September 10, 1997 3435.00-005

Mr. Mark Johnson
California Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

Subject: Response to Chiron Comments for the Site Investigation Workplan
Sherwin-Williams Facility, Emeryville, California

Dear Mark:

This letter is prepared by Levine · Fricke · Recon (LFR), on behalf of Sherwin-Williams (SW), in response to comments received on the Workplan for Site Investigation dated June 2, 1997 ("the Workplan") for the Sherwin-Williams facility in Emeryville, California. The only comments we have received to date were prepared by Erler and Kalinowski, Inc. (EKI) on behalf of Chiron Corporation, dated June 20, 1997. The comments from EKI were also discussed in a meeting at the RWQCB offices on July 23, 1997. The following summarizes the relevant portions of each of the 12 comments from EKI and presents LFR's response to each comment.

Comment No. 1: EKI recommends that the objective of the investigations should be to obtain data for selecting cleanup goals and a final remedy for the Site conducted in accordance with provisions of typical RWQCB site cleanup requirements. In addition, EKI recommends that SW's proposal to develop risk management strategies be deleted as discussed in their comment No. 12.

Response to Comment No. 1: We agree that the ultimate objective of the work is to develop cleanup goals and a final remedy. The investigation work described in the Workplan is intended to provide the necessary additional data needed for site characterization. It is anticipated that once this data is collected, a subsequent workplan will be prepared which will include a feasibility study that will recommend cleanup goals and a final remedy. Sherwin-Williams anticipates that a site cleanup requirements order will be issued by the RWQCB in the near future, which will follow typical RWQCB requirements.

SW's response concerning risk management strategies is discussed in Response to Comment No. 12 below.

Comment No. 2: EKI has expressed concerns with the effectiveness of the interim remedial measures (IRMs) that have been implemented by Sherwin-Williams. Specifically they have cited

issues with respect to outward hydraulic gradients, downward vertical gradients, apparent sources of water within the slurry wall, and intermittent operation of the groundwater extraction and treatment system. EKI recommends that the IRMs for the site need to be reevaluated and modified.

Response to Comment No. 2: While we recognize recent problems with high water levels inside the slurry wall (apparently due to a water source), LFR does not agree that the IRMs have been ineffective to date. The slurry wall and cap do provide important barriers to contaminant migration. Even though some recent data had shown higher water levels within the slurry wall compared to outside the wall, the slurry wall is significantly less permeable than the surrounding subsurface soils, and the wall has substantially limited migration of contaminants from the SW site. This is supported by the fact that the wells at the northern edge of the arsenic plume on the Rifkin property (MW-3 and RP-2 through 5) continue to show low concentrations of arsenic which are well below drinking water action levels.

Some of the recent issues with respect to outward hydraulic gradients have related to a possible source of water within the slurry wall and intermittent operation of the system during the first half of 1997. The system can be very effective in maintaining lower water levels within the slurry wall as evidenced by past data showing the hydraulic gradients during a period when a water source was not apparent and the system operated more continuously (see Attachment A). The following actions have been or are currently being taken to address the current issues relating to water levels within the slurry wall:

- The source of water within the slurry wall has been assessed by reviewing utility drawings and interviewing SW plant staff. To date, no known source (such as leaking water lines) has been identified. The fire water utility lines were moved above grade in the past and further review of firewater utility lines (and possible excavation to locate lines) will be addressed to determine if any subsurface lines are still active. In addition, the integrity of the storm-water lines will be assessed to determine if they are a potential water source. The assessment of the water and storm-water utility lines has been initiated and will be completed by the end of November 1997.
- The treatment system utilizing electrochemical co-precipitation treatment technology is a state of the art system that currently removes over 99.9% of the arsenic from the influent to the system. As discussed in the Cost and Feasibility Analysis Report (LFR report to RWQCB dated March 27, 1997), electrochemical co-precipitation is the only technologically feasible and cost effective system to meet a 25 ppb discharge limit. Improvements recently and/or currently being implemented for the system include: (a) replacing the bio-system for organics treatment with a carbon system (completed in April 1997), (b) replacing the current main process pump with a variable frequency drive and new flow meter (to be completed in September 1997), (c) installing a new electrical controller for the electrochemical cells (completed in July 1997), and (d) evaluating the potential use of a hydrogen peroxide

controller (pilot test currently being implemented). These issues are reported in more detail in the quarterly NPDES monitoring report dated August 7, 1997.

- The extraction wells have been redeveloped (completed in August 1997) in order to increase water production from each well.
- It is anticipated that the RWQCB will issue an Order for the SW site by the end of 1997 that will include a task for preparing an IRM workplan. The IRM workplan will address proposed IRMs for the site (such as additional pumping on the Rifkin property if the Rifkin investigation determines it to be applicable) as well as an assessment of the currently implemented IRMs. Under this Workplan, the current extraction and treatment system will be evaluated and any changes and/or modifications (such as adding wells within the slurry wall if appropriate) will be evaluated.
- The Workplan proposes an additional 10 piezometers within and around the slurry wall. These piezometers will allow for better assessment of water levels within the slurry wall and in relation to water levels outside of the slurry wall. These piezometers will be installed in accordance with the schedule submitted in the Workplan.

Comment No. 3: EKI recommends that areas of investigation be expanded to include other properties that have been affected by releases of chemicals of concern from SW, including the south BGR property.

Response to Comment No. 3: The Workplan provides a comprehensive set of tasks to address the properties that have potentially been impacted from SW past operations. Inclusion of the south BGR property in the investigation would not be appropriate since the investigation data collected to date for that site does not indicate that the property was impacted from SW and has likely been impacted by past operation on South BGR and/or the former PG&E facility which are now occupied by Chiron Corporation. This is based on the following facts:

- The south BGR was a former Shell development facility and aerial photos clearly show significant past industrial operations on that property, including what appears to be a "mini-refinery" (see Attachment B). The former Shell development site was a petrochemical research facility that operated between 1928 and 1972. In addition, past groundwater plume maps that were prepared by EKI clearly show a source of arsenic from the former Shell development facility (see Attachment C).
- EKI prepared a figure contouring arsenic concentrations in soil, which was included in their comments (Attachment C of the June 20, 1997 EKI comments letter). EKI claims that SW should do more investigation on the South BGR property since the property used to be an open field during the time of SW's past lead-arsenate operations and because arsenic was detected at elevated levels in several soil borings in the northern and eastern part of the property. We have taken EKI's figure and added a highlight of the area of soils where arsenic is at or below

background levels (see blue highlight on figure in Attachment D). Since south BGR was formerly an open field, one would expect the soils closer to SW to be impacted if in fact the elevated samples to the north and east were from a SW source. In fact, this is not the case and clearly the data does not support EKI's claim.

- In addition to arsenic contamination sources on the south BGR property, there was also a former PG&E facility adjacent to and northeast of the south BGR property. A November 11, 1994 report by EKI summarizing the contamination on the PG&E property indicates that this property had an average arsenic concentration of 41 mg/kg (above background) with a maximum detected level of 340 mg/kg (see Table 5 of the EKI 11/11/94 report). In addition, two out of three samples analyzed by the California WET method were characterized as hazardous waste on the former PG&E property. Clearly this property is also a likely source for the arsenic in soils on south BGR since it is in such closer proximity to where arsenic was detected on the south BGR property.

In summary, the data for south BGR indicates a source of arsenic from the South BGR property and/or the former PG&E site (both sites now owned and/or occupied by Chiron). Chiron's attempt to suggest SW is the dominant or even a significant source of contamination on their leased property defies the BGR site history and is an attempt to evade their own responsibilities on sites they occupy.

No additional investigation has been proposed in the Workplan on south BGR by SW. Please recall, however, that at the RWQCB's request, SW has proposed to collect 3 soil samples in the southern part of the south BGR property (see April 28, 1997 letter from LFR to the RWQCB). To date SW has been denied access. As previously requested, SW would appreciate if the RWQCB would assist in gaining access to this area of the property to perform the soil sampling requested.

Comment No. 4: EKI recommends that the "12 inch bored" well identified on SW past site plans be investigated. In addition, EKI recommends that utilities at or below 4 feet bgs should be investigated based on their opinion that water levels on Rifkin have reached 4.5 feet bgs in recent years.

Response to Comment No. 4: The subject "deep" well is already included as part of the conduit evaluation. Available drawings may help to identify the approximate location of the well. SW may also try to utilize ground penetrating radar to locate the well but subsurface obstructions may interfere with obtaining accurate data. SW may elect to locate the well by excavation within a limited area if it is determined that the well location can be narrowed down based on drawings and/or ground penetrating radar results. Any such excavation will require RWQCB approval in accordance with the property deed restriction (i.e., disturbance of the environmental cap). In addition, the RWQCB agreed to provide a contact person who has possibly done some work identifying wells in the Emeryville area. This may provide information on the well construction

and identify whether the well was ever abandoned in the past. The assessment of the location of the 12-inch bored well is expected to be completed by the end of November 1997.

SW intends to investigate utilities that are 6 feet or more bgs as potential lateral human-made conduits. This is based on the fact that the utility drawings for Horton Street indicate that the majority of utilities are very shallow. This has been confirmed by the Horton Street remediation work where utilities were encountered very near ground surface and in most cases less than 3 feet. Groundwater elevation in wells in the vicinity of Rifkin and Horton Street have in almost all cases since 1990 been 6 feet or deeper (see Attachment E). The only times water levels were higher than 6 feet was for short time periods for a couple of wells where groundwater was measured at approximately 5 feet bgs. These shallow water levels were not sustained for a long enough period of time to have any significant effect on groundwater gradient. It is important to note that during several winters in this time period very heavy rains (including one or more 100 year storm events) were experienced in the Bay Area. That indicates that these water levels are probably representative of the highest water levels that have occurred or will occur at the site.

Comment No. 5: EKI has pointed out that the "drainage ditch" shown on several of the figures in the Workplan is not accurate.

Response to Comment No. 5: LFR has revised the figures for the project based on more accurate drawings recently obtained and has eliminated the reference to the drainage ditch. The drawings to be used in the future will accurately identify the surface water conduit below Rifkin as the "Former Temescal Creek."

Comment No. 6: EKI has identified previous comment letters submitted to the RWQCB regarding the investigation and remediation workplans for the remediation of Horton Street. In addition, EKI has stated that the cleanup levels for Horton Street may not be applicable for other properties where other uses or construction are planned.

Response to Comment No. 6: SW acknowledges receipt of the comment letters from EKI regarding the Horton Street investigation and remediation. SW has involved all agencies and interested parties in the work proposed and implemented on Horton Street. SW has addressed all relevant comments from Chiron as well as all other agencies and interested parties prior to proceeding with the work on Horton Street. Ultimately the workplans and related documents were reviewed and approved by the RWQCB as lead agency and the City of Emeryville as property owner. SW also acknowledges that the clean-up levels that were developed for the Horton Street project may not be applicable to other properties where different uses or construction are planned. In fact, SW accepted the very conservative shallow soil cleanup levels in Horton Street (i.e., background levels) in order to expedite the soil removal process. It is anticipated that shallow soil cleanup levels may vary in other areas depending on location and potential use.

the fact that the well was installed as a piezometer intended for measuring water levels across the slurry wall in pair with LF-7. The second quarter sampling results were presented in the August 15, 1997 quarterly report which indicates arsenic levels below detection limits in this well. SW will agree to sample LF-19 on a semi-annual basis for future sampling events.

Subcomment No. 4: EKI has recommended that an open scan be performed on all soil and groundwater samples analyzed by EPA Methods 8240 and 8270 to include "tentatively identified" compounds.

Response to Subcomment No. 4: The Workplan already proposes to run a full suite of analyses of 36 soil samples and 40 groundwater samples from 22 locations. This sampling will identify the relevant chemicals of concern that will ultimately drive risk evaluations and remediation. Running an open scan for the VOCs and SVOCs would not provide any additional useful information for site investigation and remediation and would only provide qualitative results. "Tentatively identified compound" results are approximate assessments of a compound's presence and will vary from lab to lab and from chemist to chemist. Also many of the TICs are compounds that have no regulatory criteria or recommended clean-up levels. In addition, TICs are not used when assessing risk. The TICs are also in many cases SVOCs that are relatively immobile and not an extensive concern for contaminant migration. Nevertheless, as agreed in the meeting of July 23, 1997, SW will run an open scan on the soil and groundwater samples collected from the two borings in the southwest corner of the Rifkin property.

Subcomment No. 5: EKI recommends that additional analyses of soil and groundwater on the site should be run to aid in the understanding of arsenic mobility in the subsurface (e.g., redox potential, dissolved oxygen levels, arsenic speciations, etc). EKI indicates this may be useful in evaluating future remedial options.

Response to Subcomment No. 5: The most accurate way to assess the mobility of arsenic in the area of investigation will be to directly identify the nature and extent of arsenic in soil and groundwater. This will reflect actual site conditions and will be more accurate than indirect methods based on scientific theory and hypotheses. The workplan provides significant additional investigation to assess the nature and extent of arsenic. SW agrees that additional analyses may be necessary to further assess theoretic arsenic mobility, particularly where remediation of arsenic (which may be present above action levels to be determined) is infeasible and/or cost prohibitive. SW feels it is premature to run EKI's recommended additional analyses on samples. It will be more cost effective to implement the Workplan and then based on the results develop a plan for additional analysis, treatability studies, and/or pilot testing as part of the feasibility study.

Subcomment No. 6: EKI has recommended that the long-term impacts of low pH conditions on the slurry wall be assessed in the area of the former acid plant.

Response to Subcomment No. 6: The low pH conditions around the former acid plant appear to be limited to a relatively small area. The Workplan proposes one pair of piezometers across the cement-bentonite wall (see Figure 7 of the workplan identifying the 2 piezometers close to MW-4 and MW-5) to assess hydraulic gradient across the wall. LFR recommends moving the proposed piezometers approximately 50 feet to the west and adding another pair of piezometers in the area of the former acid plant (near MW-4) to help measure water levels in this area. Additionally, SW will evaluate the necessity of intrusive analysis of the wall (i.e. borings within the wall) based on the results of the water level analyses.

Comment No. 8: EKI indicates that the schedule for the "Groundwater Remedial System Workplan" dated November 7, 1996 (Appendix D of the Workplan) has not been provided and its relationship to the investigation tasks for Rifkin are not presented in the schedule. EKI recommends that the site investigation on Rifkin be completed prior to design and installation of IRMs on the Rifkin property.

Response to Comment No. 8: Since early 1994 SW has proposed a variety of remedial options for implementation of IRMs on the Rifkin property in order to address affected groundwater on the property. For every proposed remedial option presented, Chiron has always objected to SW proceeding with cleanup on the property. In November 1996 SW submitted workplans for both investigation and groundwater remediation and Chiron and their representatives continued to raise concerns, issues, and objections without granting access for site investigation except for limited tasks (i.e. quarterly monitoring and soil investigation in the southern part of Rifkin). Various discussions, meetings and correspondence have occurred between Chiron and SW since November 1996, but Chiron has continued to delay SW in proceeding with remediation on Rifkin. On March 28, 1997 SW submitted a revised investigation workplan and resubmitted the November 7, 1996 remediation workplan. Chiron, however, has continued to object to the Rifkin IRMs pending further investigation on Rifkin. To try to facilitate progress towards implementing remediation on Rifkin, SW has already agreed to implement the Rifkin investigation before finalizing the proposal for IRMs on Rifkin. As a result, the schedule for the Rifkin IRMs was not included in the Workplan. It is anticipated that a Workplan for Implementation of IRMs (including IRMs on Rifkin) will be a part of the CAO to be issued by the RWQCB.

It should be noted that, in order to be effective, IRMs would need to respond to all sources of contamination, including SW, Rifkin, BGR, and others. SW again notes that in order to address final remedy issues regarding the Rifkin property, it will be necessary for the current or historic owner or operators to investigate on-site and other off-site sources of contamination. To date, Chiron has chosen to avoid any discussion of such investigative tasks.

Based on the July 23, 1997 meeting, we hope that all parties are ready to let the investigation proceed. SW is requesting that the RWQCB grant immediate approval for site investigation on the

Rifkin property based on the Workplan with the modifications noted in these responses to comments. If Chiron continues to object to SW's proposed investigation on Rifkin, SW also requests that the RWQCB assist with gaining access to the property (and if necessary issue an order to Chiron). It is anticipated that the full CAO may not be issued until late 1997 and SW feels the schedule can be expedited by proceeding with the Rifkin investigation prior to approval of the complete CAO.

Comment No. 9: EKI has recommended that groundwater modeling be conducted prior to design of IRMs on Rifkin in order to verify an inward hydraulic gradient across the slurry wall. EKI is concerned that if wells are placed on Rifkin this may result in lower water levels on the outside of the wall. In addition, EKI has requested that another well pair be added across the slurry wall if the proposed extraction system is installed.

Response to Comment No. 9: Groundwater modeling is one way to simulate groundwater levels based on estimated pumping. GW modeling has already been conducted on a two well and three well (November 7, 1996 proposal) pumping scenario on Rifkin and the water level and capture area figures (superimposed on the plume maps) were distributed at a RWQCB meeting on November 11, 1996 (see Attachment F for a copy of the 3 well pumping scenario proposed). If necessary, additional modeling may be conducted prior to design to refine the modeling completed to date.

Under any pumping scenario on Rifkin, the water levels across the wall can also be controlled by adjusting the pumping rates of the extraction pumps (assuming water source and treatment system issues are resolved). For example, if extraction wells are installed on Rifkin, the flow rates of the pumps could be limited such that groundwater capture is achieved while at the same time maintaining higher water levels outside the wall.

SW has agreed to install two more piezometers across the wall as discussed above in Response to Comment No. 7, Subcomment No. 6.

Comment No. 10: EKI has recommended that startup monitoring be conducted as part of any extraction system that may be installed on the Rifkin property.

Response to Comment No. 10: SW has always intended that startup monitoring will be conducted as part of the startup of any extraction system on Rifkin. It is anticipated that the startup monitoring plan will be included as part of the IRM workplan which, as previously discussed, is anticipated to be part of the CAO requirements to be issued by the RWQCB.

Comment No. 11: EKI claims that the B-zone investigations presented in the workplans do not adequately address areas on SW and Rifkin which may be impacted in the B-zone from past SW chemical releases. EKI is concerned that three borings are located within the area of LF-B5 and

that three of four borings on Rifkin are located at the downgradient extent of the A-zone arsenic plume on Rifkin. EKI recommends additional borings west of LF-B5 and northeast of MW-5. In addition, EKI has requested that a CPT boring be placed next to boring location SB-4 where a 200 ug/l grab groundwater sample was collected in April 1994.

Response to Comment No. 11: LFR and SW do not agree with EKI's claim that the B-zone investigation is inadequate in addressing potential impacts from chemicals released from the SW site. In fact, all of the proposed envirocore and well boring locations were strategically chosen based on known information on the A-zone plume, existing B-zone data, and subsurface lithology. The B-zone investigation is intended to address the objectives stated in the Workplan, i.e. a) characterize the lithology and thickness of the B-zone and aquitard below the B-zone, b) characterize B-zone groundwater quality and flow direction, and c) assess the distribution of arsenic in the B-zone.

The two envirocore borings and one well located near LF-B5 are to be installed because LF-B5 is not representative of the B-zone water quality since it is screened in the A/B aquitard. The downgradient borings on Rifkin are intended to define the edge of potential B-zone contamination and therefore SW does not agree with clustering more borings within the A-zone plume itself as proposed by EKI. A significant number of borings are already proposed within the A-zone plume and SW wishes to keep the number of borings drilled into the B-zone from within the A-zone plume at the minimum necessary to minimize potential cross contamination and still achieve the stated objectives. SW does recognize that additional investigation beyond the Workplan proposal may be necessary depending on the results of the proposed B-zone investigation. The Workplan explicitly states that the locations of the proposed wells may be modified based on the CPT and envirocore results. Therefore, SW and LFR will determine the need for additional borings after the proposed CPT and envirocore borings have been installed and data evaluated.

It is important to note that, based on past data showing chlorinated compounds in the B-zone, there appears to be other local sources of B-zone contamination, including Shell's former operation on the south BGR property.

EKI's comments requesting a boring near SB-4 are an A-zone issue and are addressed by the Workplan under the Rifkin property A-zone investigation (see Section 3.4 of the Workplan). The arsenic detected in the grab groundwater sample from SB-4 collected in April 1994 appears to be from the A-zone since the depth of the boring is only approximately 25 feet. The CPT boring proposed just west of RP-1 (see Figure 3 of the Workplan) is located approximately at the point of former boring SB-4 and this was the intention of choosing this boring location when the Workplan was written.

Comment No. 12: EKI states that the preparation of a Risk Management Plan for the Site is inappropriate and should be rejected. EKI claims that SW is trying to preempt the RWQCB's decision making process by prematurely seeking approval of a Risk Management Plan and states that SW's proposal appears to assume that the RWQCB has approved a containment zone underlying the site. EKI states that Chiron is concerned that the SW site will continue to pose a significant threat to public health and safety and environment and could impede current and future operations in Emeryville. EKI notes that the SW site is not a "Brownfield" and unless the site is designated as a containment zone, that investigation and remediation should proceed in accordance with the procedures of the RWQCB's typical Site Cleanup Requirements.

Response to Comment No. 12: EKI's comment No. 12 is replete with unsubstantiated assumptions, and misses the point of risk management. In no way is SW trying to preempt the RWQCB decision-making process. SW has continually worked with the RWQCB as lead agency on a voluntary basis in proposing sound and prudent investigations and interim remedial actions to manage risk during the investigation process. In fact, discussion of risk management is responsive to earlier requests from the RWQCB to manage risks at every stage of the cleanup process to avoid health or environmental impacts. SW has continued in good faith to make progress at the site by proposing comprehensive site investigations via the Workplan and implementing necessary remedial actions (i.e. current on-site IRMs, demolition of the Rifkin wall, and the Horton Street clean-up) to address potential public health and environmental concerns. These voluntary efforts are in contrast to Chiron's lack of investigation and remediation on leased properties it now occupies. As noted above, Chiron has repeatedly delayed implementation of remedial measures on Rifkin, including the expansion of the groundwater remedial system.

Nowhere does the Workplan state that the RWQCB has approved a containment zone for the SW site. We agree that the SW site has not yet been designated as a "Brownfield." Certainly one option in the future (not the only option) is to designate the site as a containment zone. Also, while SW understands that the site is not officially designated as a "Brownfield" area, the City of Emeryville is currently developing a Brownfield program within the City and SW may elect to participate in this process subject to approval by the RWQCB as lead agency. SW has also addressed Chiron's concerns with future site development with respect to the soils and groundwater that have been impacted on Rifkin. SW's impact on Rifkin will not preclude any of Chiron's future proposed development plans. For Chiron to suggest otherwise is misleading the regulatory agencies and contradicts previous statements by Chiron personnel.

The risk management strategies proposed in the investigation workplan are appropriate for the SW site. As site data is collected we anticipate addressing sources, pathways and receptors to assess possible human health and environmental risks. Conducting risk management evaluations throughout the process will help to focus the work towards proper investigation and remedial actions. We still anticipate that a feasibility analyses, development of cleanup goals and

identification of a final remedy will be performed and the risk management evaluations will help to guide this process. As with most sites (including those Chiron representatives have been involved with) we envision a combination of remediation and risk management to resolve environmental issues at the site. It is conceivable that the management of risk may be divided into "risk management zones" depending on site use, chemical occurrence, transport pathways, potential receptors, and feasibility of remediation measures.

Please call Larry Mencin of Sherwin-Williams at 216-566-1768 or Mike Marsden or the undersigned at 510-652-4500 with any questions.

Sincerely,

Mark D. Knox

Mark D. Knox, P.E.
Principal Engineer

cc: Stephen Morse, California Regional Water Quality Control Board
Ravi Arulanantham, California Regional Water Quality Control Board
Susan Hugo, Alameda County Department of Environmental Health
Tom Dunkelman, U. S. Environmental Protection Agency
Barbara Cook, Department of Toxic Substances Controls
Ignacio Dayrit, City of Emeryville
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Allen Danzig, Sherwin-Williams
John Gerulis, Sherwin-Williams
Edward Sangster, Esq., McKenna & Cuneo
Tom Kalinowski, Erler & Kalinowksi

List of Attachments:

Attachment A A-Zone Groundwater Elevation Map - July 29, 1996 (Project No. 3435 - Figure 3)

Attachment B Photograph of Southwest and South BGR property

Attachment C South BGR, Rifkin and Sherwin-Williams Properties: Arsenic Concentration in Shallow Groundwater - August 1995 - Figure 1

Attachment D Arsenic Concentrations in Soil - (Proj. No. 3435 - Figure A)

Attachment E Depth-to Groundwater Emeryville California, Wells LF-12 and LF13
Depth-to Groundwater Emeryville California, Wells MW-1, MW-2, MW-3, MW-4 and MW-5
Depth-to Groundwater Emeryville California, Wells RP-1, RP-2, RP-3, RP-4 and RP-5

Attachment F Proposed Expansion Remedial System Capture Area with 3 Wells (Project No. 3042 - Figure 3)

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HORTON STREET

SHERWIN AVENUE

TEMESCAL CREEK

DRAINAGE DITCH

NPDES Storm Sewer Outfall

PAVED PARKING AREA

TRUCK PARKING AREA

IMPERVIOUS CAP WITHIN SLURRY WALL

SOIL-BENTONITE SLURRY CUT-OFF WALL

WAREHOUSE

WAREHOUSE AND OFFICE

SHOP

BOILER HOUSE

TRI-BIO BIOLOGICAL TREATMENT SYSTEM

WAREHOUSE

FACTORY

FACTORY

ANDCO ELECTROCHEMICAL TREATMENT SYSTEM

WAREHOUSE OFFICE

WAREHOUSE

EDGE OF PAVEMENT AND EASEMENT LINE

MW-1	6.02	MW-2	6.09	MW-3	6.52
MW-4	7.24	MW-5	7.00	RP-1	6.56
RP-2	6.35	RP-3	6.46	RP-4	6.25
RP-5	6.23	LF-1		LF-2	
LF-3	6.43	LF-4	NM	LF-5	
LF-7	4.74	LF-8	4.70	LF-9	
LF-10	NM	LF-11	6.12	LF-12	7.66
LF-13	7.82	LF-14		LF-15	
LF-16		LF-17	6.43	LF-18	4.40
LF-19	6.42	LF-20	3.86	LF-21	6.76
LF-22	6.94	LF-23	5.36	LF-24	4.98
LF-25	3.65	LF-26	4.82	LF-B1	
LF-B2		LF-B3		LF-B4	
LF-B5		LF-B6		EX-1	5.62
EX-2	4.42	EX-3	2.30		

EXPLANATION

- Property boundary
- Chain link fence
- LF-10 ● A-zone monitoring well
- LF-B3 ● B-zone monitoring well
- EX-1 ⊙ Groundwater extraction well location
- ✱ Monitoring well destroyed under permit
- ⊗ Monitoring well destroyed or lost during slurry wall and cap construction activities
- ⊕ Monitoring well destroyed during railway expansion activities
- ⊙ Rifkin property monitoring wells (TMC)
- ◒ Rifkin property monitoring wells (Levine-Fricke)
- 5.36 Groundwater elevation (feet above mean sea level)
- NM Not measured
- 5.5 Groundwater elevation contour (feet above mean sea level)

0 40 80 FEET

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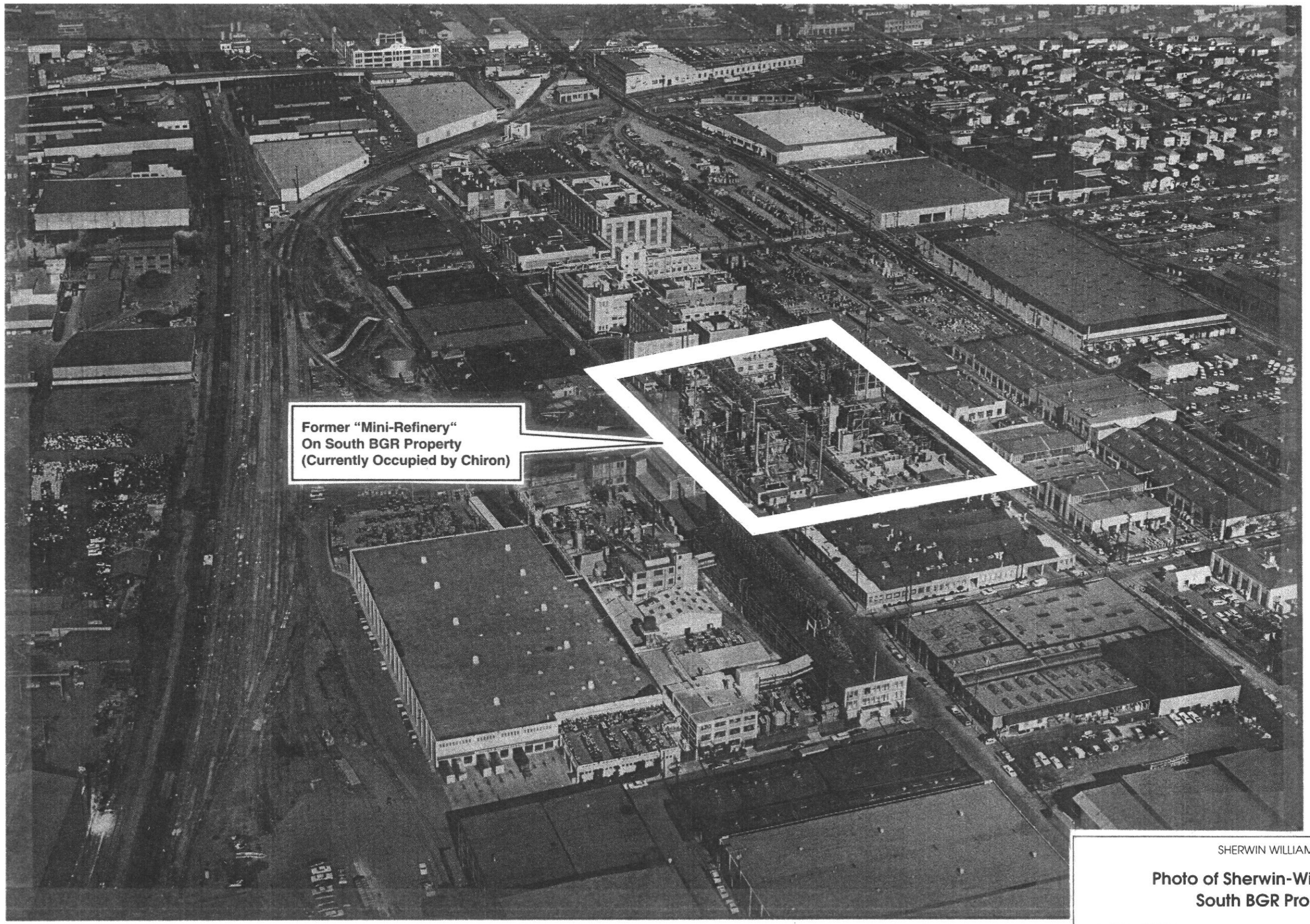
SHERWIN-WILLIAMS

A-Zone Groundwater Elevation Map, July 29, 1996

Levine-Fricke-Recon Figure 3

Project No. 3435



Source: From Photo Obtained from Sherwin-Williams.
Estimated Date of Photo Between 1964 and 1975.

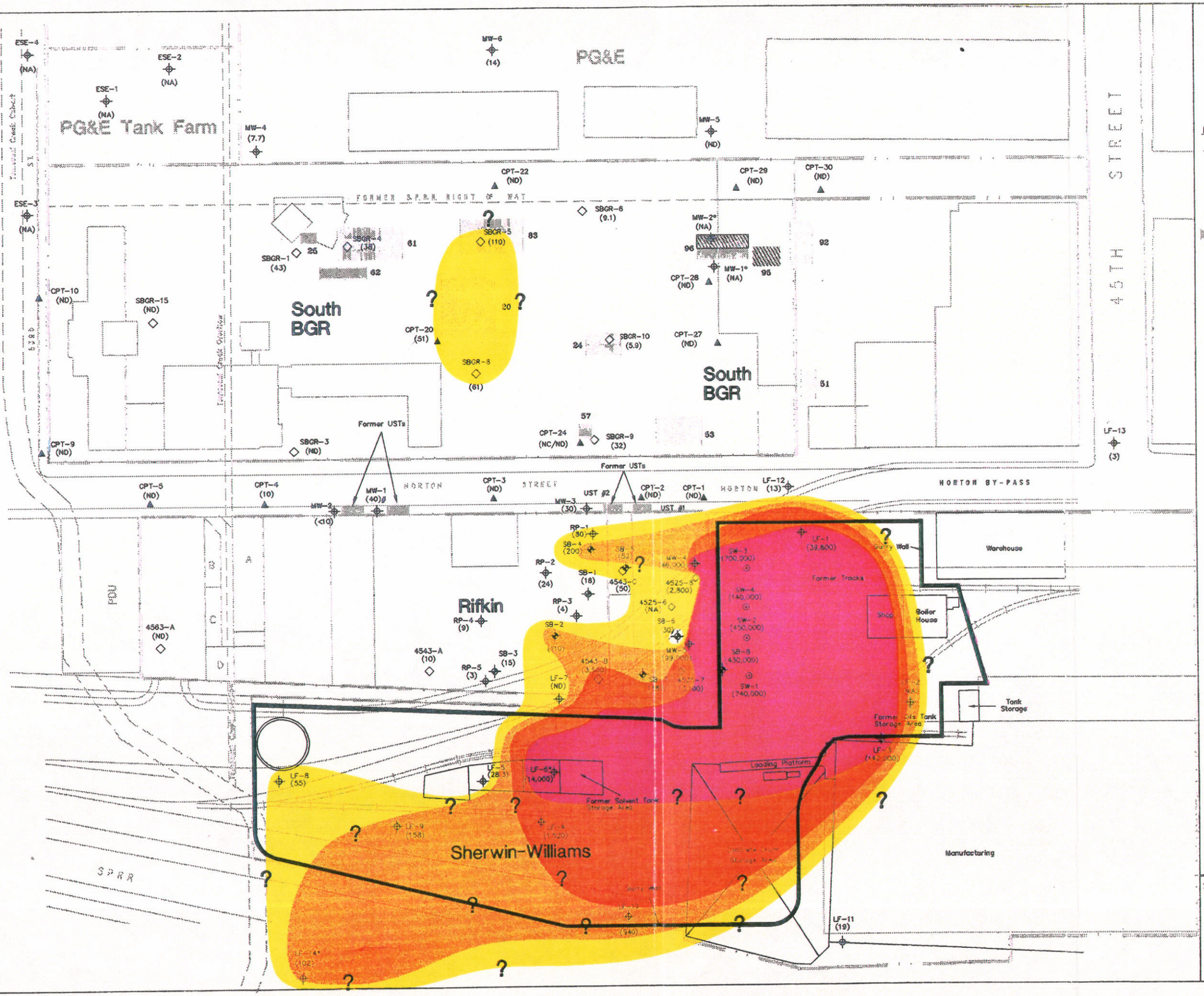
SHERWIN WILLIAMS

Photo of Sherwin-Williams and South BGR Property

Levine-Fricke-Recon **Attacment B**

Project No. 3435

3435PM01.CDR 090897



LEGEND

- Existing Monitoring Well Location
- Grab Groundwater Location by EKI
- CPT/Hydropunch Location by EKI
- Potential Tank Location
- Potential Source Area Location
- Area of Excavation
- Grab Groundwater Location by Levine-Fricke
- Grab Groundwater Location by TMC
- Well Abandoned
- (5) Arsenic Concentrations Detected in Shallow Groundwater (ug/L)
- (NA) Not Analyzed
- (ND) Not Detected
- @78.6 ug/L measured in MW-1 by TMC on 29 March 1995
- 50–100 ug/L
- 100–1,000 ug/L
- 1,000–10,000 ug/L
- >10,000 ug/L

Potential Source Area and Tank Locations Identified on Shell Development Company Property Map (24 May 1962)

20 Chemical Products Bldg
24 Fuel Tank (Abandoned)
25 Chemical Processing
51 Boilers Fuel Tank (15,000 gal.)
53 Tank Farm No. 4
57 Waste Hydrocarbon Disposal Unit
61 Tank Farm No. 1
62 Pump Shelter Tank Farm No. 1
83 Tank Farm No. 2
92 Solvent Storage Bldg.
95 Tank Farm No. 5 Tanks Removed 9/87
96 Tank Farm No. 3 Tanks Removed 7/87

Notes:

1. All locations are approximate.
2. Data from wells MW-4, MW-5, and MW-6 on PG&E are from 1984. Data from MW-1, MW-2, MW-3, MW-4 and MW-5 on Rifkin collected by TMC on 8 June 1995. All other data are from 1990 through 1994.
3. Wells LF-15 and LF-16, located off the figure, define the western extent of the plume (arsenic concentrations less than 50 ug/L).

Erler & Kalinowski, Inc.

SOUTH BGR, RIFKIN, and SHERWIN-WILLIAMS PROPERTIES: Arsenic Concentrations in Shallow Groundwater (<25 feet bgs)
Chiron
Emeryville, CA
August 1995
EKI 930028.00
Figure 1

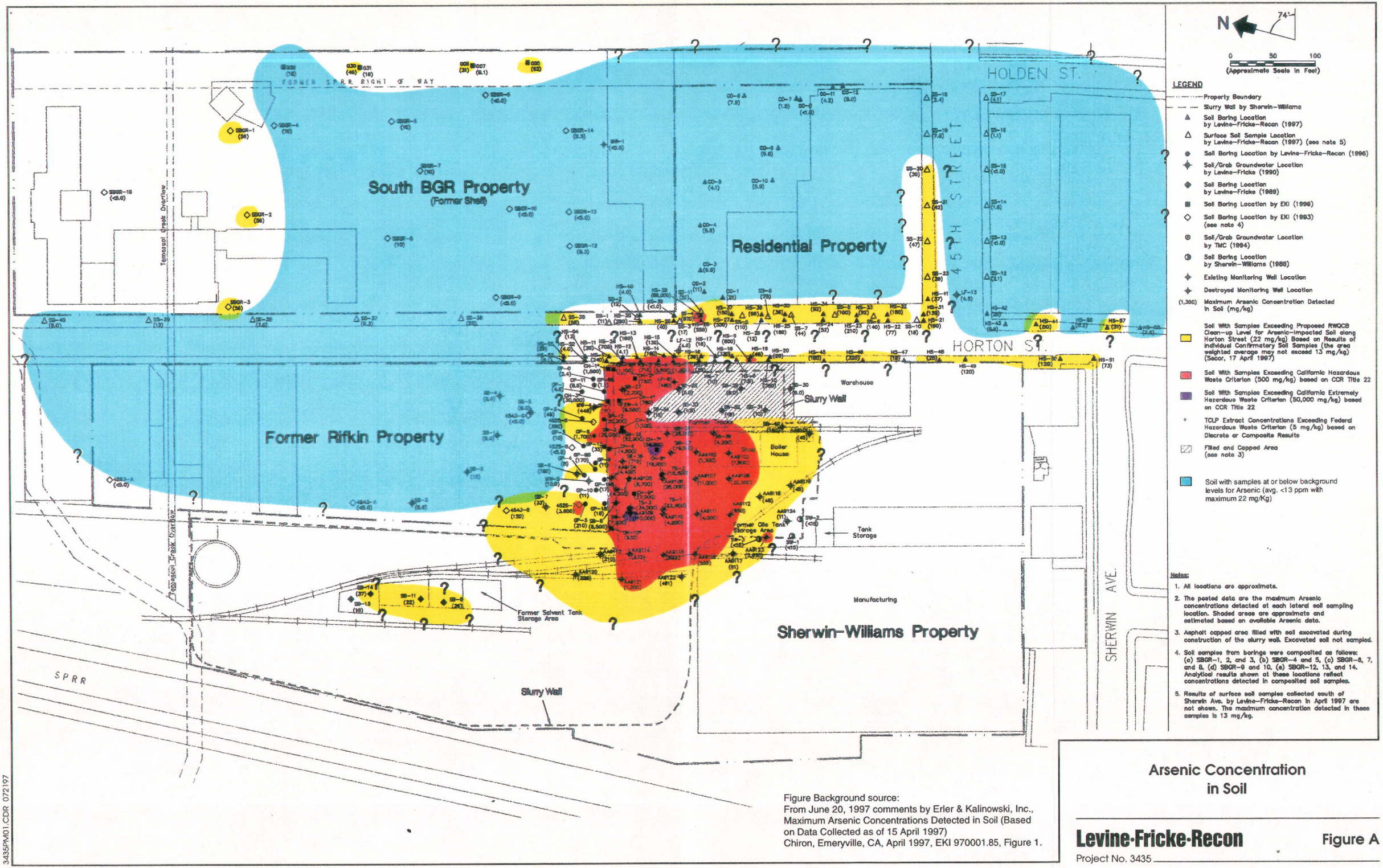


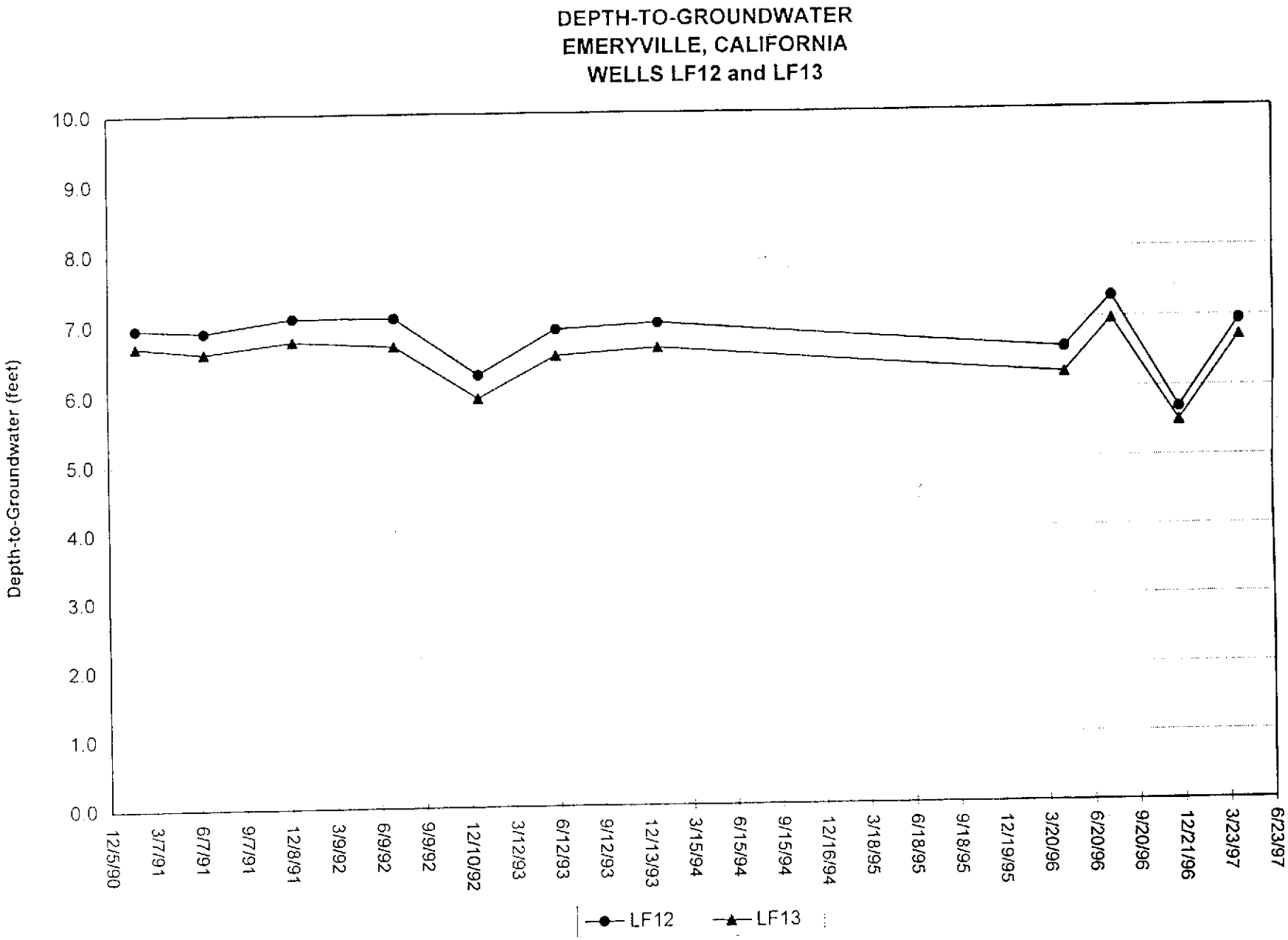
Figure Background source:
From June 20, 1997 comments by Erler & Kalinowski, Inc., Maximum Arsenic Concentrations Detected in Soil (Based on Data Collected as of 15 April 1997)
Chiron, Emeryville, CA, April 1997, EKI 970001.85, Figure 1.

3435PM01.CDR 072197

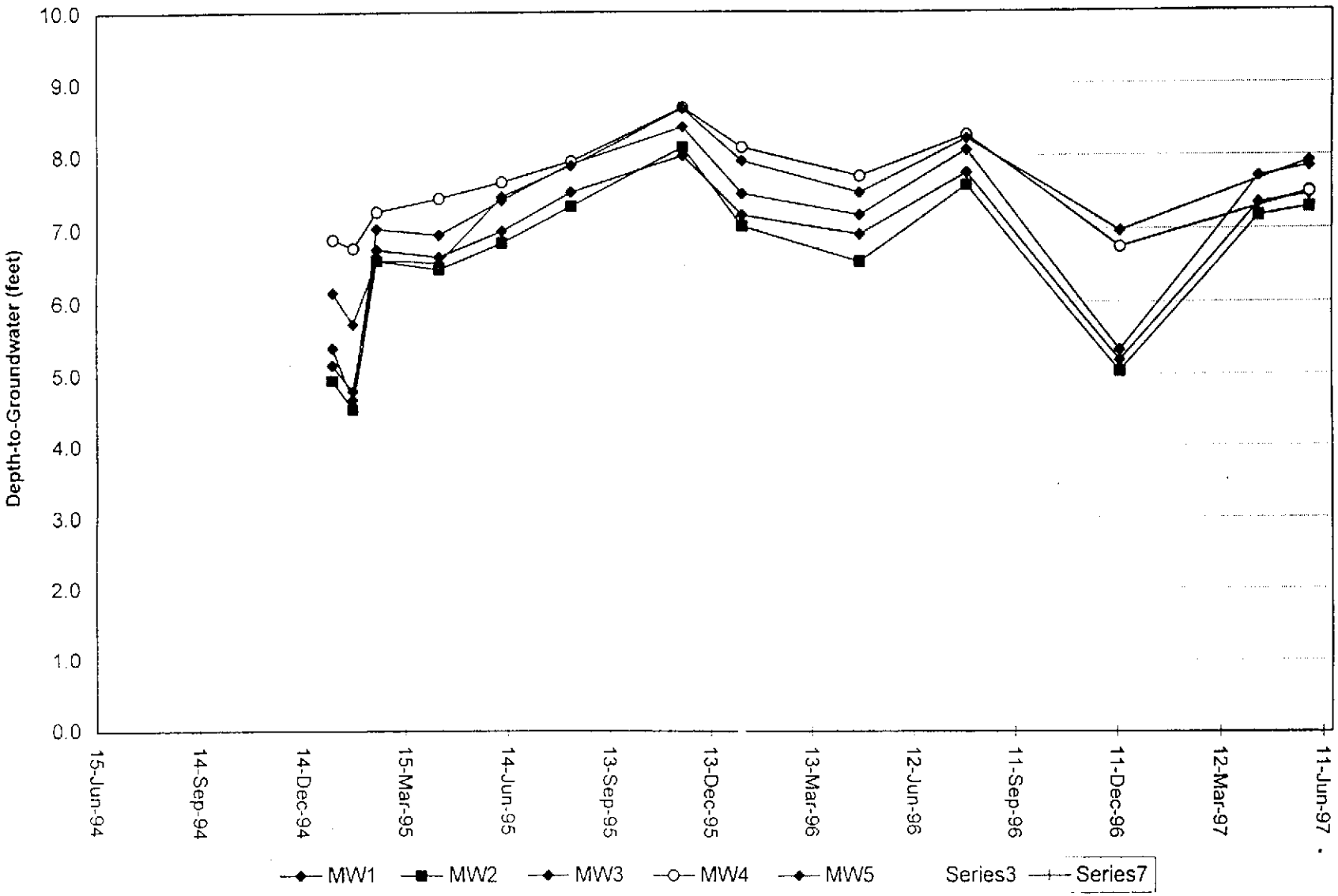
Arsenic Concentration in Soil

Levine-Fricke-Recon Figure A

Project No. 3435


DEPTH-TO-GROUNDWATER
EMERYVILLE, CALIFORNIA
WELLS LF12 and LF13
Depth-to-Groundwater (feet)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
12/5/90
3/7/91
6/7/91
9/7/91
12/8/91
3/9/92
6/9/92
9/9/92
12/10/92
3/12/93
6/12/93
9/12/93
12/13/93
3/15/94
6/15/94
9/15/94
12/16/94
3/18/95
6/18/95
9/18/95
12/19/95
3/20/96
6/20/96
9/20/96
12/21/96
3/23/97
6/23/97
LF12
LF13

DEPTH-TO-GROUNDWATER
EMERYVILLE, CALIFORNIA
WELLS MW-1, MW-2, MW-3, MW-4, and MW-5



MW (DTW)

DEPTH-TO-GROUNDWATER
EMERYVILLE, CALIFORNIA
WELL RP-1, RP-2, RP-3, RP-4, and RP-5