SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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November 5, 1992

The Weyerhaeuser Company
7001 396th Southeast
Snoqualmie, Washington 98065

Attn: Mr. Max Healea, Jr.
Environmental Project Manager

**RE: TECHNICAL MEMORANDUM 13, GROUNDWATER QUALITY DATA; THIRD BIANNUAL SAMPLING EVENT OF MONITORING WELLS IN AREAS NO. 1 AND 2**

Technical Memorandum 13 contains the results of the third biannual sampling event of the 11 groundwater monitoring wells located in Areas No. 1 and 2 within the Weyerhaeuser Cascade Division's, Snoqualmie, Washington Facility. The data from the previous two biannual sampling events are also presented in order to facilitate the evaluation of trends in the data. This memorandum and the associated sampling were performed under the original authorization and Agreement for Professional Services dated July 1991.

The data is presented in both tabular and graphical formats for total extractable petroleum hydrocarbons (TEPH), benzene, toluene, ethylbenzene, xylenes (collectively referred to as BTEX) and lead in Figures 1 through 7. Groundwater elevations are also included on these figures. The data from each sampling event is also presented in Tables 1 through 3 for the July 1991, March 1992, and September 1992 events in a format similar to the two previous reporting periods.

Data from the current sampling event indicates that concentrations of BTEX exceed Model Toxics Control Act (MTCA) Method A cleanup levels in Monitoring Well (MW) 003 in Area No. 1 (former fuel storage facility). Concentrations of TEPH are exceeded in MW-003, MW-005, and MW-006 in Area No. 1.

Total lead concentrations are exceeded in the seven monitoring wells in Area No. 1, MW-001, -002, -003, -004, -005, -006, and -007. Area No. 2 monitoring wells MW-001, -002, -003, and -004 also exceed the total lead cleanup level of 5 parts per billion. The presence of higher concentrations in the background wells indicates that the levels are "natural" and are not the direct result of spilled petroleum products which contain lead. Please note that the laboratory reporting ability for lead



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changed following the second biannual report, and is represented by a change in units in the third biannual values.

Evaluation of trends among the three sampling events indicates a direct relationship between increased water levels and increased TEPH and BTEX concentrations. In addition, the extent of the contamination does not appear to be spreading, primarily being limited to monitoring well number three in Area 1, and to a much lesser extent, in monitoring wells five and six, also in area one.

The localized nature of the contamination is a positive sign when combined with information from the June 1990 treatability study performed by ReTeC, Inc. This study says, "Initial enumeration of total microorganisms and HC degraders in Area 1 and 2 site samples resulted in healthy concentrations of cells. The number of total microorganisms were typical of active landfarming operations which range from 106-108 cells/g soil" (page 26). This indicates an active ability to decrease the hydrocarbon concentrations in-situ under naturally occurring processes.

Given the extent of the source of remediation, the fairly static nature of the petroleum movement, and the availability of natural hydrocarbon degrading microorganisms, continued monitoring rather than active remedial efforts is a reasonable and appropriate action at this time. Shannon & Wilson will perform one more sampling event at the site under the existing monitoring plan.

The data presented in this report are based on limited research at the facility and should be considered representative at the time of our observations. Shannon & Wilson, Inc. performed this work within our best judgment to adequately describe site conditions at the facility. Changes in the conditions of the property can occur with time from both natural processes and human activities. In addition, changes in governmental codes, regulations, or law may occur. Due to such changes, our observations and recommendations applicable to this facility may need to be revised wholly or in part, due to changes beyond our control.

This report was prepared for the exclusive use of the Weyerhaeuser Company, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. Shannon & Wilson has prepared the attached "Important Information About Your Subsurface Waste Management (Remediation) Report" to assist you and others in understanding the use and limitations of our reports.

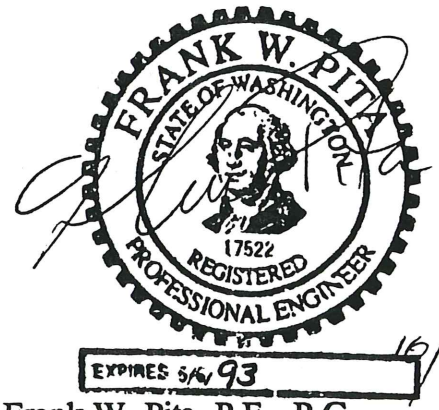
A copy of this report should be forwarded to the Washington Department of Ecology for their reference. If you have any questions or comments regarding this material, please contact me at (206) 632-8020.

Respectfully,

SHANNON & WILSON, INC.

Brian L. Clark
Environmental Engineer

Robert Colombo
Project Manager




Frank W. Pita, P.E., P.G.
Vice President

BLC:RC:FWP/blc

Enclosures: Tables 1 through 3
Figures 1 through 7
Important Information About Your Subsurface Waste Management Report

T1276-01.LTR/T1276-lkd/lkd

**Table 1. First Biannual Sampling Event (July 1991)**
**Snoqualmie Former Underground Fuel Storage and Above Ground Road Oil Storage Facilities**
**Groundwater Sample Results (1)**

| Well Location (2) | TEPH (8015 Mod.) (ppm) | Volatile Organic Analyses (EPA 624) | | | | | Total Lead (7421) (ppb) |
|---|---|---|---|---|---|---|---|
| | | Benzene (ppb) | Toluene (ppb) | Ethylbenzene (ppb) | o-Xylene (ppb) | m,p-Xylene (ppb) | |
| A1-1 | 0.12 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 24 |
| A1-2 | 0.49 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 21 |
| A1-3 | 1.5 | 640 | 200 | 1700 | 350 | 710 | 58 |
| A1-3 duplicate | 1.7 | 700 | < 10 | 670 | 430 | 160 | 64 |
| A1-4 | 0.59 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 11 |
| A1-5 | 1.1 | 14 | < 1.0 | 2.3 | 1.6 | 2.4 | 18 |
| A1-6 | 0.75 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 |
| A1-7 | 0.18 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 7 |
| A2-1 | 0.37 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 22 |
| A2-2 | 0.08 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 |
| A2-3 | 0.42 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 53 |
| A2-4 | 0.27 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 7 |
| Ecology Cleanup Levels (3) | 1.0 | 5.0 | 30.0 | 40.0 | 20.0 | 20.0 | 5.0 |

1) As reported by Alden Analytical Laboratory, Seattle, Washington
2) Legend: A1-1 = Area 1, Monitoring Well Number 1, etc.
3) Washington Model Toxics Control Act (MTCA) Method A
< Indicates value was less than the reporting limit, reporting limit indicated
Shaded cells indicate values exceeding MTCA Cleanup levels

**Table 2. Second Biannual Sampling Event (March 1992)**
**Snoqualmie Former Underground Fuel Storage and Above Ground Road Oil Storage Facilities**
**Groundwater Sample Results (1)**

| Well Location (2) | TEPH (8015 Mod.) (ppm) | Volatile Organic Analyses (EPA 624) | | | | | Total Lead (7421) (ppb) |
|---|---|---|---|---|---|---|---|
| | | Benzene (ppb) | Toluene (ppb) | Ethylbenzene (ppb) | o-Xylene (ppb) | m,p-Xylene (ppb) | |
| A1-1 | 0.26 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 6 |
| A1-2 | 0.61 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 2 |
| A1-3 | 4.6 | 1200 | 1400 | 370 | 260 | 1300 | 6 |
| A1-3 duplicate | 4.0 | 1400 | 1600 | 460 | 290 | 1500 | 7 |
| A1-4 | 0.69 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 18 |
| A1-5 | 0.98 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 7 |
| A1-6 | 0.67 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 6 |
| A1-7 | < 0.25 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 2 |
| A2-1 | 0.47 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 2 |
| A2-2 | < 0.25 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 3 |
| A2-3 | 0.78 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 6 |
| A2-4 | 0.42 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 2 |
| Ecology Cleanup Levels (3) | 1.0 | 5.0 | 30.0 | 40.0 | 20.0 | 20.0 | 5.0 |

1) As reported by Alden Analytical Laboratory, Seattle, Washington
2) Legend: A1-1 = Area 1, Monitoring Well Number 1, etc.
3) Washington Model Toxics Control Act (MTCA) Method A
< Indicates value was less than the reporting limit, reporting limit indicated
Shaded cells indicate values exceeding MTCA Cleanup levels

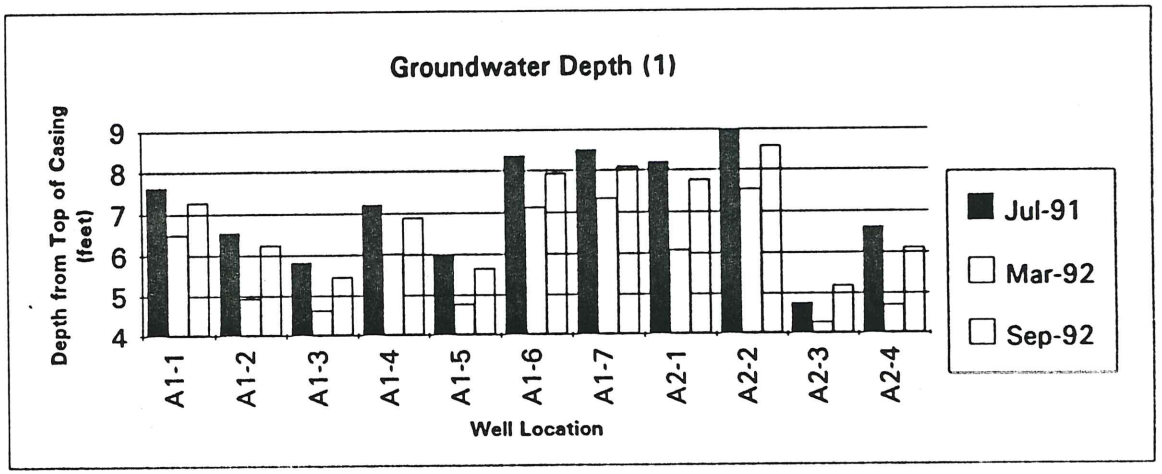
**Table 3. Third Biannual Sampling Event (September 1992)**
**Snoqualmie Former Underground Fuel Storage and Above Ground Road Oil Storage Facilities**
**Groundwater Sample Results (1)**

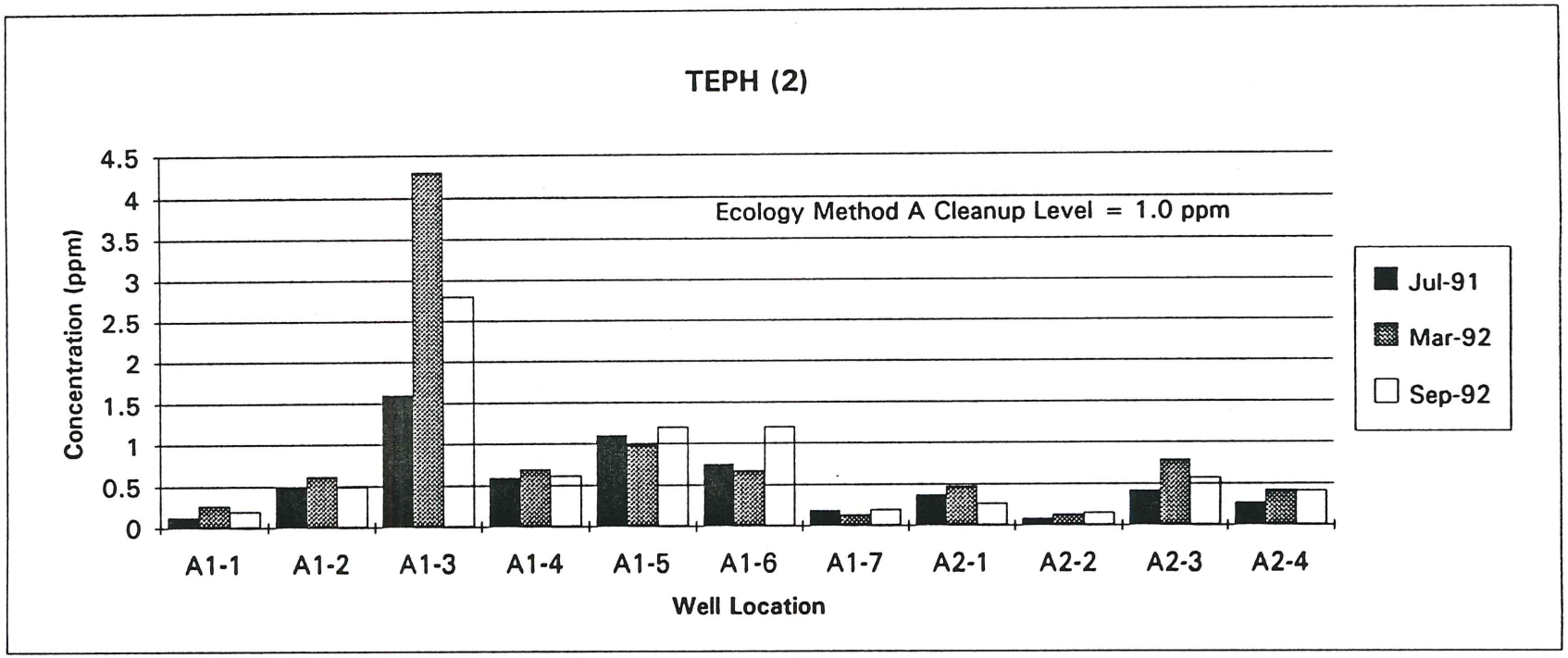
| Well Location (2) | TEPH (8015 Mod.) (ppm) | Volatile Organic Analyses (EPA 624) | | | | | Total Lead (7421) (ppm) |
|---|---|---|---|---|---|---|---|
| | | Benzene (ppb) | Toluene (ppb) | Ethylbenzene (ppb) | o-Xylene (ppb) | m,p-Xylene (ppb) | |
| A1-1 | 0.19 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.025 |
| A1-2 | 0.49 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.012 |
| A1-3 | 2.8 | 1200 | 1100 | 360 | 240 | 1100 | 0.036 |
| A1-3 duplicate | NP | NP | NP | NP | NP | NP | NP |
| A1-4 | 0.61 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.050 |
| A1-5 | 1.2 | 14 | 21 | 1.1 | 1.6 | 7.7 | 0.022 |
| A1-6 | 1.2 | 2.1 | 2.5 | < 1.0 | < 1.0 | < 1.0 | 0.034 |
| A1-7 | 0.19 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.016 |
| A2-1 | 0.26 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.030 |
| A2-2 | 0.15 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.007 |
| A2-3 | 0.57 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.16 |
| A2-4 | 0.41 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 0.047 |
| Ecology Cleanup Levels (3) | 1.0 | 5.0 | 40.0 | 30.0 | 20.0 | 20.0 | 0.005 |

1) As reported by Alden Analytical Laboratory, Seattle, Washington
2) Legend: A1-1 = Area 1, Monitoring Well Number 1, etc.
3) Washington Model Toxics Control Act (MTCA) Method A
< Indicates value was less than the reporting limit, reporting limit indicated
Shaded cells indicate values exceeding MTCA Cleanup levels
NP indicates the test was Not Performed

Figure 1

| Well No. | TEPH (ppm) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 0.12 | 0.26 | 0.19 |
| A1-2 | 0.49 | 0.61 | 0.49 |
| A1-3 | 1.6 | 4.3 | 2.8 |
| A1-4 | 0.59 | 0.69 | 0.61 |
| A1-5 | 1.1 | 0.98 | 1.2 |
| A1-6 | 0.75 | 0.67 | 1.2 |
| A1-7 | 0.18 | 0.125 | 0.19 |
| A2-1 | 0.37 | 0.47 | 0.26 |
| A2-2 | 0.08 | 0.125 | 0.15 |
| A2-3 | 0.42 | 0.78 | 0.57 |
| A2-4 | 0.27 | 0.42 | 0.41 |



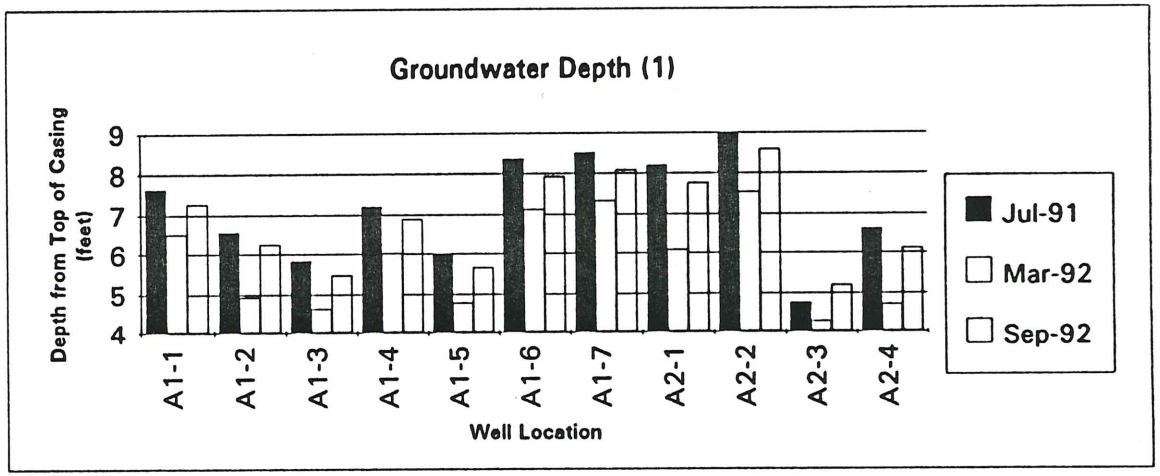



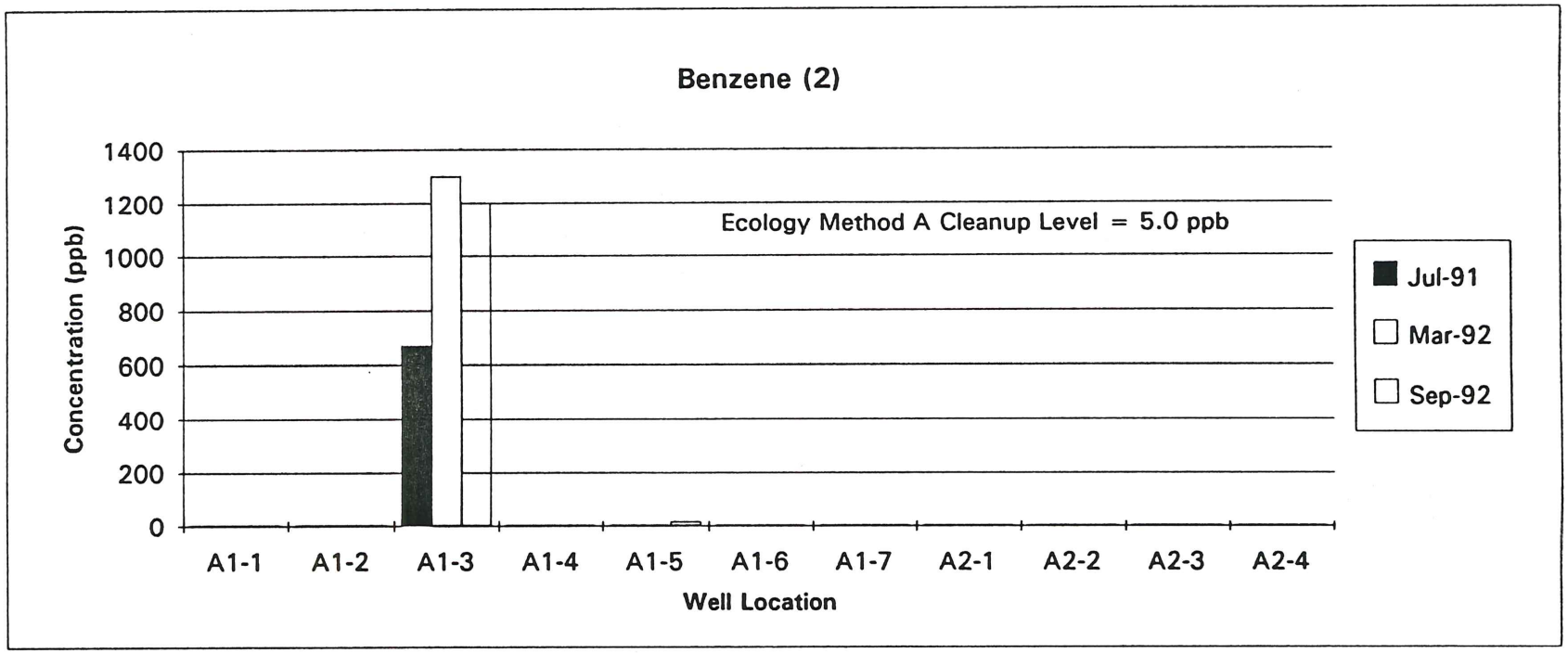

1) The groundwater depths are measured from the top of casing, therefore a lower depth indicates a higher water level

2) A value equal to one-half the reporting limit is represented for all values less than the reporting limit

Figure 2

| Well No. | Benzene (ppb) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 0.5 | 0.5 | 0.5 |
| A1-2 | 0.5 | 0.5 | 0.5 |
| A1-3 | 670 | 1300 | 1200 |
| A1-4 | 0.5 | 0.5 | 0.5 |
| A1-5 | 0.5 | 0.5 | 14 |
| A1-6 | 0.5 | 0.5 | 2.1 |
| A1-7 | 0.5 | 0.5 | 0.5 |
| A2-1 | 0.5 | 0.5 | 0.5 |
| A2-2 | 0.5 | 0.5 | 0.5 |
| A2-3 | 0.5 | 0.5 | 0.5 |
| A2-4 | 0.5 | 0.5 | 0.5 |




1) The groundwater depths are measured from the top of casing, therefore a lower depth indicates a higher water level

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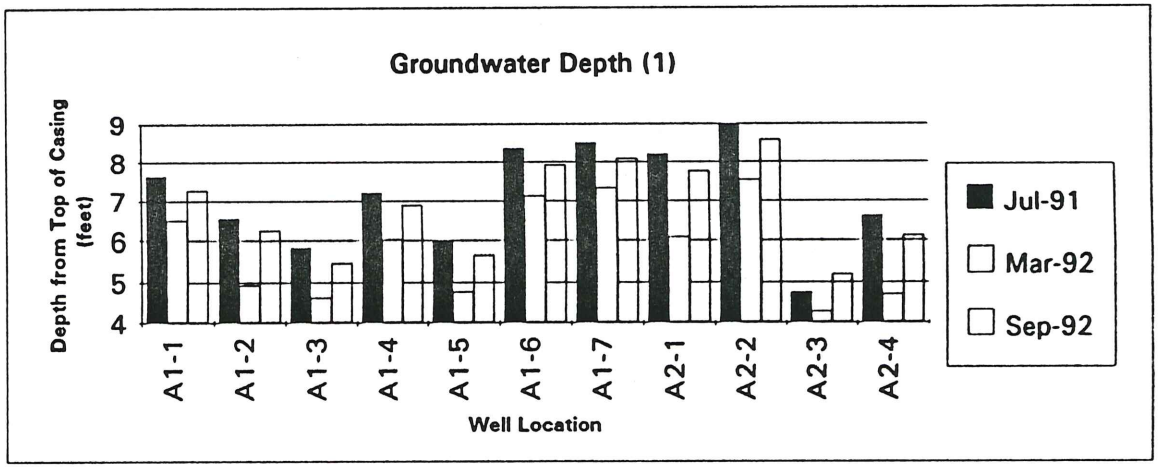
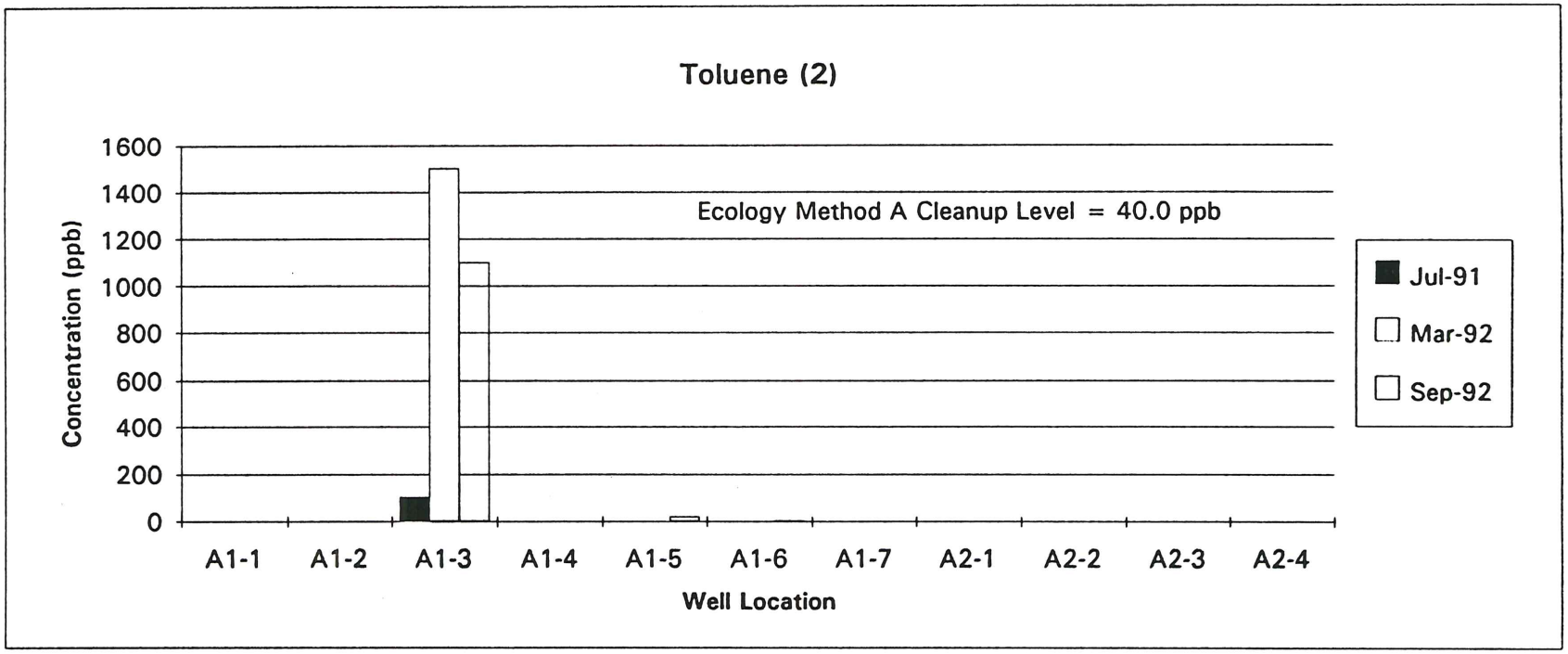
Figure 3

| Well No. | Toluene (ppb) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 0.5 | 0.5 | 0.5 |
| A1-2 | 0.5 | 0.5 | 0.5 |
| A1-3 | 102.5 | 1500 | 1100 |
| A1-4 | 0.5 | 0.5 | 0.5 |
| A1-5 | 0.5 | 0.5 | 21 |
| A1-6 | 0.5 | 0.5 | 2.5 |
| A1-7 | 0.5 | 0.5 | 0.5 |
| A2-1 | 0.5 | 0.5 | 0.5 |
| A2-2 | 0.5 | 0.5 | 0.5 |
| A2-3 | 0.5 | 0.5 | 0.5 |
| A2-4 | 0.5 | 0.5 | 0.5 |



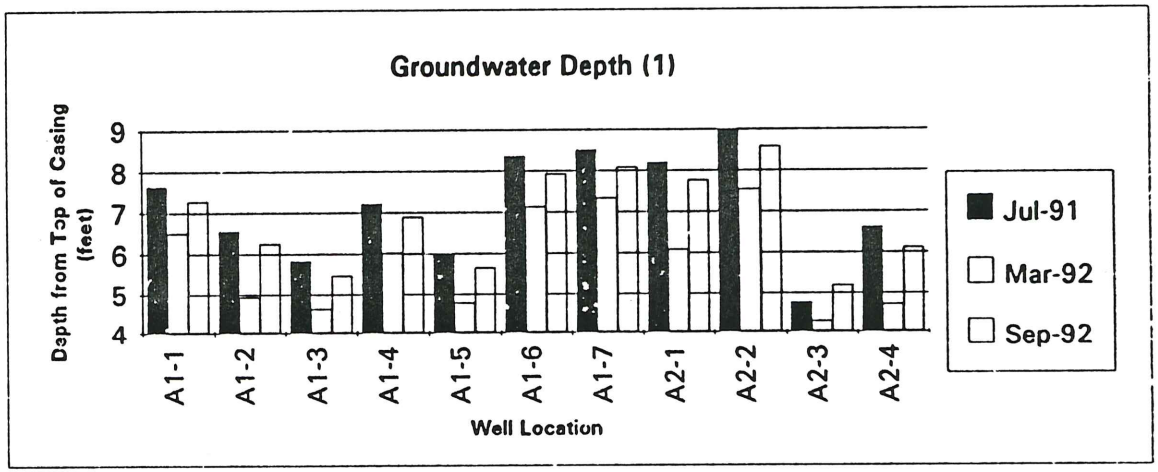



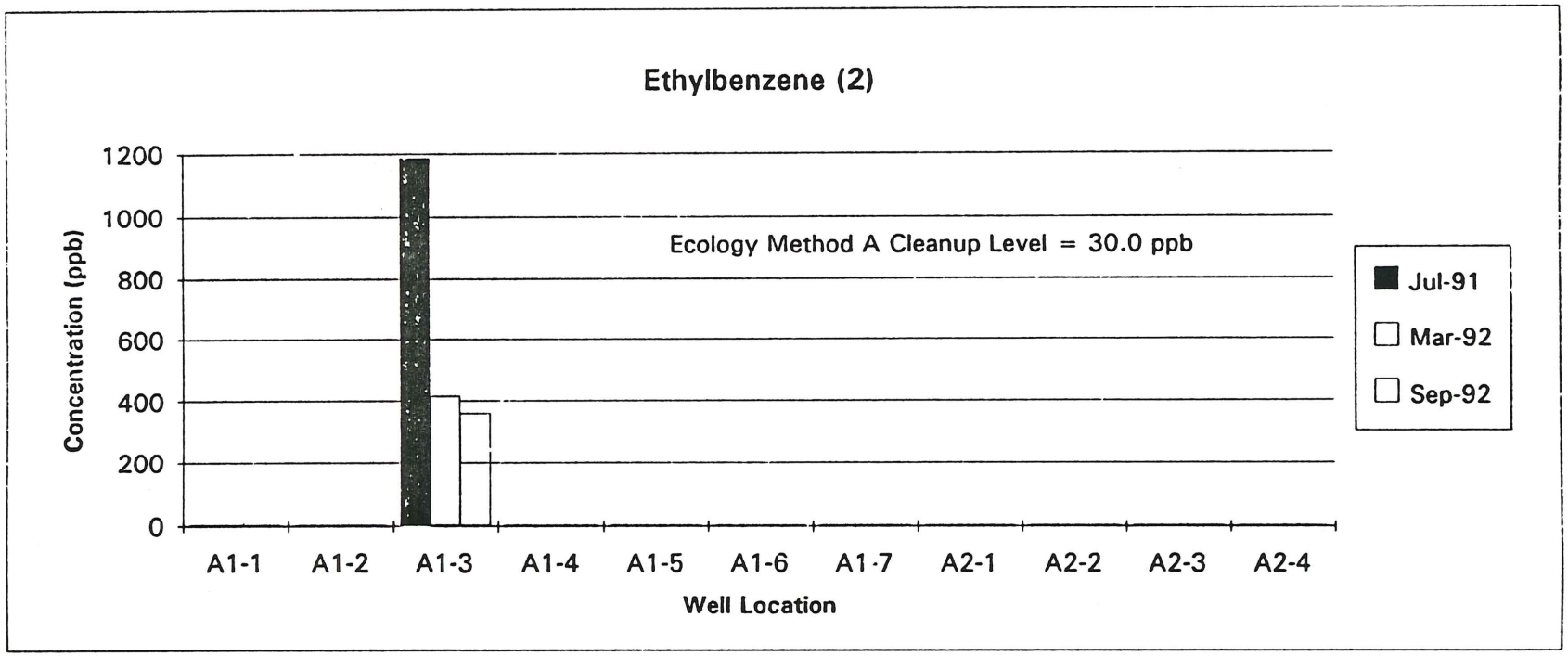

1) The groundwater depths are measured from the top of casing, therefore a lower depth indicates a higher water level

2) A value equal to one-half the reporting limit is represented for all values less than the reporting limit

Figure 4

| Well No. | Ethylbenzene (ppb) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 0.5 | 0.5 | 0.5 |
| A1-2 | 0.5 | 0.5 | 0.5 |
| A1-3 | 1185 | 415 | 360 |
| A1-4 | 0.5 | 0.5 | 0.5 |
| A1-5 | 2.3 | 0.5 | 1.1 |
| A1-6 | 0.5 | 0.5 | 0.5 |
| A1-7 | 0.5 | 0.5 | 0.5 |
| A2-1 | 0.5 | 0.5 | 0.5 |
| A2-2 | 0.5 | 0.5 | 0.5 |
| A2-3 | 0.5 | 0.5 | 0.5 |
| A2-4 | 0.5 | 0.5 | 0.5 |




1) The groundwater depths are measured from the top of casing, therefore a lower depth indicates a higher water level
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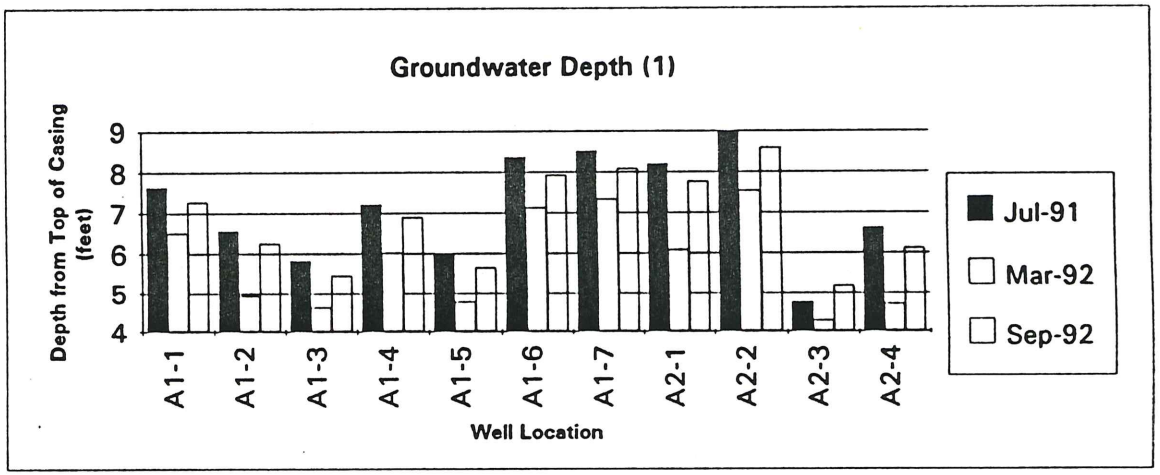
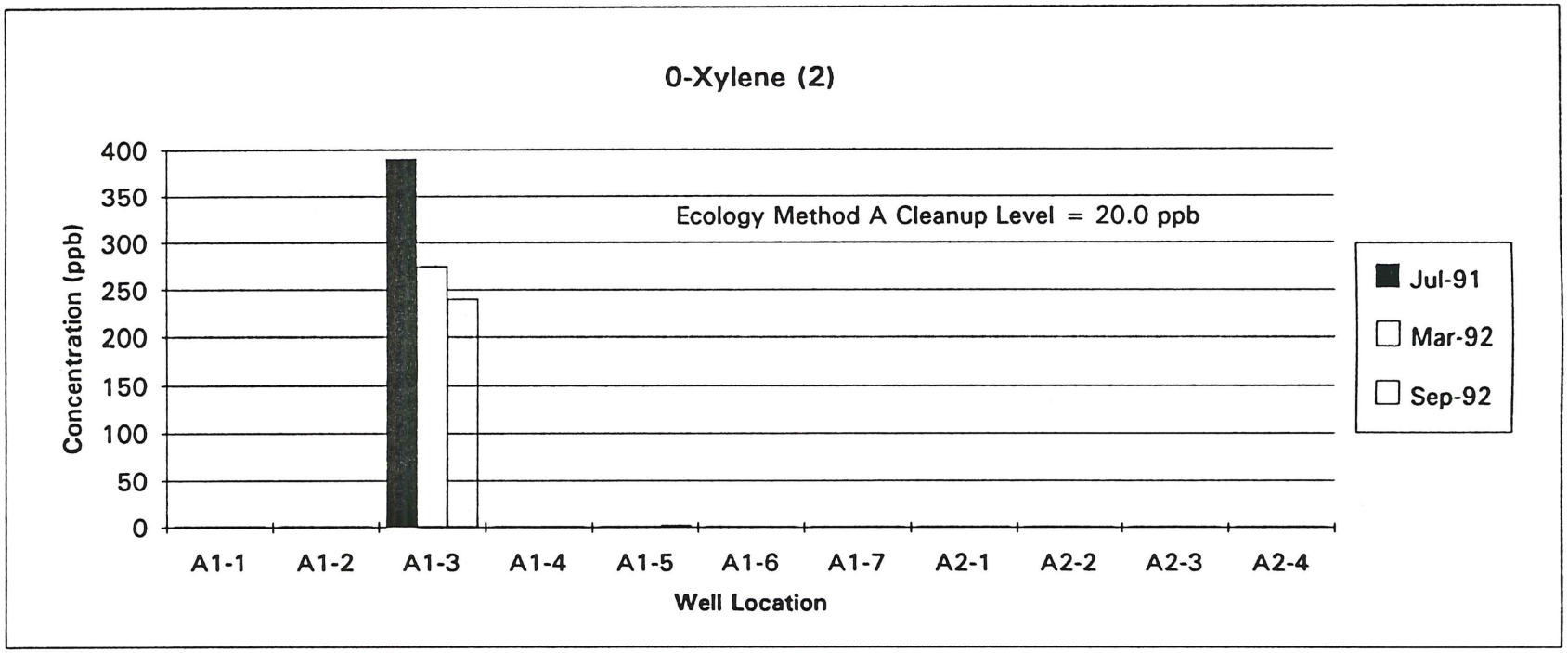
Figure 5

| Well No. | o-Xylene (ppb) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 0.5 | 0.5 | 0.5 |
| A1-2 | 0.5 | 0.5 | 0.5 |
| A1-3 | 390 | 275 | 240 |
| A1-4 | 0.5 | 0.5 | 0.5 |
| A1-5 | 0.5 | 0.5 | 1.6 |
| A1-6 | 0.5 | 0.5 | 0.5 |
| A1-7 | 0.5 | 0.5 | 0.5 |
| A2-1 | 0.5 | 0.5 | 0.5 |
| A2-2 | 0.5 | 0.5 | 0.5 |
| A2-3 | 0.5 | 0.5 | 0.5 |
| A2-4 | 0.5 | 0.5 | 0.5 |




1) The groundwater depths are measured from the top of casing, therefore a lower depth indicates a higher water level

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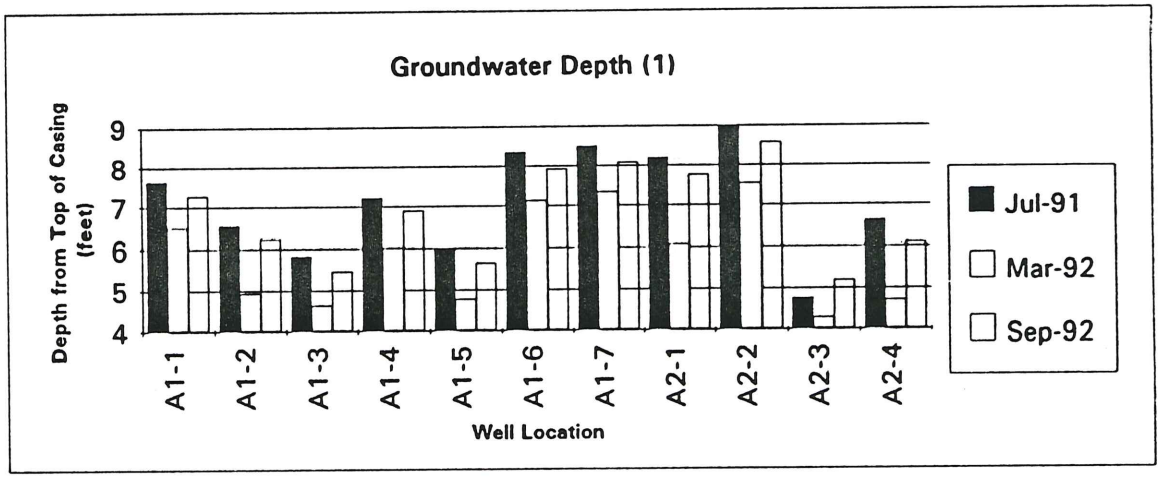
Figure 6

| Well No. | m,p-Xylene (ppb) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 0.5 | 0.5 | 0.5 |
| A1-2 | 0.5 | 0.5 | 0.5 |
| A1-3 | 435 | 1400 | 1100 |
| A1-4 | 0.5 | 0.5 | 0.5 |
| A1-5 | 2.4 | 0.5 | 7.7 |
| A1-6 | 0.5 | 0.5 | 0.5 |
| A1-7 | 0.5 | 0.5 | 0.5 |
| A2-1 | 0.5 | 0.5 | 0.5 |
| A2-2 | 0.5 | 0.5 | 0.5 |
| A2-3 | 0.5 | 0.5 | 0.5 |
| A2-4 | 0.5 | 0.5 | 0.5 |



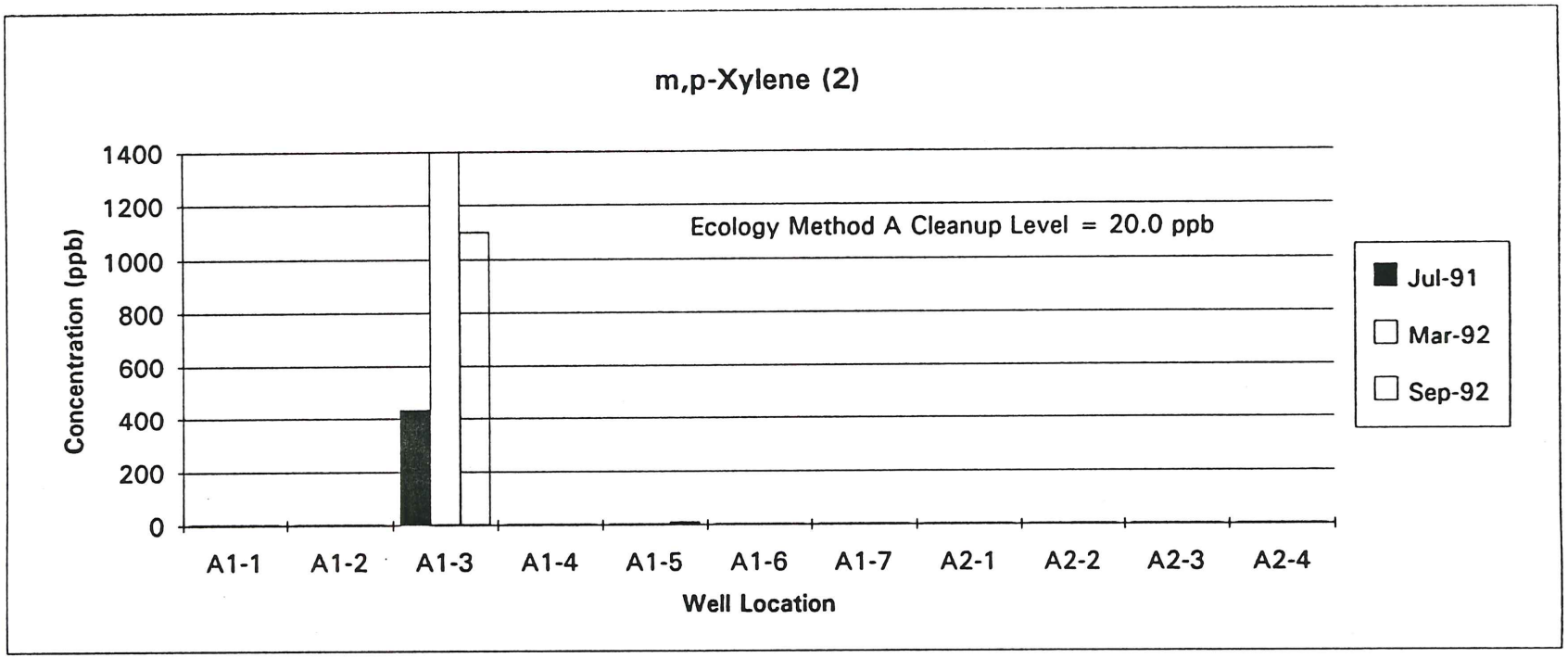




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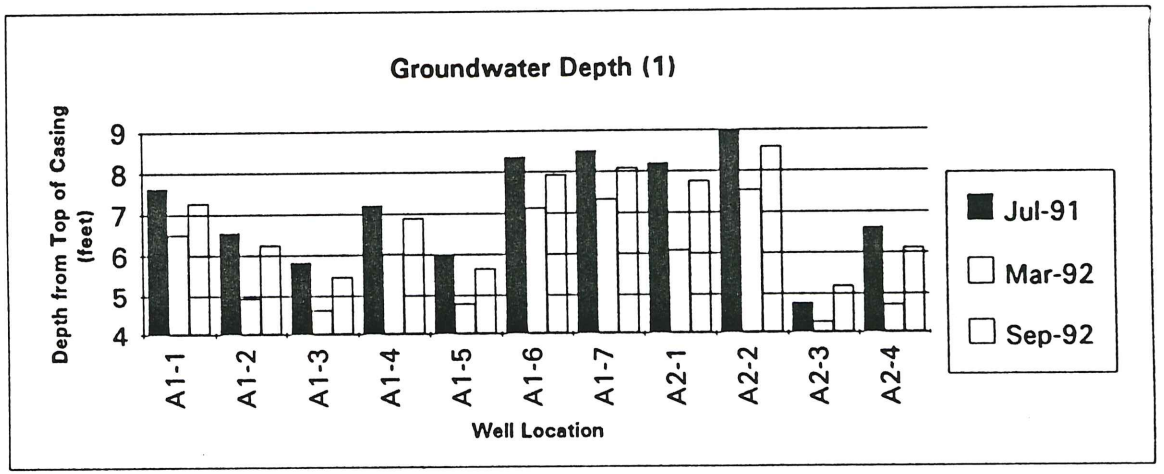
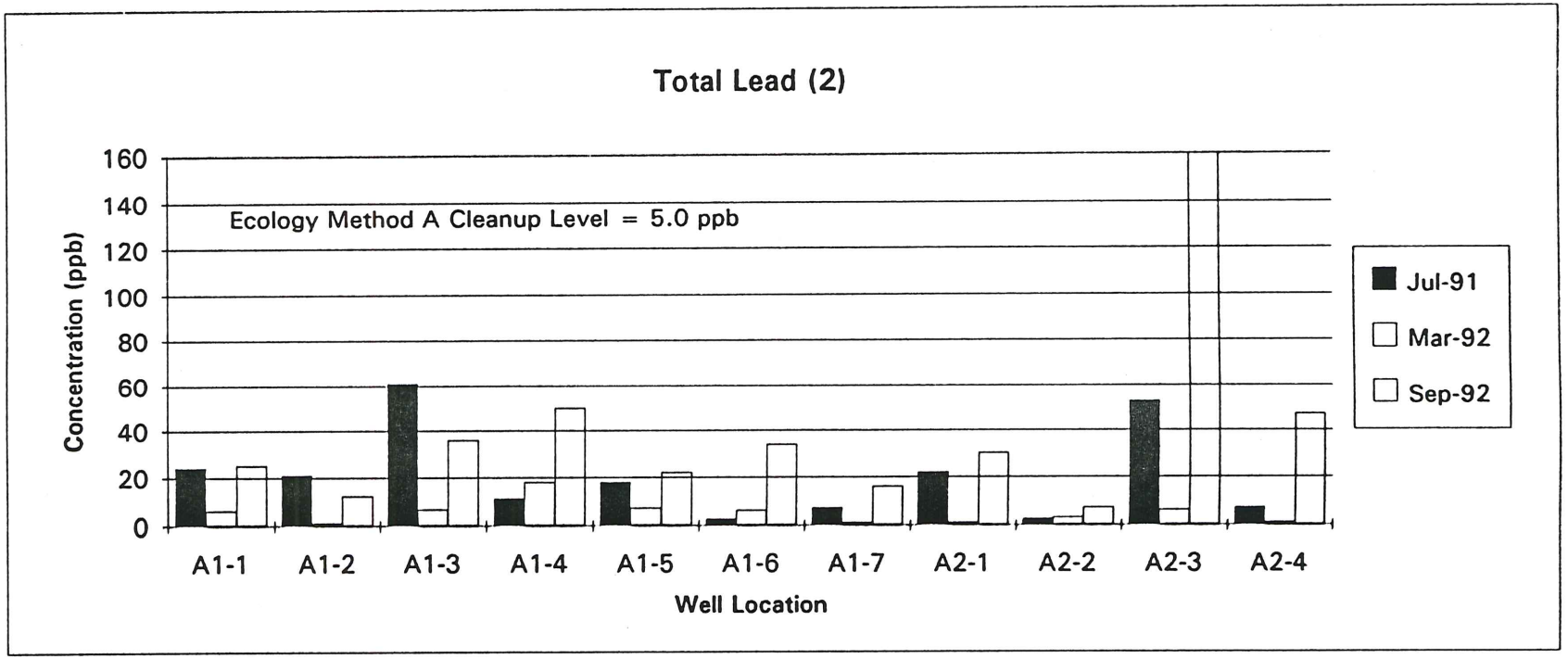
Figure 7

| Well No. | Total Lead (ppb) | | |
|---|---|---|---|
| | Jul-91 | Mar-92 | Sep-92 |
| A1-1 | 24 | 6 | 25 |
| A1-2 | 21 | 1 | 12 |
| A1-3 | 61 | 6.5 | 36 |
| A1-4 | 11 | 18 | 50 |
| A1-5 | 18 | 7 | 22 |
| A1-6 | 2.5 | 6 | 34 |
| A1-7 | 7 | 1 | 16 |
| A2-1 | 22 | 1 | 30 |
| A2-2 | 2.5 | 3 | 7 |
| A2-3 | 53 | 6 | 160 |
| A2-4 | 7 | 1 | 47 |

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2) A value equal to one-half the reporting limit is represented for all values less than the reporting limit

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants



Dated: November 6, 1992

To: The Weyerhaeuser Company
Attn: Mr. Max Healea, Jr.

# Important Information About Your Geotechnical Engineering/ Subsurface Waste Management (Remediation) Report

## AN ENGINEERING REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical engineering/subsurface waste management (remediation) report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure and property involved, its size and configuration; historical use and practice; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities; and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, have the consulting engineer/ scientists determine how any factors (which change subsequent to the date of the report) may affect the recommendations.

Unless your consulting geotechnical/civil engineer and/or scientist indicates otherwise, your report should not be used:

- when the nature of the proposed project is changed; for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one; or chemicals are discovered on or near the site;
- when the size or configuration of the proposed project is altered;
- when the location or orientation of the proposed project is modified;
- when there is a change of ownership; or
- for application to an adjacent site.

Geotechnical/civil engineers and/or scientists cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their reports have changed.

## MOST GEOTECHNICAL AND SUBSURFACE WASTE MANAGEMENT "FINDINGS" ARE PROFESSIONAL ESTIMATES.

Site exploration identifies subsurface conditions only at those points where samples are taken and when they are taken, but the physical means of obtaining subsurface data precludes the determination of precise conditions. Consequently, the information obtained is intended to be sufficiently accurate for design, but is subject to interpretation. Additionally, data derived through sampling and subsequent laboratory testing are extrapolated by the geotechnical/civil engineer and/or scientist who then renders an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and/or appropriate design. Even under optimal circumstances actual conditions may differ from those opined to exist, because no geotechnical/civil engineer and/or scientist, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. For example, the actual interface between materials and/or chemicals may be far more gradual or abrupt than the report indicates, and actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact. For this reason, most experienced owners retain their geotechnical/waste management consultant through the construction stage to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site. Prudent owners establish contingencies to account for such variations in subsurface conditions as exposed during construction.

## SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural changes or human influence. Because a geotechnical/waste management engineering report is based on conditions which existed at the time of subsurface exploration, construction decisions should not be

based on an engineering report whose adequacy may have been affected by time. Speak with the geotechnical/waste management consultant to learn if additional tests are advisable before construction starts. For example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/waste management report. The geotechnical/civil engineer and/or scientist should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

## THE GEOTECHNICAL ENGINEERING/SUBSURFACE WASTE MANAGEMENT (REMEDIATION) REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical engineering/subsurface management (remediation) report. To help avoid these problems, the geotechnical/civil engineer and/or scientist should be retained to work with other appropriate design professionals to explain relevant geotechnical, geological, hydrogeological and waste management findings and to review the adequacy of their plans and specifications relative to these issues.

## BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING/WASTE MANAGEMENT REPORT.

Final boring logs are developed by the geotechnical/civil engineer and/or scientist based upon interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering/waste management reports. These logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, contractors should be given ready access to the complete geotechnical engineering/waste management report. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to a disproportionate scale.

## READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical engineering/subsurface waste mangement (remediation) is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical/waste management consultants. To help prevent this problem, geotechnical/civil engineers and/or scientists have developed model clauses for use in written transmittals. These are not exculpatory clauses designed to foist the engineer's or scientist's liabilities onto someone else. Rather, they are definitive clauses which identify where the engineer's or scientist's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your engineer/scientist will be pleased to give full and frank answers to your questions.

## OTHER STEPS YOU CAN TAKE TO REDUCE RISK.

Your consulting engineer/scientist will be pleased to discuss other techniques which can be employed to mitigate risk and to provide a variety of materials which may be beneficial.

Contact your engineer/scientist for further information.

The preceding paragraphs are based on information provided by the Association of Soil and Foundation Engineers, Silver Spring, Maryland