling mud

B.

C.

D.

E. %

F.

G.

H.

PHYSICAL STATE: ☐ Liquid ☑ Solid

WASTE DESCRIPTION: NON-HAZARDOUS SOIL

GENERATING PROCESS: drill tailings

SPECIAL INFORMATION:

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

X [illegible]

TRANSPORTER

HaZ MaT Trans INC.

P.O. Box 5129 • San Bernardino, CA 92412 • (909) 889-5607

D.O.H.S. #0115 • EPA #CAT 080012800

TRUCK # 71

P/U DATE: [illegible]

DRIVER #

X [illegible]

TSD FACILITY

Philadelphia Recycling Mine

NAME DATE

12000 Philadelphia Street

ADDRESS

Mira Loma, CA. 91752

CITY, STATE ZIP

909-535-[illegible]

PHONE

EPA NUMBER:

X

AUTHORIZED AGENT

QUANTITY

SPECIAL HANDLING OR DISPOSAL METHOD

PH.

HaZ MaT Trans INC.

WORK ORDER 35497

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607 ▪ Fax: (909) 884-8966
D O H S #0115 ▪ Industrial Waste Removal ▪ EPA #CAT 080012800

JOB INFORMATION

COMPANY	[illegible]
ADDRESS	[illegible]
CITY / STATE / ZIP	San Bernardino, CA
CONTACT	John [illegible]
PHONE	

BILLING INFORMATION

COMPANY	#2001 [illegible]
ADDRESS	3000 W. [illegible] Blvd
CITY / STATE / ZIP	[illegible] CA 92764
CONTACT	
PHONE	714-[illegible]

DATE	P.O. NO.	UNIT NO.	C.O.D.	CHARGE
12 11 03		94		*

WORK DESCRIPTION

P/U BOX #204-2 TRANSPORT TO [illegible] RM

DESCRIPTION	UNIT PRICE	START	ARRIVE	DEPART	STOP	TOTAL HOURS	SUB TOTAL
		~~[illegible]~~	8:45	8:55			
PEM			9.35	10:00	10.45		

DISPOSAL FEE DESCRIPTION	QUANTITY	PRICE	
		TOTAL	

RECEIVED BY X [illegible]

NON HAZARDOUS WASTE MANIFEST

GENERATOR

NAME: ORANGE SHOW ROAD & SANTA ANA RIVER BOTTOM

MANIFEST NUMBER: 1/31/12

ADDRESS:

CITY, STATE: San Bernardino, CA

ZIP:

DATE: [illegible]

PHONE:

EPA NUMBER:

QUANTITY: [illegible]

LIST COMPONENTS: %

A. Drilling mud

B.

C.

D.

E.

F.

G.

H.

PHYSICAL STATE: ☐ Liquid ☒ Solid

WASTE DESCRIPTION: NON-HAZARDOUS SOIL

GENERATING PROCESS: Drill tailings

SPECIAL INFORMATION:

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS

X

TRANSPORTER

HaZ MaT Trans INC.

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607

D.O.H.S. #0115 ▪ EPA #CAT 080012800

TRUCK # 71

P/U DATE:

DRIVER #

X

TSD FACILITY

NAME: Philadelphia Recycling, Inc.

DATE:

ADDRESS: 12000 Philadelphia Street

CITY, STATE: Mira Loma, CA

ZIP: 91752

PHONE: 909-685-3313

EPA NUMBER:

QUANTITY

SPECIAL HANDLING OR DISPOSAL METHOD

PH.

X

AUTHORIZED AGENT

HaZ MaT Trans INC.

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607 ▪ Fax: (909) 884-8966
D O H S #0115 ▪ Industrial Waste Removal ▪ EPA #CAT 080012800

WORK ORDER 43412

JOB INFORMATION

COMPANY	ORANGE SHOW ROAD &
ADDRESS	THE SANTA ANA RIVER BOTTOM
CITY / STATE / ZIP	SAN BERNARDINO, CA.
CONTACT	JOHN THOMAS
PHONE	

BILLING INFORMATION

COMPANY	#2001 BEYLIK DRILLING
ADDRESS	3000 W. MacARTHUR BLVD.
CITY / STATE / ZIP	SANTA ANA, CA. 92704
CONTACT	
PHONE	714-870-5360

12-11-03		91		*

WORK DESCRIPTION

P/U BIN # 211-L & # _____ & TRANS. TO PRM

DESCRIPTION	UNIT PRICE	START	ARRIVE	DEPART	STOP	TOTAL HOURS	SUB-TOTAL
		6:30	6:40	6:50			
PRM			7:30	8:00	8:45		

DISPOSAL FEE DESCRIPTION	QUANTITY	PRICE
		TOTAL

RECEIVED BY X [illegible]

NON HAZARDOUS WASTE MANIFEST

GENERATOR

NAME: ORANGE SHOW ROAD & SANTA ANA RIVER BOTTOM

MANIFEST NUMBER: 43413

ADDRESS:

CITY, STATE: San Bernardino, CA

ZIP:

DATE: 12-11-03

PHONE:

EPA NUMBER:

QUANTITY: 130 Yds

LIST COMPONENTS:

	%		%
A. drilling mud		E.	
B.		F.	
C.		G.	
D.		H.	

PHYSICAL STATE: ☐ Liquid ☒ Solid

WASTE DESCRIPTION: NON-HAZARDOUS SOIL

GENERATING PROCESS: drill tailings

SPECIAL INFORMATION:

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

X

TRANSPORTER

HaZ MaT Trans INC.

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607

D.O.H.S. #0115 ▪ EPA #CAT 080012800

TRUCK # 94

P/U DATE: 12-11-03

DRIVER #

X

TSD FACILITY

NAME: Philadelphia Recycling Mine

DATE:

ADDRESS: 12000 Philadelphia Street

CITY, STATE: Mira Loma, CA.

ZIP: 91752

PHONE: 909-685-3343

SPECIAL HANDLING OR DISPOSAL METHOD

PH.

EPA NUMBER:

X

AUTHORIZED AGENT

QUANTITY

HaZ MaT Trans INC.

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607 ▪ Fax: (909) 884-8966
D.O.H.S #0115 ▪ Industrial Waste Removal ▪ EPA #CAT 080012800

WORK ORDER 43413

JOB INFORMATION

COMPANY	ORANGE SHOW ROAD &
ADDRESS	THE SANTA ANA RIVER BOTTOM
CITY / STATE / ZIP	SAN BERNARDINO, CA.
CONTACT	JOHN THOMAS
PHONE	

BILLING INFORMATION

COMPANY	#2001 BEYLIK DRILLING
ADDRESS	3000 W. MacARTHUR BLVD.
CITY / STATE / ZIP	SANTA ANA, CA. 92704
CONTACT	
PHONE	714-870-5360

DATE	P.O. NO.	UNIT NO.	C.O.D.	[illegible]
12-11-03		94		*

DESCRIPTION

P/U BIN # 148L & # _____ & TRANS. TO PRM

DESCRIPTION	UNIT PRICE	START	ARRIVE	DEPART	STOP	TOTAL HOURS	[illegible]
		10:45	10:50				

DISPOSAL FEE DESCRIPTION	QUANTITY	[illegible]	
		TOTAL	

RECEIVED BY X [illegible]

NON HAZARDOUS WASTE MANIFEST

GENERATOR

NAME: ORANGE SHOW ROAD & SANTA ANA RIVER BOTTOM

MANIFEST NUMBER: 4/34/11

ADDRESS:

CITY, STATE: San Bernardino, CA

ZIP:

DATE: 12-11-03

PHONE:

EPA NUMBER:

QUANTITY: 15 yds

LIST COMPONENTS:

	%		%
A. Drilling mud		E.	
B.		F.	
C.		G.	
D.		H.	

PHYSICAL STATE: ☐ Liquid ☑ Solid

WASTE DESCRIPTION: NON-HAZARDOUS SOIL

GENERATING PROCESS: drill tailings

SPECIAL INFORMATION:

THE GENERATOR CERTIFIES THAT THE WASTE AS DESCRIBED IS 100% NON-HAZARDOUS.

X

TRANSPORTER

HaZ MaT Trans INC.

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607

D.O.H.S. #0115 ▪ EPA #CAT 080012800

TRUCK # 94

P/U DATE: 12-11-03

DRIVER #

X

TSD FACILITY

NAME: Philadelphia Recycling Line

DATE:

ADDRESS: 12000 Philadelphia Street

CITY, STATE: Mira Loma, CA.

ZIP: 91752

PHONE: 909-685-8343

SPECIAL HANDLING OR DISPOSAL METHOD

PH.

EPA NUMBER:

X

AUTHORIZED AGENT

QUANTITY

HaZ MaT Trans INC.

P.O. Box 5129 ▪ San Bernardino, CA 92412 ▪ (909) 889-5607 ▪ Fax: (909) 884-8966
D.O.H.S. #0115 ▪ Industrial Waste Removal ▪ EPA #CAT 080012800

WORK ORDER 43414

JOB INFORMATION

COMPANY	ORANGE SHOW ROAD &
ADDRESS	THE SANTA ANA RIVER BOTTOM
CITY / STATE / ZIP	SAN BERNARDINO, CA.
CONTACT	JOHN THOMAS
PHONE	

BILLING INFORMATION

COMPANY	#2001 BEYLIK DRILLING
ADDRESS	3000 W. MacARTHUR BLVD.
CITY / STATE / ZIP	SANTA ANA, CA. 92704
CONTACT	
PHONE	714-870-5360

DATE	P.O. NO.	UNIT NO.	C.O.D.	CHARGE
12-11-03		94		*

DESCRIPTION

P/U BIN # 212-L & TRANS. TO PRM

DESCRIPTION	UNIT PRICE	START	ARRIVE	DEPART	STOP	TOTAL HOURS	SUB TOTAL
		1:30	1:40	1:45			

DISPOSAL FEE DESCRIPTION	QUANTITY	PRICE	
		TOTAL	

RECEIVED BY X [illegible]

APPENDIX F

WELL CONSTRUCTION REPORT

ORIGINAL Job #: 41326
File with DWR

Page 1 of 4

Owner's Well No. LMW-4

Date Work Began 10/24/03, Ended 12/2/03

Local Permit Agency San Bernardino County

Permit No. 2003-10-0832 Permit Date 10/14/03

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 0907806

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO /STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rev. Circ. FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
-0-	70	Silty sand
70	75	Clay, dark green
75	80	Sand, fine, gray
80	90	Clay, gray
90	150	Sand and gravel, brown
150	175	Sand, fine to medium grayish brown
175	230	Sand and gravel, brown
230	245	Silty sand, fine to coarse
245	250	Clayey sand, brown
250	340	Sand and grvel, fine to
340	400	Sand & silt. Brown clay
400	455	Sand & gravel, brown
455	475	Silty clay, grey brown
475	510	Sand and clay, brown
510	560	Sand, fine to medium brown
560	610	Silty sand, some gravel, brown
610	650	Clayey sand
650	725	Sand and gravel, fine to coarse, brown
725	740	Silty clay, fine, gray
740	825	Sand, fine to coarse, brown
825	860	Clayey sand, brown
860	960	Sand & gravel, fine to coarse, brown
960	975	Clayey sand, grey brown
975	980	Sand & gravel, fine to medium brown
980	990	Clayey sand, brown

TOTAL DEPTH OF BORING _____ (Feet)

TOTAL DEPTH OF COMPLETED WELL _____ (Feet)

WELL OWNER

Name Lockheed Martin Corporation

Mailing Address 2550 N. Hollywood Way, #301

Burbank (CITY) CA (STATE) 91505 (ZIP)

WELL LOCATION

Address 700 E. Orange Show Rd.

City San Bernardino

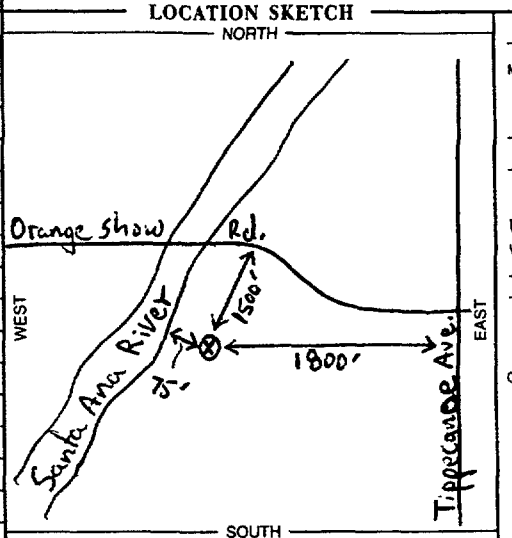
County San Bernardino

APN Book B4 Page 607 Parcel 0281-031-38-0000

Township 1S Range 4W Section 14

Lat ___ DEG. ___ MIN. ___ SEC N Long ___ DEG ___ MIN ___ SEC W

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map Use additional paper if necessary ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING X
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER n/a (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 81 (Ft.) & DATE MEASURED 11/12/03

ESTIMATED YIELD * n/a (GPM) & TEST TYPE n/a

TEST LENGTH n/a (Hrs) TOTAL DRAWDOWN n/a (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft	to Ft	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
-0-	35	24			x		LCS A53B	15.5	.250	
-0-	85	12.25	x				LCS A53B	4.26	.120	
85	105	12.25	x				304 S.S.	4.26	.120	
105	115	12.25		x			304 S.S.	4.26	.120	0.010
115	260	12.25	x				304 S.S.	4.26	.120	
260	270	12.25		x			304 S.S.	4.26	.120	0.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
-0-	50	x			
50	100		x		
100	120				2/12 sand
120	225		x		
225	275				2/12 sand
275	385		x		

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME John Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd., La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP

Signed [signature] 5/12/04 306291
C-57 LICENSED WATER WELL CONTRACTOR DATE SIGNED C-57 LICENSE NUMBER

OSP 03 788

ORIGINAL Job #: 41326
File with DWR

Page 2 of 4

Owner's Well No. LMW-4

Date Work Began 10/24/03, Ended 12/2/03

Local Permit Agency San Bernardino County

Permit No. 2003-10-0832 Permit Date 10/14/03

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0907818

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rev. Circ. FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
990	1070	Sand & gravel
1070	1100	Silty sand, some clay, grey brown

TOTAL DEPTH OF BORING 1100 (Feet)

TOTAL DEPTH OF COMPLETED WELL 1015 (Feet)

WELL OWNER

Name Lockheed Martin Corp.

Mailing Address 2550 N. Hollywood Way, #301

Burbank (CITY) CA (STATE) 91505 (ZIP)

WELL LOCATION

Address 700 E. Orange Show Rd.

City San Bernardino

County San Bernardino

APN Book B4 Page 607 Parcel 0281-031-38-00(

Township 1S Range 4W Section 14

Lat ___ DEG. ___ MIN. ___ SEC. N Long ___ DEG. ___ MIN. ___ SEC. W

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

___ NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG*

USES (✓)

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industria

MONITORING ___

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
270	390	12.25	x				304 S.S.	4.26	.120	
390	400	12.25		x			304 S.S.	4.26	.120	0.010
400	560	12.25	x				304 S.S.	4.26	.120	
560	570	12.25		x			304 S.S.	4.26	.120	0.010
570	655	12.25	x				304 S.S.	4.26	.120	
655	665	12.25		x			304 S.S.	4.26	.120	0.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
385	405				2/12 Sanc
405	555		x		
555	575				2/12 sanc
575	650		x		
650	670				2/12 san
670	770		x		

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME John Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd. La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP

5/12/04 306291

ORIGINAL Job #: 41326
File with DWR

Page 3 of 4

Owner's Well No. LMW-4

Date Work Began 10/24/03, Ended 12/12/03

Local Permit Agency San Bernardino County

Permit No 2003-10-0832 Permit Date 10-14-03

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0907807

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO /STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Rev. Circ. FLUID Water

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain size, color, etc*

TOTAL DEPTH OF BORING _____ (Feet)

TOTAL DEPTH OF COMPLETED WELL _____ (Feet)

WELL OWNER

Name Lockheed Martin Corp.

Mailing Address 2550 N. Hollywood Way, #301

Burbank (CITY) CA (STATE) 91505 (ZIP)

WELL LOCATION

Address 700 E. Orange Show Rd.

City San Bernardino

County San Bernardino

APN Book B4 Page 607 Parcel 0281-031-38-000

Township 1S Range 4W Section 14

Lat ___ N (DEG MIN SEC) Long ___ W (DEG MIN SEC)

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads Buildings, Fences, Rivers, etc and attach a map Use additional paper if necessary ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under GEOLOGIC LOG"*

USES (✓)

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industrial

MONITORING X

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (Ft) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL _____ (Ft) & DATE MEASURED _____

ESTIMATED YIELD * _____ (GPM) & TEST TYPE _____

TEST LENGTH _____ (Hrs) TOTAL DRAWDOWN _____ (Ft)

** May not be representative of a well's long-term yield*

CASING (S)

DEPTH FROM SURFACE Ft to Ft	BORE-HOLE DIA (Inches)	TYPE (✓) BLANK	SCREEN	CON DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
665 775	12¼	x				304 S.S.	4.26	.120	
775 785	12¼		x			304 S.S.	4.26	.120	0.010
785 895	12¼	x				304 S.S.	4.26	.120	
895 905	12¼		x			304 S.S.	4.26	.120	0.010
905 990	12¼	x				304 S.S.	4.26	.120	
990 1000	12¼		x			304 S.S.	4.26	.120	0.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft to Ft	TYPE: CE-MENT (✓)	BEN TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
770 790				2/12 sand
790 890		x		
890 910				2/12 sand
910 985		x		
985 1005				2/12 sand
1005 1100		x		

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME John Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd.- La Habra. CA 90631-6124]

ORIGINAL Job #: 41326
File with DWR

Page 4 of 4

Owner's Well No. LMW-4

Date Work Began 10/24/03, Ended 12/12/03

Local Permit Agency San Bernardino County

Permit No. 2003-10-0832 Permit Date 10/14/03

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 0907808

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO /STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Reverse Circ FLUID Water

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain size, color, etc.*

TOTAL DEPTH OF BORING _____ (Feet)

TOTAL DEPTH OF COMPLETED WELL _____ (Feet)

WELL OWNER

Name Lockheed Martin Corp.

Mailing Address 2550 N. Hollywood Way, #301

Burbank, CA 91505
CITY STATE ZIP

WELL LOCATION

Address 700 E. Orange Show Rd.

City San Bernardino

County San Bernardino

APN Book B4 Page 607 Parcel 0281-031-38-000

Township 1S Range 4W Section 14

Lat ___ DEG ___ MIN ___ SEC N Long ___ DEG ___ MIN ___ SEC W

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map Use additional paper if necessary ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG"*

USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING X
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (Ft) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL _____ (Ft.) & DATE MEASURED _____

ESTIMATED YIELD * _____ (GPM) & TEST TYPE _____

TEST LENGTH _____ (Hrs) TOTAL DRAWDOWN _____ (Ft)

** May not be representative of a well's long-term yield*

CASING (S)

DEPTH FROM SURFACE Ft to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
1000 1015	12¼	X				304 S.S.	4.26	.120	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

NAME John M. Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd. La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP

Signed _____ 5/12/04 306291
C-57 LICENSED WATER WELL CONTRACTOR DATE SIGNED C-57 LICENSE NUMBER

ORIGINAL Job #: 41326
File with DWR

Page 1 of 4

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 0907813

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. LMW-5
Date Work Began 11/9/03, Ended 12/16/03
Local Permit Agency San Bernardino County
Permit No. 2003-10-0833 Permit Date 10/14/03

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD Reverse Circ. FLUID Water

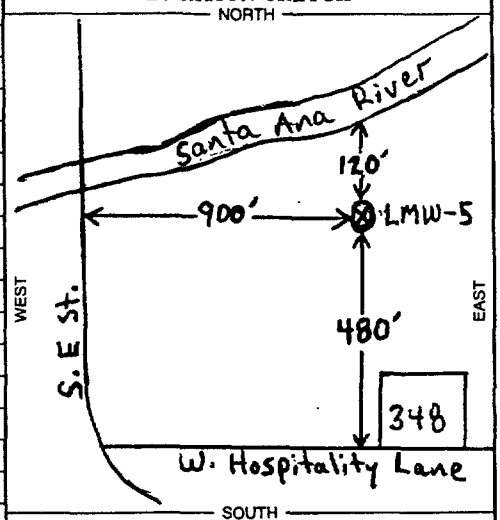
DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
-0-	63	Sitly sand, fine to med gray
63	70	Sand & gravel, yellow brown
70	75	Silty clay, brown
75	188	Sand & gravel, fine to coarse, brown
188	210	Clay, dark gray
210	225	Silty sand, fine, black
225	242	Sand & gravel, fine to gray brown
242	255	Silty clay, dark gray
255	325	Sand & gravel, gray
325	355	SAnd & silt, dark gray
355	410	Sand & silt, some gravel, gray
410	510	Sand & gravel, fine, medium gray
510	525	Silty clay, dark green
525	585	Sand & gravel, fine to coarse, green gray
585	625	Silty sand, fine to medium, dark gray
625	680	Silty clay, gray
680	700	Silty gravelly sand, dark gray
700	720	Sandy gravel, fine to coarse, gray
720	775	Sitly sand and clay, gray
775	798	Silty sand and gravel, gray
798	835	Gravelly sand, fine to coarse, gray

TOTAL DEPTH OF BORING 940 (Feet)
TOTAL DEPTH OF COMPLETED WELL 905 (Feet)

WELL OWNER
Name Lockheed Martin Corp.
Mailing Address 2550 N. Hollywood Way, #301
Burbank CA 91505
CITY STATE ZIP

WELL LOCATION
Address 348 W. Hospitality Lane
City San Bernardino
County San Bernardino
APN Book H6 Page 606 Parcel 0141-363-02-000
Township 1S Range 4W Section 22
Lat ___ N (DEG. MIN. SEC.) Long ___ W (DEG. MIN. SEC.)

LOCATION SKETCH



Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)
X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)
WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING X
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH TO FIRST WATER n/a (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 46 (Ft.) & DATE MEASURED 11/22/03
ESTIMATED YIELD * n/a (GPM) & TEST TYPE n/a
TEST LENGTH n/a (Hrs.) TOTAL DRAWDOWN n/a (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
-0-	35	24			x		lcs A53B	15½	.250	
-0-	60	12¼	x				lcs A53B	4.26	.120	
60	80	12¼	x				304 S.S.	4.26	.120	
80	90	12¼		x			304 S.S.	4.26	.120	0.010
90	160	12¼	x				304 S.S.	4.26	.120	
160	170	12¼		x			304 S.S.	4.26	.120	0.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
-0-	50	x			
50	75		x		
75	145				2/12 sand
145	155		x		
155	175				2/12 sand
175	270		x		

ATTACHMENTS (✓)
___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME John M. Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
555 S. Harbor Blvd. La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP
Signed John M. Kennedy
C-57 LICENSED WATER WELL CONTRACTOR
5/12/04 DATE SIGNED
306291 C-57 LICENSE NUMBER

ORIGINAL Job #: 41326
File with DWR

Page 2 of 4

Owner's Well No. LMW-5

Date Work Began 11/9/03, Ended 12/16/03

Local Permit Agency San Bernardino

Permit No. 2003-10-0833 Permit Date 10/14/03

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0907812

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Reverse Circ. FLUID Water

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
835	870	Silty sand, gray
870	890	Sand, fine to coarse, dark gray
890	940	Silty sand, some clay, gray

TOTAL DEPTH OF BORING 940 (Feet)

TOTAL DEPTH OF COMPLETED WELL 905 (Feet)

WELL OWNER

Name Lockheed Martin Corp.

Mailing Address 2550 N. Hollywood Way, #301

Burbank CA 91505

CITY STATE ZIP

WELL LOCATION

Address 348 W. Hospitality Ln.

City San Bernardino

County San Bernardino

APN Book H6 Page 606 Parcel 0141-363-02-000

Township 1S Range 4W Section 22

Lat ___ DEG. ___ MIN. ___ SEC. N Long ___ DEG. ___ MIN. ___ SEC. W

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industrial

MONITORING X

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___

ESTIMATED YIELD * ___ (GPM) & TEST TYPE ___

TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
170	275	12¼	x				304 S.S.	4.26	.120	
275	285	12¼		x			304 S.S.	4.26	.120	0.010
285	440	12¼	x				304 S.S.	4.26	.120	
440	450	12¼		x			304 S.S.	4.26	.120	0.010
450	570	12¼	x				304 S.S.	4.26	.120	
570	580	12¼		x			304 S.S.	4.26	.120	0.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
270	290				2/12 sand
290	435		x		
435	455				2/12 sand
455	565		x		
565	585				2/12 sar
585	625		x		

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME John M. Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd. La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP

Signed John M. Kennedy
C-57 LICENSED WATER WELL CONTRACTOR

5/12/04
DATE SIGNED

306291
C-57 LICENSE NUMBER

ORIGINAL Job #: 41326
File with DWR

Page 3 of 4

Owner's Well No. LMW-5

Date Work Began 11/9/03, Ended 12/16/03

Local Permit Agency San Bernardino County

Permit No. 2003-10-0833 Permit Date 10/14/03

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 0907810

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO /STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Reverse Circ FLUID Water

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*

TOTAL DEPTH OF BORING _____ (Feet)

TOTAL DEPTH OF COMPLETED WELL _____ (Feet)

WELL OWNER

Name Lockheed Martin Corp.

Mailing Address 2550 N. Hollywood Way, #301

Burbank (CITY) CA (STATE) 91505 (ZIP)

WELL LOCATION

Address 348 W. Hospitality Ln.

City San Bernardino

County San Bernardino

APN Book H6 Page 606 Parcel 0141-363-02-000

Township 1S Range 4W Section 22

Lat ___ DEG ___ MIN ___ SEC N Long ___ DEG ___ MIN ___ SEC W

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map Use additional paper if necessary ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)

WATER SUPPLY
___ Domestic ___ Public
___ Irrigation ___ Industrial

MONITORING X
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL _____ (Ft) & DATE MEASURED _____

ESTIMATED YIELD * _____ (GPM) & TEST TYPE _____

TEST LENGTH _____ (Hrs.) TOTAL DRAWDOWN _____ (Ft)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
580	630	12¼	x				304 SS	4.26	.120	
630	640	12¼		x			304 SS	4.26	.120	0.010
640	700	12¼	x				304 SS	4.26	.120	
700	710	12¼		x			304 SS	4.26	.120	0.010
710	800	12¼	x				304 SS	4.26	.120	
800	810	12¼		x			304 SS	4.26	.120	0.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
625	645				2/12 sand
645	695		x		
695	715				2/12 sand
715	795		x		
795	815				2/12 san
815	870		x		

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other _____

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME John M. Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd. La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP

5/12/04 306291

ORIGINAL Job #: 41326
File with DWR

Page 4 of 4

Owner's Well No. LMW-5

Date Work Began 11/9/03, Ended 12/16/03

Local Permit Agency San Bernardino County

Permit No. 2003-10-0833 Permit Date 10/14/03

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0907819

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO /STATION NO

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Reverse Circ FLUID Water

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION *Describe material, grain size, color, etc.*

TOTAL DEPTH OF BORING _____ (Feet)

TOTAL DEPTH OF COMPLETED WELL _____ (Feet)

WELL OWNER

Name Lockheed Martin Corp.

Mailing Address 2550 N. Hollywood Way, #301

Burbank CA 91505

CITY STATE ZIP

WELL LOCATION

Address 348 W. Hospitality Ln.

City San Bernardino

County San Bernardino

APN Book H6 Page 606 Parcel 0141-363-02-000

Township 1S Range 4W Section 22

Lat ___ DEG ___ MIN. ___ SEC. N Long ___ DEG ___ MIN ___ SEC W

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc and attach a map Use additional paper if necessary ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG*

USES (✓)

WATER SUPPLY

___ Domestic ___ Public

___ Irrigation ___ Industrial

MONITORING X

TEST WELL ___

CATHODIC PROTECTION ___

HEAT EXCHANGE ___

DIRECT PUSH ___

INJECTION ___

VAPOR EXTRACTION ___

SPARGING ___

REMEDIATION ___

OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL _____ (Ft) & DATE MEASURED _____

ESTIMATED YIELD * _____ (GPM) & TEST TYPE _____

TEST LENGTH _____ (Hrs) TOTAL DRAWDOWN _____ (Ft)

** May not be representative of a well's long-term yield*

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
810 875	12¼	x				304 SS	4.26	.120	
875 885	12¼		x			304 SS	4.26	.120	
885 905	12¼	x				304 SS	4.26	.120	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
870 890				2/12 sanc
890 940		x		

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

Other

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME John M. Kennedy for Beylik Drilling, Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

555 S. Harbor Blvd. La Habra, CA 90631-6124
ADDRESS CITY STATE ZIP

APPENDIX G

EVALUATION OF ENVIRONMENTAL CONSIDERATIONS

By Facsimile

September 23, 2003

San Bernardino County
Flood Control Operations- Permit Section
Attention: Mike Seal
825 East Third Street, Room 108
San Bernardino, California 92415-0835

Subject: Supplemental Information Regarding the Permit Application for Two Proposed Monitoring Wells

Dear Mr. Seal:

Lockheed Martin applied for permits to install and sample two monitoring wells proposed to be located on San Bernardino County-managed property by letter dated September 11, 2003 (attached for reference). We subsequently became aware that the proposed locations are proximal to nesting sites of some threatened and endangered species. We hereby supplement our permit application by presenting information that supports a decision of no impact to threatened and endangered species or their habitats.

Lockheed Martin has contracted Earth Tech, Inc., to drill and install two flush-mounted monitoring wells near the Santa Ana River channel on San Bernardino Flood Control District managed land. Well locations are provided with the permit applications as shown on the attached[1]. The wells will be used to monitor water quality in the vicinity if the Santa Ana River. The work area for each well site will be approximately 10,000 square feet (25-foot road width by 450-foot work area) located on the channel access road and levee.

The Southwest willow flycatcher (*Empidonax trallii extimus*) and the least Bell's vireo *(Vireo bellii pusillis*) inhabit and nest in riparian habitat along the Santa Ana River. The nesting season for these species is from April to August. Four nesting sites, five vireos, and two flycatchers have been observed in well-developed, two-story vegetation[2]. Cottonwood trees comprise the canopy. The under-story is dominated by willow and mule fat, and contains varieties of small shrub species. This vegetative habitat suitable to the vireo and flycatcher is located within the Santa Ana River channel, adjacent to the proposed locations of the two

[1] There is a slight discrepancy between the location description (700' east of South E Street) and drawing (about 525' east of South E Street) for the permit application for well LMW-5. The correct location is 700' east of South E Street.

[2] Lawrey, Shay and Marnie McKerman, 2001. *Results of 2001 Spring Bird Surveys Along for Phase II of the Proposed Santa Ana River Trail, San Bernardino County*. Environmental Management Division, San Bernardino County Department of Public Works, San Bernardino, CA., August; and Lawrey, Shay and Marnie McKerman, 2001. *Results of Sensitive Surveys and Brown-Heaved Cowbird Trapping Along Portions of the Santa Ana and Mojave River, San Bernardino County*. Environmental Management Division, San Bernardino County Department of Public Works, San Bernardino, CA., February.

monitoring wells. Nesting sites have been observed within about 500 feet of proposed well LMW-4 and 300 feet of well LMW-5 in the riparian habitat. No impact is expected during the drilling period because of the following factors:

- Drilling will occur between October and December, which does not coincide with the April to August nesting season.
- Drilling and materials storage will be outside of the riparian habitat.
    - The levee at proposed site LMW-5 is an asphalt trail on the southern edge of the Santa Ana River riparian zone. The proposed drill site is south of the levee (further from the riparian zone than the trail). The approximately 15-foot high levee will provide sound screening in the direction of the Santa Ana River.
    - The levee at proposed site LMW-4 is adjacent to and elevated relative to the Santa Ana River riparian zone. Drilling is proposed to take place in the dirt access road along the levee at LMW-4.
- Sound barriers will be placed between the drilling site and riparian zone at proposed well LMW-4. As noted above, sound screening at the proposed LMW-5 well site will be accomplished by the levee, which rises about 15 feet above grade elevation at the drill site.
- The only drilling-phase human intrusion into the riparian zone (placing a temporary *discharge pipe to convey development water to the River)*[3] *will not involve any* alteration of habitat (e.g., cutting of trees or trimming branches) and will not occur during the nesting season.

The permit application is for a period of five years so that the wells can be periodically monitored. No impacts are expected during the monitoring phase (i.e., after wells are completed in December 2003) because (1) as with the drilling activity, the sampling will be outside of the riparian zone and (2) sampling involves less equipment and noise than the drilling program.

Lockheed Martin is confident that the above-described aspects of the construction and monitoring will avoid impacts to this special habitat. If you have any further questions regarding the proposed action, please contact me at 818-847-9901 or Bill Bath at 818-847-0296.

Sincerely,

Thomas D. Blackman, R.G., C.HG.
Technical Project Manager

Cc: Matt Werner

[3] Development water discharge will occur over several days. Discharge will be in accordance with a Regional Water Quality Control Board permit.

APPENDIX H

WELL DEVELOPMENT LOGS

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-4 PORT # 1 | SAMPLE NO.: LMW-4 (PORT 1)

START (Date): 11-19-2003 (Time): 1635 | END (Date): 11-19-2003 (Time): 2225

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: CLEAR & COLD

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC / ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	
1015'			4" - 0.66 gpf
			5" - 0.93 gpf
			6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
1635	0	0					DTW 24" TO WATER IN TANK (START)
1639	4	15	—	—	—	—	STOP PUMP (HOSE BROKE)
2131							PUMP STARTED
2135	4	60 / 75	18.9	7.35	0.716	29	15 GPM
2140	5 / 9	75 / 150	19.4	7.31	0.725	10	
2145	5 / 14	75 / 225	19.5	7.34	0.724	07	
2150	5 / 21	75 / 300	19.7	7.33	0.720	10	
2155	5 / 26	75 / 375	19.7	7.31	0.723	10	
2200	5 / 31	75 / 450	19.8	7.30	0.720	11	
2205	5 / 36	75 / 525	19.7	7.23	0.720	08	
2210	5 / 41	75 / 600	19.9	7.24	0.721	04	
2215	5 / 46	75 / 675	19.8	7.25	0.722	04	
2220	5 / 51	75 / 750					SAMPLED
2225	5 / 56	75 / 825					PUMP OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR: 500 mL - Poly w/ HNO_3 200.7 CATIONS (TOTAL)

1 L - POLY UNPRES. 300.0 ANIONS (w/ FLUORIDE & BROMIDE)

310.1 ALKALINITY

116.1 TDS

40 mL - VOAs w/ HCL 601/602 VOC

40 mL - VOAs UNPRES. 314.0 PERCHLORATE

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-4 PORT 2 | SAMPLE NO.: LMW-4-260 (PORT 2)

START (Date): 11-19-2003 (Time): 2336 | END (Date): 11-20-2003 (Time): 0115

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: CLEAR & COLD

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC / ATONAL MAIRES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
2336	0	0					PUMP STARTED / 1.5 gpm
2340	4	60	17.9	7.18	.701	6	
2350	10/14	150/210	18.9	7.35	.614	50	
2400	10/24	150/360	18.2	7.40	.619	22	
2410	10/34	150/510	18.2	7.38	.622	34	
2420	10/44	150/660	18.4	7.33	.634	57	
2430	10/54	150/810	18.6	7.33	.632	38	
2440	10/64	150/960	18.7	7.33	.630	26	
2450	10/74	150/1110	18.6	7.35	.635	12	
0100	10/84	150/1260	18.6	7.36	.636	1	
0110	10/94	150/1410					SAMPLED
0115	10/104	150/1560					PUMP STOPPED

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR: 200.7 - CATIONS (TOTAL)
300.0 - ANIONS w/ FLORIDE & BROMIDE
310.1 - ALKALINITY
116.1 - TDS
601/602 - VOC
314.0 - PERCHLORATE

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773-03.03 | TEAM BEYLIK

PURGING LOG

WELL NO.: LMW-4 PORT 3 | SAMPLE NO.: LMW-4-390 (PORT 3)

START (Date): 11-20-2003 (Time): 0210 | END (Date): 11-20-03 (Time): 0849

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC / ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers (X) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	
			4" - 0.66 gpf
			5" - 0.93 gpf
			6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
0210	0	0					PUMP STARTED
0215	5	75	17.7	7.27	.758	750	15gpm
0225	10/15	150/225	18.7	7.27	.628	345	
0235	10/25	150/375	19.1	7.32	.649	226	
0245	10/35	150/525	19.2	7.37	.631	177	
0300	15/50	225/750	18.8	7.37	.622	80	
0315	15/65	225/975	19.2	7.33	.611	140	
0330	15/80	225/1200	19.5	7.35	.611	166	
0345	15/95	225/1425	19.3	7.32	.598	122	
0425	40/135	400/1825	19.3	7.36	599	24	DISCHARGE - 5GAL / 30sec = 10 gal/min
0455	30/165	450/2275	19.3	7.39	622	50	DISCHARGE - 5gal / 21 sec = 14.28 gal/min & 15 gal/
0535	40/205	720/2995	19.1	7.40	631	24	REPLACED BATTERY IN HORIB. 5GAL / 17 sec = 18 GAL/min
0605	30/235	540/3535	19.0	~~6.97~~ 7.40	638	34	RECALIBRATED HORIBA
0620	30/265	540/4075	19.3	7.45	631	85	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs (	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR: 200.7 - CATIONS (TOTAL)

300.0 - ANIONS w/ FLORIDE & BROMIDE

310.1 - ALKALINITY

116.1 - TDS

601/602 - VOC

314.0 - PERCHLORATE

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-4 PORT #3 | SAMPLE NO.: LMW-4-390 (PORT 3)

START (Date): 11-20-2003 (Time): 0210 | END (Date): 11-20-03 (Time): 0849

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers (X) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°C)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0635	15/280	270/4340	19.3	7.51	636	120	
0655	20/300	360/4700	~~19.3~~ 19.5	7.53	635	24	
0725	30/330	540/5240	19.5	7.48	631	14	
0755	30/360	540/5780	19.7	7.49	632	8	
0810	15/375	270/6050	20.0	7.61	638	8	
0825	15/390	270/6320	20.2	7.63	639	8	
0840	15/405	270/6590	20.2	7.56	640	8	
0845							SAMPLE
0849	9/414	135/6725					PUMPING STOPPED

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773.0303 | TEAM. Beylik

PURGING LOG

WELL NO.: LMW-4 PORT #4 | SAMPLE NO.: LMW-4-S60 (Port 4)

START (Date): 11-20-03 (Time): 0938 | END (Date): (Time) 1200

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): Liles Cobb

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers (X) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
0938	0	0					DTW Pump started
0943	5	75	20.6	7.60	694	23	15 gpm
0953	10/15	150/225	20.7	7.48	697	5	
1003	10/25	150/375	21.0	7.49	692	3	
1013	10/35	150/525	21.0	7.48	667	3	
1023	10/45	150/675	20.9	7.50	642	3	Shut pump down/tank
1115							Pump restarted
1125	10/55	150/825	21.4	7.54	622	2	
1135	10/65	150/975	20.6	7.54	611	3	
1145	10/75	150/1125	20.4	7.58	601	2	
1155	10/85	150/1275	20.2	7.58	598	2	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: Sample for : 200.7 Cations (Total)
300.0 - Anions with Fluoride & Bromide
310.1 Alkalinity
160.1 TDS
601/602 VOC
314.0 Perchlorate

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773.0303 | TEAM. Beylik

PURGING LOG

WELL NO.: LMW-4 PORT #5 | SAMPLE NO.: LMW-4-655

START (Date): 11/20/03 (Time): 1235 | END (Date): (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
							DTW
1235	0	0					Pump Started
1240	5	75	20.9	7.60	602	2	15 gpm
1250	10/15	150/225	20.7	7.54	660	4	
1300	10/25	150/375	20.4	7.54	671	4	
1310	10/35	150/525	20.4	7.58	666	4	L. COBB ~~A. Mones~~
1335	25/60	375/400	20.2	7.57	638	0	A. Mones
1400	25/85	375/775	20.5	7.54	617	2	
1415	15/100	225/1000	20.4	7.56	609	0	
1430	15/115	225/1225	20.3	7.56	611	0	
1445	15/130	225/1450	20.3	7.56	612	0	
1450	15						SAMPLE
1455							Duplicate
1515	30/160	450/1900					pump off

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

1/2

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-4 PORT # 6 | SAMPLE NO.: LMW-4-775

START (Date): 11-20-03 (Time): 1600 | END (Date): (Time):

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
1600	0	0					~15 gpm
1650	50	750	19.8	7.24	.597	213	
1700	10/60	150/900	19.5	7.63	.603	225	
1715	15/75	225/1125	19.4	7.64	.591	112	
1730	15/90	225/1350	19.4	7.69	.589	92	
1800	30/120	450/1800	19.2	7.72	.576	65	
1830	30/150	450/2250	19.2	7.67	.572	60	
1900	30/180	450/2700	19.3	7.67	.549	29	
1930	30/210	450/3150	19.2	7.64	.537	29	
2000	30/240	450/3600	19.2	7.61	.525	26	
2030	30/270	450/4050	18.9	7.63	.517	21	
2100	30/300	450/4500	18.9	7.65	.503	29	
2130	30/330	450/4950	19.1	7.65	.487	20	
2200	30/360	450/5400	19.0	7.63	.487	25	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

2/2

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: Lmw-4 PART #6 | SAMPLE NO.: Lmw-4- 775

START (Date): (Time): | END (Date): (Time):

WELL CASING DIAMETER: 2" ( ) 4" ( ) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
	0	0					
2230	30/390	450/5850	18.9	7.68	.464	30	
2300	30/420	450/6300	19.0	7.67	.457	24	
2305							Recalibrate Horiba
2310	10/430	150/6450 ~~300/6600~~	19.1	6.95	.466	21	
2320	10/440	150/6600	19.3	7.53	.459	21	
2330	10/450	150/6750	19.1	7.58	.454	14	
2335							SAMPLED
2340	10/460	150/6900					Pump OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773-03.03 | TEAM: BEFLIK

PURGING LOG

WELL NO.: LMW-4 PORT # 7 | SAMPLE NO.: LMW-4-895

START (Date): 11-21-2003 (Time): 0026 | END (Date): (Time).

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: FAIR

FIELD PERSONNEL'S NAME(S): TOM V. / ANGEL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
0026	0	0					15gpm
0030	4	60	18.0	7.83	.446	199	
0040	10/14	150/310	18.7	7.45	.600	50	
0050	00/25	150/325	18.8	7.81	.548	999.	Really Turbid
0050	00/25	150/375	19.3	8.04	.390	999	
0110	10/35	150/525	19.2	7.98	.351	220	
0140	30/65	450/975	19.2	7.96	.343	177	
0211	30/95	450/1425	18.9	7.97	.342	166	
0241	30/125	450/1875	18.7	7.97	.342	73	
0311	30/155	450/1325	18.9	7.97	.341	60	
0341	30/185	450/1775	18.9	7.95	.335	50	
0420	40/225	~~[illegible]~~	18.8	7.99	339	52	FLOW 18/MIN A. Mares
0500	40/265	1440/3215	18.5	7.50	327	28	FLOW MEASURED 5GAL = 17 SEC = 18GAL/M
0530	30/295	450/3665	18.8	7.54	336	14	FLOW 5 GAL = 20 SEC = 15 GAL/MIN

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

18.7 7.71 335 14

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773,03,03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-4 PORT #7 | SAMPLE NO.: LMW-4-895

START (Date): 11/21/03 (Time): 0026 | END (Date): (Time):

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: FAIR

FIELD PERSONNEL'S NAME(S): ATOMAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0600	30/~~0325~~	45 0/4115	18.7	7.71	335	14	FLOW AT 15 GAL/MIN
0630	30/355	450/4565	18.7	7.47	334	12	
0700	30/385	450/5015	18.8	7.64	332	12	
0730	30/415	450/5465	~~18.~~ 19.1	7.96	330	~~12~~ 10	
0800	30/445	450/5915	19.1	7.94	329	10	
0830	30/475	450/6365	19.1	7.95	328	10	
0840							COLLECT SAMPLE
0842	12/487	180/6545					PUMP OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs (	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773 03,03 | TEAM: BETLIK

PURGING LOG

WELL NO.: LMW-4 PORT # 8 | SAMPLE NO.: LMW-4-990

START (Date): 11/21/03 (Time): 1014 | END (Date): 11/21/03 (Time). 1334

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: OVERCAST, CALM

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	
	$(2/12)^2 \times \pi = .0873\ ft^2$	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf	0.66 x 105 = 670 gallons

1015 x - ~~4.00~~ = 88.6 cu ft x 0.66 Gal./Csg. Vol. x 3 Csg. Vol. = ~~205~~ 2010 G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
1014	0	0	DELAY	PARAMETERS, WATER TURBID			DTW STARTED PUMPING SUMP FULL OF SEDIMENT
1034	20/20	300/300	19.0	7.27	635	12	CLEANED UP QUICKLY
1150	76/96	1140/1440	19.2	7.32	630	12	OFF-SITE TO DELIVER SAMPLES
1220	20/116	300/1740	19.2	7.29	629	12	
1240	20/146	450/2190	19.4	7.29	628	1	
1300	20/166	300/2490	19.4	7.29	628	1	
1325	25/191	375/2865	~~19.8~~ 19.7	7.28	626	1	
1330							BOLLET SAMPLE
1334	9/200	135/3000					PUMP STOPPED

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

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EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM: BEYUK

PURGING LOG WESTBAY

WELL NO.: LMW -4 PORT #1 | SAMPLE NO.: ~~LMW5~~ PORT @ 112

START (Date) 12/8/03 (Time): 1420 | END (Date): 12/8/03 (Time) 1645

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: FAIR

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) Submersible Grundfos Pump (X) WATERRA LIFT PUMP

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg Vol. x 3 Csg. Vol = ____ G

PURGE WATER CONTAINERIZED? YES / NO | AVERAGE PURGE RATE: gpm

WATERRA LIFT PUMP

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°C)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
1420	0	0					
1450	30/30		19.2	6.94	721	2	
1520	30/60		19.1	7.09	715	1	
1600	40/100		18.8	7.06	715	0	
1615	15/115		18.7	7.07	712	0	
1630	15/130		18.7	7.07	713	0	
1645	15/145		18.7	7.08	712	0	
		145 GALLONS					

Field Blanks ( )

SAMPLING LOG

~~SAMPLING METHOD:~~ BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) BVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl
~~PERCHLORATE~~ 314.0 3, 40 mL VIALS, UN PRESERVED
CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO3
ANIONS (INCLUDING FLUORIDE ~~AND BROMIDE~~ 300.0)
ALKALINITY ~~310.0~~ 310.1 - 1, 1000 mL POLY BOTTLE
TDS 160.1 UN PRESERVED

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM. BEYUK

PURGING LOG

WELL NO.: LMW - 4 (PORT #2) | SAMPLE NO.: ~~[illegible]~~ Port @ 260

START (Date): 12-9-03 (Time): 0753 | END (Date): 12-9-03 (Time): 1013

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING (260 - 270)

OVM READING: | ORIGINAL DTW: 78.67' TOC | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump ( ) WATERRA LIFT PUMP (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
							DTW
0705	0	0					CALIBRATE HORIBA
			18.6	7.36	636	1	DATA FROM DEVELOPMENT
							13" WATER IN TANK
0753							START PUMP
0808	15/15		15.0	6.30	704	7	
0838	30/45		17.6	7.09	694	3	
0908	30/75		18.4	7.31	657	3	
0923	15/90		18.4	7.29	640	2	
0938	15/105		18.6	7.29	619	2	
0953	15/120		18.8	7.34	593	1	25" WATER IN TANK
1008	15/135		19.0	7.34	586	Ø	
1013	5/140	210					PUMP OFF
							27" WATER IN TANK

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: ~~SAMPLES FOR~~ VOC 601/602 - 3, 40 ML VIALS PRESERVED W/ HCL

~~PERCHLORATES 314.0 3, 40 ML VIALS, UN PRESERVED~~

~~CATIONS (TOTAL) 200.7 1, 500 ML POLY BOTTLE, PRESERVED W/ HNO3~~

~~ANIONS (INCLUDING FLUORIDES AND BROMIDE 300.0)~~

~~ALKALINITY 310.0 310.1 1, 1000 ml POLY BOTTLE~~

~~TDS 160.1 UN PRESERVED~~

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYLIK

PURGING LOG

WELL NO.: LMW - 4 (PORT #3) (390-400) | SAMPLE NO.: ~~[illegible]~~ PORT @ 390

START (Date) 12-9-03 (Time) 1100 | END (Date) 12-9-03 (Time) 1301

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: CLEAR

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING (390-400)

OVM READING: | ORIGINAL DTW: 78.67' TOC | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump ~~(X)~~

WATERRA LIFT PUMP (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/in)	TURB (NTU)	COMMENTS DTW
	0	0	20.2	7.56	640	8	DATA FROM DEVELOPMENT
1026							CALIBRATE HORIBA
1100							PUMP ON (1" WATER IN TANK)
1115	15/15		19.5	7.38	622	7	
1145	30/45		20.2	7.30	656	12	
1215	30/75		20.5	7.26	682	3	
1230	15/90		19.8	7.16	699	1	
1245	15/105		19.7	7.12	707	0	
1300	15/120		19.7	7.12	712	0	
1301							PUMP OFF
							12" WATER IN TANK

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD. BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) 8VOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 ML VIALS ~~PRESERVED W/ HCL~~
~~PERCHLORATE~~ 314.0 3, 40 ML ~~VIALS~~, UN PRESERVED
CATIONS (TOTAL) 200.7 ~~1, 500 ML~~ POLY BOTTLE, PRESERVED W/ HNO3
ANIONS (INCLUDING FLUORIDES AND BROMIDE ~~300.0~~)
ALKALINITY ~~310.0~~ 310.1 - 1, 1000 ml POLY BOTTLE
TDS 160.1 UN PRESERVED

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYLIK

PURGING LOG

WELL NO.: LMW - 4 (PORT #4) (560-570) | SAMPLE NO.: PORT @ 560

START (Date) 12-9-03 (Time) 1352 | END (Date) 12-9-03 (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: CLEAR

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: 78.67' TOC | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump ( ) WATERRA LIFT PUMP (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
	0	0	20.2	7.58	598	2	DATA FROM DEVELOPMENT
1352							PUMP ON (Horiba Calibrated)
1407			20.2	6.07	754	0	(WATER STARTED 12" FROM BOTTOM)
1437			19.8	7.14	646	0	
1507			19.7	7.17	643	0	
1522			19.5	7.16	648	0	
1537			19.4	7.16	640	0	
1552			19.2	7.16	638	0	
1554		165					PUMP OFF
							(WATER 23" FROM BOTTOM)

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCL

~~PERCHLORATE~~ 314.0 3, 40 mL VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, ~~500 mL~~ POLY BOTTLE, PRESERVED W/ HNO3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0

ALKALINITY ~~310.0~~ 310.1 1, 1000 mL POLY BOTTLE

~~TDS~~ 116.1 UNPRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM: BEYUK

PURGING LOG

WELL NO.: LMW - 4 (PORT #5) (655-665) | SAMPLE NO.: [redacted] PORT @ 655

START (Date): 12-10-03 (Time): 0713 | END (Date): 12-10-03 (Time): 1028

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: CLOUDY COOL - MORNING

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: 98.00' | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump [redacted]

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf | 5" - 0.93 gpf | 6" - 1.50 gpf | (WATERRA LIFT PUMP (X))

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
	~~0~~	~~0~~	20.3	7.56	612	0	DATA FROM DEVELOPMENT
0705							CALIBRATE HORIBA
0713							PUMP STARTED (WATER 1" INTAKE)
0728	15/15		18.2	6.91	661	10	
0758	30/45		18.1	7.20	629	10	CALIBRATE HORIBA
0805	7/52		18.2	6.60	661	70	
0835	30/82		18.8	7.16	632	28	
0905	30/112		18.7	7.15	630	26	
0935	30/142		18.5	7.17	631	23	
1005	30/172		18.9	7.15	624	3	
1025	15/187		18.9	7.14	623	0	
1028		270					PUMP OFF
							19" WATER ON BOTTOM

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) 8VOCs ( ) Filtered Metals ( )

6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )

Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl

18 PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED

15 CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO3

90 ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

18° ALKALINITY ~~310.0~~ 310.1 1, 1000 mL POLY BOTTLE

27° ~~TDS~~ 116.1 UNPRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYLIK

PURGING LOG

WELL NO LMW -4 (PORT #6 775-785) | SAMPLE NO.: PORT @ 775

START (Date) 12-10-03 (Time) 1110 | END (Date): 12-10-03 (Time) 1420

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: PARTLY CLOUDY; 60°

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING (775-785)

OVM READING: | ORIGINAL DTW: 99.00' | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump ( ) WATERRA LIFT PUMP (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
	0	0	19.1	7.58	454	14	
1045			18.1	3.98	4.44	0	CALIBRATE HORIBA
1110							PUMP ON
1130	20/20		19.3	6.45	667	2	
1200	30/50		19.4	7.09	636	7	
1230	30/80		19.2	7.17	633	5	
1360	30/110		19.0	7.17	631	3	
1330	30/140		18.8	7.17	630	2	
1345	15/155		18.8	7.16	631	2	
1400	15/170		19.0	7.16	628	1	
1415	15/185		19.0	7.16	628	0	
1420		285					19" FROM BOTTOM (WATER)
							PUMP OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD. BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 ml VIALS ~~PRESERVED W/ HCL~~

~~PERCHLORATE 314.0 3, 40 ml VIALS, UN PRESERVED~~

CATIONS (TOTAL) ~~200.7~~ 1, 500 ml POLY BOTTLE, PRESERVED W/ HNO

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

ALKALINITY ~~310.0~~ 310.1 } 1 1000 ml POLY BOTT

TDS 160.1 } UN PRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW -4 (PORT#7 895-905) | SAMPLE NO.: PORT @ 895

START (Date): 12-10-03 (Time): 1615 | END (Date): 12-10-03 (Time): 1816

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: COLD, CLOUDY w/ SPRINKLE

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING (895-905)

OVM READING: | ORIGINAL DTW: 99.00' | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump ( ) WATERRA LIFT PUMP (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°C)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
	0	0	19.1	7.95	328	10	DATA FROM DEVELOPMENT
1500			20.1	3.98	4.41	0	CALIBRATE HORIBA
1615	15/15						PUMA STARTED
1630	15/15		18.2	6.25	663	1	
1700	30/45		18.3	7.05	630	19	
1730	30/75		18.4	7.16	626	10	
1800	30/105		18.3	7.15	631	0	
1815	15/120		18.5	7.16	629	0	
1816	1/121	270					PUMPOFF
							18" OF TOTAL WATER PUMPED
							INTO TANK

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 ml VIALS ~~PRESERVED~~ W/ HCl

~~PERCHLORATE 314.0 3, 40 ml VIALS, UN PRESERVED~~

CATIONS (TOTAL) 200.7 1, 500 ml POLY BOTTLE, PRESERVED W/ HNO

ANIONS (INCLUDING ~~FLUORIDE AND BROMIDE~~ 300.0)

ALKALINITY ~~310.0~~ 310.1 } 1, 1000 ml POLY BOT. UN PRESERVED

TDS 116.1

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM: BEYUK

PURGING LOG

WELL NO.: LMW -5 (PORT #8 990-1000) | SAMPLE NO.: PORT @ 990

START (Date): 12-11-03 (Time): | END (Date): 12-11-03 (Time):

WELL CASING DIAMETER: 2"( ) 4"(X) 6"( ) | WEATHER: COLD, PT. CLOUDY

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING (990-1000)

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS
	0	0	19.7	7.28	626	1	DTW DEVELOPMENT DATA
0655	LOT #3215		16.7	3.96	4.50	0	CALIBRATE HORIBA
0805							PUMP ON
0825	20/20		18.0	6.50	651	1	
0855	30/50		18.4	7.14	641	1	
11/11/03 0925	30/80		18.8	7.40	632	245	
0955	30/110		19.4	7.56	499	170	
1025							PUMP OFF (FUSE OUT)
1048							PUMP ON
1055	5/115		19.3	7.59	469	80	PUMP BROKE DOWN
1175	30/145		19.1	7.77	460	180	REPLACEMENT REQUIRED
1140							PUMP OFF
TANK PUMPED OUT BUT NO DEPTH RECORDED 11/12/03 a. Moss 1030	0/145	NO	MEASUREMENT, PUMP REPLACED				ESTIMATED PUMPAGE 5 GAL IN 5 MIN IS OK, NEW PUMP
1100	30/175		18.9	7.64	453	50	BEGIN WITH TANK AT 2 IN FROM BOTTOM

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCL
PERCHLORATE 314.0 3, 40 mL VIALS, UN PRESERVED
CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO3
ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)
ALKALINITY 310.1 310.1 1, 500 mL POLY BOTT UN PRESERVED
TDS 160.1

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM. BEYLIK

PURGING LOG WESTBAY

WELL NO.: LMW -4 (PORT 8 990-1000) | SAMPLE NO.: LMW5-

START (Date): 12/11/03 (Time): 0655 | END (Date): 12/12/03 (Time): 1415

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: FAIR / CLEAR

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP of CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer (X) Submersible Grundfos Pump (X) LIFT PUMP

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°C)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
				7.35			DTW
1115	15/190	~~0~~	18.8	~~6.93~~	455	33	CALIBRATED HORIBA
1129	PUMP OFF TO REPOSITION AND ADJUST HOLD DOWNS						
1130	PUMP ON						
1133	17/207		19.0	7.68	448	65	
1145	[illegible]/219		19.2	7.74	474	337	
1200	15/234		19.5	7.84	432	190	
1215	15/249		19.5	7.79	424	86	
1230	15/264		19.5	7.78	421	51	
1245	15/279		19.5	7.76	421	110	15-2 = 13, 13x15 = 195 gallons
1300	15/294		19.6	7.76	423	95	179 minutes
1315	15/309		19.6	7.75	419	94	195 gallons / 179 min = 1.09 gal/min
1330	15/324		19.6	7.73	421	95	TANK AT 15 INCHES
1345	15/339		19.6	7.74	418	95	FROM BOTTOM
1400			19.6	7.77	418	82/80	
1415 ~~Field Blanks ( )~~	15/354		19.6	7.70	417	90	

5.4 Hrs

1415 PUMP TURNED OFF

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UN PRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0

ALKALINITY ~~310.0~~ 310.1 1 1000 mL POLY BOT: UN PRESERVED

TDS 116.1

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-5 (PORT #1) | SAMPLE NO.: LMW-5-80

START (Date): 11-24-2003 (Time): 2334 | END (Date): 11-25-2003 (Time): 0110

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: COLD ~ 45°F CLEAR

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC & ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: 80-90' bgs

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers (X) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
							DTW
2334	0	0					PUMP ON (15 gpm)
2338	4	60	23.4	6.20	1.29	14	* CALIBRATED HORIBA
2343	5/9	75/135	22.8	6.93	.998	10	PRIOR TO PUMPING
2358	15/24	225/360	22.4	7.71	1.24	1	@ 2310
0013	15/39	225/585	22.0	7.36	1.24	0	
0028	15/54	225/810	22.2	7.32	1.24	0	
0043	15/69	225/1035	22.1	7.33	1.24	0	
0058	15/84	225/1260	22.1	7.32	.998	0	
0105							SAMPLED
0110	12/96	180/1440	—	—	—	—	PUMP OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR: 601/602 VOCs
314.0 PERCHLORATE
200.7 CATIONS (TOTAL)
300.0 ANIONS
310.1 ALKALINITY
160.1 TDS

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-5 (PORT #2) | SAMPLE NO.: LMW-5-160

START (Date): 11-25-2003 (Time): | END (Date): 11/25/03 (Time): 0710

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC & ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: 160-170' bgs

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0140	0	0					PUMP ON, ~15gpm
0145	5	75	21.2	7.39	1.25	200	
0155	10/15	150/225	21.9	7.54	.727	41	
0210	15/30	225/450	22.2	7.55	.724	35	
0225	15/45	225/675	22.1	7.53	.721	28	
0240	15/60	225/900	22.2	7.50	.721	25	
0255	15/75	225/1125	22.1	7.50	.720	23	
0325	30/105	450/1575	22.2	7.51	.716	19	
0345	50/155	750/2325	22.3	7.49	.718	6	
0455	40/195	600/2925	22.4	7.48	.717	5	
0525	30/225	450/3375	22.1	7.49	.720	5	
0555	30/255	450/3825	22.2	7.52	.719	4	SAMPLE TAKEN 0705
0625	30/285	450/4275	22.3	7.49	.717	3	PUMP OFF 0710
0~~700~~ 0655	30/315	450/4725	22.2	7.49	.721	3	

Field Blanks ( ) 0710 | 15/330 | 225/4950 |

SAMPLING LOG

SAMPLING METHOD: BAILER (X) | Westbay ( ) | Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs (	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR: 601/602 VOCs

314.0 PERCHLORATE

200.7 CATIONS (TOTAL)

300.0 ANIONS w/ FLUORIDE & BROMIDE

310.1 ALKALINITY

116.1 TDS

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773 03,03 | TEAM BEHLIK

PURGING LOG

WELL NO. LMW-5 PORT #3 (275-285) | SAMPLE NO.: LMW-5-275

START (Date) 11/25/03 (Time): 0740 | END (Date) 11/25/03 (Time) 1300

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER. FAIR - COLD

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
0740	0	0	NO	PARAMETER	TOO TURBID		RATE = 18 GALLONS/MINUTE
0815	35/35	525/525	22.0	7.63	862	50	
0915	60/95	900/1425	22.7	7.66	689	22	
1010	50/145	750/2175	22.7	7.73	626	11	
1050	40/185	600/2775	22.8	7.75	587	9	
1130	40/225	600/3375	22.9	7.79	558	8	
1200	30/250	450/3825	23.0	7.81	539	5	
1230	30/280	450/4275	22.9	7.80	527	5	
1245	15/295	225/4500	23.0	7.84	522	5	SAMPLE AT 1255
1300	15/310	225/4725					
							PUMP STOPPED
							AT 1300

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773, 03, 03 | TEAM: BEYUK

PURGING LOG

WELL NO.: LMW -5 PORT #4 (440-480 | SAMPLE NO.: LMW5 - 440

START (Date): 11-25-03 (Time): 1300 | END (Date): 11-25-03 (Time) 2039

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: CLEAR & COLD

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC & ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: 440 - 450' bgs

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf | 5" - 0.93 gpf | 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
							DTW
1300	0	0	NO PARAMETERS		TAKEN		PUMP TURNED ON
1315	15/15	225				999	
1500	105/120	1575/1800	23.2	7.26	584	71	
1550	50/170	750/2550	23.3	7.40	539	25	
1620	30/200	450/3000	23.3	7.78	~~521~~ 5	7 20	~~AMB~~ AMBIENT AIR COLDER
1700	40/240	600/3600	22.3	7.79	.498	17	
1730	30/270	450/4050	22.2	7.80	.492	14	
1815	45/315	675/4725	22.2	7.80	.480	14	
1900	45/360	675/5200	22.5	7.79	.472	22	
1945	45/405	675/5875	22.1	7.80	.470	11	
2015	30/435	450/6325	22.3	7.81	.468	9	
2030	15/450	225/6550	22.6	7.85	.469	6	
2035	5/455	75/6625					SAMPLED
2039	9/469	135/6760					PUMP OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )

6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )

Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

ALKALINITY ~~310.0~~ 310.1 } 1, 1000 ml, POLY BOTTLE

TDS 116.1 } UNPRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-5 (PORT #5 570-580') | SAMPLE NO.: LMW-5-570

START (Date): 11-25-03 (Time): | END (Date): (Time):

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC & ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: 570 - 580' bgs

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf | 5" - 0.93 gpf | 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: ~15 gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
							DTW
2130	0	0					PUMP ON
2138	8	120	20.6	7.93	.864	999	BROWN Color
2220	42/50	630/750	22.1	7.98	.504	366	
2300	40/90	600/1350	22.1	8.19	.491	132	
2330	30/120	450/1800	22.3	8.29	.496	80	
2430	60/180	900/2700	22.3	8.34	.500	55	
0100	30/210	450/3150	22.1	8.42	.507	36	(RECALIBRATE HORIBA)
0130	30/240	450/3600	22.3	7.83	.547	32	
0200	30/270	450/4050	22.8	8.19	.524	35	
0230	30/300	450/4500	22.7	8.43	.526	35	
0315	45/345	675/5175	22.4	8.47	.528	180	FAIRLY STRONG SULFIDE ODOR
0415	60/405	900/5235	23.2	8.53	534	18	A. Mars
0445	30/435	450/5685	23.2	8.54	536	20	
0545	60/495	900/6585	22.9	8.57	540	20	

Field Blanks ( ) ← 7425 gallons (MISTAKE

SAMPLING LOG

SAMPLING METHOD: BAILER (X) | Westbay ( ) | Portable Pump ( )

LAB ANALYSES:

Explosives ( ) | VOCs ( ) | SVOCs (| Filtered Metals ( )

6+ Cr ( ) | Unfiltered Metals ( ) | Pesticides ( ) | Herbicides ( )

Cyanide ( ) | Gross Alpha/Beta ( ) | General Chemistry ( ) | Treatability Parameters ( )

COMMENTS: SAMPLE FOR: VOC 601/602 — 3 - 40mL VOAs w/HCl

PERCHLORATE 314.0 — 3 - 40mL VOAs; UNPRES.

CATIONS (TOTAL) 200.7 — 1 - 500 mL POLY w/ HNO3

ANIONS w/FLUORIDE & BROMIDE 300.0 } 1 - 1000mL POLY; UNPRES.

ALKALINITY 310.1

TDS 116.1

560 15

1560 250 4400

15 930

1200

2½

14 PARA TEADY 8 HRS

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM. BEYUK

PURGING LOG

WELL NO.: LMW -5 PORT #5 | SAMPLE NO.: LMW5-

START (Date): (Time): | END (Date): (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf | 5" - 0.93 gpf | 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINs) 495	VOLUME PURGED (gal.) 7425	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
5HRS 0615	30 ~~0~~ 525	450 ~~0~~ ~~[illegible]~~	23.0	8.56	536 ~~646~~	18	DTW STILL SULFIDE ODOR
0655	40 / 565	600 / ~~[illegible]~~ 7625	23.0	8.54	542	18	" SULFIDE ODOR
0725	30 / 595	450 / ~~8085~~ 8075	23.3	8.55	536	16	
0735	10 / 605	150 / ~~8235~~ 9075					Sample
0740	5 / 610	75 / ~~8310~~ 9150					Duplicate
0759	19 / 629	285 / ~~8595~~ 9435 TOTAL					PUMP SHUT DOWN

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )

6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )

Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601 / 602 - 3, 40 mL VIALS PRESERVED W / HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W / HNO3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

ALKALINITY ~~310.0~~ 310.1 } 1, 1000 ml, POLY BOTTLE UNPRESERVED

TDS 116.1

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

1/2

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYUK

PURGING LOG

WELL NO.. LMW -5 PORT # 6 | SAMPLE NO LMW5-630

START (Date) 12/1/03 (Time). 1250 | END (Date). (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: FAIR, COOL

FIELD PERSONNEL'S NAME(S): ALONAL MARRES / LILES COBB

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal /Csg Vol. x 3 Csg. Vol = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE. 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°C)	pH	EC (umhos/m)	TURB (NTU)	COMMENTS
							DTW VERY ~~FAIRLY CLEAR~~ DIRTY
1250	0	0	TOO TURBID FOR READINGS				
1320	40/40	600/600	23.3	6.63	516	290	
1400	30/70	450/1050	23.2	7.31	448	220	
1430	30/100	450/1500	23.3	7.37	431	180	
1530	60/160	900/2400	23.2	8.07	440	330	
1630	60/220	900/3300	22.9	8.27	425	380	
4.7HRS 1730	60/280	900/4200	22.9	8.49	439	180	
1830	60/320	900/5100	22.9	8.55	440	130	
2 1900	30/350	450/5550	22.9	8.73	440	90	
3 1930	30/380	450/6000	22.7	8.79	433	64	
4 2000	30/410	450/6450	22.8	8.70	436	64	
2030	30/440	450/6900	22.8	8.71	434	64	
2100	30/470	450/7350	22.7	8.69	435	53	
2130	30/500	450/7800	22.4	8.72	435	40	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 ML VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 ML VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, 500 ML POLY BOTTLE, PRESERVED W/ HNO3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

ALKALINITY ~~310.0~~ 310.1 } 1, 1000 ml POLY BOTTLE UNPRESERVED

TDS 160.1

2/2

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW -5 PORT #6 | SAMPLE NO.: LMW5-630

START (Date): (Time): | END (Date): 12/1/03 (Time) 2250

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? YES / NO | AVERAGE PURGE RATE: gpm

7800

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
2200	30/530	450/5250	22.3	8.68	435	42	
2230	30/560	450/8700	22.5	8.69	436	42	
2250	20/580	300/9000	22.6	8.70	434	42	Sample Collected at 2240

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 ml VIALS PRESERVED W/ HCl
PERCHLORATE 314.0 3, 40 ml VIALS, UN PRESERVED
CATIONS (TOTAL) 200.7 1, 500 ml POLY BOTTLE, PRESERVED W/ HNO3
ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0
ALKALINITY ~~310.0~~ 310.1
TDS 160.1
} 1, 1000 ml POLY BOTTLE UN PRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYUK

PURGING LOG

WELL NO.. LMW-5 Port 7 | SAMPLE NO LMW5-700

START (Date) 12/1/03 (Time) 0015 | END (Date) (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: Clear, cool

FIELD PERSONNEL'S NAME(S): L. Les Cobb

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	
			4" - 0.66 gpf
			5" - 0.93 gpf
			6" - 1.50 gpf

____ - ____ = ____ x ____ Gal /Csg Vol x 3 Csg. Vol = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE. 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0015							
0045	30	450	20.4	8.30	493	178	
0115	30/60	450/900	21.2	8.52	497	145	
0145	30/90	450/1350	21.7	8.58	498	81	
0215	30/120	450/1800	21.6	8.62	502	79	
0245	30/150	450/2250	21.3	8.65	504	61	
0315	30/180	450/2700	21.2	8.72	504	70	
0345	30/210	450/3150	22.1	8.74	513	80	
0430	45/255	675/3825	21.9	8.77	512	105	
0500	30/285	450/4275	22.1	8.79	513	70	
0530	30/315	450/4725	~~22.~~ 21.9	8.83	514	38	
0600	30/345	450/5175	21.9	8.77	519	54	
0630	30/375	450/5625	22.0	8.84	519	52	
0700	30/405	450/6075	21.8	8.83	520	65	
~~0800~~ 0730	50/455	750/6825	22.0	8.75	524	65	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD. BAILER (X) | Westbay ( ) | Portable Pump ( )

LAB ANALYSES:

Explosives ( ) | VOCs ( ) | SVOCs ( ) | Filtered Metals ( )

6+ Cr ( ) | Unfiltered Metals ( ) | Pesticides ( ) | Herbicides ( )

Cyanide ( ) | Gross Alpha/Beta ( ) | General Chemistry ( ) | Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UN PRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0

ALKALINITY ~~310.0~~ 310.1

TDS 160.1

1, 1000 mL POLY BOTTLE UN PRESERVED

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM. BEYUK

PURGING LOG

WELL NO LMW -5 PORT ~~#6~~ #7 | SAMPLE NO.: LMW5 - ~~630~~ 700

START (Date) (Time) | END (Date) (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf, 5" - 0.93 gpf, 6" - 1.50 gpf

_____ - _____ = _____ x _____ Gal./Csg. Vol. x 3 Csg. Vol. = _____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

CARRIED OVER 455 6825

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0830	40/495	600/7425	20.9	8.72	499	58	
0900	30/525	450/7875	21.4	8.85	518	60	Sample 1215
0930	30/555	450/8325	22.2	8.83	518	72	Duplicate 1220
1000	30/585	450/8775	22.9	8.83	516	70	
1030	30/615	450/9225	23.0	8.84	517	55	
1100	30/645	450/9675	23.1	8.85	513	66	
1130	30/675	450/10,125	23.3	8.82	514	53	
1200	30/705	450/10,575	23.3	8.83	516	63	
1232	32/737	480/11,055					Pump SHUT OFF

Pu, 3 HRS

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD. BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) 8VOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl
PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED
CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO
ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)
ALKALINITY ~~310.0~~ 310.1 1, 1000 mL POLY BOT: UNPRESERVED
TDS 116.1

1/2

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM: BEYUK

PURGING LOG

WELL NO.: LMW-5 PORT #8 (800/810) | SAMPLE NO.: LMW5-800

START (Date): 12/2/03 (Time): 1300 | END (Date): 12-3-03 (Time): 0020

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S):

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf, 5" - 0.93 gpf, 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
1300	0	0					
1350	50/50	750	22.6	8.34	487	170	
1450	60/110	900/1650	22.9	8.25	481	106	
1530	40/150	600/2250	22.9	7.94	483	91	CALIBRATED HORIBA
1600	30/180	450/2700	22.2	7.59	472	112	
1630	30/210	450/3150	22.2	8.82	486	73	
1700	30/240	450/3600	22.0	8.84	486	121	
1730	30/270	450/4050	21.9	8.84	488	85	
1800	30/300	450/4500	21.7	8.85	489	130	
1830	30/330	450/4950	21.8	8.85	489	72	
1900	30/360	450/5400	21.8	8.85	490	76	
1930	30/390	450/5850	21.9	8.83	490	58	
2000	30/420	450/6300	21.6	8.82	490	49	
2030	30/450	450/6750	21.5	8.83	491	38	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )

6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )

Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

ALKALINITY ~~310.0~~ 310.1 } 1, 1000 mL POLY BOT: UNPRESERVED

TDS 116.1

2/2

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773-03.03 | TEAM: BEYLIK

PURGING LOG

WELL NO.: LMW-5 (Port #8, 800-810) | SAMPLE NO.: LMW-5-800

START (Date): (Time): | END (Date): (Time):

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC & ATUNAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: 800-810' bgs

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	
			4" - 0.66 gpf
			5" - 0.93 gpf
			6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
	0	0					
2100	30/480	450/7200	21.6	8.86	493	35	
2130	30/510	450/7650	21.6	8.82	490	33	
2200	30/540	450/8100	21.6	8.85	492	32	
2230	30/570	450/8550	21.5	8.82	490	29	
2300	30/600	450/9000	21.5	8.84	491	29	
2330	30/630	450/9450	21.4	8.82	491	28	
2400	30/660	450/9900	21.1	8.81	490	27	
0010	10/640	150/10050	21.4	8.85	493	28	
0015							SAMPLED
0020	10/650	150/10200					PUMP OFF

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773-03.03 | TEAM. BEYLIK

PURGING LOG

WELL NO.: LMW-5 (PORT #9 875-885') | SAMPLE NO.: LMW-5-875

START (Date): 12-3-03 (Time): 0115 | END (Date): (Time).

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER:

FIELD PERSONNEL'S NAME(S): THOMAS VESPALEC & ATOUAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: 875-885' bgs

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 15 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0115	0	0					PUMP ON
0145							VERY TURBID
0715	60/60	900/900	19.6	8.33	507	445	
0745	30/90	450/1350	20.2	8.54	444	278	
0815	30/120	450/1800	20.4	8.60	454	185	
0845	30/150	450/2250	21.2	8.75	454	145	A. Mares
0930	45/195	675/2925	20.8	8.79	452	110	
0500	30/225	450/3375	20.7	8.87	451	93	
0545	45/265	675/4050	20.5	8.93	440	59	
0630	45/310	675/4725	21.2	8.93	445	60	
≈ 6 HRS 0718	48/358	720/5445					PUMPING STOPPED
1030	0/358	0/5445					PUMPING RESUMED
1045	15/373	225/5670	22.0	8.92	439	200	
1100	15/388	225/5895	22.3	8.97	439	140	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs (	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: SAMPLE FOR: VOCs 601/602 3-40 mL VOAs w/ HCl

PERCHLORATE 314.0 3-40mL VOAs unpreserved

CATIONS (TOTAL) 200.7 1-500 mL Poly w/ HNO3

ANIONS (w/ FLUORIDE & BROMIDE) 300.0 } 1-1000 mL Poly

ALKALINITY 310.1 } with no preserv.

TDS 160.1

2 OF 2

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYUK

PURGING LOG

WELL NO.: LMW-5 PORT #9 | SAMPLE NO LMW5-5-875

START (Date) 12/3/03 (Time). 0115 | END (Date) 12/3/03 (Time)

WELL CASING DIAMETER: 2" ( ) 4" (X) 6" ( ) | WEATHER: FAIR

FIELD PERSONNEL'S NAME(S): ATONAL WARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD. Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf | 5" - 0.93 gpf | 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal /Csg Vol. x 3 Csg. Vol = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE. 15 gpm

CONTINUED 388 5895

	ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
7 Hrs	1130	30/418	450/6345	22.8	8.95	436	95	
8 Hrs	1230	60/478	910/6405	22.8	8.99	437	57	
	1300	30/508	450/6855	23.0	9.01	435	55	
9 Hrs	1330	30/538	450/7305	22.7	9.03	436	46	
	1400	30/568	450/7755	22.9	9.01	435	43	STABLE 2 HRS
10 Hrs	1430	30/598	450/8205	22.7	9.01	439	50	
	1505	35/633	525/8730	22.6	9.03	436	45	
	1515							COLLECT SAMPLE
	1518	STOPPED PUMPING						
		13/646	195/8925					
		COMPARISON	TO STD SOLUTION					HORIBA
	1530			27.7	4.07	451	0	WITH CALIBRATION SOLUTION
				25.0	4.00	449	0	Calibration STD PUBLISHED

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) | Westbay ( ) | Portable Pump ( )

LAB ANALYSES:

Explosives ( ) | VOCs ( ) | 8VOCs ( ) | Filtered Metals ( )

6+ Cr ( ) | Unfiltered Metals ( ) | Pesticides ( ) | Herbicides ( )

Cyanide ( ) | Gross Alpha/Beta ( ) | General Chemistry ( ) | Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO_3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0)

ALKALINITY ~~310.0~~ 310.1 — 1, 1000 ml, POLY BOTTLE UNPRESERVED

TDS 116.1

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM BEYUK

PURGING LOG WESTBAY

WELL NO.: LMW -5 PORT 1 (80-90) | ~~SAMPLE NO.: LMW5~~

START (Date) 12/13/03 (Time): 0718 | END (Date): 12/13/03 (Time) 0927

WELL CASING DIAMETER: 2" (X) 4" (X) 6" ( ) | WEATHER: CLEAR, COLD

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer (X) ~~Submersible Grundfos Pump (X)~~

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf	LIFT PUMP

= x Gal./Csg. Vol. x 3 Csg. Vol. = G

270 gal / 129 min = 2.09 gpm

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal)	TEMP. (°F)	pH	EC (umhos/m) mS/cm	TURB. (NTU)	COMMENTS DTW
0718	0	0					WATER PUMPING
0726	8/8		19.7	7.23	975	3	BOTTOM OF TANK FULLY WET, TANK INCLINED
0736	10/18		20.6	7.25	1.250	0/3	HORIBA NOT MEASURING TURBIDITY, CANT GET CALIBRATION
0746	10/28		20.9	7.24	1.250	0	
0851	65/6993		20.8	7.22	1.270	7.-2	
0906	15/108		21.1	7.25	1.280	-2	FILTERED WATER MEASURED AT -3
	WARMED CALIBRATION SOLUTION AND SUCCESSFULLY CALIBRATED HORIBA (SOL. WAS 9°C)						
0912	6/114		20.9	~~6.87~~ 7.05	1.32	0	pH 7.05
0915	3/117		21.0	7.16	1.31	0	
0918	3/120		21.1	7.18	1.31	0	
0921	3/123		21.1	7.19	1.31	0	WATER IN TANK 19"
0927	6/129		21.2	7.21	1.31	0	- 1" AT BEGINNING = 18"
PUMP STOPPED 0927							PUMPED = 270 gal

Field Blanks ( )

SAMPLING LOG

~~SAMPLING METHOD: BAILER (X)~~ ~~Westbay (X)~~ Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) 8VOCs ( ) Filtered Metals ( )

6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )

Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: SAMPLE FOR VOC 601/602 - 3, 40 ml VIALS PRESERVED W/ HCL

PERCHLORATE 314.0 3, 40 ml VIALS, UN PRESERVED

CATIONS (TOTAL) 200.7 1, 500 ml POLY BOTTLE, PRESERVED W/ HNO3

ANIONS (INCLUDING FLUORIDE AND BROMIDE 300.0

ALKALINITY ~~310.0~~ 310.1 1, 1000 ml POLY BOTTLE

TDS 160.1 UN PRESERVED

HOWEVER pH AND EC REMAINED WITHIN 10%

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM: BEYUK

PURGING LOG WEST BAY

WELL NO.: LMW -5 PART 2 (160-170) | SAMPLE NO.: LMW5-

START (Date): 12/13/03 (Time): 0952 | END (Date): 12/13/03 (Time): 1158

WELL CASING DIAMETER: 2" (X) 4" (X) 6" ( ) | WEATHER: FAIR COLD

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X) LIFT PUMP

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 225/125 = 1.80 gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0952	0	0					
1012	20/20		20.7	7.37	828	0/4	
1027	15/35		21.2	7.23 ~~6.84~~ 7.0	940	0	RECHARGED INTERNAL REF. SOLUTION AND RECALIBRATED
1042	15/50		21.3	7.34	769	0	
1057	15/65		21.3	7.33	768	1	
1112	15/80		21.3	7.33	768	1	
1127	15/95		21.3	7.31	767	1	
1142	15/110		21.3	7.31	767	0	
2 HRS 1157	~~10~~ 15/125		21.3	7.31	767	0	WATER 15" USED 15X15 = 225 GALLONS
1158	PUMP	STOPPED					

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: ~~BAILER (X)~~ ~~Westbay (X)~~ Portable Pump ( )

LAB ANALYSES:

Explosives ( ) | VOCs ( ) | 8VOCs ( ) | Filtered Metals ( )

6+ Cr ( ) | Unfiltered Metals ( ) | Pesticides ( ) | Herbicides ( )

Cyanide ( ) | Gross Alpha/Beta ( ) | General Chemistry ( ) | Treatability Parameters ( )

COMMENTS: SAMPLE FOR – VOC 601/602 – 3, 40 ML VIALS PRESERVED W/ HCL

~~PERCHLORATE~~ 314.0 3, 40 mL VIALS, UN PRESERVED

CATIONS (TOTAL) ~~200.7~~ 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO3

ANIONS (INCLUDING FLUORIDE AND ~~BROMIDE~~ 300.0

ALKALINITY ~~310.0~~ 310.1 1 1000 mL POLY BOTTLE

TDS 160.1 UN PRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO 52773, 03, 03 | TEAM. BEYUK

PURGING LOG WESTBAY

WELL NO.: LMW -5 PORT 3 (275-285') | ~~SAMPLE NO.: LMW5 -~~

START (Date) 12/13/03 (Time): 1233 | END (Date) 12/13/03 (Time) 1434

WELL CASING DIAMETER: 2" (X) ~~4" (X)~~ 6" ( ) | WEATHER: FAIR COOL

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) ~~Bailer (X)~~ ~~Submersible Grundfos Pump (X)~~ LIFT PUMP

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf, 5" - 0.93 gpf, 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: 225/120 = 1.9 gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
1233	0	0					
1303	30/30		21.4	7.06	900	15	
1318	15/45		21.6	7.16	901	8	
1333	15/60		21.7	7.16	898	6	
1348	15/75		21.7	7.16	899	5	
1403	15/90		21.7	7.15	898	4	
1418	15/105		21.7	7.14	899	4	in gal/in
1433	15/120		21.7	7.15	896	4	15 x 15 = 225 gallons
1434	PUMP OFF						

Field Blanks ( )

SAMPLING LOG

~~SAMPLING METHOD:~~ ~~Bailer (X)~~ ~~Westbay (X)~~ Portable Pump ( )

LAB ANALYSES:
Explosives ( ) VOCs ( ) 8VOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS: ~~SAMPLES FOR~~ VOC 601/602 - 3, 40 mL VIALS PRESERVED W/ HCl
~~PERCHLORATE 314.0~~ 3, 40 mL VIALS, UNPRESERVED
CATIONS (TOTAL) 200.7 ~~1~~, 500 mL POLY BOTTLE, PRESERVED W/ HNO3
ANIONS (INCLUDING FLUORIDE AND BROMIDE ~~300.0~~)
ALKALINITY ~~310.0~~ 310.1 } 1, 1000 ml, POLY BOTTLE
TDS 116.1 } UNPRESERVED

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM. BEYUK

PURGING LOG WEST BAY

WELL NO.: LMW -5 PORT 4 (440-450) | SAMPLE ~~NO.~~ LMW5 -

START (Date): 12/13/03 (Time): 1511 | END (Date): 12/13/03 (Time): 1712

WELL CASING DIAMETER: 2" (X) 4" (X) 6" ( ) | WEATHER: FAIR - COLD

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) ~~Submersible Grundfos Pump (X)~~

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf	LIFT PUMP

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
1511	0	0					
1541	30/30		21.8	7.01	899	9	
~~15~~ 1556	15/45		21.8	7.12	899	6	
1611	15/60		21.7	7.11	898	4	
1626	15/75		21.6	7.12	897	4	
1641	15/90		21.6	7.11	898	2	
1656	15/105		21.6	7.11	896	2	TANK PUMPED = 17"
1711	15/120		21.6	7.14	896	2	17 x 15 = 255 gallons
1712	PUMP	TURN	OFF				

Field Blanks ( )

SAMPLING LOG

~~SAMPLING METHOD:~~ ~~BAILER (X)~~ Westbay (X) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS: ~~SAMPLE FOR~~ VOC 601/602 - 3, 40 ml VIALS PRESERVED W/ HCl

~~PERCHLORATE 314.0~~ 3, 40 ml VIALS, UN PRESERVED

CATIONS (TOTAL) 200.7 1, 500 ml POLY BOTTLE, PRESERVED W/ HNO

ANIONS (INCLUDING FLUORIDE AND ~~BROMIDE~~ 300.0

ALKALINITY ~~310.0~~ 310.1 } 1000 ml POLY BOT. UN PRESERVED

TDS 160.1

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM: BEYUK

PURGING LOG WESTBAY

WELL NO.: LMW -5 PORT 5 (570-580) | ~~SAMPLE NO.: LMW5 -~~

START (Date): 12/14/03 (Time): 0717 | END (Date): 12/14/03 (Time): 1034

WELL CASING DIAMETER: 2" (X) 4" (X) 6" ( ) | WEATHER: FAIR/COLD

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT:

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) ~~Submersible Grundfos Pump (X)~~

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf, 5" - 0.93 gpf, 6" - 1.50 gpf | LIFT PUMP

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
0717	0	0					DTW TANK EMPTY
0732	15/15		21.5	7.24	898	~~[illegible]~~ 3	
~~0747~~							
0802	15/30		21.3	7.13	903	50	
0817	15/45		21.6	7.09	893	50	
0832	15/60		21.6	7.10	893	60	
0847	15/75		21.7	7.12	891	70	TURBIDITY CHECKED WITH FILTERED W[illegible] = 0 (NTU)
0907	15/90		21.9	7.09	890	70	WATTERRA PUMP WAS NOT DISCHARGING FULL OUTPUT
0917	15/105		21.9	7.13	889	120	WATERRA NOW SET TO PUMP 1 + GAL / MIN.
0932	15/120		21.9	7.06	888	180	
0947	15/135		21.9	7.09	887	24	
1002	15/150		21.9	7.09	887	2	
1017	15/165		21.9	7.12	887	1 ~~1/2~~	19 inches in tank
1032	15/180		21.9	7.12	886	0	19 x 15 = 285 gal

Field Blanks ( ) PUMP OFF AT 1034 — CHECKED TURBIDITY AGAIN WITH FILTERED WATER

MIXING IN WESTBAY

TURBIDITY

ER ~~2 HRS~~ HRS ~~15 MIN~~ ~~2 1/2 HRS~~ 2 1/2 — 3 1/4 HRS

PURGING WESTBAY

SAMPLING LOG

~~SAMPLING METHOD:~~ BAILER (X) | Westbay ( ) | Portable Pump ( )

LAB ANALYSES:

Explosives ( ) | VOCs ( ) | SVOCs ( ) | Filtered Metals ( )

6+ Cr ( ) | Unfiltered Metals ( ) | Pesticides ( ) | Herbicides ( )

Cyanide ( ) | Gross Alpha/Beta ( ) | General Chemistry ( ) | Treatability Parameters ( )

~~COMMENTS:~~ SAMPLE FOR A. Mares

VOC 601/602 — 3, 40 mL VIALS PRESERVED W/ HCl

PERCHLORATE 314.0 3, 40 mL VIALS, UNPRESERVED

CATIONS (TOTAL) 200.7 1, 500 mL POLY BOTTLE, PRESERVED W/ HNO

ANIONS (INCLUDING FLUORIDE AND BROMIDE ~~300.0~~)

ALKALINITY ~~310.0~~ 310.1 — 1, 1000 mL POLY BOT. UNPRESERVED

TDS 116.1

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773 03,03 | TEAM: BEYLIK

PURGING LOG WEST BAY

WELL NO.: LMW-4 PORT 6(635-640) | ~~SAMPLE NO.~~

START (Date): 12/14/03 (Time): 1115 | END (Date): 12/14/03 (Time): 1419

WELL CASING DIAMETER: 2" X 4" ( ) 6" ( ) | WEATHER: OVERCAST – RAINING

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF ~~WEST~~ CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) Submersible Grundfos Pump (X)

LIFT PUMP

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

	ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
	~~10~~ 1115	0	0	~~21.8~~	~~7.12~~	~~884~~	~~2~~	TANK EMPTY
	1130	15/15		21.8	7.12	884	2	
	1145	~~15~~/30		22.4	7.22	841	25	
	1200	15/45		22.2	7.26	919	25	calibrated ~~HORIBA~~
1Hr	1215	15/60		22.3	7.36	918	25	
	1230	15/75		22.3	7.34	917	20	
	1245	15/90		22.3	7.37	918	20	
	1300	15/105		22.2	7.36	918	18	
2Hr	1315	15/120		22.2	7.36	918	13	
	1330	15/135		22.2	7.35	917	9	
	1345	15/150		22.0	7.32	916	8	
	1400	15/165		22.1	7.33	918	7	19" WATER IN TANK
3Hr	1415	15/180		22.2	7.36	918	5	
	1419		PUMP	STOPPED				19 x 15 = 285

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773.03.03 | TEAM: BEYUK

PURGING LOG WEST BAY

WELL NO.: LMW 5 PORT 7 (700-710) | ~~SAMPLE NO.:~~

START (Date): 12/14/03 (Time): 1527 | END (Date): 12/15/03 (Time): 1038

WELL CASING DIAMETER: 2" (X) 4" ( ) 6" ( ) | WEATHER: RAIN (12/14) CLEAR-SUNNY (12/15)

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF 4" CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers (X) Multiple Port ( ) Bailer ( ) Submersible Grundfos Pump (X)

LIFT PUMP

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

	ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°F)	pH	EC (umhos/in)	TURB. (NTU)	COMMENTS DTW
12/14/03	1527	0	0					TANK EMPTY
	1557	30/30		21.6	7.30	740	110	
	1612	15/45		21.8	7.31	921	360	
	1627	15/60		21.3	7.13	903	150	
	1642	15/75		21.6	7.18	939	140	
1 1/2	1657	15/90		22.0	7.31	930	115	8" IN TANK
	~~1712~~	1657	PUMP	SHUT	DOWN			
12/15/03	0827	0/90	RESU	MED	PUMPING			TANK EMPTY
	0842	15/105		21.9	7.44	929	65	
2 HRS	0857	15/120		22.2	7.34	928	100	
	0912	15/135		22.3	7.34	919	33	
	0927	15/150		22.3	7.32	925	10	
	0942	15/165		22.4	7.32	923	5/6	
3 HRS	0957	15/180		22.3	7.35	925	3	

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	SVOCs ( )	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773, 03, 03 | TEAM: BETLIK

PURGING LOG WESTBAY

WELL NO.: LMW-5 PORT 7 (700-710) | ~~SAMPLE NO.:~~

START (Date): 12/14/03 (Time): 1527 | END (Date): 12/15/03 (Time): 1038

WELL CASING DIAMETER: 2" ( ) 4" ( ) 6" ( ) | WEATHER: CLEAR - SUNNY 12/15/03

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD | ORIGINAL DTW | CASING VOLUME | 4" - 0.66 gpf | 5" - 0.93 gpf | 6" - 1.50 gpf | LIFT PUMP

___ - ___ = ___ x ___ Gal./Csg. Vol. x 3 Csg. Vol. = ___ G

PURGE WATER CONTAINERIZED? YES / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINs)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
	0	0					
3 .5 min 1012	15/195		22.4	7.37	924	3	
3 1/2 Hr ~~1027~~	~~15/210~~		22.2	7.30	926	2	TANK AT 13"
1037	25/220						315 GALLONS
1038	STOPPED PUMPING						
							TOTAL OF 21" PUMPED
							21 x 15 = 315 GALLONS

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) SVOCs ( ) Filtered Metals ( )

6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )

Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO. 52773 03.03 | TEAM: DEYLIK

PURGING LOG WESTBAY

WELL NO.: LMW-5 PORT 8 (800-810) | ~~SAMPLE NO.:~~

START (Date): 12/15/03 (Time): 1130 | END (Date): 12/15/03 (Time): 1502

WELL CASING DIAMETER: 2" (X) 4" ( ) 6" ( ) | WEATHER: FAIR, SUNNY, COLD

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) Submersible Grundfos Pump (X)

LIFT PUMP

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

	ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS
	1130	0	0					DTW ~~HORIBA CHECKED WITH~~ DISTILLED WATER
	1210	40/40		22.6	7.20	917	90	CONDUCTIVITY AT 0
	1230	20/60		23.0	7.31	930	39	AND TURBIDITY = 0
	1245	15/75		23.0	7.34	927	22	pH AT 7.77
	1300	15/90		23.1	7.35	926	18	
	1315	15/105		23.1	7.37	927	16	
2 HRS -	1330	15/120		23.2	7.37	926	11	
	1345	15/135		23.2	7.39	928	9	~~DISTILLED WATER~~, pH 7.46, -.002 COND., -1 NTU
	1400	15/150		22.9	7.18	942	8	CALIBRATED / HORIBA
	1415	15/165		22.8	7.39	942	8	
3 HRS -	1430	15/180		22.8	7.37	940	7	
	1445	15/195		22.8	7.36	937	5	
3½ HRS	1500	15/210		22.8	7.35	944	5	22" in TANK
	1502	STOPPED		PUMPING				330 gallons.

Field Blanks ( )

SAMPLING LOG

SAMPLING METHOD: ~~Bailer (X)~~ Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( )	VOCs ( )	8VOCs (	Filtered Metals ( )
6+ Cr ( )	Unfiltered Metals ( )	Pesticides ( )	Herbicides ( )
Cyanide ( )	Gross Alpha/Beta ( )	General Chemistry ( )	Treatability Parameters ( )

COMMENTS:

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

GROUNDWATER MONITORING WELL PURGING AND SAMPLING LOG

PROJECT NO: 52773 03,03 | TEAM: BEYLIK

PURGING LOG WESTBAY

WELL NO.: LMW-5 PORT #9 (875-885) | ~~SAMPLE NO.:~~

START (Date): 12/16/03 (Time): 0622 | END (Date): 12/16/03 (Time): 1026

WELL CASING DIAMETER: 2" (X) 4" ( ) 6" ( ) | WEATHER: COLD, CLEAR

FIELD PERSONNEL'S NAME(S): ATONAL MARES

REFERENCE POINT OF DEPTH MEASUREMENT: TOP OF CASING

OVM READING: | ORIGINAL DTW: | FINAL DTW:

PURGE METHOD: Packers ( ) Multiple Port (X) Bailer ( ) Submersible Grundfos Pump (X)

MEASURED WELL TD	ORIGINAL DTW	CASING VOLUME	4" - 0.66 gpf 5" - 0.93 gpf 6" - 1.50 gpf

____ - ____ = ____ x ____ Gal./Csg. Vol. x 3 Csg. Vol. = ____ G

PURGE WATER CONTAINERIZED? (YES) / NO | AVERAGE PURGE RATE: gpm

ACTUAL TIME	ELAPSED TIME (MINS)	VOLUME PURGED (gal.)	TEMP. (°f)	pH	EC (umhos/m)	TURB. (NTU)	COMMENTS DTW
0622	0	0					TANK EMPTY
0732	70/70		24.1	7.36	929	5	
0747	15/85		23.2	7.08	944	3	
0802	15/100		23.0	6.99	945	2	checked WITH DISTILLED WATER TURB. 1 NTU
2 HRS 0822	20/120		22.3	6.80	942	2	Calib Horiba
0837	15/135		22.9	7.32	963	3	
0852	15/150		23.0	7.34	962	3	
0907 ~~0917~~	15/165		22.8	7.32	964	3	
3 HRS 0922	15/180		23.1	7.37	962	2	
0937	15/195		23.2	7.40	963	2	
~~3~~ 2 HRS 0952	15/200		23.1	7.39	961	1	26 1/2" WATER IN TANK
1007	15/225		23.2	7.40	961	1	
4 HRS 1022	15/240		23.3	7.38	959	1	397.5 GALLONS
1026	4/244						

Field Blanks ( )

~~SAMPLING LOG~~

SAMPLING METHOD: BAILER (X) Westbay ( ) Portable Pump ( )

LAB ANALYSES:

Explosives ( ) VOCs ( ) 8VOCs ( ) Filtered Metals ( )
6+ Cr ( ) Unfiltered Metals ( ) Pesticides ( ) Herbicides ( )
Cyanide ( ) Gross Alpha/Beta ( ) General Chemistry ( ) Treatability Parameters ( )

COMMENTS:

APPENDIX I

VIDEO LOG IMAGES OF SCREENS POST-DEVELOPMENT

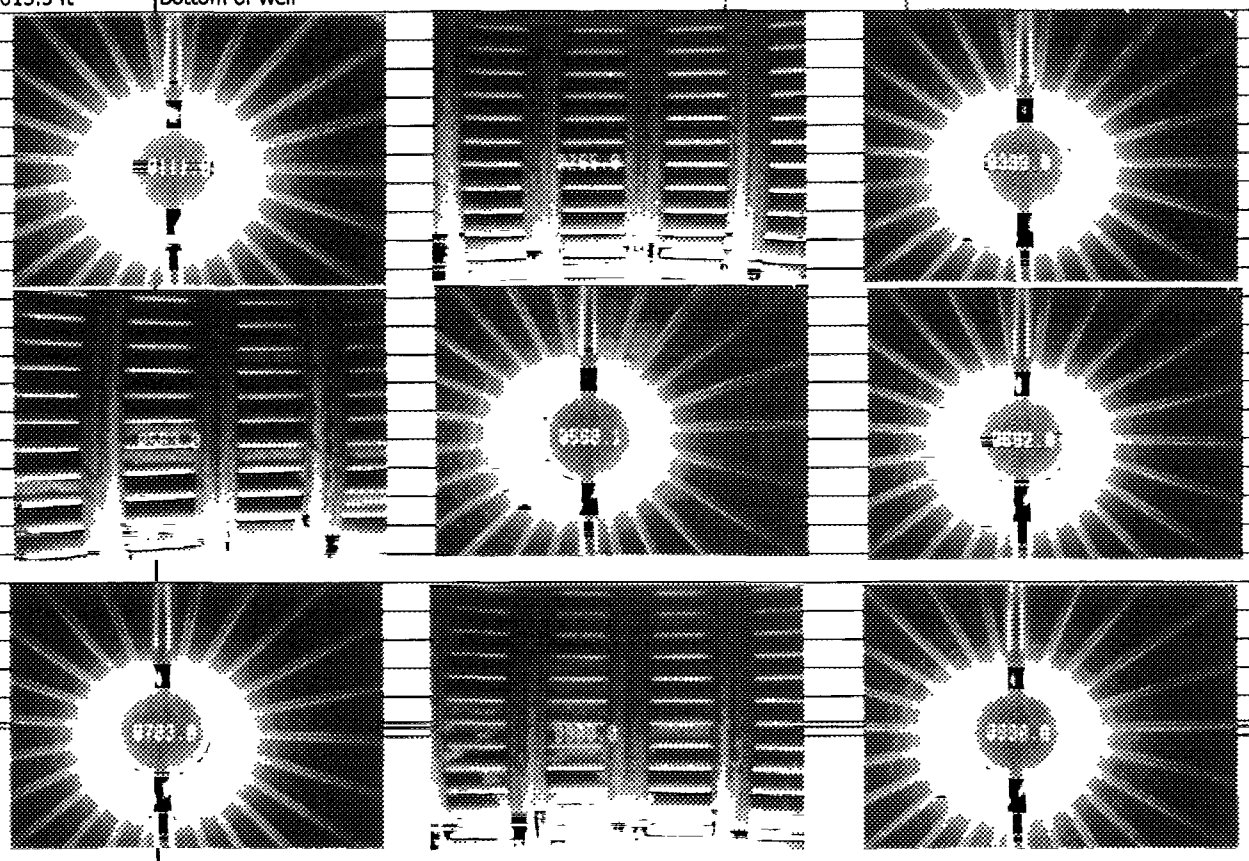
Pacific Surveys

a full service geophysical well logging company

Video Survey Report

Company:	BEYLIK DRILLING	**Date:**	02-Dec-03
Well:	LMW-4	**Run No.**	One
Field:	San Bernardino	**Job Ticket:**	11113
State:	California	**Total Depth:**	1,015.0 ft
		Water Level:	81.0 ft
Location:	Orange Show Rd. at Santa Ana Wash		
Zero Datum:	Ground level	**Tool Zero:**	Side view lens
Reason for Survey:	New well		

Depth	Remarks		
0.0 ft	Begin recording	**Perforation:**	
81.0 ft	Static water level	**Wire wrap**	105.00 ft to 115.00ft
95.0 ft	Change depth to 94' due to 1' casing stickup		260.00 ft to 270.00ft
	above ground level.		390.00 ft to 400.00ft
105-115 ft	Screen (clean and open)		560.00 ft to 570.00ft
260.5-270.5 ft	Screen (clean and open)		655.00 ft to 665.00ft
390.8-400.9 ft	Screen (clean and open)		775.00 ft to 785.00ft
561.3-571.3 ft	Screen (some material in screen)		895.00 ft to 905.00ft
656.5-666.5 ft.	Screen (clean and open)		990.00 ft to 1,000.00ft
775.6-785.6 ft	Screen (material in the last 6")		
896-906 ft	Screen (some material in screen)	**Casing Size**	
991.3-1001.3 ft	Screen (some material in screen)	**4.00 in**	0.00 ft to 1,015.00ft
1,015.5 ft	Bottom of well		



Notes: **Depth is referenced at side view lens.**
Bottom of light bar is 24" below side view lens.

4456 via st ambrose
claremont ca 91711

800.919.7555
909.625.6262

fax: 909.399.3180

Pacific Surveys

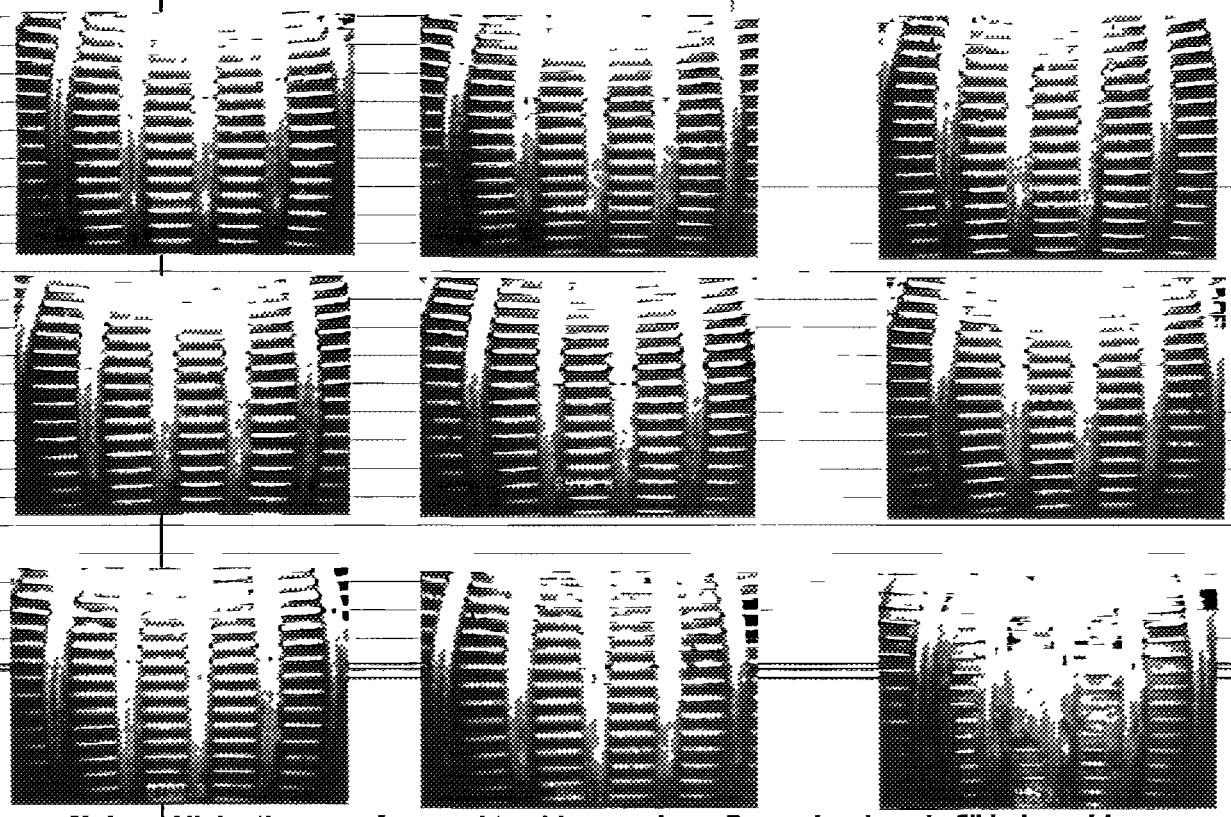
a full service geophysical well log service company

Video Survey Report

Company:	Beylik Drilling	**Date:**	05-Dec-03
Well:	LMW-5	**Run No.**	One
Field:	San Bernardino	**Job Ticket:**	11132
State:	California	**Total Depth:**	900 ft
		Water Level:	49 ft
Location:	Hunts Lane south of Santa Ana River		
Zero Datum:	Top of casing	**Tool Zero:**	Side-scan
Reason for Survey:	Initial inspection		

Depth	Remarks
0.0 ft	Start of survey
48.7 ft	Static water level: Water cloudy
59.5 ft	Stainless steel starts
80-90ft	Screen (clean and open) water moving downward
160-170ft	Screen (clean and open)
275-285ft	Screen (clean and open)
440-450ft	Screen (clean and open)
570-580ft	Screen (clean and open)
630-640ft	Screen (clean and open)
700-710ft	Screen (clean and open)
800-810ft	Screen (clean and open)
875-885ft	Screen (clean and open)
900.0 ft	Fill: End of survey
	Water moving downward throughout survey

Perforation:	160.00 ft to 170.00ft
Wire-wrap	275.00 ft to 285.00ft
	440.00 ft to 450.00ft
	570.00 ft to 580.00ft
	630.00 ft to 640.00ft
	700.00 ft to 710.00ft
	800.00 ft to 810.00ft
	875.00 ft to 885.00ft
Casing Size	
4"	0.00 ft to 905.00ft
Stainless Steel.	



Notes: **All depths are referenced to side-scan lens. Downview lens is 5" below side-scan.**

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APPENDIX J

WESTBAY INSTALLATION REPORT

COMPLETION REPORT

MP38 Monitoring Wells: LMW-4, LMW-5

San Bernardino, California

Prepared for:

Beylik Drilling Inc.
3000 West MacArthur Blvd., Suite 660
Santa Ana, California, 92704
U.S.A.

Prepared by:

Westbay Instruments Inc.
WB764
March 2, 2004

Westbay Instruments Inc
A Schlumberger Company

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APPENDICES:

APPENDIX 1: LMW-4

APPENDIX 2: LMW-5

1. Introduction

This report and the attached Appendices document the technical services carried out by Westbay Instruments Inc. under Beylik Drilling Inc. (Beylik) P.O. No.04-03288. A Westbay MP 38 groundwater monitoring system was installed in boreholes LMW-4 and LMW-5, in San Bernardino, California.

Westbay technical services representatives Mr. Mark Lessard and Mr. Darcy Sinclair were on site for the installations from December 4 to 11, 2003. Mr. Darcy Sinclair was on site as a Westbay trainee, at no cost to the client.

This report documents the installation tasks and related QA checks.

2. Installation

The monitoring wells were installed on the dates indicated below.

(Note: all depths are with respect to ground surface. Monitoring well reference elevations were not available at the time of writing).

Monitoring Well No.	Installation Dates	Borehole Depth (ft)	MP38 Casing Length (ft)	No. Monitoring Zones
LMW-4	Dec 3-7, 2003	1100	1013	8
LMW-5	Dec 7-11, 2003	905	903	9

The wells were installed according to the procedure described below.

2.1 Previous Activities

A nominal 12-inch diameter borehole was drilled by Beylik using a mud-rotary drilling method. A multi-screened steel-cased 4-inch diameter (4.25 inch ID) well was installed in the borehole, using a 20-slot screen size and backfilled with #2 sand adjacent to the screen intervals, with a bentonite/sand seal between sand packs. All backfill material was installed through a tremmie pipe.

Each screen interval was developed to remove drilling fluids before installation of the MP casing. A separate contractor, supervised by Beylik, conducted a video log of the completed multi-screen cased wells prior to installation of the Westbay casing items.

2.2 Preparation of Monitoring Well Design

Preliminary monitoring zone locations for the Westbay MP38 wells were sent to Westbay by Beylik. The casing designs were used to construct preliminary MP casing logs, which specify the location of components in the boreholes. The logs were review in the field by Mr. Lyles Cobb of Earth Technology Corp. prior to installation of the wells. Minor changes were made, if necessary. The MP

Casing Logs as approved were used as an installation guide in the field. Field copies of the logs are in the Appendices.

An MP measurement port coupling was included in each screened zone to provide the capability to measure fluid pressures and collect fluid samples. Measurement port couplings were also included in QA zones to provide QA testing capabilities and to permit operation of the squeeze relief venting capabilities of the MP38 packer inflation tool. A pumping port coupling was also included in each screened zone to provide purging and hydraulic conductivity testing capabilities.

2.3 Layout of MP Casing Components

Prior to MP System installation, the MP System casing components were set out near the borehole according to the sequence indicated on the appropriate MP Casing Log. Each casing length was numbered beginning with the lowermost as an aid to confirming the proper sequence of components. The appropriate MP System couplings were attached to the casing sections. Magnetic location collars were attached 2 feet below the center of the MP measurement port in each sampling zone. The location of each magnetic collar is 3 feet above the respective pumping port. Each casing component was strapped and the actual lengths were entered in Westbay's Well Designer software program. From these adjusted lengths, minor changes to the well design were made.

Each casing component was visually inspected. Serial numbers for each MP packer, MP pumping port and MP measurement port coupling were recorded on the MP Casing Logs. The well component layout was confirmed with the log before the components were lowered into the boreholes.

2.4 Lowering of MP Components

The MP casing components were lowered into the well by hand. Each casing joint was tested with a minimum internal hydraulic pressure of 150 psi for one minute to confirm hydraulic seals. A record of each successful joint test and the placement of each casing component are noted on the MP Casing Logs by check marks.

Some of the Measurement Ports did not pass the field test of re-seal pressure. These were rebuilt in the field following procedures used at Westbay for standard production. First the setscrew and valve cover plate were removed. Then the valve spring and poppet valve were removed. All surfaces were inspected for damage or any foreign matter. The valve spring was removed and visually compared in height to a valve spring of known closing pressure and measured with Vernier calipers. The spring was adjusted if necessary and a small amount of Dow #4 silicon was reapplied to the valve spring and the o-ring on the poppet valve. All parts were reassembled and the ports were tested for resealing pressure and leaks for at least three minutes.

Clean water supplied by Beylik was added to the MP casings when necessary to counter buoyancy effects while components were lowered into the borehole and for testing of joint seals during lowering.

2.5 Hydraulic Integrity Testing

After the MP casings were lowered into the borehole, the water inside the MP casing was monitored at a depth different from the open borehole water level for a minimum period of thirty minutes to confirm hydraulic integrity of the casings. The data from the hydraulic integrity tests are shown on the last page of the respective MP Casing Logs in the Appendices. Westbay personnel measured the borehole water levels prior to the lowering of the Westbay casing. The borehole water levels for

LMW-4 and LMW-5 were 81.3 feet below ground surface (bgs) and 47.9 feet (bgs) respectively. The MP casing water levels were 428.5 feet and 350.6 feet (bgs) respectively. In each case the test indicated that the MP casing was water tight prior to packer inflation.

2.6 Positioning of MP Components

After the components were lowered into the wells, the MP casing strings were positioned as indicated on the cover page of the Summary Casing Logs. Ground surface was used as the borehole datum. The MP casing strings were supported in these positions while packer inflation was carried out. Summary Casing Logs, which show the final "as-built" locations of the components in each well, are included in the Appendices.

2.7 Pre-inflation Profile

Prior to inflating the packers a pre-inflation pressure profile was carried out at each well to confirm the proper operation and position of measurement ports and magnetic collars. The data confirmed that the ports operated properly and are positioned correctly (Figures 1-2). The data for each pre-inflation profile are located in the Appendices. There are two pre-inflation profiles for well LMW-4. The second profile for LMW-4 was done with screened zones only and the Westbay casing water level sounded.

2.8 Inflation of MP System Packers

The MP packers were inflated sequentially beginning at the bottom of the wells using clean water. Westbay's model No. 6055 vented inflation tool was used for packer inflation. All of the packers appear to have inflated normally. The data for inflation of each packer are provided on the MP Packer Inflation Records included in the Appendices.

3. Fluid Pressure Measurements

After packer inflation was completed, fluid pressures were measured at each measurement port. At that time, the in-situ formation pressures may not have recovered from the pre-installation activities and potential groundwater pressure increases in monitoring zones that may result from packer inflation. This latter effect may be more likely to occur in monitoring zones located in low-permeability geological formations. Longer term monitoring may be required to establish representative fluid pressures.

A plot of the Piezometric levels in all zones in each well is shown on Figure 1 in the respective Appendices. The data were examined to confirm proper operation of the measurement ports and as a check on the presence of annulus seals between monitoring zones. The calculation sheets for the pressure profiles of the MP monitoring wells are also enclosed in the Appendices.

4. Operator Training

Beylik representatives Mr. Bob Scott and Mr. Julio Valenzula were trained in the operation and maintenance of the Model 6012S open/close tool (for operation of pumping ports) and operation of the Model 3033 manual cable reel.

Table 2a, Depths of Key Items for MP Monitoring Well LMW-4.

Zone No.	Screen Interval*	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position **	Magnetic Collar Depth	Measurement Port Depth**	Pumping Port Depth**	Port Name
LQA-1	----	2	1	13242	1003.0	----	1008.0	----	LQA-1
1	990-1000	----	----	----	----	995.0	993.0	998.0	Zone 1
----	----	6	2	13241	982.9	----	----	----	----
SQA-1	----	8	3	13240	972.9	----	978.0	----	SQA-1
LQA-2	----	15	4	13243	907.8	----	912.8	----	LQA-2
2	895-905	----	----	----	----	899.8	897.8	902.8	Zone 2
----	----	19	5	13244	887.7	----	----	----	----
SQA-2	----	21	6	13245	877.7	----	882.7	----	SQA-2
LQA-3	----	31	7	13246	787.5	----	792.6	----	LQA-3
3	775-785	----	----	----	----	779.5	777.5	782.5	Zone 3
----	----	35	8	13247	767.5	----	----	----	----
SQA-3	----	37	9	13325	757.5	----	762.5	----	SQA-3
LQA-4	----	47	10	13323	667.3	----	672.3	----	LQA-4
4	655-665	----	----	----	----	659.2	657.3	662.2	Zone 4
----	----	51	11	13324	647.2	----	----	----	----
SQA-4	----	53	12	13322	637.2	----	642.2	----	SQA-4
LQA-5	----	60	13	13327	572.1	----	577.1	----	LQA-5
5	560-570	----	----	----	----	564.0	562.1	567.0	Zone 5
----	----	64	14	13326	552.0	----	----	----	----
SQA-5	----	66	15	13328	542.0	---	547.0	----	SQA-5
LQA-6	----	82	16	13329	402.7	----	407.7	----	LQA-6
6	390-400	----	----	----	----	394.7	392.7	397.7	Zone 6
----	----	86	17	13340	382.6	----	----	----	----
SQA-6	----	88	18	13255	372.6	----	377.7	----	SQA-6
LQA-7	----	99	19	13254	272.4	----	277.5	----	LQA-7
7	260-270	----	----	----	----	264.4	262.5	267.4	Zone 7
----	----	103	20	13251	252.4	----	----	----	----
SQA-7	----	105	21	13249	242.4	----	247.4	----	SQA-7

Table 2a, (cont'd) Depths of Key Items for MP Monitoring Well LMW-4.

Zone No.	Screen Interval*	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position **	Magnetic Collar Depth	Measurement Port Depth**	Pumping Port Depth**	Port Name
LQA-8	----	118	22	13248	117.1	----	122.1	----	LQA-8
8	105-115	----	----	----	----	109.1	107.1	112.2	Zone 8
----	----	122	23	13252	97.1	----	----	----	----
SQA-8	----	124	24	13361	87.0	----	92.1	----	SQA-8

*Note: depths are with respect to ground level.

** Component positions are referenced to the middle of the subject MP System coupling.

Table 2b, Depths of Key Items for MP monitoring well LMW-5.

Zone No.	Screen Interval*	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position **	Magnetic Collar Depth	Measurement Port Depth**	Pumping Port Depth**	Port Name
LQA-1	----	2	1	13341	888.0	----	893.0	----	LQA-1
1	875-885	----	----	----	----	880.0	878.0	883.0	Zone 1
----	----	6	2	13345	868.0	----	----	----	----
SQA-1	----	8	3	13344	858.0	----	863.0	----	SQA-1
LQA-2	----	13	4	13343	812.8	----	817.8	----	LQA-2
2	800-810	----	----	----	----	804.8	802.8	807.8	Zone 2
----	----	17	5	13342	792.8	----	----	----	----
SQA-2	----	19	6	13355	782.8	----	787.8	----	SQA-2
LQA-3	----	27	7	13354	712.6	----	717.6	----	LQA-3
3	700-710	----	----	----	----	704.6	702.6	707.6	Zone 3
----	----	31	8	13356	692.6	----	----	----	----
SQA-3	----	33	9	13357	682.6	----	687.6	----	SQA-3
LQA-4	----	38	10	13358	642.4	----	647.4	----	LQA-4
4	630-640	----	----	----	----	634.4	632.4	637.4	Zone 4
----	----	42	11	13359	622.4	----	----	----	----
SQA-4	----	44	12	13360	612.4	----	617.4	----	SQA-4
LQA-5	----	48	13	13362	582.3	----	587.3	----	LQA-5
5	570-580	----	----	----	----	574.3	572.3	577.3	Zone 5
----	----	52	14	13363	562.3	----	----	----	----
SQA-5	----	54	15	13367	552.3	---	557.3	----	SQA-5
LQA-6	----	66	16	13347	453.0	----	458.0	----	LQA-6
6	440-450	----	----	----	----	445.0	443.0	448.0	Zone 6
----	----	70	17	13346	433.0	----	----	----	----
SQA-6	----	72	18	13350	423.0	----	428.0	----	SQA-6
LQA-7	----	86	19	13365	287.6	----	292.6	----	LQA-7
7	275-285	----	----	----	----	279.6	277.6	282.6	Zone 7
----	----	90	20	13366	267.6	----	----	----	----
SQA-7	----	92	21	13348	257.6	----	262.6	----	SQA-7

Table 2b, (cont'd) Depths of Key Items for MP Monitoring Well LMW-5.

Zone No.	Screen Interval*	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position **	Magnetic Collar Depth	Measurement Port Depth**	Pumping Port Depth**	Port Name
LQA-8	----	101	22	13349	172.3	----	177.3	----	LQA-8
8	160-170	----	----	----	----	164.3	162.3	167.3	Zone 8
----	----	105	23	13364	152.3	----	----	----	----
SQA-8	----	107	24	13351	142.3	----	147.3	----	SQA-8
LQA-9	----	113	25	13352	92.1	----	97.1	----	LQA-9
9	80-90	----	----	----	----	84.1	82.1	87.1	Zone 9
----	----	117	26	13353	72.1	----	----	----	----
SQA-9	----	119	27	13402	62.1	----	67.1	----	SQA-9

*Note: depths are with respect to ground level.

** Component positions are referenced to the middle of the subject MP System coupling.

APPENDIX 1

Monitoring Well LMW-4

Summary Casing Log	- 6 pages
Figure 1-2, Pre-Inflation Pressure Profile	- 2 pages
Pre-inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet	- 3 pages
Figure 2-3, Piezometric Pressure Profile	- 2 pages
Piezometric Pressure/Levels	
Field Data and Calculation Sheet	- 2 pages
Casing Installation Log (field copy)	- 13 pages
MP Packer Inflation Records	- 26 pages

Summary Casing Log

Company: Beylik Drilling Inc.
Well: LMW-4
Site: San Bernardino
Project:

Job No: WB764
Author: ML

Well Information

Reference Datum:
Elevation of Datum: 0.00 ft.
MP Casing Top: 0.00 ft.
MP Casing Length: 1013.16 ft.

Borehole Depth: 1100.00 ft.
Borehole Inclination:
Borehole Diameter: 0.00 in.

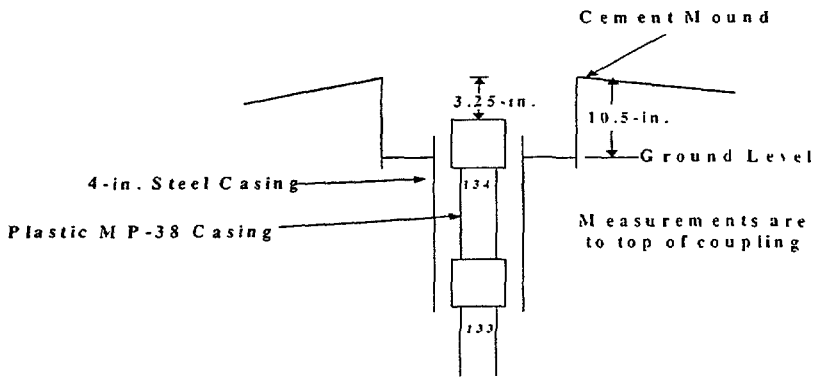
Well Description:
MP-38
Other References:

File Information

File Name: LMW-4.WWD
Report Date: Thu Feb 26 15:20:50 2004

File Date: Jan 19 13:19:15 2004

Sketch of Wellhead Completion



Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Legend

(Qty) MP Components

(Library - WD Library 7/27/00)

(3) 0225F02 - MP38 Casing, PVC, 2 ft.

(37) 0225F05 - MP38 Casing, PVC, 5 ft.

(70) 0225F10 - MP38 Casing, PVC, 10 ft.

(24) 0239F05 - MP38 Packer, Stiffened

(1) 0223 - MP38 End Cap

(102) 0202 - MP38 Regular Coupling

(24) 0205 - MP38 Measurement Port

(8) 0224 - MP38 Pumping Port

(8) 0216 - MP38 Magnetic Location Collar

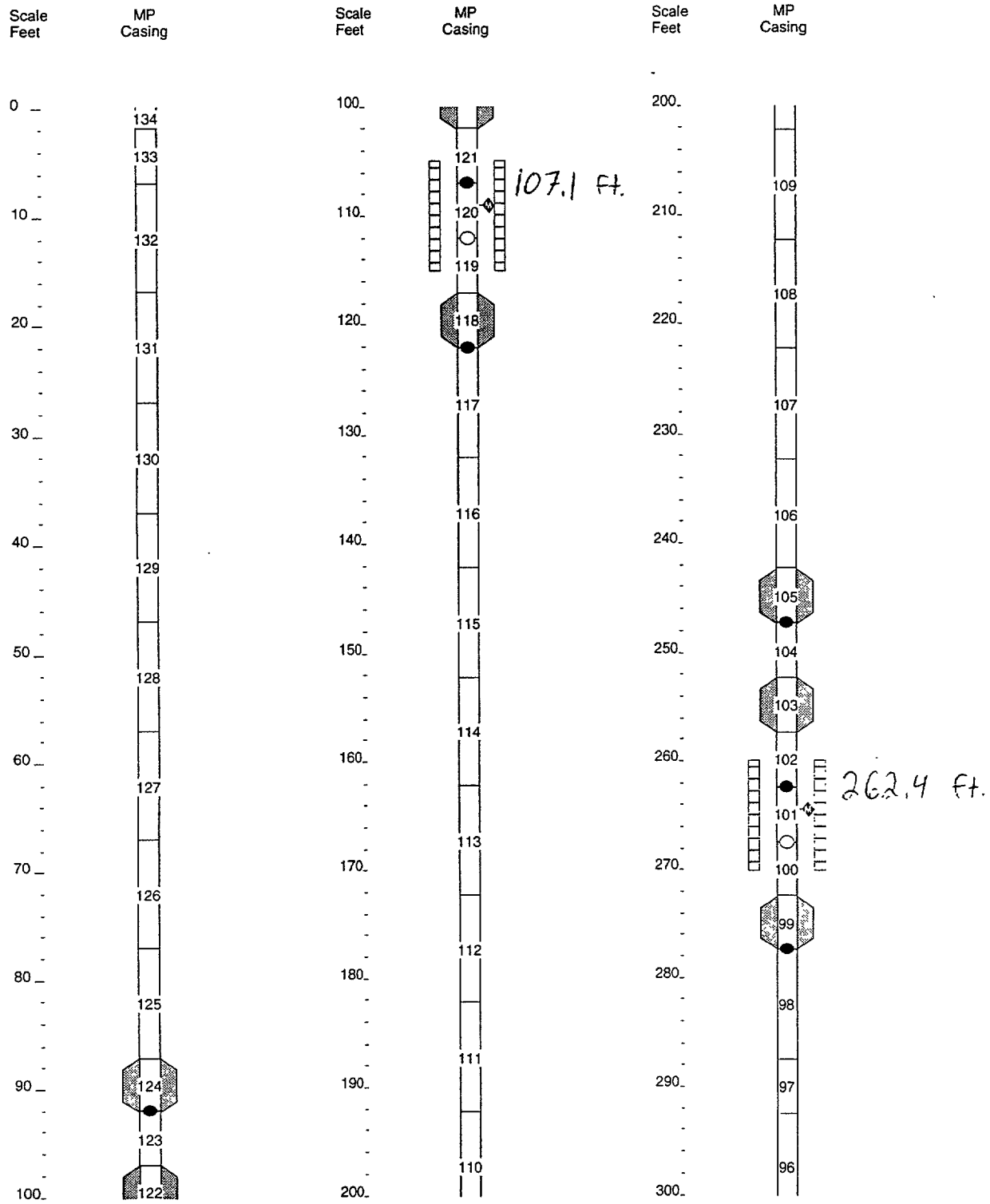
Geology

Backfill/Casing

Well Screen

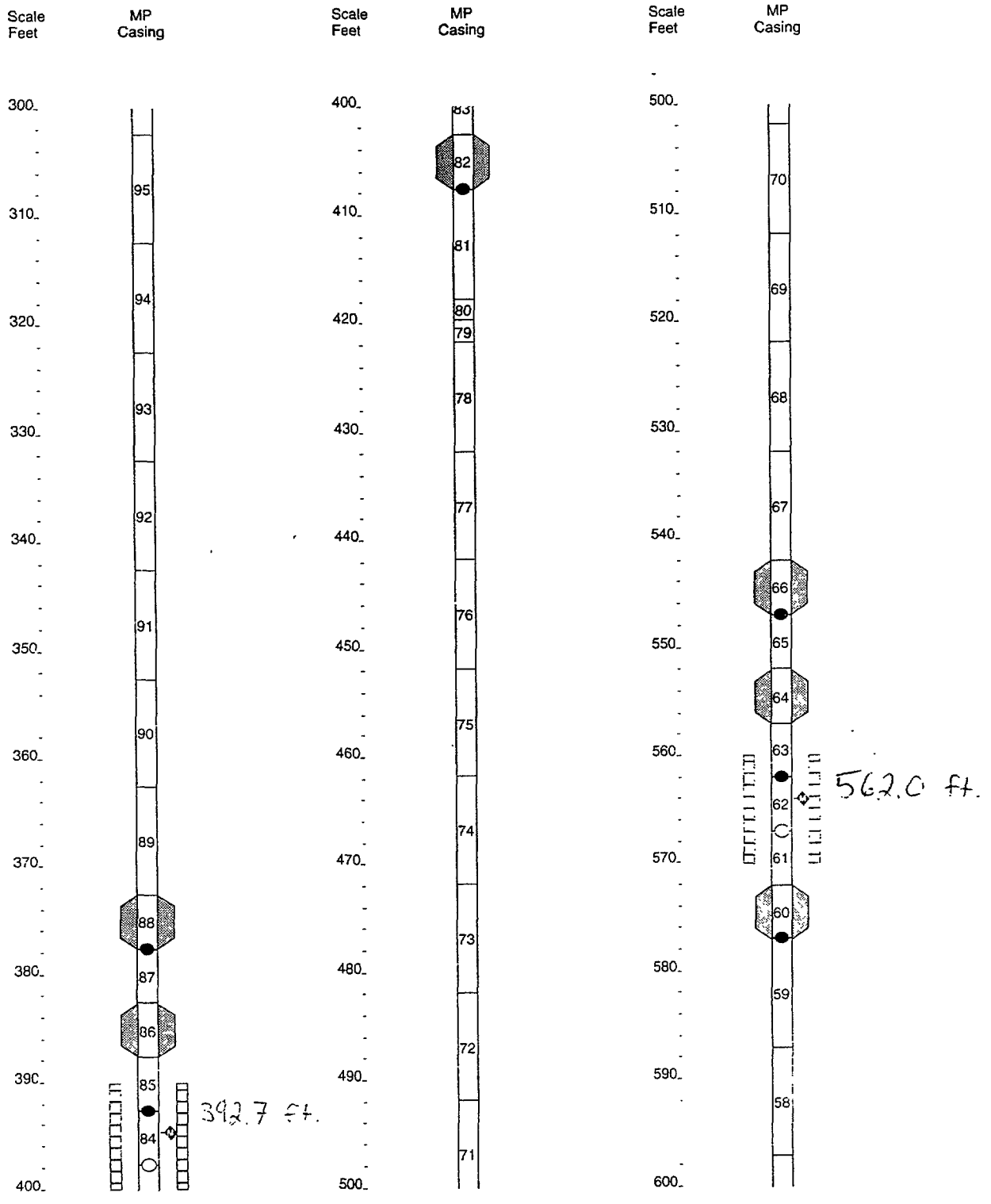
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4



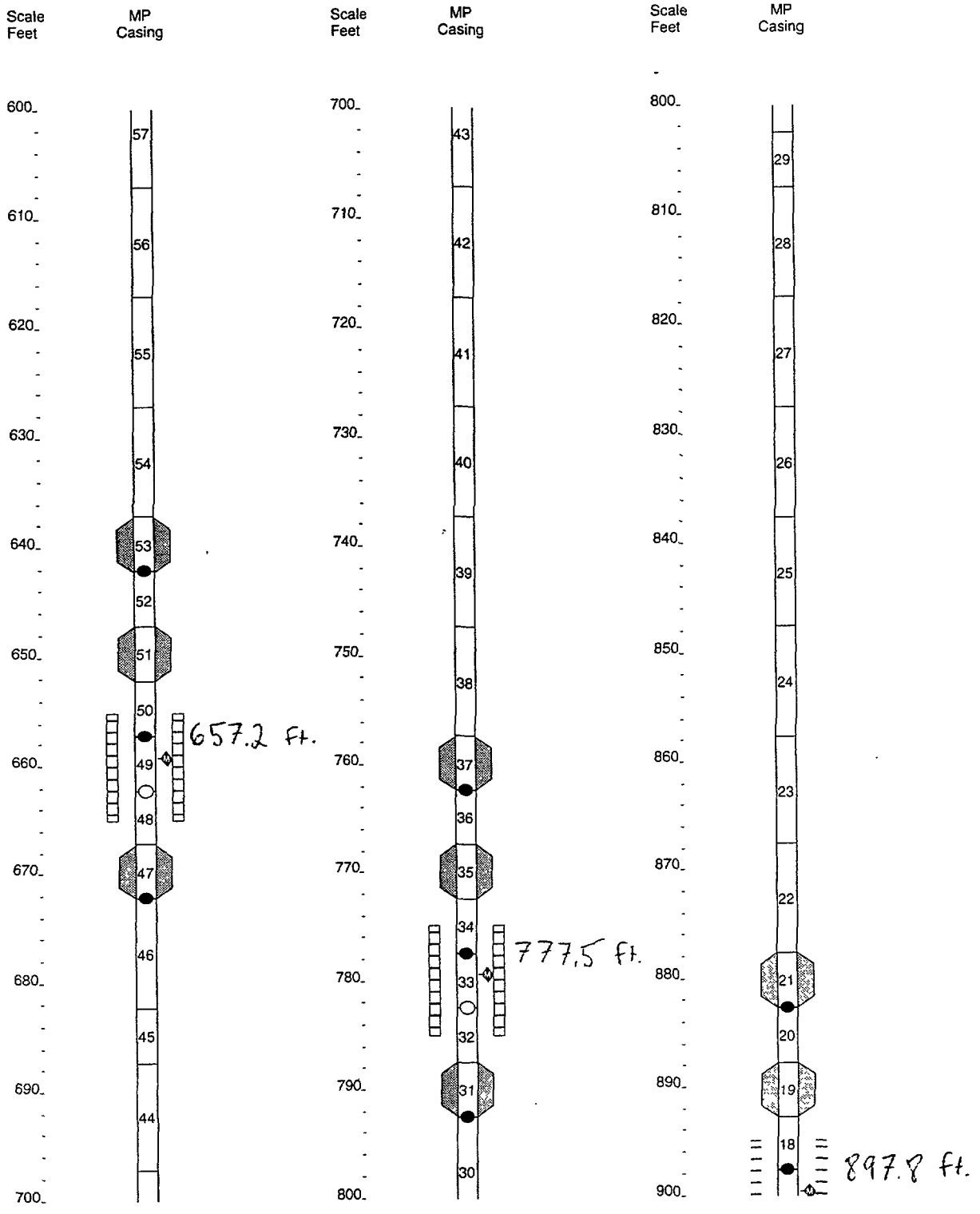
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4



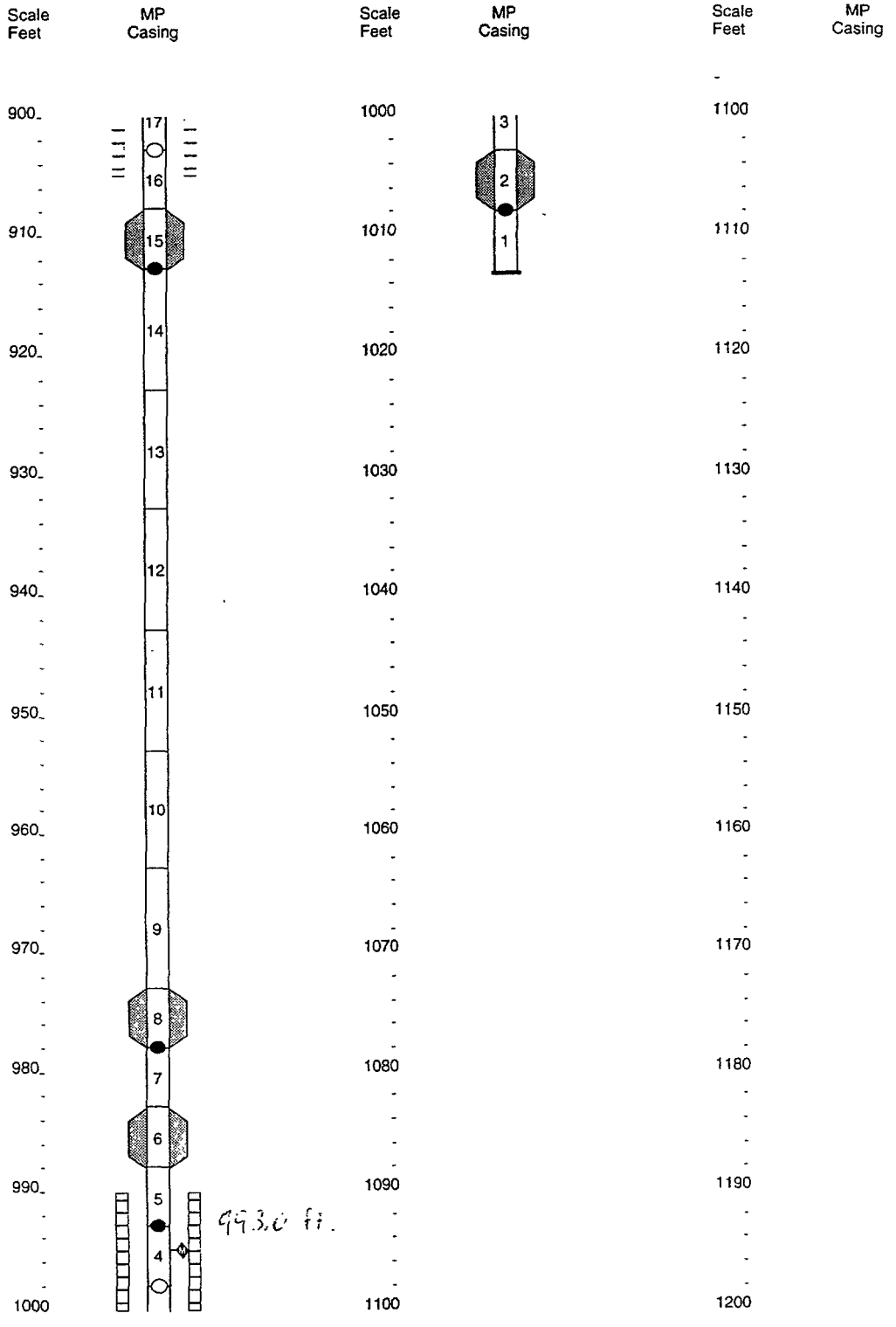
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4



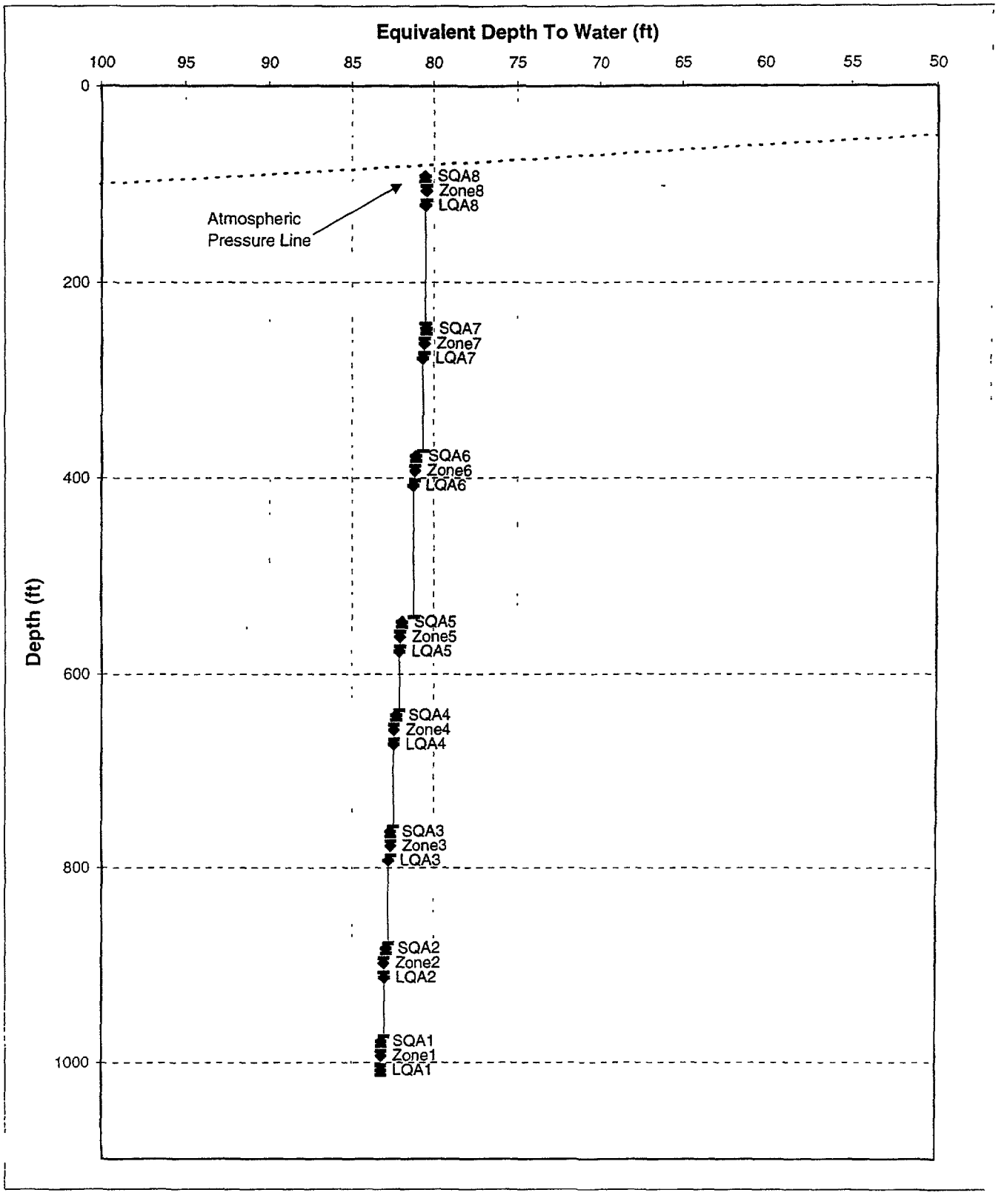
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4



Pre-inflation Piezometric Profile
Monitoring Well: LMW-4

Figure: 1
Profile Date: December 6, 2003
Comments: All Zones

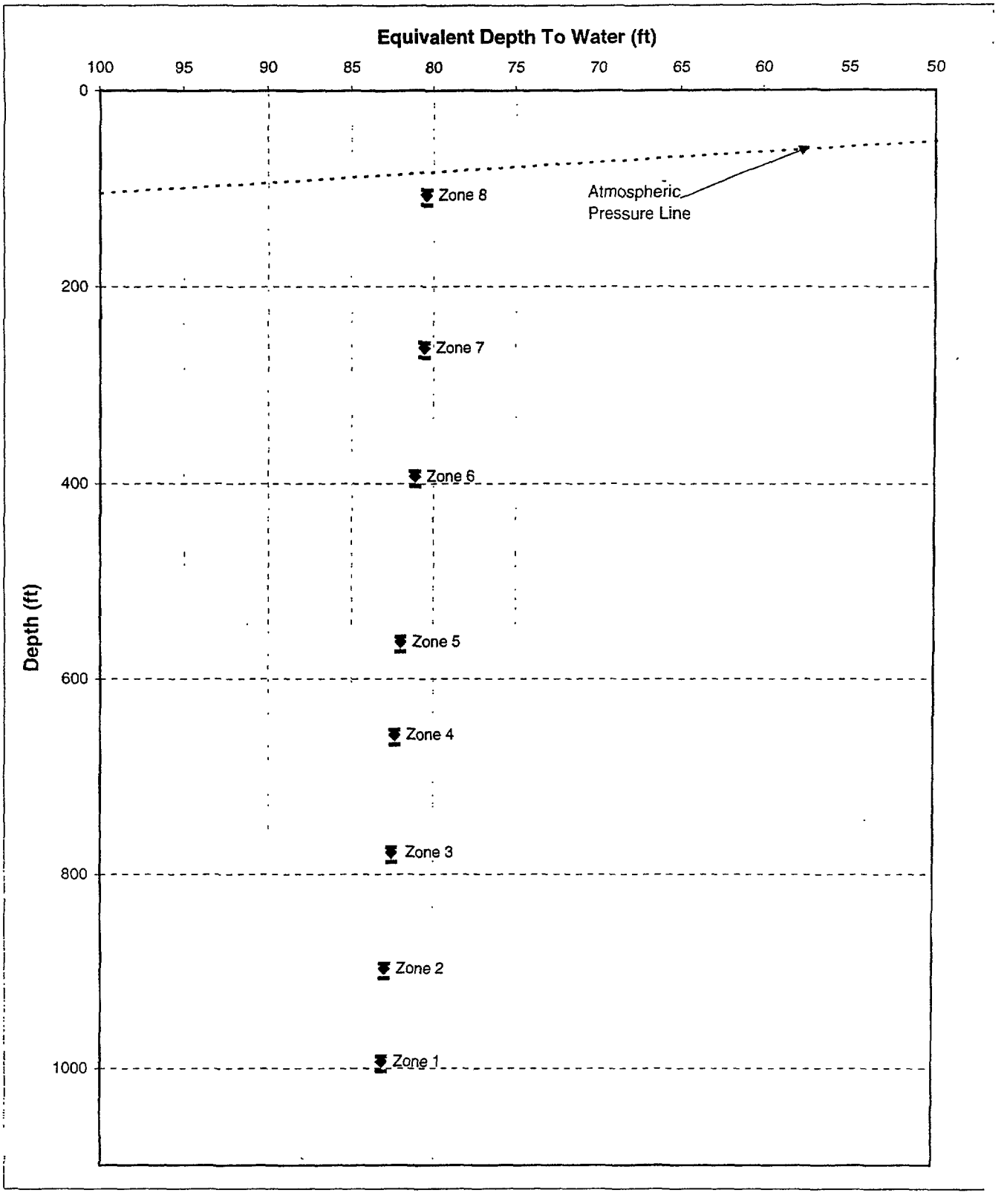


Client: Beylik Drilling
Site: San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By: DL Date: 04 MAR 04
Westbay Project : WB764

Pre-inflation Piezometric Profile
Monitoring Well: LMW-4

Figure: 2
Profile Date: December 6, 2003
Comments: Screened Zones Only



Client: Beylik Drilling
Site:San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By: DL Date: 04 MAR 04
Westbay Project : WB764

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet
Pre Inflation Profile #1

Datum: Ø Probe Type: Pressure Client: Beylik Drilling Date: Dec 6/03
Elev G.S.: Ø Serial No.: EM2662 Job No.: WB 764 Well No. LMW-4
Height of MP above G.S.: 0.114' Probe Range: 0 to 500 psi Location San Bernardino
Elev. top of MP Casing: Ø Weather: Hot, Sunny MP Casing Type: MP38
Reference Elevation: Ø Atm. Pressure: 14.16 Operator: ML/DS
Ambient Reading (Patm) (Pressure, Temperature, time) Start: 09:35 Finish:

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (✓)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp (°C)	Time H M.S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez Level Outside Port (ft) Dz = Dp - H	Comments	DZ
1	1008.0	1007.8	N/A	410.03	415.06	410.03	23.45	09:41	924.8	83.06		83.2
2	993.0	992.9		403.50	408.56	403.50	23.74	09:44	909.8	83.05	Collar	83.2
3	978.0	977.11		396.95	402.06	396.94	23.56	09:47	894.8	83.05		83.2
4	912.8	908.8		360.65	373.88	368.66	19.67	10:01	829.8	82.86		83.0
5	897.8	898.9		362.12	367.37	362.13	19.22	10:07	814.8	82.87	Collar	83.0
6	882.7	[illegible]		355.61	360.88	355.60	19.11	10:10	799.8	82.75		82.9
7	792.6	795.0		[illegible]	321.85	316.65	18.91	[illegible]	709.8	82.61		82.7
8	777.5	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	694.9	[illegible]	[illegible]	82.6
9	762.5	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	10:18	679.9	[illegible]		82.6
10	672.3	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	589.9	[illegible]		82.4
11	657.3	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	574.9	[illegible]	[illegible]	[illegible]
12	642.2	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	559.9	[illegible]		82.2
13	577.1	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	495.0	[illegible]		82.1
14	562.1	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	480.1	[illegible]	[illegible]	82.0
15	547.0			[illegible]	[illegible]	209.82		[illegible]	465.1	[illegible]		81.9
16	407.7	[illegible]		149.32	156.69	149.32	18.69	[illegible]	326.5	[illegible]		81.7
17	392.7	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	81.00	[illegible]	[illegible]
18	377.7	[illegible]		136.25	146.74	136.24	18.70	10:44	296.6	80.95		81.1
19	277.5	288.70		92.68	99.50	92.68	18.68	10:47	196.9	80.50		80.6
20	262.5	273.80	↓	86.15	93.02	86.15	18.42	10:49	181.9	80.45	collar	80.6

31

25/05/00 WHB

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet
Pre Inflation Profile #1

Datum: ϕ Probe Type: Pressure Client: Baylik Drilling Date: Dec 06/03
Elev. G.S.: ϕ Serial No.: EM2662 Job No.: WB 764 Well No.: CMW-4
Height of MP above G.S.: 0.114' Probe Range: 0 to 500psi Location: San Bernadino
Elev. top of MP Casing: ϕ Weather: Warm Sunny MP Casing Type: MP 38
Reference Elevation: ϕ Atm. Pressure: 14.16 Operator: ML/DS
Ambient Reading (Patm) (Pressure, Temperature, time) Start: 09:35 Finish: 10:59

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (—)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (°C)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments	DZ
21	247.4	258.10	N/A	79.60	86.53	79.59	19.08	10:51	166.9	80.32		80.5
22	122.2	135.00	↓	25.02	32.24	25.02	19.27	10:53	41.7	80.35		80.5
23	107.1	120.2	↓	18.44	25.72	18.43	19.36	10:55	26.7	80.29	collar	80.5
	92.1	105.2	↓	14.24	19.17	14.23	19.44	10:57	11.6	80.40		80.5

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet
Pre inflation Profile #2

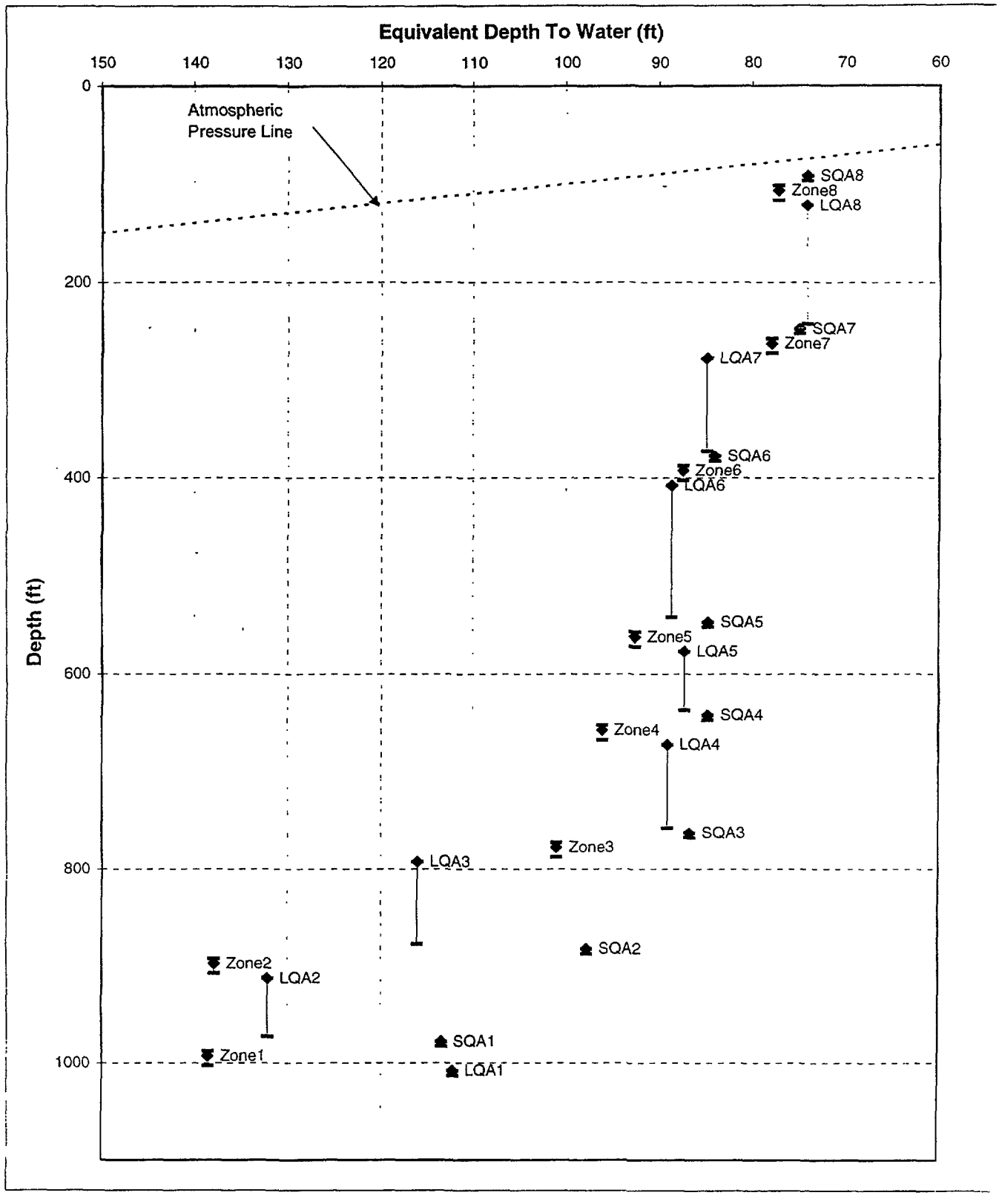
Datum: Ø Probe Type: Pressure Client: Beylik Drilling Date: Dec 6/03
Elev. G.S.: Ø Serial No.: EM 2662 Job No.: WB 764 Well No.: LMW-4
Height of MP above G.S.: 0.114' Probe Range: 0 to 500 psi Location: San Bernardino
Elev. top of MP Casing: Ø Weather: Hot, Sunny MP Casing Type: NP 38
Reference Elevation: Ø Atm. Pressure: 14.14 Operator: NL/DS
Ambient Reading (Patm) (Pressure, Temperature, time) Start: 14.14 11:50am Finish: 14.14 12:35pm 14.63

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (−)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (°C)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments WB WL Difference	Westbay Cas ng Water lev.
1	993.0	983	—	403.42	408.60	403.93	23.52	12:02	909.9	83.06	0	95.54
5	897.8	889.8	—	362.00	367.34	362.00	20.45	12:08	814.8	83.04	.43	95.97
8	777.5	772.2	—	309.80	315.38	309.79	19.37	12:11	694.90	82.60	.44	96.48
11	657.3	654.8	—	257.57	263.38	257.57	18.94	12:15	574.9	82.35	1.48	97.02
14	562.1	561.8	—	216.25	222.27	216.25	18.79	12:20	480.1	81.98	1.91	97.45
17	392.7	395.7	—	142.67	148.22	142.67	18.76	12:25	311.6	81.10	2.69	98.18
20	262.5	267.7	—	86.03	93.03	86.03	18.91	12:28	182.0	80.52	3.21	98.75
23	107.1	114.9	—	18.36	25.72	18.34	19.28	12:32	26.7	80.39	3.91	99.45

25/05/00 WHB

Piezometric Profile
Monitoring Well: LMW-4

Figure: 3
Profile Date: December 7, 2003
Comments: All Zones

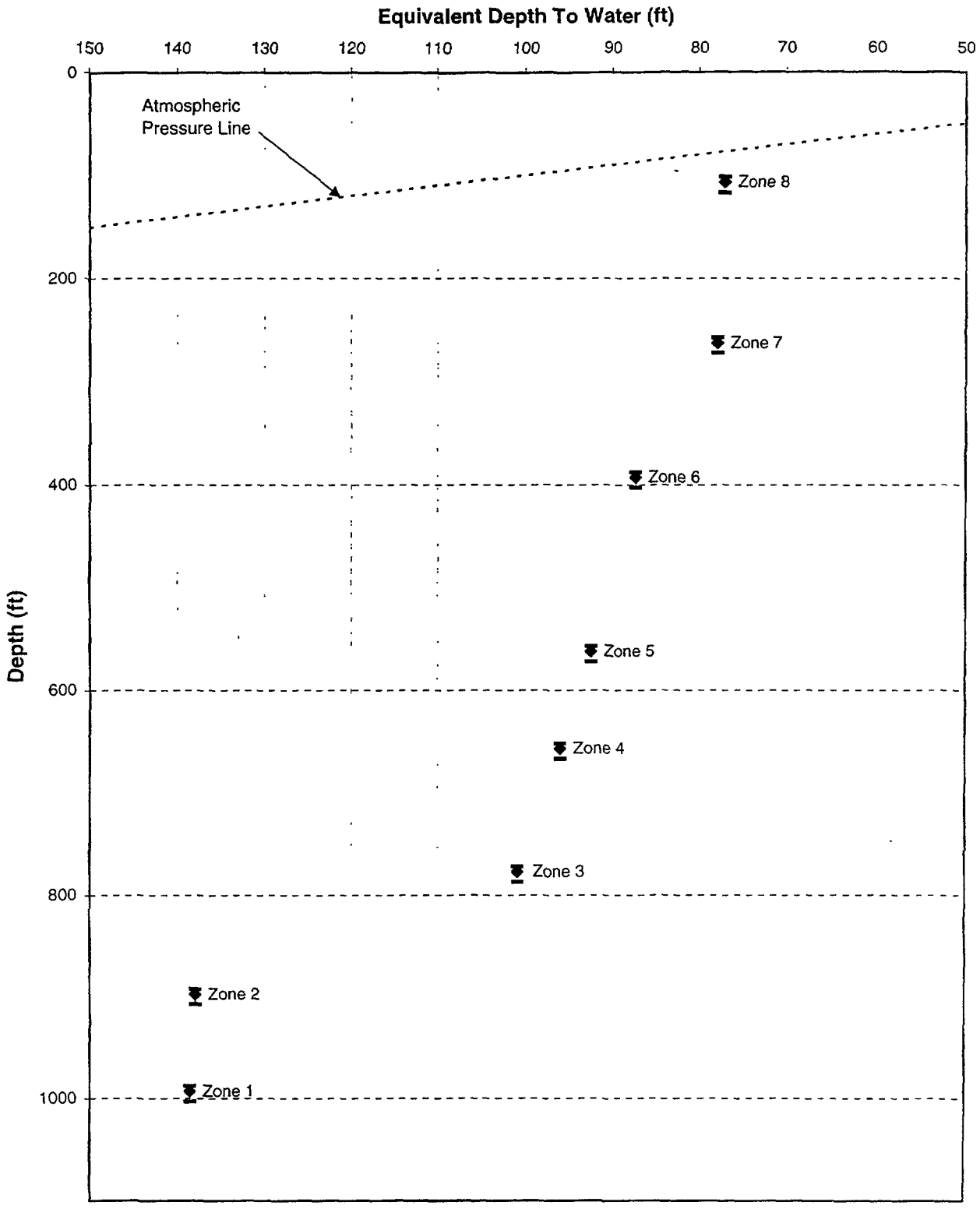


Client: Beylik Drilling
Site: San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By: DL Date: 04 MAR 04
Westbay Project : WB764

Piezometric Profile
Monitoring Well: LMW-4

Figure: 4
Profile Date: December 7, 2003
Comments: Screened Zones Only



Client: Beylik Drilling
Site:San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By: D.[illegible] Date: 04 MAR 04
Westbay Project : WB764

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet

Datum: Ø Probe Type: Pressure Client: Beylik Drilling Date: Dec 7/03

Elev. G.S.: Ø Serial No.: EM2662 Job No.: WB 764 Well No.: LMW-4

Height of MP above G.S.: 0.114' Probe Range: 0 to 500 Location: San Bernardino

Elev. top of MP Casing: Ø Weather: cloudy, warm MP Casing Type: MP38

Reference Elevation: Ø Atm. Pressure: 14.12 Operator: ML/DS

Ambient Reading (Patm) (Pressure, Temperature, time) Start: 14.12 3:46pm Finish: 14:12 5:07pm 19.49°

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (-)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (°C)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments
1	1008.0	1008' 0"	/	419.25	402.47	419.25	24.04	4:02	895.85	112.15	
2	993.0	992' 2"	/	412.69	384.53	412.68	24.12	4:05	854.46	138.54	collar
3	978.0	978' 2"	/	406.18	388.92	406.17	24.06	4:07	864.59	113.41	
4	912.8	912' 8"	/	377.82	352.52	377.84	22.67	4:11	780.62	132.18	
5	897.8	897' 9"	/	371.29	343.54	371.29	21.39	4:13	759.91	137.89	collar
6	882.7	882' 7"	/	364.79	354.44	364.78	20.92	4:16	785.05	97.65	
7	792.6	793' 3"	/	325.73	307.43	325.62	20.17	4:19	676.61	115.99	
8	777.5	778' 5"	/	319.13	307.42	319.10	19.47	4:22	676.59	100.91	collar
9	762.5	763' 3"	/	312.58	307.15	312.58	19.21	4:25	675.96	86.54	
10	672.3	674' 0"	/	273.35	266.99	273.35	18.82	4:29	583.32	88.98	
11	657.3	658' 7"	/	266.86	257.44	266.85	18.72	4:32	561.29	96.01	collar
12	642.2	643' 8"	/	260.26	255.82	260.27	18.63	4:35	557.55	84.65	
13	577.1	579' 0"	/	231.89	226.51	232.00	18.54	4:38	489.94	87.16	
14	562.1	563' 9"	/	225.47	217.62	225.42	18.66	4:41	469.57	92.53	collar
15	547.0	548' 11"	/	218.94	214.56	218.45	18.63	4:43	462.33	84.62	
16	407.7	412' 5"	/	158.46	157.45	158.42	18.64	4:46	319.10	87.90	
17	392.7	393' 7"	/	151.38	146.48	151.82	18.41	4:50	305.33	87.37	collar
18	377.7	378' 5"	/	145.34	140.25	145.34	18.46	4:53	293.73	83.97	
19	277.5	280' 7"	/	101.76	97.66	101.77	18.45	4:56	192.71	84.79	
20	262.5	265' 7"	/	95.21	94.12	95.21	18.97	4:58	184.54	77.96	collar

25/05/00 WHB

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet

Datum: ∅ Probe Type: Pressure Client: Beylik Drilling Date: Dec 7/03

Elev. G.S.: ∅ Serial No.: EM 2662 Job No.: WB 764 Well No.: LMW-4

Height of MP above G.S.: 0.114' Probe Range: 0 to 500 Location: San Bernadino, Cal

Elev. top of MP Casing: ∅ Weather: cloudy / warm MP Casing Type: MP 38

Reference Elevation: ∅ Atm. Pressure: 14:12 Operator: ML/DS

Ambient Reading (Patm) (Pressure, Temperature, time) Start: ~~14:12~~ 3.46 pm Finish: 507pm 14.12 psi

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (—)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (—)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments
21	247.4	250'7"	/	88.68	88.86	88.68	19.12	4:59	172.41	74.99	
22	122.2	126'0"	/	34.11	34.94	34.10	19.39	5:03	48.03	74.17	
23	107.1	111'0"	/	27.56	27.09	27.56	19.47	5:05	29.92	77.18	Collar
24	92.1	96'0"	/	20.96	21.89	20.95	19.72	5:07	17.92	74.18	

25/05/00 WHB

MP Casing Log

Company: Beylik Drilling Inc.
Well: LMW-4
Site: San Bernardino
Project:

Job No: WB764
Author: ML

Well Information

Reference Datum:
Elevation of Datum: 0.00 ft.
MP Casing Top: 0.00 ft.
MP Casing Length: 1013.16 ft.

Borehole Depth: 1100.00 ft.
Borehole Inclination:
Borehole Diameter: 0.00 in.

Well Description:
MP-38
Other References:

File Information

File Name: LMW-4.WWD
Report Date: Thu Dec 04 15:28:34 2003

File Date: Dec 04 14:23:49 2003

Comments

Log Information

Borehole condition confirmed.	(method) L. dee	Date: Dec 2/03
MP well design & preparation.	By: [illegible]	Date: [illegible]
MP well design checked.	By: [illegible]	Date: [illegible]
MP well and borehole approved to install.	By: [illegible]	Date: 12/4/03

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Legend

(Qty) MP Components
(Library - WD Library 7/27/00)

(3) 0225F02 - MP38 Casing, PVC, 2 ft.

(37) 0225F05 - MP38 Casing, PVC, 5 ft.

(70) 0225F10 - MP38 Casing, PVC, 10 ft.

(24) 0239F05 - MP38 Packer, Stiffened

(1) 0223 - MP38 End Cap

(102) 0202 - MP38 Regular Coupling

(24) 0205 - MP38 Measurement Port

(8) 0224 - MP38 Pumping Port

(8) 0216 - MP38 Magnetic Location Collar

Geology

Backfill/Casing

Well Screen

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

d of lowering
45 p.m
c 5/03

Scale Feet	MP Casing Backfill		QA Test/OK	Serial No.	MP Casing Description
0		135			0225F02 - MP38 Casing, PVC, 2 ft.
		134			0202 - MP38 Regular Coupling
		133			0225F05 - MP38 Casing, PVC, 5 ft.
					0202 - MP38 Regular Coupling
10		132			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
20		131			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
30		130			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
40		129			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
50		128			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
60		127			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
70		126			0225F10 - MP38 Casing, PVC, 10 ft.
					0202 - MP38 Regular Coupling
80		125			0225F10 - MP38 Casing, PVC, 10 ft
					0202 - MP38 Regular Coupling
90		124			0239F05 - MP38 Packer, Stiffened
					0205 - MP38 Measurement Port
	FD	123			0225F05 - MP38 Casing, PVC, 5 ft.
					0202 - MP38 Regular Coupling
100		122			0239F05 - MP38 Packer, Stiffened

replaced with 13361 / 130 psi

13352 135 psi

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description	
100					
				0202 - MP38 Regular Coupling	
	121			0225F05 - MP38 Casing, PVC, 5 ft.	
				0205 - MP38 Measurement Port	1373
110	120			0225F05 - MP38 Casing, PVC, 5 ft.	
				0224 - MP38 Pumping Port	
	119			0225F05 - MP38 Casing, PVC, 5 ft.	6200
				0202 - MP38 Regular Coupling	
120	118			0239F05 - MP38 Packer, Stiffened	13248 140 psi.
				0205 - MP38 Measurement Port	1377
	FS				
	117			0225F10 - MP38 Casing, PVC, 10 ft.	
130					
				0202 - MP38 Regular Coupling	
	116			0225F10 - MP38 Casing, PVC, 10 ft.	
140					
				0202 - MP38 Regular Coupling	
	115			0225F10 - MP38 Casing, PVC, 10 ft.	
150					
				0202 - MP38 Regular Coupling	
	114			0225F10 - MP38 Casing, PVC, 10 ft.	
160					
				0202 - MP38 Regular Coupling	
	113			0225F10 - MP38 Casing, PVC, 10 ft.	
170					
				0202 - MP38 Regular Coupling	
	112			0225F10 - MP38 Casing, PVC, 10 ft	
180					
				0202 - MP38 Regular Coupling	
	111			0225F10 - MP38 Casing, PVC, 10 ft	
190					
				0202 - MP38 Regular Coupling	
	110			0225F10 - MP38 Casing, PVC, 10 ft.	
200					

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description		
200				0202 - MP38 Regular Coupling		
	109			0225F10 - MP38 Casing, PVC, 10 ft.		
210				0202 - MP38 Regular Coupling		
	108			0225F10 - MP38 Casing, PVC, 10 ft.		
220				0202 - MP38 Regular Coupling		
	107			0225F10 - MP38 Casing, PVC, 10 ft.		
230				0202 - MP38 Regular Coupling		
	106			0225F10 - MP38 Casing, PVC, 10 ft.		
240				0202 - MP38 Regular Coupling		
	105			0239F05 - MP38 Packer, Stiffened	1324	130 psi
				0205 - MP38 Measurement Port	1374	
250	104			0225F05 - MP38 Casing, PVC, 5 ft.		
				0202 - MP38 Regular Coupling		
	103			0239F05 - MP38 Packer, Stiffened	1325	130 psi
				0202 - MP38 Regular Coupling		
260	102			0225F05 - MP38 Casing, PVC, 5 ft.		
				0205 - MP38 Measurement Port	1376	
	101			0225F05 - MP38 Casing, PVC, 5 ft.		
				0224 - MP38 Pumping Port		
270	100			0225F05 - MP38 Casing, PVC, 5 ft.	6201	
				0202 - MP38 Regular Coupling		
	99			0239F05 - MP38 Packer, Stiffened	1325	135 psi
				0205 - MP38 Measurement Port	1379	
280	98			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
290	97			0225F05 - MP38 Casing, PVC, 5 ft.		
				0202 - MP38 Regular Coupling		
	96			0225F10 - MP38 Casing, PVC, 10 ft.		
300						

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description
300				
				0202 - MP38 Regular Coupling
	95			0225F10 - MP38 Casing, PVC, 10 ft.
310				
				0202 - MP38 Regular Coupling
	94			0225F10 - MP38 Casing, PVC, 10 ft.
320				
				0202 - MP38 Regular Coupling
	93			0225F10 - MP38 Casing, PVC, 10 ft.
330				
				0202 - MP38 Regular Coupling
	92			0225F10 - MP38 Casing, PVC, 10 ft.
340				
				0202 - MP38 Regular Coupling
	91			0225F10 - MP38 Casing, PVC, 10 ft.
350				
				0202 - MP38 Regular Coupling
	90			0225F10 - MP38 Casing, PVC, 10 ft.
360				
				0202 - MP38 Regular Coupling
	89			0225F10 - MP38 Casing, PVC, 10 ft.
370				
				0202 - MP38 Regular Coupling
	88			0239F05 - MP38 Packer, Stiffened
				0205 - MP38 Measurement Port
380	FS 87			0225F05 - MP38 Casing, PVC, 5 ft.
				0202 - MP38 Regular Coupling
	86			0239F05 - MP38 Packer, Stiffened
				0202 - MP38 Regular Coupling
390	85			0225F05 - MP38 Casing, PVC, 5 ft.
				0205 - MP38 Measurement Port
	84			0225F05 - MP38 Casing, PVC, 5 ft.
				0224 - MP38 Pumping Port
400				

13255 140ps
1378
13340 130ps.
1330

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description
400	83	✓		0225F05 - MP38 Casing, PVC, 5 ft.
		✓		0202 - MP38 Regular Coupling
	82	✓		0239F05 - MP38 Packer, Stiffened
		✓		0205 - MP38 Measurement Port
410	81	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
420	80	✓		0225F02 - MP38 Casing, PVC, 2 ft.
		✓		0202 - MP38 Regular Coupling
	79	✓		0225F02 - MP38 Casing, PVC, 2 ft.
		✓		0202 - MP38 Regular Coupling
	78	✓		0225F10 - MP38 Casing, PVC, 10 ft.
430		✓		0202 - MP38 Regular Coupling
	77	✓		0225F10 - MP38 Casing, PVC, 10 ft.
440		✓		0202 - MP38 Regular Coupling
	76	✓		0225F10 - MP38 Casing, PVC, 10 ft.
450		✓		0202 - MP38 Regular Coupling
	75	✓		0225F10 - MP38 Casing, PVC, 10 ft.
460		✓		0202 - MP38 Regular Coupling
	74	✓		0225F10 - MP38 Casing, PVC, 10 ft.
470		✓		0202 - MP38 Regular Coupling
	73	✓		0225F10 - MP38 Casing, PVC, 10 ft.
480		✓		0202 - MP38 Regular Coupling
	72	✓		0225F10 - MP38 Casing, PVC, 10 ft.
490		✓		0202 - MP38 Regular Coupling
	71	✓		0225F10 - MP38 Casing, PVC, 10 ft.
500				

✓FS

13329 130pt.
1385

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description	
500					
				0202 - MP38 Regular Coupling	
	70			0225F10 - MP38 Casing, PVC, 10 ft.	
510					
				0202 - MP38 Regular Coupling	
	69			0225F10 - MP38 Casing, PVC, 10 ft.	
520					
				0202 - MP38 Regular Coupling	
	68			0225F10 - MP38 Casing, PVC, 10 ft.	
530					
				0202 - MP38 Regular Coupling	
	67			0225F10 - MP38 Casing, PVC, 10 ft	
540					
				0202 - MP38 Regular Coupling	
	66			0239F05 - MP38 Packer, Stiffened	13328 140psi
				0205 - MP38 Measurement Port	
550	FS 65			0225F05 - MP38 Casing, PVC, 5 ft.	1384
				0202 - MP38 Regular Coupling	
	64			0239F05 - MP38 Packer, Stiffened	
				0202 - MP38 Regular Coupling	13326 130psi
560	63			0225F05 - MP38 Casing, PVC, 5 ft.	
				0205 - MP38 Measurement Port	1352
	62			0225F05 - MP38 Casing, PVC, 5 ft.	
				0224 - MP38 Pumping Port	6205
570	61			0225F05 - MP38 Casing, PVC, 5 ft.	
				0202 - MP38 Regular Coupling	13327 130psi
	60			0239F05 - MP38 Packer, Stiffened	
				0205 - MP38 Measurement Port	139
580	FS				
	59			0225F10 - MP38 Casing, PVC, 10 ft.	
				0202 - MP38 Regular Coupling	
590					
	58			0225F10 - MP38 Casing, PVC, 10 ft	
				0202 - MP38 Regular Coupling	
600					

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description		
600						
	57	✓		0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
610						
	56	✓		0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
620						
	55	✓		0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
630						
	54	✓		0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
640	53	✓		0239F05 - MP38 Packer, Stiffened	13322	130 psi
				0205 - MP38 Measurement Port		
	FS 52	✓		0225F05 - MP38 Casing, PVC, 5 ft.	1386	
				0202 - MP38 Regular Coupling		
650	51	✓		0239F05 - MP38 Packer, Stiffened	13324	130 psi
				0202 - MP38 Regular Coupling		
	50	✓		0225F05 - MP38 Casing, PVC, 5 ft.		
				0205 - MP38 Measurement Port	1387	
660	49	✓		0225F05 - MP38 Casing, PVC, 5 ft.		
				0224 - MP38 Pumping Port	6199	
	48	✓		0225F05 - MP38 Casing, PVC, 5 ft.		
				0202 - MP38 Regular Coupling		
670	47	✓		0239F05 - MP38 Packer, Stiffened	13323	135 psi
	FS			0205 - MP38 Measurement Port	1383	
	46	✓		0225F10 - MP38 Casing, PVC, 10 ft.		
680						
				0202 - MP38 Regular Coupling		
	45	✓		0225F05 - MP38 Casing, PVC, 5 ft.		
				0202 - MP38 Regular Coupling		
690						
	44	✓		0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
700						

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description
700				
	43	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
710	42	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
720	41	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
730	40	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
740	39	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
750	38	✓		0225F10 - MP38 Casing, PVC, 10 ft.
		✓		0202 - MP38 Regular Coupling
760	37	✓		0239F05 - MP38 Packer, Stiffened
	✓FS	✓	13325	0205 - MP38 Measurement Port 130 psi
	36	✓	1325	0225F05 - MP38 Casing, PVC, 5 ft.
		✓		0202 - MP38 Regular Coupling
770	35	✓	13247	0239F05 - MP38 Packer, Stiffened 140 psi
		✓		0202 - MP38 Regular Coupling
	34	✓		0225F05 - MP38 Casing, PVC, 5 ft.
		✓	1366	0205 - MP38 Measurement Port
780	33	✓		0225F05 - MP38 Casing, PVC, 5 ft.
		✓	6203	0224 - MP38 Pumping Port
	32	✓		0225F05 - MP38 Casing, PVC, 5 ft.
		✓	13296	0202 - MP38 Regular Coupling 130 psi
790	31	✓		0239F05 - MP38 Packer, Stiffened
	✓FS	✓	1322	0205 - MP38 Measurement Port
	30	✓		0225F10 - MP38 Casing, PVC, 10 ft.
800				

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description		
800						
				0202 - MP38 Regular Coupling		
	29			0225F05 - MP38 Casing, PVC, 5 ft.		
				0202 - MP38 Regular Coupling		
810						
	28			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
820						
	27			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
830						
	26			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
840						
	25			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
850						
	24			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
860						
	23			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
870						
	22			0225F10 - MP38 Casing, PVC, 10 ft.		
				0202 - MP38 Regular Coupling		
880	21			0239F05 - MP38 Packer, Stiffened	13245	130 ← CHANGED OUT FOR
				0205 - MP38 Measurement Port		
	✓FS 20			0225F05 - MP38 Casing, PVC, 5 ft.	1370	# 13253 140
				0202 - MP38 Regular Coupling		
890	19			0239F05 - MP38 Packer, Stiffened	13244	[illegible]
				0202 - MP38 Regular Coupling		
	18			0225F05 - MP38 Casing, PVC, 5 ft.		
				0205 - MP38 Measurement Port	1368	
900						

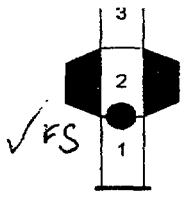
MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description	
900	17			0225F05 - MP38 Casing, PVC, 5 ft.	
				0224 - MP38 Pumping Port	0206
	16			0225F05 - MP38 Casing, PVC, 5 ft.	
				0202 - MP38 Regular Coupling	
910	15			0239F05 - MP38 Packer, Stiffened	13243 135 psi
				0205 - MP38 Measurement Port	1369
	FS				
	14			0225F10 - MP38 Casing, PVC, 10 ft.	
920					
				0202 - MP38 Regular Coupling	
	13			0225F10 - MP38 Casing, PVC, 10 ft.	
930					
				0202 - MP38 Regular Coupling	
	12			0225F10 - MP38 Casing, PVC, 10 ft.	
940					
				0202 - MP38 Regular Coupling	
	11			0225F10 - MP38 Casing, PVC, 10 ft.	
950					
				0202 - MP38 Regular Coupling	
	10			0225F10 - MP38 Casing, PVC, 10 ft.	
960					
				0202 - MP38 Regular Coupling	
	9			0225F10 - MP38 Casing, PVC, 10 ft.	
970					
				0202 - MP38 Regular Coupling	
	8			0239F05 - MP38 Packer, Stiffened	[illegible]
				0205 - MP38 Measurement Port	[illegible]
980	7			0225F05 - MP38 Casing, PVC, 5 ft.	
				0202 - MP38 Regular Coupling	
	6			0239F05 - MP38 Packer, Stiffened	[illegible]
				0202 - MP38 Regular Coupling	
990	5			0225F05 - MP38 Casing, PVC, 5 ft.	
				0205 - MP38 Measurement Port	1371
	4			0225F05 - MP38 Casing, PVC, 5 ft.	
				0224 - MP38 Pumping Port	6202
1000					

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-4

Scale Feet	MP Casing Backfill	QA Test/OK	Serial No.	MP Casing Description
1000		☑		0225F05 - MP38 Casing, PVC, 5 ft.
		☑		0202 - MP38 Regular Coupling
		☑		0239F05 - MP38 Packer, Stiffened
		☑		0205 - MP38 Measurement Port
1010		☑		0225F05 - MP38 Casing, PVC, 5 ft.
		☑		0223 - MP38 End Cap
1020	Start Lowering WB casing 8:40 am Dec 5/03			
1030				
1040				
1050				
1060				
1070				
1080				
1090				
1100				

13242 140psi
1367

Borehole Water Level
81.6 ft. Dec 4/03
81.3 ft. Dec 5/03

Hydraulic Integrity Test
428.47' @ 4.55pm Dec 5/03
428.47' @ 8:08am Dec 6/03
Westbay casing is watertight.
[signature]

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated Dec 6/03

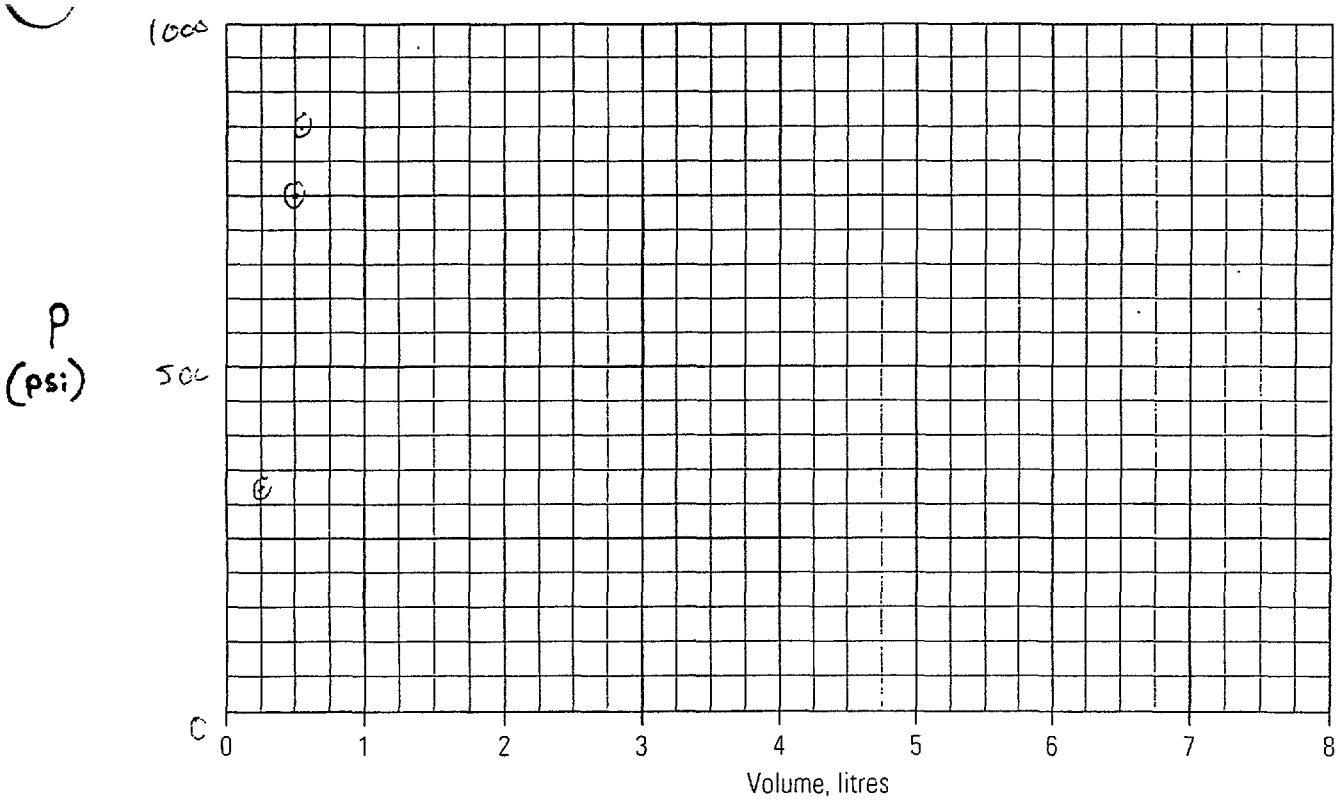
Packer No.: BWT Serial No.: n/a Depth (ft/m): 1013 Inflation Tool No: TIW 1088

Packer Valve Pressure, P_V: n/a psi Final Line Pressure, P_L: 850 psi Tool Pressure, P_T 300 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ n/a psi

Volume, litres	0.25	0.5	0.55	0.2							
Pressure, psi	325	750	850	Ø							
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments BWT - Blank wall test

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 6/03

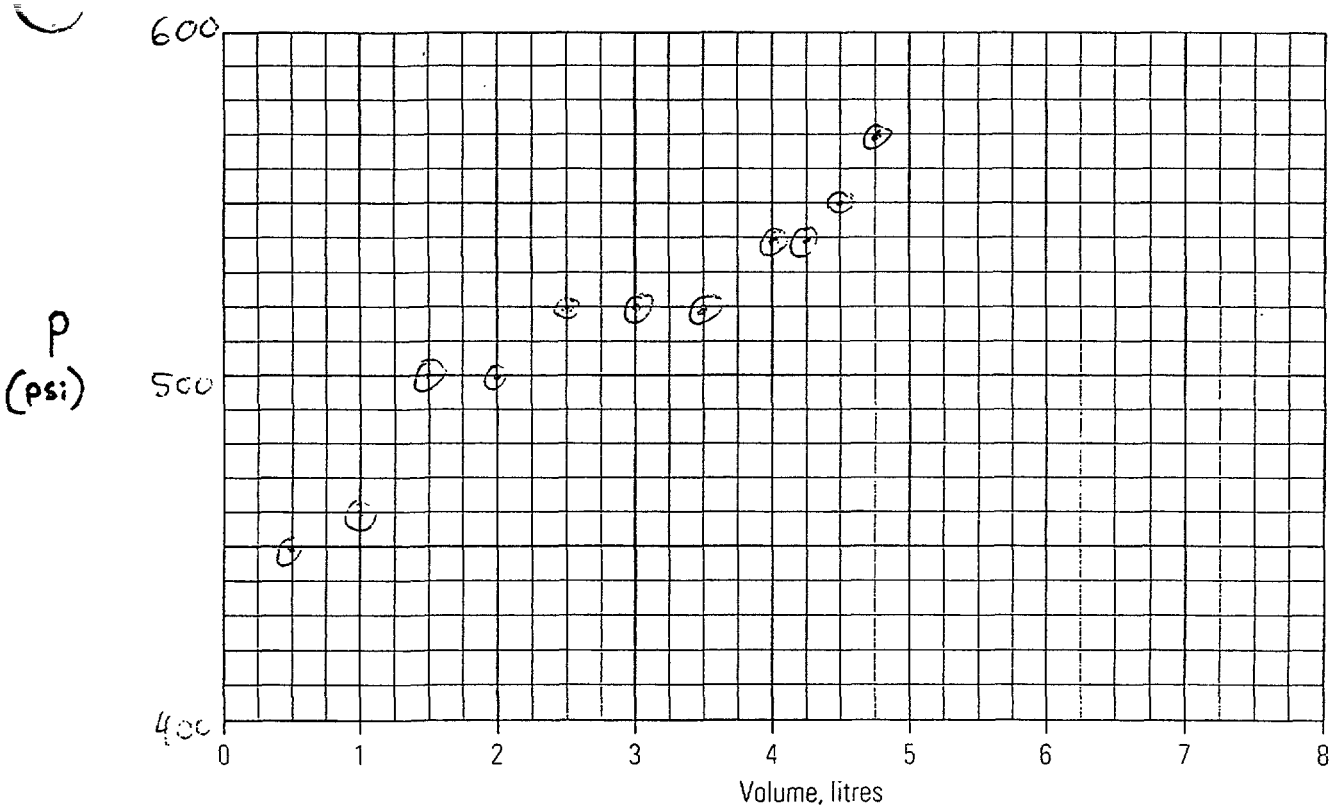
Packer No.: 1 comp 2 Serial No.: 13242 Depth (ft / m): 1002.92' Inflation Tool No: TFW1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 21.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.25	4.5	4.75
Pressure, psi	450	460	500	500	520	520	520	540	540	550	570
Volume, litres	4.4										
Pressure, psi	Ø										

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #1

Sheet 3 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project Beylik Drilling Inc. | Project No WB 764 | Well No LMW-4

Location San Bernardino | Completed by ML/DS | Date Inflated Dec 6/03

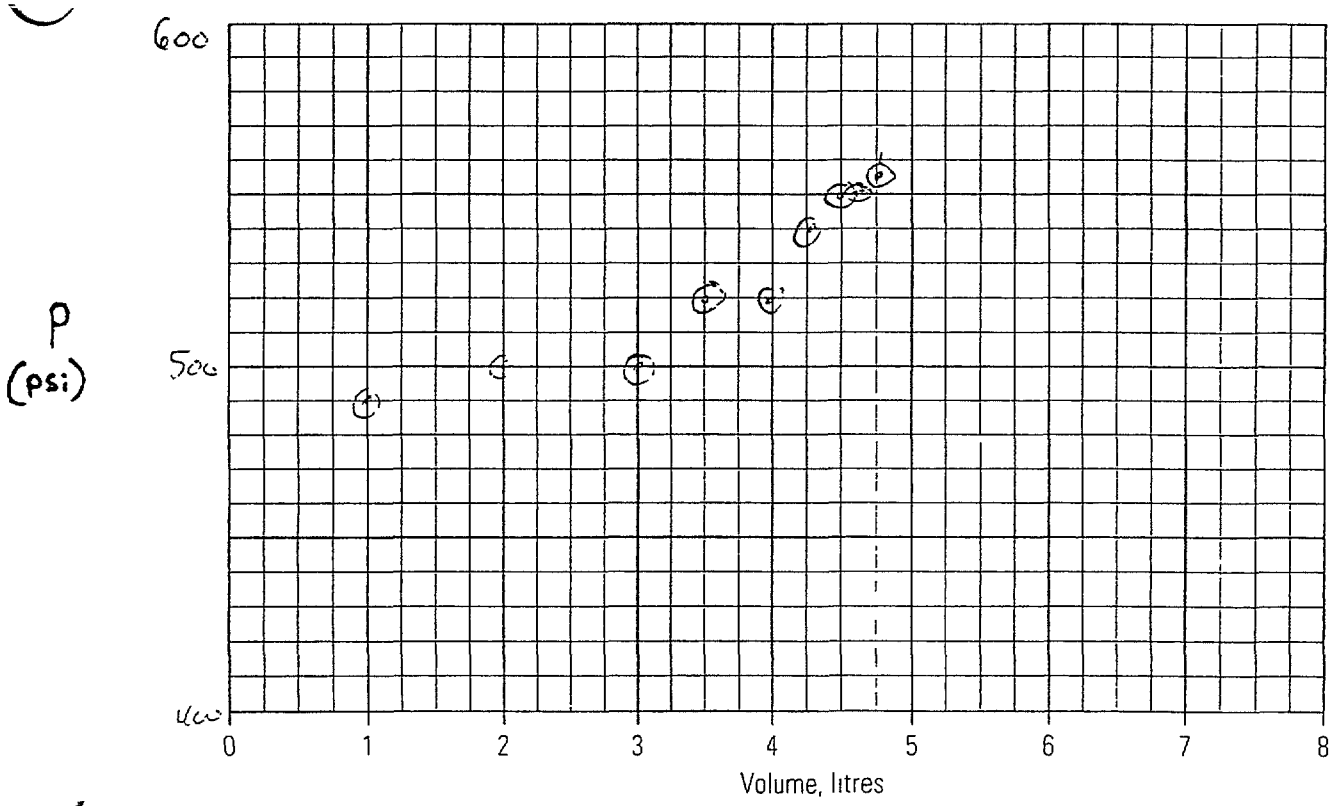
Packer No 2, comp 6 | Serial No 13241 | Depth (ft/m) 982.94 | Inflation Tool No TIW1088

Packer Valve Pressure P_V 145 psi | Final Line Pressure P_L 555 psi | Tool Pressure P_T 300 psi

Borehole Water Level 813 (ft/m) = 35 psi (P_W) | Calculated Packer Element Pressure $P_E = P_L + P_W$ | $P_V - P_T$ = 145 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.25	4.5	4.6	4.75	4.45	
Pressure, psi	490	500	500	520	520	540	550	550	555	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs Volume (litres)



Comments Packer 2

Sheet 4 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 6/03

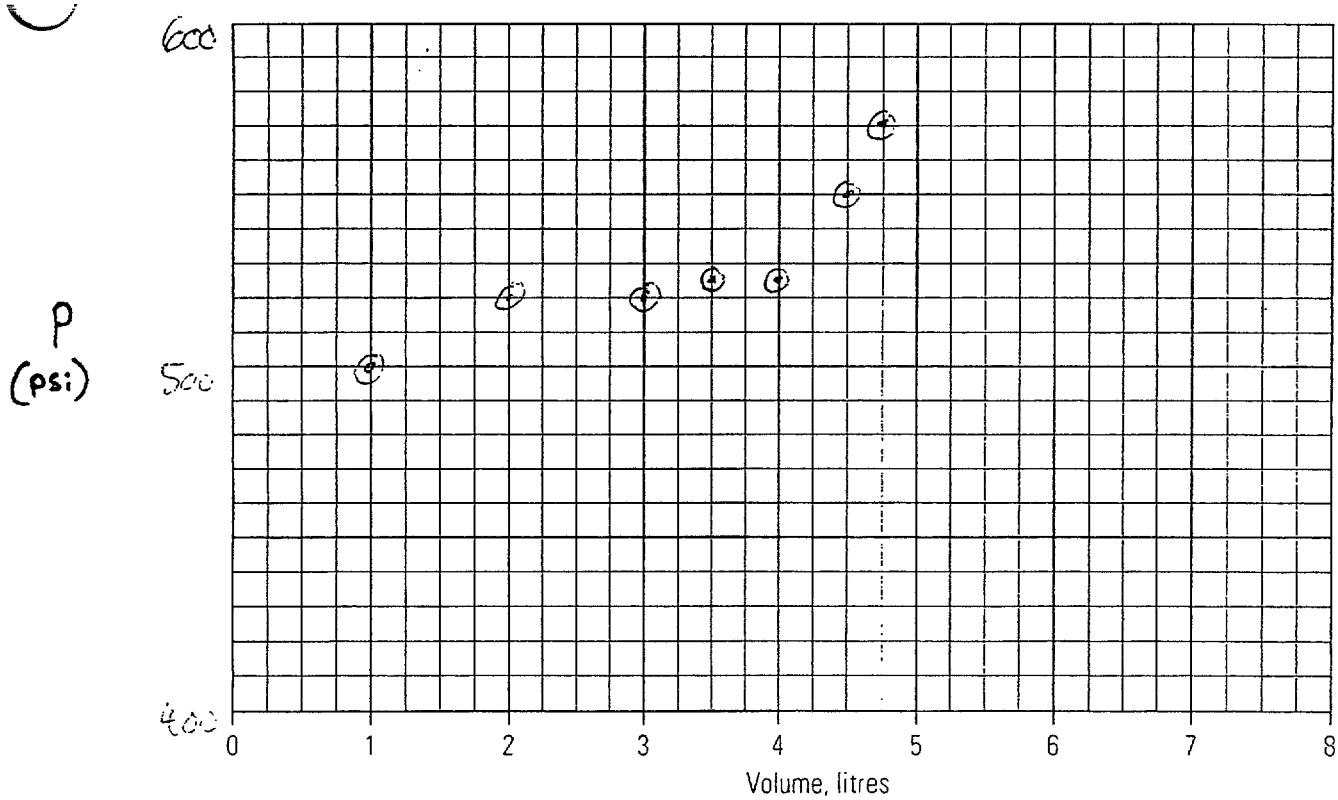
Packer No.: 3, cap 8 Serial No.: 13240 Depth (ft / m): 972.91 Inflation Tool No.: TI-1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 61.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.4			
Pressure, psi	500	520	520	525	525	550	570	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #3

Sheet 5 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML / DS Date Inflated: Dec 6/03

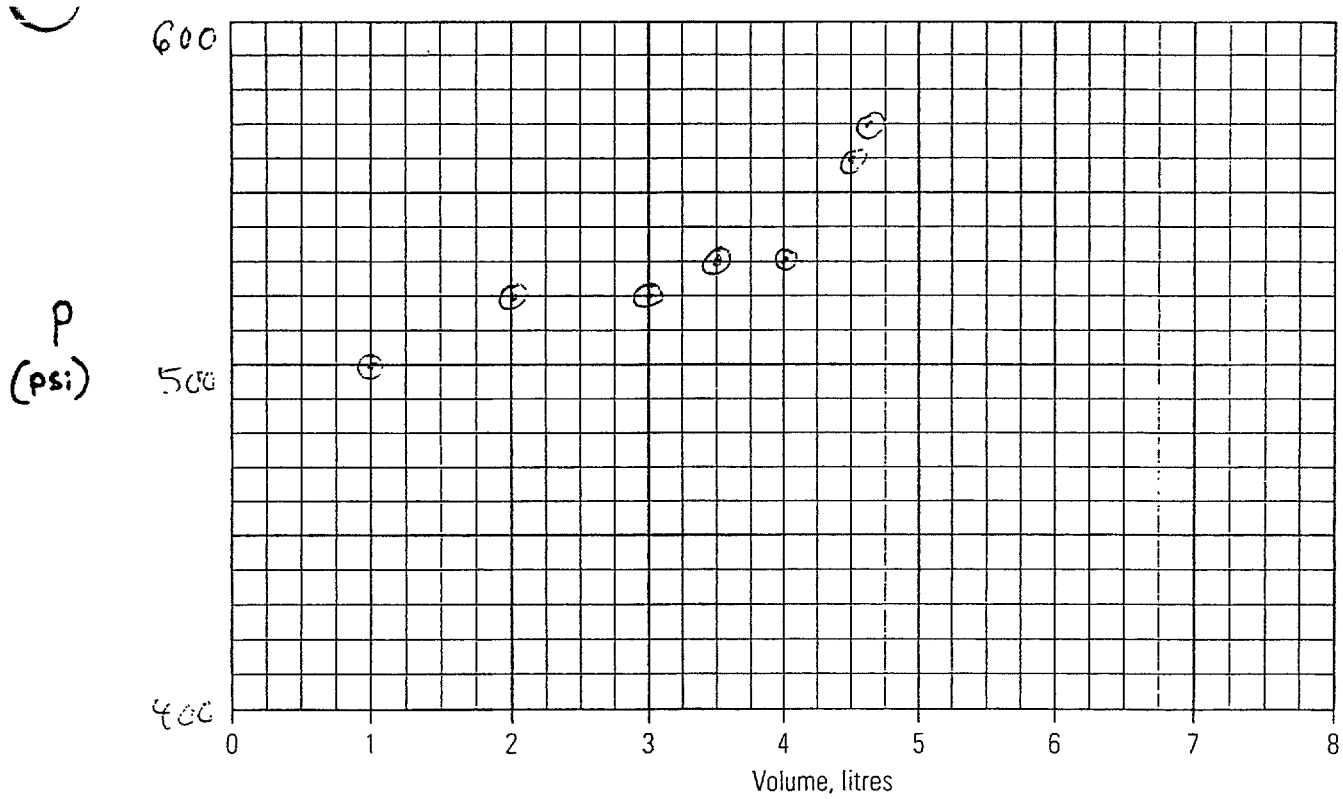
Packer No.: 4, comp 15 Serial No.: 13243 Depth (ft / m): 907.79 Inflation Tool No.: TI-w 1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.65	4.4			
Pressure, psi	500	520	520	530	530	560	570	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #4

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 6/03

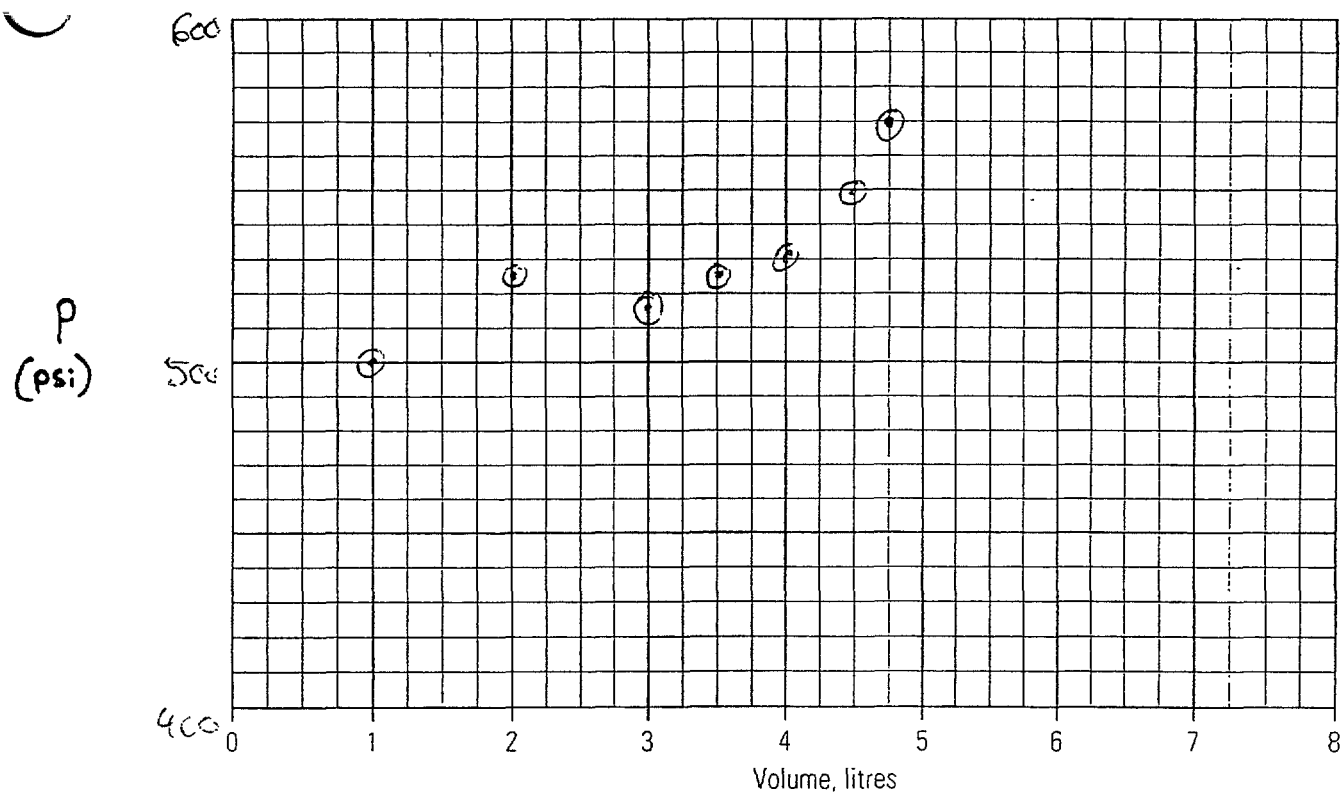
Packer No.: 5, comp19 Serial No.: 13244 Depth (ft/m): 887.73 Inflation Tool No: TIW1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.45			
Pressure, psi	500	525	515	525	530	550	570	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #5

Sheet 7 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Da 6/03

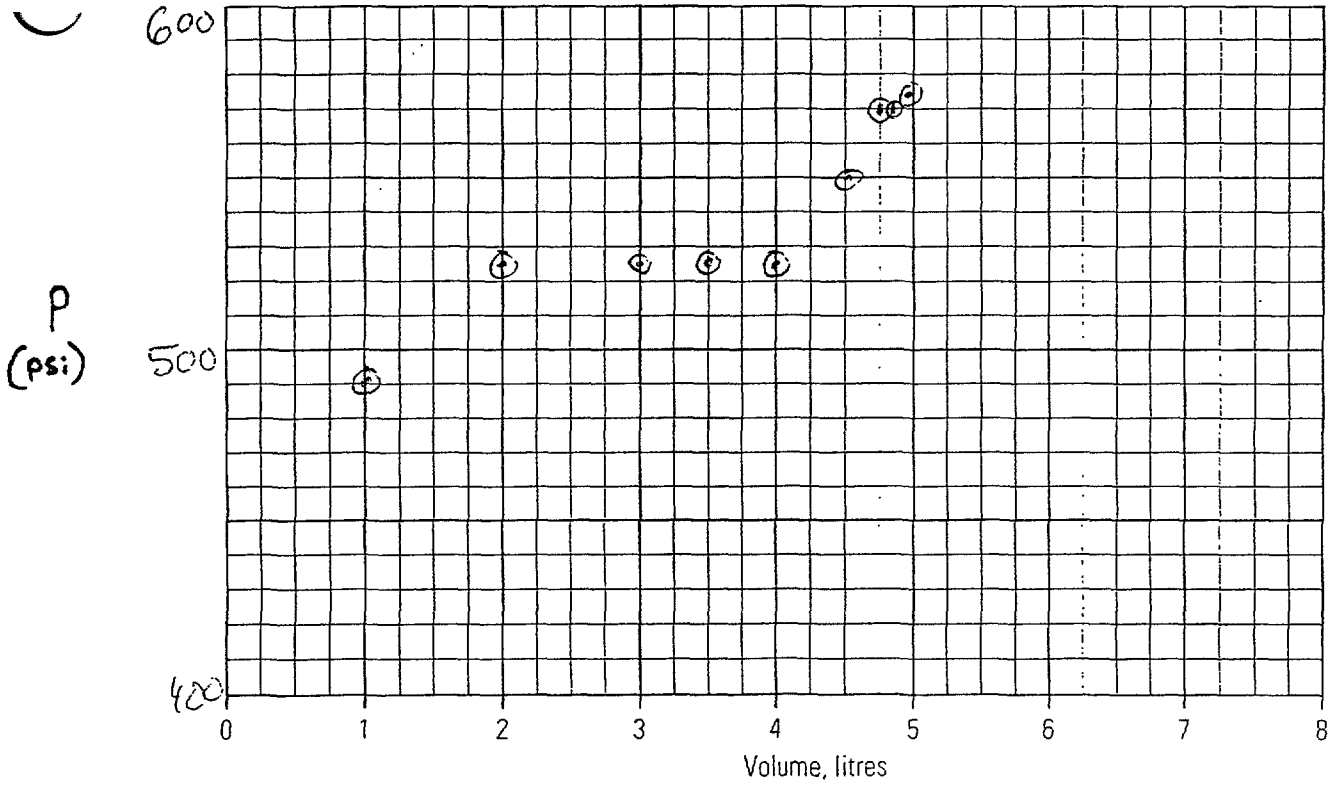
Packer No.: 6, comp 21 Serial No.: 13245 Depth (ft / m): 877.71 Inflation Tool No.: TIW1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_C = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.85	4.95	4.55	
Pressure, psi	490	525	525	525	525	550	570	570	575	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #6

Sheet 8 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

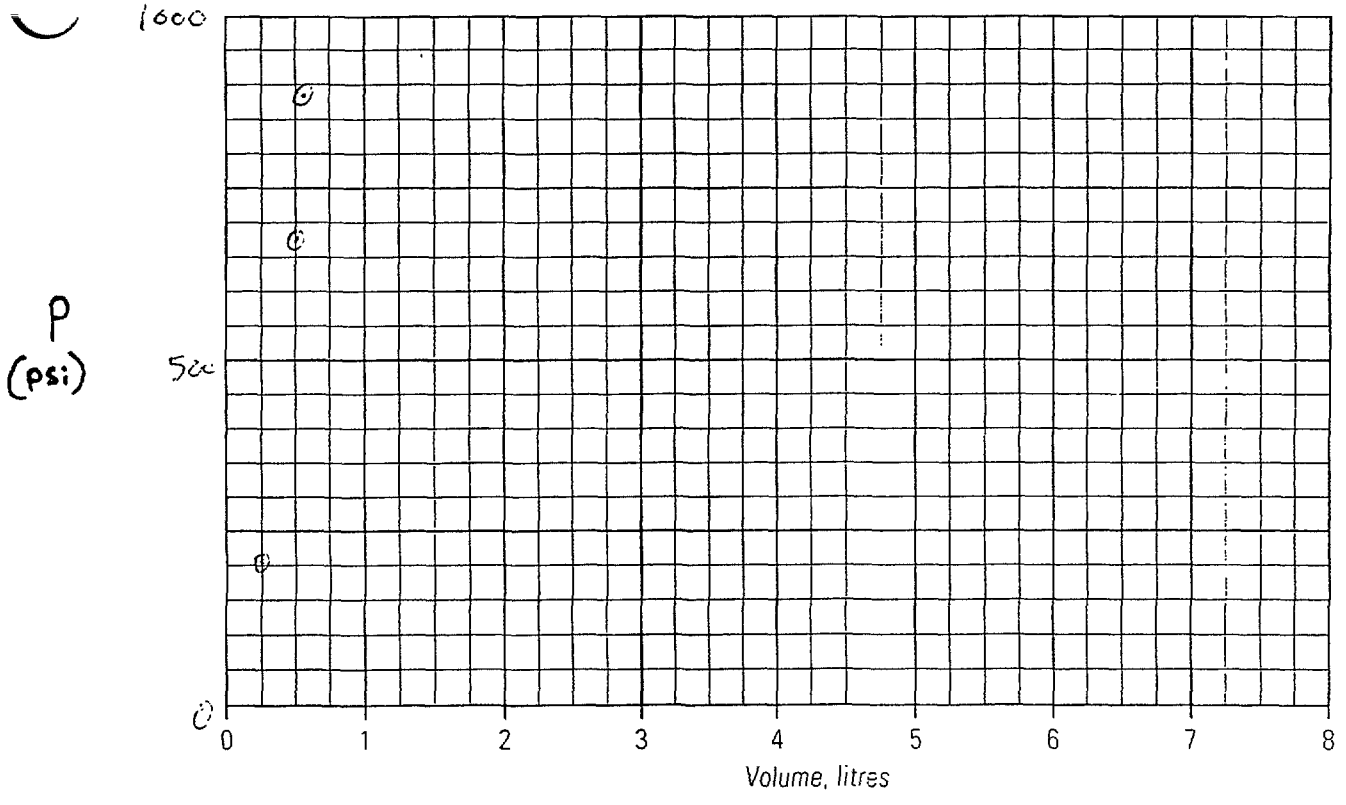
Packer No.: BWT Serial No.: n/a Depth (ft/m): ≈ 840. Inflation Tool No.: TIW10X8

Packer Valve Pressure, P_V: n/a psi Final Line Pressure, P_L: 880 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 8.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ _____ psi

Volume, litres	.25	.50	.60	.30							
Pressure, psi	210	675	880	Ø							
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments BWT

Sheet 9 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

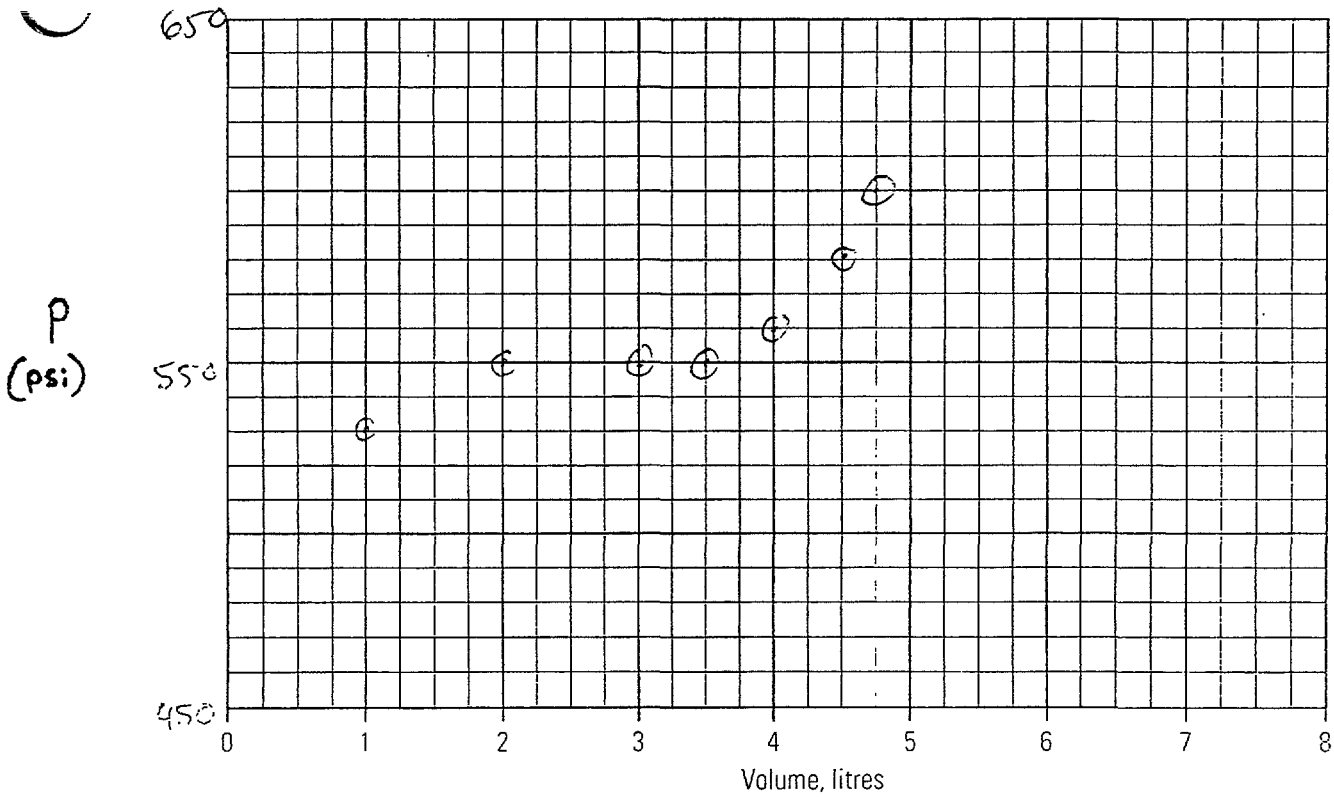
Packer No.: 7, comp 31 Serial No.: 13246 Depth (ft / m): 787.53 Inflation Tool No.: TIW1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.5			
Pressure, psi	530	550	550	550	560	580	600	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #7

Sheet 10 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

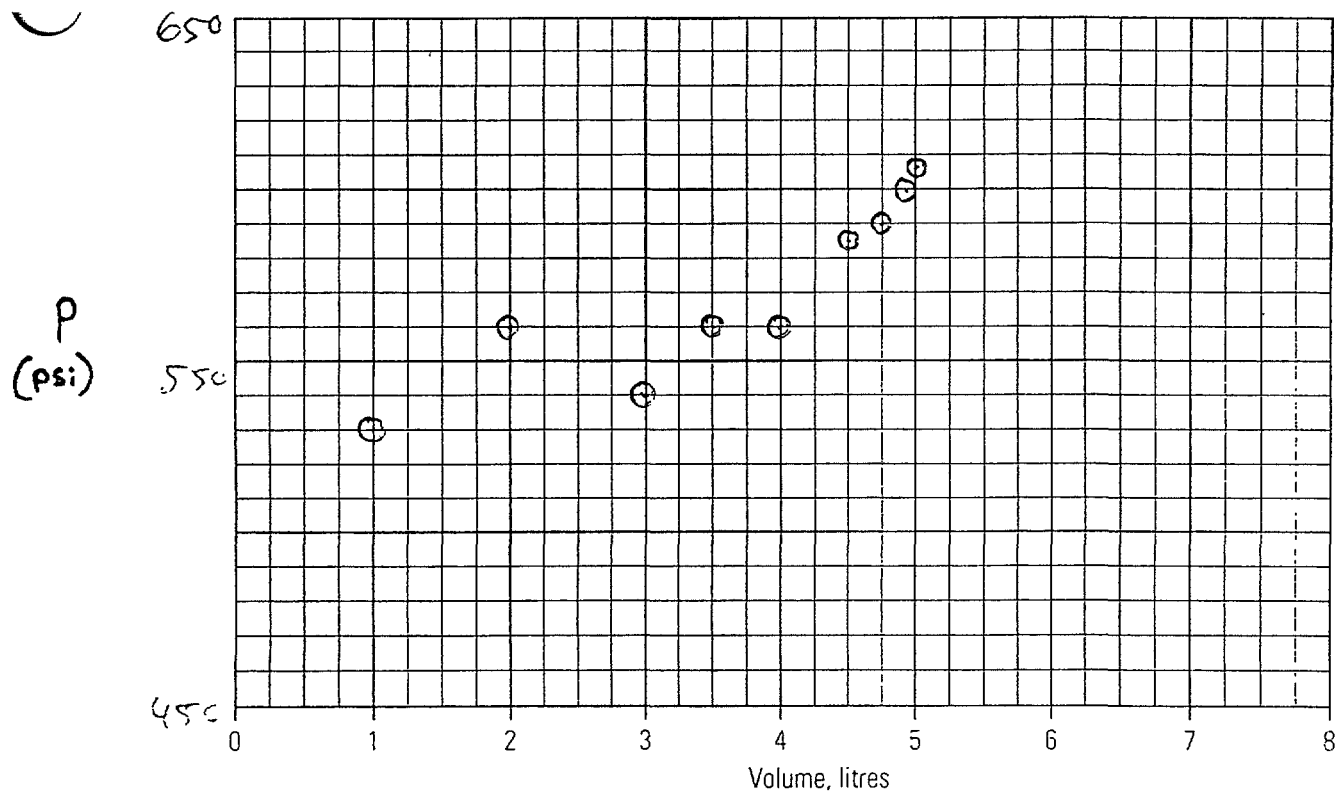
Packer No.: 8, comp 35 Serial No.: 13247 Depth (ft/m): 767.48 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 605 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 8.3 (ft/m) = 3.5 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.90	5.0	4.75	
Pressure, psi	530	560	540	560	560	585	590	600	605	∅	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #8

Sheet 11 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

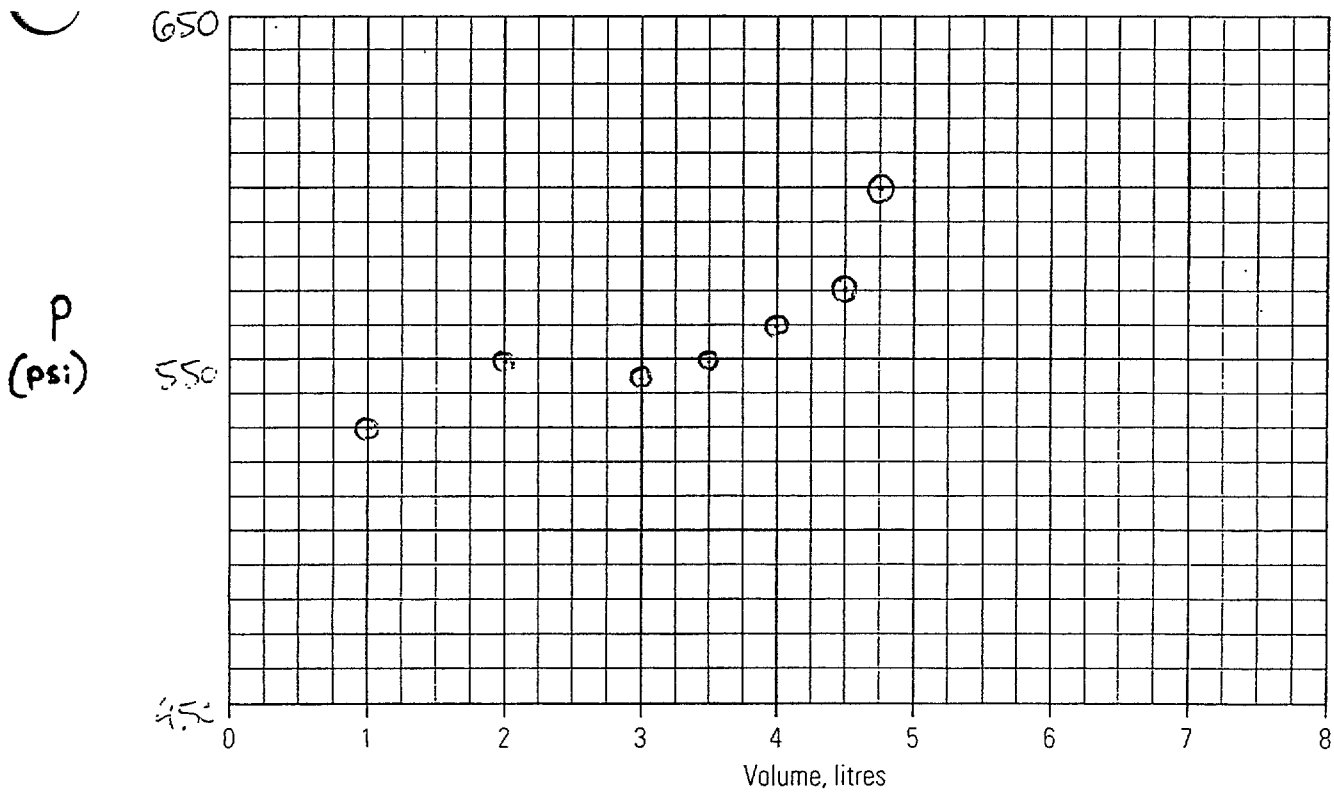
Packer No.: 9, comp 37 Serial No.: 13325 Depth (ft/m): 757.45 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T 350 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.5			
Pressure, psi	530	550	545	550	560	570	600	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer # 9

Sheet 12 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

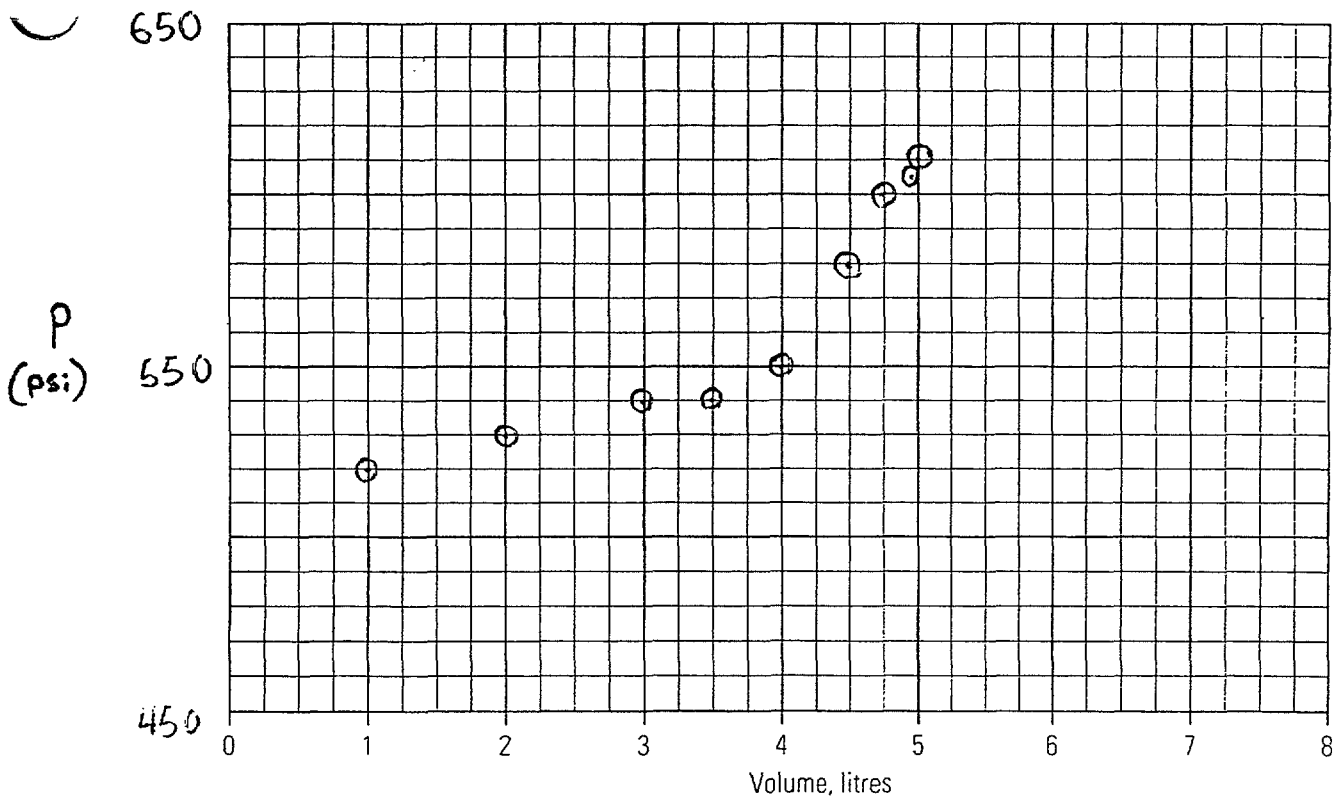
Packer No.: 10 comp 47 Serial No.: 13323 Depth (ft/m): 667.26 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 610 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	5.0	4.65	
Pressure, psi	520	530	540	540	550	580	600	605	610	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #10

Sheet 13 of 26

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML / DS Date Inflated: Dec 07 / 03

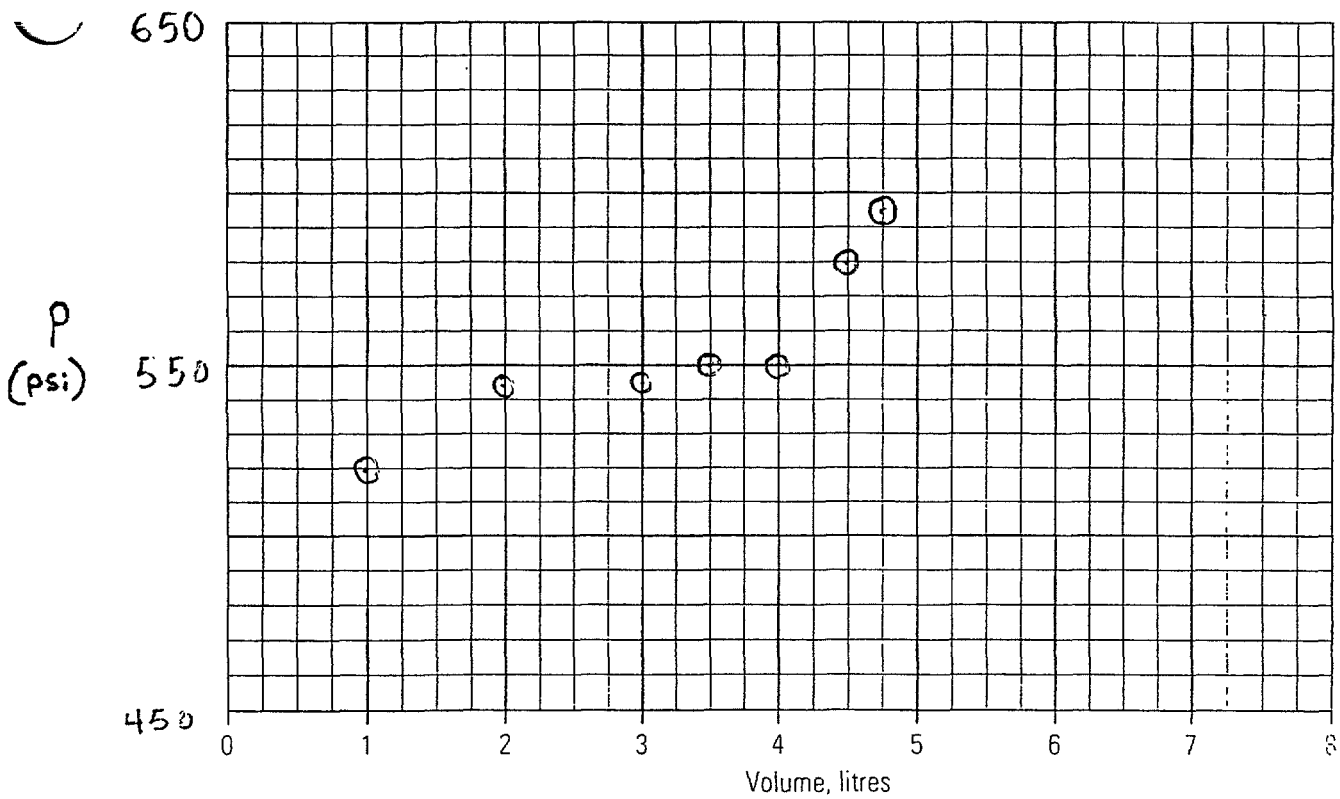
Packer No.: 11 comp 51 Serial No.: 13324 Depth (ft or m): 647.22 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft or m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.5			
Pressure, psi	520	545	545	550	550	580	595	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #11

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML / DS Date Inflated: Dec 7/03

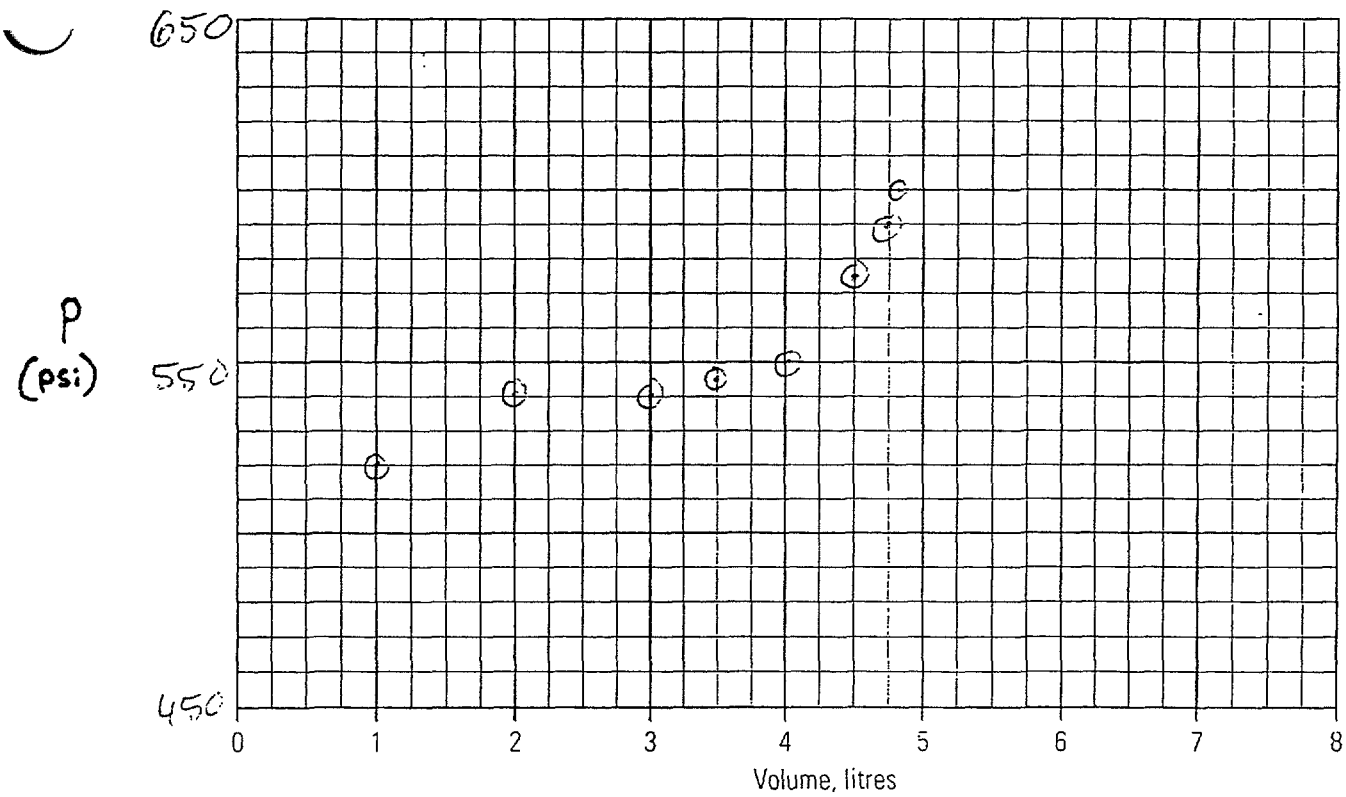
Packer No.: 12, comp 53 Serial No.: 13322 Depth (ft / m): 637.19 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.85	4.5		
Pressure, psi	520	540	540	595	550	575	590	600	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #12

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

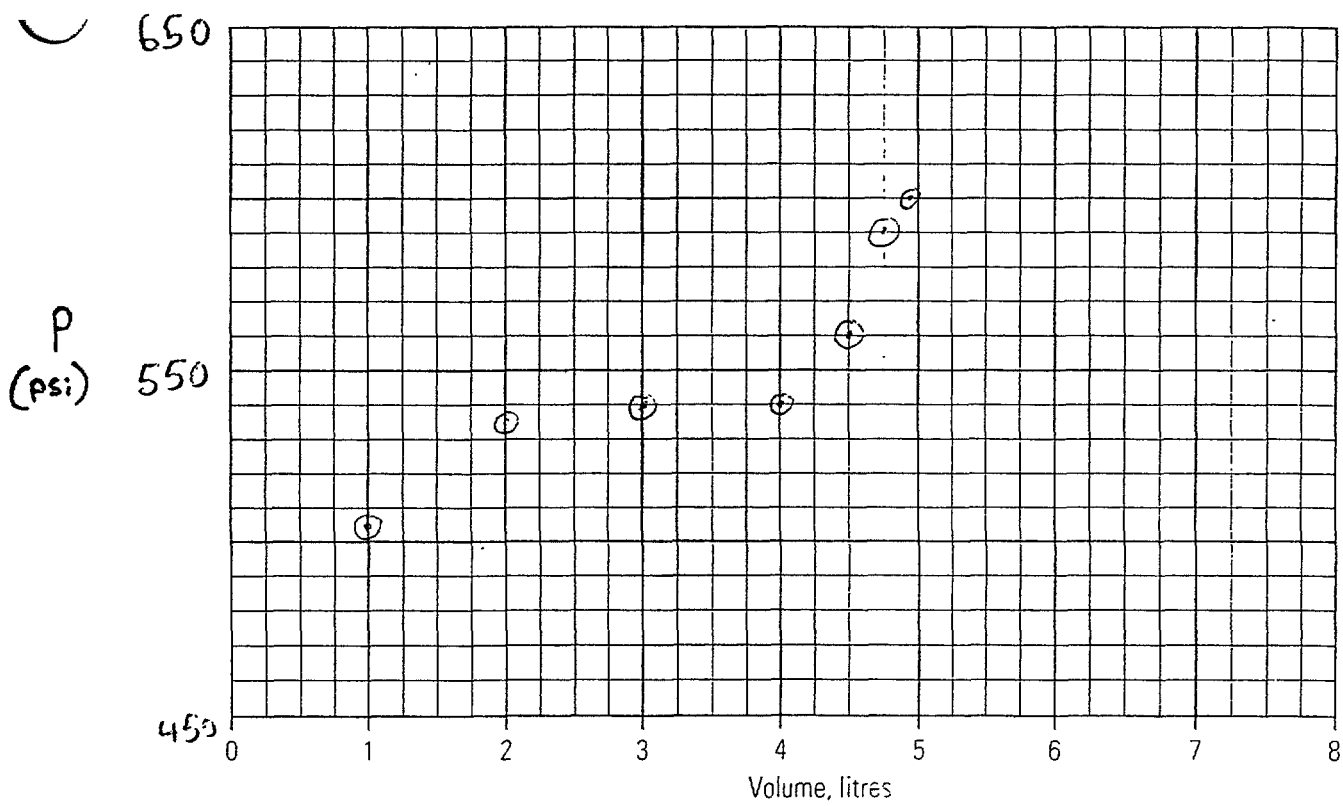
Packer No.: 13, comp60 Serial No.: 13327 Depth (ft/m): 572.07 Inflation Tool No.: TFW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 11.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	~~4.0~~ 3.5	4.0	4.5	4.75	4.9	4.55		
Pressure, psi	505	535	540	540	540	560	590	600	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #13

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

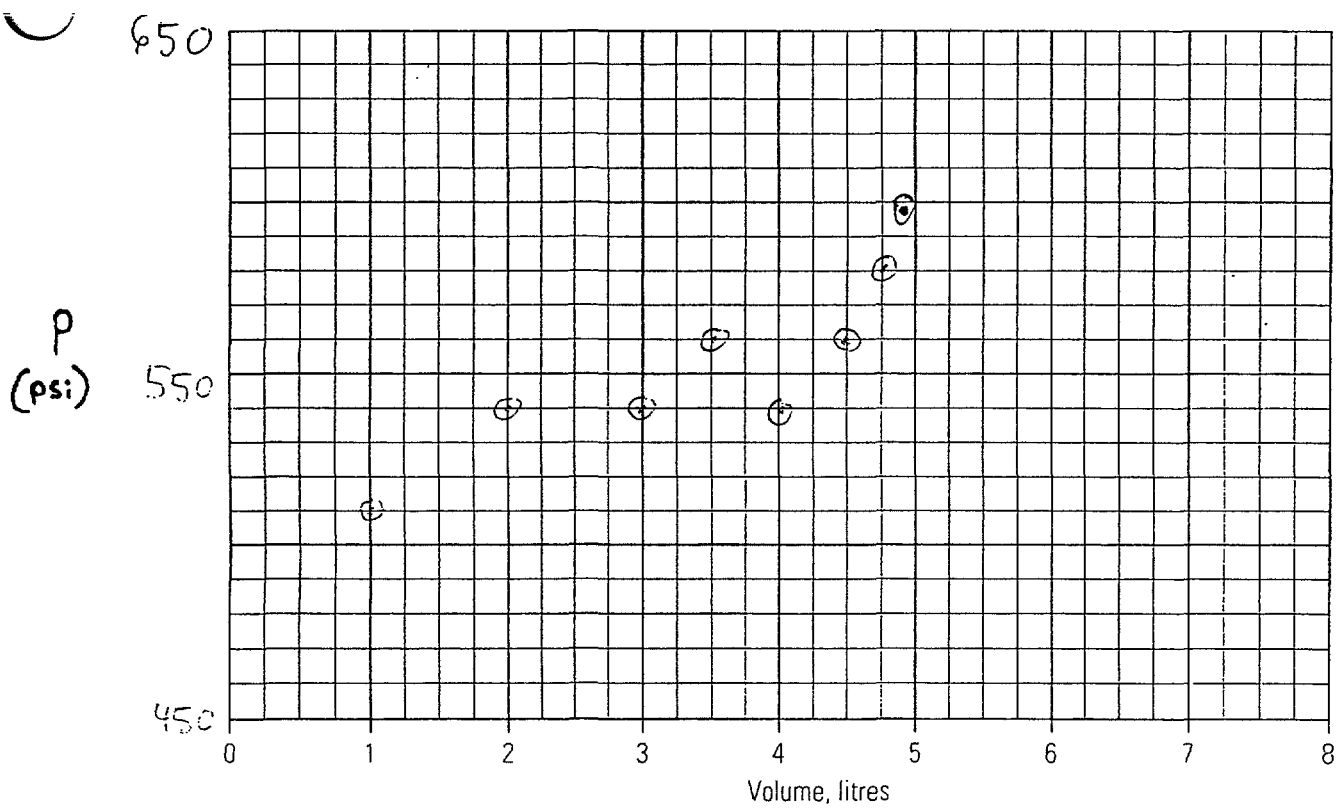
Packer No.: 14, comp 64 Serial No.: 13326 Depth (ft / m): 552.03 Inflation Tool No.: TIW-1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: N/A (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	4.5		
Pressure, psi	510	540	540	560	540	560	580	595	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #14

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML / DS Date Inflated Dec 7/03

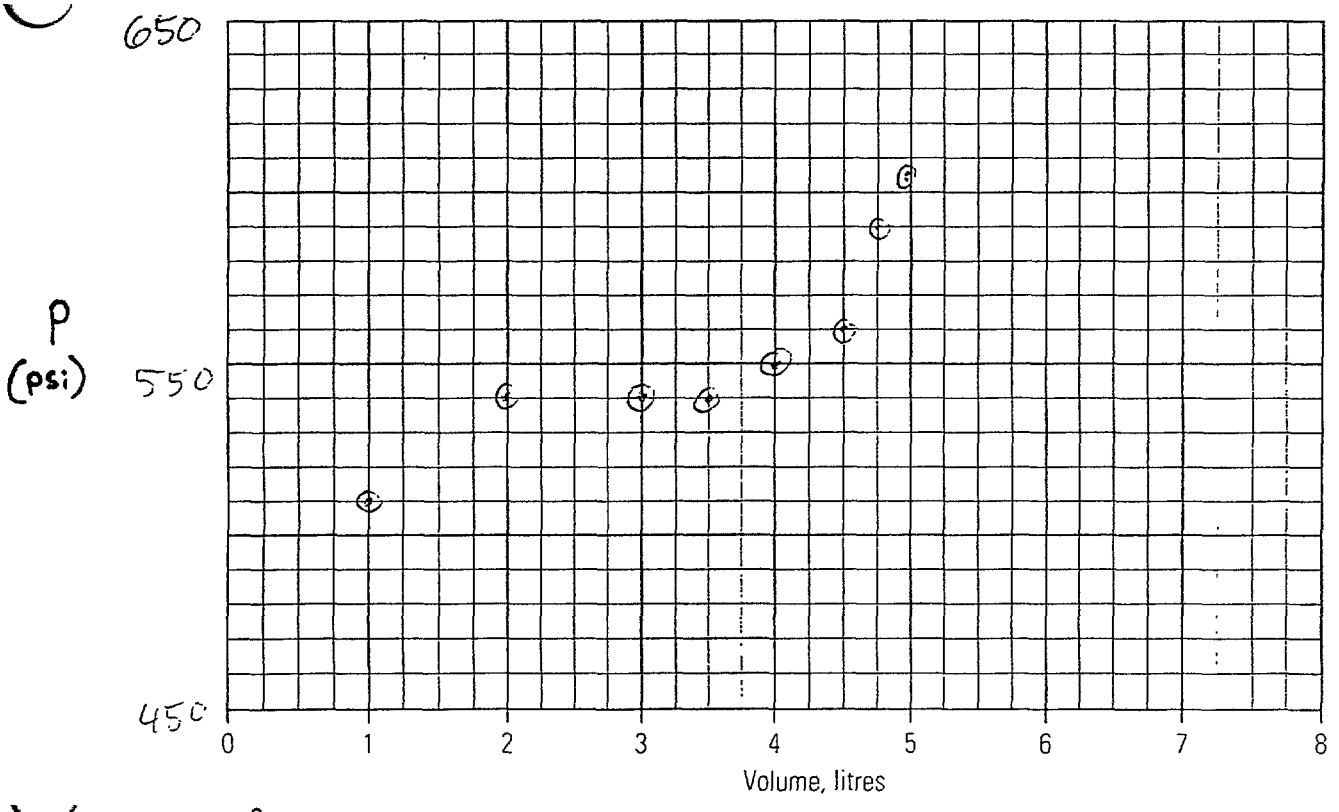
Packer No.: 15, comp 66 Serial No.: 13328 Depth (ft / m): 542.00 Inflation Tool No.: TFW 0088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: _____ psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	4.55		
Pressure, psi	510	540	540	540	550	560	590	605	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #15

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

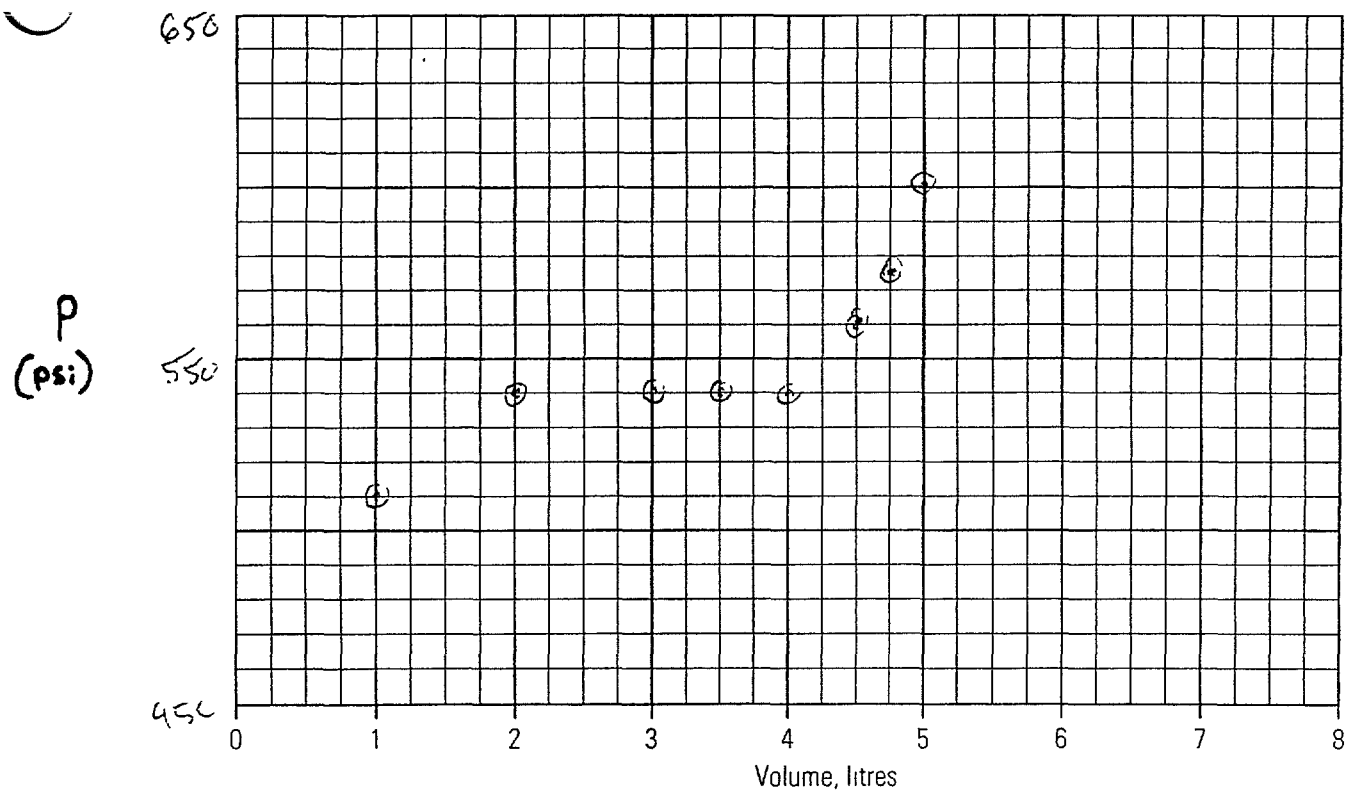
Packer No.: 16, co-p 82 Serial No.: 13329 Depth (ft/m): 402.70 Inflation Tool No: IFW.088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 660 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	5.0	4.6		
Pressure, psi	510	540	540	540	540	560	575	600	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #16

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

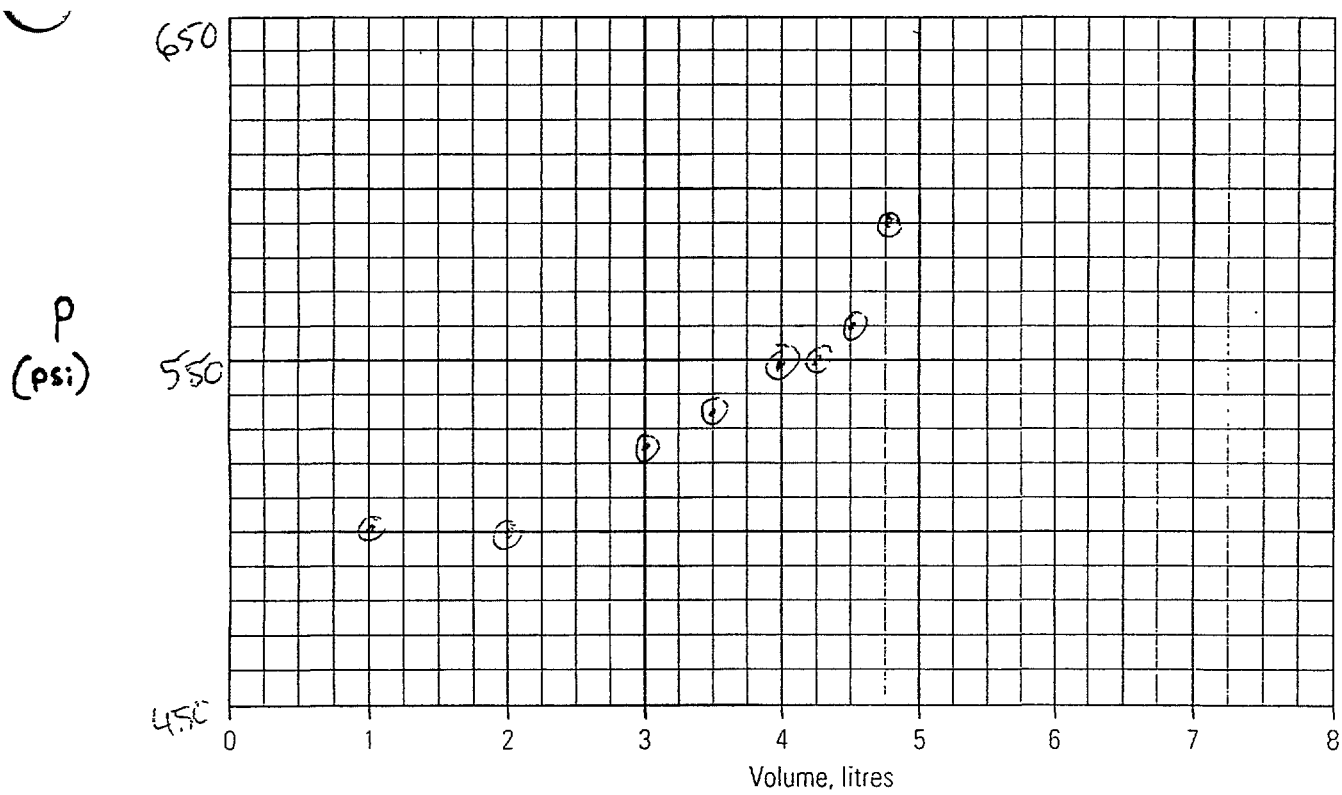
Packer No.: 17.comp86 Serial No.: 13340 Depth (ft / m): 382.65 Inflation Tool No.: TFW1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 8.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_C = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.25	4.5	4.75	4.85	4.5	
Pressure, psi	500	500	525	535	550	550	560	590	595	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #17

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

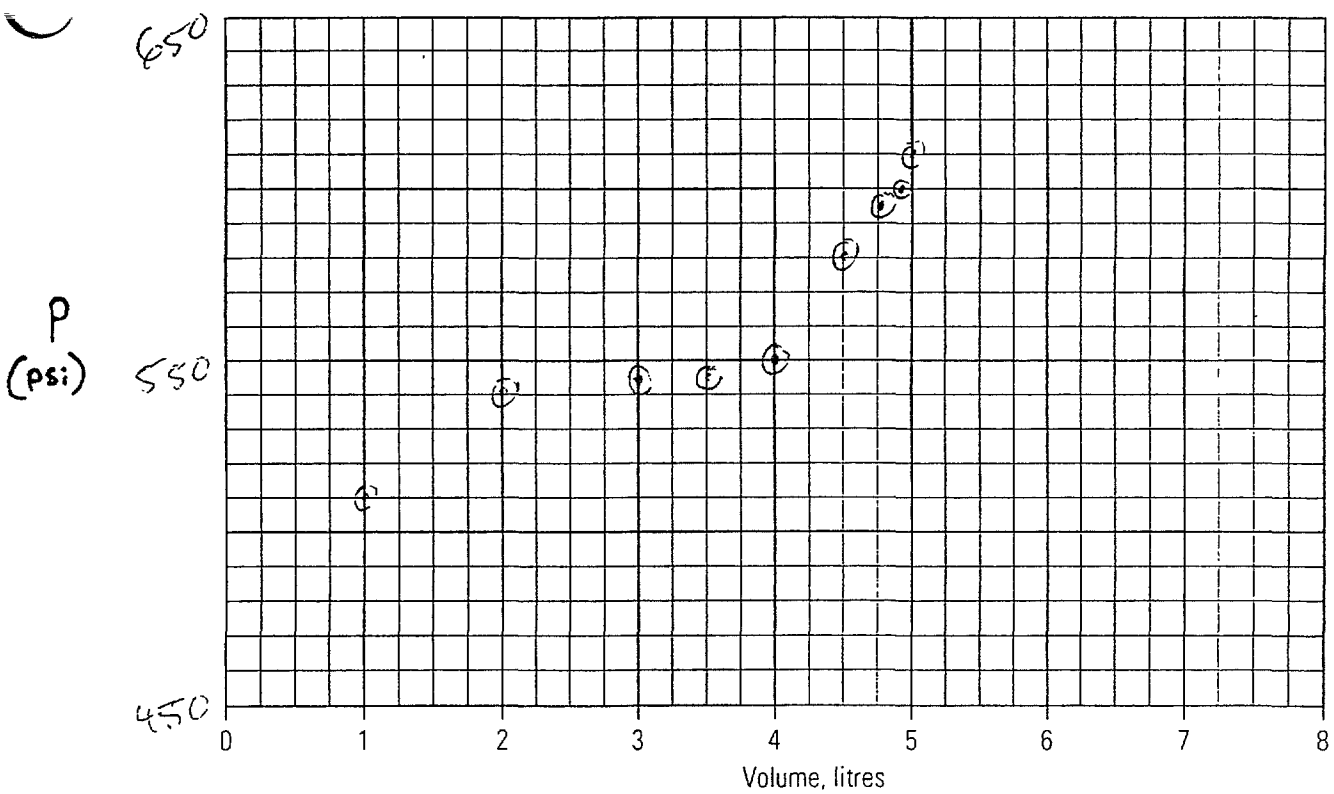
Packer No. 18/comp 88 Serial No.: 13255 Depth (ft/m): 372.62 Inflation Tool No.: TIm1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 610 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	5.0	4.6	
Pressure, psi	510	540	545	545	550	580	595	600	610	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #18

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML / DS Date Inflated: Dec 7/03

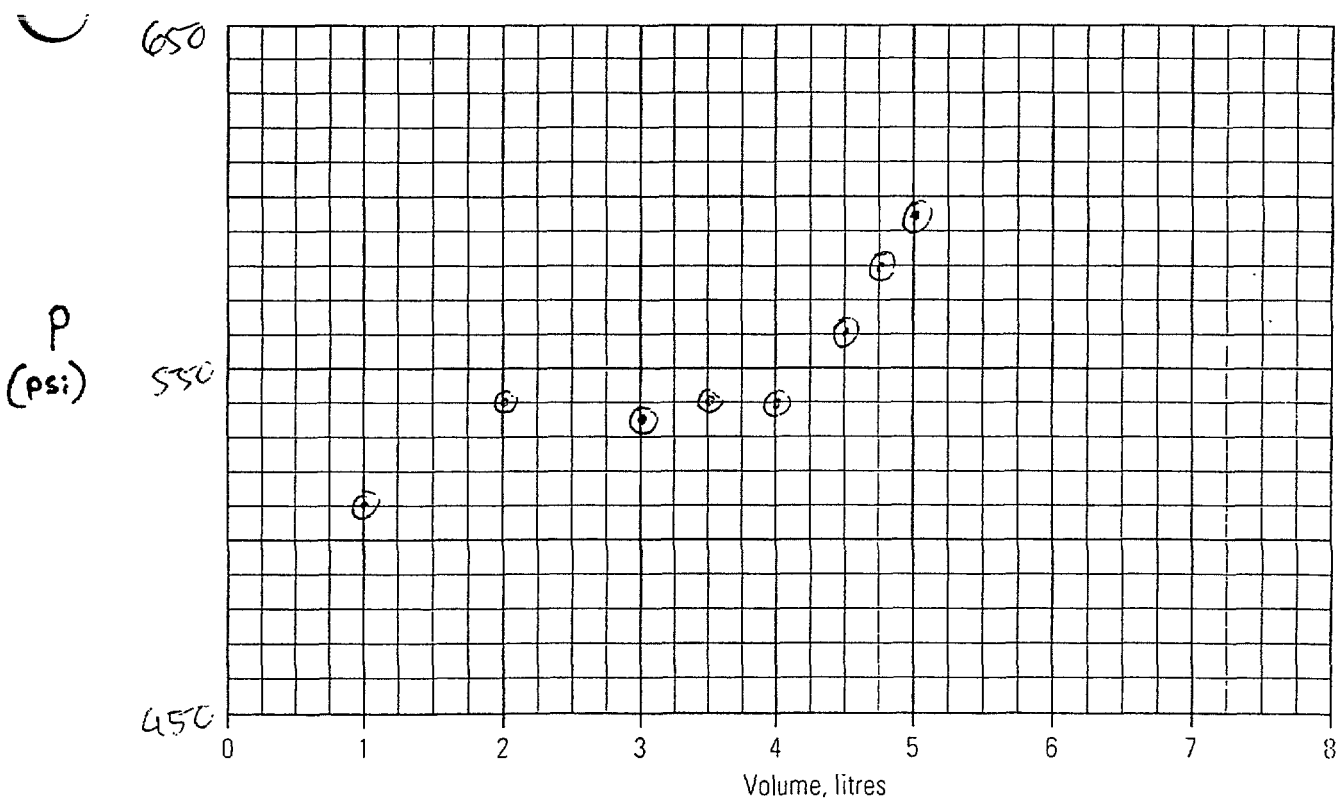
Packer No.: 19, camp99 Serial No.: 13254 Depth (ft / m): 272.75 Inflation Tool No.: TIW1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 145 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	5.0	4.65		
Pressure, psi	510	540	535	540	540	560	580	595	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #19

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML / DS Date Inflated: Dec 7/03

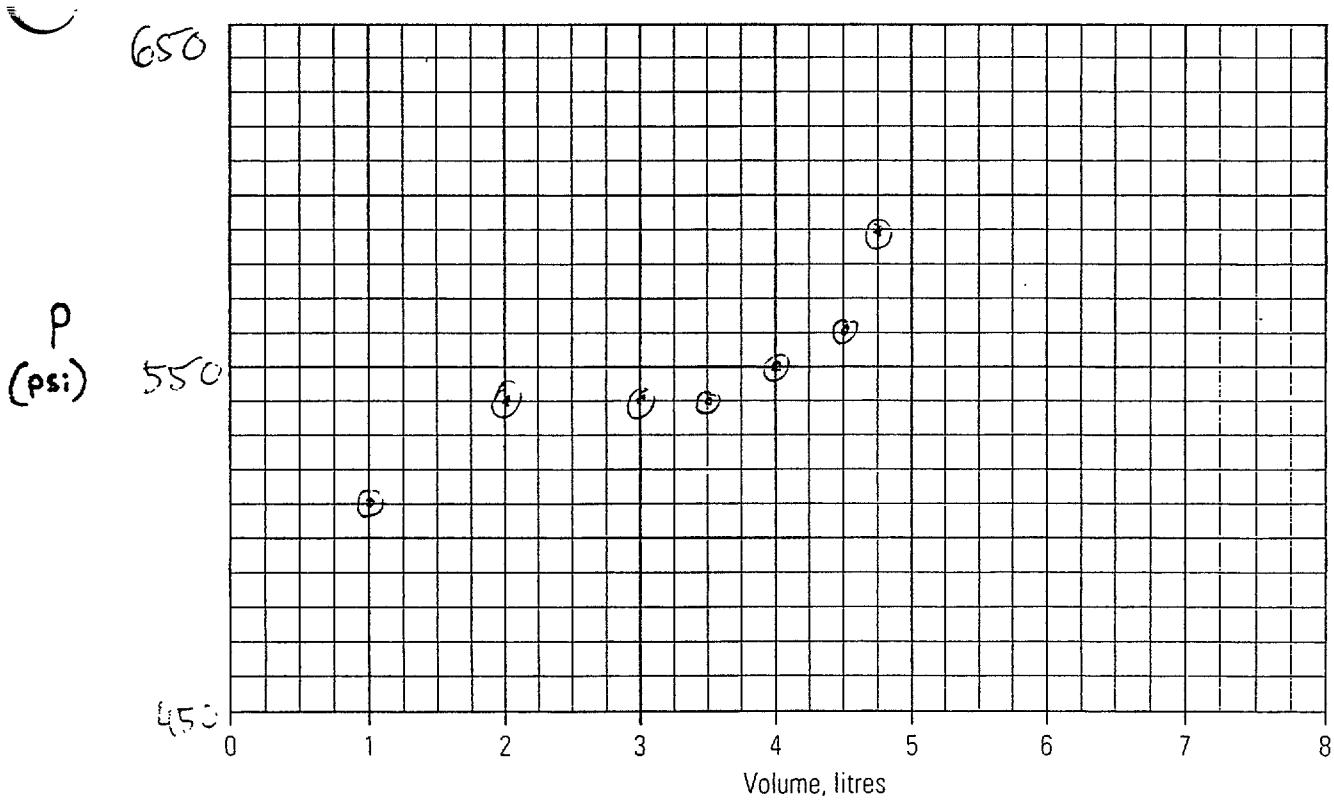
Packer No.: 20, comp 103 Serial No.: 13251 Depth (ft / m): 252.40 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	4.5		
Pressure, psi	510	540	540	540	550	560	590	600	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #20

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

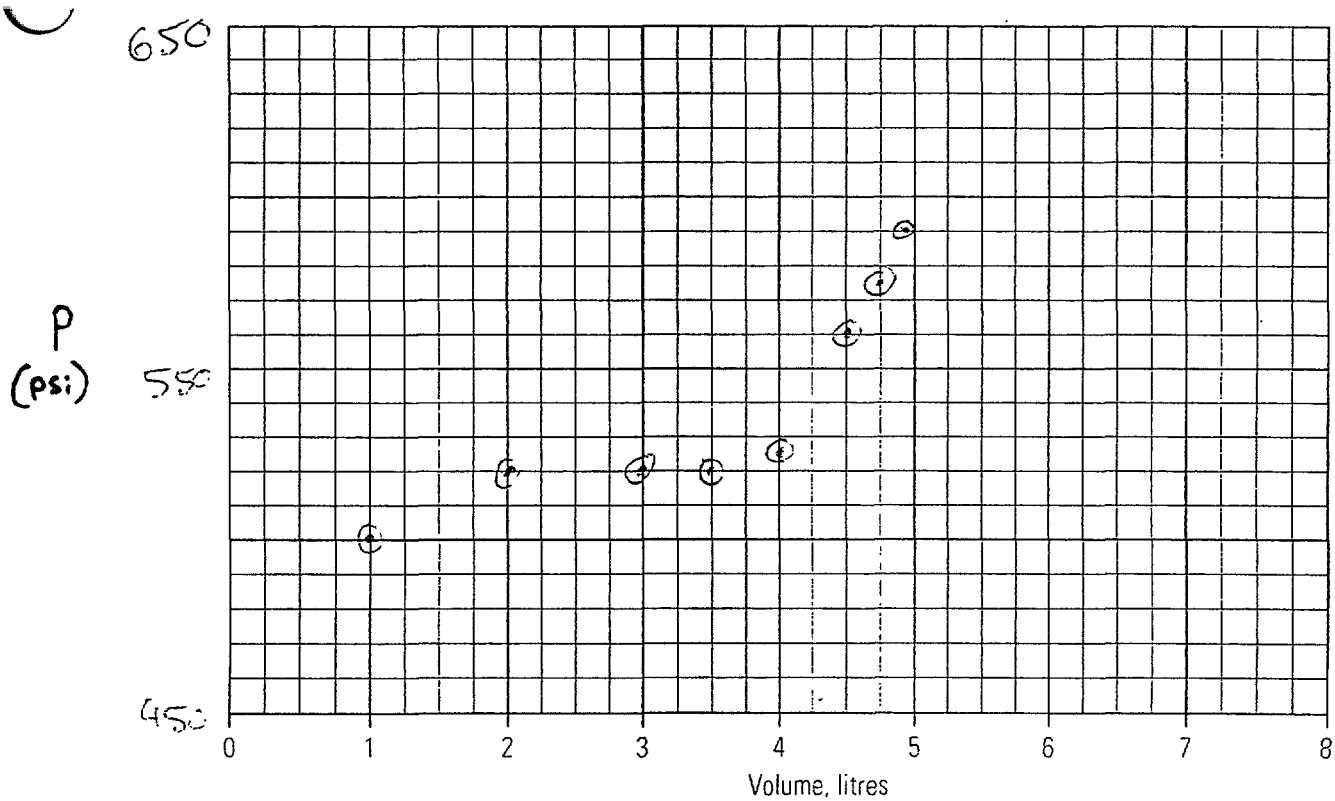
Packer No.: 21 comp105 Serial No.: 13249 Depth (ft / m): 242.37 Inflation Tool No.: TIW1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	5.0	4.7	
Pressure, psi	500	520	520	520	525	560	575	590	600	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #21

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7 03

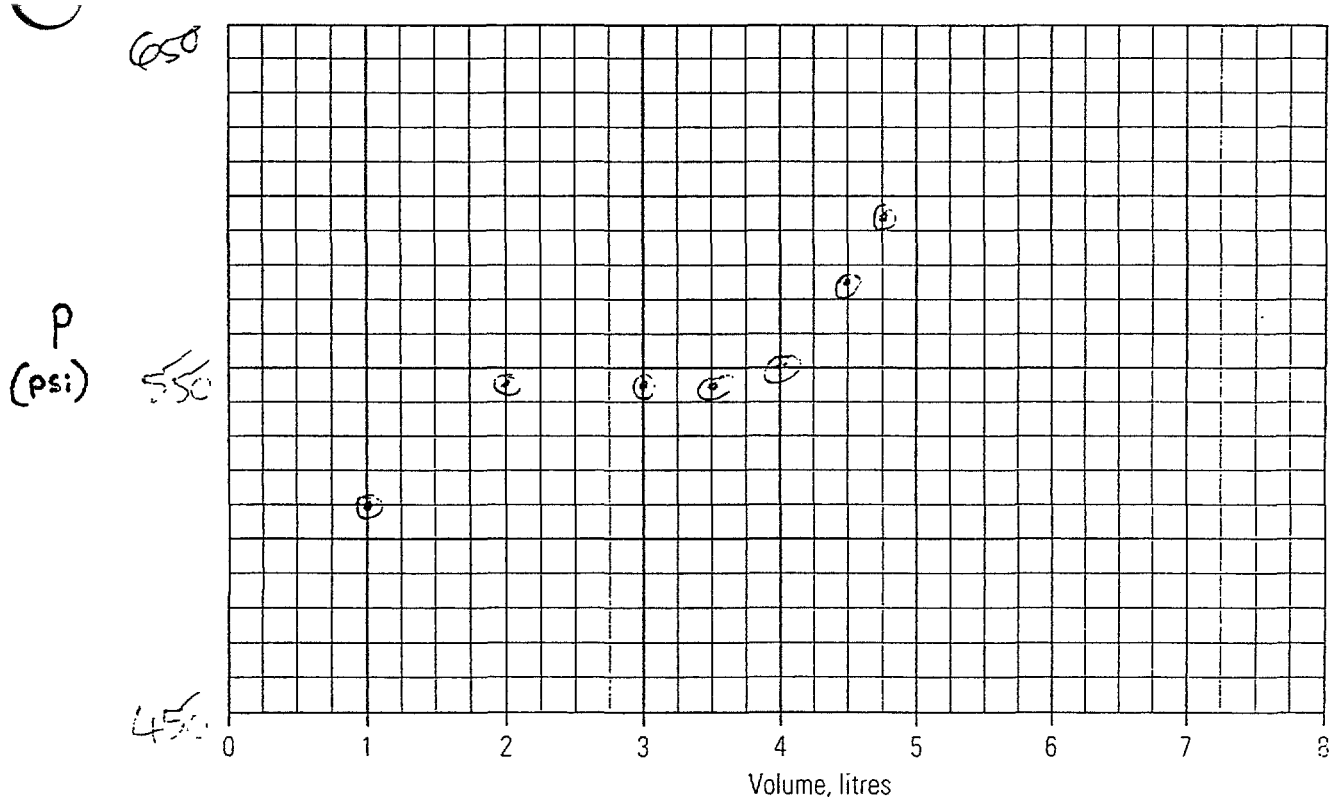
Packer No.: 22 comp 118 Serial No.: 13248 Depth (ft/m): 117.11 Inflation Tool No.: TIW1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 605 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	4.5		
Pressure, psi	510	545	545	545	550	575	590	605	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #22

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

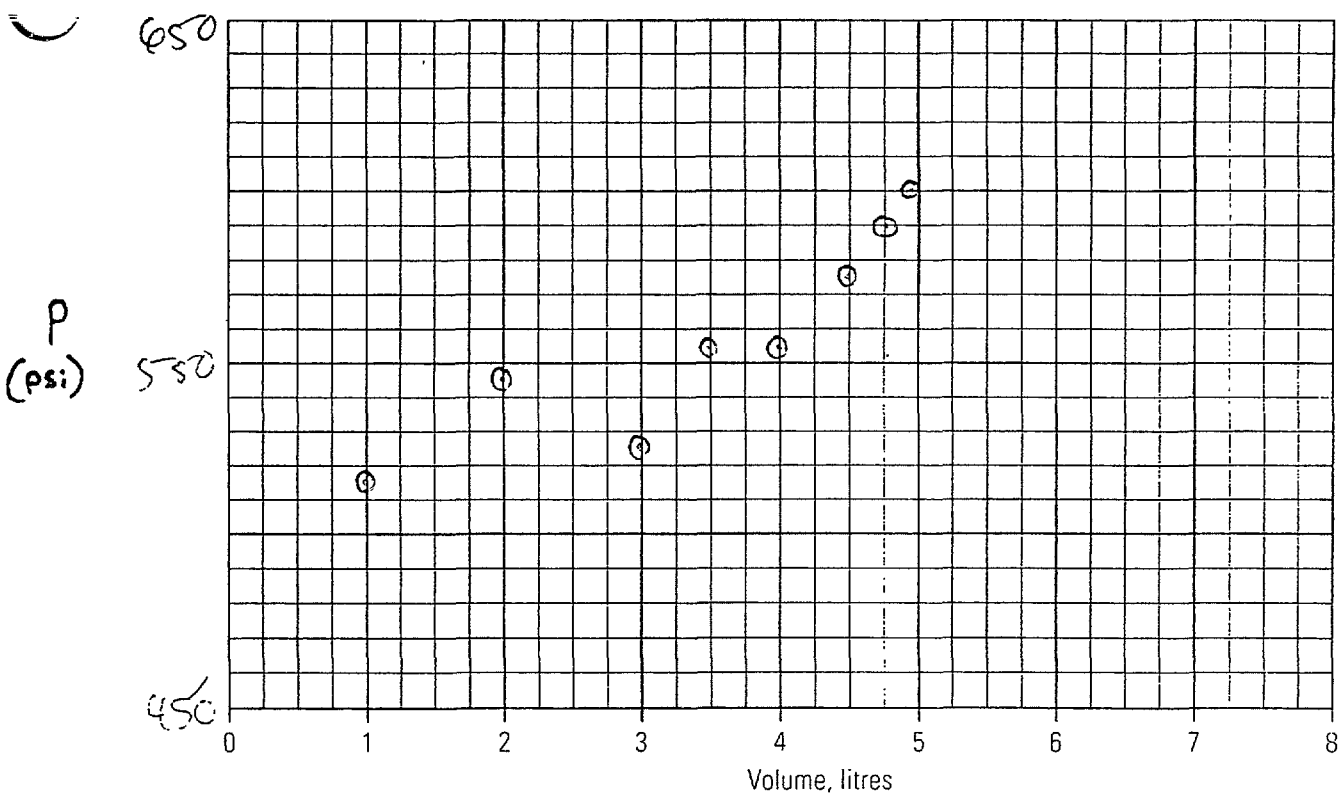
Packer No.: 23 comp 122 Serial No.: 13252 Depth (ft / m): 97.06 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 350 psi

Borehole Water Level: 11.3 (ft / m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.90	4.6		
Pressure, psi	515	545	525	555	555	575	590	600	∅		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #23

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-4

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 7/03

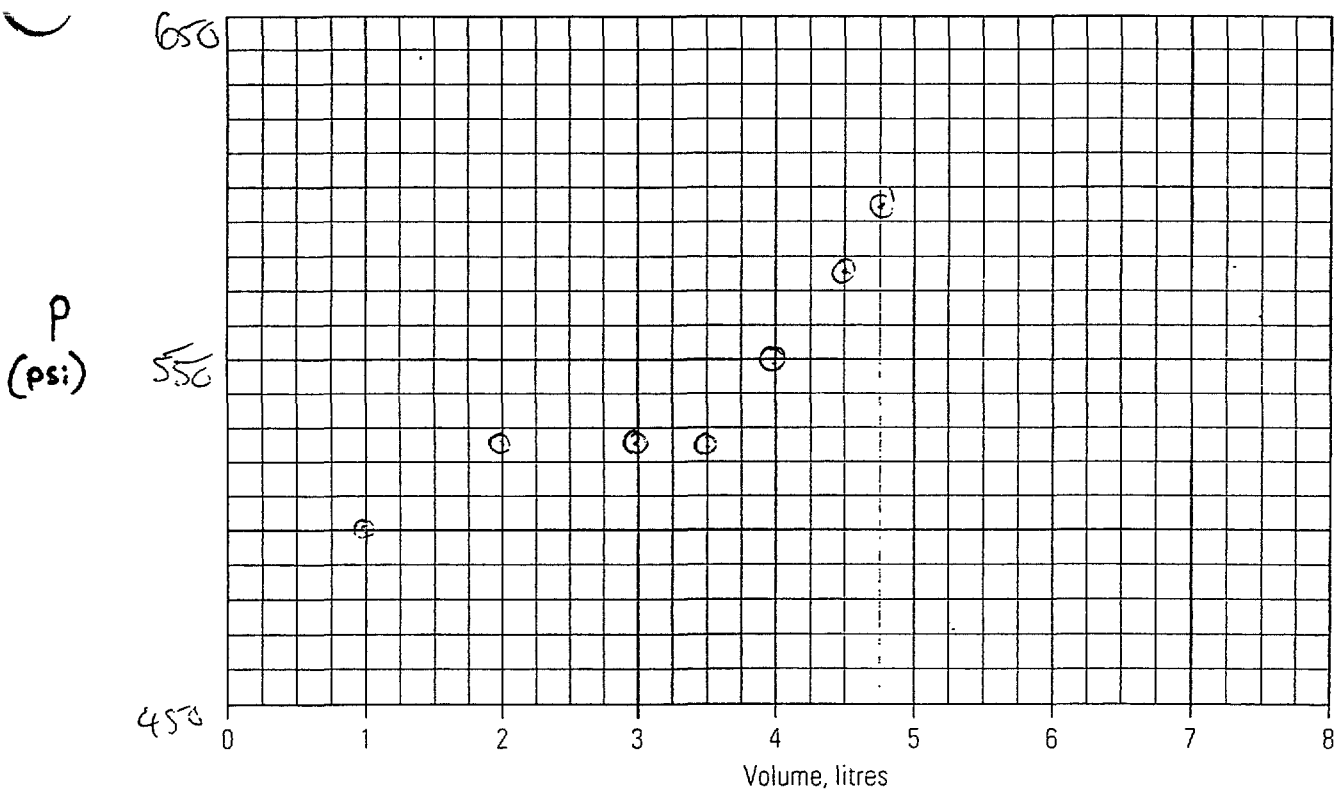
Packer No.: 24, comp 24 Serial No.: 13361 Depth (ft/m): 87.04 Inflation Tool No.: TFW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 358 psi

Borehole Water Level: 81.3 (ft/m) = 35 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 150 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.5			
Pressure, psi	500	525	525	525	550	575	595	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer # 24

APPENDIX 2

Monitoring Well LMW-5

Summary Casing Log	- 6 pages
Figure 1-2, Pre-Inflation Pressure Profile	- 2 pages
Pre-inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet	- 2 pages
Figure 3-4, Piezometric Pressure Profile	- 2 pages
Piezometric Pressure/Levels	
Field Data and Calculation Sheet	- 2 page
Casing Installation Log (field copy)	- 12 pages
MP Packer Inflation Records	- 29 pages

Summary Casing Log

Company: Beylik Drilling Inc.
Well: LMW-5
Site: San Bernardino
Project:

Job No: WB764
Author: ML / AB / DS

Well Information

Reference Datum:
Elevation of Datum: 0.00 ft.
MP Casing Top: 0.00 ft.
MP Casing Length: 903.22 ft.

Borehole Depth: 905.00 ft.
Borehole Inclination:
Borehole Diameter: 0.00 in.

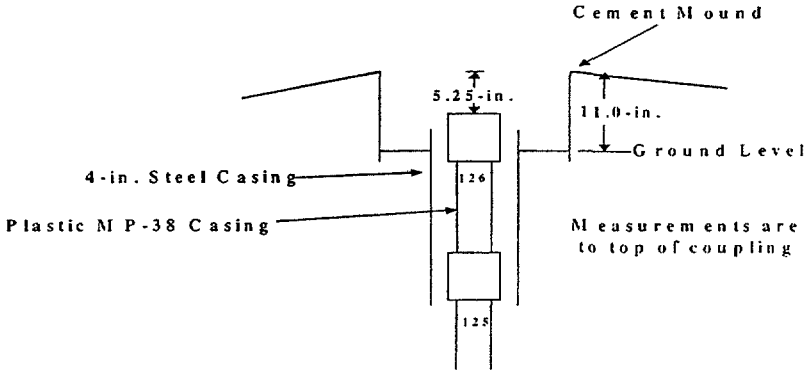
Well Description:
MP-38
Other References:

File Information

File Name: LMW-5.WWD
Report Date: Thu Feb 26 16:06:48 2004

File Date: Jan 19 14:40:15 2004

Sketch of Wellhead Completion



Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Legend

(Qty) MP Components

(Library - WD Library 7/27/00)

(3) 0225F02 - MP38 Casing, PVC, 2 ft.

(56) 0225F10 - MP38 Casing, PVC, 10 ft.

(27) 0239F05 - MP38 Packer, Stiffened

(40) 0225F05 - MP38 Casing, PVC, 5 ft.

(1) 0223 - MP38 End Cap

(90) 0202 - MP38 Regular Coupling

(27) 0205 - MP38 Measurement Port

(9) 0224 - MP38 Pumping Port

(9) 0216 - MP38 Magnetic Location Collar

Geology

Backfill/Casing

Concrete

Bentonite

Gravel

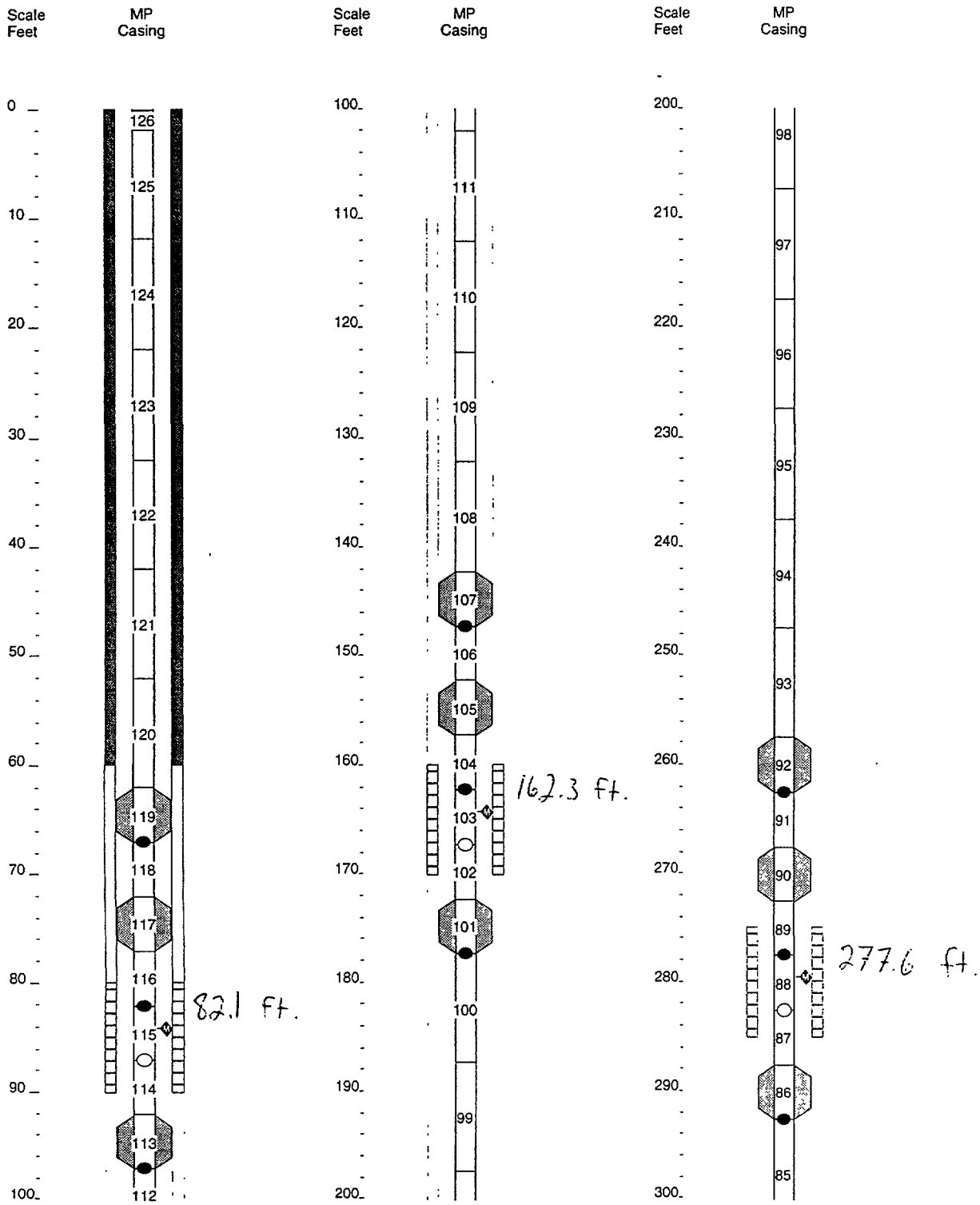
Mild Steel

Stainless Steel

Well Screen

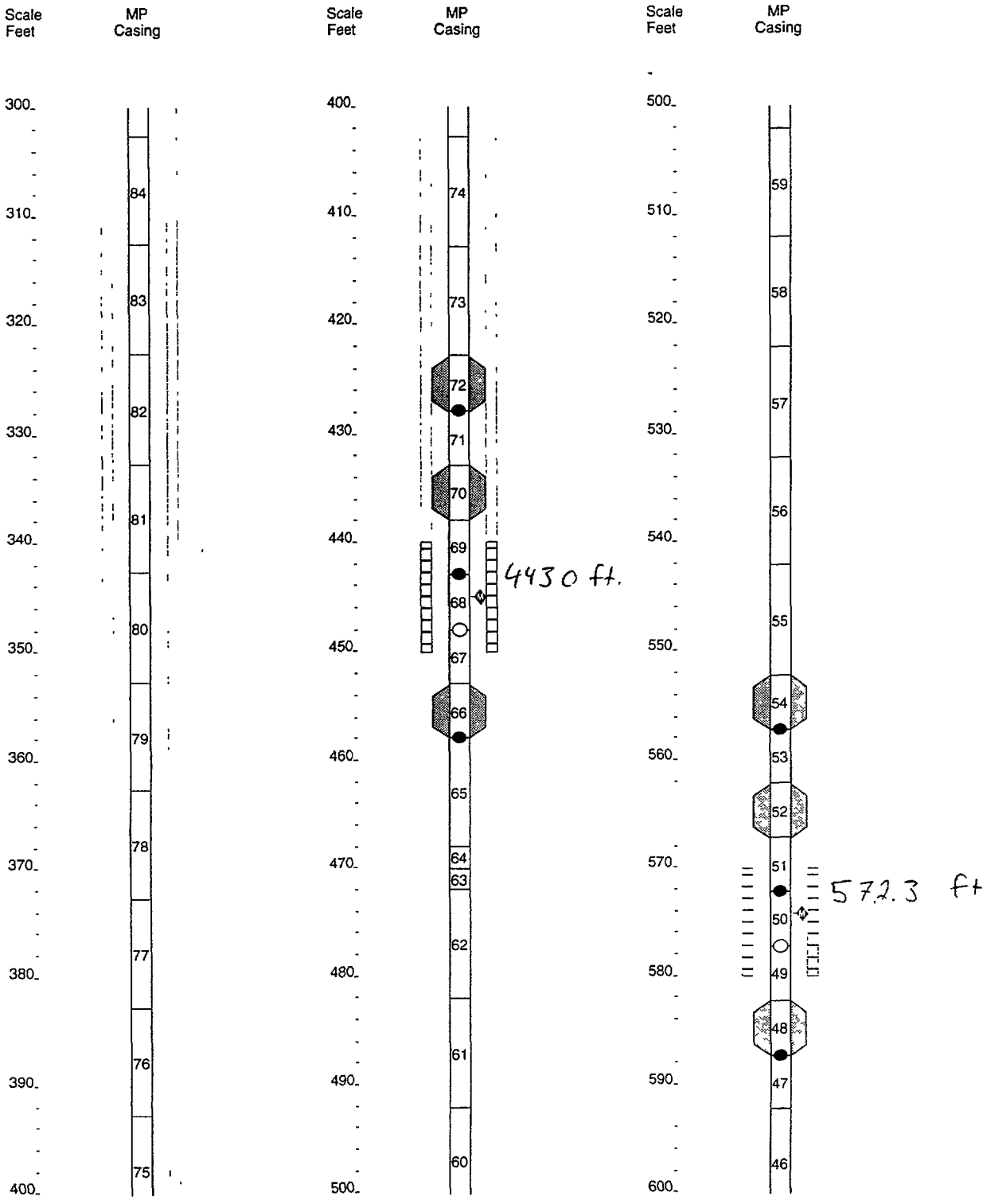
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5



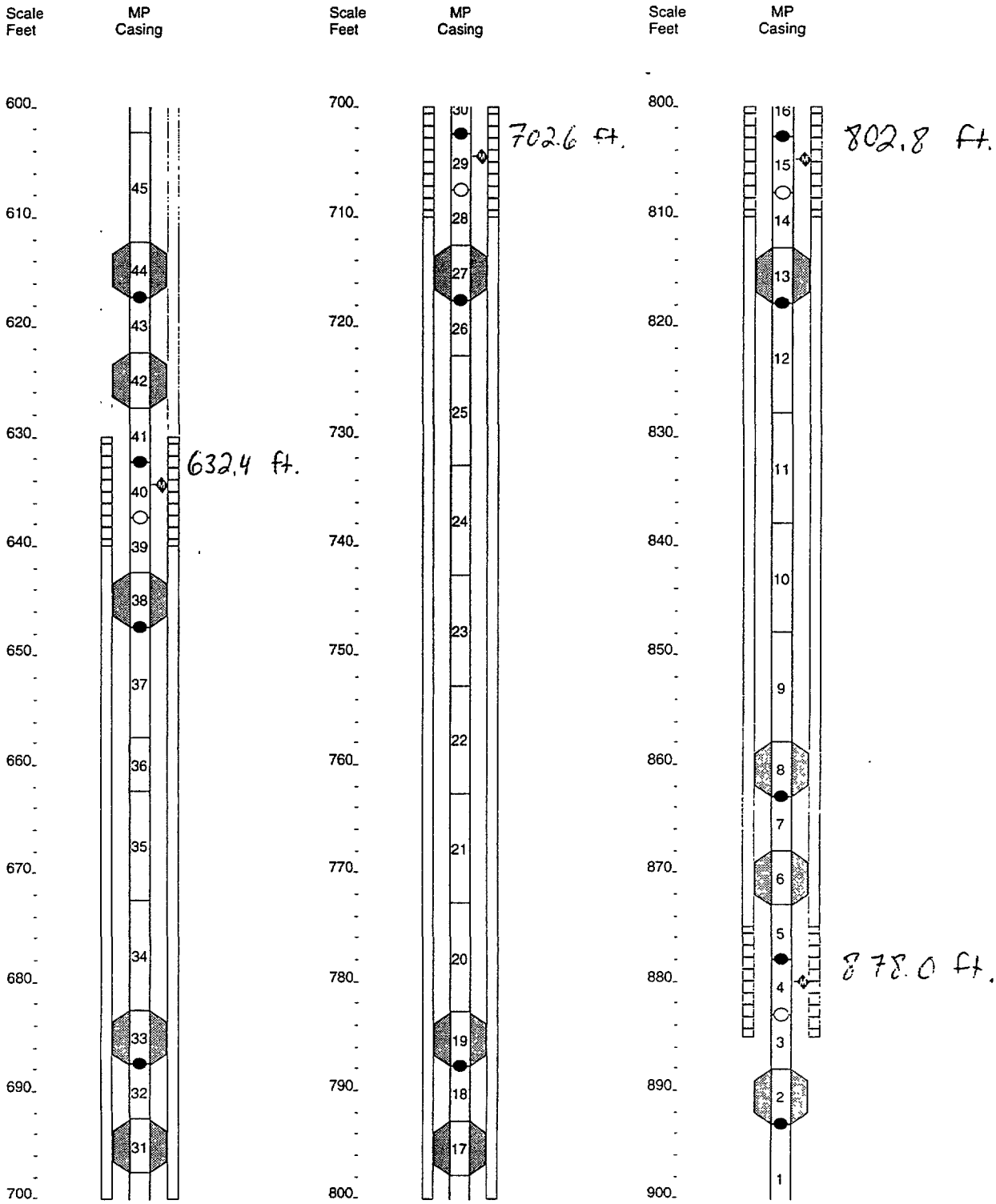
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5



Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5



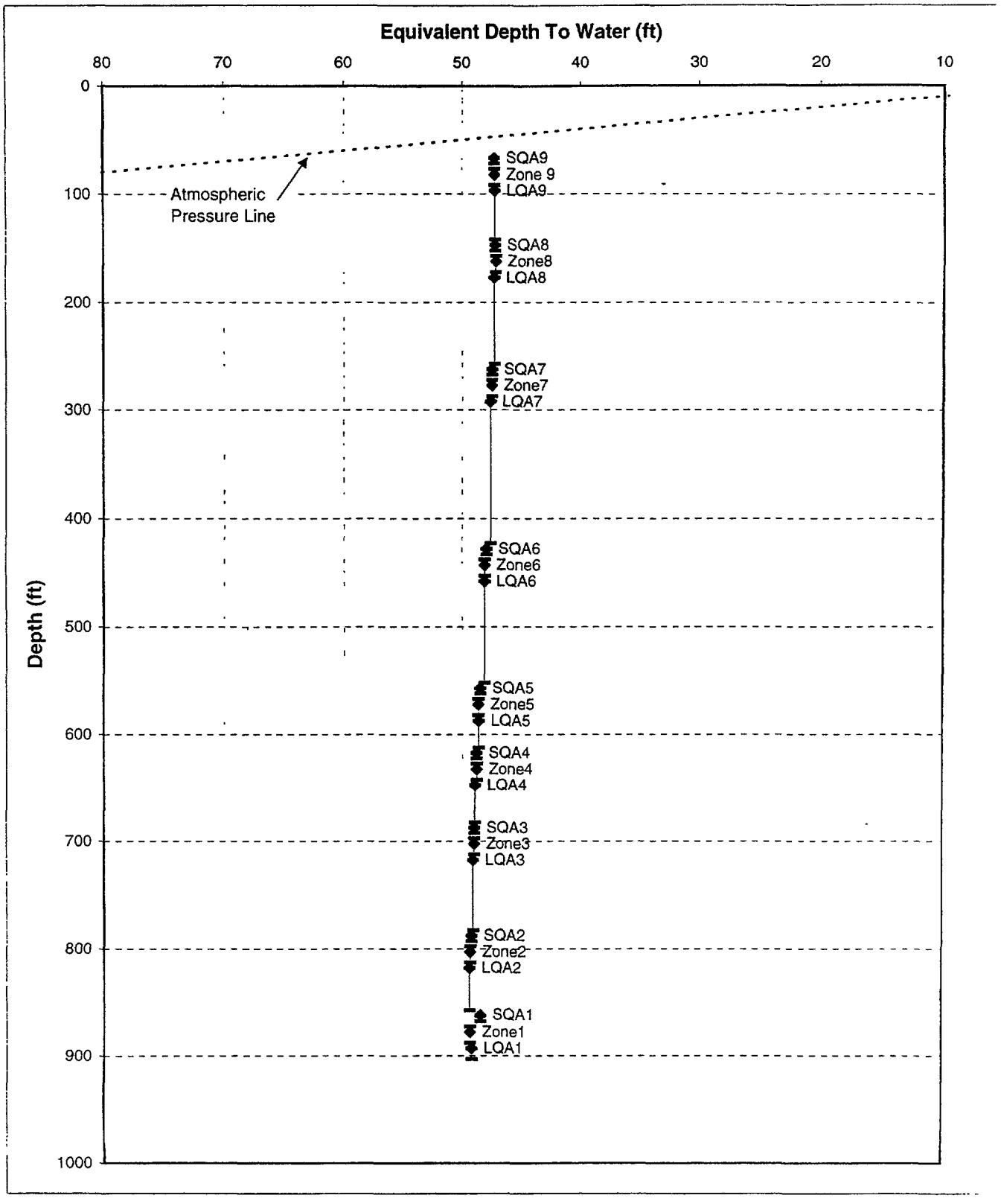
Summary Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	Scale Feet	MP Casing	Scale Feet	MP Casing
900		1000		1100	
910		1010		1110	
920		1020		1120	
930		1030		1130	
940		1040		1140	
950		1050		1150	
960		1060		1160	
970		1070		1170	
980		1080		1180	
990		1090		1190	
1000		1100		1200	

Pre-inflation Piezometric Profile
Monitoring Well: LMW-5

Figure: 1
Profile Date: December 11, 2003
Comments: All Zones

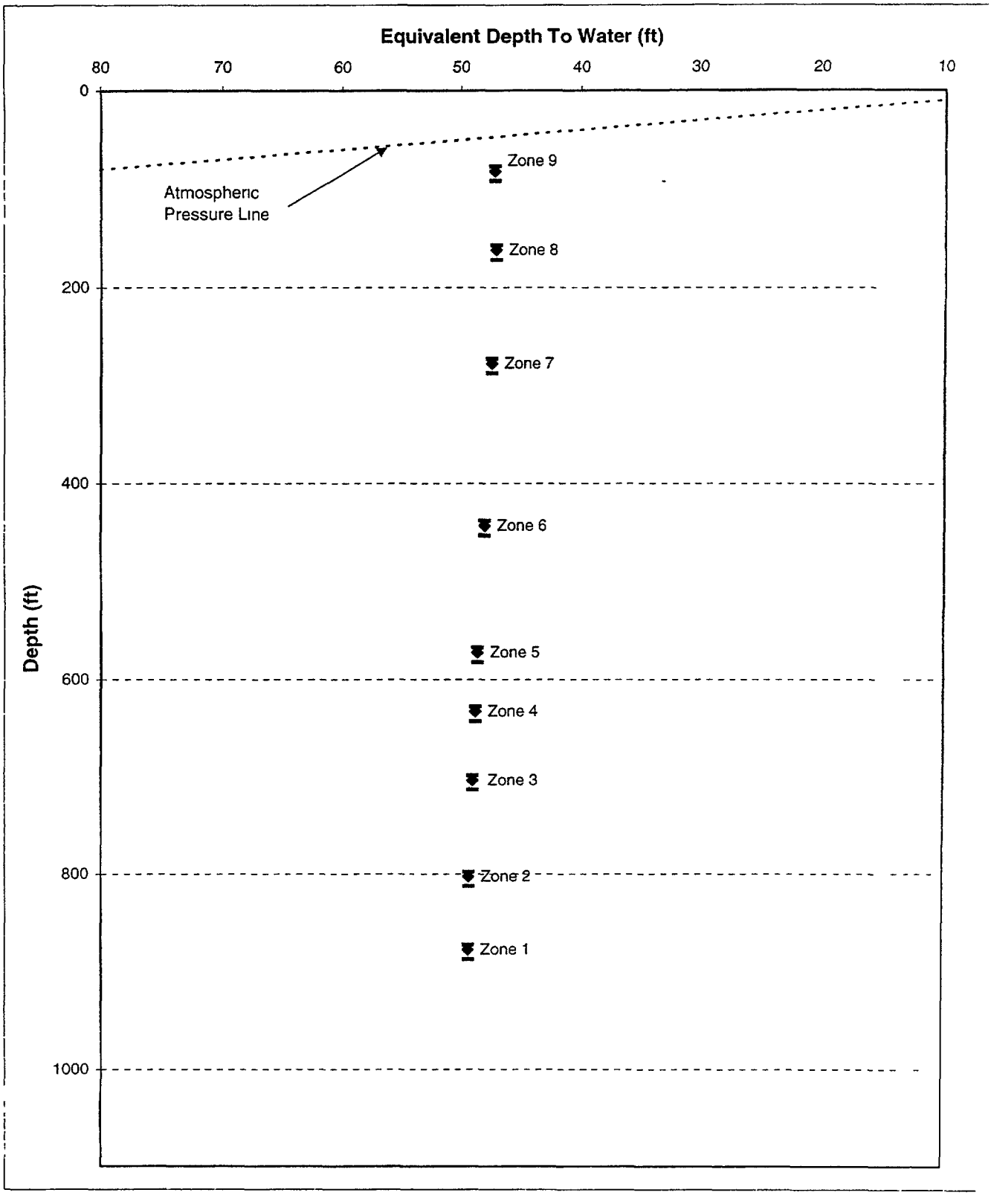


Client: Beylik Drilling
Site: San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By: DL Date: 03 MAR 04
Westbay Project : WB764

Pre-inflation Piezometric Profile
Monitoring Well: LMW-5

Figure 2
Profile Date December 11, 2003
Comments Screened Zones Only



Client Beylik Drilling
Site San Bernardino
Datum ground surface

Plot By _____ Date _____
Checked By JL Date 03APR09
Westbay Project WB764

Pre Inflation Profile 1/2

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet

Datum: Ø Probe Type: 500psi pressure Client: Bey Lik Drilling Date: Dec 10/03

Elev. G.S.: Ø Serial No.: EM 2662 Job No.: 764 Well No.: LMW-05

Height of MP above G.S.: _____ Probe Range: 0 to 500psi Location: San Bernadino, Cal

Elev. top of MP Casing: Ø Weather: Partially overcast MP Casing Type: 38mm 1.5" plastic

Reference Elevation: Ø Atm. Pressure: 14.20 (14.21av) Operator: ML/DS

Ambient Reading (Patm) (Pressure, Temperature, time) Start: 0800 Finish: _____

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (—)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (°C)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments
1	893.0	890.9/12		364.22	379.97	364.20	21.93	07:59	843.74	49.26	~~Collar~~
2	878.0	875.9		357.62	373.42	357.60	22.95	08:01	828.63	49.37	Collar
3	862.0	860.10		351.05	366.86	351.05	22.78	08:04	~~836.56~~ 813.49	48.51	
4	817.9	816.00		331.45	347.36	331.45	22.52	08:07	~~994.51~~ 768.51	49.39	Collar
5	802.8	801.2		324.91	340.84	324.92	22.43	08:08	753.47	49.33	Collar
6	787.8	786.2		318.49	334.37	318.40	22.36	08:11	738.65	49.25	
7	717.7	716.5		288.02	304.04	287.98	22.24	08:13	668.58	49.12	
8	702.6	701.6		281.42	297.54	281.42	22.05	08:15	653.59	49.01	Collar
9	687.6	686.8		274.83	291.04	274.86	21.97	08:18	638.59	49.01	
10	647.5	646.9		257.45	273.65	257.46	21.85	08:21	598.55	48.95	
11	632.4	631.10		250.94	267.20	250.94	21.81	08:23	583.60	48.80	Collar
12	617.4	616.10		244.42	260.69	244.42	21.76	08:25	568.58	48.82	
13	587.3	586.11		231.38	247.73	231.36	21.74	08:27	538.69	48.61	
14	572.3	572.0		224.86	241.22	224.84	21.71	08:29	523.67	48.63	Collar
15	557.2	557.1		218.34	234.74	218.33	21.70	08:31	508.72	48.48	
16	458.0	458.3		175.27	191.89	175.26	21.64	08:35	409.87	48.13	
17	443.0	443.3		168.71	185.40	168.73	21.62	08:38	394.90	48.10	Collar
18	427.9	428.4		162.22	178.92	162.20	21.63	08:40	379.95	47.95	
19	292.7	293.6		103.45	120.46	103.46	21.48	08:43	245.10	47.60	
20	277.6	278.5		96.92	113.96	96.92	21.35	08:46	230.10	47.50	Collar

25/05/00 WHB

Pre Inflaton Profile 2/2

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet

Pressure 500psi

Datum: Ø Probe Type: EM 2662 Client: Boylik Drilling Inc Date: Dec 10/03

Elev. G.S.: Ø Serial No.: EM 2662 Job No.: 764 Well No.: LMIV-05

Height of MP above G.S.: _____ Probe Range: 0 to 500psi Location: San Bernadino, Cal

Elev. top of MP Casing: Ø Weather: partially overcast MP Casing Type: MP38

Reference Elevation: Ø Atm. Pressure: 14.20 average Operator: ML/DS

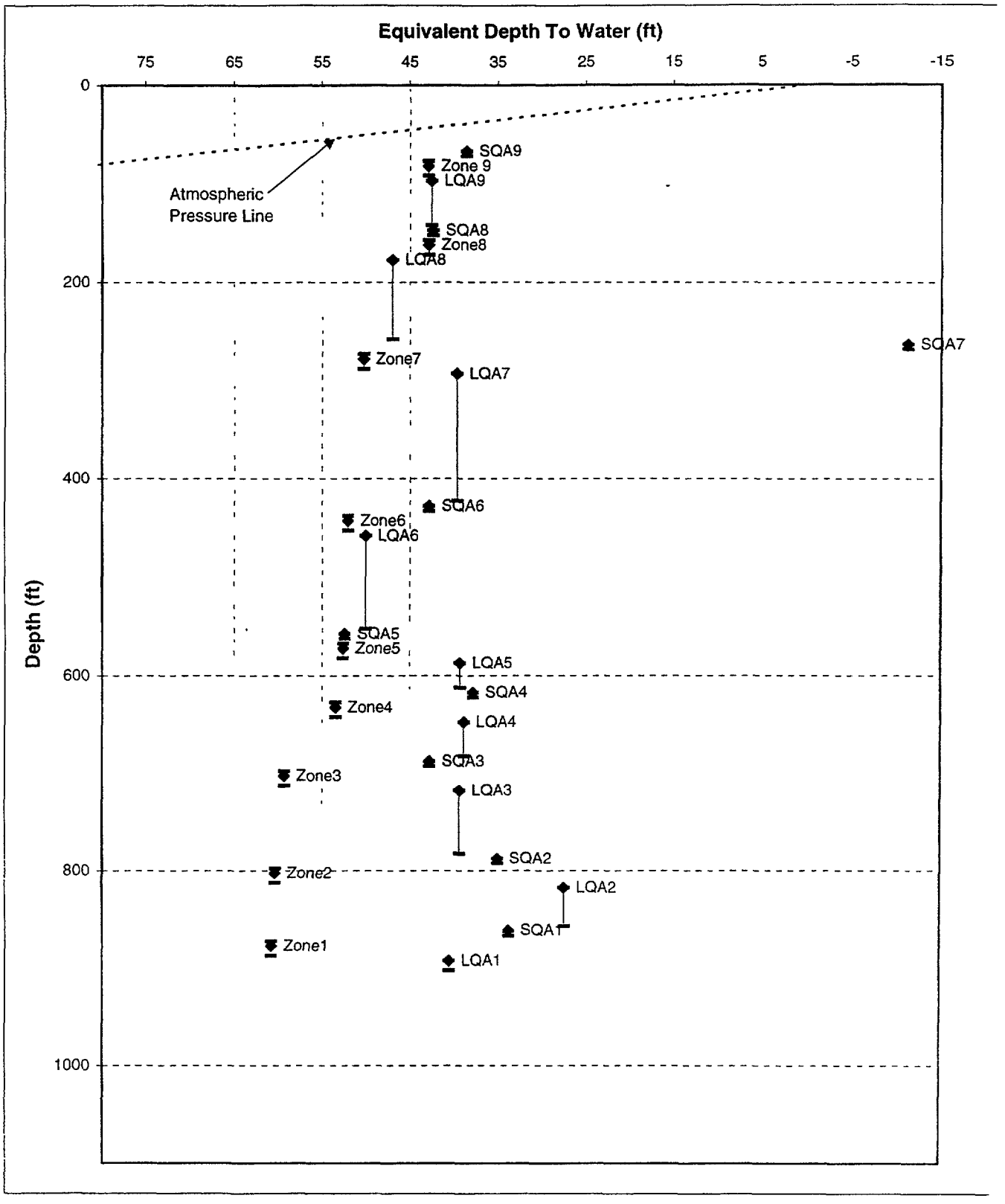
Ambient Reading (Patm) (Pressure, Temperature, time) Start: 08.00 Finish: 14.23 psi

Port No.	Port Depth From Log ( )	Port Depth From Cable ( )	Port Elev. ( )	Fluid Pressure Readings Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. ( )	Time H.M:S	Pressure Head Outside Port ( ) H = (P2-Patm)/w	Piez. Level Outside Port ( ) Dz = Dp - H	Comments
21	262.6	263.6		90.42	137.47	90.42	21.32	08 47	215.13	47.47	
22	177.4	178.7		53.41	70.62	53.42	21.32	08 50	130.13	47.27	
23	162.3	163.7		46.80	64.13	46.83	21.28	08:52	115.16	47.14	Collar
24	147.3	148.7		40.26	57.59	40.25	21.21	08:54	100.07	47.23	
25	97.2	98.7		18.41	35.86	18.41	21.12	08:56	49.94	47.26	
26	82.2	83.7		14.27	29.35	14.27	21.10	08:58	34.93	47.27	Collar
27	67.1	68.7		14.26	22.30	14.27	21.13	09:00	19.32	47.28	

25/05/00 WHB

Piezometric Profile
Monitoring Well: LMW-5

Figure: 3
Profile Date: December 11, 2003
Comments: All Zones

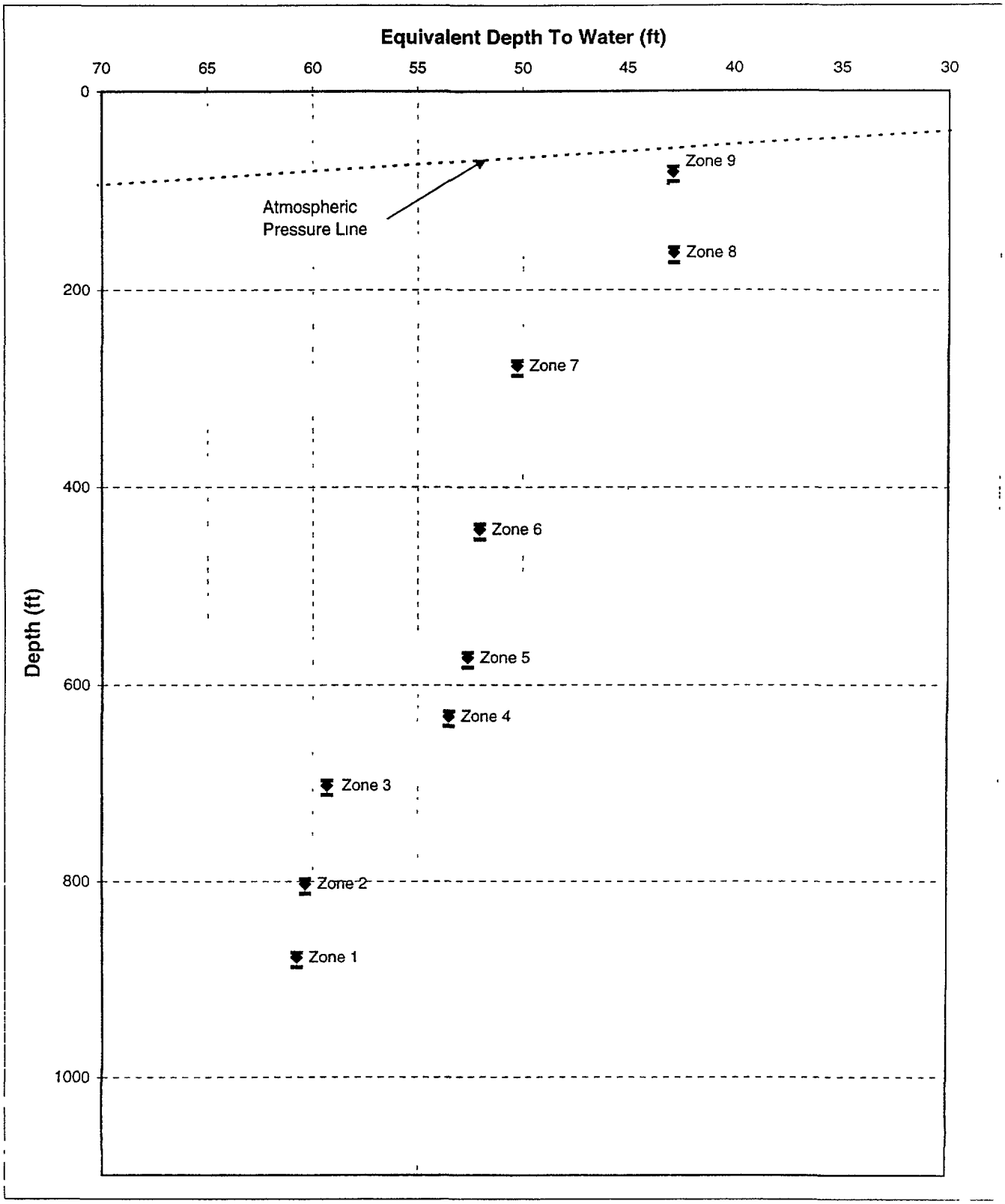


Client: Beylik Drilling
Site: San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By: DL Date: 04 MARCH
Westbay Project : WB764

Piezometric Profile
Monitoring Well: LMW-5

Figure: 4
Profile Date: December 11, 2003
Comments: Screened Zones Only



Client: Beylik Drilling
Site:San Bernardino
Datum: ground surface

Plot By:_____ Date:_____
Checked By:DL Date:5 MAR 04
Westbay Project : WB764

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet

Datum: Ø Probe Type: Pressure Client: Beylik Drilling Date: Dec 11/03

Elev. G.S.: Ø Serial No.: EM2662 Job No.: WB 764 Well No.: LMW-5

Height of MP above G.S.: 0' Probe Range: 0 to 500 Location: San Bernardino

Elev. top of MP Casing: Ø Weather: Overcast MP Casing Type: MP38

Reference Elevation: Ø Atm. Pressure: 14.14 Operator: ML/DS

Ambient Reading (Patm) (Pressure, Temperature, time) Start: 14.14 1:14pm 15.0°C Finish: 14.13 2:38pm 21.38°C

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft) TN	Port Elev. (−)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (°C)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments	MP WATER DEPTH
1	893.0	892.4	/	383.92	383.70	383.92	25.97	1:26	852.5	40.5		38.75
2	878.0	877.4	/	377.34	368.41	377.33	25.13	1:30	817.2	60.8	Collar ✓	38.8[illegible]
3	863.0	862.4	/	Bouncy 370.82	373.14	370.81	24.69	1:34	828.2	33.7		38.9[illegible]
4	817.9	817.5	/	Bouncy 351.51	356.82	351.25	24.75	1:36	790.5	27.4		39.10
5	802.8	802.5	/	344.73	335.99	344.71	24.03	1:41	742.4	60.3	collar ✓	39.15
6	787.8	787.6	/	338.20	340.47	338.20	24.23	1:45	752.8	35.0		39.2[illegible]
7	717.7	717.9	/	307.81	308.20	307.78	24.73	1:48	678.3	39.4		39.5[illegible]
8	702.6	702.9	/	301.23	293.00	301.23	24.02	1:50	643.3	59.3	collar ✓	39.60
9	687.6	687.10	/	294.71	293.68	294.71	23.91	1:53	644.8	42.8		39.70
10	647.5	648.0	/	277.36	277.99	277.34	23.97	1:55	608.7	38.8		39.85
11	632.4	633.0	/	270.73	265.10	270.74	23.38	1:57	578.9	53.5	Collar ✓	39.95
12	617.4	618.0	/	264.24	265.39	264.25	23.31	2:00	579.6	37.8		40.[illegible]
13	587.3	588.1	/	251.19	251.71	251.18	23.30	2:03	548.0	39.3		40.01
14	572.3	573.1	/	244.64	239.43	244.64	22.66	2:06	519.7	52.6	Collar ✓	40.30
15	557.2	558.3	/	238.11	232.95	238.10	22.68	2:08	504.7	52.4		40.3[illegible]
16	458.0	459.5	/	195.09 [illegible]	190.98	195.09	23.05	2:11	407.9	50.1		40.[illegible]
17	443.0	444.5	/	188.53	183.62	188.52	22.61	2:13	391.0	52.0	collar ✓	40.[illegible]
18	427.9	429.[illegible]	/	181.96	181.08	181.95	22.37	2:15	385.[illegible]	42.[illegible]		40.[illegible]
19	292.7	294.10	/	123.28	123.84	123.25	22.24	2:18	253.1	39.6		41.50
20	277.6	279.10	/	116.74	112.69	116.71	21.99	2:20	227.3	50.3	Collar ✓	41.55

25/05/00 WHB

Westbay Instruments Inc.
A Schlumberger Company

Piezometric Pressures/Levels
Field Data and Calculation Sheet

Datum: Ø Probe Type: Pressure Client: Beylik Drilling Date: Dec 11/03
Elev. G.S.: Ø Serial No.: EM2662 Job No.: WB 764 Well No.: LMW-5
Height of MP above G.S.: 0' Probe Range: 0 to 500 Location: San Bernardino
Elev. top of MP Casing: Ø Weather: Overcast MP Casing Type: MP38
Reference Elevation: Ø Atm. Pressure: - Operator: ML / DS
Ambient Reading (Patm) (Pressure, Temperature, time) Start: - Finish: -

Port No.	Port Depth From Log (ft)	Port Depth From Cable (ft)	Port Elev. (—)	Fluid Pressure Readings: Inside Casing (P1)	Outside Casing (P2)	Inside Casing (P1)	Temp. (°C)	Time H:M:S	Pressure Head Outside Port (ft) H = (P2-Patm)/w	Piez. Level Outside Port (ft) Dz = Dp - H	Comments	MP WATER DEPTH
21	262.6	264.8	/	110.18	132.86	110.17	21.86	2:22	273.9	-11.3		41.6
22	177.4	180.1	/	73.09	70.66	73.09	21.78	2:26	130.4	47.0		42.0
23	162.3	165.1	/	66.55	65.92	66.54	21.72	2:28	119.4	42.8	collar ✓	42.10
24	147.3	150.2	/	60.00	59.63	60.01	21.66	2:30	104.9	42.4		42.15
25	97.2	100.2	/	38.19	37.84	38.18	21.60	2:32	54.7	42.5		42.40
26	82.2	85.2	/	31.62	31.18	31.62	21.49	2:34	39.3	42.9	collar	42.45
27	67.1	70.2	/	25.05	26.50	25.05	21.40	2:36	28.5	38.6		42.50

25/05/00 WHB

MP Casing Log

Company: Beylik Drilling Inc.
Well: LMW-5
Site: San Bernardino
Project:

Job No: WB764
Author: ML / AB / DS

Well Information

Reference Datum:
Elevation of Datum: 0.00 ft.
MP Casing Top: 0.00 ft.
MP Casing Length: 903.22 ft

Borehole Depth: 905.00 ft.
Borehole Inclination:
Borehole Diameter. 0.00 in

Well Description:
MP-38
Other References:

File Information

File Name LMW-5.WWD
Report Date Mon Dec 08 22:02:49 2003

File Date: Dec 08 21:32 12 2003

Comments

Log Information

Borehole condition confirmed	(method) [illegible]	Date
MP well design & preparation	By [illegible]	Date [illegible]
MP well design checked	By [illegible]	Date: [illegible]
MP well and borehole approved to install.	By [illegible]	Date: 12/9/03

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Legend

(Qty) MP Components

(Library - WD Library 7/27/00)

- (3) 0225F02 - MP38 Casing, PVC, 2 ft.
- (56) 0225F10 - MP38 Casing, PVC, 10 ft.
- (27) 0239F05 - MP38 Packer, Stiffened
- (40) 0225F05 - MP38 Casing, PVC, 5 ft.
- (1) 0223 - MP38 End Cap
- (90) 0202 - MP38 Regular Coupling
- (27) 0205 - MP38 Measurement Port
- (9) 0224 - MP38 Pumping Port
- (9) 0216 - MP38 Magnetic Location Collar

Geology

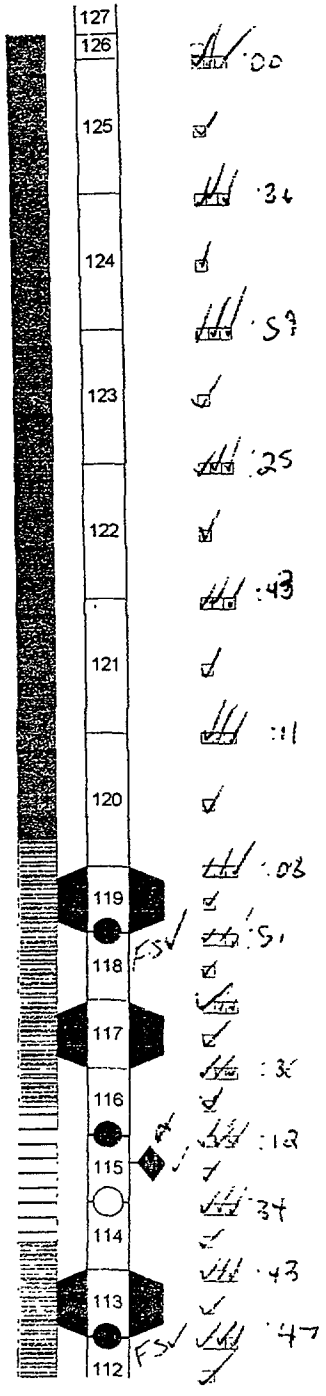
Backfill/Casing

- Concrete
- Bentonite
- Gravel
- Mild Steel
- Stainless Steel
- Well Screen

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

End Lowering
124 pm
Dec 9/03



MP Casing Description		
0225F02 - MP38 Casing, PVC, 2 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0239F05 - MP38 Packer, Stiffened	13462	140 psi
0205 - MP38 Measurement Port	1536	
0225F05 - MP38 Casing, PVC, 5 ft.		
0239F05 - MP38 Packer, Stiffened	13353	135 psi
0225F05 - MP38 Casing, PVC, 5 ft		
0205 - MP38 Measurement Port	1535	
0225F05 - MP38 Casing, PVC, 5 ft.		
0224 - MP38 Pumping Port	6275	
0225F05 - MP38 Casing, PVC, 5 ft		
0239F05 - MP38 Packer, Stiffened	13352	135 psi
0205 - MP38 Measurement Port		
0225F05 - MP38 Casing, PVC, 5 ft	1539	

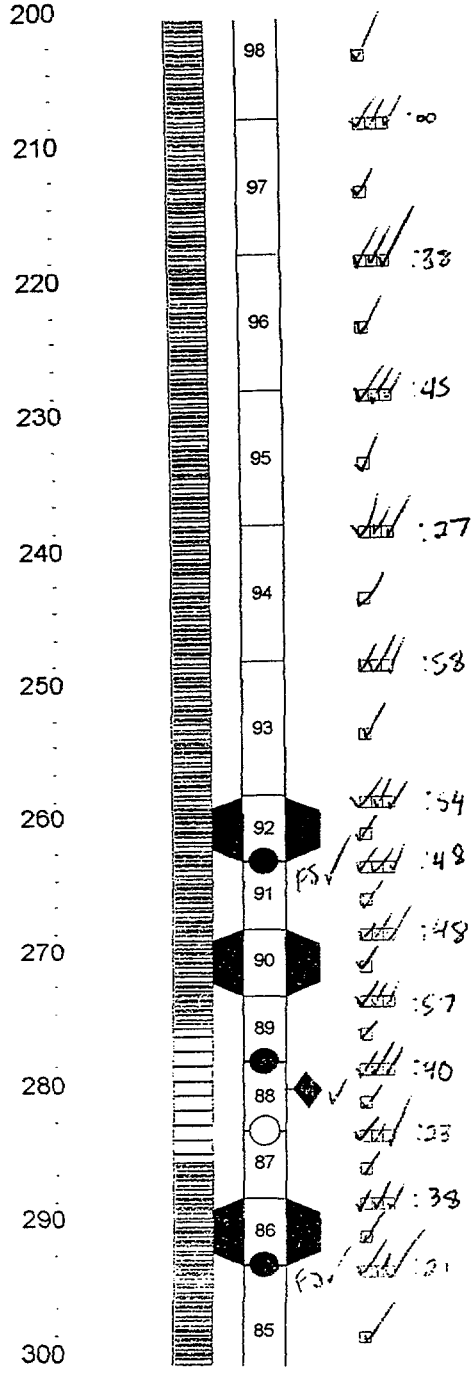
MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	QA Test/OK	MP Casing Description		
100		:06			
	111	✓	0225F10 - MP38 Casing, PVC, 10 ft.		
110		:23			
	110	✓	0225F10 - MP38 Casing, PVC, 10 ft.		
120		:37			
	109	✓	0225F10 - MP38 Casing, PVC, 10 ft.		
130		:56			
	108	✓	0225F10 - MP38 Casing, PVC, 10 ft.		
140		:38			
	107	✓	0239F05 - MP38 Packer, Stiffened	13351	130 psi
		FS ✓ :54	0205 - MP38 Measurement Port	1541	
150	106	✓	0225F05 - MP38 Casing, PVC, 5 ft.		
		:28			
	105	✓	0239F05 - MP38 Packer, Stiffened	13364	140 ps.
		:51			
160	104	✓	0225F05 - MP38 Casing, PVC, 5 ft.		
		:21	0205 - MP38 Measurement Port	1540	
	103	✓	0225F05 - MP38 Casing, PVC, 5 ft.		
		:21	0224 - MP38 Pumping Port	6270	
170	102	✓	0225F05 - MP38 Casing, PVC, 5 ft.		
		:12			
	101	✓	0239F05 - MP38 Packer, Stiffened	13349	130 ps.
		FS ✓ :58	0205 - MP38 Measurement Port	1525	
180	100	✓	0225F10 - MP38 Casing, PVC, 10 ft.		
		:20			
190	99	✓	0225F10 - MP38 Casing, PVC, 10 ft		
		:06			
200					

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5



MP Casing Description		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0239F05 - MP38 Packer, Stiffened	13348	130 ps.
0205 - MP38 Measurement Port	1537	
0225F05 - MP38 Casing, PVC, 5 ft.		
0239F05 - MP38 Packer, Stiffened	13366	130 ps.
0225F05 - MP38 Casing, PVC, 5 ft.		
0205 - MP38 Measurement Port	1535	
0225F05 - MP38 Casing, PVC, 5 ft.		
0224 - MP38 Pumping Port	6268	
0225F05 - MP38 Casing, PVC, 5 ft.		
0239F05 - MP38 Packer, Stiffened	13365	140 ps.
0205 - MP38 Measurement Port	1534	
0225F10 - MP38 Casing, PVC, 10 ft.		

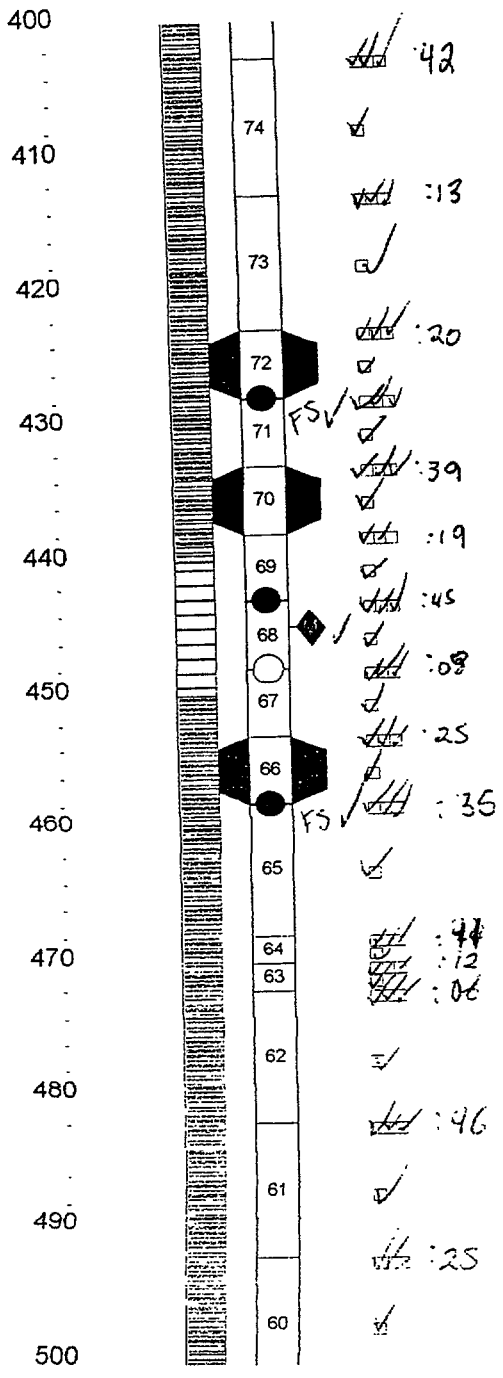
Job No: WB764
Well: LMW-5

MP Casing Log
Beylik Drilling Inc.

Scale Feet	MP Casing	QA Test/OK	MP Casing Description
300		:49	
	84	✓	0225F10 - MP38 Casing, PVC, 10 ft.
310		:36	
	83	✓	0225F10 - MP38 Casing, PVC, 10 ft.
320		:56	
	82	✓	0225F10 - MP38 Casing, PVC, 10 ft.
330		:12	
	81	✓	0225F10 - MP38 Casing, PVC, 10 ft.
340		:55	
	80	✓	0225F10 - MP38 Casing, PVC, 10 ft.
350		:11	
	79	✓	0225F10 - MP38 Casing, PVC, 10 ft.
360		:37	
	78	✓	0225F10 - MP38 Casing, PVC, 10 ft.
370		:32	
	77	✓	0225F10 - MP38 Casing, PVC, 10 ft.
380		:31	
	76	✓	0225F10 - MP38 Casing, PVC, 10 ft.
390		:04	
	75	✓	0225F10 - MP38 Casing, PVC, 10 ft.
400			

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5



MP Casing Description		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0239F05 - MP38 Packer, Stiffened	13350	135 psi
0205 - MP38 Measurement Port	1543	
0225F05 - MP38 Casing, PVC, 5 ft.		
0239F05 - MP38 Packer, Stiffened	13346	130 psi
0225F05 - MP38 Casing, PVC, 5 ft.		
0205 - MP38 Measurement Port	1547 failed, repaired by MJL. retested passed	
0225F05 - MP38 Casing, PVC, 5 ft.		
0224 - MP38 Pumping Port	6271	
0225F05 - MP38 Casing, PVC, 5 ft.		
0239F05 - MP38 Packer, Stiffened		
0205 - MP38 Measurement Port	13347	130 psi
0225F10 - MP38 Casing, PVC, 10 ft.	1542	
0225F02 - MP38 Casing, PVC, 2 ft.		
0225F02 - MP38 Casing, PVC, 2 ft		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft.		
0225F10 - MP38 Casing, PVC, 10 ft		

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	QA Test/OK	MP Casing Description		
500		:45			
	59		0225F10 - MP38 Casing, PVC, 10 ft.		
510		:38			
	58		0225F10 - MP38 Casing, PVC, 10 ft.		
520		:36			
	57		0225F10 - MP38 Casing, PVC, 10 ft.		
530		:13			
	56		0225F10 - MP38 Casing, PVC, 10 ft.		
540		:48			
	55		0225F10 - MP38 Casing, PVC, 10 ft.		
550		:34			
	54		0239F05 - MP38 Packer, Stiffened	13367	140 ps.
		FS	0205 - MP38 Measurement Port	1545	
560	53		0225F05 - MP38 Casing, PVC, 5 ft.		
		:54			
	52		0239F05 - MP38 Packer, Stiffened	13363	130 ps.
		:20			
570	51		0225F05 - MP38 Casing, PVC, 5 ft.		
			0205 - MP38 Measurement Port	1549	
	50		0225F05 - MP38 Casing, PVC, 5 ft		
		:36	0224 - MP38 Pumping Port	0269	
580	49		0225F05 - MP38 Casing, PVC, 5 ft.		
		:26			
	48		0239F05 - MP38 Packer, Stiffened	13362	130 ps.
		FS	0205 - MP38 Measurement Port	1544	
590	47		0225F05 - MP38 Casing, PVC, 5 ft.		
		:39			
	46		0225F10 - MP38 Casing, PVC, 10 ft.		
600					

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	QA Test/OK	MP Casing Description	
600		:13		
	45	✓	0225F10 - MP38 Casing, PVC, 10 ft.	
610		:48		
	44	✓	0239F05 - MP38 Packer, Stiffened	13360 130 psi
		FS ✓	0205 - MP38 Measurement Port	1546
620	43	✓	0225F05 - MP38 Casing, PVC, 5 ft.	
		:03		
	42	✓	0239F05 - MP38 Packer, Stiffened	13359 130 psi
630	41	✓	0225F05 - MP38 Casing, PVC, 5 ft.	
		✓ :25/:25	0205 - MP38 Measurement Port	1548 ← failed repaired, retested, & inc. failed, repaired, retested OK.
	40	✓	0225F05 - MP38 Casing, PVC, 5 ft.	
		:16	0224 - MP38 Pumping Port	6267
640	39	✓	0225F05 - MP38 Casing, PVC, 5 ft.	
		.12		
	38	✓	0238F05 - MP38 Packer, Standard	13358 130 psi
		FS ✓	0205 - MP38 Measurement Port	1532
650	37	✓	0225F10 - MP38 Casing, PVC, 10 ft.	
		.03		
660	36	✓	0225F05 - MP38 Casing, PVC, 5 ft.	
		:39		
	35	✓	0225F10 - MP38 Casing, PVC, 10 ft.	
670		.50		
	34	✓	0225F10 - MP38 Casing, PVC, 10 ft.	
680		:20		
	33	✓	0239F05 - MP38 Packer, Stiffened	13357 135 psi
		FS :04/:35/:51	0205 - MP38 Measurement Port	1526 failed, replaced with 1528 ← failed, replaced, retested passed
690	32	✓	0225F05 - MP38 Casing, PVC, 5 ft.	
		:17		
	31	✓	0239F05 - MP38 Packer, Stiffened	13356 130 psi
700		:12		

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	QA Test/OK	MP Casing Description	
700	30	1.26	0225F05 - MP38 Casing, PVC, 5 ft	1531 ← failed, repaired by ML retested passed.
			0205 - MP38 Measurement Port	
	29		0225F05 - MP38 Casing, PVC, 5 ft	
		.35	0224 - MP38 Pumping Port	6274
710	28		0225F05 - MP38 Casing, PVC, 5 ft	
		.26		
	27		0239F05 - MP38 Packer, Stiffened	13354 130
		:30 / .17	0205 - MP38 Measurement Port	
720	26	FS	0225F05 - MP38 Casing, PVC, 5 ft	1557 failed, repaired by ML. retested, passed
		:03		
	25		0225F10 - MP38 Casing, PVC, 10 ft	
730		:31		
	24		0225F10 - MP38 Casing, PVC, 10 ft	
740		:00		
	23		0225F10 - MP38 Casing, PVC, 10 ft	
750		:04		
	22		0225F10 - MP38 Casing, PVC, 10 ft	
760		:15		
	21		0225F10 - MP38 Casing, PVC, 10 ft	
770		:36		
	20		0225F10 - MP38 Casing, PVC, 10 ft	
780		.2		
	19		0239F05 - MP38 Packer, Stiffened	13355 130
790		FS .9	0205 - MP38 Measurement Port	1529
	18		0225F05 - MP38 Casing, PVC, 5 ft	
		.37		
	17		0239F05 - MP38 Packer, Stiffened	13342 130
800		:26		

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	QA Test/OK	MP Casing Description	
800	16		0225F05 - MP38 Casing, PVC, 5 ft.	1530 failed initially. Repair by ML. retested passed
	15	:38 / :19	0205 - MP38 Measurement Port	
			0225F05 - MP38 Casing, PVC, 5 ft.	
		:20	0224 - MP38 Pumping Port	6273
810	14		0225F05 - MP38 Casing, PVC, 5 ft.	
		:14		
	13		0239F05 - MP38 Packer, Stiffened	13343 130 psi
	FS	:42 / :52 / :20	0205 - MP38 Measurement Port	1528 ← failed replaced with
820	12		0225F10 - MP38 Casing, PVC, 10 ft.	failed → 1431 replaced with passed 1430
		:20		
830	11		0225F10 - MP38 Casing, PVC, 10 ft.	
		:50		
840	10		0225F10 - MP38 Casing, PVC, 10 ft.	
		:54		
850	9		0225F10 - MP38 Casing, PVC, 10 ft.	
		:40		
860	8		0239F05 - MP38 Packer, Stiffened	13344 130 psi ~~replaced~~
	FS	:05 / :52	0205 - MP38 Measurement Port	1527 ~~← failed~~ ~~1431~~ passed DAS
	7		0225F05 - MP38 Casing, PVC, 5 ft.	
870	6		0239F05 - MP38 Packer, Stiffened	13345 135 psi
	5		0225F05 - MP38 Casing, PVC, 5 ft.	
880	4	:56	0205 - MP38 Measurement Port	1533
			0225F05 - MP38 Casing, PVC, 5 ft.	
	3		0224 - MP38 Pumping Port	6270
			0225F05 - MP38 Casing, PVC, 5 ft.	
890	2		0239F05 - MP38 Packer, Stiffened	13341 130 psi
	FS		0205 - MP38 Measurement Port	
900	1		0225F10 - MP38 Casing, PVC, 10 ft.	

MP Casing Log
Beylik Drilling Inc.

Job No: WB764
Well: LMW-5

Scale Feet	MP Casing	QA Test/OK	MP Casing Description
900			0223 - MP38 End Cap
910	Start Lowering Westbay Casing 8.46 am. Dec 9/03		
920			Borehole Water Level 47.90 ft.
930			Hydraulic Integrity Test 350.70' @ 5:28 pm Dec 9/03 350.64' @ 7:00 am Dec 10/03 Westbay well is water-tight [illegible]
940			
950			
960			
970			
980			
990			
1000			

Sheet 1 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated Dec 10, 2003

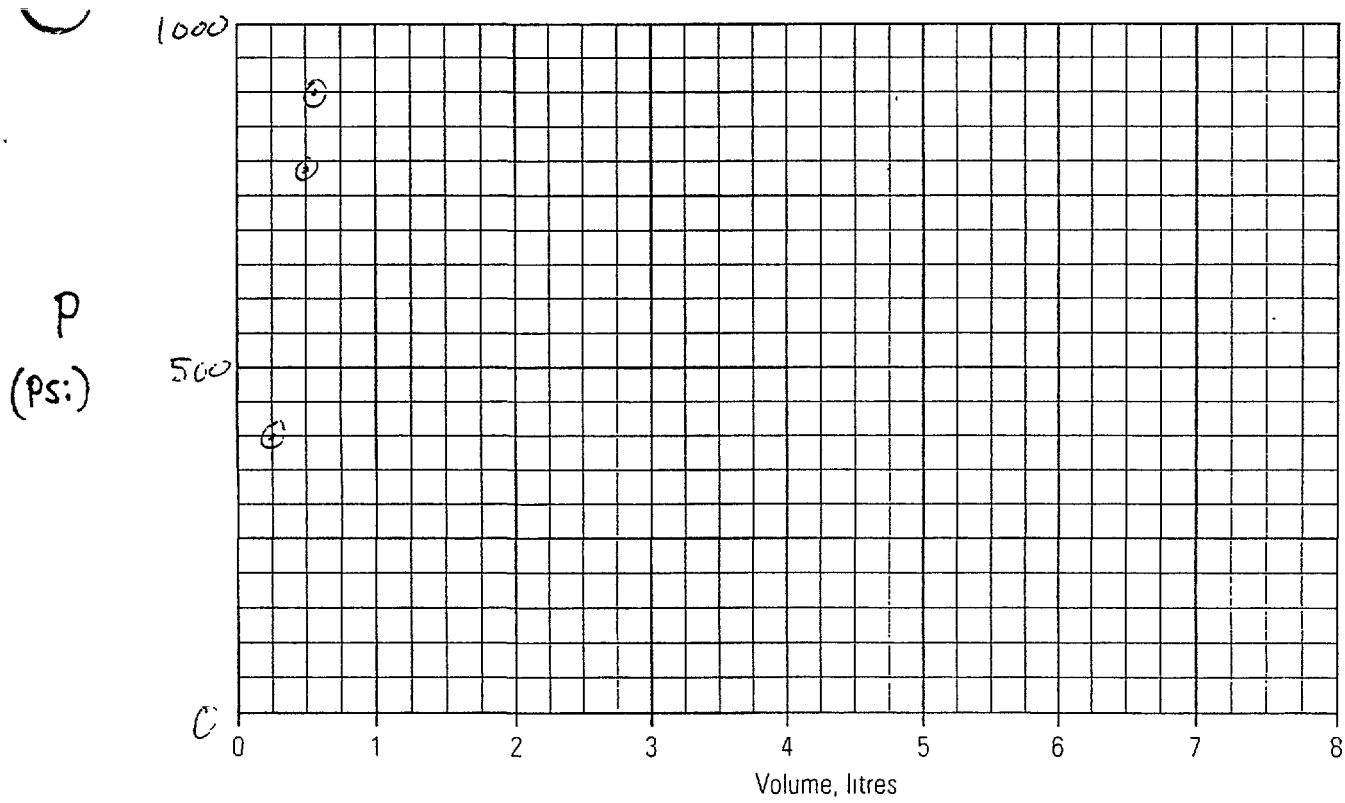
Packer No.: BWT Serial No.: N/A Depth (ft/m) ≈ 903 Inflation Tool No. TIW 1088

Packer Valve Pressure, P_V: NA psi Final Line Pressure, P_L: 900 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = N/A psi

Volume, litres	.25	.50	.55								
Pressure, psi	400	790	900								
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Blank Wall Test

Sheet 2 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

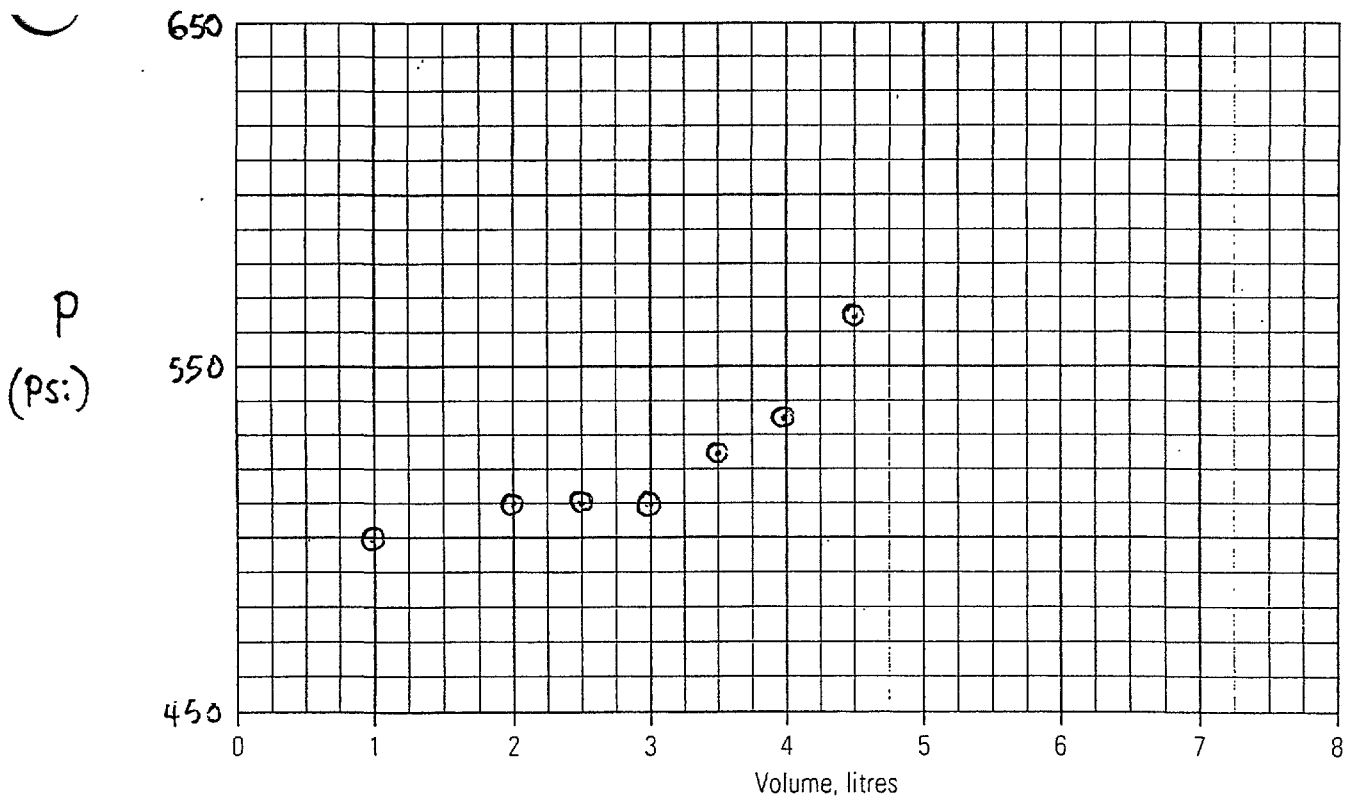
Packer No.: 1, comp 2 Serial No.: 13341 Depth (ft/m): 888.0 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 565 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	2.5	3.0	3.5	4.0	4.5	4.2			
Pressure, psi	500	510	510	510	525	535	565	0			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #1

Sheet 3 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec. 10/03

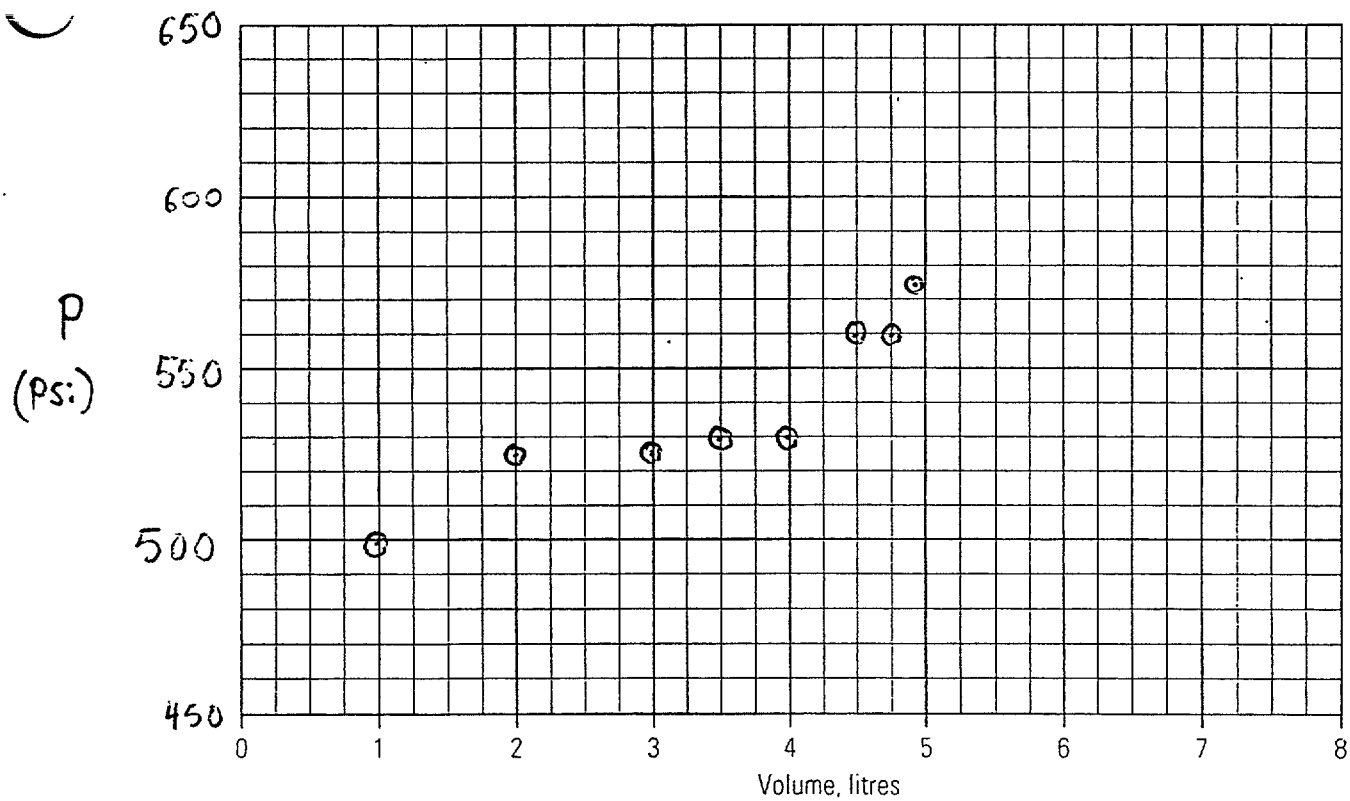
Packer No.: 2, comp 6 Serial No.: 13345 Depth (ft/m): 868.0. Inflation Tool No: TIW 1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.85	4.6		
Pressure, psi	500	525	525	530	530	560	560	575	ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #2

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

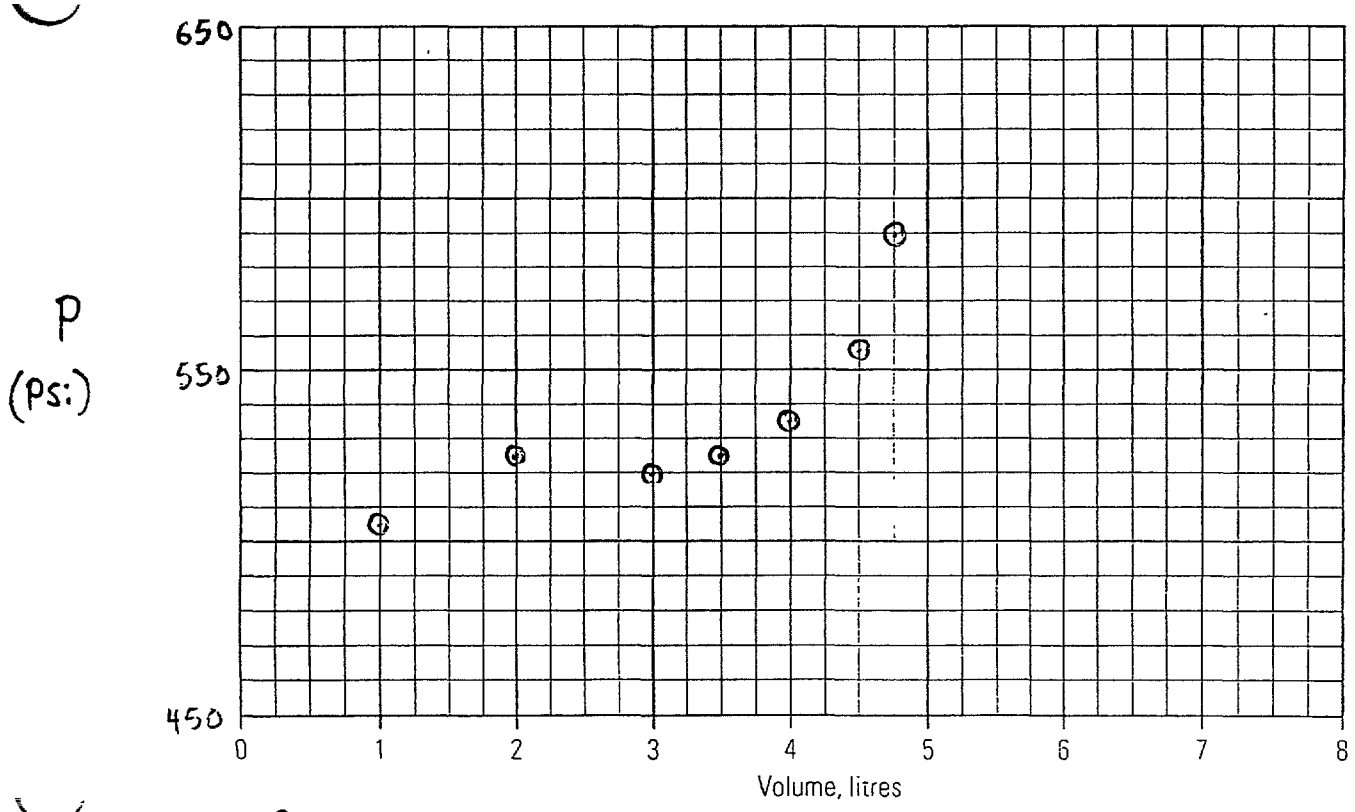
Packer No.: 3 Comp 8 Serial No.: 13344 Depth (ft/m): 858.0 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 180 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.5			
Pressure, psi	505	525	520	525	535	555	590	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #3

Sheet 5 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

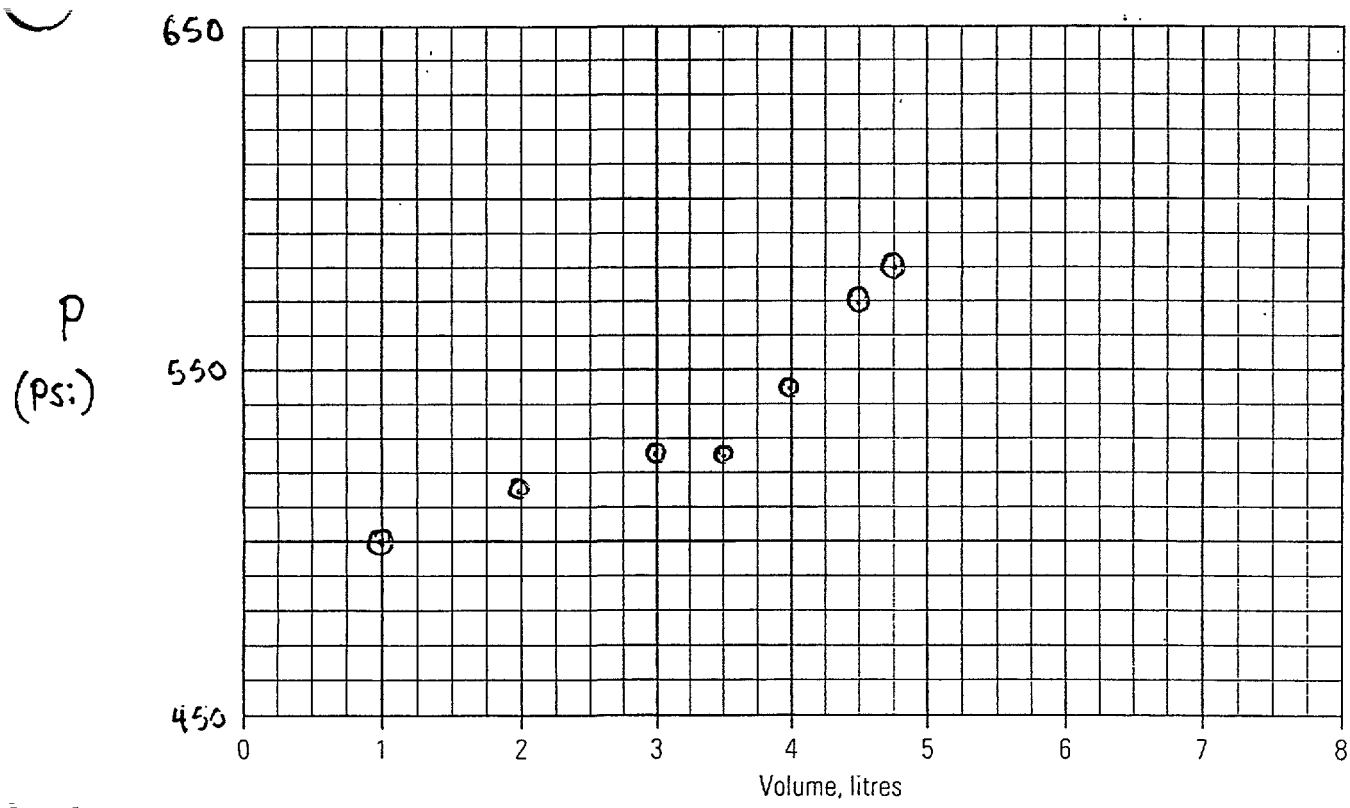
Packer No.: 4 comp 13 Serial No.: 13343 Depth (ft/m): 812.8 Inflation Tool No.: TIW 1068

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 580 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.5			
Pressure, psi	500	515	525	525	545	570	580	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #4

Sheet 6 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

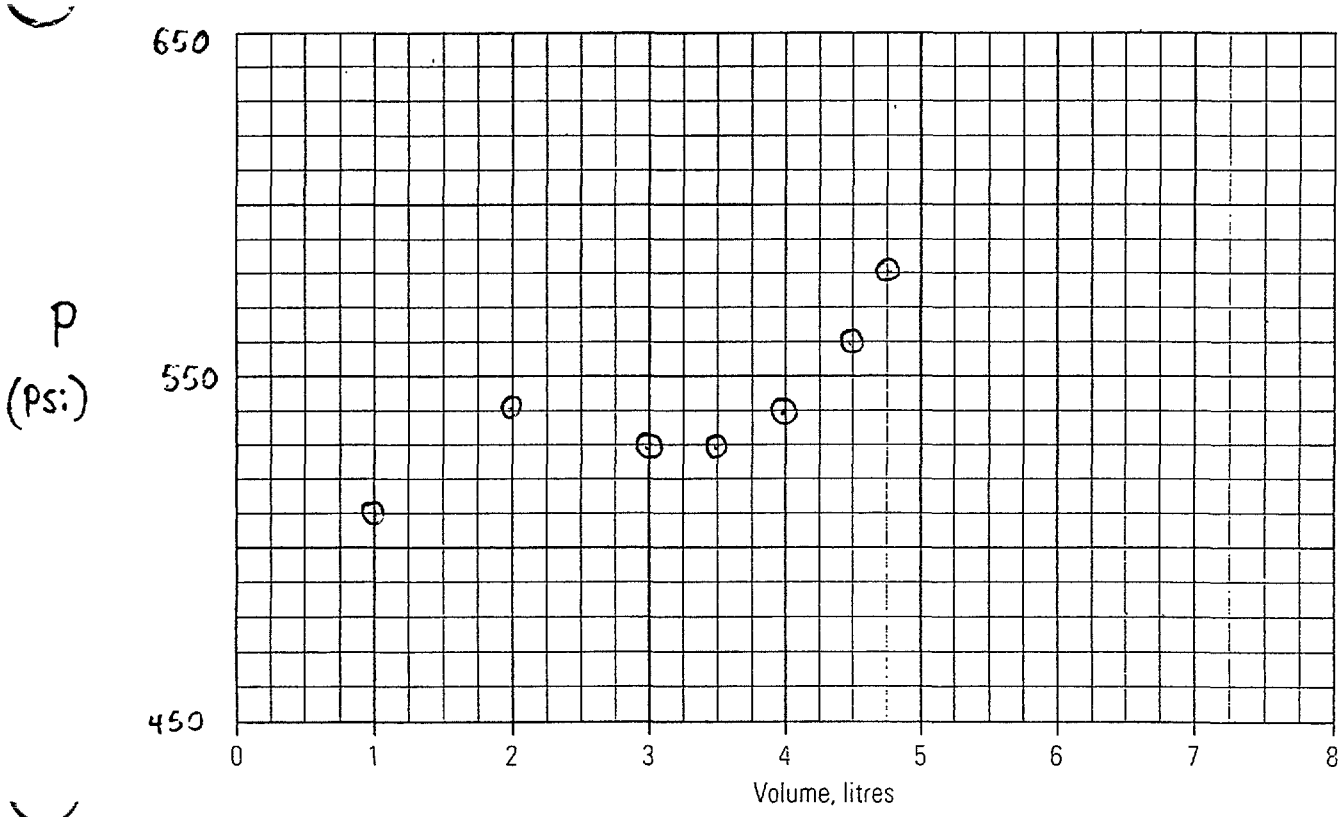
Packer No.: 5, comp 17 Serial No.: 13342 Depth (ft/m): 792.8 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 580 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.45			
Pressure, psi	510	540	530	530	540	560	580	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #5

Sheet 7 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project Beylik Drilling Inc. Project No WB 764 Well No LMW-5

Location San Bernardino Completed by ML/DS Date Inflated Dec. 10/03

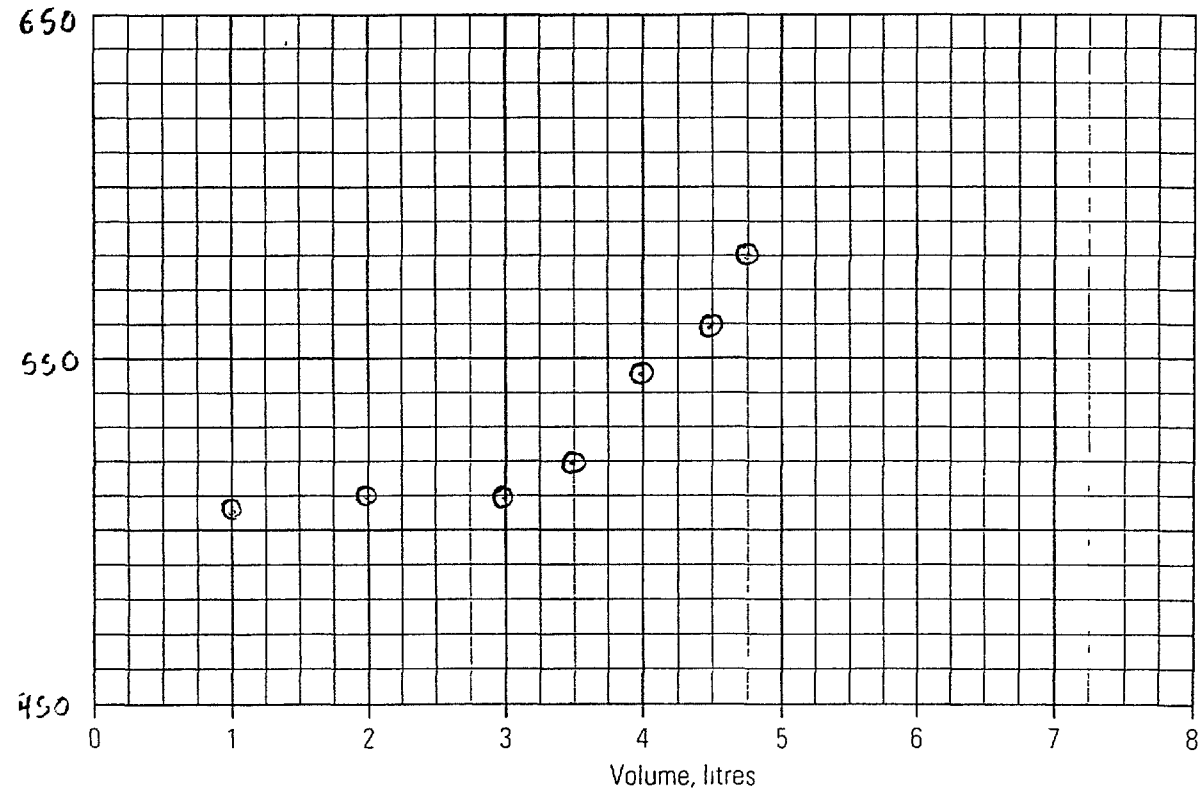
Packer No 6 comp 19 Serial No 13355 Depth (ft/m) 782.8 Inflation Tool No TIW 1088

Packer Valve Pressure, P_V 130 psi Final Line Pressure, P_L 580 psi Tool Pressure P_T 300 psi

Borehole Water Level 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T =$ 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.4			
Pressure, psi	505	510	510	520	545	560	580	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #6

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

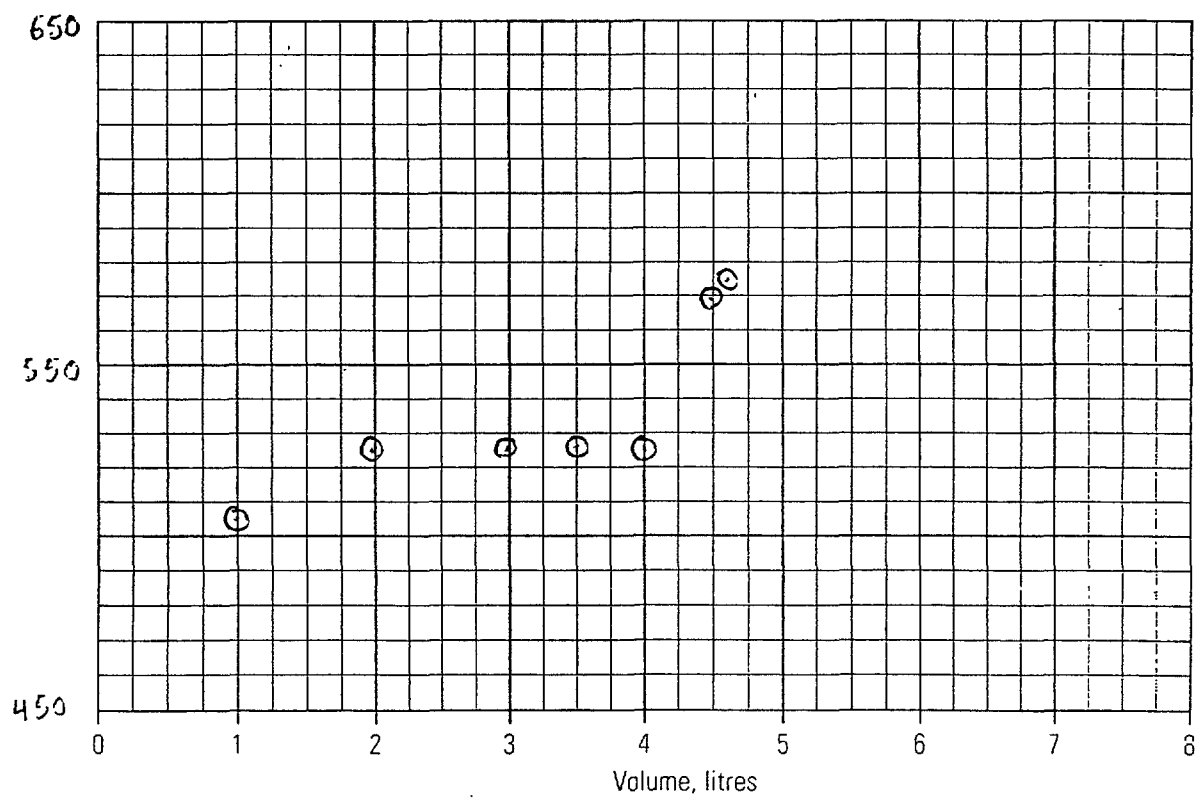
Packer No.: 7, comp 27 Serial No.: 13354 Depth (ft/m): 712.6 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.65	4.3			
Pressure, psi	505	525	525	525	525	570	575	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #7

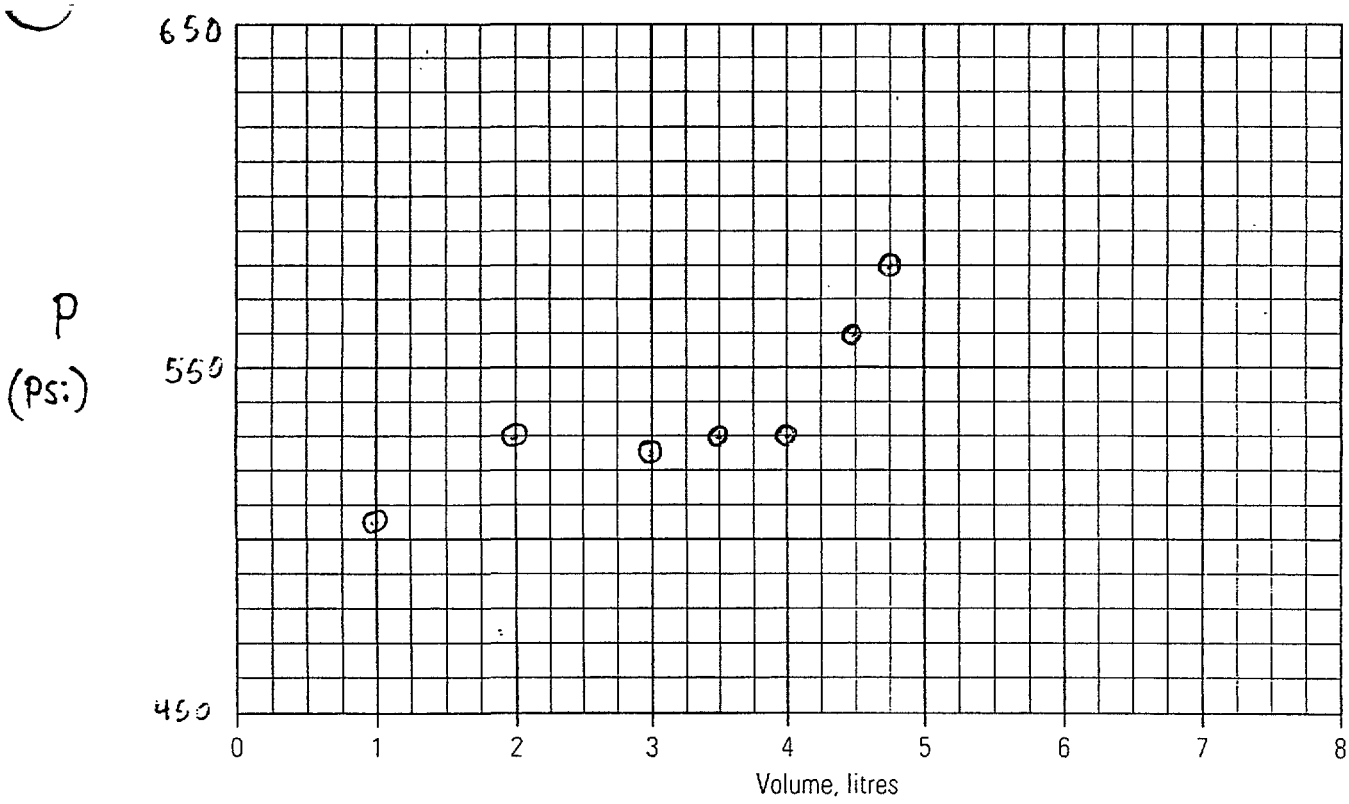
Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5
Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03
Packer No.: 8, comp 31 Serial No.: 13356 Depth (~~ft~~/m): 692.6 Inflation Tool No.: TIW 1088
Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 580 psi Tool Pressure, P_T: 300 psi
Borehole Water Level: 48 (~~ft~~/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.4			
Pressure, psi	505	530	525	530	530	560	580	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #8

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

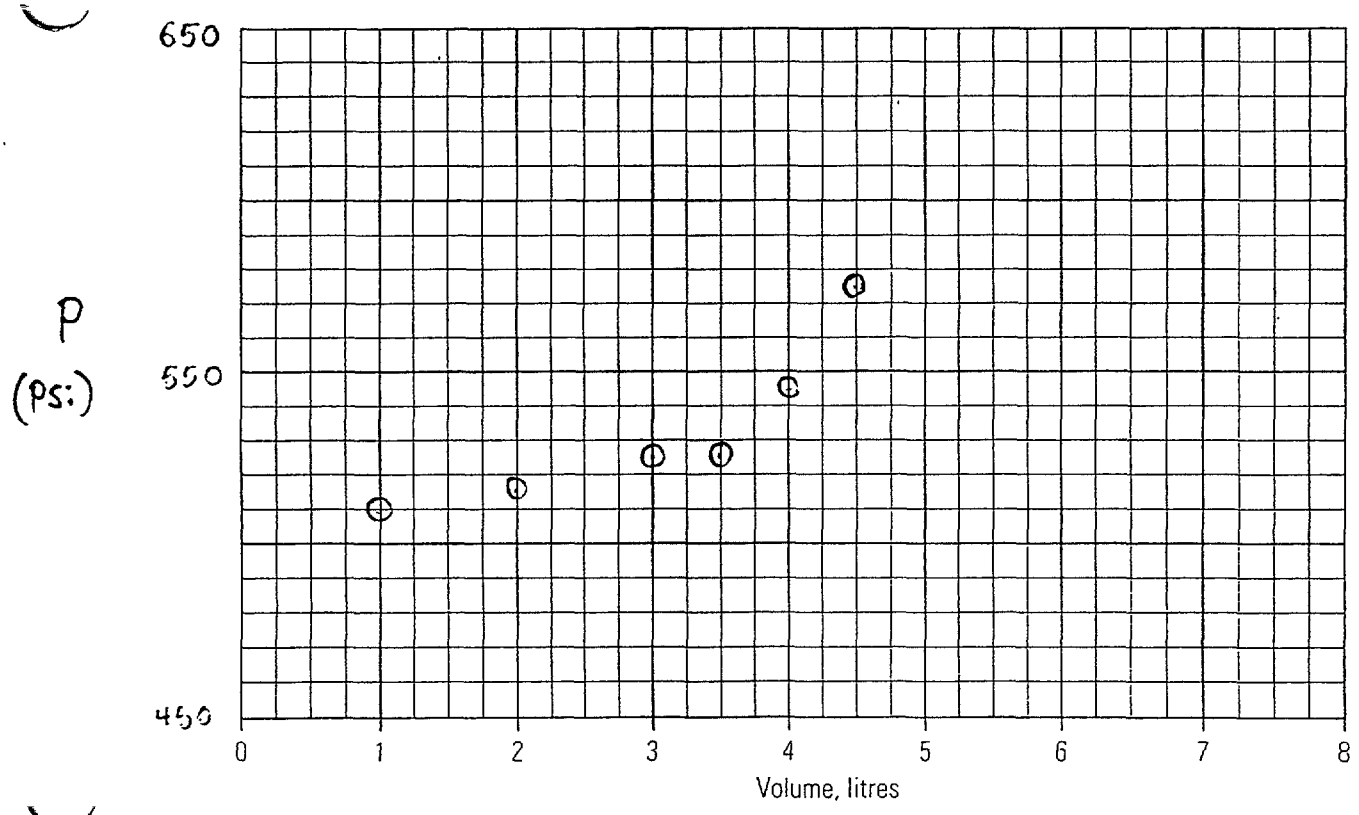
Packer No.: 9, comp 33 Serial No.: 13357 Depth (ft/m): 682.5 Inflation Tool No.: TIW 1038

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.25				
Pressure, psi	510	515	525	525	545	575	Ø				
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #9

Sheet 11 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

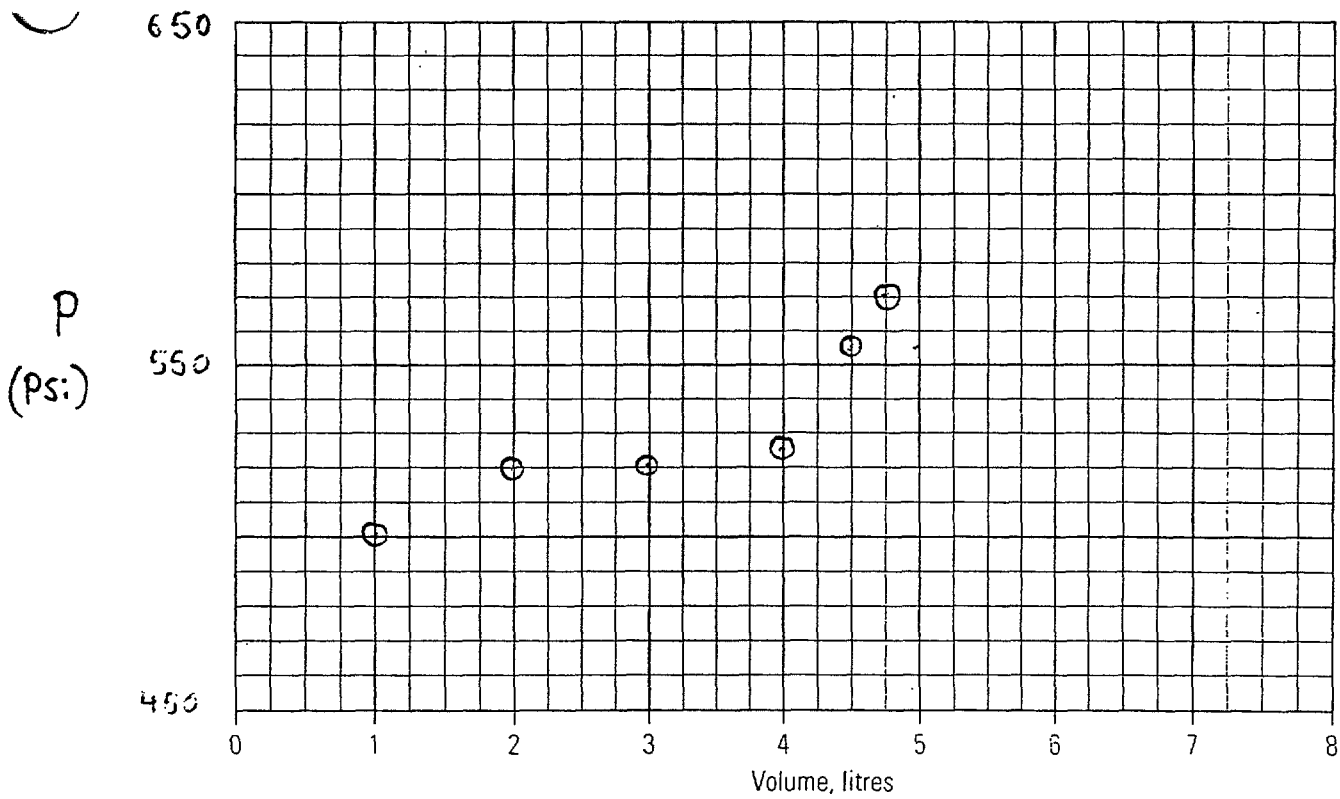
Packer No.: 10 comp 38 Serial No.: 13358 Depth (ft/m): 642.4 Inflation Tool No.: Tiw 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.45			
Pressure, psi	500	520	520	520	525	555	570	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #10

Sheet 16 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated Dec. 10/03

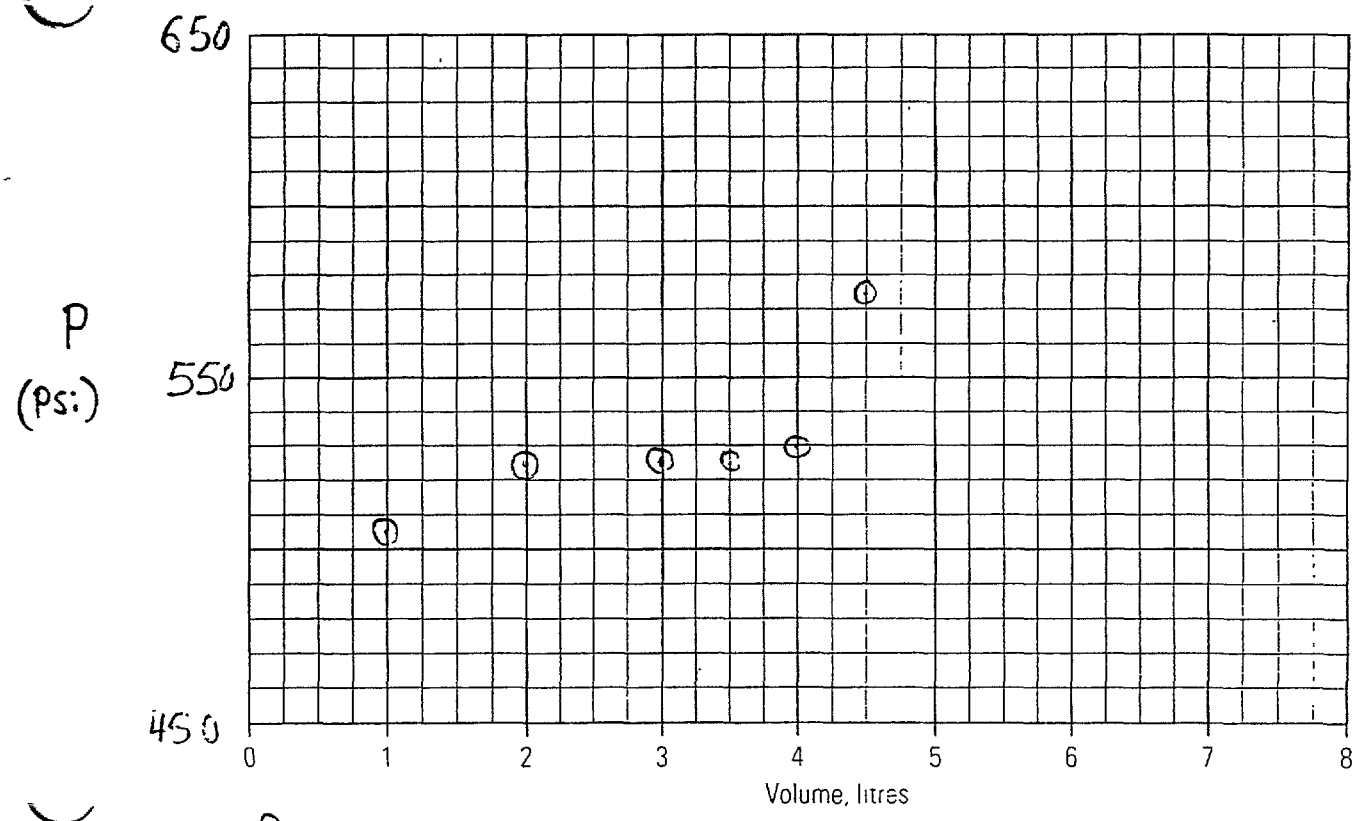
Packer No.: 15 comp 54 Serial No.: 13367 Depth (ft/m): 552.2 Inflation Tool No: TIW 1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 155 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.25				
Pressure, psi	505	525	525	525	530	575	Ø				
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer # 15

Sheet 12 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

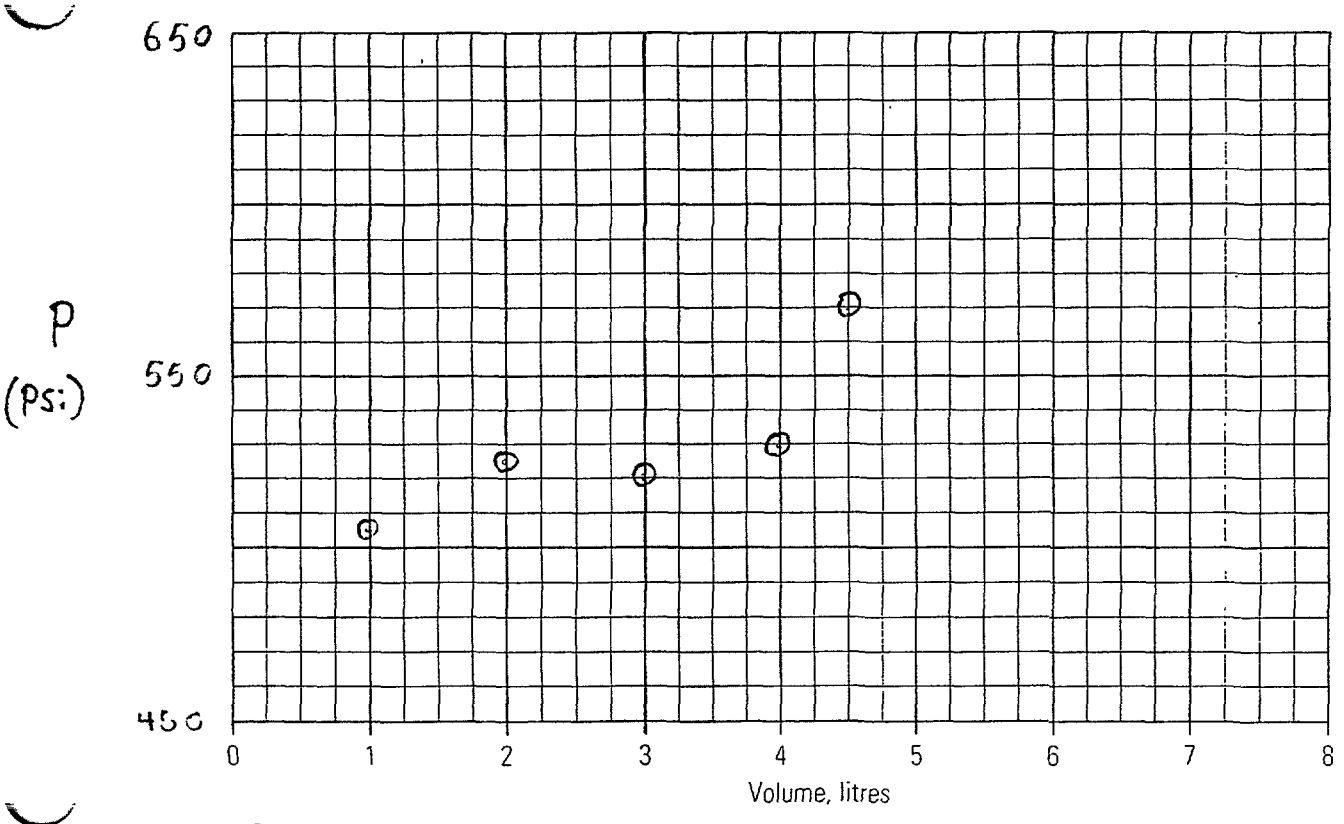
Packer No.: 11, comp 42 Serial No.: 13359 Depth (ft/m): 622.4 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.25				
Pressure, psi	505	525	520	525	530	570	Ø				
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #11

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated Dec 10/03

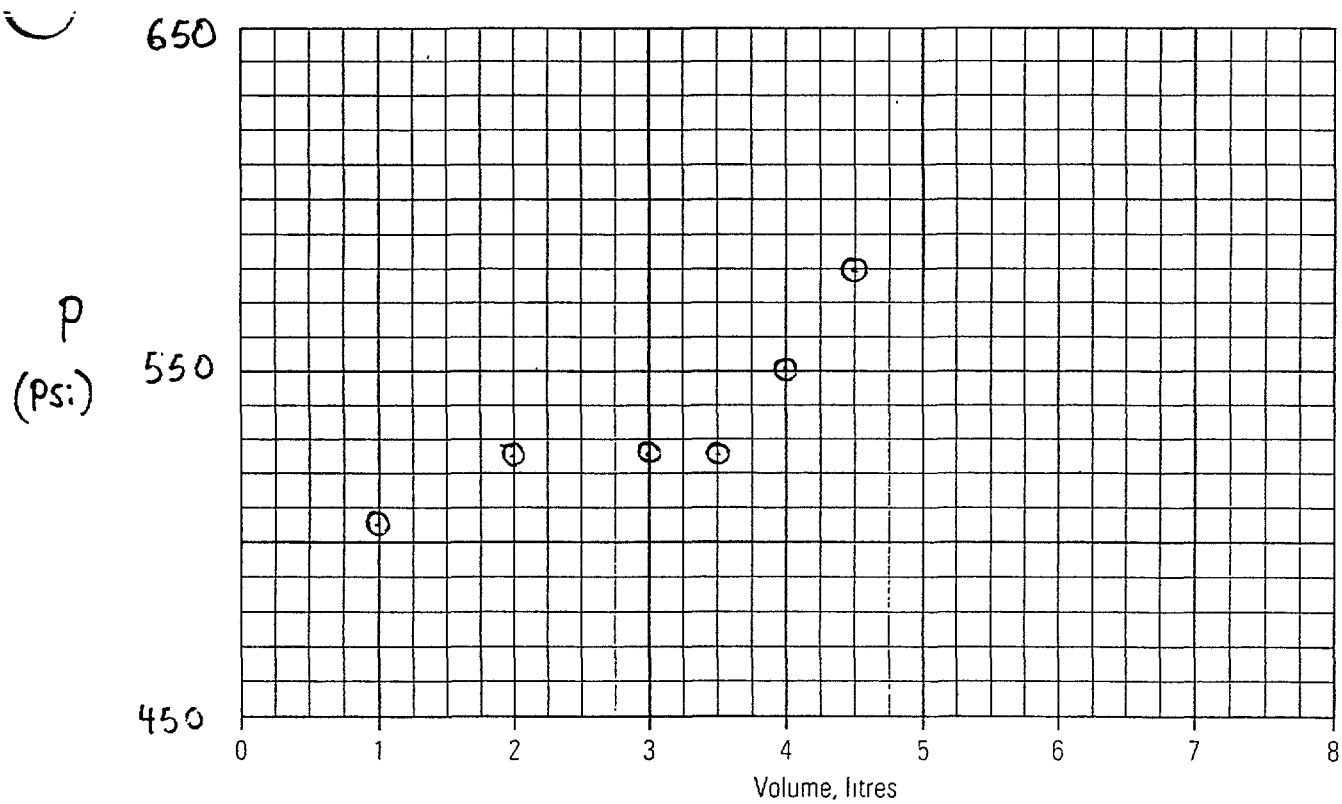
Packer No.: 12, comp 44 Serial No.: 13360 Depth (ft/m): 612.4 Inflation Tool No: TIW1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 580 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.2				
Pressure, psi	505	525	525	525	550	580	Ø				
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #12

Sheet 14 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

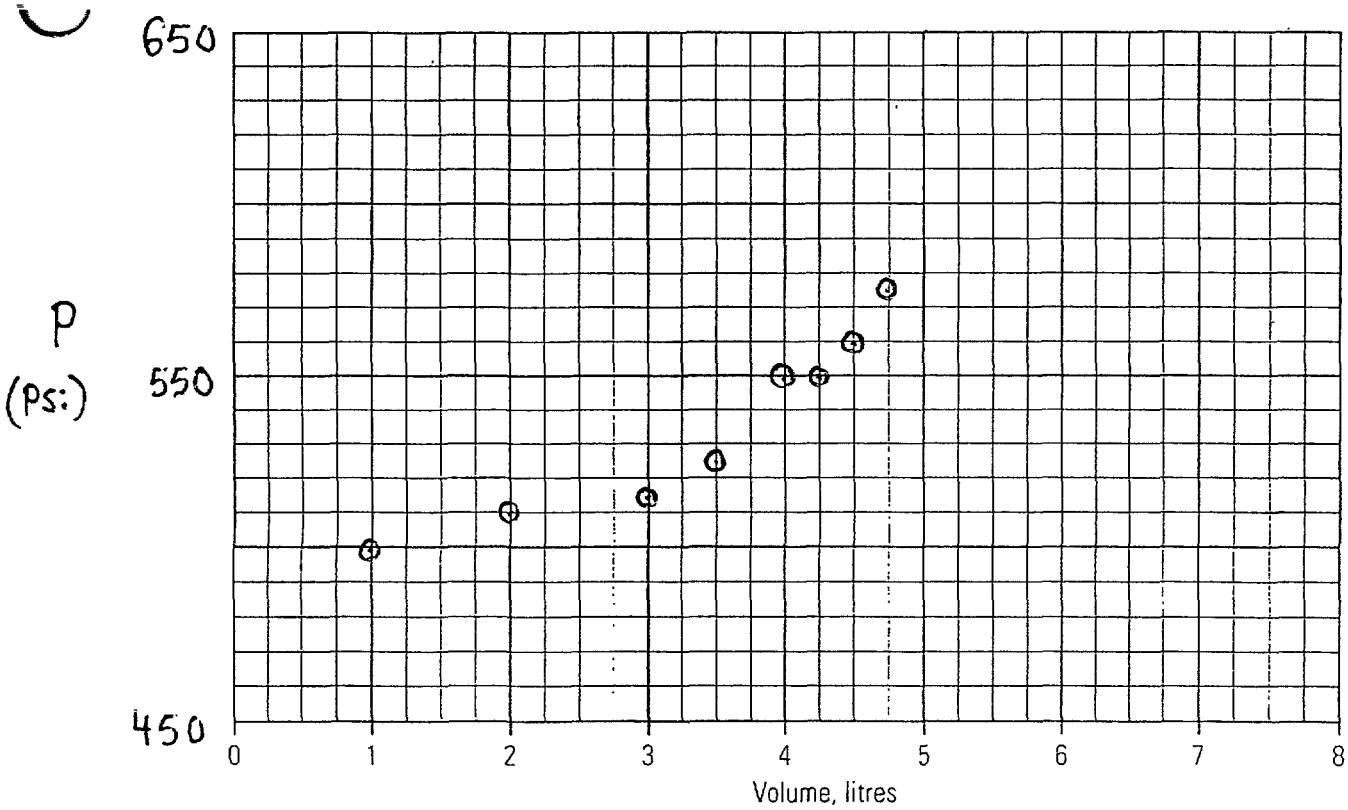
Packer No.: 13, comp 48 Serial No.: 13362 Depth (ft/m): 582.3 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.25	4.5	4.75	4.45		
Pressure, psi	500	510	515	525	550	550	560	575	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #13

Sheet 15 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

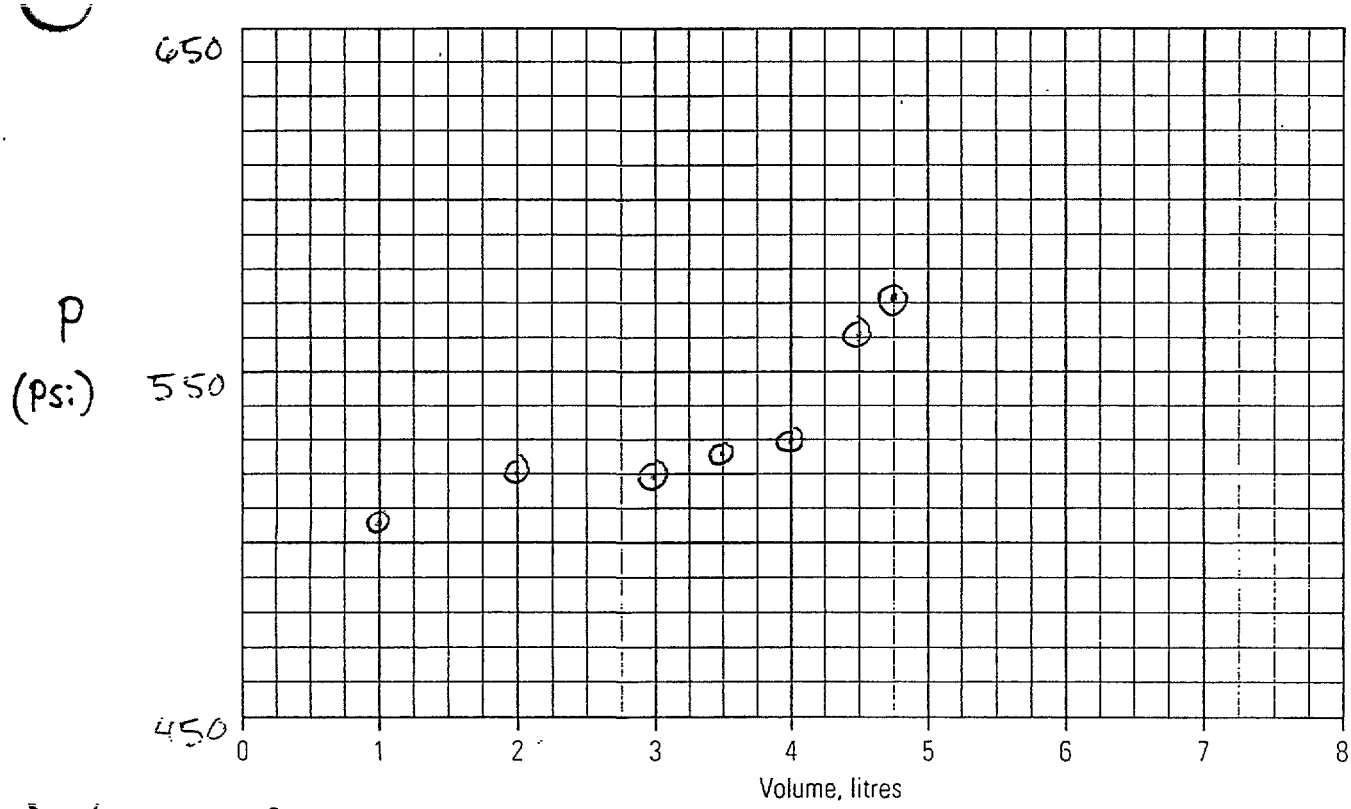
Packer No.: 14, comp 52 Serial No.: 13363 Depth (ft/m): 562.2 Inflation Tool No.: TEW 1688

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 570 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.4			
Pressure, psi	505	520	520	525	530	560	570	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #14

Sheet 17 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 10/03

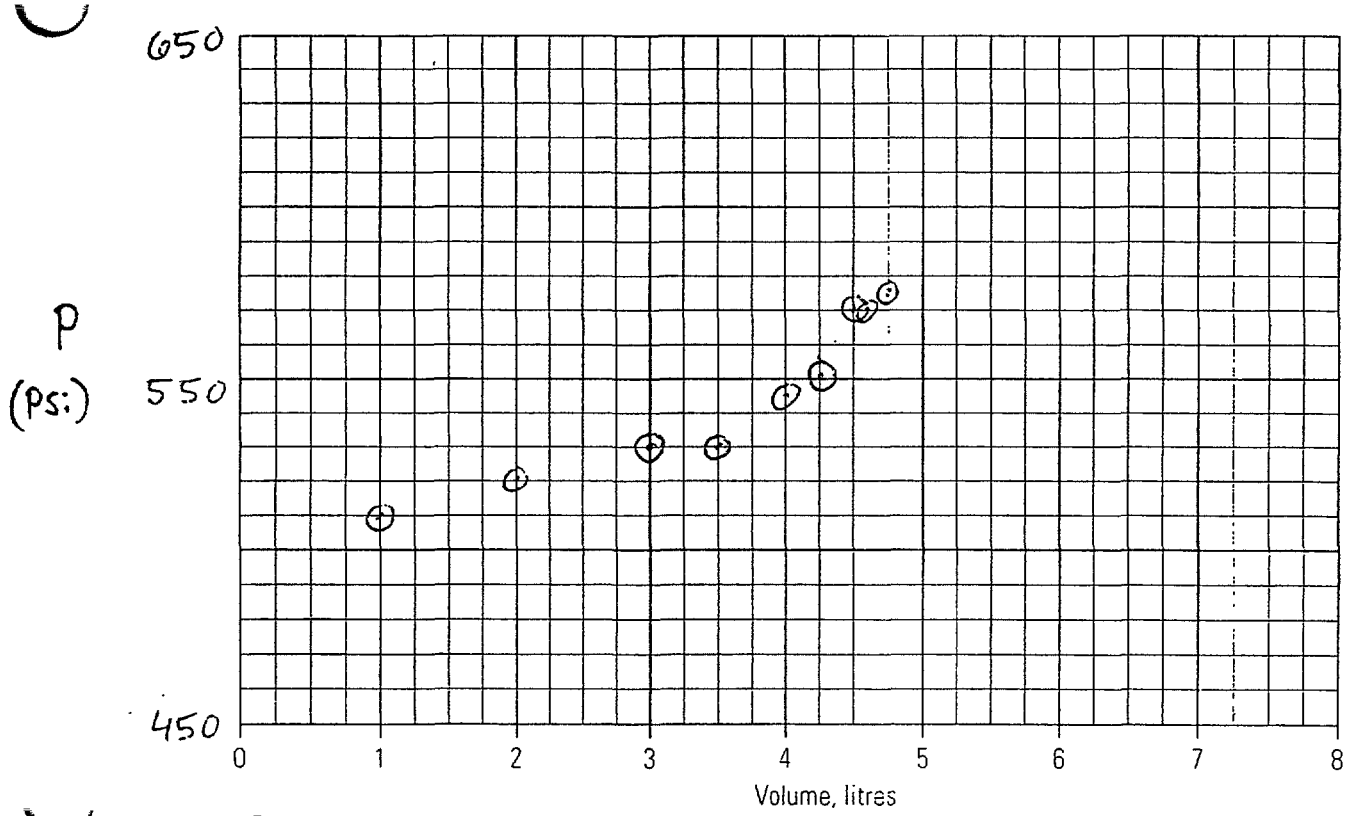
Packer No.: 16, comp 66 Serial No.: 13347 Depth (ft/m): 453.0 Inflation Tool No.: TFW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 575 psi Tool Pressure, P_T: 300 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.25	4.5	4.6	4.75	4.5	
Pressure, psi	510	520	530	530	545	550	570	570	575	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer # 16

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec. 11/03

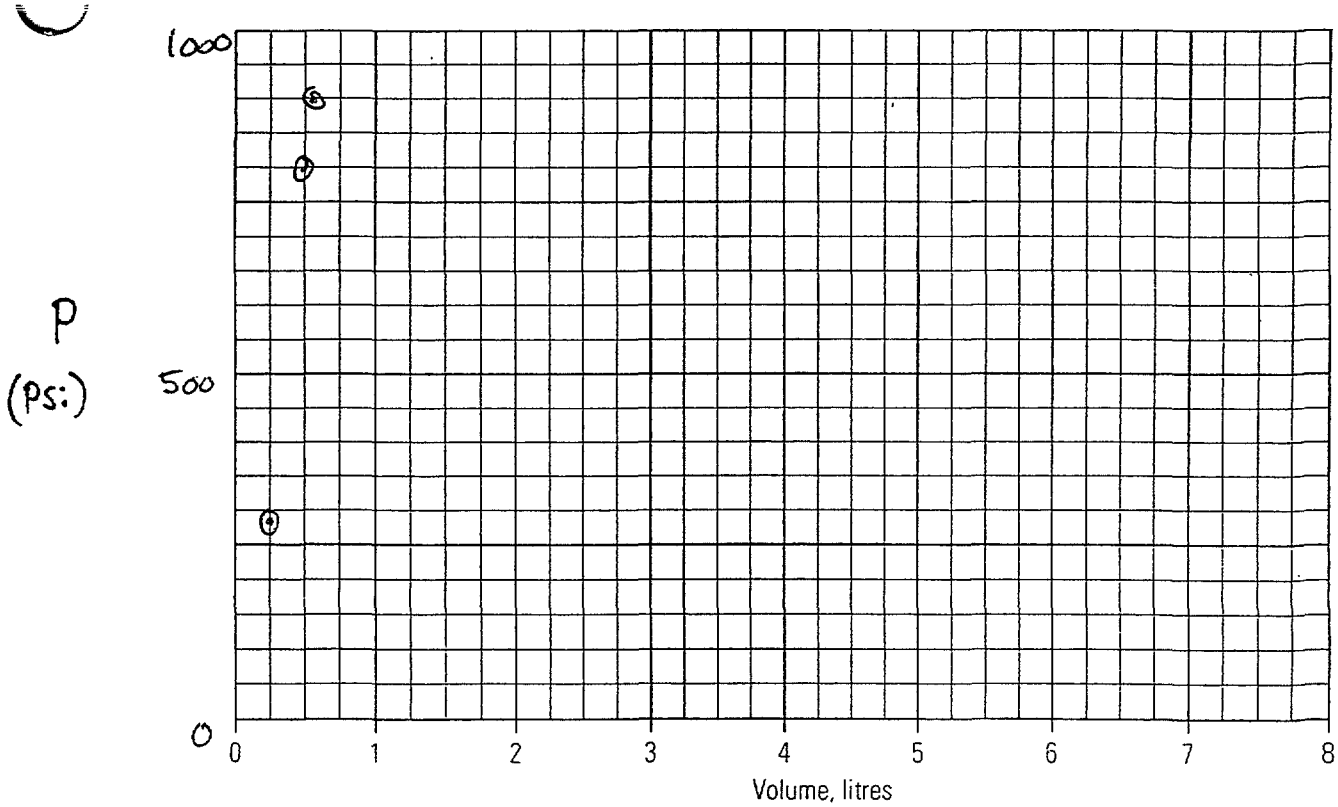
Packer No.: BWT Serial No.: Ø Depth (ft/m): ≈ 530 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: n/a psi Final Line Pressure, P_L: 900 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = n/a psi

Volume, litres	.25	.50	.75	.20							
Pressure, psi	280	800	900	Ø							
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Blank wall test - 2nd day of inflation

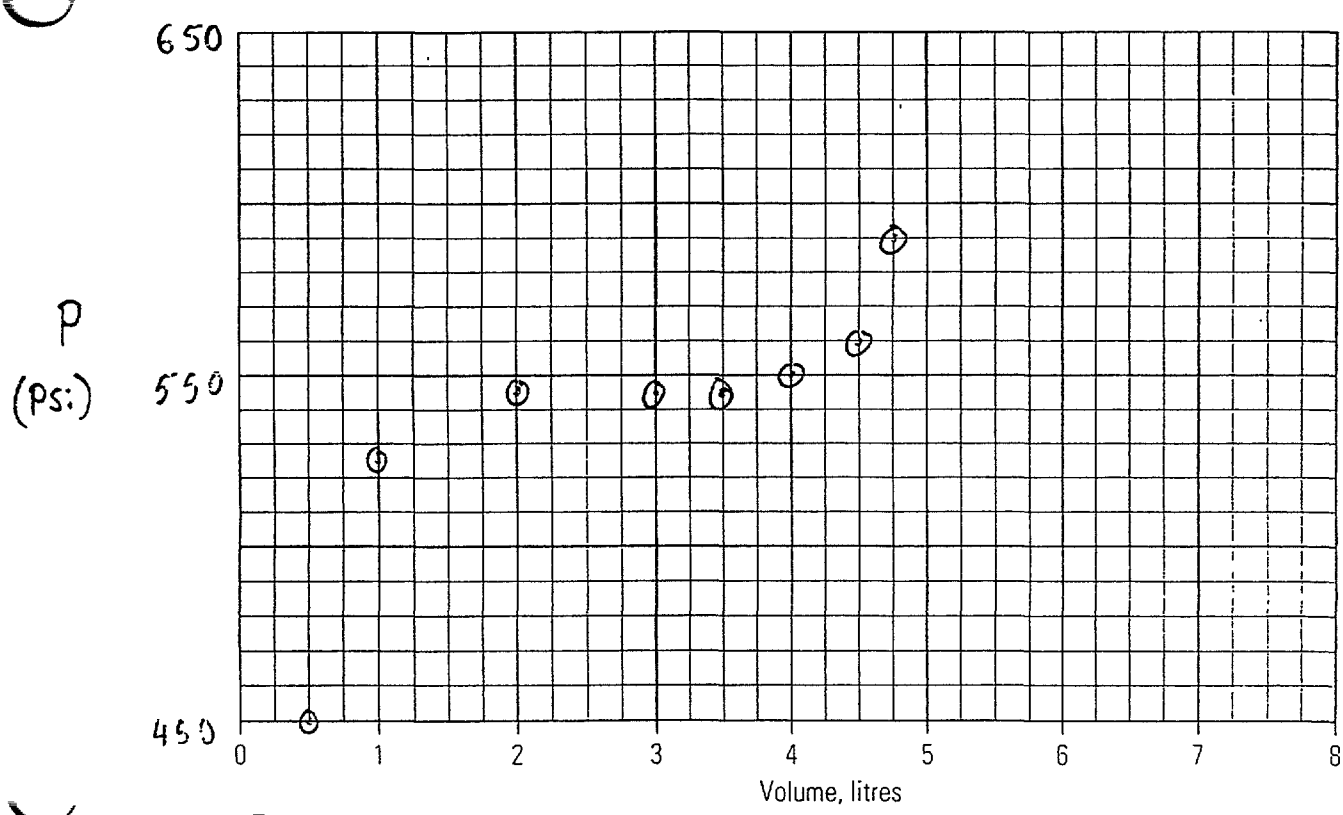
Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5
Location: San Bernardino Completed by: ML/DS Date Inflated Dec 11/03
Packer No.: 17 Comp 70 Serial No.: 13340 Depth (ft/m): 432.9 Inflation Tool No.: TIW 1088
Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 310 psi
Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	0.5	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.4		
Pressure, psi	450	525	545	545	545	550	560	590	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #17

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03

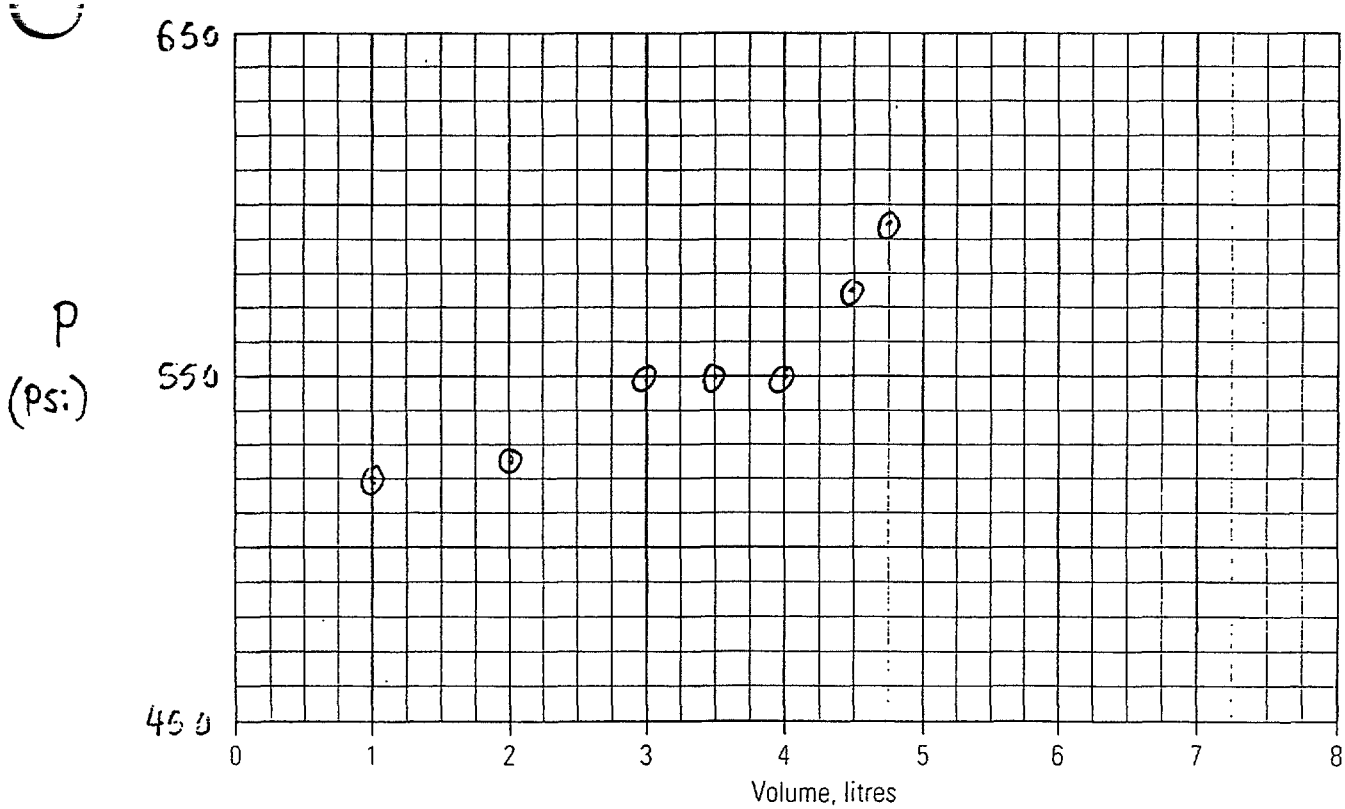
Packer No.: 18, comp 72 Serial No.: 13350 Depth (ft/m): 422.9 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.45			
Pressure, psi	520	525	550	550	550	575	595	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #18

Sheet 21 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03

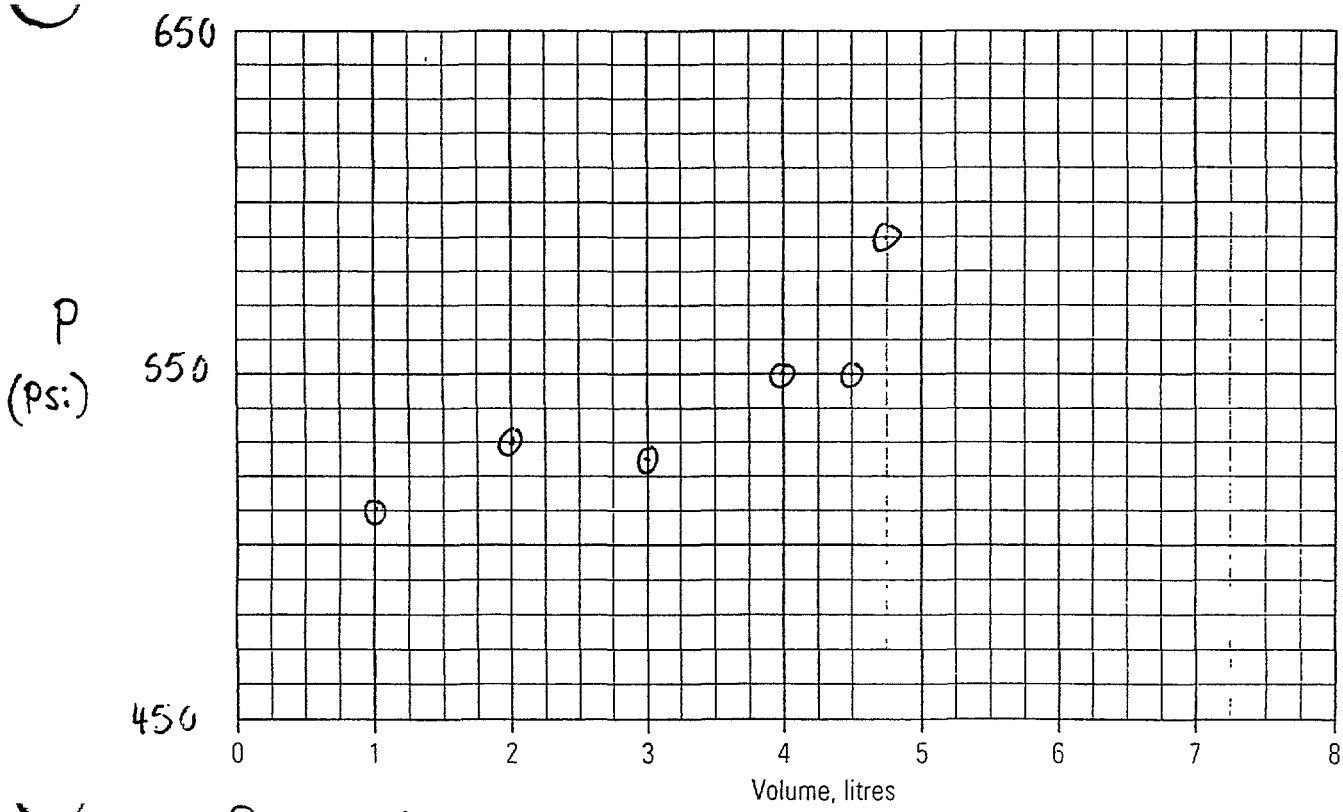
Packer No: Comp 86, packer 19 Serial No.: 13365 Depth (ft/m): 287.6 Inflation Tool No: TIW 1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 160 psi

Volume, litres	1.0	2.0	3.0	4.0	4.5	4.75	4.40				
Pressure, psi	510	530	525	550	550	590	Ø				
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments: Packer #19

Sheet 22 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No. LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated Dec 11/03

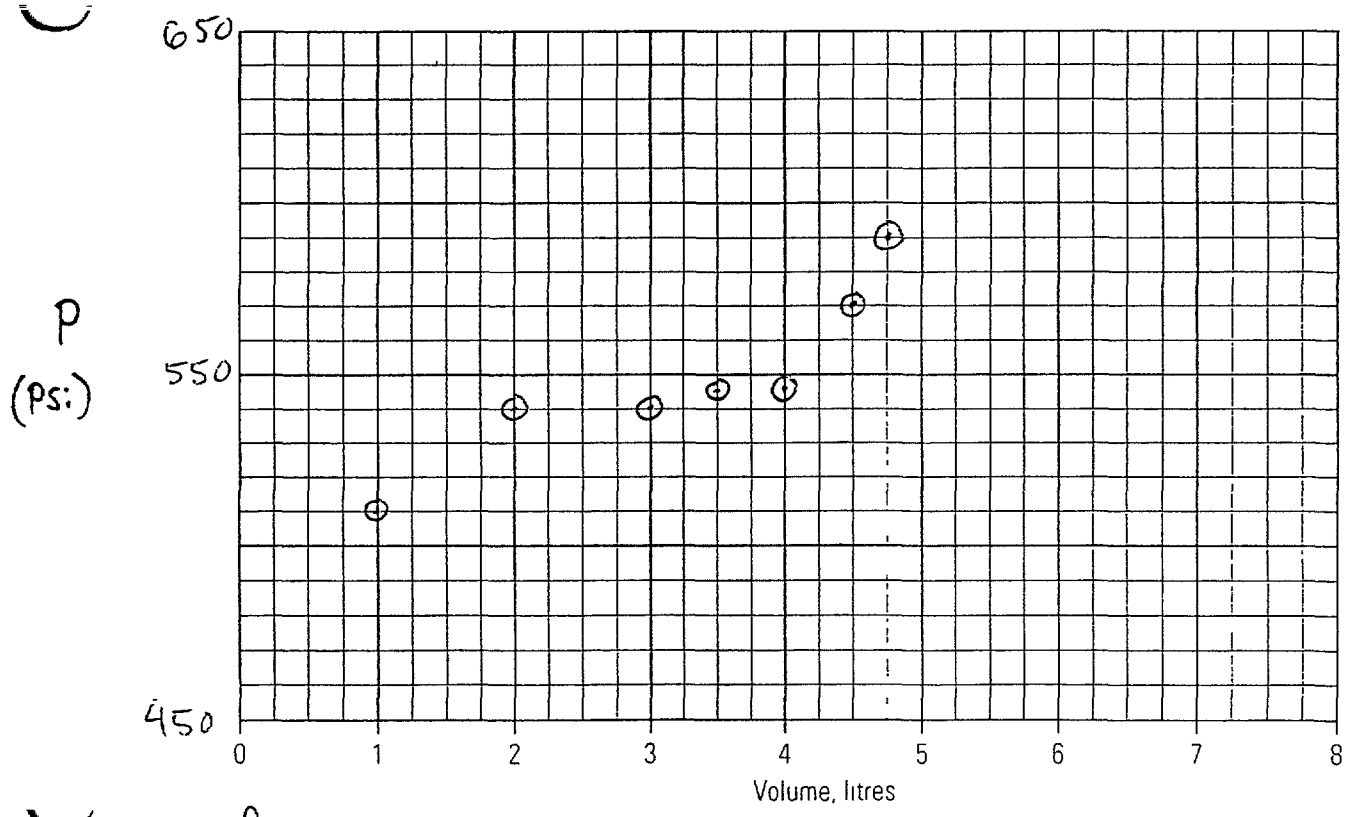
Packer No: 20 comp 90 Serial No.: 13366 Depth (ft/m): 267.6 Inflation Tool No TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.35			
Pressure, psi	510	540	540	545	545	570	590	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer # 20

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated Dec 11/03

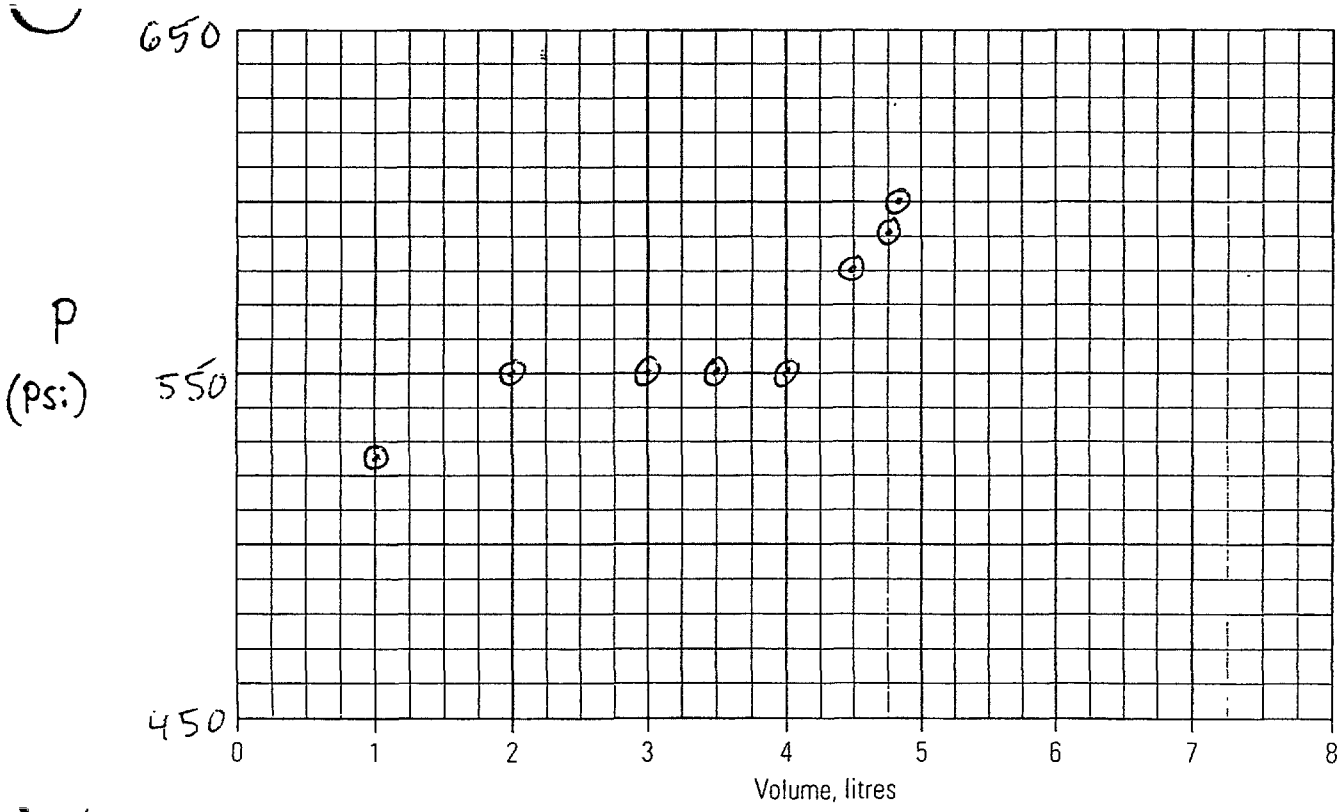
Packer No.: 21, comp 92 Serial No.: 13348 Depth (ft/m): 257.5 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 180 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.85	4.45		
Pressure, psi	525	550	550	550	550	580	590	600	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #21

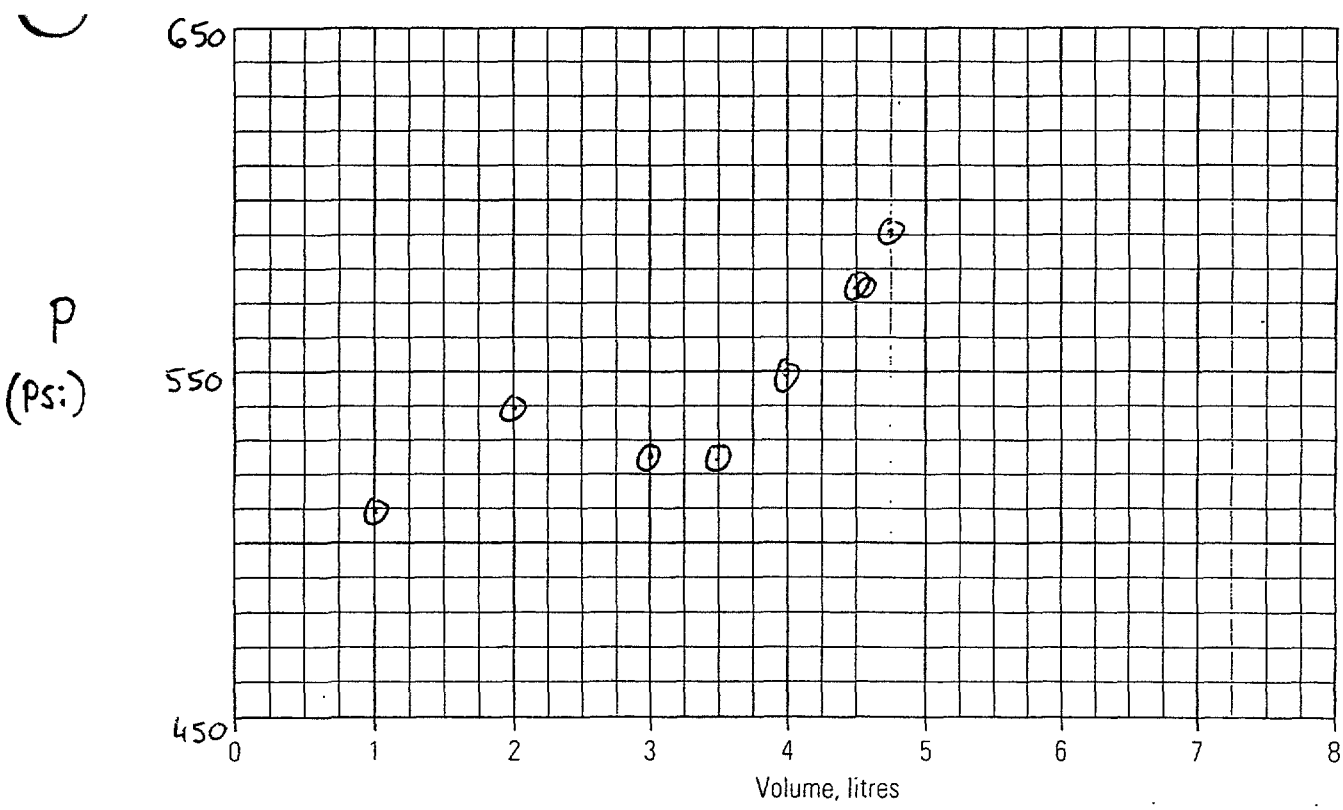
Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5
Location: San Bernardino Completed by: ML/DS Date Inflated:
Packer No.: 22, comp 101 Serial No.: 13349 Depth (m/ft): 172.4 Inflation Tool No.: TIW 1088
Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 310 psi
Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.6	4.75	4.45		
Pressure, psi	510	540	525	525	550	575	575	590	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #22

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03

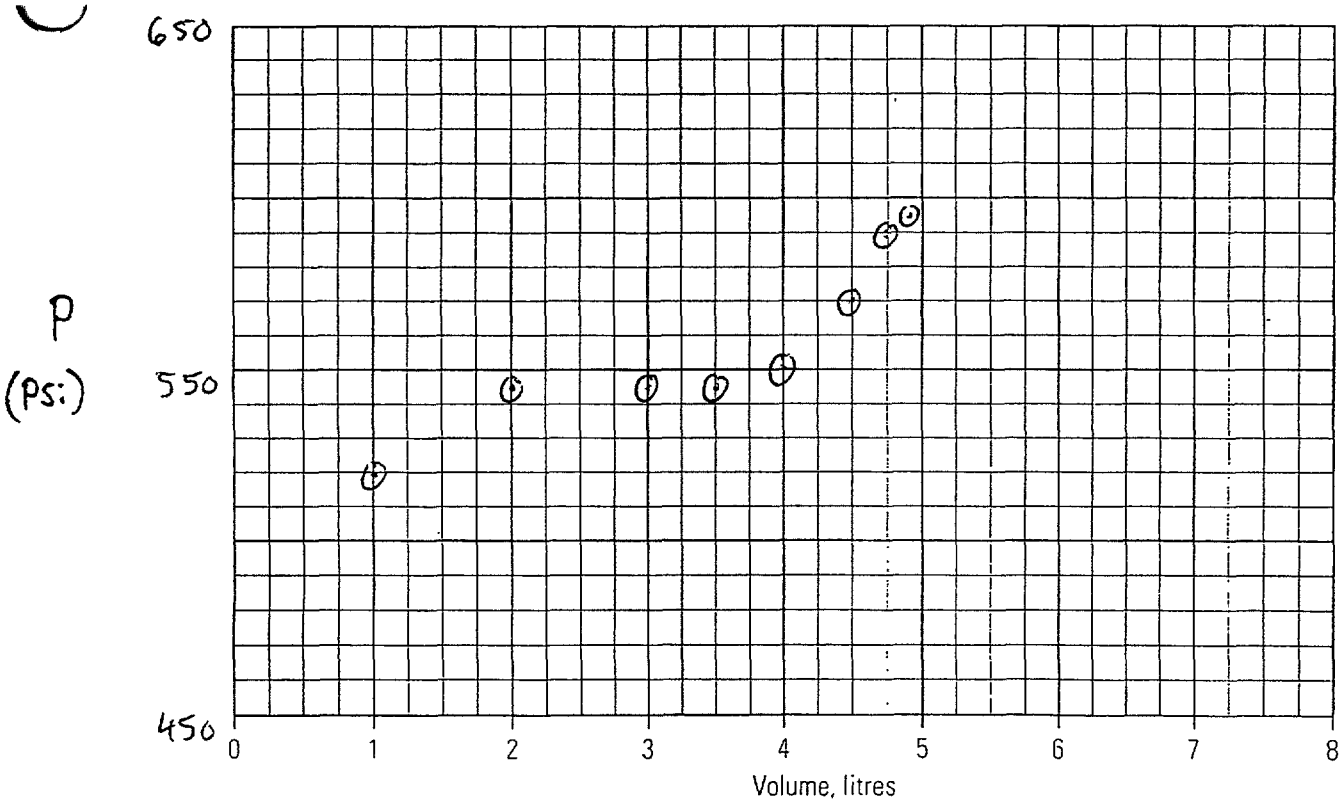
Packer No.: 23, Comp 105 Serial No.: 13364 Depth (ft/m): 152.3 Inflation Tool No.: TIW 1088

Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 595 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.9	4.5		
Pressure, psi	520	545	545	545	550	570	590	595	Ø		
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #23

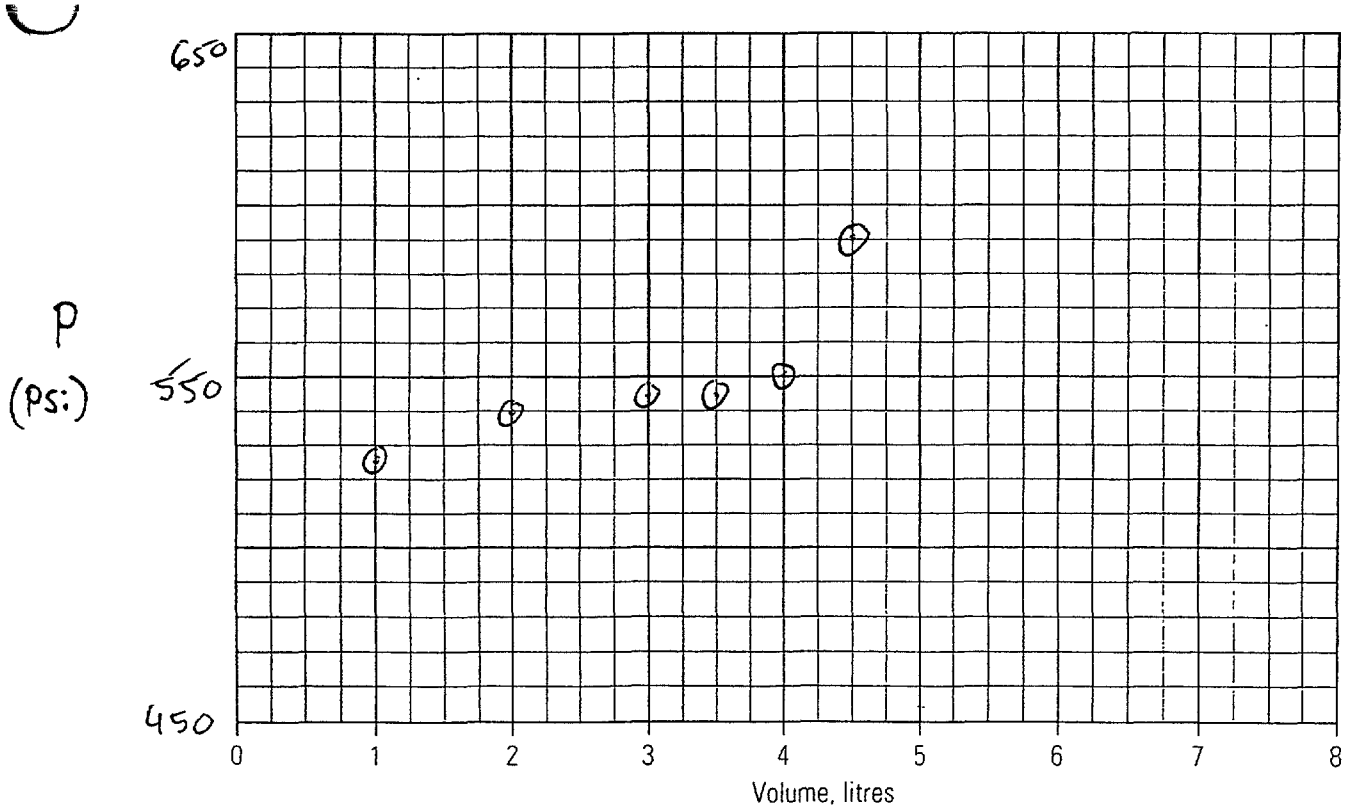
Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5
Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03
Packer No.: 24, comp 107 Serial No.: 13351 Depth (ft/m): 142.3 Inflation Tool No.: TIW 1088
Packer Valve Pressure, P_V: 130 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 310 psi
Borehole Water Level: 48 (ft / m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 170 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.25				
Pressure, psi	525	540	545	545	550	590	Ø				
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #24

Sheet 27 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03

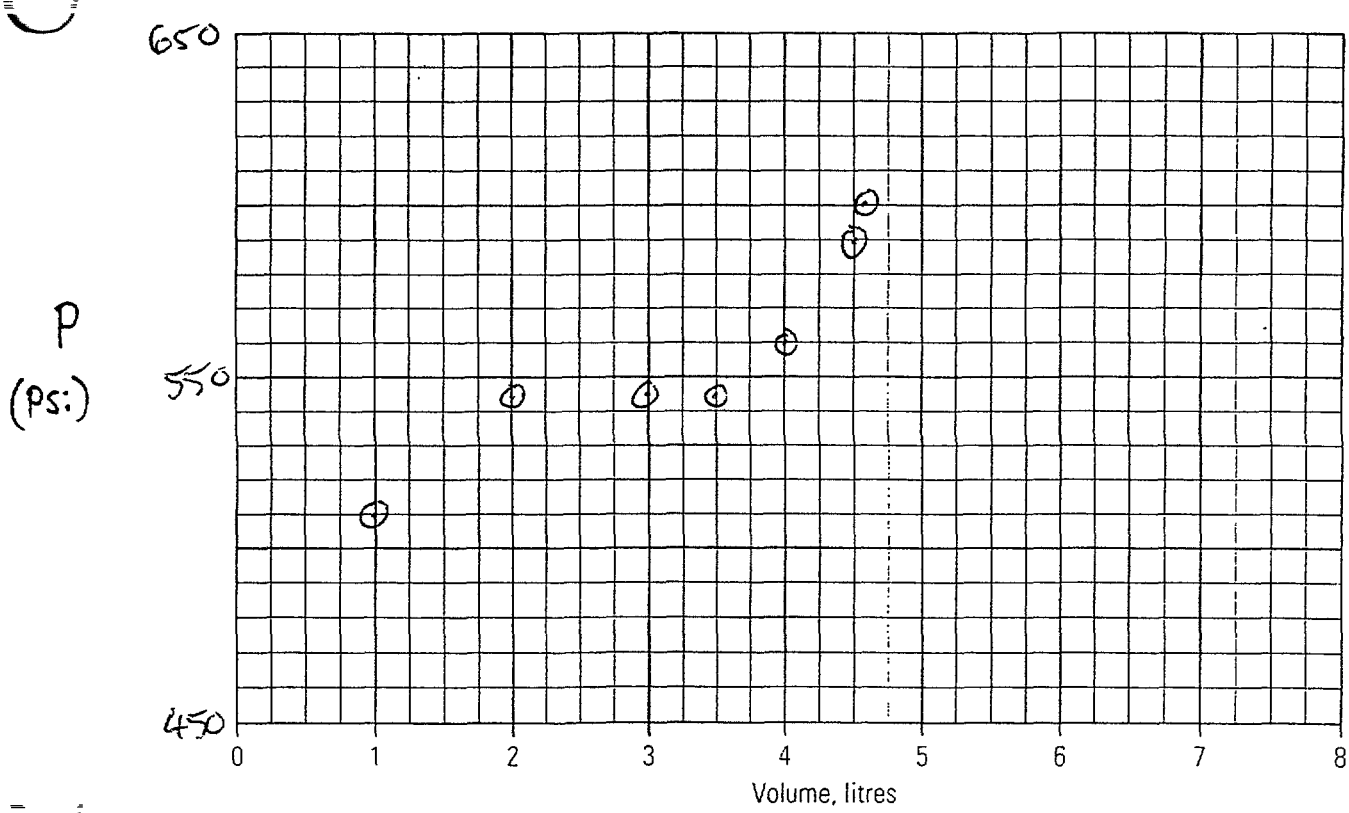
Packer No.: 25, comp 113 Serial No.: 13352 Depth (ft/m): 92.2 Inflation Tool No: TIW 1088

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 600 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 175 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.6	4.25			
Pressure, psi	510	545	545	545	560	590	600	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer # 25

Sheet 28 of 29

Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No.: LMW-5

Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03

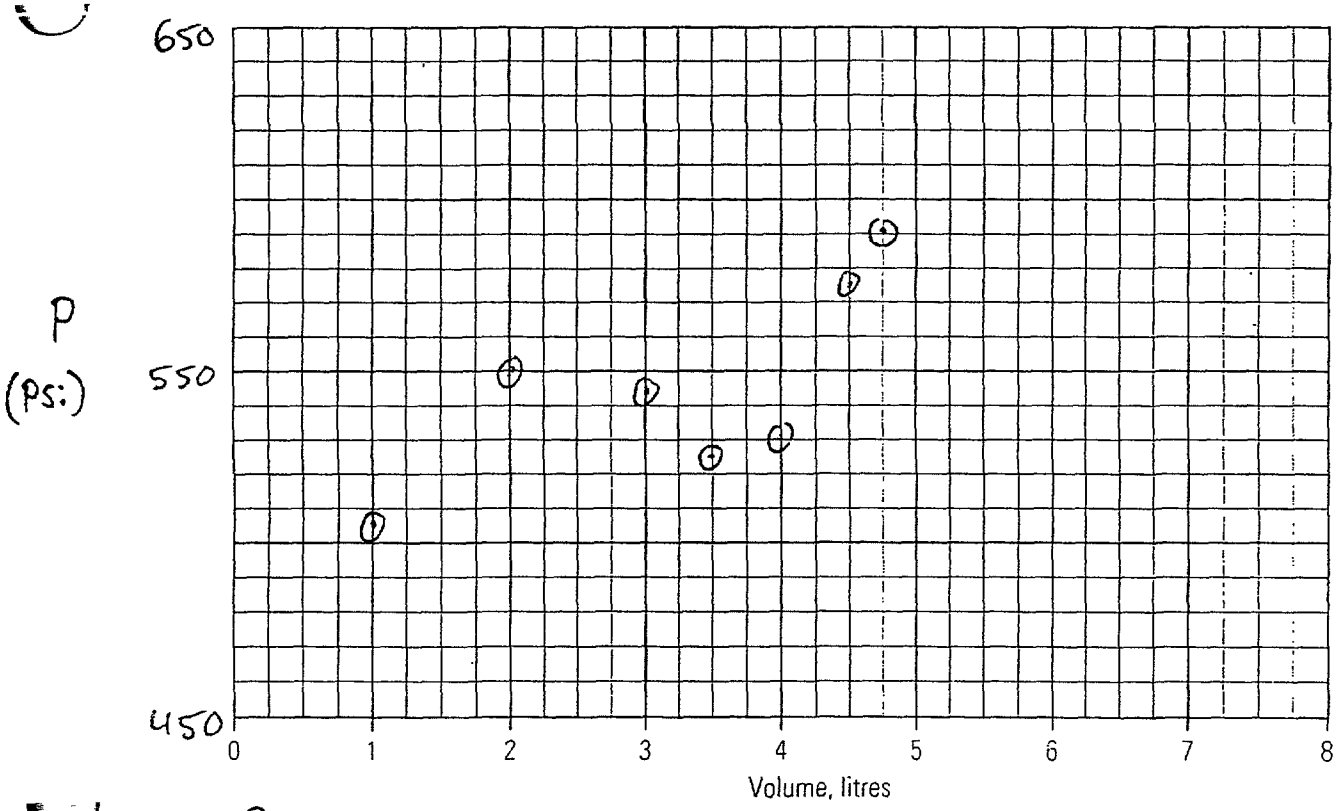
Packer No.: 26, Camp 117 Serial No.: 13353 Depth (ft/~~m~~): 72.1 Inflation Tool No.: TEW 1058

Packer Valve Pressure, P_V: 135 psi Final Line Pressure, P_L: 590 psi Tool Pressure, P_T: 310 psi

Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 165 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.75	4.45			
Pressure, psi	505	550	545	525	530	575	590	Ø			
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #26

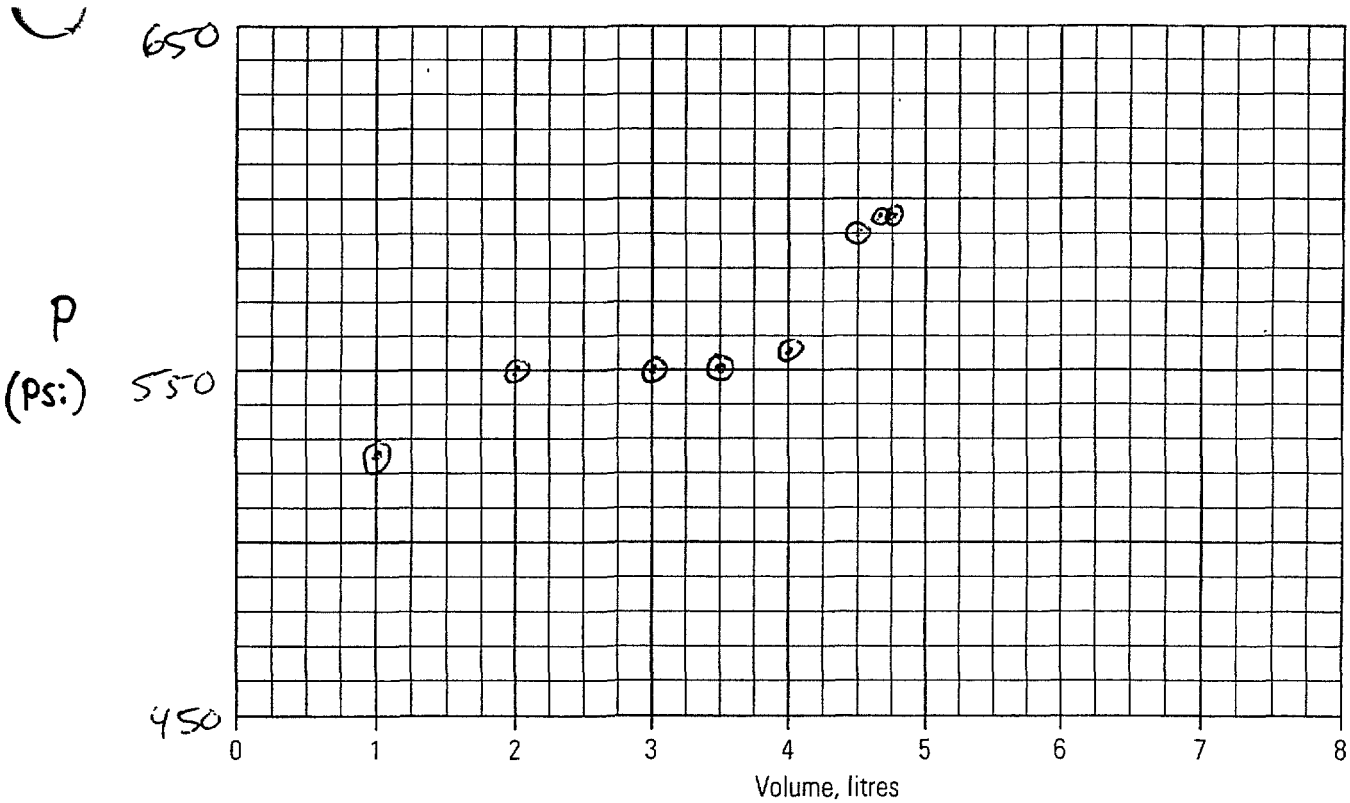
Westbay Instruments Inc.
A Schlumberger Company

MP Packer Inflation Record

Project: Beylik Drilling Inc. Project No.: WB 764 Well No: LMW-5
Location: San Bernardino Completed by: ML/DS Date Inflated: Dec 11/03
Packer No.: 27, comp 119 Serial No.: 13407 Depth (ft/m): 62.1 Inflation Tool No: IEW-1088
Packer Valve Pressure, P_V: 140 psi Final Line Pressure, P_L: 605 psi Tool Pressure, P_T: 310 psi
Borehole Water Level: 48 (ft/m) = 20 psi (P_W) Calculated Packer Element Pressure, $P_E = P_L + P_W - P_V - P_T$ = 175 psi

Volume, litres	1.0	2.0	3.0	3.5	4.0	4.5	4.65	4.75	4.9	4.5	
Pressure, psi	525	550	550	550	555	590	595	595	605	Ø	
Volume, litres											
Pressure, psi											

Plot of Gauge Pressure (psi) vs. Volume (litres)



Comments Packer #27