E. 350.5.5

PHASE I REPORT

TASK ASSIGNMENT K-2

WEST VAN BUREN AREA

PHOENIX, ARIZONA

JULY 1989

KLEINFELDER

Phase I Report
West Van Buren Area
Phoenix, Arizona
Task Assignment K-2

July 1989

KLEINFELDER, INC.
4920 E. McDowell Road, Suite 101
Phoenix, Arizona 85008

Dear Reader:

The Arizona Department of Environmental Quality (ADEQ) has initiated this study in order to investigate and identify the threat or existence of a release of hazardous substances to waters of the State, to determine the extent and nature of the hazardous substance release, and the potential threat to the public health or the environment. In conducting this work, the Department has acted in accordance with the statutory authority and requirements for the use of the Water Quality Assurance Revolving Fund, ARS 49-282.B.2., 4., and 5., and ARS 49-287.J.

This report represents the findings of the first phase of the Department's remedial investigation. It includes an assessment of existing conditions, and analysis of collected information derived from record reviews, questionnaires, field reconnaissance and sampling. This report represents one of several documents prepared under contract for this first phase of technical investigations. This report also recommends specific actions for further technical investigations which include physical testing, site inspections, record searches and questionnaires.

The Department previously issued a draft of this report which was circulated to interested parties. The Department has invited comments and incorporated the comments into an appendix in this report, along with a summary of responses. This report differs from the previous draft report in other ways.

- The WQARF site boundaries are being adjusted where possible to encompass areas where chemicals observed in the ground water have exceeded maximum contaminant levels or Arizona action levels.

- All information which has been collected by the contractor has been indexed and is available for review in central locations at ADEQ offices.

- Based upon extensive review and comments of the draft report, factual errors or omissions have been corrected.

- A chapter has been added to explain the legal requirements of WQARF with an explanation of how the WQARF process works.

- Terms have been clarified to ensure that a facility is not labeled a potential source or suspected source of contamination until such time the Department finishes its complete investigation.

- Facilities which will be subject to further technical investigation have been identified. The scope of the technical investigation is also identified which will be completed during Phase II of the Department's WQARF study.

The identification of a facility in this report does not mean that the Department has determined that a release of a hazardous substance has occurred at a facility or that a facility is a responsible party. The identification of a facility within this report is not a finding of culpability or an indication of guilt. It is important to note that a facility is not considered to be a responsible party merely because they use chemicals, are located in proximity to observed chemicals in the ground water, or own land which has ground water contamination beneath it. It is the responsibility of the Department to show that a person is a responsible party by demonstrating there has been a release or threatened release of a hazardous substance from a facility pursuant to ARS 49-283.

If a person is determined by the Department to be a responsible party, the Department will initiate the formal notice requirements which require the Department to show there has been a release or threat of a release of a hazardous substance from a facility which may present an imminent and substantial danger to the public health or welfare.

It is the goal of the Department to ensure the timely cleanup of environmental contamination in a cost effective, practical manner which protects the public health, welfare and the environment. The Department will encourage responsible parties which have not yet been defined, to initiate voluntary cleanup actions whenever possible. The Department will also seek cost recovery and applicable penalties if responsible parties fail to perform remedial action after ordered pursuant to ARS 49-286 and 287.

The Department priorities for Phase II of the WQARF study will be to reissue questionnaires to persons who have not responded. This will focus upon facilities which may handle or dispose of hazardous substances and are located in close proximity to the observed chemicals in the

ground water. Search warrants will be sought for those persons who fail to respond. Further technical investigations will be initiated at specific locations to determine if there has been a release or threatened release of a hazardous substance from a facility into the environment such that waters of the State have been or may be affected. The specific locations were selected by proximity to the observed chemicals in the ground water, likelihood of use of chemicals of interest, and periods of operation, based upon an assessment of information, including reports, records, photographs, maps, analytical data, correspondence, field observations, and other available materials.

In terms of the Department's allocation of resources for Phase II studies, facilities which are scheduled for physical testing will be the first to be evaluated by the Department. Physical testing may include soil gas monitoring, well installations, geophysical testing or additional monitoring. Facilities scheduled for site inspections will be the second group addressed by the Department, and facilities scheduled for records searches will be the third group addressed by the Department. The Department may cease technical investigation of a facility dependent on information gathered or provided. Facilities which previously completed a questionnaire and are not identified for further technical investigations have been eliminated from the Phase II study.

If you have questions regarding this report or the Water Quality Assurance Revolving Fund Program, please call Tom Curry at 257-6830 or Sandra Eberhardt at 257-6841.

Sincerely,

Norm Weiss

Norm Weiss, Assistant Director for the
Office of Waste Programs

A report prepared for:

State of Arizona
Department of Environmental Quality
2005 North Central Avenue
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Phase I Report
West Van Buren Area
Phoenix, Arizona
Task Assignment K-2

Kleinfelder Job No. 52-1015-01
ADEQ Contract No. 2207-000000-3-3-DM-8038

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July 1989

DISCLAIMER

This report has been reviewed by the Arizona Department of Environmental Quality (ADEQ) and other interested parties. This document does not represent a decision or administrative finding of culpability or liability by ADEQ, its consultants, or any other party. This document represents a compilation of data, and lists facilities for continuing evaluation.

ADEQ may use the information contained in this document in addition to any other information that might be available, to make a further determination of any course of action to identify and, as appropriate, remediate sources of environmental contamination.

EXECUTIVE SUMMARY

This Phase I Report has been prepared by Kleinfelder, Inc. (as consultant) with assistance from Malcolm Pirnie, Inc. (as subconsultant) as part of the requirements of Contract Number 2207-000000-3-3-DM-8038 with the Arizona Department of Environmental Quality (ADEQ) for Task Assignment K-2, West Van Buren Area, Phoenix, Arizona (Figure 1). This Phase I Report describes the results from data gathering activities and presents a listing of facilities for continuing evaluation. The report was prepared in support of activities under the State's Water Quality Assurance Revolving Fund (WQARF), which has as its primary goal the maintenance of beneficial uses of the State's water resources. A draft report was submitted to ADEQ on October 27, 1988. ADEQ subsequently made the report available for public review and comment. The comments received are included as an appendix to this report.

For this study, a literature and records search was conducted to provide background information on the geology, hydrogeology, and present and past land use, and to identify potential chemical manufactures, users, and disposers within the West Van Buren Area. The literature and records search involved a review of various local, State, and Federal documents and records. In addition, aerial photographs dating back to 1953 were reviewed and used in identifying potential sites of chemical releases. Historical water quality data were collected and compiled using Kleinfelder's data management software (ENVIS). These data were then compared with Federal Maximum Contaminant Levels (MCLs) and Arizona Department of Health Services (ADHS) Action Level guidelines (AALs). MCLs are the enforceable drinking water standards set by the U.S. Environmental Protection Agency (EPA). AALs are draft interim public drinking water supply criteria set, and currently being revised, by the ADHS. The compilation of results were reviewed and arranged in groupings of elevated chemical concentrations, which outlined areas of potentially affected ground water.

The compilation of historic ground water quality data, as well as the review of literature and records, and a reconnaissance of properties and wells, led to a limited sampling of ground water

and soils in order to supplement historic data. Ground water samples were analyzed for general minerals, volatile organic compounds (VOCs), and metals.

The analytical results from the samples collected as part of this Phase I of the study indicated the presence of detectable levels of VOCs in seven wells. One of these wells, (A-1-2)21add (owned by Frank Peterson) is a private domestic well. However, only two of the wells, (A-1-2)1cac (located at Greenwood Memorial Park) and (A-1-3)18bbc (RID No. 104) sampled as part of this study, gave results which exceeded MCLs or AALs.

Based on historic data and samples collected and analyzed as part of this study, thirteen locations in the West Van Buren Study Area were identified in which concentrations of volatile organic compounds (VOCs) exceeded MCLs or AALs. The VOCs most commonly observed at these sites were trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethane (1,2-DCA), and trichlorofluoromethane (Freon 11). At two locations, constituents of gasoline products (benzene, ethylbenzene, toluene, and xylene) were also identified above MCLs or AALs. The concentrations of the VOCs detected at or above MCLs or AALs are listed in Appendix D of this report. The thirteen locations and associated wells are:

1. Van Buren Street and 75th Avenue, Evans Well, (A-1-1)12bba
2. Van Buren Street and 64th Drive, Prohoroff Well, (A-1-2)7bba
3. Van Buren Street and 51st Avenue (Tank Farm), numerous monitoring wells installed by the owners/operators of the facility
4. Van Buren Street and 45th Avenue, Roosevelt Irrigation District (RID) Well No. 110, (A-1-2)9aab
5. Buckeye Road and 43rd Avenue, APS Monitoring Well No. 1, (A-1-2)9dbd
6. 43rd Avenue south of Grant Street at Smith Park, RID Well No. 92, (A-1-2)10cbc
7. Van Buren Street and 37th Avenue, RID Well No. 111, (A-1-2)10aba
8. Van Buren Street and 12th Avenue at University Park, Well (A-1-3)6dcd
9. Interstate 10 and Van Buren Street, Well (A-1-2)1cac, Greenwood Memorial Park Cemetery, and Well (A-1-2)12baa, RID Well No. 114.
10. Interstate 10 and the Southern Pacific Railroad, Holsum Bakery Well, (A-1-2)12caa
11. 19th Avenue and Interstate 10, RID Well No. 104, (A-1-3)18bbc and other City of Phoenix wells at the 19th Avenue Landfill
12. 27th Avenue and Pima Street, RID Well No. 99, (A-1-2)14aad

13. Lower Buckeye Road between 27th and 35th Avenues, City of Phoenix Monitoring Wells III-1 through III-7 at the 27th Avenue Landfill, and RID Well No. 97, (A-1-2)14cdd.

The geographic locations are given for ease of reference purposes only and are not to be interpreted as "plumes". Several of these geographic locations may be part of a single plume, however, there are insufficient data to positively link them together at this time.

As a result of the soil sampling conducted during this phase of investigation, VOCs were detected in soils at 19 locations. At 15 of these locations, the VOC concentrations were above ADHS soil cleanup level guidelines. Two of these 15 locations were selected for the collection of background samples. The background locations were selected in the field where soils appeared to be undisturbed and uncontaminated. The detection of these high levels of VOCs in the background samples cast some doubt on the meaningfulness of the VOCs detected in the soils at the other locations.

Based on the results of records and literature searches and field reconnaissance, a list of approximately 850 facilities was compiled for further study. In July 1988, a questionnaire was sent to these facilities requesting information on chemical use and past handling practices, and the nature of facility activities. Of the questionnaires sent, approximately 300 responses were returned.

The facilities were then evaluated by: reviewing available documents and literature; observing existing facilities and environmental practices during field reconnaissance; reviewing the responses to the questionnaire; and assessing the proximity of the facility to observed chemical concentrations in the ground water.

Evaluation of the facilities resulted in the determination of the most appropriate investigative activities to be carried out at specific facilities during the next phase of investigation.

Ground water within the study area is not generally used for municipal supply. However, there are some private domestic wells that have already been affected by VOCs. These wells are referred to in this report as the Evans and Peterson wells. Their respective legal well designations are (A-1-1)12bba and (A-1-2)21add. The status of the Evans well is not known. However, the Peterson well is reportedly used for private drinking water supply. A total of 12 municipal supply wells appear to be potentially downgradient (based on regional data) from the areas identified as having observed chemical concentrations greater than detection limits. In addition, two former municipal wells, six active municipal wells, and eight domestic supply wells

appear to be located downgradient from the wells located along Van Buren Street. Migration of the observed chemicals could possibly impact the future use of these wells. It is also possible that any other private domestic wells located downgradient could be affected.

The information presented in this report is based on the available background information, collected field data, responses to the questionnaire, and the scope of work approved by ADEQ. No inference as to the completeness of the available information is made; and it should be understood that the field effort was not exhaustive. The level of effort expended on field reconnaissance and sampling was given by the project's Scope of Work and budgetary allowances. For these reasons, the listing of facilities is only intended to be a list of facilities for continuing evaluation.

Based on the above findings and limitations, a number of recommendations are made. These include:

- reissuing of selected questionnaires to facilities that did not respond
- redefine the study area to areas where VOCs in the ground water exceed MCLs or AALs
- continuation of site inspections and record searches
- further characterization and delineation of affected areas
- remediation of affected ground water
- periodic monitoring of the area's ground water.

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1 PROJECT PURPOSE AND BACKGROUND

1.1. Summary of the Water Quality Assurance Revolving Fund

1.1.1 Purpose

This section provides background information on the Water Quality Assurance Revolving Fund (WQARF), its major provisions, how it works, enforcement mechanisms, and how it was used in support and administration of this work.

1.1.2 Key Elements of WQARF

WQARF, described in ARS 49, Article 5, consists of State appropriations, civil and criminal penalties, and recoveries from responsible parties, with a Fund cap of $25 million. The Fund may be used for Federal Superfund (CERCLA) match, remedial actions where there is no responsible party, emergency remedial actions, monitoring waters of the State, investigations, and clean up. The statute defines remedial actions as those actions reasonable and necessary in the event of a threat or release of hazardous substances that may affect waters of the State, to monitor the release, dispose of material or take other actions necessary to minimize damage, and may include providing alternative water supplies.

1.1.3 ADEQ Programs Funded by WQARF

The following programs in the Arizona Department of Environmental Quality (ADEQ) are funded by WQARF:

- *Statewide Water Quality Monitoring*

  The Statewide water quality monitoring expenditures are authorized by ARS 49-282 B.6 and described in ARS 49-225. They are administered by the ADEQ Office of Water Quality and cover both surface water and ground water.

- *Health Effects Studies Conducted by ADHS*

  The health effects studies are administered via an intergovernmental agreement with Arizona Department of Health Services (ADHS), Division of Disease Prevention. The contract is monitored and administered by ADEQ and individual task assignments are issued requesting health-based criteria for unregulated substances, epidemiological studies, risk assessments, and the like.

- *Emergency Actions*

  ADEQ may access WQARF to support emergency actions on a case-by-case basis. There are two emergency contractors available on a 24-hour per day basis to respond throughout the State. WQARF-supported emergency actions have been taken by the ADEQ Emergency Response Unit at five sites to date.

- *Long-term Remedial Action Program*

  The present report covers one of the long-term remedial action sites under WQARF. An annual priority list process for selection of such long-term projects has been established. Three types of long-term remedial actions have been identified: those conducted by voluntary or responsible parties, those conducted by other state agencies or political subdivisions, and those conducted by ADEQ through its contractors where responsible parties have not been identified. The Department has two long-term remedial action contractors. To date, eight projects have involved ADEQ contractors (one of which this report addresses), eight have been conducted by political subdivisions, and three have been conducted by voluntary parties, for a total of 19 projects. Six new projects have been proposed for this year's priority list and seven projects from last year have been proposed for additional funding.

1.1.4 Use of WQARF by Political Subdivisions and State Agencies

The law provides for the use of the fund by political subdivisions of the State which use water for drinking water purposes, or by any State agency. The political subdivision must provide matching funds. The annual priority list process, described in A.A.C. R18-7-105. begins July 1 each year when ADEQ sends letters to all City and State agencies and places newspaper advertisements requesting applications. The applications, called letter of intent, are evaluated by ADEQ and a priority list is drafted and subject to a 30-day public comment period. ADEQ then writes decision records reserving funds for each site and gives the applicants 90 days to submit remedial action plans. An intergovernmental agreement incorporating the remedial action is then signed and invoices are paid as the work progresses.

1.1.5 Process for Selecting and Remediating Sites

ADEQ submits its own letters of intent at the same time the municipalities and other State agencies submit theirs. The letters of intent are evaluated by ADEQ staff using the eligibility and evaluation forms which assess the population and environment at risk; the routes of exposure; the amount, fate, and hazard of the contaminants; the possible extent of migration; the availability of responsible parties; the effectiveness of the proposed remedial action; its practicality and cost effectiveness; and the availability of other funding or enforcement mechanisms. The scores are reviewed by a committee which includes representatives of the Departments of Environmental Quality, Water Resources, and Health Services and a draft priority list is drawn up.

Similarly, the remedial action plans are reviewed by ADEQ's technical staff. The remedial actions are required to protect public health and the environment, provide for cleanup to allow the use of water, and be reasonable, necessary, and cost effective. Remedial action requirements are given in A.A.C. R18-7-108. Where public interest is expressed, a period of public review may be provided as given in A.A.C. R18-7-110.

1.1.6 Enforcement Under WQARF

A responsible party is defined in ARS 49-283. In general, a responsible party is defined as one who owned or operated the facility, owned or possessed the hazardous substance, or accepted the hazardous substance for transport to a disposal or treatment facility. A

responsible party may also be a person who engaged in or permitted others in business to use the facility, permitted the disposal, knew of the hazards or took contributing actions. ARS 49-285 provides for strict, joint, and several liability, which is retroactive. ADEQ may request the Attorney General's office to take civil action for cost recovery, request the court to impose a fine of $5,000 per day for violation of an order, or impose punitive damages up to three times the cost of the remedial action. A facility is not considered to be a responsible party merely because they use chemicals, are located in proximity to observed chemicals in the ground water, or own land which has ground water contamination beneath it.

Remediation is ADEQ's highest priority and in cases of potential imminent and substantial danger, ADEQ cleans up first and enforces later. In cases of long-term contamination where no immediate danger exists, ADEQ seeks responsible parties in accordance with the provisions of ARS 49-282.B.2. through 5, to initiate clean up.

1.1.7 Work by WQARF Contractors

The WQARF contractors were used for eight projects: Miracle Mile, Tucson; West Van Buren, Phoenix: West Central Phoenix; East Central Phoenix; East Washington, Phoenix (formerly Eastlake Park); South Mesa; Northeast Mesa; and Nogales Wash. The purpose of the work was to:

1) Investigate and identify the existence and extent of hazardous substances in the ground water

2) Initiate the process of identifying the source and nature of the hazardous substances

3) Determine the danger to the public health or welfare or to the environment in order to provide for a timely, cost effective and reasonable cleanup of the contamination.

The contractors produced the following work products:

1) A Summary Report compiling:

- Historic water quality and water level measurements
- Analysis of historic aerial photography from the 1950s to the present for signs of disposal and discharge which could affect area surface water or ground water
- Area-wide geologic and hydrologic conditions which may affect the rate and direction of contaminant movement
- Zoning which allows for activities known to utilize chemicals or precursors to chemicals which were found in ground water
- Records searches for various incidents or violations which could indicate discharges of hazardous substances to the environment.

2) A workplan outlining further work to be done in Phase I

3) A soil sampling plan, along with the rationale for site selection

4) A ground water sampling plan, along with the rationale for site selection

5) A draft Phase I Report.

ADEQ decided to have a concurrent open review process for the draft Phase I reports and disseminated them to public libraries, local agencies, and facilities identified in the reports. Numerous comments were received during the review process. As a result of the comments, ADEQ made the following changes:

1) Terminology and processes have been standardized between the two contractors

2) Priorities were established for further technical investigation. The terms "high, medium, or low priority facilities" have been eliminated

3) Written comments were incorporated in the appendices of the report along with a responsiveness summary

4) Errors of fact and omission were corrected

5) Site boundaries were recommended to be reduced where possible to encompass areas containing wells in which chemicals were observed at or near MCL's or Arizona action levels

6) The term "suspected sources of contamination" and "potential responsible parties" were eliminated. The term responsible party will be used when the Department has made its finding based on evidence and notified the person as prescribed by law.

7) Information gathered by the contractors was indexed as an administrative record and made available for public review

8) Introductory chapters on WQARF requirements and processes were included.

1.1.8 Proposed Phase II Activities

Facilities, located in or near the areas of observed chemicals in the ground water, which previously failed to respond to the questionnaire, will be sent a second questionnaire by certified mail. Those which fail to respond to the second questionnaire may be subject to search warrant and record seizure by ADEQ. In allocating resources for Phase II, facilities which are scheduled for physical testing will be the first to receive additional investigation by ADEQ. Facilities scheduled for site inspections will be the second group, and facilities scheduled for records searches will be the third group addressed. Facilities which previously completed a questionnaire and are not identified for further technical investigations have been placed in an inactive category at this time.

Physical testing may include soil gas monitoring, well installation and ground water sampling, soil sampling, geophysical testing or additional ground water monitoring using existing or new wells. Site inspection may include visual and physical inspection of the facility, field screening measurements, employee interviews, determination of site operational and disposal history, a review of storage facilities for hazardous substances, and a review of the facility history of disposal, spills, leaks, fires, and emergency incidents. Records searches may include a review and compilation of facility records including chemical purchases, analytical data, wastewater discharge records, water use

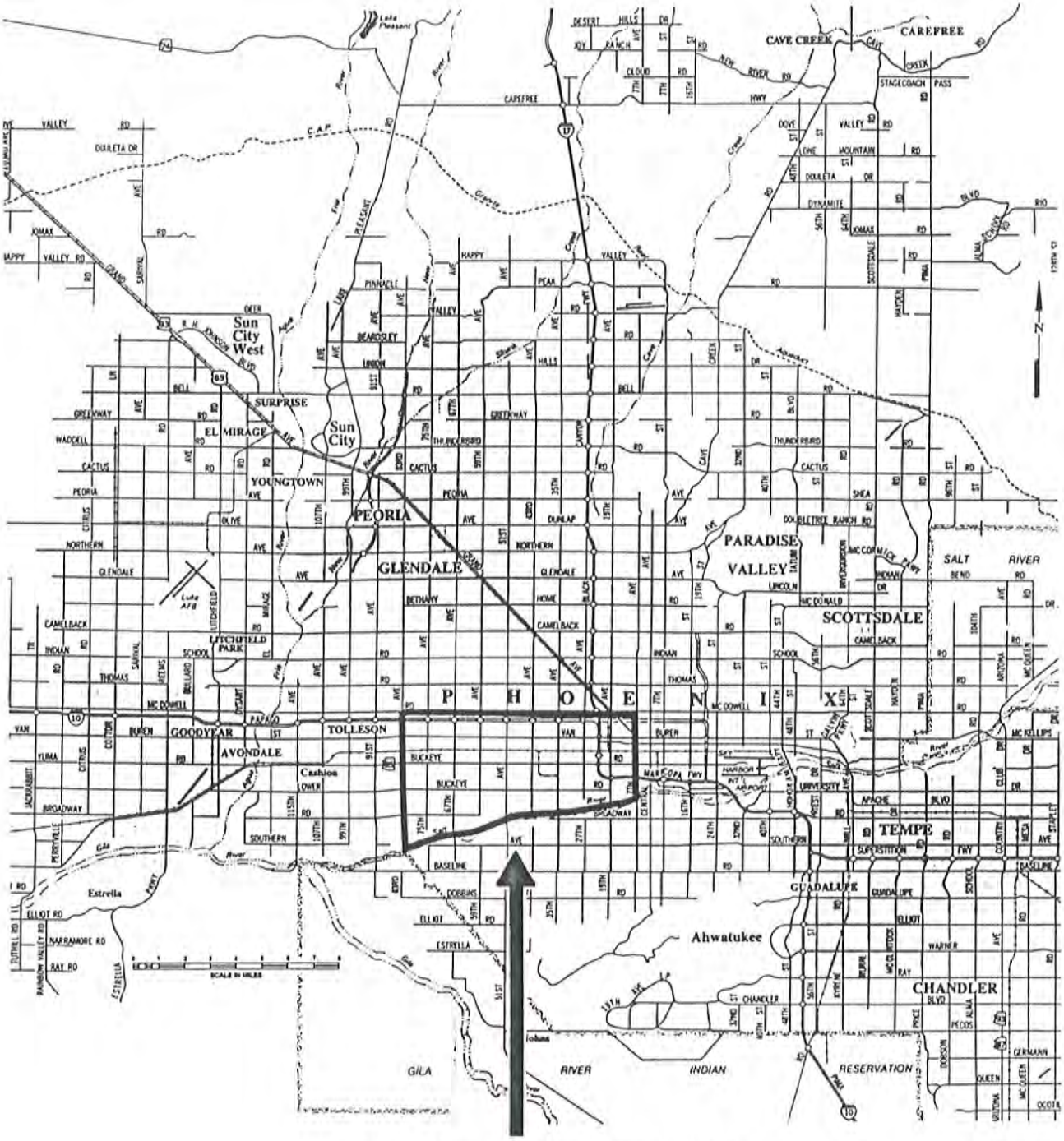
records, hazardous waste manifests, activity records, invoices, and facility maps and plans, or, records from sources outside the facility such as historical aerial photographs, compliance records, wastewater discharge records, registered dry wells, registered wells, registered underground storage tanks, fire department records, complaints, and analytical data. ADEQ may place a facility in the inactive category dependent on information gathered or provided during Phase II activities.

If a facility is determined by ADEQ to be a responsibly party, ADEQ will initiate the formal notice procedures which require ADEQ to show there has been a release or threat of a release of a hazardous substance from a facility which may present an imminent and substantial danger to the public health or welfare. ADEQ will encourage private parties to initiate voluntary cleanup actions. ADEQ will also seek cost recovery and applicable penalties if responsible parties fail to perform remedial actions after being ordered pursuant to ARS 49-286 and 287. Where ADEQ cannot identify responsible parties, the Fund will be used to initiate remedial actions. ADEQ will oversee and coordinate work being conducted simultaneously in adjacent areas by private parties and contractors so as to avoid duplication. ADEQ will also provide for community information including public presentations and written information.

1.2 Introduction

The project study area consists of approximately 35 square miles in southwestern Phoenix, and is bounded by McDowell Road to the north, 7th Avenue to the east, the Salt River to the south, and 83rd Avenue to the west. The study area is illustrated on Figure 1. Historic ground water analyses have indicated the presence of at least sixteen volatile organic compounds (VOCs) at concentrations above the U.S. Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs) and/or Arizona Department of Health Services (ADHS) Action Level guidelines (AALs) within the West Van Buren Study Area. MCLs are the enforceable drinking water standards set by the EPA. AALs are draft interim public drinking water supply criteria set, and currently being revised, by the ADHS.

Wells in the area are used for commercial cooling systems, industry, and agricultural irrigation. Eleven City of Phoenix municipal supply wells are located within three miles of the study area. However, no active municipal supply wells are located within the study area. The City of



West Van Buren Study Area

KLEINFELDER

Project Number 52-1015-01 July 1989

ADEQ Task Assignment K-2
West Van Buren Area
Phoenix, Arizona

VICINITY MAP

FIGURE
1

Tolleson has supply wells which appear (based on regional data) to be located downgradient from the area with concentrations of chemicals in the ground water exceeding MCLs or AALs.

1.3 Objectives

This Phase I Report has been prepared by Kleinfelder, Inc. (as prime consultant) with assistance from Malcolm Pirnie, Inc. (as subconsultant) as part of the requirements of Contract Number 2207-000000-3-3-DM-8038 with the ADEQ for Task Assignment K-2, West Van Buren Area, Phoenix, Arizona (Figure 1). In conducting Phase I, *Kleinfelder* was responsible for project management, the review of aerial photographs, questionnaire distribution and the processing of responses, the computer input and management of historic ground water quality data, and the production of project-related reports. *Malcolm Pirnie* was responsible for collecting published data on regional and local geology and hydrogeology, the collection and assimilation of government records including available historic water quality data, the reconnaissance of properties and wells, the sampling of ground water and soils, and the listing of facilities. *ADEQ* staff wrote Section 1.1 of this report. This Phase I report describes the findings from activities carried out during this study, and presents a list of facilities for continuing evaluation.

The objectives of this study are:

A. Establish a database consisting of available documents such as governmental records, technical papers, and pertinent hydrogeologic studies which can assist ADEQ in assessing potential environmental impact and health effects.

B. Establish, from available or compiled technical data, more applicable study area boundaries either within or beyond the previously described confines which encompass the observed extent of chemicals in the ground water.

C. Conduct or coordinate further information gathering and field work necessary to list facilities which warrant additional study.

D. List the facilities and respective investigative activities planned for the next phase of investigation.

1.4 Purpose

This report is intended to be a starting point for remediating ground water quality degradation in the study area. Presented as an appendix to this report is a list of facilities which, based on available information, appear to warrant further, more site-specific investigation relative to their possible contribution of observed chemicals to the ground water. The report also presents conclusions and recommendations relative to subsequent investigative efforts.

1.5 Background

In fulfilling one of the requirements of this contract, a Summary Report was submitted to ADEQ on May 16, 1988. The purpose of that report was to establish a database to assist ADEQ in assessing impacts on the ground water, and in evaluating the health effects associated with the use of the area's ground water. The work activities involved in the preparation of the Summary Report included: a literature and records search to provide background information on the geology and hydrogeology, land use, and potential chemical manufacturers and users within the area, and sites where potential uncontrolled releases may have occurred; a field reconnaissance of the area with emphasis on making observations in the industrial area and on confirming well locations; and a review of historical aerial photographs to identify land uses which are characteristic of chemical storage and use, or waste disposal.

The Summary Report discussed the available data obtained during that phase of the study in light of: 1) the hydrogeologic characteristics of the Salt River Valley Basin; 2) EPA MCLs promulgated under the Safe Drinking Water Act; and 3) draft ADHS interim criteria for public drinking water supply. The results of the data gathering efforts for the Summary Report are reviewed in Section 4 of this report.

In July of 1988, Kleinfelder submitted a Workplan to ADEQ which described the sequence of activities to be carried out during, and subsequent to, the preparation of the Summary Report. The purpose of the activities described in the Workplan was to assist with defining the extent and source of the contamination and identifying facilities for further evaluation. These activities included further review of aerial photos, continued literature and records searches, development and distribution of questionnaires to appropriate parties in the area, and design and implementation of soil and ground water sampling programs.

In July, 1988, a questionnaire was developed and mailed to facilities in the area which might manufacture, store, use, or dispose of chemicals. The information requested on this questionnaire included such things as industrial operations performed, dates of operation, chemical substances used, disposal practices, storage facilities on site, and spill records. The results of this questionnaire mailing are summarized in Section 4.

In August of 1988, Kleinfelder submitted to ADEQ Ground Water and Soil Sampling Plans which were designed to supplement historic data and aid in investigating the ground water contamination observed in the study area. The Ground Water Sampling Plan proposed the sampling of selected existing wells in the general area of chemicals found in the ground water. The Soil Sampling Plan proposed the sampling of soils at sites which appeared on aerial photos to have stained soils, chemical storage facilities, or other locations where specific land-use practices could not be confirmed. Soil sampling sites were also selected based on an evaluation and interpolation of available water quality data, and field reconnaissance of the area. The sampling proposed in these plans was carried out during the month of September, 1988. The results of these sampling programs are summarized in Section 4 of this report.

Along with presenting a review of historic information and recently collected data, this Phase I Report presents and discusses a list of facilities for continuing evaluation. The list of facilities is presented in Appendix A. Conclusions and recommendations are presented in Sections 6 and 7, respectively. Related reports and information collected during this phase of the investigation have been indexed and are available at ADEQ.

A draft of this Phase I Report was submitted to ADEQ on October 27, 1988. ADEQ subsequently made the report available for review and comment. The comments received are included as an appendix to this report. Responses to those comments are also included in this report as Appendix F.

2 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

2.1 Introduction

This section presents a condensation of the geologic and hydrogeologic information as discussed in the Summary Report (Kleinfelder, 1988). The information given is derived from available published and unpublished reports, maps and other data sources and does not represent any findings from field work performed by the consultants. Discussed in this section are: regional and local geology; geologic structure; regional hydrogeology and ground water quality; and a description of the aquifer units underlying the study area, including ground water movement and quality. Determination of site-specific (i.e., at specific facilities) hydrogeologic conditions such as ground water gradient, flow direction, and velocity were not within the scope of this first phase of the study. Regional characteristics have been relied upon where they generally appear to be representative of the conditions underlying the study area. More detailed, site-specific investigations are planned for subsequent phases of the study.

2.2 Geologic Conditions

2.2.1 Regional Geology

The Phoenix region is located within the Salt River Valley Basin, which is part of the Basin and Range physiographic province as described by Fenneman (1931). The Salt River Valley Basin is a structural depression formed by Cenozoic crustal extension, and is characterized by broad sloping valleys bounded by generally northwesterly trending mountain ranges, including the McDowell, Superstition, Sierra Estrella, and White Tank Mountains.

The Salt River Valley Basin lies within a broad alluvial-filled valley composed of Cenozoic (Oligocene to Recent) sedimentary deposits. The alluvial basin extends to maximum projected depths of approximately 10,000 feet (Oppenheimer, 1980), and

predominantly consists of consolidated to unconsolidated sands and gravels with local discontinuous clays and silts. Valley floor elevations range from a minimum of 800 feet in the southwest portion of the basin to a maximum of 2000 feet in the northeast.

Cenozoic basin-fill material can be divided into four general stratigraphic units including: the Red Unit, of Oligocene-Miocene age; the Lower Unit, of Miocene-Pliocene age; the Middle Unit, of Pliocene-Pleistocene age; and the Upper Unit, of Holocene (Recent) age. Descriptions of these stratigraphic units are given in the Summary Report (Kleinfelder, 1988).

2.2.2 Regional Geologic Structure

The geologic structure in the Phoenix region is predominantly associated with Basin and Range crustal extension causing widespread, northwest-trending normal faulting. As evidenced by the displacement within the local sedimentary deposits, the faulting apparently occurred during the early Tertiary period. High-angle normal faults separate large mountain blocks by a series of broad, downfaulted alluvial valleys. Pre-Basin and Range sediments (Red Unit) and the older basin-fill deposits (basal portion of the Lower Unit) are offset by these high-angle normal faults throughout the Phoenix Basin. Younger sedimentary basin-fill deposits were not subject to this faulting, and evidence of displacement is not detected in the alluvial deposits above the basal portion of the Lower Unit (USGS, 1988).

2.2.3 Local Geology

Similar to the Phoenix area as a whole, the West Van Buren Area is underlain by a thick sequence of Cenozoic sedimentary deposits that form the major aquifer units of the main Salt River Valley Basin. Although the sedimentary basin is known to locally exceed thicknesses of 10,000 feet, the Middle and the Upper units typically form the primary aquifers. The Upper Unit is a highly productive aquifer in the central portion of the basin and along the Salt River (ibid.).

The sedimentary deposits primarily consist of unconsolidated to semi-consolidated silts, sands, and gravels that yield substantial quantities of ground water. Local semi-confined conditions may occur due to both interbedded clay layers within the Middle Unit, and basalt and pyroclastic layers within the Lower Unit (ibid.).

The Upper Unit is considered the most productive aquifer within the study area, and is observed at the surface throughout the study area. The thickness of the Upper Unit generally increases in a westerly direction, and ranges from a minimum thickness of 200 feet in the east up to 450 feet in the west (ibid.).

Non-waterbearing bedrock formations are not observed at the surface within the study area, nor are they encountered in wells within the study area, but are estimated at depths greater than 2,500 feet (Oppenheimer, 1981).

Determination of site-specific geologic conditions was not within the scope of work for this phase of the study. However, site-specific investigations are planned for subsequent phases of the study.

2.3 Hydrogeologic Conditions

2.3.1 Climatology

The Salt River Valley is located within the Sonoran Desert Climatic Region and is characterized by hot summers and cool winters. Average maximum temperatures reach a high of 105°F in July and a low of 65°F in December. Minimum temperatures range from an average of 80°F in July to an average of 39°F in December (Green and Sellers, 1964).

Precipitation averages 7.2 inches annually in the vicinity of the study area. The majority of the precipitation occurs in both the hot summer months of July through September, and the cooler winter months of December through March. Little precipitation occurs during the spring and fall. Average annual evaporation is approximately 72 inches, with the greatest evaporation occurring during the hot summer months (Sellers, 1974).

2.3.2 Regional Hydrogeology

For the purposes of this report, geologic materials in the Phoenix region have been grouped into two broad categories: non-water-bearing and water-bearing. The general distribution of geologic materials is presented on Plate 1. Non-water-bearing formations comprise the mountain ranges bounding the alluvial valleys and smaller isolated

mountains found within the central basin outcropping on the valley floor. These geologic units include Precambrian through Tertiary igneous, metamorphic, and consolidated sedimentary rocks. They do not produce appreciable amounts of water, and may cause restrictions or barriers to ground water flow.

Water-bearing deposits that form the major aquifer units in the Phoenix area include the basin-fill sediments observed in the central portion of the valley. The largely unconfined aquifers are primarily composed of unconsolidated, medium and coarse-grained sediments, although perched and semi-confined conditions may be present locally at depth due to interfingering finer-grained deposits.

Regional ground water elevations and ground water contours developed from the most recently available DWR (1985) ground water data are shown on Plate 1. The ground water contours suggest that regional ground water movement in the study area is generally to the west and northwest. **North of the Salt River channel, ground water flow is complicated by local pumping patterns. As a result, ground water gradients and flow directions may vary significantly throughout the year and from site to site within the West Van Buren Study Area.** Also, because the Salt River is normally dry but is also the main channel for surface runoff and a source of recharge to the ground water, the hydraulic gradient fluctuates measurably during runoff.

Ground water recharge to the basin aquifers is derived from infiltration of precipitation, infiltration of runoff from the adjacent mountains, infiltration of controlled releases from upstream reservoirs along the Salt River, return flow from agricultural irrigation, canal seepage, and subsurface ground water inflow from adjacent areas. Although the ground water basins in the Phoenix region are considered to be in overdraft condition, ground water elevations have increased locally by as much as 50 to 70 feet since the mid-1960s, due to overall decreases in ground water use and runoff from higher than normal precipitation.

2.3.3 Regional Ground Water Quality

Regional ground water quality in the Salt River Valley is controlled by the natural geologic formations and infiltration of recharge water derived from precipitation, runoff and irrigation return flow. Calcium and sodium are the predominant cations, and chloride and bicarbonate are the most common anions in ground water in the Phoenix

region. Historic ground water quality data indicate a broad overall change in ground water chemistry in recent years from calcium bicarbonate water to sodium chloride water. This change is reported to be informally attributable to return flows from applied irrigation in excess of the consumptive use of the vegetation (USGS, 1988).

Total dissolved solids (TDS) concentrations from wells in the Salt River Valley range from a reported minimum of approximately 200 mg/L near Sun City, Arizona, north of the study area, to 7,000 mg/L near Buckeye, west of the study area. Most wells containing high TDS concentrations are perforated within the Upper Unit. Ground water samples from wells within the study area generally exceed the EPA recommended drinking water standard of 500 mg/L TDS. Increased recharge from above-average precipitation in recent years has resulted in a decline in TDS concentrations in aquifers near the Salt River, but concentrations generally remain above the recommended standard (ibid.).

2.3.4 Hydrogeologic Conditions Underlying the West Van Buren Area

The project study area consists of approximately 35 square miles in an area north of the Salt River, south of McDowell Road, west of 7th Avenue, and east of 83rd Avenue. Although semi-confined conditions may occur locally, the saturated basin-fill deposits are assumed to be a single unconfined aquifer system with appreciable amounts of water available within each geologic formation (ibid.).

2.3.4.1 Aquifer Characteristics

Although some wells within the West Van Buren Area may penetrate all of the aquifer units, the Upper Unit is the most productive aquifer within the study area. The thickness of the unit ranges from approximately 200 feet near the eastern study area boundary to 450 feet near the western study area boundary. Within the study area, the Upper Unit includes fluvial deposits of the Salt River channel and associated terrace deposits. The Upper Unit is exposed at the surface throughout the study area. Ground water levels are typically above the base of the Upper Unit, with saturated thicknesses ranging from 120 feet in the east to 400 feet in the west. Hydraulic conductivities in the Upper Unit reportedly range from 180 to 1700 ft/day. This range is based on data from

outside of the study area and may not be representative of aquifer conditions within the study area (ibid.).

The Middle Unit, a main aquifer in the Salt River Valley, is generally encountered at depths of 180 to 450 feet within the study area. The thickness of this Unit ranges up to 500 feet. It includes alluvial fan, lacustrine, and fluvial stream deposits, and is saturated throughout the study area. Hydraulic conductivities in the Middle Unit reportedly range from 4 to 60 ft/day. These values are based on data from outside the study area and may not completely represent the aquifer conditions within the study area (ibid.).

The Lower Unit is of less importance as an aquifer in this area. The thickness of this unit is estimated to range from 900 feet near the eastern portion of the study area to possibly greater than 1,200 feet near the western portion of the study area. Hydraulic conductivities range from 6 to 14 ft/day (ibid.).

The Red Unit has been encountered in wells in the central portion of the study area. Data for Well (A-1-2)9dcc indicate a depth to the Red Unit of 1,240 feet. Wells in the western portion of the study area are reportedly not deep enough to penetrate the Red Unit. Estimates from drillers reports of wells outside the study area indicate that fractured sections of the Red Unit may provide well yields of up to 1,000 gpm (ibid.). Reported estimates of hydraulic conductivities of the Red Unit range from 0.001 to 100 ft/day (ibid.).

2.3.4.2 Ground Water Movement

Ground water movement within the study area is controlled by several general geologic features, including: the location and distribution of non-waterbearing formations; locally discontinuous and regionally extensive fine-grained or consolidated deposits; and the presence of fault systems in the basal portion of the Lower Unit. The location and volume of ground water extracted from the aquifer by local water producers also affects the general ground water flow pattern, and results in seasonal variations in flow direction.

Under non-pumping conditions, the direction of ground water flow is primarily in a westerly direction, roughly parallel to the Salt River drainage. Recharge from

infiltration of flood flows along the Salt River has reportedly not significantly changed the flow direction in surrounding areas, but may cause local increases in ground water elevations immediately adjacent to the channel. **Because of seasonal and areal variations in pumpage the direction and rate of ground water flow varies measurably throughout the year and from site to site within the West Van Buren Study Area.**

The depth to ground water within the study area ranges from 40 feet along the Salt River to greater than 80 feet in the northwestern portion of the study area, based on 1983 data. Historic ground water level data indicate a general decline of ground water elevations from 1930 to 1965 of up to 130 feet in the northwestern portion of the study area. Over the same period, ground water elevations near the Salt River were subject to declines of up to 50 feet. Post 1965 ground water elevation data indicate a general rise in water levels of up to 80 feet in the northern portion of the study area (ADWR, 1986).

Regional hydraulic gradients are estimated to be approximately seven to ten feet per mile (0.0013-0.0019) to the west and northwest within the study area.

2.3.4.3 Ground Water Quality

Ground water quality data from wells within the study area indicate that the ground water is generally a sodium chloride type water. The data also indicate that the ground water is generally very hard (>180 ppm total hardness) and exceeds the Secondary Maximum Contaminant Levels (which are not health-related, but are based on aesthetic concerns) for chloride (250 ppm), sulfate (250 ppm), and total dissolved solids (500 ppm). In addition, nitrate levels in the ground water frequently exceed the MCL of 10 ppm (as nitrogen).

The data indicate that the sodium concentrations in the ground water generally range from 100 to 600 ppm while chloride concentrations range from 140 to 1110 ppm. Sulfate is found in the ground water at concentrations up to 350 ppm. The total dissolved solids (TDS) content ranges from about 650 ppm to 2400 ppm but is generally between 1000 and 2000 ppm. Water quality, relative to the introduction of human-induced chemical contaminants, is the principal subject of this report.

3 DATA COLLECTION

3.1 Introduction

This section discusses the methods of data collection and sources of data used for this study. The sources of data discussed in the following pages included: numerous government agencies; aerial photographs; field reconnaissance; a questionnaire distributed during this study; and soil chemistry and ground water quality data from sampling conducted as part of this study, as well as that from available historic records.

3.2 Literature and Records Search

A literature and records search was conducted to provide background information on the geology, hydrogeology, and land use, and to identify potential chemical manufacturers and users, and areas where potential uncontrolled releases occurred within the West Van Buren Area. The literature and records search involved a review of:

- Maricopa County and City of Phoenix zoning and tax assessors' information to determine land-use classifications and property owners;
- United States Environmental Protection Agency (EPA), Arizona Department of Environmental Quality (ADEQ), Maricopa Association of Governments (MAG), police, and fire department records relative to chemical users, disposers, and accidental spills;
- available published and unpublished reports, maps, and aerial photographs for geologic, hydrogeologic, water quality, and land-use characteristics;
- Arizona Department of Water Resources (ADWR), Roosevelt Irrigation District (RID), Salt River Project (SRP), and City of Phoenix records for water well locations, construction details, and uses.

The following discussion provides a summary of the information categories and the entities contacted during the course of the investigation. A list of references is presented in Section 9 of this report. The information which has been collected or summarized has been indexed and is available at ADEQ.

3.2.1 United States Environmental Protection Agency (EPA)

The EPA was contacted to obtain preliminary assessment and other available information from Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and Superfund Amendments Reauthorization Act (SARA) files for facilities within the West Van Buren Area. Two studies in areas north of the study area have been completed. These studies, "Aerial Photographic Analysis of the Phoenix Well Sites Number 71 and 226" (1988), and an "Aerial Photographic Analysis of the Fowler Industrial Area" (1988), were obtained through the EPA. In addition, the National Pollutant Discharge Elimination System (NPDES) permit list for Maricopa County was obtained from the EPA.

3.2.2 United States Geological Survey (USGS)

The USGS was contacted to obtain geologic and hydrogeologic information available for the Phoenix area. The USGS also provided pertinent information on the construction, water quality, and location of wells within the West Van Buren Area. The information obtained is included in the geology and hydrogeology sections of this report and the Summary Report (Kleinfelder, 1988).

3.2.3 United States Soil Conservation Service (SCS)

Available maps and publications were obtained from the SCS and reviewed to determine soil characteristics, such as soil texture and infiltration rates. The information obtained has been used to assess the distribution of native soils and to estimate infiltration rates in the West Van Buren Area.

3.2.4 Arizona Department of Environmental Quality (ADEQ)

The ADEQ provided access to available records and reports pertaining to the study area. This information included: a compilation of previous ground water quality analyses; available waste permit data; underground storage tank listings; dry well listings; previous geologic and hydrogeologic reports; compliance files; permits; CERCLA, SARA and RCRA files; and Fire Incidence Reports (FIRs). ADEQ also provided a list of key contacts for relevant information.

3.2.5 Arizona Department of Health Services (ADHS)

The ADHS was contacted to obtain information pertaining to disease prevention studies that may have been conducted in the Phoenix area. The ADHS indicated that the Division of Disease Prevention is conducting a series of relevant studies in Maricopa County.

3.2.6 Arizona Department of Transportation (ADOT)

ADOT was contacted to obtain a list of permitted transporters of hazardous wastes. These transporters are required to obtain an EPA ID number. ADEQ maintains this list of transporters and ID numbers.

3.2.7 Arizona Department of Water Resources (ADWR)

The ADWR provided information from the well registration, Ground Water Survey Inventory (GWSI), well logs files, and general files. Available ADWR reports on the Phoenix area were also compiled. These data have been used to help develop the well location maps and the hydrogeologic information included in the text.

3.2.8 Arizona State Structural Pest Control Board

The Structural Pest Control Board provided a listing of certified pesticide applicators in the Phoenix area. This list was used in the evaluation of the facilities currently handling these types of chemicals.

3.2.9 Maricopa Association of Governments (MAG)

MAG was contacted to obtain documents pertaining to previous studies that have been conducted within the study area. Although MAG has not done site specific studies within the study area, it did provide regional information pertaining to ground water use. In addition, MAG provided 1985 census data for Maricopa County, including the West Van Buren Study Area.

3.2.10 Maricopa County Assessors Office

Maricopa County Assessors Office was contacted, and subdivision maps and parcel identification information, including parcel owners and legal addresses, were gathered for the study area. These data provided owner's names and addresses of properties of interest, but did not necessarily provide information pertaining to the current land occupant. Where a land-use practice suggestive of chemical usage, waste handling, or disposal was observed or documented, the parcel owner and identification information were included in the data base.

3.2.11 Maricopa County Bureau of Air Pollution Control

Maricopa County Bureau of Air Pollution Control (APC) was contacted to obtain information on facilities using VOCs. The APC personnel indicated that compliance files were kept for those facilities using VOCs within the West Van Buren Study Area. These files included information on the number of degreasing units in operation and the types of chemicals utilized for degreasing operations on site.

3.2.12 Maricopa County Department of Civil Defense and Emergency Services

Maricopa County Department of Civil Defense and Emergency Services provided the community right-to-know filings from local industries. These files were used to determine which facilities may have activities that use the chemicals detected in ground water samples throughout the study area.

3.2.13 Maricopa County Department of Public Health

Maricopa County Department of Public Health provided a list of septic tank users and registered public water companies within the study area.

3.2.14 Maricopa County Planning Department

The Maricopa County Planning Department was contacted to provide land-use and zoning information. This information was utilized to identify the distribution of industrial and commercial property within the study area.

3.2.15 City of Phoenix

City of Phoenix personnel were contacted to obtain analytical data, well information and previous reports published for sites within the Phoenix area.

3.2.16 City of Phoenix Fire Department

The City of Phoenix Fire Department was contacted to obtain Fire Incidence Reports (FIRs) and lists of facilities storing chemicals within the study area. These files included a listing, by street names and block numbers, of all Arizona firms within the study area that regularly store, use or handle chemicals. However, these records can only be accessed through the administration of a court order. Therefore the ADEQ was used as an alternate source for SARA and FIR listings. ADEQ personnel indicated that their files did not contain summaries of code violations noted by Fire Department personnel during routine inspections of facilities. The Fire Department files were not available for use in this report.

3.2.17 City of Phoenix Industrial Waste Discharge

City of Phoenix Industrial Waste Discharge personnel were contacted to obtain permits and files on facilities disposing of wastes into the sewer systems. Several facilities within the study area have been cited for non-compliance with wastewater standards.

3.2.18 City of Phoenix Planning Department

City of Phoenix Planning Department was contacted to provide land-use and zoning information. This information was used to help identify the distribution of industrial and commercial property within the study area.

3.2.19 Roosevelt Irrigation District

Roosevelt Irrigation District was contacted for well construction, pumping schedules, and chemical analyses data for wells within the West Van Buren Study Area. The water quality data were utilized to help identify areas of ground water degradation.

3.2.20 Salt River Project (SRP)

SRP personnel were contacted to obtain information regarding the location, status, construction data, previous ground water quality analyses, and operational history of wells within the study area.

3.2.21 University of Arizona and Arizona State University

University of Arizona and Arizona State University personnel in the Water Resources Research Center (WRRC), Geology and Climatology Departments were contacted for information on the general hydrogeology, geology and land-use practices in the study area. Also provided was an aerial photo interpretation of past land-use changes and climatic data for stations within the study area.

3.2.22 Aerial Photographs

Part of background data gathering involved procurement of both recent and historic aerial photography for the vicinity of West Van Buren. Aerial photography was obtained for the years 1953, 1954, 1964, 1965, 1970, 1972, 1980 and 1986. The aerial photographs were used in identifying potential sites of chemical releases. In addition, the following EPA documents were reviewed: "Remote Sensing Investigation, Solid/Liquid Waste Disposal Sites, Phoenix, Tucson, Arizona and Southern Regions of Arizona" (1980); and "Aerial Photographic Analysis of the Fowler Industrial Area, Phoenix, Arizona" (1988). During subsequent phases of this study, the potential sites

were investigated and evaluated for additional information. The sites are described and identified on 1986 aerial photographs in Appendix A of the Summary Report (Kleinfelder, 1988). The results of the aerial photograph review are discussed in Section 4.2.2.

3.2.23 Quality Assurance/Quality Control

The numerical data obtained during the literature and records search were screened for duplication and errors, and placed into a computer data base to assist in data compilation and correlation. ENVIS, the Kleinfelder Environmental Information System, was utilized for data storage, manipulation, and reporting. Information included in the data base was verified through random double entry. Water quality data stored in ENVIS are included in the Summary Report (Kleinfelder, 1988).

3.3 Questionnaires

During July, 1988, a questionnaire was sent to a preliminary group of approximately 850 facilities. The preliminary listing of facilities, which was developed from site reconnaissance and searches of available data sources, included facilities that use, store, produce, or dispose of chemicals (including petroleum hydrocarbons) and/or apparently did so in the past. A copy of the questionnaire is included in Appendix B. The results of the questionnaire response are summarized in Section 4.3.

3.4 Field Activities

For this report, a number of field activities were conducted. These included a reconnaissance of properties and wells, and the sampling and analysis of ground water and soils.

3.4.1 Reconnaissance of Properties

A field reconnaissance of the study area was performed during May, 1988. Further field investigation was carried out through September, 1988. The reconnaissance of properties focused on observing the industrial and commercial areas as determined from zoning information. The following discussion presents a summary of activities conducted during these field activities.

Reconnaissance activities followed the general guidelines outlined in the "Procedures for Identifying Responsible Parties" (USEPA, 1982). **The field reconnaissance was limited by the scope of work.** The scope of this phase of the project did not include efforts leading to authorized access. In some cases requests were made, but access was denied.

If observed during the field investigations, the following were recorded:

- DRUMS: the number, status, and, if readily apparent, contents of drums at a facility, as well as visual observations of disposal or storage practices

- STAINED SOIL: the presence of stained (or discolored) soil and stockpiled soils

- NOTABLE PRACTICES: land-use practices that deviated from Federal, State, or local requirements including, but not limited to: disposal of fluids into wells, sumps, dry wells, or gravel pits; storage of drums; and storage or handling of chemicals

- STORAGE TANKS: the existence of underground and above-ground storage tanks; the number of tanks and contents whenever possible

- GENERAL HOUSEKEEPING: the overall cleanliness and orderliness of the facility

- DRY WELLS: locations; proximity to facilities, chemical use and storage; stained soils; and unusual disposal practices

- INDUSTRY TYPE: (e.g. electronics manufacturing, metal fabrication)

- CHEMICAL USE: The potential use of chemicals observed in the ground water was estimated based on the type of industry encountered. The background information utilized for investigating the typical chemical uses included such references as the Merck Index.

3.4.2 Reconnaissance of Wells

A reconnaissance of wells in the West Van Buren Study Area was performed during May, 1988, to note their location and current status, if possible. Further field investigation was conducted through September, 1988. The initial reconnaissance of wells focused on observing the location, type of pumping equipment installed, operational status, and potential owner. The following discussion presents a summary of the activities conducted during the well reconnaissance.

Initially, available information pertaining to well locations, water quality, well construction, and well ownership was gathered from Federal, State, and local government agencies, private water purveyors, and various published and unpublished reports. The reported well locations were plotted on a base map of the study area at a scale of 1:9,600. Legal well designations were used to approximately locate wells within a 10-acre area. A preliminary survey of the well locations was then performed to verify and adjust well locations. Project personnel, for the most part, did not enter private or commercial properties, and restricted their observations to publicly accessible lands. Where feasible, the well owner was contacted to verify the well location and operational status.

The locations of the wells documented in the historical records and observed during the field investigation are shown on Plate 1. The following general information was observed regarding well status:

- LOCATION: The location of a well was field plotted on the base map. Wells that could not be located, or were enclosed and could not be observed, were noted.

- EQUIPMENT: If visible, the well head was inspected for the type of installed pumping equipment.

- STATUS: The active, inactive, or abandoned status of the well was recorded.

- OWNER: The name of the owner or facility operator was noted if obtained during the reconnaissance visit.

KEY TO FIGURE 2

ENVIS Site Number	Legal Well Designation	(#)	Owner
1004	(A-1-2)12baa	(1)	RID #114
1008*	(A-1-2)1bdb	(2)	Beth El Cem.
1009*	(A-1-2)1cac	(3)	Greenwood Mem. Park
2022*	(A-1-2)9ccc	(4)	Western Cotton Serv. Co.
4002	(A-1-1)11bcc	(5)	Soil Service, Inc.
5001*	(A-1-1)13add	(6)	M.H. Sanders
6008*	(A-1-2)17add	(17)	RID #88
6016	(A-1-2)19baa	(7)	Mastin
6056*	(A-1-2)19cdc	(8)	Crawford
7013	(A-1-2)21bba	(9)	Swift
7024*	(A-1-2)21add	(10)	Peterson
7034	(A-1-2)16cbb	(11)	NA
8021	(A-1-2)13bbb	(12)	NA
8031*	(A-1-2)13dad	(13)	RID #103
8059*	(A-1-2)24baa	(14)	23rd Ave. Treat. Plant
9003*	(A-1-3)18bbc	(15)	RID #104
9007	(A-1-3)6dca	(16)	City of Phx. Parks & Rec.

(#) Sample Location Number

* Wells actually sampled

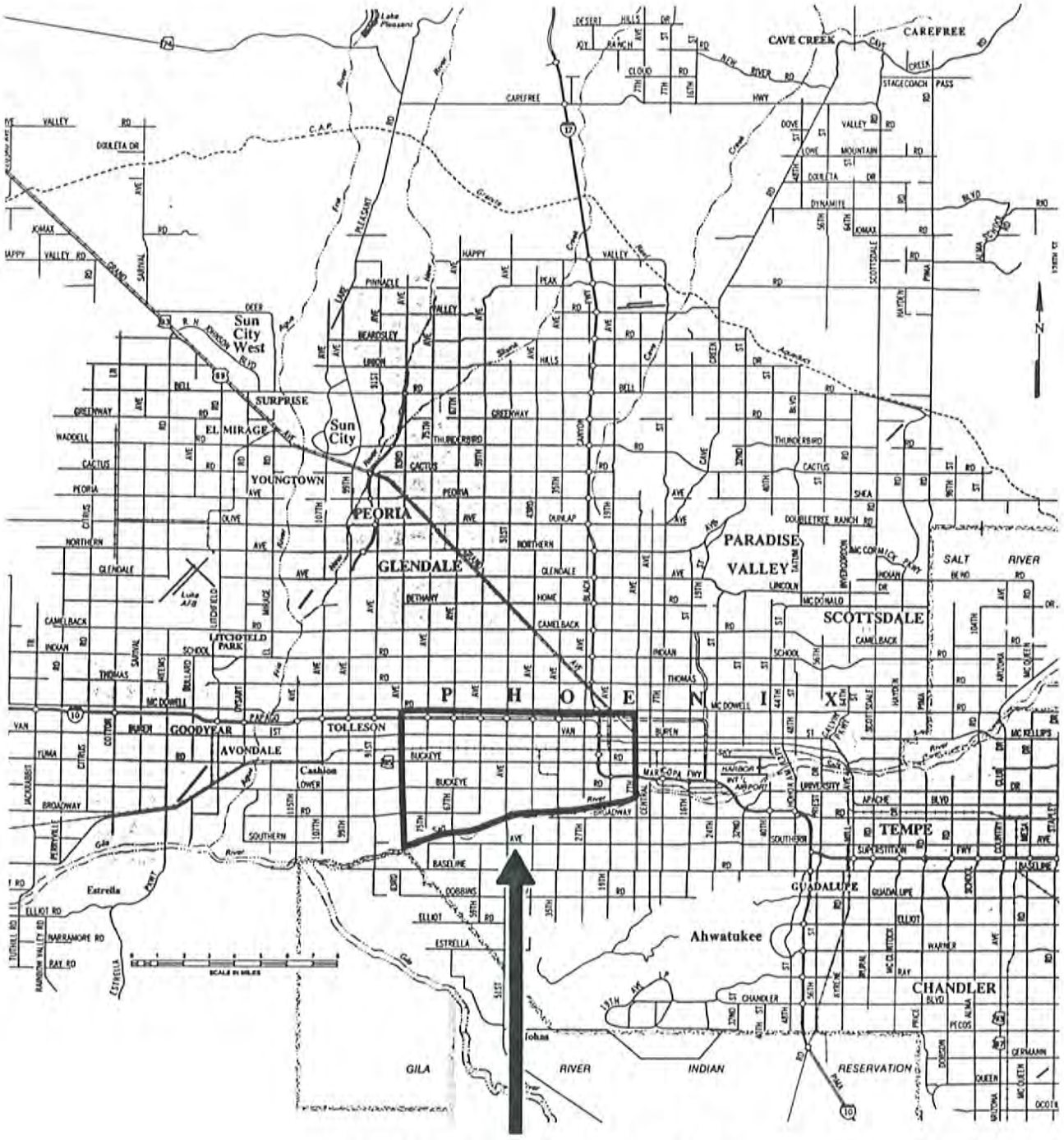
RID = Roosevelt Irrigation District

KEY TO FIGURE 2 (CONT.)

WELLS IN WHICH VOCs HAVE BEEN DETECTED ABOVE MCLs OR ADHS ACTION LEVELS

ENVIS Site Number	Legal Well Designation	Owner
1001	(A-1-2)12caa	Holsum Bakery
1004	(A-1-2)12baa	RID #114
1009	(A-1-2)1cac	Greenwood Mem. Park
2001	(A-1-2)9bbb1	RID #109
2002	(A-1-2)9bbb2	RID #109
2003	(A-1-2)10aba	RID #111
2004	(A-1-2)10cbc	RID #92
2005	(A-1-2)9aab	RID #110
2027	(A-1-2)9dbd	APS MW-1
3001	(A-1-2)8aa1	Van Buren Tank Farm
to	to	
3011	(A-1-2)8aa11	Van Buren Tank Farm
3013	(A-1-2)8baa1	RID #108
3015	(A-1-2)7bba	Prohoroff
3016	(A-1-2)8ada	Cons. West Steel Div.
3020	(A-1-2)8aa13	Van Buren Tank Farm
3021	(A-1-2)8aa14	Van Buren Tank Farm
3022	(A-1-2)8aa15	Van Buren Tank Farm
4027	(A-1-1)12bba	Evans
8001	(A-1-2)23aaa	City of Phx. III-1
8002	(A-1-2)23aad	City of Phx. III-2
8003	(A-1-2)23adb	City of Phx. III-3
8004	(A-1-2)23aab	City of Phx. III-4
8005	(A-1-2)23abb	City of Phx. III-5
8006	(A-1-2)23bab	City of Phx. III-6
8007	(A-1-2)23bbb	City of Phx. III-7
8011	(A-1-2)14cdd	RID #97
8014	(A-1-2)14aad	RID #99
9001	(A-1-3)18caa	City of Phx. DM-4
9002	(A-1-3)6dcd	Univ. Park R-G #1
9003	(A-1-3)18bbc	RID #104

RID = Roosevelt Irrigation District
APS = Arizona Public Service Co.



West Van Buren Study Area

KLEINFELDER

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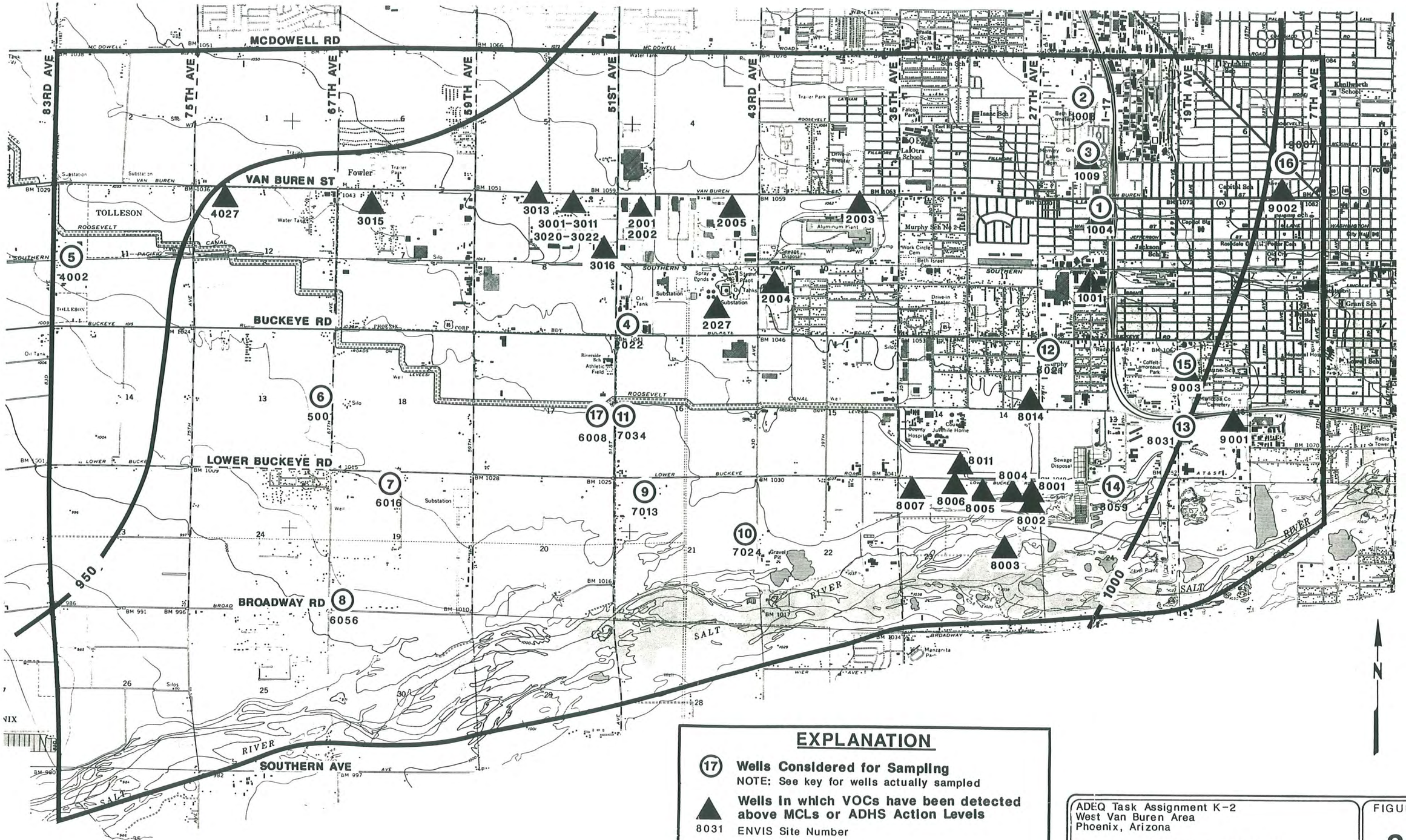
ADEQ Task Assignment K-2
West Van Buren Area
Phoenix, Arizona

VICINITY MAP

FIGURE 1



EXPLANATION

(17) **Wells Considered for Sampling**
NOTE: See key for wells actually sampled

▲ **Wells in which VOCs have been detected above MCLs or ADHS Action Levels**

8031 ENVIS Site Number

Phase I Study Area Boundary

950 **Regional Ground Water Contours (after ADWR, 1986)**

ADEQ Task Assignment K-2
West Van Buren Area
Phoenix, Arizona

GROUND WATER SAMPLING LOCATIONS

FIGURE **2**

KLEINFELDER

Project Number 52-1015-01

July 1989

KEY TO FIGURE 3 (CONT.)

▲ **WELLS IN WHICH VOCs HAVE BEEN DETECTED ABOVE MCLs OR ADHS ACTION LEVELS**

ENVIS Site Number	Legal Well Designation	Owner
1001	(A-1-2)12caa	Holsum Bakery
1004	(A-1-2)12baa	RID #114
1009	(A-1-2)1cac	Greenwood Mem. Park
2001	(A-1-2)9bbb1	RID #109
2002	(A-1-2)9bbb2	RID #109
2003	(A-1-2)10aba	RID #111
2004	(A-1-2)10cbc	RID #92
2005	(A-1-2)9aab	RID #110
2027	(A-1-2)9dbd	APS MW-1
3001	(A-1-2)8aa1	Van Buren Tank Farm
to	to	
3011	(A-1-2)8aa11	Van Buren Tank Farm
3013	(A-1-2)8baa1	RID #108
3015	(A-1-2)7bba	Prohoroff
3016	(A-1-2)8ada	Cons. West Steel Div.
3020	(A-1-2)8aa13	Van Buren Tank Farm
3021	(A-1-2)8aa14	Van Buren Tank Farm
3022	(A-1-2)8aa15	Van Buren Tank Farm
4027	(A-1-1)12bba	Evans
8001	(A-1-2)23aaa	City of Phx. III-1
8002	(A-1-2)23aad	City of Phx. III-2
8003	(A-1-2)23adb	City of Phx. III-3
8004	(A-1-2)23aab	City of Phx. III-4
8005	(A-1-2)23abb	City of Phx. III-5
8006	(A-1-2)23bab	City of Phx. III-6
8007	(A-1-2)23bbb	City of Phx. III-7
8011	(A-1-2)14cdd	RID #97
8014	(A-1-2)14aad	RID #99
9001	(A-1-3)18caa	City of Phx. DM-4
9002	(A-1-3)6dcd	Univ. Park R-G #1
9003	(A-1-3)18bbc	RID #104

RID = Roosevelt Irrigation District
APS = Arizona Public Service Co.

KEY TO FIGURE 3

Soil Sample Location Number	Owner/Description
1*	Research Chemicals
2*	World Resources Co.
3*	Feed dist. facility Surface impoundments
4*	Petco, Inc.
5*	Phoenix Vegetable Dist.
6	Surface impoundments
7*	Joe's Diesel Repair
8	AT&T Technologies Inc.
9*	Western Cotton Services Co.
10*	Revlon Inc.
11*	Surface impoundments
12*	Transcon Lines
13*	Maricopa By-Products Inc.
14*	Smithey Recycling Co.
15	Surface impoundments
16	Sahuaro Petroleum and Asphalt Co.
17*	Santa Fe R.R. Yard
18	Santa Fe R.R. Yard
19*	Ray & Bob's Truck Salvage
20*	Schuff Steel
21	National Metals
22	Tanner Co.
23	Tanner Co.
24*	Chevron, U.S.A., Inc.
25	Sahuaro Petroleum and Asphalt Co.
26*	Blue Circle West (adjacent to Western Petroleum)
27	Southern Pacific R.R. Yard
28	Maricopa Meat Packing Co.

* locations actually sampled

Following the field reconnaissance of wells, additional information was obtained regarding the operational status and use of the wells from owners, operators, or State and local agencies.

3.4.3 Sampling of Wells

A ground water sampling plan was submitted to ADEQ by Kleinfelder on August 25, 1988. In this plan the sampling of 16 existing wells in the area was proposed in order to supplement existing data. In proposing the wells to be sampled, those wells which had previously been located in the field were considered. Most of the wells selected for sampling were located near areas of observed elevated chemical concentrations, or were located in areas where data are sparse or completely lacking (Figure 2). In addition, some wells were sampled to verify previous analytical results. Analyses of the samples collected from these wells included VOCs, general minerals, and select metals.

Ground water samples were collected between September 6 and 12, 1988. Of the 16 wells proposed for sampling, only 9 could be sampled. The remaining wells were not in their reported locations or were not operational. A tenth well was selected by the staff and added for sampling. The locations of wells that were sampled are shown on Figure 2 and resulting data are given in Section 4.3.2.

A sampling notebook was prepared prior to sampling, and maintained throughout the sampling activities. Information contained in this notebook included: water levels; well locations; condition of the well heads; casing volume calculations; estimated pumping rates; pH, conductivity, and temperature measurements taken during the pumping of the well; and appearance of the discharge water during pumping.

Prior to sampling, the sampling equipment was decontaminated either by steam cleaning or by cleaning in the following manner:

1. laboratory-grade detergent scrub
2. tap water rinse
3. triple rinse with distilled water
4. triple rinse with methanol
5. air dry
6. triple rinse with distilled water.

Prior to use at each sampling location the pH, conductivity, and temperature meters were calibrated according to manufacturers' recommended procedures.

Upon arrival at each well the depth to water was measured, where possible, to the nearest 100th of a foot using a water level probe manufactured by Solinst.

In all wells where the dimensions of the well were known or could be determined, five casing volumes were evacuated from the well before samples were taken. In wells where the volume of the casing could not be determined, the well was evacuated until the pH, temperature, and conductivity of the discharge water stabilized. During the evacuation period the appearance of the discharge water was also noted and recorded in the field notebook.

Just prior to sampling, the appropriate sample bottles were labeled with a water proof marker. Sample bottle labels included the following information:

- sample ID
- time and date of sample collection
- analyses requested
- samplers' names
- project number
- preservative.

When filling the sample bottles, care was taken to ensure that there was no head space remaining. After filling each bottle (particularly VOC vials), the cap and a Teflon-lined septum were placed on the bottle, and the bottle was then inverted and checked for air bubbles. If bubbles were observed, more sample water was added until the head space was removed. Hydrochloric acid was added, as a preservative, to the VOC sample bottles prior to sampling. Ground water samples collected for metals analyses were vacuum filtered (through a disposable 0.45-micron filter) in the field prior to being placed in the sample bottle. Nitric acid was added, as a preservative, to these sample bottles prior to sampling. The preservatives were added to the sample bottles by the laboratory.

Upon completion of sampling at each well, sample containers were placed in a cooler with Blue Ice to maintain the proper temperature (approximately 4°C). The coolers, with chain-of-custody, were transported to the analytical laboratory (Analytical Technologies, Inc. of Phoenix, Arizona) at the end of each day of sampling. Analytical Technologies, Inc. is an EPA approved contract laboratory and State certified for the types of analyses performed during this study.

3.4.4 Sampling of Soils

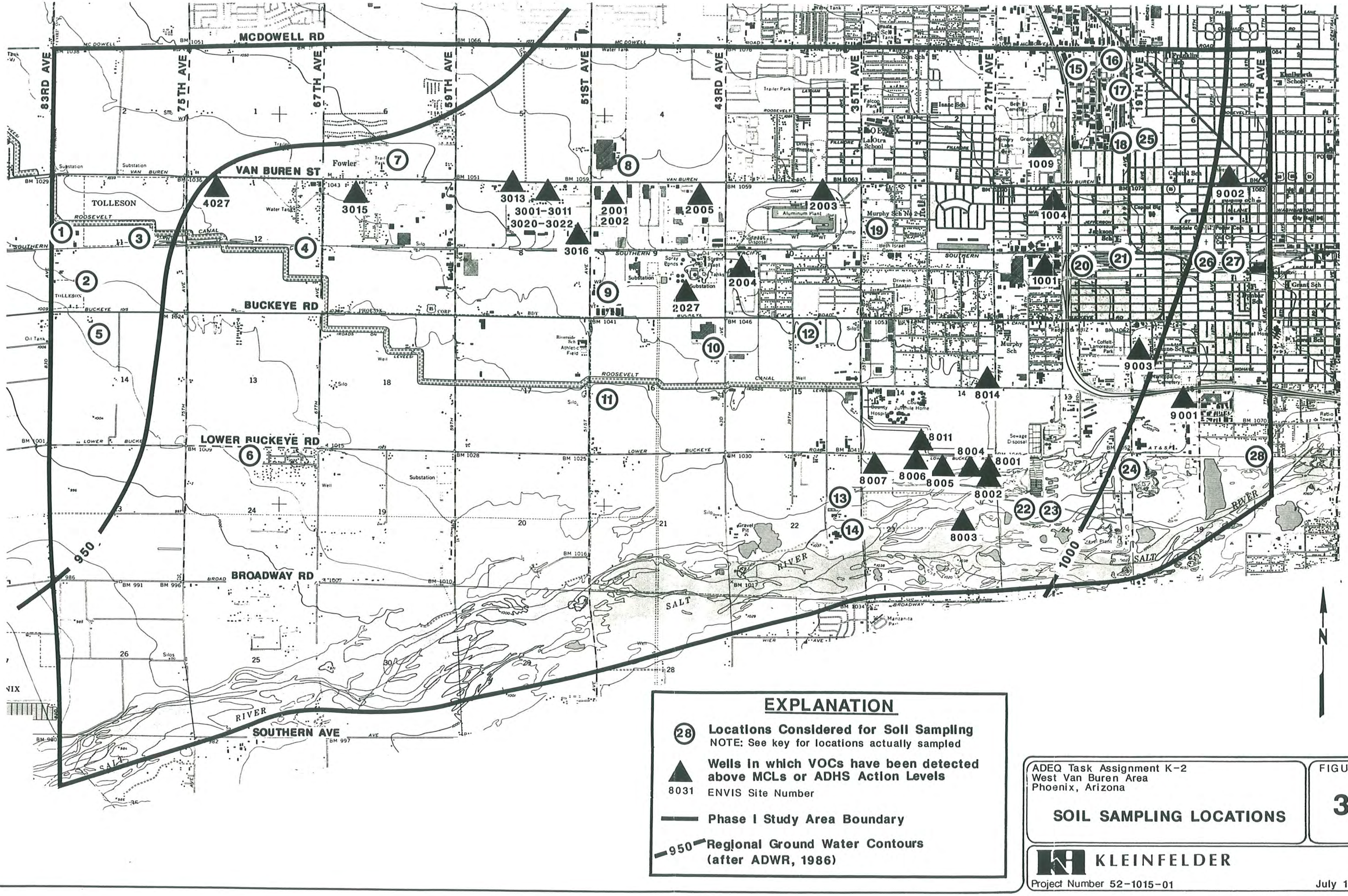
A soil sampling plan was submitted to ADEQ by Kleinfelder on August 25, 1988. In the plan the sampling of soils at 28 locations was proposed. These locations were chosen based on an evaluation and interpretation of available water quality data, examination of aerial photographs, and observations made during field reconnaissance of the area. Analyses of soils collected from these locations included VOCs and metals.

Soil samples were collected between September 8 and 14, 1988. Of the 28 proposed soil sampling locations, 17 were sampled. The remaining sites were not sampled because surfaces were paved, where they had not been paved in the 1986 air photos, or because, upon close inspection, no evidence could be found on the site to justify sampling. Two sites were not sampled because they were recently sampled by others and the resulting data were being transmitted to ADEQ. Proposed and actual soil sampling locations are shown on Figure 3 and resulting data are presented in Section 4.4.

The sampling notebook prepared for the ground water sampling was maintained throughout the soil sampling activities. Information recorded during soil sampling included descriptions of sampling locations, soil descriptions, measurements taken with the photoionization detector (PID), and observations made at the site.

Non-disposable sampling equipment was decontaminated before sampling each well location as previously described.

Samples were collected by first drilling with a stainless steel hand auger to a depth of two to three feet in order to reach subsurface soils. The surface soils were avoided in an effort to collect samples where the VOCs had not yet completely volatilized. Before sampling from the bottom of the augered holes, readings were taken inside the holes with the PID to obtain an indication of the presence of VOCs. After reaching the



EXPLANATION

- (28) **Locations Considered for Soil Sampling**
  NOTE: See key for locations actually sampled
- ▲ **Wells in which VOCs have been detected above MCLs or ADHS Action Levels**
  8031 ENVIS Site Number
- **Phase I Study Area Boundary**
- 950 **Regional Ground Water Contours (after ADWR, 1986)**

ADEQ Task Assignment K-2
West Van Buren Area
Phoenix, Arizona

SOIL SAMPLING LOCATIONS

FIGURE **3**

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desired depth, a core sampler was driven into the underlying soil, beginning at the bottom of the hole. The core sampler, manufactured by GeoMatic, Inc., used 3-inch diameter, 6-inch long brass tubes to extract intact soil samples. After extracting the sample tubes from the augered holes, the ends of the tubes were covered with Teflon film and plastic caps, and sealed with tape and immediately placed in a cooler with Blue Ice. Duplicate samples were collected by taking two samples immediately adjacent to each other. The chilled samples were transported to the laboratory accompanied by chain of custody forms. Copies of the chain-of-custody forms are included in Appendix C with the laboratory results.

Soil samples to be analyzed for metals were collected from the soils extracted from the hole with the stainless steel auger and placed into glass containers. Duplicate samples were collected in the same manner as duplicate samples for VOCs.

Each sample container was labeled with the following information:

- sample ID
- time and date of sample collection
- analyses requested
- samplers' names
- project number.

3.4.5 Analysis of Soil and Ground Water Samples

Soil and ground water samples were submitted to Analytical Technologies, Inc. of Phoenix, Arizona for analysis. Ground water samples were analyzed for VOCs (EPA Methods 601 and 602) using a gas chromatograph. This method analyzes for the following organic compounds:

chloromethane	bromomethane
vinyl chloride	trichlorofluoromethane
methylene chloride	chloroethane
1,1-dichloroethene	1,1-dichloroethane
1,2-dichloroethene	1,2-dichloroethane
1,1,1-trichloroethane	1,1,2-trichloroethane
carbon tetrachloride	bromodichloromethane
1,1,2-tetrachloroethane	1,2-dichloropropane
trans-1,3-dichloropropene	trichloroethene
dibromochloromethane	1,2-dichlorobenzene
1,3-dichlorobenzene	1,4-dichlorobenzene
dichlorodifluoromethane	cis-1,3-dichloropropene
2-chloroethyl vinyl ether	bromoform
chloroform	tetrachloroethene
toluene	benzene
chlorobenzene	ethylbenzene
xylenes	

Some of the ground water samples were also analyzed for primary drinking water standard metals using an inductively coupled plasma/atomic absorption spectrophotometer. The analyzed metals included the following:

arsenic	barium
cadmium	chromium
lead	mercury
selenium	silver

In addition, a general minerals suite (California Title 22) of analyses was performed on the samples in order to help characterize the hydrologic system. These analyses included the following:

alkalinity	pH
conductivity	hardness
total dissolved solids	calcium
chloride	copper
fluoride	iron
magnesium	zinc
manganese	nitrate
sodium	sulfate
potassium	

Soil samples were analyzed for VOCs using EPA Methods 8010 and 8020. These methods analyze for the same VOCs as listed above for Methods 601 and 602.

At locations where high levels of metals might be found in the soil, the samples were also analyzed for the suite of metals listed above using an inductively coupled plasma

spectrophotometer and an atomic absorption spectrophotometer. The samples were prepared for analysis using the extraction procedure (EP) as described in 40 CFR 261, Appendix II.

3.4.6 Quality Assurance/Quality Control

3.4.6.1 QA/QC Samples

During the sampling program conducted as a part of this study, duplicate field samples were collected and analyzed as blind samples by the laboratory. Samples were coded to help ensure that the laboratory did not know which samples were duplicates.

Background soil samples were collected in the field. The exact locations were selected in the field where undisturbed and apparently uncontaminated soil could be found within the study area.

For ground water sampling, equipment rinsate samples and travel blanks were also submitted to the laboratory. Equipment rinsate samples were collected in order to verify the effectiveness of equipment decontamination. Travel blanks were included in order to detect laboratory or inadvertent contamination during sample handling and transport.

Laboratory quality control samples consisted of matrix spike and reagent blank samples. Details of the laboratory's QA/QC program are included as Appendix B in the Ground Water and Soil Sampling Plans (Kleinfelder, 1988).

3.4.6.2 Sample Custody

Complete chain-of-custody records were maintained from the time of sample collection until the samples arrived at the laboratory. Samples were in the custody of the sampler until they were turned over to the laboratory. The chain-of-custody was maintained by having the sample receiving clerk at the laboratory sign the chain-of-custody form.

3.4.6.3 Laboratory Sample Management and Document Control

Samples submitted to the laboratory were handled according to procedural safeguards established by the EPA. Details of these procedures are included in Appendix B of the Ground Water and Soil Sampling Plans (ibid.).

3.5 Other Remedial Activities Currently Underway

A number of public and private entities within the West Van Buren Area have recently been defining and remediating chemical concentrations in the soils and ground water. The following list provides a summary of these investigations. This list is derived from previous environmental reports provided by the ADEQ, ADHS, and EPA. This list contains only those entities that are working with oversight by ADEQ. This list is not comprehensive, is for information only, and should not be interpreted in any way to infer that these entities are or are not the sources of chemicals in the ground water.

Van Buren Tank Farm (51st Avenue and Van Buren Street)

The owner/operators of this facility have implemented individual site assessment programs at the facility. (The owners/operators include: Powerine, Maricopa County, ARCO, Chevron, Texaco, Exxon, City of Phoenix, Salt River Project, Shell, Southern Pacific Pipe Lines, Inc., UNOCAL, CalJet Corporation.) One hundred twelve (112) borings have been drilled and 232 soil samples have been collected and analyzed. In addition, eight of the owners/operators installed monitoring wells and sampled ground water under their sites. Fifty-one (51) of the soil borings were converted to monitoring wells and sampled. Releases of fuel stored at some sites have reportedly led to both soil and ground water contamination at the facility. In addition, suspected releases of halogenated volatile organic compounds from off-site sources have led to ground water contamination beneath the site (ENSR, 1988).

19th Avenue Landfill (19th Avenue and the Salt River Channel)

The City of Phoenix is currently conducting a Remedial Investigation/Feasibility Study (City of Phoenix, 1988) for this site which is a Federal Superfund site ranked as number 115 on the National Priorities List (40 CFR 300 App.B) by the EPA.

27th Avenue Landfill (2800 South 27th Avenue)

The City of Phoenix is currently conducting a ground water quality investigation which includes quarterly sampling of the ground water in the vicinity of this facility (City of Phoenix, 1988).

Reynolds Aluminum Plant (35th Avenue and Van Buren Street)

Reynolds recently completed a soils investigation at this facility and submitted a report of the findings to ADEQ on December 22, 1988. The results of this investigation indicated the presence of "elevated levels" of VOCs at seven locations (Dames & Moore, 1988). Ground water sampling is planned for the next phase of Reynolds' investigation.

Revlon Plant (43rd Avenue and Buckeye Road)

Revlon is currently conducting a soils investigation relative to a reported leakage of ethyl alcohol from a tank at their facility (Revlon, 1988a). Also, in December, 1988, Revlon submitted a report to ADEQ describing the removal of buried 55-gallon drums which were discovered at its facility (Revlon, 1988b).

Viking Freight Systems (2205 South 43rd Avenue)

As a result of a spill of diesel fuel, contaminated soil was removed up to a depth of 26 feet. During this remediation, gasoline contamination (apparently from a previous tenant of the property) was encountered. Monitoring wells have been installed to assess the extent of the contamination (ADEQ, 1989a).

Phoenix Ready-Mix, Company (3635 South 43rd Avenue)

A study is currently underway at this site to assess the extent of a reported diesel spill (ibid.).

TNT Bestway Transportation (3045 South 43rd Avenue)

In May of 1988 a spill of diesel fuel (estimated to be 38,000 gallons) was reported to ADEQ. Monitoring wells were installed to establish the ground water gradient and additional down gradient wells have been proposed (ibid.).

Mardian Construction Company (4044 West Lower Buckeye Road)

Soils have been sampled and monitoring wells installed to assess the releases of waste oil and diesel from underground storage tanks at the site (ibid.).

Sahuaro Petroleum and Asphalt (731 North 19th Avenue)

Approximately 2,000 cubic yards of diesel-contaminated soil was excavated. The contaminated soil was then mixed with asphaltic material and used on roadways at the site (ADEQ, 1989b).

Arizona Public Service, West Phoenix Power Plant (408 and 410 South 43rd Avenue)

Four monitoring wells have been installed and sampled to assess the extent of diesel fuel leakage from a one-inch diameter pipeline (ADEQ, 1989c).

Penn Athletics Plant (306 South 45th Avenue)

An estimated 20,000 gallons of diesel fuel were spilled at this site over a 1 to 2-year period. Three monitoring wells have been installed to date (ibid.).

In order to avoid duplication of effort and to conserve project resources, a detailed analysis of data reported for these sites was not included in this phase of study.

4 RESULTS OF INVESTIGATION

4.1 Introduction

This section presents the results of the data gathering activities conducted for this study. In particular it discusses: the classification of the zoning codes within the study area; the results of the aerial photo interpretation; interpretation of historic water quality data; results of recent ground water and soil sampling conducted as a part of this study; and the results of the questionnaire distributed and returned during this study.

4.2 Literature and Records Search

A literature and records search was completed to provide background information on the geology, hydrogeology, and land use, and to identify potential sites of chemical manufacturing, use, or disposal within the West Van Buren Area. The following discussion provides a summary of the findings developed from the literature and records search portion of the investigation.

4.2.1 Zoning

Maricopa County and City of Phoenix zoning maps and codes were obtained to assist in identification of the distribution of industrial and commercial properties within the study area. Based on existing land-use patterns, the 1987 zoning codes were grouped as described in Table 1 of the Summary Report (Kleinfelder, 1988). Some zones represented those areas most likely to have activities involving fuels, chemicals, or chemical waste generation. Other zones contained land-use practices that are only occasionally associated with chemical use and chemical waste generation. Land users in areas that are zoned residential are not expected to be significant generators or users of chemicals. The distribution of the zones are illustrated on Plate 1 of the Summary Report (ibid.).

4.2.2 Aerial Photograph Review

After reviewing the aerial photos and EPA documents described in Section 3.2.22, sites which could be potential sources of chemicals were identified and described. These included various land uses such as: agricultural, mining, and industrial. The sites identified in this study area included: a tank farm, an aluminum plant, a steam power plant, a telecommunications cable manufacturing plant, a steel plant, landfills, a cotton seed processing plant, a heavy metal recovery operation, numerous surface impoundments and above-ground storage tanks, electrical substations, a railroad maintenance yard, numerous feedlots, several automobile reclamation yards, sand and gravel mining in and adjacent to the Salt River channel, and several unidentifiable operations.

The EPA, in its report covering the Fowler Industrial Area (which encompasses Sections 4, 8, 9, 10, 16 and 21 of Township 1 north Range 2 east), noted a number of observations that were substantiated by this study's interpretation of aerial photographs. In addition, other less obvious sites were noted as potential chemical sources. These included: automobile reclamation yards, apparent soil staining at various sites, some smaller possible landfill sites, ditches presumably constructed to discharge unknown substances into the Salt River channel, and surface impoundments.

Of particular interest were the stereo photos which were viewed at the Office of Arid Land Studies in Tucson. In these photos, the impact of sand and gravel mining excavations in the Salt River channel became more obvious. Many of these excavations are to depths that impact and intersect the local ground water levels, therefore creating numerous ponds along the river channel. At times when ground water levels are above the bottom of these excavations, chemicals spilled or dumped into these excavations would migrate quickly into the ground water. At other sites where the ground water is at some distance below the ground surface, travel time of chemicals to the ground water may be significantly impeded by lithology, natural degradation, and thickness of the unsaturated zone.

The areas identified as having a strong potential for past land uses conducive to adverse impacts on the ground water were plotted on the base maps, and correlated with the

zoning and parcel information for identification purposes. The results of the air photo investigation were used as an aid in selecting soil sampling locations.

4.3 Questionnaire Data

In July 1988, a questionnaire was mailed to approximately 850 facilities located in the West Van Buren Area. To date, approximately 300 responses to the questionnaire have been returned. The responses were reviewed and compared with other available information regarding those facilities.

4.4 Ground Water Quality Data

4.4.1 Historic Data

A total of 27 organic compounds, three pesticides, and 14 inorganic compounds were reported in the available historic ground water quality data. Of these, 17 organic and six inorganic constituents exceed MCLs or AALs. Concentrations of VOCs, observed above detection limits, were found in numerous locations throughout the study area as shown on Plate 1.

Of the numerous locations where VOCs were historically observed in the ground water above detection limits, the VOC concentrations exceeded MCLs and/or AALs in thirteen general locations as depicted on Plate 1 and described later in this section. Specific well designations and analytical results are shown on Plate 2. Analytical results exceeding MCLs or AALs are also presented in Appendix D. The VOCs which were observed at concentrations exceeding the MCLs and/or AALs include the following:

Chemicals (acronym)	MCL*	ADHS Action Level*
trichloroethene (TCE)	5.0	5.0
tetrachloroethene (PCE)	NE	1.0
1,1-dichloroethene (1,1-DCE)	7.0	7.0
trans-1,2-dichloroethene (1,2-DCE)	70	70
carbon tetrachloride	5.0	5.0
1,2-dichloroethane (1,2-DCA)	5.0	5.0
1,1,2,2-tetrachloroethane (PCA)	NE	0.50
trichlorofluoromethane (Freon 11)	NE	1.0
1,2-dichloropropane	NE	1.0
chloroform	100(a)	3.0(b)
methylene chloride	NE	4.7
vinyl chloride	2.0	2.0
benzene	5.0	5.0
ethylbenzene	NE	680
toluene	NE	2000
xylenes	NE	440
chloromethane	NE	0.5

* all units are in ug/L
NE = none established
(a) for total trihalomethanes
(b) when source is not a by-product of chlorination

In addition to the VOCs listed above, concentrations above detection limits were observed for the following:

Chemicals (acronym)	MCL*	ADHS Action Level*
1,1,1-trichloroethane (TCA)	200	200
1,1-dichloroethane (1,1-DCA)	NE	NE
chlorobenzene (also monochlorobenzene)	NE	60
1,2-dichlorobenzene (o-DCB)	NE	620
bromodichloromethane	100(a)	NE
dibromochloromethane	100(a)	NE
1,4-dichlorobenzene (p-DCB)	75	75
chloroethane	NE	NE
dichlorodifluoromethane (Freon 12)	NE	1.0
phthalates	NE	NE

* all units are in ug/L
NE = none established
(a) for total trihalomethanes

In addition to the organic constituents listed above, several inorganic constituents were detected in excess of EPA primary drinking water standards. These included:

Chemicals	MCL*
arsenic	50
cadmium	10
mercury	2
nitrate (as nitrogen, N)	10 mg/L
barium	1000
lead	50

* all units are in ug/L unless otherwise stated

The following inorganic constituents have been detected at concentrations above EPA secondary MCLs which have been set based upon aesthetic considerations rather than health effects.

Chemicals	SMCL*
chloride	250
manganese	50
sulfate	250 mg/L

* all units are in ug/L unless otherwise stated

The following paragraphs discuss the general geographic locations at which VOCs were historically observed above MCLs or AALs. **The geographic locations are given for ease of reference purposes only and are not to be interpreted as "plumes". Several of these geographic locations may be part of a single plume, however, there are insufficient data to positively link them together at this time.** A more accurate estimate of the distribution of the chemicals in the ground water is planned for Phase II of the investigation.

Van Buren Street and 75th Avenue

In Well (A-1-1)12bba (Evans Well) concentrations of 1,1-DCE and PCE were observed above MCLs or AALs in 1986. In addition, TCA and TCE were observed above detection limits.

Van Buren Street and 64th Drive

In Well (A-1-2)7bba (Prohoroff Well), PCE and 1,1-DCE have been observed above MCLs or AALs. TCE, TCA, and 1,2-DCE, have been detected in this well below MCLs or AALs.

Van Buren Street and 51st Avenue (Tank Farm)

This site is located south of Van Buren Street between 51st and 55th Avenues. In numerous wells installed by the owners/operators of the facility the fuel constituents benzene, toluene, xylenes, and ethylbenzene (BTXE) have been observed at concentrations above MCLs or AALs in the ground water. In addition to the BTXEs, other VOCs including TCE, PCE, 1,1-DCE, 1,2-DCE, 1,2-DCA, 1,1,2,2-PCA, Freon 11 and chloroform have been observed in the ground water at concentrations above MCLs or AALs. Also, two wells adjacent to the tank farm ((A-1-2)8baa1 and (A-1-2)9bbb2) owned by Roosevelt Irrigation District (Nos. 108 and 109), have been found to contain concentrations of TCE, PCE, 1,1-DCE, and Freon 11 above MCLs or AALs. TCA, 1,1-DCA, and 1,2,-DCE were observed below MCLs or AALs in some of these wells at this location. Extensive testing of soils at the tank farm detected numerous high levels of BTXE compounds but only four samples were found to contain other VOCs which are not components of petroleum products. This site is currently being studied by the owners/operators, with oversight by ADEQ, relative to the BTXE compounds associated with reported spills or leaks at the facility.

Van Buren Street and 45th Avenue

In Well (A-1-2)9aab (Roosevelt Irrigation District Well No. 110), TCE, PCE, and Freon 11 have been observed at concentrations exceeding MCLs or AALs. In addition, TCA, 1,2-DCE, and 1,2-DCA have been detected in this well below MCLs or AALs.

Buckeye Road and 43rd Avenue

Northwest of this intersection benzene has been observed in Well (A-1-2)9dbd (APS Monitoring Well No. 1), at concentrations exceeding MCLs or AALs. In addition, toluene, xylene and ethylbenzene have been detected in this well below MCLs or AALs.

43rd Avenue South of Grant Street at Smith Park

In Well (A-1-2)10cbc (RID Well No.92), PCE has been observed at concentrations exceeding MCLs or AALs. In addition, 1,1-DCE, 1,1-DCA, 1,2-DCE, and Freon 11 have been detected in this well below MCLs or AALs.

Van Buren Street and 37th Avenue

At this location, concentrations of TCE and PCE exceeding MCLs or AALs in Well (A-1-2)10aba (Roosevelt Irrigation District Well No. 111), have been observed. Chloroform was detected in this well below AALs.

Van Buren Street and 12th Avenue at University Park

At this location concentrations of TCE and PCE, exceeding MCLs or AALs have been observed in Well (A-1-3)6dcd (University Park Well R-G#1). In addition, 1,1-DCE, 1,2-DCE, 1,2-DCA, Freon 11 and chloroform have been observed above detection limits.

Interstate 10 and the Southern Pacific Railroad

In Well (A-1-2)12caa (Holsum Bakery Well), located west of I-10 and south of the railroad, concentrations of TCE, PCE, 1,1-DCE and chloroform have been observed exceeding MCLs or AALs.

Interstate 10 and Van Buren Street

In Well (A-1-2)12baa, (Roosevelt Irrigation District Well No. 114) TCE, PCE, and chloroform have been observed at concentrations exceeding AALs. 1,1-DCE was detected in this well below AALs.

19th Avenue and Interstate 10

This is in the vicinity of the 19th Avenue Landfill which is a Federal Superfund site listed as number 115 on the EPA's National Priority List. The City of Phoenix is currently conducting a Remedial Investigation/Feasibility Study of the landfill. In

monitoring wells installed by the City vinyl chloride, PCE, carbon tetrachloride, methylene chloride, chloromethane and Freon 11 have been detected above MCLs or AALs. Also detected were TCE, TCA, 1,1-DCE, 1,1-DCA, 1,2-DCE, toluene, chlorobenzene, 1,2-dichlorobenzene, chloroform, bromodichloromethane, 1,4-dichlorobenzene, and chloroethane.

27th Avenue and Pima Street

In Well (A-1-2)14aad (Roosevelt Irrigation District Well No. 99), concentrations of PCE exceeding MCLs or AALs were observed. TCE, TCA, 1,1-DCE, and 1,1-DCA were detected below MCLs or AALs.

Lower Buckeye Road between 27th and 35th Avenues

In this area around the 27th Avenue Landfill, concentrations of VOCs exceeding MCLs or AALs have been observed in eight wells. The wells and associated VOCs are:

- Well (A-1-2)23aaa (City of Phoenix Well III-1), vinyl chloride, chloromethane, and chloroform;
- Well (A-1-2)23aad (City of Phoenix Well III-2), vinyl chloride, and chloromethane;
- Well (A-1-2)23adb (City of Phoenix Well III-3), methylene chloride, chloromethane, and 1,2-dichloropropane;
- Well (A-1-2)23aab (City of Phoenix Well III-4), vinyl chloride, trichlorofluoromethane (Freon 11), and chloromethane;
- Well (A-1-2)23abb (City of Phoenix Well III-5), TCE, PCE, vinyl chloride, Freon 11, 1,2-dichloropropane, and chloromethane;
- Well (A-1-2)23bab (City of Phoenix Well III-6), PCE, vinyl chloride, Freon 11, and chloromethane;
- Well (A-1-2)23bbb (City of Phoenix Well III-7) PCE, vinyl chloride, Freon 11, methylene chloride, and chloromethane;
- Well (A-1-2)14cdd (Roosevelt Irrigation District Well No. 97), PCE, and Freon 11.

Other VOCs observed above detection limits in these wells include TCA, 1,1-DCE, 1,2-DCE, 1,1-DCA, 1,2-DCA, 1,1,2,2-TCA, benzene, toluene, ethylbenzene, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, phthalates, and chloroethane.

4.4.2 Recent Data

Review of the historical data led to a limited sampling of existing wells in order to supplement the historical data. As discussed in Section 3.3.3, most of the wells proposed for sampling were located near areas where VOCs have been observed in the ground water, or in areas where data were sparse or completely lacking. Wells recently sampled by SRP or other parties were not resampled. The results of the ground water sampling efforts are summarized in Tables 4-1 and 4-2. Laboratory data sheets are included in Appendix C.

The analytical results from the ground water samples collected during this study indicate the presence of VOCs above detection limits in seven locations. VOCs were not noted in the historical data at these locations. VOCs were observed at the following locations:

Well (A-1-2)17add (Roosevelt Irrigation District Well No. 88) located at 51st Avenue and the Roosevelt Canal. The only VOC detected in this well was 1,1-DCA (0.7 ug/L).

Well (A-1-2)19cdc (Crawford well), located just northeast of the intersection of 67th Avenue and Broadway Road. VOCs detected in this well include: TCE (0.5 ug/L); TCA (0.9 ug/L); PCE (0.2 ug/L); and 1,2-dichlorobenzene (0.5 ug/L).

Well (A-1-2)13dad (Roosevelt Irrigation District Well No. 103) located approximately 750 feet south of Interstate-10 on the west side of 19th Avenue. VOCs detected in this well include: TCE (0.4 ug/L); TCA (0.8 ug/L); PCE (0.3 ug/L); 1,1-DCA (2.2 ug/L); 1,1-DCE (0.6 ug/L); 1,2-DCE (0.6 ug/L); and benzene (0.6 ug/L).

Well (A-1-2)1cac (Greenwood Memorial Park Well), 2300 West Van Buren Street. VOCs detected in this well include: TCE (1.3 ug/L); PCE (1.1 ug/L); toluene (0.5 ug/L); and xylenes (1.1 ug/L).

TABLE 4-1
RECENT GROUND WATER SAMPLING LOCATIONS
SEPTEMBER 1988
WEST VAN BUREN AREA

SAMPLE LOCATION NUMBER	ENVIS SITE NUMBER	LEGAL WELL DESIGNATION	APPROXIMATE LOCATION	WELL OWNER OR COMMON NAME	WELL CONSTRUCTION DETAILS	WATER USE	SAMPLES COLLECTED
1	1004	(A-1-2)12baa	S.W. corner of Van Buren & 33rd Ave.	Roosevelt Irr. Dist. #114	395'/20"/60' to 198' 205' to 380'	A	None, well collapsed
2	1008	(A-1-2)1bdb	25th Ave. at Beth El Cemetery	Beth El Cemetery	400'/NA	NA	General minerals/metals/VOCs
3	1009	(A-1-2)1cac	2300 W. Van Buren	Greenwood Memorial Park	250'/NA	D	General minerals/metals/VOCs
4	2022	(A-1-2)9ccc	300' E. of 51st Ave., 500' N. of Buckeye Rd.	Western Cotton Services Co.	195'/NA	F	General minerals/VOCs
5	4002	(A-1-1)11bcc	2500' S. of Van Buren St., 300' E. of 83rd Ave.	Soil Service Inc.	150'/NA	F	None, well abandoned
6	5001	(A-1-1)13add	2400' S. of Buckeye Rd. on W. side of 67th Ave.	M.H. Sanders	100'/NA	NA	General minerals/metals/VOCs
*	6008	(A-1-2)17add	51st Ave and Roosevelt Canal	Roosevelt Irr. Dist. #88	1800'/24", 20", & 16"/ 165' to 1785'	A	General minerals/metals/VOCs
7	6016	(A-1-2)19baa	S.W. corner of Lower Buckeye Rd. and 63rd Ave.	Mastin	208'/NA/60' to 199'	A	None, Unable to access
8	6056	(A-1-2)19cdc	6412 W. Broadway Rd.	Crawford	NA	NA	General minerals/metals/VOCs
9	7013	(A-1-2)21bba	1000' E. of 51st Ave. on S. side of Lower Buckeye Rd.	Swift	NA	D	None, Unable to access
10	7024	(A-1-2)21add	3414 S. 43rd Ave.	Peterson	316'/NA/NA	D	General minerals/metals/VOCs
11	7034	(A-1-2)16cbb	E. side of 51st Ave., S. of Roosevelt Canal	Roosevelt Irr. Dist. (#NA)	340'/NA/50' to 302'	A	None, Unable to locate
12	8021	(A-1-2)13bbb	E. side of 27th Ave., 700' S. of Buckeye Rd.	NA	NA	NA	None, Unable to locate
13	8031	(A-1-2)13dad	750' S. of I-10, W. side of 19th Ave.	Roosevelt Irr. Dist. #103	440'/24"/80' to 420'	NA	General minerals/metals/VOCs
14	8059	(A-1-2)24baa	Between settling ponds at treatment plant	23rd Ave. Treatment Plant	NA	NA	General minerals/metals/VOCs
15	9003	(A-1-3)18bbc	200' E. of 19th Ave. on N. side of Pima St.	Roosevelt Irr. Dist. #104	410'/24"/100' to 370'	A	General minerals/metals/VOCs
16	9007	(A-1-3)6dca	University Park	City of Phx. Parks & Rec.	355'/NA/160' to 190' 210' to 250' 285' to 335'	G	None, Unable to access

a = depth/casing diameter/perforated interval
* = Alternate sample location
NA = Not available
A = Irrigation
D = Domestic
F = Industrial
G = Recreation

TABLE 4-2
SUMMARY OF RECENT GROUND WATER SAMPLING RESULTS
WEST VAN BUREN AREA
SEPTEMBER 1988
DETECTED VOLATILE ORGANIC COMPOUNDS (VOCs)

PARAMETER	WATER QUALITY STANDARD	OWNER LEGAL WELL DESIGNATION ENVIS NUMBER GREENWOOD MEM. PARK (A-1-2)1cac 1009	BETH EL CEMETERY (A-1-2)1bdb 1008	RID #104 (A-1-3)18bbc 9003	RID #88 (A-1-2)17add 6008	CRAWFORD (A-1-2)19cdc 6056	RID #103 (A-1-2)13dad 8031	PETERSON (A-1-2)21add 7024
Benzene	5.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5
Chloroform	3.0 ADHS	<0.2	1.8	<0.2	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	620 PMCLG	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5
1,1-Dichloroethane	NE	<0.2	<0.2	<0.2	0.7	<0.2	2.2	<0.2
1,1-Dichloroethene	7.0	<0.2	<0.2	0.8	<0.2	<0.2	0.6	<0.2
1,2-Dichloroethene (total)	70 PMCLG*	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	<0.2
Tetrachloroethene	1.0 ADHS	1.1	0.6	7.8	<0.2	0.2	0.3	<0.2
Toluene	2000 PMCLG	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
1,1,1-Trichloroethane	200	<0.2	<0.2	<0.2	<0.2	0.9	0.8	<0.2
Trichloroethene	5.0	1.3	0.3	8.8	<0.2	0.5	0.4	<0.2
Xylenes (m-,p-, and o-)	440 PMCLG	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	1.4

All units are in micrograms per liter.
Only those compounds detected during this sampling program are listed.
PMCLG = EPA Proposed Maximum Contaminant Level Goal.
ADHS = Arizona Department of Health Services Action Level guidelines.
All others are EPA Maximum Contaminant Levels.
*For both trans-1,2-DCE and cis-1,2-DCE
RID = Roosevelt Irrigation District
NE = none established.
Values exceeding MCLs or AALs are underlined.

TABLE 4-2 (continued)
SUMMARY OF RECENT GROUND WATER SAMPLING RESULTS
WEST VAN BUREN AREA
SEPTEMBER 1988
GENERAL MINERALS

PARAMETER	WATER QUALITY STANDARD	GREENWOOD MEM. PARK (A-1-2)1cac 1009	BETH EL CEMETARY (A-1-2)1bdb 1008	RID #104 (A-1-3)18bbc 9003	RID #88 (A-1-2)17add 6008	CRAWFORD (A-1-2)19cdc 6056	23RD AVE. TREAT. PLANT (A-1-2)24baa 8059	M.H. SANDERS (A-1-2)13add 5001	RID #103 (A-1-2)13dad 8031	PETERSON (A-1-2)21add 7024	WESTERN COTTON (A-1-2)9cc 2022
		OWNER LEGAL WELL DESIGNATION ENVIS NUMBER									
Bicarbonate	NE	180	194	256	254	242	324	422	295	126	152
Conductivity (1)	NE	1200	1290	980	1240	980	1420	1720	1330	1070	1370
pH (unitless)	6.5-8.5 SMCL	7.7	7.7	7.6	7.4	7.5	7.0	7.6	7.4	7.8	7.9
Total Alkalinity	NE	180	194	256	254	242	324	422	295	126	152
TDS	500 SMCL	836	864	664	878	710	938	1180	926	718	888
Anions											
Chloride	250 SMCL	316	321	171	269	196	290	304	258	316	363
Fluoride	1.4-2.4	0.29	0.27	0.31	0.34	0.32	0.29	0.90	0.26	0.26	0.35
Nitrate (as N)	10	1.5	3.4	2.6	4.8	0.13	0.94	7.6	2.3	0.37	4.1
Sulfate	250 SMCL	61	71	69	102	82	79	138	131	42	88
Cations											
Calcium	NE	63	56	40	59	37	81	40	69	35	40
Magnesium	NE	39.3	39.2	18.4	27.1	17.1	32.8	21.5	29.0	30.5	30.1
Potassium	NE	5.1	4.2	4.3	5.0	4.1	7.8	4.7	5.8	5.0	4.8
Sodium	NE	160	186	166	197	178	197	348	201	153	219

All units are in milligrams per liter (mg/L) unless otherwise noted.
(1) umhos/cm.
Water Quality Standards are EPA Maximum Contaminant Level unless otherwise noted.
SMCL = EPA Secondary Maximum Contaminant Level.
NE = none established.
NT = not tested.
RID = Roosevelt Irrigation District

TABLE 4-2 (continued)
SUMMARY OF RECENT GROUND WATER SAMPLING RESULTS
WEST VAN BUREN AREA
SEPTEMBER 1988
METALS

PARAMETER	WATER QUALITY STANDARD	GREENWOOD MEM. PARK (A-1-2)1cac 1009	BETH EL CEMETARY (A-1-2)1bdb 1008	RID #104 (A-1-3)18bbc 9003	RID #88 (A-1-2)17add 6008	CRAWFORD (A-1-2)19cdc 6056	23RD AVE TREAT. PLANT (A-1-2)24baa 8059	M.H. SANDERS (A-1-2)13add 5001	RID #103 (A-1-2)13dad 8031	PETERSON (A-1-2)21add 7024	WESTERN COTTON (A-1-2)9ccc 2022
		OWNER LEGAL WELL DESIGNATION ENVIS NUMBER									
Arsenic	0.05	NT	<0.005	NT	NT	NT	0.015	NT	NT	<0.005	NT
Barium	1.0	NT	0.15	NT	NT	NT	0.10	NT	NT	0.07	NT
Cadmium	0.01	NT	0.004	NT	NT	NT	0.010	NT	NT	<0.003	NT
Copper	1.0 SMCL	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	0.40
Iron	0.3 SMCL	<0.030	0.035	<0.030	<0.030	0.062	0.414	<0.030	<0.030	<0.030	0.154
Manganese	0.05 SMCL	<0.010	<0.010	<0.010	<0.010	<0.010	0.074	<0.010	0.027	0.014	<0.010
Zinc	5.0 SMCL	<0.010	<0.010	<0.010	<0.010	0.025	0.047	0.035	0.011	0.049	0.028

All units are in milligrams per liter.

SMCL = EPA Secondary Maxiumum Contaminant Level.

NE = none established.

NT = not tested.

RID = Roosevelt Irrigation District

Well (A-1-2)1bdb (Beth El Cemetery Well), located at 25th Avenue south of McDowell Road. VOCs detected in this well include: TCE (0.3 ug/L); PCE (0.6 ug/L); and chloroform (1.8 ug/L).

Well (A-1-3) 18bbc (Roosevelt Irrigation District Well No. 104), located just east of 19th Avenue on the north side of Pima Street. VOCs detected in this well include: TCE (8.8 ug/L); PCE (7.8 ug/L); and 1,1-DCE (0.8 ug/L).

Well (A-1-2)21add (Peterson well), located on the west side of 43rd Avenue approximately one-half mile south of Lower Buckeye Road. VOCs detected in this well include toluene (0.7 ug/L) and xylenes (1.4 ug/L)

VOC concentrations in two of these wells exceeded MCLs and/or AALs. The wells and the analytical results are:

Well	VOC Detected	Concentration (ug/L)	MCL	AALs
(A-1-2)1cac Greenwood Mem. Park	PCE	1.1	----	1.0
(A-1-3)18bbc RID No. 104	TCE	8.8	5.0	5.0
	PCE	7.8	----	1.0

The results from the QA/QC samples validated the results of the samples collected from the above locations. The VOCs detected at the above locations were not detected in travel blanks or reagent blanks. In addition, the absence of the same VOCs in the sampling equipment rinsate samples verified the adequacy of the decontamination procedures.

4.5 Soil Sampling Data

As part of this study soil samples were collected at sites where there seemed to be potential for the presence of chemicals in the soils. These sites were proposed based on land-use practices in the area, aerial photograph analysis, stained soil locations, and proximity to areas where chemicals had previously been observed in the ground water. The sampled locations are listed

in Table 4-3 and shown on Figure 3. Details of the sampling program are discussed in Section 3.3.4. The results of the soil sampling effort are summarized in Table 4-4.

Laboratory data sheets are included in Appendix C. In summary, the results of the sample analyses indicated the presence of VOCs in the soil at the following 17 sites:

* Research Chemicals, 8220 Harrison Street: TCE (4.0 mg/kg) and TCA (0.1 mg/kg).
* World Resources Company, 8113 West Sherman Street: TCE (9.6 mg/kg) and TCA (0.2 mg/kg).
* Owner unknown, site located west of 75th Avenue between Roosevelt Canal and Southern Pacific Railroad: TCE (4.2 mg/kg) and TCA (0.2 mg/kg).
* Petco Inc. Interstate, 304 South 67th Avenue: TCE (4.9 mg/kg) and TCA (0.1 mg/kg).
* Phoenix Vegetable Distributors, south side of Buckeye Road, one-half mile east of 83rd Avenue: TCE (0.4 mg/kg).
* Joe's Diesel Repair, 6316 West Van Buren Street: TCE (0.6 mg/kg) and TCA (0.2 mg/kg).
* Western Cotton Services Company, 615 South 51st Avenue: TCE (6.2 mg/kg).
  - Revlon Inc., 4301 West Buckeye Road: TCE (0.05 mg/kg); TCA (0.07 mg/kg); and xylenes (0.26 mg/kg).
* Roadway Express, 2021 South 51st Avenue: TCE (1.8 mg/kg); and xylenes (1.0 mg/kg).
* Transcon Lines, 3839 West Buckeye Road: toluene (0.05 mg/kg); TCA (0.09 mg/kg); TCE (1.5 mg/kg); and xylenes (0.07 mg/kg).
* Maricopa By-Products Inc., 3602 West Elwood: toluene (0.03 mg/kg); TCA (0.1 mg/kg); TCE (0.3 mg/kg); and xylenes (0.16 mg/kg).
* Smithey Recycling Company, 3640 South 35th Avenue: TCA (0.02 mg/kg); TCE (0.3 mg/kg); and xylenes (0.15 mg/kg).
  - Santa Fe Railroad Yard, located west of 19th Avenue between McDowell Road and Filmore Street: TCA (0.02 mg/kg); TCE (0.05 mg/kg); and xylenes (0.15 mg/kg).
* Ray and Bob's Truck Salvage, 101 South 35th Avenue: TCA (0.03 mg/kg); and TCE (0.5 mg/kg).
* Schuff Steel Company, 420 South 19th Avenue: TCA (0.02 mg/kg); and TCE (0.3 mg/kg).
  - Chevron Asphalt Depot, 3050 South 19th Avenue: TCA (0.04 mg/kg) and TCE (0.1 mg/kg).
  - Blue Circle West, Inc., 1510 West Lincoln: xylenes (4.8 mg/kg).

TABLE 4-3
RECENT SOIL SAMPLING LOCATIONS
SEPTEMBER 1988
WEST VAN BUREN AREA

SAMPLE LOCATION NUMBER	SUMMARY REPORT AIR PHOTO SITE NO./PLATE NO.	APPROXIMATE LOCATION	OWNER/DESCRIPTION	SAMPLES COLLECTED
1	5/A-4	8220 W. Harrison St., Tolleson	Research Chemicals	Metals, VOCs
2	7/A-4	8113 W. Sherman Street	World Resources Co.	Metals, VOCs
3	6/A-3	W. of 75th Ave. between Roosevelt Canal and Southern Pacific Railroad (S.P.R.R.)	feed distributor	VOCs
4	10/A-5	W. of 67th Ave., N. of (S.P.R.R.)	Petco, Inc.	VOCs
5	11/A-6	S. Side of Buckeye Road, 1/2 mile east of 83rd Ave.	Phoenix Vegetable Dist.	VOCs
6	13/A-8	S.W. corner of intersection of Lower Buckeye Rd., and 71st Ave.	planted field	None, tilled/planted
7	27/A-14	6316 W. Van Buren St.	Joe's Diesel Repair	VOCs
8	54/A-26	505 N. 51st Ave.	AT&T Technologies Inc.	None, recently sampled by others, data forthcoming to ADEQ
9	58/A-28	615 S. 51st Ave.	Western Cotton Services Co.	VOCs
10	65/A-30	4301 W. Buckeye Rd.	Revlon Inc.	VOCs
11	66/A-31	2021 S. 51st Ave.	Roadway Express	VOCs
12	67/A-32	3839 W. Buckeye Rd.	Transcon Lines	VOCs
13	79/A-37	3602 W. Elwood	Maricopa By-Products Inc.	Metals, VOCs
14	80/A-37	3640 S. 35th Ave.	Smithey Recycling Co.	Metals, VOCs

TABLE 4-3 (continued)
RECENT SOIL SAMPLING LOCATIONS
SEPTEMBER 1988
WEST VAN BUREN AREA

SAMPLE LOCATION NUMBER	SUMMARY REPORT AIR PHOTO SITE NO./PLATE NO.	APPROXIMATE LOCATION	DESCRIPTION	SAMPLES COLLECTED
15	83/A-39	S.W. corner, 22nd Ave. & Willeta St.	I-10 construction area	None, asphalt covered
16	85/A-39	1935 W. McDowell Rd.	Sahuaro Petroleum and Asphalt Co.	None, asphalt covered
17	85/A-39	W. of 19th Ave., between McDowell Rd. and Filmore St.	Santa Fe Railroad Yard	VOCs
18	85/A-39	W. of 19th Ave., between McDowell Rd. and Filmore St.	Santa Fe Railroad Yard	None, asphalt encountered at one foot depth
19	88/A-40	101 S. 35th Ave	Ray & Bob's Truck Salvage	Metals, VOCs
20	92/A-41	420 S. 19th Ave.	Schuff Steel	Metals, VOCs
21	92/A-41	320 S. 19th Ave.	National Metals	None, sampled by others, data forthcoming to ADEQ
22	100/A-44	3640 S. 19th Ave.	Tanner Co.	None, no outward signs of chemical releases
23	100/A-44	3640 S. 19th Ave.	Tanner Co.	None, no outward signs of chemical releases
24	102/A-45	3050 S. 19th Ave.	Chevron U.S.A., (Asphalt Div.)	VOCs
25	110/A-48	E. of 19th Ave., between Filmore St. and Roosevelt St.	Sahuaro Petroleum & Asphalt Co.	None, unable to access (defunct)
26	111/A-49	1510 W. Lincoln	Blue Circle West	VOCs
27	112/A-49	Between Grant St. and Harrison St., and 17th Ave. and 7th Ave.	Southern Pacific Railroad Yard	None, unable to sample (obstructions and asphalt)
28	117/A-51	N. side of Salt River, W. side of 7th Ave.	Maricopa Meat Packing Co.	None, unable to access (locked)

TABLE 4-4
SUMMARY OF RECENT SOIL SAMPLING RESULTS
WEST VAN BUREN AREA
SEPTEMBER 1988
DETECTED VOLATILE ORGANIC COMPOUNDS (VOCs)

PARAMETER	SOIL CLEANUP LEVEL*	SAMPLE LOCATION NUMBERS FACILITY NAME OR LOCATION 1 Research Chemicals	2 World Resources Company	3 W. 75th Ave. near Roos. Canal	4 Petco, Inc.	5 Phoenix Vegetable Dist.
1,1,1-Trichloroethane	20	0.1	0.2	0.2	0.1	ND
Trichloroethene	0.260	4.0	9.6	4.2	4.9	0.4

PARAMETER	SOIL CLEANUP LEVEL*	SAMPLE LOCATION NUMBERS FACILITY NAME OR LOCATION 7 Joe's Diesel Repair	9 Western Cotton Services Co.	10 Revlon Inc.	11 Roadway Express	12 Transcon Lines	13 Maricopa By-Products Inc.
Toluene	200	ND	ND	ND	ND	0.05	0.03
1,1,1-Trichloroethane	20	0.2	ND	0.07	ND	0.09	0.1
Trichloroethene	0.260	0.6	6.2	0.05	1.8	1.5	0.3
Xylenes (m,p-,o-)	44	ND	ND	0.26	1.0	0.07	0.16

All units are in milligrams per kilogram (mg/kg).
Only those compounds detected during this sampling program are listed.
ND indicates not detected above detection limit of analysis.
* Arizona Department of Health Services guidelines.
Values exceeding ADHS soil cleanup levels are underlined.

TABLE 4-4 (cont.)
SUMMARY OF RECENT SOIL SAMPLING RESULTS
WEST VAN BUREN AREA
SEPTEMBER 1988
DETECTED VOLATILE ORGANIC COMPOUNDS (VOCs)

PARAMETER	SOIL CLEANUP LEVEL*	SAMPLE LOCATION NUMBERS / FACILITY NAME OR LOCATION							
		14 Smithey Recycling Company	17 Santa Fe R.R. Yard	19 Ray & Bob's Truck Salvage	20 Schuff Steel	24 Chevron Asphalt Depot	26 Blue Circle West (adj. to Western Pet.)	29 Background 71st Ave. & Lower Buckeye	30 Background 51st Ave. & Buckeye
1,1,1-Trichloroethane	20	0.02	0.02	0.03	0.02	0.04	ND	0.07	ND
Trichloroethene	0.260	0.3	0.05	0.5	0.3	0.1	ND	0.8	10.4
Xylenes (m,p-,o-)	44	0.15	0.15	ND	ND	ND	4.8	ND	ND

All units are in milligrams per kilogram (mg/kg).
Only those compounds detected during this sampling program are listed.
ND indicates not detected above detection limit of analysis.
* Arizona Department of Health Services guidelines.
Values exceeding ADHS soil cleanup levels are underlined.

TABLE 4-4 (continued)
SUMMARY OF RECENT SOIL SAMPLING RESULTS
WEST VAN BUREN AREA
SEPTEMBER 1988
DETECTED METALS

PARAMETER	MAXIMUM CONCENTRATION OF CONTAMINANTS FOR CHARACTERISTIC OF EP TOXICITY (ppm)*	SAMPLE LOCATION NUMBER FACILITY NAME OR LOCATION						
		1 Research Chemicals	2 World Resources Company	10 Maricopa By-Products Inc.	14 Smithey Recycling Company	19 Ray & Bob's Truck Salvage	20 Schuff Steel	29 Background 71st Ave.& Lower Buckeye
Arsenic	5.0	<0.005	0.045	0.022	0.010	0.023	0.007	0.046
Barium	100	0.43	0.75	0.72	1.05	1.05	0.82	0.85
Cadmium	1	<0.003	0.007	0.016	0.017	0.009	0.019	0.023
Lead	5	<0.02	0.10	0.17	0.19	0.09	0.21	0.29
Silver	5	<0.010	<0.010	0.012	0.013	<0.010	0.010	0.025

*Maximum concentration of contaminants for characteristic of EP Toxicity are reported in milligrams per liter (mg/L) or ppm per 40 CFR 261.24.

All laboratory results are reported in milligrams per kilogram (mg/kg) or ppm.

Samples were analyzed for EP Toxicity, not for total metals.

VOC concentrations exceeded ADHS soil cleanup level guidelines for TCE (0.260 mg/kg) at 15 locations as shown above by the asterisk (*) and at two sites where background samples were collected:

- 51st Avenue and Buckeye Road (background sample): TCE (10.4 mg\kg)
- 71st Avenue and Lower Buckeye Road (background sample): TCE (0.8 mg\kg); TCA (0.07 mg\kg).

Duplicate samples from the above locations supported the validity of the results of samples for which they were the duplicates. However, the detection of VOCs above cleanup level guidelines in two background samples cast doubt on the meaningfulness of the VOCs detected in the soils at the other locations.

4.6 Distribution of Chemicals in the Ground Water

4.6.1 Areal Distribution

Based on available historic water quality data, supplemented by data from samples collected during this first phase of investigation, a number of wells have been identified as containing various concentrations of VOCs. Table 4-5 presents a summary of the wells in which the VOCs have been detected; lists the VOCs detected in each well; and, lists the wells in which the VOC concentrations reportedly exceed MCLs or AALs. The locations of the wells in which VOCs exceed MCLs or AALs are indicated on Figures 2 and 3 as well as Plate 1. Specific concentrations of VOCs for those wells are presented in Appendix D. As described in Section 4.4.1 the wells in which VOCs exceed MCLs or AALs have been grouped, for reference purposes only, into the following general geographic locations. These locations, as depicted on Plate 1, should not be interpreted as "plumes".

1 Van Buren Street and 75th Avenue
2. Van Buren Street and 64th Drive
3. Van Buren Street and 51st Avenue
4. Van Buren Street and 45th Avenue
5. Buckeye Road and 43rd Avenue
6. 43rd Avenue south of Grant Street at Smith Park

TABLE 4-5

SUMMARY OF VOCs OBSERVED IN THE GROUND WATER IN THE WEST VAN BUREN STUDY AREA

Water Use	Well Name/Owner No Legal Well Desig.	trichloroethene	1,1,1-trichloroethane	tetrachloroethene	1,1-dichloroethene	1,1-dichloroethane	trans-1,2-dichloroethene	1,2-dichloroethane	1,1,2,2-tetrachloroethane	vinyl chloride	trichlorofluoromethane	carbon tetrachloride	methylene chloride	1,2-dichloropropane	benzene	ethylbenzene	toluene	xylenes	chlorobenzene	1,2-dichlorobenzene	chloromethane	chloroform	bromodichloromethane	dibromochloromethane	phthalates	1,4-dichlorobenzene	chloroethane
N	Holsum Bakery (A-1-2)12caa	◉		◉	◉																◉						
A	Beth El Cemetery (A-1-2)1bdb	●		●																	●						
A	Greenwood Mem.Park (A-1-2)1cac	●		◉												●	●										
A	RID No. 109 (A-1-2)9bbb1	◉	●	◉	◉																●						
A	RID No. 109 (A-1-2)9bbb2	◉	●	◉	◉						◉				●						●						
A	RID No.111 (A-1-2)10aba	◉		◉				●													●						
A	RID No. 92 (A-1-2)10cbc			◉	●	●	●				●																
A	RID No.110 (A-1-2)9aab	◉	●	◉			●	●			◉																
M	APS MW-1 (A-1-2)9dbd													◉	●	●	●										
M	Van Buren Tank Farm (A-1-2)8aa **	◉	●	◉	◉	●	◉	◉	◉		◉			◉	◉	◉	◉				◉						
A	RID No. 108 (A-1-2)8baa1	◉	●	◉	◉	●	●	●			◉		●	◉			●				●						
	Prohoroff (A-1-2)7bba	●	●	◉	◉		●																				
F	Cons. West Steel Div (A-1-2)8ada	◉										●	●								●						
F	Soil Service Inc. (A-1-1)11bcc																				●						

● Observed above detection limits

◉ Observed above MCLs or ADHS Action Level guidelines

Water Use Codes: A=Irrigation; D=Domestic; E=Municipal; F=Industrial; J=Stock; M=Monitoring; N=None

** This is a synopsis of 51 monitoring wells installed and sampled by the owners/operators

TABLE 4-5

SUMMARY OF VOCs OBSERVED IN THE GROUND WATER IN THE WEST VAN BUREN STUDY AREA

Water Use	Well Name/Owner No Legal Well Desig.	trichloroethene	1,1,1-trichloroethane	tetrachloroethene	1,1-dichloroethene	1,1-dichloroethane	trans-1,2-dichloroethene	1,2-dichloroethane	1,1,2,2-tetrachloroethane	vinyl chloride	trichlorofluoromethane	carbon tetrachloride	methylene chloride	1,2-dichloropropane	benzene	ethylbenzene	toluene	xylenes	chlorobenzene	1,2-dichlorobenzene	chloromethane	chloroform	bromodichloromethane	dibromochloromethane	phthalates	1,4-dichlorobenzene	chloroethane
A	SRP 5E 4.5N (A-1-1)11add	●		●																							
A	SRP 5E 2.3N (A-1-1)23dda	●	●	●																		●					
A	SRP 5.8E 2.8N (A-1-1)24aaa	●	●	●																							
	Riverside School (A-1-2)17aad											●															
	(A-1-2)18ddd2	●																									
A	RID No. 88 (A-1-2)17add					●																					
J	Crawford (A-1-2)19cdc	●	●	●															●								
A.	RID No.91 (A-1-2)15bcc		●									●										●	●	●			
D	Peterson (A-1-2)21add															●	●										
M	City of Phoenix III-1 (A-1-2)23aaa	●	●	●		●	●	●		◉			●	●	●	●	●		●	●	◉	◉			●	●	●
M	City of Phoenix III-2 (A-1-2)23aad	●	●	●		●	●	●		◉			●	●	●	●	●		●	●	◉				●	●	●
M	City of Phoenix III-3 (A-1-2)23adb											◉	◉	●		●		●		◉					●		
M	City of Phoenix III-4 (A-1-2)23aab	●	●	●	●	●	●	●		◉	◉		●	●	●	●	●		●		◉	●			●	●	●
M	City of Phoenix III-5 (A-1-2)23abb	◉	●	◉	●	●	●	●	●	◉	◉		●	◉	●		●		●		◉	●			●	●	●

● Observed above detection limits

◉ Observed above MCLs or ADHS Action Level guidelines

Water Use Codes: A=Irrigation; D=Domestic; E=Municipal; F=Industrial; J=Stock; M=Monitoring; N=None

TABLE 4-5

SUMMARY OF VOCs OBSERVED IN THE GROUND WATER IN THE WEST VAN BUREN STUDY AREA

Water Use	Well Name/Owner No Legal Well Desig.	trichloroethene	1,1,1-trichloroethane	tetrachloroethene	1,1-dichloroethene	1,1-dichloroethane	trans-1,2-dichloroethene	1,2-dichloroethane	1,1,2,2-tetrachloroethane	vinyl chloride	trichlorofluoromethane	carbon tetrachloride	methylene chloride	1,2-dichloropropane	benzene	ethylbenzene	toluene	xylenes	chlorobenzene	1,2-dichlorobenzene	chloromethane	chloroform	bromodichloromethane	dibromochloromethane	phthalates	1,4-dichlorobenzene	chloroethane	dichlorodifluoromethane
M	City of Phoenix III-6 (A-1-2)23bab	●	●	◉	●	●	●			◉	◉		●		●	●	●		●		◉				●	●	●	
M	City of Phoenix III-7 (A-1-2)23bbb	●	●	◉	●	●	●			◉	◉	●	◉		●	●	●				◉	●			●		●	
M	City of Phx DM3-I (A-1-2)13bdb3	●	●	●																		●							
M	City of Phx DM3-P (A-1-2)13bdb1		●			●	●			●																			●
M	19th Ave. Landfill* (A-1-3)18ca	●	●	◉	●	●	●			◉	◉	◉	◉				●		●	●	◉	●	●			●	●		
A	RID No. 97 (A-1-2)14cdd			◉		●	●				◉																		
A	SRP 11.8E 2N (A-1-2)24dcc	●	●	●																			●						
A	RID No. 99 (A-1-2)14aad	●	●	◉	●	●																							
A	RID No. 103 (A-1-2)13dad	●	●	●	●	●	●							●															
E	Univ. Park R-G#1 (A-1-3)6dcd	◉		◉	●		●	●			●											●							
A	RID No. 104 (A-1-3)18bbc	◉		◉	●																								
	Evans (A-1-1)12bba	●	●	◉	◉																								
A	RID No.114 (A-1-2)12baa	◉		◉	●																	◉							

● Observed above detection limits ◉ Observed above MCLs or ADHS Action Level guidelines

Water Use Codes: A=Irrigation; D=Domestic; E=Municipal; F=Industrial; J=Stock; M=Monitoring; N=None

* This is a synopsis of data from City of Phoenix monitoring wells generated as part of their RI/FS

7. Van Buren Street and 37th Avenue
8. Van Buren Street and 12th Avenue at University Park
9. Interstate 10 and the Southern Pacific Railroad
10. Interstate 10 and Van Buren Street
11. 19th Avenue and Interstate 10
12. 27th Avenue and Pima Street
13. Lower Buckeye Road between 27th and 35th Avenues.

4.6.2 Vertical Distribution

As discussed in Section 2 of this report, the basin-fill material can be divided into four general stratigraphic units: the Upper Unit; the Middle Unit; the Lower Unit; and, the Red Unit. Although semi-confined conditions may occur locally, the saturated basin-fill deposits are assumed to be a single unconfined aquifer system with appreciable amounts of water available within each geologic formation (USGS, 1988).

The perforated intervals for those wells in which VOC concentrations exceed MCLs or AALs (see Table 4-6) were used to estimate the vertical distribution of VOCs in the ground water. Based on the descriptions of the aquifer units presented in Section 2.3.4.1 it appears that most of the wells penetrate the Upper and/or Middle Units between 50 and 500 feet below the ground surface. However, Well (A-1-2)14cdd (RID Well No. 97) is perforated at deeper intervals (836-1490' and 1500-1788') which may include the Lower Unit and the Red Unit. Depending on the potentiometric differences, if any, between the aquifer units the VOCs may or may not be migrating down to the deeper aquifer units. More detailed investigations, which might include isolated-zone testing in these wells, are needed before a more reliable estimate of the vertical distribution of the VOCs can be made.

Table 4-6

Perforated Intervals for Wells in Which VOCs
Have Been Detected Above MCLs or ADHS Action Levels

ENVIS Site Number	Legal Well Designation	Owner Designation	Perforated Interval (feet below ground surface)
1001	(A-1-2)12caa	Holsum Bakery	100-150
1004	(A-1-2)12baa	RID #114	205-380
1009	(A-1-2)1cac	Greenwood Mem. Park	NA
2001	(A-1-2)9bbb1	RID #109	60-232
2002	(A-1-2)9bbb2	RID #109	140-394
2003	(A-1-2)10aba	RID #111	55-192 206-442
2004	(A-1-2)10cbc	RID #92	180-488
2005	(A-1-2)9aab	RID #110	140-465
2027	(A-1-2)9dbd	APS MW-1	60-110
3001 to 3011	(A-1-2)8aa1 to (A-1-2)8aa11	Van Buren Tank Farm	50-150 (range)
3013	(A-1-2)8baa1	RID #108	62-270
3015	(A-1-2)7bba	Prohoroff	NA
3016	(A-1-2)8ada	Cons. West Steel Div.	NA
3020	(A-1-2)8aa13	Van Buren Tank Farm	
3021	(A-1-2)8aa14	Van Buren Tank Farm	50-150 (range)
3022	(A-1-2)8aa15	Van Buren Tank Farm	
4027	(A-1-1)12bba	Evans	NA
8001	(A-1-2)23aaa	City of Phx. III-1	37-99
8002	(A-1-2)23aad	City of Phx. III-2	32-102
8003	(A-1-2)23adb	City of Phx. III-3	41-100
8004	(A-1-2)23aab	City of Phx. III-4	30-123
8005	(A-1-2)23abb	City of Phx. III-5	32-124
8006	(A-1-2)23bab	City of Phx. III-6	30-123
8007	(A-1-2)23bbb	City of Phx. III-7	41-130
8011	(A-1-2)14cdd	RID #97	200-284 836-1490 1500-1788
8014	(A-1-2)14aad	RID #99	70-400
9001	(A-1-3)18caa	City of Phx. DM-4	110-150
9002	(A-1-3)6dcd	Univ. Park R-G #1	160-190 210-250
9003	(A-1-3)18bbc	RID #104	100-370

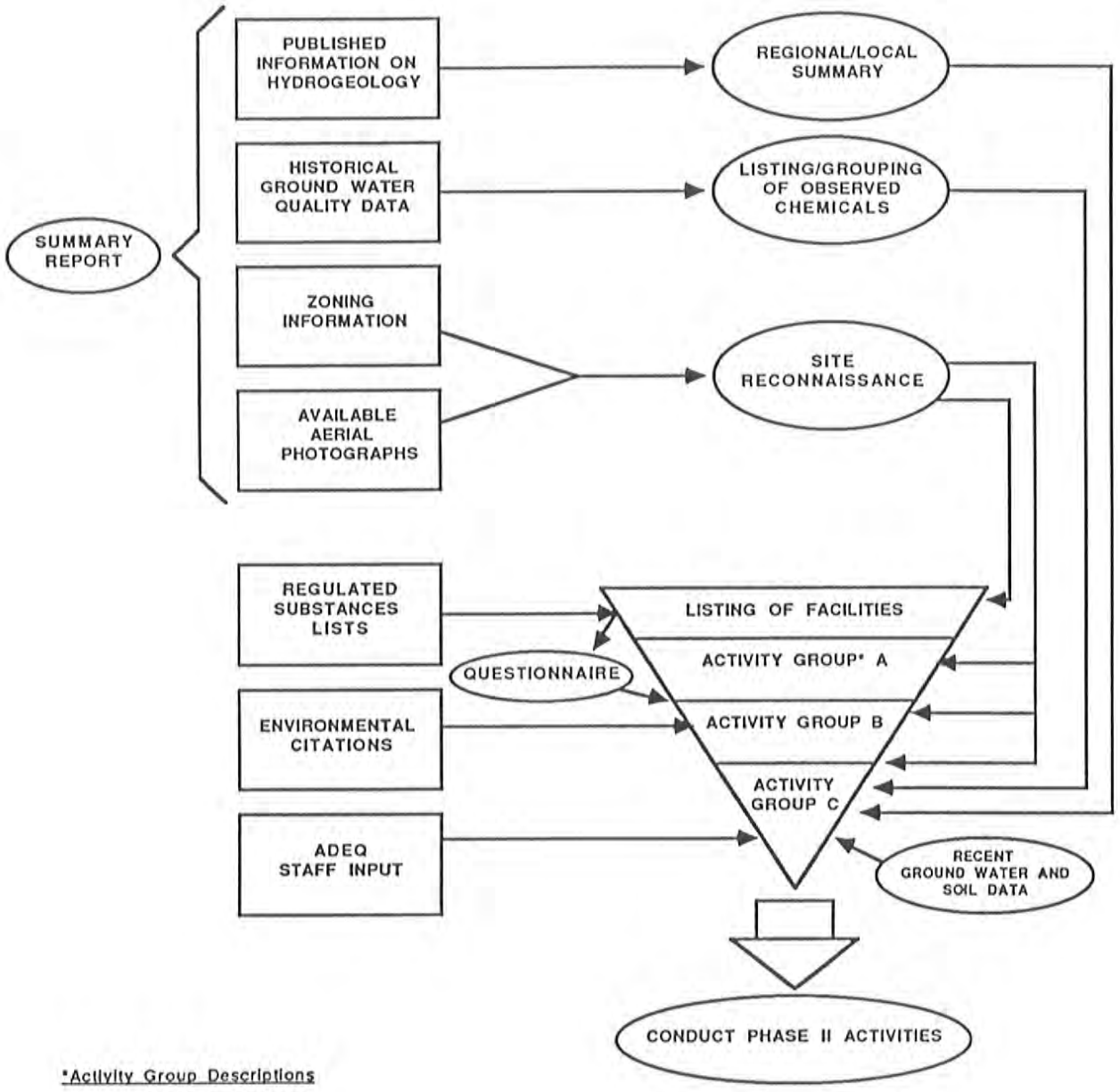
RID = Roosevelt Irrigation District
APS = Arizona Public Service
NA = Not Available

5 DETERMINATION OF PHASE II INVESTIGATIVE ACTIVITIES

5.1 Methodology

The following sections provide a summary of the rationale and procedures used in developing: 1) a list of facilities for continuing evaluation; and, 2) recommendations for the level of effort for continuing evaluation. The process (shown schematically in Figure 4) refined initial listings of facilities within the study area, to eventually establish a list of facilities proposed for further work in Phase II of the continuing WQARF investigations. Future investigative activities to be carried out at the listed facilities may include some or all of the following: questionnaire responses; detailed records searches; detailed site inspections; and physical testing. Facilities requiring questionnaire responses would satisfy the requirement by submitting a response to ADEQ's questionnaire. A detailed records search would entail a review of land uses, ownership, aerial photographs, etc., in a manner similar to that performed for environmental site assessments conducted during the buying or selling of property. Detailed site inspections would be conducted at a given facility by trained ADEQ or contractor staff. "Physical testing" may include: near surface soil sampling and analysis; soil boring (with sampling and analysis); and ground water sampling and analysis. Physical testing could also include the construction of monitoring wells or the hydrogeologic characterization of the site. The specific activities recommended to be carried out at respective facilities are indicated on the facilities list in Appendix A.

The activities leading to the determination of appropriate future investigative activities for facilities listed included: reviewing available information previously published and contained in the Summary Report (Kleinfelder, 1988); observing existing facilities and practices during site reconnaissance; reviewing responses to the questionnaire developed for this study; evaluating the data obtained by this study during recent ground water and soil sampling; reviewing additional historic ground water quality data acquired since the publishing of the Summary Report; reviewing available public records regarding regulated substances and environmental citations for the listed facilities; and incorporating ADEQ comments.



*Activity Group Descriptions

A: respond to questionnaire plus records search
B: Activity Group A plus site inspection
C: Activity Group B plus physical testing

KLEINFELDER

Project Number 52-1015-01 July 1989

ADEQ Task Assignment K-2
West Van Buren Study Area
Phoenix, Arizona

Process for Listing of Facilities for Continuing Evaluation

FIGURE 4

A review of compiled data and information was conducted to determine appropriate future investigative activities at the respective facilities. Figure 4 illustrates the linking of information and how some information was used to define groups of facilities warranting subsequent activities. Figure 4 uses rectangles to designate information collected by other parties and generally publicly available; the ovals indicate information generated by this study; and the inverted triangle depicts the process of listing facilities and determining appropriate subsequent activities.

The list of facilities indicates what investigative activities are planned for each facility. Ranking scores were not developed during this process, since much of the data typically used (for example, by the USEPA) for ranking a particular site were not available at this phase of study.

The listing of facilities was developed in the following step-wise manner:

1. Information gathered during the documents search was compiled to develop a summary of regional and local hydrogeology, and a listing and grouping of chemicals observed in ground water within the study area.

2. a) A reconnaissance was performed at study area sites identified through a review of zoning information and available aerial photographs. During site reconnaissance, chemical and or waste handling practices were observed, where feasible.

   b) Based on the results of the site reconnaissance and a review of regulated substances lists, an initial listing of facilities was developed. A total of approximately 850 facilities were initially listed.

   c) Field observations during site reconnaissance were used to classify the initial list into a group of facilities for which investigative activities in Phase II will include additional records searches and requests for questionnaire responses. Examples of such field observations may include: evidence of drum storage; stained ground in the vicinity of drum storage or maintenance areas; and active disposal or previously documented spills of wastes in non-designated disposal areas or unlisted disposal facilities.

3. A questionnaire was developed and sent to the initial list of approximately 850 facilities to assess chemical handling and disposal practices, and existing reporting procedures. A review of the responses was performed, and the results were compared with the field observations, and environmental citation files, to further group the list of facilities. From the first group of selected facilities, a second group was selected for which Phase II activities would include detailed site inspections, additional records searches, and requests for questionnaire responses, if none had previously been received.

4. The facility's proximity to areas of observed chemicals in the ground water was reviewed. In addition, field observations, recent ground water and soil data, and reported chemical uses were reviewed along with input from ADEQ staff to further classify the list into a third group of facilities for which Phase II investigative activities will include physical testing, detailed site inspections, additional records searches, and requests for questionnaire responses, if none had previously been received. The list of facilities and respective investigative activities planned for Phase II of this study are included in Appendix A. A more detailed discussion of Phase I activities leading to the determination of Phase II activities at listed facilities is presented in the following sections.

5.1.1 Literature and Records Search

A literature and records search was conducted to review published information on the West Van Buren Study Area. The reviewed information was used early in the process to eliminate areas such as residential zones and to include previously identified sources of chemicals, as well as to investigate potential chemical migration routes, and to assess the types and groupings of observed chemicals in the ground water. The following information was utilized:

- LAND USE: Zoning information was used to help identify commercial and industrial land uses. City and county zoning descriptions were used to classify the study area into areas based on the type of zoned land use (see Summary Report, Kleinfelder, 1988 and Section 4.2.1 of this report).

- STUDY AREA CONDITIONS: Information on geology, hydrogeology, and ground water quality was assembled through a review of available reports and

historical data. The sources of this information are discussed in Section 3 and are presented in greater detail in the Summary Report (Kleinfelder, 1988). This information was used to estimate potential chemical migration routes, and to list and group the chemicals historically observed in the ground water.

- CHEMICAL USERS: Files obtained from Federal, State and local government agencies were reviewed for the location and types of chemicals known to be used by industries within the study area, or for any known chemical waste generators. The results of the review were compared with ground water quality data to identify facilities which appeared to be either: a) upgradient (based on regional ground water migration), or b) using chemicals observed in the ground water. Additionally, compliance files were reviewed to investigate the past disposal history and use of observed chemicals, as well as to identify the types of chemicals involved in previously documented chemical releases.

- AERIAL PHOTOGRAPH REVIEW: A review of available aerial photographs (Section 4.2.2) identified several land uses which suggest either chemical storage and use, or potential waste disposal. A compilation of the aerial photograph review is presented in Appendix A of the Summary Report (Kleinfelder, 1988), along with copies of the 1986 photographs on which observations from historic photographs have been noted. The areas identified as having a strong potential for past land uses conducive to chemical releases were plotted on the base maps, and identified using zoning and parcel information. Some of these locations were then chosen for soil sampling based on apparent stained soil, the presence of storage tanks, debris, spoil piles, landfills, or other suspect land uses (see Final Soil Sampling Plan, Kleinfelder, 1988).

5.1.2 Site Reconnaissance

A site reconnaissance resulted in a listing of facilities and readily observable information on chemical storage, handling, and disposal practices. Stained ground around chemical storage areas, drum storage, and other practices were noted if observed during the site reconnaissance. The general housekeeping practices were observed, and facilities with practices that may contribute to spills were considered for further investigation.

5.1.3 Questionnaire Responses and Compliance

A questionnaire was sent to those current owner/operators (approximately 850) identified as a result of the literature and records search, and the site reconnaissance. Facility responses to the questionnaire were reviewed regarding the types of chemicals handled by the facility and the reporting procedures pertaining to the handling and disposal of the chemicals. A non-response to the questionnaire did not, by itself, adversely affect the evaluation of a facility. Approximately 300 responses were received.

Following this review, RCRA, CERCLA, ADEQ, and local agency compliance files were investigated to identify those facilities with past histories of compliance problems. Particular attention was given to the types of chemicals involved and the reported handling or disposal measures. Facilities were classified as needing additional records searches and/or detailed site inspections if: 1) the questionnaire response did not correlate with compliance information; or 2) a questionnaire response had not been returned for a facility with a reported compliance violation; or 3) the questionnaire response indicated that a facility utilized one or more of the chemicals observed in the ground water.

5.1.4 Proximity to Observed Chemicals in the Ground Water

Available ground water quality data were compiled, and a listing of observed chemicals and their distribution were developed (see Plates 1 and 2 and Section 4.4).

Facilities were reviewed for their proximity to areas where chemicals have been observed in the ground water. Facilities that were previously classified as needing additional record searches and detailed site inspections and generally appeared to be regionally upgradient of, overlying, or adjacent to, areas of observed chemicals in the ground water were classified as also needing physical testing.

In addition, several facilities were classified as needing physical testing based on site reconnaissance information, the results of recent ground water and soil analyses (Sections 4.4 and 4.5), and/or discussions with ADEQ staff.

5.2 Continuing Evaluation of Facilities

The majority of chemicals of concern in the ground water are synthetic chemical compounds. Thus, the apparent source of these compounds is the activity of humans. In general, comparing the distribution of the chemicals with land uses indicates that the potential sources are typically located in areas that are zoned for light and heavy industrial use; although commercial uses are also present, such as facilities with underground fuel storage tanks. The majority of the chemicals of concern encountered are industrial solvents, degreasing agents, and fuels typically utilized in the manufacturing or fabrication of metal and metal products, electronics and coatings, or are associated with bulk storage and equipment maintenance and use. This phase of investigation has been performed to develop a list of facilities for subsequent investigative activities. Although industrial or commercial enterprises involved in the manufacturing, distribution, use, or disposal of these chemicals were not exclusively investigated, the majority of the listed facilities are associated with these industries.

The facility listing process has involved several steps (as previously discussed) with input from various types of information. As explained in Section 5.1, facilities on the list are classified according to the investigative activities planned for Phase II. (The list of facilities is presented in Appendix A.) A goal of Phase II is to determine the extent (if any) that a facility has or may have contributed to the observed chemicals in the ground water.

6 CONCLUSIONS

6.1 Chemical Releases into the Ground Water

This section presents conclusions based on available data obtained during the study, and the correlation of these data with respect to: 1) the hydrogeologic characteristics of the Salt River Basin; and 2) EPA Maximum Contaminant Levels (MCLs) promulgated under the Safe Drinking Water Act. Draft Arizona Department of Health Services (ADHS) interim criteria for public drinking water supply were also used in evaluating the data. The conclusions are:

- Concentrations of chemical constituents in excess of established MCLs or AALs have been observed in the vicinity of West Van Buren, Phoenix, Arizona. The organic constituents include:

Chemicals (acronym)	MCL*	AAL*
trichloroethene (TCE)	5.0	5.0
tetrachloroethene (PCE)	NE	1.0
1,1-dichloroethene (1,1-DCE)	7.0	7.0
trans-1,2-dichloroethene (t-1,2-DCE)	70	70
1,2-dichloroethane (1,2-DCA)	5.0	5.0
1,1,2,2-tetrachloroethane (1,1,2,2-PCA)	NE	0.50
trichlorofluoromethane (Freon 11)	NE	1.0
carbon tetrachloride	5.0	5.0
1,2-dichloropropane	NE	1.0
chloroform	100(a)	3.0(b)
methylene chloride	NE	4.7
vinyl chloride	2.0	2.0
benzene	5.0	5.0
ethylbenzene	NE	680
toluene	NE	2000
xylenes	NE	440
chloromethane	NE	0.5

* all units are in ug/L
NE = none established
(a) for total trihalomethanes
(b) when source is not a by-product of chlorination

In addition to the organics, nine inorganic chemicals were observed with concentrations exceeding established primary MCLs.

Chemicals	MCL*
arsenic	50
cadmium	10
mercury	2
nitrate (as nitrogen, N)	10mg/L
barium	1000
lead	50

* all units are in ug/L unless otherwise stated

- Based on historic data and samples collected and analyzed as part of this study, thirteen locations in the West Van Buren Study Area have been identified in which concentrations of VOCs in the ground water exceeded MCLs or AALs. The organic chemicals most commonly detected above MCLs or AALs at these sites were: TCE, PCE, 1,1-DCE, and Freon 11. In addition, VOCs were observed at concentrations above detection limits, but below MCLs or AALs, in several other locations (see Plate 1) throughout the study area. These VOCs are listed in Section 4.4.1. At two sites constituents of petroleum products (benzene, ethylbenzene, toluene, and xylene) were also observed. The thirteen locations, associated wells, and VOCs which have been observed in concentrations above MCLs or AALs are summarized below. The concentrations of VOCs detected above MCLs or AALs at these sites are listed in Appendix D. Additional VOC data are given on Plate 2.

Van Buren Street and 75th Avenue

Well (A-1-1)12bba (Evans well):
PCE
1,1-DCE

Van Buren Street and 64th Drive

Well (A-1-2)7bba (Prohoroff Well):
PCE
1,1-DCE

Van Buren Street and 51st Avenue (Tank Farm)

Numerous wells installed by the owners/operators of the facility:

benzene
toluene
xylenes
ethylbenzene
TCE
PCE
1,1-DCE
1,2-DCE
1,2-DCA
1,1,2,2-PCA
Freon 11
chloroform

Wells (A-1-2)8baa and (A-1-2)9bbb (RID Well Nos. 108 and 109):

TCE
PCE
1,1-DCE
Freon 11
benzene (RID No. 108 only)

Van Buren Street and 45th Avenue

Well (A-1-2)9aab (RID No. 110):

TCE
PCE
Freon 11

Buckeye Road and 43rd Avenue

Well (A-1-2)9dbd (APS Monitoring Well No. 1):

benzene

43rd Avenue south of Grant Street at Smith Park

Well (A-1-2)10cbc (RID Well No. 92):
PCE

Van Buren Street and 37th Avenue

Well (A-1-2)10aba (RID No. 111):
TCE
PCE

Interstate 10 and Van Buren Street at Greenwood Memorial Park Cemetery

Well (A-1-2)1cac (Greenwood Memorial Park Well):
PCE

Well (A-1-2)12baa (RID No. 114):
TCE
PCE
chloroform

Van Buren Street and 12th Avenue at University Park

Well (A-1-3)6dcd (Univ. Park R-G #1):
TCE
PCE

Interstate 10 and the Southern Pacific Railroad

Well (A-1-2)12caa (Holsum Bakery Well):
TCE
PCE
1,1-DCE
chloroform

19th Avenue and Interstate 10

Numerous monitoring wells installed by the City of Phoenix:

vinyl chloride
PCE
carbon tetrachloride
methylene chloride
chloromethane
Freon

Well (A-1-3)18bbc (RID No. 104):

TCE
PCE

27th Avenue and Pima Street

Well (A-1-2)14aad (RID No. 99):

PCE

Lower Buckeye Road between 27th and 35th Avenues (27th Avenue Landfill)

Well (A-1-2)23aaa (City of Phoenix Well III-1):

vinyl chloride
chloromethane
chloroform

Well (A-1-2)23aad (City of Phoenix Well III-2):

vinyl chloride
chloromethane

Well (A-1-2)23adb (City of Phoenix Well III-3):

methylene chloride
chloromethane
1,2-dichloropropane

Well (A-1-2)23aab (City of Phoenix Well III-4):

vinyl chloride
Freon 11
chloromethane

Well (A-1-2)23abb (City of Phoenix Well III-5):

TCE
PCE
vinyl chloride
Freon 11
1,2-dichloropropane
chloromethane;

Well (A-1-2)23bab (City of Phoenix Well III-6):

PCE
vinyl chloride
Freon 11
chloromethane;

Well (A-1-2)23bbb (City of Phoenix Well III-7) :

PCE
vinyl chloride
Freon 11
methylene chloride
chloromethane;

Well (A-1-2)14cdd (RID Well No. 97):

PCE
Freon 11

- Most of the wells in which VOCs reportedly exceed MCLs or AALs penetrate the Upper and/or Middle Units between 50 and 500 feet below the ground surface. An exception is Well (A-1-2)14cdd (RID Well No. 97), which is perforated at deeper intervals (836'-1490' and 1500' - 1788')

6.2 Continuing Evaluation of Facilities

In the initial stages of this study a list of facilities within the study area was developed from available data sources and field reconnaissance. As this study progressed, several steps were taken to determine the appropriate investigative activities to be carried out during Phase II of this investigation. These steps (as discussed in Section 5) included: literature and records searches; site reconnaissance; the distribution of a questionnaire to and processing of responses from facilities on the initial list; and evaluation of proximity to observed chemicals in the ground water. This Phase I study resulted in the development of a listing of facilities for continuing evaluation to determine their potential for contributing to the observed chemicals in the ground water. The list of facilities, along with the investigative activities planned for each, is given in Appendix A.

6.3 Potential Effects of Ground Water Degradation

Table 6-1 provides a list of the municipal wells that could potentially be affected by the migration of chemicals observed in ground water in the West Van Buren Area. Even though there are no municipal wells within the West Van Buren Area, several are located downgradient (based on regional data). Two City of Phoenix wells (No. 196 and No. 179) have been shut down due to poor water quality.

Only one of the above listed wells has been sampled for VOCs. Well (A-1-1)11bcc, which is reportedly abandoned, has been reported to contain elevated concentrations of chloroform. Although no sample results are available for Well (A-1-3)18bad, recent sampling has indicated that Well (A-1-3)18bbc, approximately 1,600 feet to the west, contains elevated concentrations of TCE, PCE and 1,1-DCE.

Available pumping schedules for City of Phoenix, RID, and SRP wells within the West Van Buren Study Area were also obtained. The City of Phoenix reported that its wells are either inactive or abandoned. RID wells, located near the Roosevelt Canal, generally pump continuously from mid-March through mid-September. During heavy pumping periods, these wells may create pumping gradients that deflect flow towards the Roosevelt Canal which runs west to east through the study area. Ground water with elevated chemical concentrations observed within the West Van Buren Study Area could potentially be directed toward the irrigation wells along the canal during periods

of heavy pumping. SRP wells in the northwest portion of the study area (north of Buckeye Road and west of 67th Avenue) are generally active for 10 to 15 days in mid-July. These wells are also active intermittently during November and December.

TABLE 6-1
LOCATIONS OF POTENTIALLY AFFECTED MUNICIPAL WELLS

Well Number	Owner	Owner Designation	Status
(A-1-1) 11bcc	City of Phoenix	Well No. 196	Abandoned
(A-1-2) 2bcc	City of Phoenix	Falcon Park	Inactive
(A-1-2) 7daa	City of Phoenix	Well No. 179	Abandoned
(A-1-3) 6dca	City of Phoenix	University Park	Inactive
(A-1-3) 18bad	City of Phoenix	Alkire Park	Inactive
(A-1-1) 9aaa1	City of Tolleson	Well No. 1	Active
(A-1-1) 9aaa2	City of Tolleson	Well No. 2	Active
(A-1-1) 4ddb	City of Tolleson	Well No. 3	Active
(A-1-1) 3bca	City of Tolleson	Well No. 4	Active
(A-1-1) 10aaa	City of Tolleson	Well No. 5	Active
(A-1-1) 11bcc	City of Tolleson	Well No. 6	Inactive
(A-1-1) 9bac	City of Tolleson	Well No. 7	Active

6.4 Limitations of Collected Information

The results of this study are based on the available background information, responses to a questionnaire, comments on the draft Phase I Report, and the scope of work commensurate with available funding. No inference as to the completeness of the available information is made; nor is it meant to be inferred that the field effort was exhaustive. The level of effort expended on field reconnaissance and sampling was defined by the project's Scope of Work.

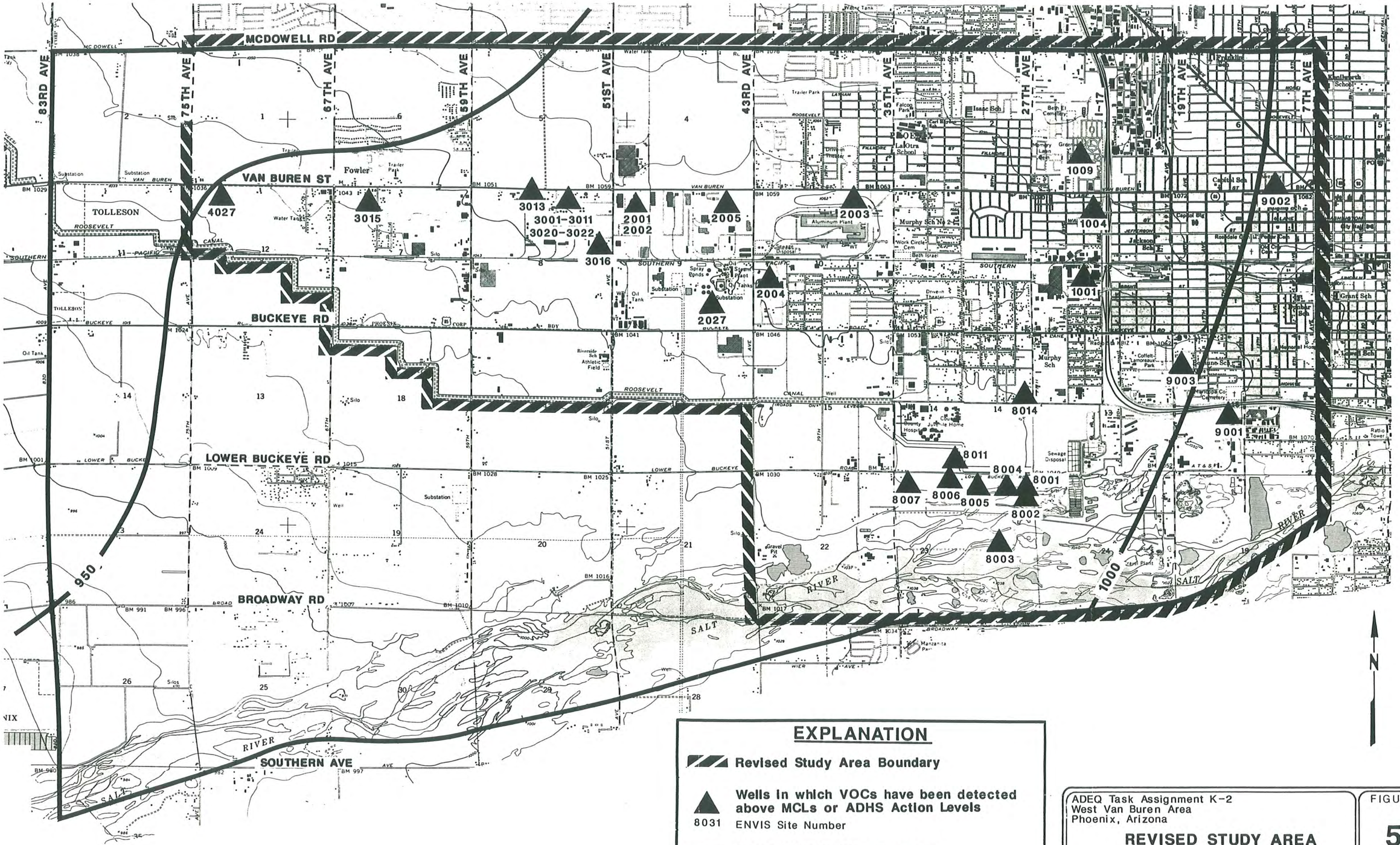
7 PLANNED PHASE II ACTIVITIES

7.1 Redefine Study Area Boundaries

Based on the accumulated data from this Phase I investigation, the study area boundaries will be adjusted to reflect these data. The boundaries, as shown on Figure 5, will allow a concentration of project efforts for the planned Phase II activities. The reduced area represents a region where VOCs have been observed in the ground water at concentrations above MCLs or AALs.

7.2 Continue Investigations

The actual sources of VOCs in the ground water have not been identified. However, additional investigative activities are planned for a number of facilities, in a continuing effort to determine the sources. Accordingly, Phase II investigative activities are planned. Initial Phase II activities include the reissuing of the questionnaire to selected facilities, with appropriate follow-up to ensure proper response. Based in part on the information in the responses, detailed record searches may be conducted at selected facilities to determine if site inspections or physical testing are warranted. At a number of facilities sufficient information has been gathered during Phase I to justify detailed site inspections. These inspections are planned to include meetings between ADEQ and the current operators/owners of the facilities. The result of these activities would be the determination of whether or not sampling of the ground water and soils at and near the facility would be justified.



ADEQ Task Assignment K-2
West Van Buren Area
Phoenix, Arizona

REVISED STUDY AREA BOUNDARY

FIGURE **5**

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July 1989

7.3 Involve Facilities

7.3.1 Site Characterization

Site characterization activities are planned at selected facilities. Initial site characterization may include sampling of soils collected at intervals from the surface to the water table, and the installation of ground water monitoring wells. Preliminary results would be evaluated to determine if a more thorough characterization of the site is necessary. This site characterization will be carried out in conformance with appropriate RCRA, CERCLA and ADEQ guidelines. The resulting information will assist in understanding what chemicals were released from the facility and their current distribution.

7.3.2 Remediation

Once it is determined that a particular facility has, or had, an uncontrolled release of chemicals, then remedial planning would proceed. Based on results of site characterization and a quantified estimate of released chemicals into the ground water, an appropriate remedial action can be designed and implemented. Remedial action may include, but not be limited to: in-situ biodegradation; pumping, treatment, and reinjection of the ground water; removal, treatment, and disposal of affected soil; or installation of appropriate treatment facilities on downgradient public drinking water supply wells.

7.4 Refine Estimate of Distribution of Chemicals in the Ground Water

This phase of study was limited in that much of the data accumulated were historical and regional. Phase II activities are now being initiated to augment the data base. These activities may include more extensive and concurrent sampling of existing wells in the area. Also, installation and sampling of additional monitoring wells may be required, so that deficiencies in data might be eliminated or minimized.

7.5 Monitor the Ground Water

Frequent monitoring of ground water quality in the study area is planned. This will aid in understanding the path and rate of migration of currently observed chemicals. To collect these data a monitoring network designed specifically for this area would be established and sampled on a quarterly basis. This monitoring network may consist of both new and existing wells. Any new monitoring wells would be designed in accordance with current professional standards for monitoring well construction and ADWR guidelines.

7.6 Remediate

Additional remedial actions may be necessary to retard the movement of contaminants in the ground water and to remove or immobilize the sources. Remediation may include pumping and treating contaminated wells. Where possible, interested parties would be encouraged to conduct such activities (see Section 7.3). Where that is not possible, ADEQ has the option to utilize WQARF funds for remediation, and pursue cost recovery at a later date.

8 LIMITATIONS

The data, discussions, conclusions, and recommendations generated from this phase of activities are based on the following:

- quality and completeness of well records and analytical data obtained and collated for this study
- information provided by contacts at the listed agencies and personal communication during site contacts
- observations of field personnel
- soil and ground water conditions at the time of this investigation
- published guidelines for Maximum Contaminant Levels provided by EPA and unpublished ADHS Action Level guidelines.

It is very possible that variations in the soil or ground water conditions could exist beyond the points addressed in this investigation and within the study area. Also, changes in the ground water conditions could occur at any time due to variations in rainfall, temperature, and local and regional water usage, to name some of the more significant factors.

The services performed by *Kleinfelder* have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in Arizona. No other warranty, expressed or implied, is made.

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APPENDIX A
FACILITIES LIST

APPENDIX A

Facilities List

This appendix contains the list of facilities for which further investigative activities are planned. The specific activities planned for each facility are also indicated.

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
23rd Ave. Landfill	23rd Ave. & Lower Buckeye Rd. Phoenix, Arizona 85009				X	X
23rd Ave. Wastewater Treatment Facility	2301 West Durango St. Phoenix, Arizona 85009	City of Phoenix 135 N. 2nd Ave. Phoenix, Arizona 85003			X	
27th Ave. Landfill	2800 S. 27th Ave. Phoenix, Arizona 85009	City of Phoenix, Public Works 101 S. Central Ave., No. 500 Phoenix, Arizona 85004	X	X	X	
A.B. Dick Products	302 S. 23rd Ave. Phoenix, Arizona 85009				X	X
Acme Printing & Ink Co.	5127 W. Polk St. Phoenix, Arizona 85043					X
ADOT Equipment Services	2225 S. 22nd Ave. Phoenix, Arizona 85009	ADOT 206 S. 17th Ave. Phoenix, Arizona 85009		X	X	
ADOT Central Materials Lab.	1745 W. Madison St. Phoenix, Arizona 85007	ADOT 206 S. 17th Ave. Phoenix, Arizona 85007		X	X	
Airtuff Products	101 N. 45th Ave. Phoenix, Arizona 85043	Joe Gonzales 269-9741			X	X
Alco Manufacturing	255 N. 47th Ave. Phoenix, Arizona 85043				X	X

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
American National Can Corporation	211 N. 51st Ave. Phoenix, Arizona 85031	National Can Corporation B101 W. Higgins Chicago, Illinois 60631		X	X	
Anderson Clayton (see Western Cotton Svcs Co.)	615 S. 51st Ave. Phoenix, Arizona 85043			X	X	
Anocad Plating & Painting Company	6033 W. Sherman St. Phoenix, Arizona 85043	David A. Rodriguez 6033 W. Sherman St. Phoenix, Arizona 85043		X	X	
Antex Plastics	922 N. 17th Ave. Phoenix, Arizona 85007					X
ARCO Petroleum Products Co. Phoenix Terminal	5333 W. Van Buren St. Phoenix, Arizona 85043 (Van Buren Tank Farm)	Atlantic Richfield Co. 515 S. Flower St. Los Angeles, Calfornia 90071			X	
Arizona Public Service Co. West Phoenix Power Plant and Chemical Lab.	408 & 410 S. 43rd Ave. Phoenix, Arizona 85009	411 N. Central Ave. Phoenix, Arizona 85009		X	X	
Arizona Recycling	400 S. 15th Ave. Phoenix, Arizona 85007	Sal & Edythe Bova 1740 W. Heatherbrae Phoenix, Arizona		X	X	
Arizona Refining Co.	1935 W. McDowell Rd. Phoenix, Arizona 85009					X

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Arizona Transmission Service	402 N. 35th Ave. Phoenix, Arizona 85009	Robbie Hopper			X	
Arizona Zinc Platers	918 W. Buchanan St. Phoenix, Arizona 85007					X
AT&T Technologies, Inc.	505 N. 51st Ave. Phoenix, Arizona 85047			X	X	
Atchison, Topeka & Santa Fe Railroad	19th Ave. & McDowell Road. Phoenix, Arizona 85015					X
Atlantic Richfield	5333 W. Van Buren St. Phoenix, Arizona 85005 (Van Buren Tank Farm)	P.O. Box 6535 Phoenix, Arizona			X	
Auto Safety House	2630 W. Buckeye Rd. Phoenix, Arizona 85009				X	
Aztec Construction, Inc.	4022 W. Lincoln St. Phoenix, Arizona 85009				X	
Bailey & Bailey/ Petro System	338 N. 9th Ave. Phoenix, Arizona 85001	Bailey & Bailey General Part P.O. Box 660836 Miami Springs, Florida 33166				X
Bud's Oil Service, Inc.	1340 W. Lincoln St. Phoenix, Arizona 85007	J & S Properties 1340 W. Lincoln St. Phoenix, Arizona 85007			X	
C.W. Chapman	4648 W. Van Buren St. Phoenix, Arizona 85043				X	X

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Cactus Chemical Co.	3112 W. Polk St. Phoenix, Arizona 85009					X
Cal Ink	1035 N. 21st Ave. Phoenix, Arizona 85009					X
Caljet, Inc	125 N. 53th Ave. Phoenix, Arizona 85043 (Van Buren Tank Farm)	DBA Cardlock Fuels 2850 W. Camelback Rd., Ste. 102 Phoenix, Arizona 85017			X	
Car Doctor	337 N. Black Canyon Phoenix, Arizona 85009					X
Castle Mfg., Inc.	3702 W. Lower Buckeye Rd. Phoenix, Arizona 85009				X	X
Central Avenue Landfill	South Central Av./Watkins Rd. Phoenix, Arizona 85066				X	
ChemResearch	1101 & 1122 W. Hilton Ave. Phoenix, Arizona 85007			X	X	
Chemical Waste Management, Inc.	2301 W. Broadway Rd. Phoenix, Arizona 85041			X	X	
Chevron USA, Inc.	5110 W. Madison St. Phoenix, Arizona 85043 (Van Buren Tank Farm)				X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities			
			Physical Testing	Site Inspection	Records Search	Questionnaire Response
Chromalloy American Corp.	5161 W. Polk St. Phoenix, Arizona 85043			X	X	
Combs Auto Repair, Inc.	3323 W. Lincoln St. Phoenix, Arizona 85009				X	
Conair Corporation	2 N. 59th Ave. Phoenix, Arizona 85043					X
Coolair	2901 W. Buckeye Rd. Phoenix, Arizona 85009				X	
Cooper State Rubber	750 S. 59th Ave. Phoenix, Arizona 85043					X
Copperstate Metals	3720 W. Lower Buckeye Rd. Phoenix, Arizona 85009				X	X
Custom Polishing and Plating	2320 W. Sherman St. Phoenix, Arizona 85009					X
Data Packaging Corp.	425 S. 67th Ave. Phoenix, Arizona 85043		X	X	X	X
Dolphin, Inc.	740 S. 59th Ave. Phoenix, Arizona 85043			X	X	
Easco Aluminum	249 S. 51st Ave. Phoenix, Arizona 85043	Easco Corporation P.O. Box 60 Girard, Ohio 44420		X	X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities			
			Physical Testing	Site Inspection	Records Search	Questionnaire Response
Empire Metals, Inc.	2010 W. Lower Buckey Rd. Phoenix, Arizona 85009					X
EMS, Inc.	2412 W. Durango St. Phoenix, Arizona 85009				X	
Engine Exchange	1764 Grand Ave. Phoenix, Arizona 85007			X	X	X
Exxon	W. Madison St. Phoenix, Arizona 85043 (Van Buren Tank Farm)				X	
Fite Dry Cleaning	3125 W. Van Buren Phoenix, Arizona 85009					X
Glacier Ice	5925 W. Van Buren St. Phoenix, Arizona 85043				X	
Guy's Truck Repair	1395 N. 19th Ave. Phoenix, Arizona 85009	Guy N. Sacco 1395 N. 19th Ave. Phoenix, Arizona 85009			X	
Hi-Tech Plating & Shielding	4313 W. Van Buren St. Phoenix, Arizona 85009			X	X	
Holsum Bakery, Inc.	408 S. 23rd Ave. Phoenix, Arizona 85005	Edward Eisele P.O. Box 6690 Phoenix, Arizona 85005		X	X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Hyster	317 S. 9th Ave. Phoenix, Arizona 85007					X
Incide Technologies	50 N. 41st Ave. Phoenix, Arizona 85009					X
Jaquays Equipment Co.	1219 S. 19th Ave. Phoenix, Arizona 85009	Jacqueline Gannan 9268 Wrightstown Rd. Tucson, Arizona 85215	X	X	X	
Joe's Diesel Repair	6316 W. Van Buren St. Phoenix, Arizona 85043	see Western Diesel Repair			X	X
Johnson Freightliner	3737 W. Buckeye Rd. Phoenix, Arizona 85009	E.P. Hennesy 127 E. San Miguel Ave. Phoenix, Arizona 85012			X	
K L Quartztek	20 S. 48th Ave. Phoenix, Arizona 85035				X	X
Kraft Food Service	1601 S. 35th Ave. Phoenix, Arizona 85009					X
LORN Technical Coatings	116 N. 59th Ave. Phoenix, Arizona 85043					X
M & D Electrical Parts Remanufacturing, Inc.	2 N. 35th Ave. Phoenix, Arizona 85009				X	
Madison Industries	2100 S. 11th Ave. Phoenix, Arizona 85007					X

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Manco, Inc.	1738 W. Lincoln St. Phoenix, Arizona 85007				X	
Manufacturers Coop	64 N. 45th Ave. Phoenix, Arizona 85043					X
Marco Crane & Rigging Co.	221 S. 35th Ave. Phoenix, Arizona 85009				X	
Maricopa County Health Dept. Warehouse	2323 S. 35th Ave. Phoenix, Arizona 85009				X	X
Maricopa County Highway Dept. Warehouse	3325 W. Durango St. St. Phoenix, Arizona 85009				X	
Maricopa County Tanks	5140 W. Monroe St. Phoenix, Arizona 85043 (Van Buren Tank Farm)	Maricopa Co. Materials Management 320 W. Lincoln st. Phoenix, Arizona 85003			X	
Maryatt Industries Phoenix	720 W. Buchanan St. Phoenix, Arizona 85007	Maryatt Industries, Inc. 771 Valley St. Seattle, Washington St. 98109			X	
Maximet Corp.	5925 W. Monroe St. Phoenix, Arizona 85043			X	X	
Metra Steel	210 S. 51st Ave. Phoenix, Arizona 85043					X
Meyer & Lundahl Manufacturing	2345 W. Lincoln St. Phoenix, Arizona 85009				X	X

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Milum Textile Services	333 N. 7th Ave. Phoenix, Arizona 85007			X	X	
National Metals Company	320 S. 19th Ave. Phoenix, Arizona 85007			X	X	X
Optifab, Inc.	1550 W. Van Buren St. Phoenix, Arizona 85007	Robert G. Loeb 3720 E. Mountain View Phoenix, Arizona		X	X	
Orbit Cleaners	902 N. 35th Ave. Phoenix, Arizona 85009					X
Owens Corning Fiberglass	1880 W. Fillmore St. Phoenix, Arizona 85007	5151 N. 16th St. Phoenix, Arizona				X
P.K. Weatherland	3214 W. Durango St. Phoenix, Arizona 85009				X	
P.K. Weatherland Co.	3138 W. Durango St. Phoenix, Arizona 85009				X	
PMF	230 S. 49th Ave. Phoenix, Arizona 85043					X
Patco Distributing	1205 W. Hilton Ave. Phoenix, Arizona 85007					X
Penn Athletic Products Division	306 S. 45th Ave. Phoenix, Arizona 85043		X	X	X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
City of Phoenix Petroleum Store	5119 W. Monroe St. Phoenix, Arizona 85009 (Van Buren Tank Farm)	City of Phoenix 135 N. 2nd Ave. Phoenix, Arizona 85003			X	
City of Phoenix Petroleum Store	2239 W. Lower Buckeye Rd. Phoenix, Arizona 85009	City of Phoenix 135 N. 2nd Ave. Phoenix, Arizona 85003			X	
City of Phoenix WWT	(see 23rd Ave. Wastewater Treatment Facility)				X	
Phoenix Generator Exchange, Inc.	1644 W. Linden Phoenix, Arizona 85007			X	X	
Phoenix Heat Treating	2405 W. Mohave St. Phoenix, Arizona 85009			X	X	X
Pioneer Metal Finishing	230 S. 49th Ave. Phoenix, Arizona 85043			X	X	
Powerine Oil	5159 W. Monroe St. Phoenix, Arizona 85043 (Van Buren Tank Farm)				X	
Precision Painting	1139 W. Hilton Ave. Phoenix, Arizona 85007					X
Prudential Overall Supply, Inc.	5102 W. Roosevelt St. Phoenix, Arizona 85043				X	X
R B Machine Company, Inc.	3729 W. Buchanan St. Phoenix, Arizona 85009	Richard & Helga Baworowski 1234 E. LeMarche			X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Ramco Industries	4940 W. Jefferson St. Phoenix, Arizona 85043					X
Revlon, Inc.	4301 W. Buckeye Rd. Phoenix, Arizona 85043			X	X	
Reynolds Aluminum Plant Ponds	43rd Ave. & Salt River Phoenix, Arizona 85042		X		X	
Reynolds Metals Co.	3663 W. Van Buren St. Phoenix, Arizona 85009	4101 W. Van Buren St. Phoenix, Arizona 85009	X		X	
Reynolds Metals Co.	3501 W. Van Buren St. Phoenix, Arizona 85009	P.O. Box 27003 Richmond, Virginia 23261	X		X	
Rinchem Co.	1550 W. Lower Buckeye Rd. Phoenix, Arizona 85007	411 W. Turney Ave. Phoenix, Arizona				X
Sahuaro Petroleum & Asphalt	1935 W. McDowell Rd. Phoenix, Arizona 85009			X	X	X
Sahuaro Petroleum & Asphalt	731 N. 19th Ave. Phoenix, Arizona 85009	1935 W. McDowell Rd. Phoenix, Arizona 85009		X	X	X
San Joaquin Refining Co.	131 S. 57th Ave. Phoenix, Arizona 85043				X	X
Sav-Trac of Arizona	2602 W. Durango St. Phoenix, Arizona 85009	Durango Industrial Inc. 509 E. Eva St. Phoenix, Arizona 85020		X	X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Schuff Steel Company	420 S. 19th Ave Phoenix, Arizona 85009	19th Avenue Ltd. Partnership		X	X	
Shasta Industries	2130 W. Fillmore St. Phoenix, Arizona 85009	Carl Baker 7710 N. 16th Ln. Phoenix, Arizona 85021				X
Shell Oil Co.	109 N. 55th Ave. Phoenix, Arizona 85043 (Van Buren Tank Farm)	Southern Pacific Pipe Line Co. 888 S. Figueroa St. Los Angeles, Calfornia 90017			X	
Smith Pipe & Steel	735 N. 19th Ave. Phoenix, Arizona 85009				X	
Southern Pacific Pipe Lines, Inc.	49 N. 53rd Ave. Phoenix, Arizona 85031 (Van Buren Tank Farm)	Exxon Company USA 16945 Northchase Blvd. Houston, Texas 77060			X	
Southern Pacific Transportation Company	13th Ave. & Harrison St. Phoenix, Arizona					X
Southwest Gas Corporation	9 S. 43rd Ave. Phoenix, Arizona 85072			X	X	X
SRP	55th Ave. & Madison St. Phoenix, Arizona 85043 (Van Buren Tank Farm)				X	
Sub-Zero Freezer Co., Inc.	3865 W. Van Buren St. Phoenix, Arizona 85009	Sub-Zero Freezer Co., Inc. P.O. Box 4130 Madison, Wisconsin 53711		X	X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Sun Plating	3308 W. Sherman St. Phoenix, Arizona 85009	(vacant)			X	X
Superior Retreading, Inc.	420 S. 35th Ave. Phoenix, Arizona 85009				X	X
Texaco	303 N. Black Canyon Hwy. Phoenix, Arizona 85009					X
Texaco Phx. Az. Sales Terminal	5325 W. Van Buren St. Phoenix, Arizona 85043 (Van Buren Tank Farm)	Texaco Refining/Marketing, Inc. 10 Universal City Plaza Los Angeles, California 90051			X	
Treffers Precision, Inc.	1021 N. 22nd Ave. Phoenix, Arizona 85009	John Treffers		X	X	
Tritech Manufacturing, Inc.	5144 W. McKinley St. Phoenix, Arizona 85043	CMD Southwest 3225 S. Hardy Dr., #105			X	
Truck Salvage	1433 S. 19th Ave. Phoenix, Arizona 85009				X	
U.S. Dept. of Interior Bureau of Reclamation Az. Projects	505 S. 43rd Ave. Phoenix, Arizona 85009				X	
Union Oil Co. of California (UNOCAL)	10 S. 51st Ave. Phoenix, Arizona 85009 (Van Buren Tank Farm)				X	

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
US Con Rod	1559 Grand Ave. Phoenix, Arizona 85007					X
US Steel	Madison St. Phoenix, Arizona 85043					X
V.G.R.	2418 W. Grant St. Phoenix, Arizona 85009				X	X
Valley Forge	1825 S. 27th Ave. Phoenix, Arizona 85009				X	X
Valley Machine Work	701 W. Jackson St. Phoenix, Arizona 85007					X
Valley North American	1825 S. Black Canyon Hwy. Phoenix, Arizona 85009	ARIPROP 1825 S. Black Canyon Hwy. Phoenix, Arizona 85009				X
Valley Truck & Trailer	2302 S. 15th Ave. Phoenix, Arizona 85007				X	
Van Waters & Rogers, Inc.	50 S. 45th Ave. Phoenix, Arizona 85043	Univar Corp. 801 2nd Ave. Seattle, Washington 98104	X	X	X	
Wakefield Mfg.	1726 W. Linden St. Phoenix, Arizona 85007				X	X

List of Facilities
West Van Buren Study Area

July 1989

Current Name Owner/Operator	Site Address	Current Owner of Record	Planned Activities: Physical Testing	Site Inspection	Records Search	Questionnaire Response
Wash House	3114 W. Van Buren St. Phoenix, Arizona 85009					X
Waste Management of Phoenix-South	3000 S. 19th Ave. Phoenix, Arizona 85005	Superior Equipment				X
Western Cotton Services Co.	615 S. 51st Ave. Phoenix, Arizona 85043	Anderson Clayton 615 S. 51st Ave. Phoenix, Arizona 85043		X	X	
Western Diesel Repair	6316 W. Van Buren St. Phoenix, Arizona 85043			X	X	X

APPENDIX B
SAMPLE QUESTIONNAIRE

APPENDIX B

Sample Questionnaire

This appendix contains a sample of the questionnaire sent out as a part of this phase of investigation.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Ronald L. Miller, PhD, PE
Acting Director

July 13, 1988

Dear Sir or Madame:

The Arizona Department of Environmental Quality requests your assistance in gathering information on present and past businesses which use, treat, store, or dispose of hazardous materials, mixtures containing hazardous materials, and/or hazardous waste. The attached questionnaire is being issued under the authority of Arizona Revised Statutes S49-287.K., which requires that hazardous materials users furnish information related to hazardous substances.

Please complete the questionnaire and return it to the following address within twenty-one calendar days.

Arizona Department of Environmental Quality
2005 N. Central Avenue
Suite 400
Phoenix, Arizona 85004
Attn: Sandra Eberhardt

The Department is conducting this survey as part of the West Van Buren Project supported by the Water Quality Assurance Revolving Fund. The area under study consists of approximately 35 square miles in southwestern Phoenix bounded by McDowell Rd. to the north, 7th Avenue to the east, the Salt River to the south, and 83rd Avenue to the west. Elevated volatile organic compound concentrations were found in ground water at ten locations in the West Van Buren Area.

A hazardous material may be broadly defined as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. A hazardous material includes, but is not limited to, a hazardous substance, hazardous waste, and any material for which there is reasonable basis for believing it would be injurious to human health and safety, or harmful to the environment if released. To assist you in determining whether you are dealing with hazardous materials, attachment

A has been included which provides a list of hazardous wastes for reference. If you are in doubt as to whether a material is hazardous, please include that material when completing the attached questionnaire. Even though you may not use, treat, store, or dispose of a hazardous material or waste, you should still complete and return the attached questionnaire so that our records are accurate and current.

Thank you for your cooperation. If you have questions you may call me at (602) 257-6841.

Sincerely,

Sandra Eberhardt

ATTN: SANDRA EBERHARDT, PROJECT MANAGER

WEST VAN BUREN AREA
HAZARDOUS MATERIALS QUESTIONNAIRE

1. Company name _____

   Company representative/contact _____

   Street address _____

   City, zip code _____

   Phone number _____

   Business license number _____

   Principal business activity _____

   Standard Industrial Code _____

   Number of employees _____

   Property Parcel Number _____

2. What specific activities are carried out at your facility?

_____

_____

_____

3. Are you the owner of the property? [ ] Yes [ ] No

   If no, please provide the following:

   A. Name of owner(s): _____

   B. Address of owner(s): _____

   C. Telephone number(s): _____

4. How long has the company been at this location? _____

5. Name and business of previous occupant?

_____

_____

6. Does your business, at the location above, currently:

   generate [ ], transport [ ], treat [ ], store [ ], or dispose [ ]

   of hazardous materials, mixtures containing hazardous materials, or hazardous wastes? (Please check all that apply.)

7. Has your business ever:

   generated [ ],transported [ ], treated [ ], stored [ ], or disposed of [ ]

   hazardous materials, mixtures containing hazardous materials, or hazardous waste? (Please check all that apply.)

8. Has the company ever had a chemical, solvent and/or hazardous substance spill, leak or release at this location? [ ] Yes [ ] No

   If yes, please provide the following:

   A. Chemical name of substance spilled:_____

   B. Quanity spilled:_____ [ ] gallons [ ] pounds

   C. Date of spill:_____

   D. Type of cleanup, if applicable:_____

   E. Regulatory agency involved:_____

9. Please indicate if your business has any of the following:

   [ ] Industrial wastewater discharge permit, No._____

   [ ] Underground storage tank notification to ADEQ

   [ ] Environmental Protection Agency,
   Generator Identification No._____

   [ ] Air Pollution Control Permit, number of permit_____

10. Has your facility been on the sewer system since beginning of occupancy?

    [ ] Yes [ ] No - If no, when was your facility connected to the sewer system?

_____

11. If your facility is currently on the sewer system are there any restrictions or pretreatment requirements? [ ] No [ ] Yes - If yes, please specify-

_____

_____

12. If your facility currently is not or in the past was not connected to the sewer, how is or was the facility's wastewater disposed of?

_____

13. Which of the following are located within the boundaries of your property? (Please check all that apply.) Please estimate the amount and type of material disposed of to each of the checked items; attach any design or construction data you have for the facilities indicated. Also, please attach copies of analyses of any solid or liquid samples from these facilities on your property, and similar facilities located adjacent to your property.

[ ] Wells _____
If yes, Provide State Well ID or Registration #_____

[ ] Surface impoundments (evaporation ponds, storage ponds, etc.)

_____

[ ] Leach fields _____

[ ] Sumps _____

[ ] Underground storage tanks _____

[ ] Above-ground storage tanks (including drums) _____

[ ] Drainage ditch running off the property _____

14. If available, attach your most recent annual report.

15. Provide any other information you may have regarding the use, storage or disposal of wastes, chemicals or hazardous substances at any other facilities in the West Van Buren Area. Please be as specific as possible including names, addresses, locations, dates, quantity, and identity of substances involved.

_____

_____

_____

16. For each hazardous material or mixture containing hazardous materials, used in the past or currently used at your facility, and for any hazardous waste generated at your facility, please provide all of the information requested in the following matrix. Two sheets have been provided. Please attach copies if more space is required. Please include appropriate units, i.e. gallons, pounds, etc.

HAZARDOUS MATERIALS

Common Name						
Chemical Name						
CAS Number						
Indicate if pure, or concentration if mixture						
Typical amount used per year						
Type and size of storage or containment						
Method and amount of disposal						
Normal use of the substance						
Dates of use						

HAZARDOUS MATERIALS

Common Name						
Chemical Name						
CAS Number						
Indicate if pure, or concentration if mixture						
Typical amount used per year						
Type and size of storage or containment						
Method and amount of disposal						
Normal use of the substance						
Dates of use						

ATTACHMENT A

LIST OF HAZARDOUS WASTES

FROM

40CFR 261.3

Hazardous wastes from non-specific sources

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Generic:		
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T) (I)*
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)*
F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I,T)
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	(T)
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum	(T)
F007	Spent cyanide plating bath solutions from electroplating operations	(R, T)
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R, T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R, T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R, T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R, T)
F012	Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process.	(T)
F024	Wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. [This listing does not include light ends, spent filters and filter aids, spent dessicants, wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in § 261.32.].	(T)
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H)
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	(H)
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.	(H)
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H)
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H)
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.).	(H)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.	(T)

*(I,T) should be used to specify mixtures containing ignitable and toxic constituents.

Hazardous wastes from specific sources

Industry and EPA hazardous waste No	Hazardous waste	Hazard code
Wood preservation: K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
Inorganic pigments:		
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.	(T)
K003	Wastewater treatment sludge from the production of molybdate orange pigments	(T)
K004	Wastewater treatment sludge from the production of zinc yellow pigments	(T)
K005	Wastewater treatment sludge from the production of chrome green pigments	(T)
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).	(T)
K007	Wastewater treatment sludge from the production of iron blue pigments	(T)
K008	Oven residue from the production of chrome oxide green pigments	(T)
Organic chemicals:		
K009	Distillation bottoms from the production of acetaldehyde from ethylene	(T)
K010	Distillation side cuts from the production of acetaldehyde from ethylene	(T)
K011	Bottom stream from the wastewater stripper in the production of acrylonitrile	(R, T)
K013	Bottom stream from the acetonitrile column in the production of acrylonitrile	(R, T)
K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile	(T)
K015	Still bottoms from the distillation of benzyl chloride	(T)
K016	Heavy ends or distillation residues from the production of carbon tetrachloride	(T)
K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.	(T)
K018	Heavy ends from the fractionation column in ethyl chloride production	(T)
K019	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.	(T)
K020	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.	(T)
K021	Aqueous spent antimony catalyst waste from fluoromethanes production	(T)
K022	Distillation bottom tars from the production of phenol/acetone from cumene	(T)
K023	Distillation light ends from the production of phthalic anhydride from naphthalene	(T)
K024	Distillation bottoms from the production of phthalic anhydride from naphthalene	(T)
K093	Distillation light ends from the production of phthalic anhydride from ortho-xylene	(T)
K094	Distillation bottoms from the production of phthalic anhydride from ortho-xylene	(T)
K025	Distillation bottoms from the production of nitrobenzene by the nitration of benzene	(T)
K026	Stripping still tails from the production of methy ethyl pyridines	(T)
K027	Centrifuge and distillation residues from toluene diisocyanate production	(R, T)
K028	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.	(T)
K029	Waste from the product steam stripper in the production of 1,1,1-trichloroethane	(T)
K095	Distillation bottoms from the production of 1,1,1-trichloroethane	(T)
K096	Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.	(T)
K030	Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.	(T)
K083	Distillation bottoms from aniline production	(T)
K103	Process residues from aniline extraction from the production of aniline	(T)
K104	Combined wastewater streams generated from nitrobenzene/aniline production	(T)
K085	Distillation or fractionation column bottoms from the production of chlorobenzenes	(T)
K105	Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.	(T)
K111	Product washwaters from the production of dinitrotoluene via nitration of toluene	(C, T)
K112	Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.	(T)
K113	Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	(T)
K114	Vicinals from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	(T)
K115	Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	(T)
K116	Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.	(T)
K117	Wastewater from the reactor vent gas scrubber in the production of ethylene dibromide via bromination of ethene.	(T)
K118	Spent adsorbent solids from purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	(T)
K136	Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene	(T)
Inorganic chemicals		
K071	Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.	(T)
K073	Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.	(T)
K106	Wastewater treatment sludge from the mercury cell process in chlorine production	(T)
Pesticides		
K031	By-product salts generated in the production of MSMA and cacodylic acid	(T)
K032	Wastewater treatment sludge from the production of chlordane	(T)
K033	Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.	(T)
K034	Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.	(T)
K097	Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.	(T)
K035	Wastewater treatment sludges generated in the production of creosote	(T)
K036	Still bottoms from toluene reclamation distillation in the production of disulfoton	(T)
K037	Wastewater treatment sludges from the production of disulfoton	(T)
K038	Wastewater from the washing and stripping of phorate production	(T)

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
K039	Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.	(T)
K040	Wastewater treatment sludge from the production of phorate	(T)
K041	Wastewater treatment sludge from the production of toxaphene	(T)
K098	Untreated process wastewater from the production of toxaphene	(T)
K042	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.	(T)
K043	2,6-Dichlorophenol waste from the production of 2,4-D	(T)
K099	Untreated wastewater from the production of 2,4-D	(T)
K123	Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenebisdithiocarbamic acid and its salt.	(T)
K124	Reactor vent scrubber water from the production of ethylenebisdithiocarbamic acid and its salts.	(C, T)
K125	Filtration, evaporation, and centrifugation solids from the production of ethylenebisdithiocarbamic acid and its salts.	(T)
K126	Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylenebisdithiocarbamic acid and its salts.	(T)
Explosives:		
K044	Wastewater treatment sludges from the manufacturing and processing of explosives	(R)
K045	Spent carbon from the treatment of wastewater containing explosives	(R)
K046	Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.	(T)
K047	Pink/red water from TNT operations	(R)
Petroleum refining:		
K048	Dissolved air flotation (DAF) float from the petroleum refining industry	(T)
K049	Slop oil emulsion solids from the petroleum refining industry	(T)
K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry	(T)
K051	API separator sludge from the petroleum refining industry	(T)
K052	Tank bottoms (leaded) from the petroleum refining industry	(T)
Iron and steel:		
K061	Emission control dust/sludge from the primary production of steel in electric furnaces.	(T)
K062	Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332).	(C,T)
Secondary lead:		
K069	Emission control dust/sludge from secondary lead smelting	(T)
K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting	(T)
Veterinary pharmaceuticals:		
K084	Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds	(T)
K101	Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	(T)
K102	Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	(T)
Ink formulation: K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead	(T)
Coking:		
K060	Ammonia still lime sludge from coking operations	(T)
K087	Decanter tank tar sludge from coking operations	(T)

Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof (acute)

Hazardous waste No.	Chemical abstracts No.	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P066	16752-77-5	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester
P002	591-08-2	1-Acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-alpha-Aminopyridine
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P010	7778-39-4	Arsenic acid
P012	1327-53-3	Arsenic oxide As_2O_3
P011	1303-28-2	Arsenic oxide As_2O_5
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl
P036	696-28-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro-
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-
P046	122-09-8	Benzeneethanamine, alpha,alpha-dimethyl-
P014	108-98-5	Benzenethiol
P001	81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium dust
P016	542-88-1	Bis(chloromethyl) ether
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P021	592-01-8	Calcium cyanide
P022	75-15-0	Carbon bisulfide
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P029	544-92-3	Copper cyanide
P030	.....	Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropyl fluorophosphate (DFP)
P004	309-00-2	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-
P060	465-73-6	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3b]oxirane, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-
P051	72-20-8	2,7:3,6-Dimethanonaphth[2,3b]oxirane, octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-
P044	60-51-5	Dimethoate
P045	39196-18-4	3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P047	534-52-1	4,6-Dinitro-o-cresol and salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramide, octamethyl-
P039	298-04-4	Disulfoton
P049	541-53-7	2,4-Dithiobiuret
P050	115-29-7	Endosulfan
P088	145-73-3	Endothal
P051	72-20-8	Endrin
P042	51-43-4	Epinephrine
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethyleneimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoroacetic acid, sodium salt
P065	628-86-4	Fulminic acid, mercury(2+) salt (R,T)
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyltetraphosphate
P116	79-19-6	Hydrazinecarbothioamide
P068	60-34-4	Hydrazine, methyl-
P063	74-90-8	Hydrocyanic acid
P063	74-90-8	Hydrogen cyanide
P096	7803-51-2	Hydrogen phosphide
P064	624-83-9	Isocyanic acid, methyl ester
P060	465-73-6	Isodrin
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P092	62-38-4	Mercury, (acetato-O)phenyl-
P065	628-86-4	Mercury fulminate (R,T)
P082	62-75-9	Methanamine, N-methyl-N-nitroso-
P016	542-88-1	Methane, oxybis[chloro-

Hazardous waste No.	Chemical abstracts No.	Substance
P112	509-14-8	Methane, tetranitro- (R)
P118	75-70-7	Methanethiol, trichloro-
P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepen, 6,7,8,9,10,10-hexachloro- 1,5,5a,6,9,9a-hexahydro-, 3-oxide
P059	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P066	16752-77-5	Methomyl
P067	75-55-8	2-Methylaziridine
P068	60-34-4	Methyl hydrazine
P064	624-83-9	Methyl isocyanate
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P072	86-88-4	alpha-Naphthylthiourea
P073	13463-39-3	Nickel carbonyl
P073	13463-39-3	Nickel carbonyl, (T-4)-
P075	[1] 54-11-5	Nicotine and salts
P076	10102-43-9	Nitric oxide
P077	100-01-6	p-Nitroaniline
P078	10102-44-0	Nitrogen dioxide
P076	10102-43-9	Nitrogen oxide NO
P078	10102-44-0	Nitrogen oxide NO_2
P081	55-63-0	Nitroglycerine (R)
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P074	557-19-7	Nickel cyanide
P085	152-16-9	Octamethylpyrophosphoramide
P087	20816-12-0	Osmium oxide
P087	20816-12-0	Osmium tetroxide
P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P089	56-38-2	Parathion
P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	51-28-5	Phenol, 2,4-dinitro-
P047	[1] 534-52-1	Phenol, 2-methyl-4,6-dinitro- and salts
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P092	62-38-4	Phenylmercury acetate
P093	103-85-5	Phenylthiourea
P094	298-02-2	Phorate
P095	75-44-5	Phosgene
P096	7803-51-2	Phosphine
P041	311-45-5	Phosphonc acid, diethyl 4-nitrophenyl ester
P039	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P044	60-51-5	Phosphorodithioic acid, O,O-dimethyl S[2-(methylamino)-2-oxoethyl] ester
P043	55-91-4	Phosphorofluoric acid, bis(1-methylethyl)- ester
P089	56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P040	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P097	52-85-7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester
P071	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester
P110	78-00-2	Plumbane, tetraethyl-
P098	151-50-8	Potassium cyanide
P099	506-61-6	Potassium silver cyanide
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P101	107-12-0	Propanenitrile
P027	542-76-7	Propanenitrile, 3-chloro-
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55-63-0	1,2,3-Propanetriol, trinitrate (R)
P017	598-31-2	2-Propanone, 1-bromo-
P102	107-19-7	Propargyl alcohol
P003	107-02-8	2-Propenal
P005	107-18-6	2-Propen-1-ol
P067	75-55-8	1,2-Propylenimine
P102	591-08-2	2-Propyn-1-ol
P008	504-24-5	Pyridinamine
P075	[1] 54-11-5	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts
P111	107-49-3	Pyrophosphoric acid, tetraethyl ester
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide
P107	1314-96-1	Strontium sulfide
P108	[1] 57-24-9	Strychnidin-10-one, and salts
P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P108	[1] 57-24-9	Strychnine and salts
P115	10031-59-1	Sulfuric acid, thallium(I) salt
P109	3689-24-5	Tetraethyldithiopyrophosphate
P110	78-00-2	Tetraethyl lead
P111	107-49-3	Tetraethylpyrophosphate
P112	509-14-8	Tetranitromethane (R)
P062	757-58-4	Tetraphosphonc acid, hexaethyl ester
P113	1314-32-5	Thallic oxide
P113	1314-32-5	Thallium(III) oxide
P114	12039-52-0	Thallium(I) selenite
P115	10031-59-1	Thallium(I) sulfate
P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P045	39196-18-4	Thiofanox
P049	541-53-7	Thioimidodicarbonic diamide
P014	108-98-5	Thiophenol
P116	79-19-6	Thiosemicarbazide
P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P072	86-88-4	Thiourea, 1-naphthalenyl-
P093	103-85-5	Thiourea, phenyl-
P123	8001-35-2	Toxaphene
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Vanadic acid, ammonium salt
P120	1314-62-1	Vanadium(V) oxide
P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-
P001	81-81-2	Warfarin
P121	557-21-1	Zinc cyanide
P122	1314-84-7	Zinc phosphide (R,T)

[1] CAS Number given for parent compound only.

Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof (toxic)

Hazardous waste No.	Chemical abstracts No.	Substance
U001	75-07-0	Acetaldehyde (I)
U034	75-87-6	Acetaldehyde, trichloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl
U112	141-78-6	Acetic acid, ethyl ester (I)
U144	301-04-2	Acetic acid, lead salt
U214	563-68-8	Acetic acid, thallium (1 +) salt
U232	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U006	75-36-5	Acetyl chloride (C,R,T)
U007	79-06-1	Acrylamide
U008	79-10-7	Acrylic acid (I)
U009	107-13-1	Acrylonitrile
U011	61-82-5	Amitrole
U012	62-53-3	Aniline (I,T)
U014	492-80-8	Auramine
U015	115-02-6	Azaserine
U010	50-07-7	Azirino(2',3':3,4)pyrrolo(1,2-a)indole-4,7-dione, 6-amino-8-[((aminocarbonyl)oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-
U157	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	225-51-4	3,4-Benzacridine
U017	98-87-3	Benzal chloride
U192	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-diethyl-2-propynyl)-
U018	56-55-3	Benz[a]anthracene
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-
U012	62-53-3	Benzenamine (I,T)
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95-53-4	Benzenamine, 2-methyl-
U353	106-49-0	Benzenamine, 4-methyl-
U158	101-14-4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636-21-5	Benzenamine, 2-methyl-, hydrochloride
U181	99-55-8	Benzenamine, 2-methyl-5-nitro-
U019	71-43-2	Benzene
U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U035	305-03-3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	108-90-7	Benzene, chloro-
U221	25376-45-8	Benzenediamine, ar-methyl-
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexy) ester
U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	117-84-0	1,2-Benzenedicarboxylic acid, di-n-octyl ester
U070	95-50-1	Benzene, 1,2-dichloro-
U071	541-73-1	Benzene, 1,3-dichloro-
U072	106-46-7	Benzene, 1,4-dichloro-
U060	72-54-8	Benzene, 1, 1'-(2,2-dichloroethylidene)bis[4-chloro-
U017	98-87-3	Benzene, (dichloromethyl)-
U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330-20-7	Benzene, dimethyl- (I,T)
U201	108-46-3	1,3-Benzenediol
U127	118-74-1	Benzene, hexachloro-
U056	110-82-7	Benzene, hexahydro- (I)
U220	108-88-3	Benzene, methyl-
U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U106	606-20-2	Benzene, 2-methyl-1,3-dinitro-
U055	98-82-8	Benzene, (1-methylethyl)- (I)
U169	98-95-3	Benzene, nitro- (I,T)
U183	608-93-5	Benzene, pentachloro-
U185	82-68-8	Benzene, pentachloronitro-
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U020	98-09-9	Benzenesulfonyl chloride (C,R)
U207	95-94-3	Benzene, 1,2,4,5-tetrachloro-
U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)[4-methoxy-
U023	98-07-7	Benzene, (trichloromethyl)- (C,R,T)
U234	99-35-4	Benzene, 1,3,5-trinitro- (R,T)
U021	92-87-5	Benzidine
U202	181-07-2	1,2-Benzisothiazol-3-(2H)-one, 1,1-dioxide and salts
U203	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-
U141	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-
U090	94-58-6	1,3-Benzodioxole, 5-propyl-
U064	189-55-9	Benzo[rst]pentaphene
U022	50-32-8	Benzo[a]pyrene
U197	106-51-4	p-Benzoquinone
U023	98-07-7	Benzotrichloride (C,R,T)
U085	1464-53-5	2,2'-Bioxirane (I,T)
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine
U073	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U027	39638-32-9	Bis(2-chloroisopropyl) ether
U024	111-91-1	Bis(2-chloromethoxy) ethane
U028	117-81-7	Bis(2-ethylhexyl) phthalate
U225	75-25-2	Bromoform
U030	101-55-3	4-Bromophenyl phenyl ether
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-

Hazardous waste No.	Chemical abstracts No.	Substance
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-
U031	71-36-3	1-Butanol (I)
U159	78-93-3	2-Butanone (I,T)
U160	1338-23-4	2-Butanone peroxide (R,T)
U053	4170-30-3	2-Butenal
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)
U143	303-34-4	2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy)methyl]-2,3,5,7a-tetrahydro-1-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S, 3R), 7aalpha]]-
U031	71-36-3	n-Butyl alcohol (I)
U136	75-60-5	Cacodylic acid
U032	13765-19-0	Calcium chromate
U238	51-79-6	Carbamic acid, ethyl ester
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester
U097	79-44-7	Carbamic chloride, dimethyl-
U114	' 111-54-6	Carbamodithioic acid, 1,2-ethanediylbis-,salts and esters
U062	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-S-(2,3-dichloro-2-propenyl) ester
U215	6533-73-9	Carbonic acid, dithallium(1+) salt
U033	353-50-4	Carbonic difluoride
U156	79-22-1	Carbonochloridic acid, methyl ester (I,T)
U033	353-50-4	Carbon oxyfluoride (R,T)
U211	56-23-5	Carbon tetrachloride
U034	75-87-6	Chloral
U035	305-03-3	Chlorambucil
U036	12789-03-6	Chlordane
U026	494-03-1	Chlornaphazine
U037	108-90-7	Chlorobenzene
U039	59-50-7	p-Chloro-m-cresol
U041	106-89-8	1-Chloro-2,3-epoxypropane
U042	110-75-8	2-Chloroethyl vinyl ether
U044	67-66-3	Chloroform
U046	107-30-2	Chloromethyl methyl ether
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	o-Chlorophenol
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U032	13765-19-0	Chromic acid, calcium salt
U050	218-01-9	Chrysene
U051	8021-39-4	Creosote
U052	1319-77-3	Cresols (Cresylic acid)
U053	4170-30-3	Crotonaldehyde
U055	98-82-8	Cumene (I)
U246	506-68-3	Cyanogen bromide
U197	106-51-4	2,5-Cyclohexadiene-1, 4-dione
U056	110-82-7	Cyclohexane (I)
U057	108-94-1	Cyclohexanone (I)
U130	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	50-18-0	Cyclophosphamide
U240	' 94-75-7	2,4-D, salts and esters
U059	20830-81-3	Daunomycin
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	53-70-3	Dibenz[a,h]anthracene
U064	189-55-9	Dibenzo[a,i]pyrene
U066	96-12-8	1,2-Dibromo-3-chloropropane
U069	84-74-2	Dibutyl phthalate
U070	95-50-1	o-Dichlorobenzene
U071	541-73-1	m-Dichlorobenzene
U072	106-46-7	p-Dichlorobenzene
U073	91-94-1	3,3'-Dichlorobenzidine
U074	764-41-0	1,4-Dichloro-2-butene (I,T)
U075	75-71-8	Dichlorodifluoromethane
U078	75-35-4	1,1-Dichloroethylene
U079	156-60-5	1,2-Dichloroethylene
U025	111-44-1	Dichloroethyl ether
U081	120-83-2	2,4-Dichlorophenol
U082	87-65-0	2,6-Dichlorophenol
U240	' 94-75-7	2,4-Dichlorophenoxyacetic acid, salts and esters
U083	78-87-5	1,2-Dichloropropane
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	1,2:3,4-Diepoxybutane (I,T)
U108	123-91-1	1,4-Diethyleneoxide
U086	1615-80-1	N,N-Diethylhydrazine
U087	3288-58-2	O,O-Diethyl-S-methyl-dithiophosphate
U088	84-66-2	Diethyl phthalate
U089	56-53-1	Diethylstilbestrol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	124-40-3	Dimethylamine (I)
U093	60-11-7	Dimethylaminoazobenzene
U094	57-97-6	7,12-Dimethylbenz[a]anthracene
U095	119-93-7	3,3'-Dimethylbenzidine
U096	80-15-9	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U097	79-44-7	Dimethylcarbamoyl chloride
U098	57-14-7	1,1-Dimethylhydrazine
U099	540-73-8	1,2-Dimethylhydrazine
U101	105-67-9	2,4-Dimethylphenol
U102	131-11-3	Dimethyl phthalate
U103	77-78-1	Dimethyl sulfate
U105	121-14-2	2,4-Dinitrotoluene
U106	606-20-2	2,6-Dinitrotoluene
U107	117-84-0	Di-n-octyl phthalate

Hazardous waste No.	Chemical abstracts No.	Substance
U108	123-91-1	1,4-Dioxane
U109	122-66-7	1,2-Diphenylhydrazine
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n-propylnitrosamine
U001	75-07-0	Ethanal (I)
U174	55-18-5	Ethanamine, N-ethyl-N-nitroso-
U155	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U067	106-93-4	Ethane, 1,2-dibromo-
U076	75-34-3	Ethane, 1,1-dichloro-
U077	107-06-2	Ethane, 1,2-dichloro-
U131	67-72-1	Ethane, hexachloro-
U024	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U117	60-29-7	Ethane, 1,1'-oxybis- (I)
U025	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
U184	76-01-7	Ethane, pentachloro-
U208	630-20-6	Ethane, 1,1,1,2-tetrachloro-
U209	79-34-5	Ethane, 1,1,2,2-tetrachloro-
U218	62-55-5	Ethanethioamide
U227	110-80-5	Ethanol, 2-ethoxy-
U359	79-00-5	Ethane, 1,1,2-trichloro-
U173	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
U004	98-86-2	Ethanone, 1-phenyl-
U043	75-01-4	Ethene, chloro-
U042	110-75-8	Ethene, (2-chloroethoxy)-
U078	75-35-4	Ethene, 1,1-dichloro-
U079	156-60-5	Ethene, 1,2-dichloro-, (E)-
U210	127-18-4	Ethene, tetrachloro
U228	79-01-6	Ethene, trichloro
U112	141-78-6	Ethyl acetate (I)
U113	140-88-5	Ethyl acrylate (I)
U238	51-79-6	Ethyl carbamate
U038	510-15-6	Ethyl 4,4'-dichlorobenzilate
U114	111-54-6	Ethylenebisdithiocarbamic acid, salts and esters
U067	106-93-4	Ethylene dibromide
U077	107-06-2	Ethylene dichloride
U359	110-80-5	Ethylene glycol monoethyl ether
U115	75-21-8	Ethylene oxide (I,T)
U116	96-45-7	Ethylene thiourea
U117	60-29-7	Ethyl ether (I)
U076	75-34-3	Ethylidene dichloride
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethylmethanesulfonate
U120	206-44-0	Fluoranthene
U122	50-00-0	Formaldehyde
U123	64-18-6	Formic acid (C,T)
U124	110-00-9	Furan (I)
U125	98-01-1	2-Furancarboxaldehyde (I)
U147	108-31-6	2,5-Furandione
U213	109-99-9	Furan, tetrahydro- (I)
U125	98-01-1	Furfural (I)
U124	110-00-9	Furfuran (I)
U206	18883-66-4	D-Glucopyranose, 2-deoxy-2(3-methyl-3-nitrosoureido)-
U126	765-34-4	Glycidylaldehyde
U163	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso-
U127	118-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U129	58-89-9	Hexachlorocyclohexane (gamma isomer)
U130	77-47-4	Hexachlorocyclopentadiene
U131	67-72-1	Hexachloroethane
U132	70-30-4	Hexachlorophene
U243	1888-71-7	Hexachloropropene
U133	302-01-2	Hydrazine (R,T)
U086	1615-80-1	Hydrazine, 1,2-diethyl-
U098	57-14-7	Hydrazine, 1,1-dimethyl-
U099	540-73-8	Hydrazine, 1,2-dimethyl-
U109	122-66-7	Hydrazine, 1,2-diphenyl-
U134	7664-39-3	Hydrofluoric acid (C,T)
U134	7664-39-3	Hydrogen fluoride (C,T)
U135	7783-06-4	Hydrogen sulfide
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U136	75-60-5	Hydroxydimethylarsine oxide
U116	96-45-7	2-Imidazolidinethione
U137	193-39-5	Indeno[1,2,3cd]pyrene
U139	9004-66-4	Iron dextran
U190	85-44-9	1,3-Isobenzofurandione
U140	78-83-1	Isobutyl alcohol (I,T)
U141	120-58-1	Isosafrole
U142	143-50-0	Kepone
U143	303-34-4	Lasiocarpine
U144	301-04-2	Lead acetate
U146	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri-
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lead subacetate
U129	58-89-9	Lindane
U147	108-31-6	Maleic anhydride
U148	123-33-1	Maleic hydrazide
U149	109-77-3	Malononitrile
U150	148-82-3	Melphalan
U151	7439-97-6	Mercury
U152	126-98-7	Methacrylonitrile (I,T)
U092	124-40-3	Methanamine, N-methyl- (I)

Hazardous waste No.	Chemical abstracts No.	Substance
U029	74-83-9	Methane, bromo-
U045	74-87-3	Methane, chloro- (I,T)
U046	107-30-2	Methane, chloromethoxy-
U068	74-95-3	Methane, dibromo-
U080	75-09-2	Methane, dichloro-
U075	75-71-8	Methane, dichlorodifluoro-
U138	74-88-4	Methane, iodo-
U119	62-50-0	Methanesulfonic acid, ethyl ester
U211	56-23-5	Methane, tetrachloro-
U153	74-93-1	Methanethiol (I,T)
U225	75-25-2	Methane, tribromo-
U044	67-66-3	Methane, trichloro-
U121	75-69-4	Methane, trichlorofluoro-
U123	64-18-6	Methanoic acid (C,T)
U154	67-56-1	Methanol (I)
U155	91-80-5	Methapyrilene
U142	143-50-0	1,3,4-Methano-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U247	72-43-5	Methoxychlor
U154	67-56-1	Methyl alcohol (I)
U029	74-83-9	Methyl bromide
U186	504-60-9	1-Methylbutadiene (I)
U045	74-87-3	Methyl chloride (I,T)
U156	79-22-1	Methylchlorocarbonate (I,T)
U226	71-55-6	Methylchloroform
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4'-Methylenebis(2-chloroaniline)
U068	74-95-3	Methylene bromide
U080	75-09-2	Methylene chloride
U159	78-93-3	Methyl ethyl ketone (MEK) (I,T)
U160	1338-23-4	Methyl ethyl ketone peroxide (R,T)
U138	74-88-4	Methyl iodide
U161	108-10-1	Methyl isobutyl ketone (I)
U162	80-62-6	Methyl methacrylate (I,T)
U163	70-25-7	N-Methyl-N'-nitro-N-nitrosoguanidine
U161	108-10-1	4-Methyl-2-pentanone (I)
U164	56-04-2	Methylthiouracil
U010	50-07-7	Mitomycin C
U059	20830-81-3	5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-
U165	91-20-3	Naphthalene
U047	91-58-7	Naphthalene, 2-chloro-
U166	130-15-4	1,4-Naphthalenedione
U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'dimethyl-(1,1'biphenyl)-4,4'-diyl)]-bis(azo)bis(5-amino-4-hydroxy)-, tetrasodium salt
U166	130-15-4	1,4-Naphthoquinone
U167	134-32-7	alpha-Naphthylamine
U168	91-59-8	beta-Naphthylamine
U026	494-03-1	2-Naphthylamine, N,N'-bis(2-chloromethyl)-
U167	134-32-7	1-Naphthylenamine
U168	91-59-8	2-Naphthylenamine
U217	10102-45-1	Nitric acid, thallium(1+) salt
U169	98-95-3	Nitrobenzene (I,T)
U170	100-02-7	p-Nitrophenol
U171	79-46-9	2-Nitropropane (I,T)
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	N-Nitroso-N-ethylurea
U177	684-93-5	N-Nitroso-N-methylurea
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	N-Nitrosopiperidine
U180	930-55-2	N-Nitrosopyrrolidine
U181	99-55-8	5-Nitro-o-toluidine
U193	1120-71-4	1,2-Oxathiolane, 2,2-dioxide
U058	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U115	75-21-8	Oxirane (I,T)
U126	765-34-4	Oxiranecarboxyaldehyde
U041	106-89-8	Oxirane, (chloromethyl)-
U182	123-63-7	Paraldehyde
U183	608-93-5	Pentachlorobenzene
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
U242	87-86-5	Pentachlorophenol
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U188	108-95-2	Phenol
U048	95-57-8	Phenol, 2-chloro-
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-
U101	105-67-9	Phenol, 2,4-dimethyl-
U052	1319-77-3	Phenol, methyl-
U132	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U170	100-02-7	Phenol, 4-nitro-
U242	87-86-5	Phenol, pentachloro-
U212	58-90-2	Phenol, 2,3,4,6-tetrachloro-
U230	95-94-4	Phenol, 2,4,5-trichloro-
U231	88-06-2	Phenol, 2,4,6-trichloro-
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U145	7446-27-7	Phosphoric acid, lead salt
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl-, S-methyl-, ester
U189	108-95-2	Phosphorous sulfide (R)

Hazardous waste No.	Chemical abstracts No.	Substance
U190	85-44-9	Phthalic anhydride
U191	109-06-8	2-Picoline
U179	100-75-4	Piperidine, 1-nitroso-
U192	23950-58-5	Pronamide
U194	107-10-8	1-Propanamine (I,T)
U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U110	142-84-7	1-Propanamine, N-propyl- (I)
U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U149	109-77-3	Propanedinitrile
U171	79-46-9	Propane, 2-nitro- (I,T)
U027	39638-32-9	Propane, 2,2'-oxybis[2-chloro-
U193	1120-71-4	1,3-Propane sultone
U235	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U140	78-83-1	1-Propanol, 2-methyl- (I,T)
U002	67-64-1	2-Propanone (I)
U084	542-75-6	1-Propene, 1,3-dichloro-
U152	126-98-7	2-Propenenitrile, 2-methyl- (I,T)
U007	79-06-1	2-Propenamide
U243	1888-71-7	1-Propene, hexachloro-
U009	107-13-1	2-Propenenitrile
U008	79-10-7	2-Propenoic acid (I)
U113	140-88-5	2-Propenoic acid, ethyl ester (I)
U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80-66-2	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U233	93-72-1	Propionic acid, 2-(2,4,5-trichlorophenoxy)-
U194	107-10-8	n-Propylamine (I,T)
U083	78-87-5	Propylene dichloride
U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro-
U196	110-86-1	Pyridine
U191	109-06-8	Pyridine, 2-methyl-
U237	66-75-1	2,4(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U164	56-04-2	4-(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930-55-2	Pyrrolidine, 1-nitroso-
U200	50-55-5	Reserpine
U201	108-46-3	Resorcinol
U202	81-07-2	Saccharin and salts
U203	94-59-7	Safrole
U204	7783-00-8	Selenious acid
U204	7783-00-8	Selenium dioxide
U205	7446-34-6	Selenium sulfide (R,T)
U015	115-02-6	L-Serine, diazoacetate (ester)
U233	93-72-1	Silvex
U206	18883-66-4	Streptozotocin
U103	77-78-1	Sulfuric acid, dimethyl ester
U189	1314-80-3	Sulfur phosphide (R)
U232	93-76-5	2,4,5-T
U207	95-94-3	1,2,4,5-Tetrachlorobenzene
U208	630-20-6	1,1,1,2-Tetrachloroethane
U209	79-34-5	1,1,2,2-Tetrachloroethane
U210	127-18-4	Tetrachloroethylene
U212	58-90-2	2,3,4,6-Tetrachlorophenol
U213	109-99-9	Tetrahydrofuran (I)
U214	15843-14-8	Thallium(I) acetate
U215	6533-73-9	Thallium(I) carbonate
U216	7791-12-0	Thallium chloride
U217	10102-45-1	Thallium(I) nitrate
U218	62-55-5	Thioacetamide
U153	74-93-1	Thiomethanol (I,T)
U244	137-26-8	Thioperoxydicarbonic diamide, tetramethyl-
U219	62-56-6	Thiourea
U244	137-26-8	Thiuram
U220	108-88-3	Toluene
U221	25376-45-8	Toluenediamine
U223	26471-62-5	Toluene diisocyanate (R,T)
U328	95-53-4	o-Toluidine
U353	106-49-0	p-Toluidine
U222	636-21-5	o-Toluidine hydrochloride
U011	61-82-5	1H-1,2,4-Triazol-3-amine
U226	71-55-6	1,1,1-Trichloroethane
U227	79-00-5	1,1,2-Trichloroethane
U228	79-01-6	Trichloroethylene
U121	75-69-4	Trichloromonofluoromethane
U230	95-95-4	2,4,5-Trichlorophenol
U231	88-06-2	2,4,6-Trichlorophenol
U234	99-35-4	sym-Trinitrobenzene (R,T)
U182	123-63-7	1,3,5-Trioxane, 2,4,6-trimethyl-
U235	126-72-7	Tris (2,3-dibromopropyl) phosphate
U236	72-57-1	Trypan blue
U237	66-75-1	Uracil mustard
U176	759-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U043	75-01-4	Vinyl chloride
U248	81-81-2	Warfarin, when present at concentrations of 0.3% or less
U239	1330-20-7	Xylene (I)
U200	50-55-5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester
U249	1314-84-7	Zinc phosphide, when present at concentrations of 10% or less

[1] CAS Number given for parent compound only

APPENDIX C

LABORATORY DATA SHEETS

APPENDIX C

Laboratory Data Sheets

This appendix contains the laboratory data sheets for the ground water and soils analyses conducted as a part of this phase of investigation.

Key to Laboratory Data Reports
West Van Buren Study Area

Lab I.D.	Matrix	Analyses	Client I.D.	Legal Well Designation or Soil Sampling Location	ENVIS Number
809028		Gen/metals	Quality Control		
809028		VOCs	Reagent Blank		
80902801	Water	Gen/metals/VOCs	(A-1-1)13add	(A-1-1)13add	5001
80902802	Water	Gen/metals/VOCs	(A-1-2)13dad	(A-1-2)13dad	8031
80902803	Water	Gen/metals/VOCs	(A-1-2)13dad (DUPL)	(A-1-2)13dad	8031
80902804	Water	Gen/metals/VOCs	(A-1-2)21add	(A-1-2)21add	7024
809034		Gen/metals/VOCs	Quality Control		
80903401	Water	Gen/metals/VOCs	(A-1-2)1cac	(A-1-2)1cac	1009
80903402	Water	Gen/metals/VOCs	(A-1-2)1bdb	(A-1-2)1bdb	1008
80903403	Water	Gen/metals/VOCs	(A-1-2)1bdb (DUPL)	(A-1-2)1bdb	1008
80903404	Water	Gen/metals/VOCs	(A-1-3)18bbc	(A-1-3)18bbc	9003
80903405	Water	Gen/metals/VOCs	(A-1-2)17add	(A-1-2)17add	6008
80903406	Water	Gen/metals/VOCs	(A-1-2)19cdc	(A-1-2)19cdc	6056
80903407	Water	VOCs	Rinsate #1		
80903408	Water	Gen/metals/VOCs	(A-1-2)24baa#5	(A-1-2)24baa	8059
80903409	Water	VOCs	Trip Blank		
809054		Metals	Quality Control		
809054		VOCs	Reagent Blank		
80905401	Soil	Metals/VOCs	Sample Point #1	Research Chemicals	
80905402	Soil	Metals/VOCs	Sample Location #2	World Resources	
80905403	Soil	VOCs	Sample Location #3	W. 75th Ave. bet. Roos. Canal and S.P.R.R.	
80905404	Soil	VOCs	Sample Location #4	Petco, Inc.	
80905405	Soil	VOCs	Sample Location #5	Phoenix Vegetable Dist.	
80905406	Soil	Metals/VOCs	Sample Location #29	Background (71st Ave. S. of Lower Buckeye)	
80905407	Soil	VOCs	Sample Location #7	Joe's Diesel Repair	
80905408	Soil	VOCs	Sample Location #10	Revlon, Inc.	
80905409	Soil	VOCs	Sample Location #34	Revlon, Inc. (dup)	
809064		Gen/metals/VOCs	Quality Control		
809064		VOCs	Reagent Blank		
80906401	Soil	Metals/VOCs	Site #30	Background (51st Ave. S. of Buckeye Rd.)	
80906402	Water	Gen/VOCs	Sample #4	(A-1-2)9ccc	2022
80906403	Water	Gen/VOCs	Duplicate #4	Duplicate of (A-1-2)9ccc	
80906404	Soil	VOCs	Site #9	Western Cotton Services Co.	
80906405	Soil	VOCs	Site #11	Roadway Express	
80906406	Soil	VOCs	Site #12	Transcon	
80906407	Soil	Metals/VOCs	Site #13	Maricopa By-Products	
80906408	Soil	Metals/VOCs	Duplicate B	Duplicate Maricopa By-Products	
80906409	Soil	VOCs	Site #24	Chevron U.S.A, (Asphalt Div.)	
80906410	Water	VOCs	Trip Blank		

Gen = General Minerals, California Title 22
VOCs = Volatile Hydrocarbons/Aromatics (EPA 601/602)
Metals = Arsenic, barium, cadmium, chromium, mercury, lead, selenium, silver

Key to Laboratory Data Reports (cont.)
West Van Buren Study Area

Lab I.D.	Matrix	Analyses	Client I.D.	Legal Well Designation or Soil Sampling Location	ENVIS Number
809074	Soil	Metals	Quality Control		
809074	Soil	VOCs	Reagent Blank		
80907401	Soil	VOCs	Site #17	Santa Fe Railroad Yard	
80907402	Soil	Metals/VOCs	Site #14	Smithey Recycling Co.	
80907403	Soil	Metals/VOCs	Duplicate A	Duplicate Smithey Recycling Co.	
80907404	Soil	Metals/VOCs	Site #20	Schuff Steel	
80907405	Soil	Metals/VOCs	Site #19	Ray & Bob's Truck Salvage	
809081		VOCs	Reagent Blank		
80908101	Soil	VOCs	Site #26	Blue Circle West	

VOCs = Volatile Hydrocarbons/Aromatics (EPA 601/602)
Metals = Arsenic, barium, cadmium, chromium, mercury, lead, selenium, silver

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

OCTOBER 12, 1988

KLEINFELDER AND ASSOCIATES
4920 E. McDOWELL ROAD
SUITE 101
PHOENIX, AZ 85008

RECEIVED
OCT 13 1988
KLEINFELDER
PHOENIX

Accession: 809028

Date Received: 9/6/88

Attention: RON TURNER

Project: 52-1015-01

Elizabeth Proffitt
Elizabeth Proffitt
Project Manager

Robert V. Woods
Robert V. Woods
Laboratory Manager

RVW/jlf

Note: Samples will be disposed of within 30 days unless otherwise notified.

Analytical Technologies, Inc

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/06/88
REPORT DATE : 10/12/88

ATI I.D. : 809028

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	(A-1-1)13add	AQUEOUS	09/06/88
02	(A-1-2)13dad	AQUEOUS	09/06/88
03	(A-1-2)13dad (DUPL)	AQUEOUS	09/06/88
04	(A-1-2)21add	AQUEOUS	09/06/88

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

GENERAL CHEMISTRY RESULTS

ATI I.D. : 809028

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/06/88

REPORT DATE : 10/12/88

PARAMETER	UNITS	01	02	03	04
CARBONATE	MG/L	<1	<1	<1	<1
BICARBONATE	MG/L	422	294	295	126
HYDROXIDE	MG/L	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	422	294	295	126
CHLORIDE	MG/L	304	248	258	316
CONDUCTIVITY, (UMHOS/CM)		1720	1320	1330	1070
FLUORIDE	MG/L	0.90	0.26	0.24	0.26
NITRATE AS NITROGEN	MG/L	7.6	2.3	2.3	0.37
PH	UNITS	7.6	7.4	7.4	7.8
SULFATE	MG/L	138	131	131	42
TOTAL DISSOLVED SOLIDS	MG/L	1180	920	926	718

Analytical Technologies, Inc

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

ATI I.D. : 809028

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	80902105	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		136	134	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		136	134	1	NA	NA	NA
CHLORIDE	MG/L	80902804	316	317	0	828	500	102
CONDUCTIVITY(UMHOMS/CM		80902101	571	585	2	NA	NA	NA
FLUORIDE	MG/L	80902804	0.26	0.26	0	1.17	1.00	91
NITRATE AS NITROGEN	MG/L	80903408	0.94	0.91	3	1.75	1.0	90
PH	UNITS	80902105	7.7	7.7	0	NA	NA	NA
SULFATE	MG/L	80902101	71	71	0	269	200	99
TOTAL DISSOLVED SOLIDS	MG/L	80903406	710	700	1	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809028

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/06/88

REPORT DATE : 10/12/88

PARAMETER	UNITS	01	02	03	04
SILVER	MG/L	-	-	-	<0.010
ARSENIC	MG/L	-	-	-	<0.005
BARIUM	MG/L	-	-	-	0.07
CALCIUM	MG/L	40	69	69	35
CADMIUM	MG/L	-	-	-	<0.003
CHROMIUM	MG/L	-	-	-	<0.02
COPPER	MG/L	<0.010	<0.010	<0.010	<0.010
IRON	MG/L	<0.030	<0.030	<0.030	<0.030
HARDNESS	MG/L	188	292	291	213
MERCURY	MG/L	-	-	-	<0.0002
POTASSIUM	MG/L	4.7	5.8	5.8	5.0
MAGNESIUM	MG/L	21.5	29.0	28.8	30.5
MANGANESE	MG/L	<0.010	0.027	0.026	0.014
SODIUM	MG/L	348	198	201	153
LEAD	MG/L	-	-	-	<0.002
SELENIUM	MG/L	-	-	-	<0.005
ZINC	MG/L	0.035	0.011	<0.010	0.049

Analytical Technologies, Inc METALS - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE) ATI I.D. : 809028

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	80903504	<0.010	<0.010	NA	1.00	1.000	100
ARSENIC	MG/L	80807502	0.046	0.047	2	0.095	0.050	98
BARIUM	MG/L	80900901	0.19	0.21	10	20.9	20.00	104
CALCIUM	MG/L	80903503	59	59	0	151	100	92
CADMIUM	MG/L	80903504	<0.003	<0.003	NA	0.486	0.500	97
CHROMIUM	MG/L	80903504	<0.02	<0.02	NA	1.94	2.000	97
COPPER	MG/L	80903504	<0.010	<0.010	NA	1.02	1.000	102
IRON	MG/L	80903504	0.160	0.165	3	2.08	2.000	96
HARDNESS	MG/L	80902801	NA	NA	NA	NA	NA	NA
MERCURY	MG/L	80903403	<0.0002	<0.0002	NA	0.0051	0.0050	102
POTASSIUM	MG/L	80902804	5.0	5.1	2	24.7	20.00	99
MAGNESIUM	MG/L	80903401	39.3	39.6	0.8	88.4	50.00	97
MANGANESE	MG/L	80903504	0.048	0.049	2	2.10	2.000	103
SODIUM	MG/L	80903402	186	186	0	577	400.0	98
LEAD	MG/L	80907804	0.061	0.056	9	0.161	0.10	100
SELENIUM	MG/L	80903403	<0.005	<0.005	NA	0.044	0.050	88
ZINC	MG/L	80902801	0.035	0.034	3	0.582	0.500	109

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80902801

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/06/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/06/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-1)13add	DATE ANALYZED	: 09/13/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM . .	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	95
BROMOFLUOROBENZENE (%)	90

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80902802

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/06/88
PROJECT #	: 52-1010-01	DATE RECEIVED	: 09/06/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)13dad	DATE ANALYZED	: 09/13/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	0.6
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	2.0
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	0.6
1,2-DICHLOROETHENE(TOTAL)	0.4
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	0.3
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	0.8
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	0.4
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	91
BROMOFLUOROBENZENE (%)	85

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80902803

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/06/88
PROJECT #	: 52-1015-1	DATE RECEIVED	: 09/06/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)13dad (DUPL)	DATE ANALYZED	: 09/13/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	0.6
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	2.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	0.6
1,2-DICHLOROETHENE(TOTAL)	0.6
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	0.8
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	0.4
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	95
BROMOFLUOROBENZENE (%)	77

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80902804

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/06/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/06/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)21add	DATE ANALYZED	: 09/14/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	0.7
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	0.8
ORTHO & PARA XYLENE	0.6

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	89
BROMOFLUOROBENZENE (%)	91

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	ATI I.D.	: 809028
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/13/88
PROJECT NAME	: (NONE)	DATE ANALYZED	: 09/13/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	6.7
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	87
BROMOFLUOROBENZENE (%)	88

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	ATI I.D.	: 809028
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/14/88
PROJECT NAME	: (NONE)	DATE ANALYZED	: 09/14/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	4.9
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	89
BROMOFLUOROBENZENE (%)	86

Analytical Technologies, Inc.

San Diego • Phoenix • Seattle

Chain of Custody

DATE 9/6/88 PAGE 1 OF 1

PROJ. MGR. Grant Burns
COMPANY Klenfelder
ADDRESS 4920 E. McDowell Rd.
Phoenix, AZ 85008

SAMPLERS (SIGNATURE) K. Mantha - MPI
(PHONE NO.) 241-1770

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418	Gravimetric Measurements	TTLC Zn/Ni/Cr	PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE	Ni			NUMBER OF CONTAINERS
(A-1-1)13add	9/6/88	12:45pm	WATER	1						✓	✓				✓	✓						✓			5
(A-1-2)13dad	9/6/88	1:40pm	WATER	2						✓	✓				✓	✓						✓			4
(A-1-3)13dad(Dup)	9/6/88	1:40pm	WATER	3						✓	✓				✓	✓						—			4
(A-1-4)21add	9/12/88	5:25pm	WATER	4						✓	✓				✓	✓			✓			✓			4

PROJECT INFORMATION	
PROJECT:	52-1052-01
PO NO.	
SHIPPING ID. NO.	
VIA:	

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	25
CHAIN OF CUSTODY SEALS	N
REC'D GOOD CONDITION/COLD	Y
CONFORMS TO RECORD	Y
LAB NO.	809028

INVOICE TO:

SPECIAL INSTRUCTIONS/COMMENTS:
Call Ron Turner for details on General Minerals - Per Ron Turner 9/7/88 10 Ca. Title 22 less Zn/Ni/Cr plus Ni

RELINQUISHED BY	RELINQUISHED BY
Karen M. Mantha 6:15pm	
(Signature) (Time) Karen M. Mantha 9/6/88	(Signature) (Time)
(Printed Name) (Date) Malcolm Pirnie	(Printed Name) (Date)
(Company)	(Company)
RECEIVED BY	RECEIVED BY (LABORATORY) Mike Arthur
(Signature) (Time)	(Signature) (Time) Michael A. Atchison
(Printed Name) (Date)	(Printed Name) A.T.I.
(Company)	ANALYTICAL TECHNOLOGIES, INC

C-15

Analytical Technologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

OCTOBER 7, 1988

KLEINFELDER & ASSOCIATES
4920 E. McDOWELL ROAD
SUITE 101
PHOENIX, AZ 85008

Accession: 809034

Date Received: 9/7/88

Attention: RON TURNER

Project: ADEQ K-2 52-1015-01

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW/clf

Note: Samples will be disposed of within 30 days unless otherwise notified.

Analytical Technologies, Inc

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01

DATE RECEIVED : 09/07/88
REPORT DATE : 10/10/88

ATI I.D. : 809034

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	(A-1-2)1cac	AQUEOUS	09/07/88
02	(A-1-2)1bdb	AQUEOUS	09/07/88
03	(A-1-2)1bdb(DUPL)	AQUEOUS	09/07/88
04	(A-1-3)18bbc	AQUEOUS	09/07/88
05	(A-1-2)17add	AQUEOUS	09/07/88
06	(A-1-2)19ccc	AQUEOUS	09/07/88
07	RINSATE #1	AQUEOUS	09/07/88
08	(A-1-2)24baa#5	AQUEOUS	09/07/88
09	TRIP BLANK	AQUEOUS	09/07/88

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	9

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

GENERAL CHEMISTRY RESULTS

ATI I.D. : 809034

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01

DATE RECEIVED : 09/07/88

REPORT DATE : 10/10/88

PARAMETER	UNITS	01	02	03	04	05
CARBONATE	MG/L	<1	<1	<1	<1	<1
BICARBONATE	MG/L	180	194	193	256	254
HYDROXIDE	MG/L	<1	<1	<1	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	180	194	193	256	254
CHLORIDE	MG/L	316	321	321	171	269
CONDUCTIVITY, (UMHOS/CM)		1200	1280	1290	980	1240
FLUORIDE	MG/L	0.29	0.27	0.26	0.31	0.34
NITRATE AS NITROGEN	MG/L	1.5	3.4	3.3	2.6	4.8
PH	UNITS	7.7	7.7	7.7	7.6	7.4
SULFATE	MG/L	61	71	68	69	102
TOTAL DISSOLVED SOLIDS	MG/L	836	864	858	664	878

Analytical Technologies, Inc

GENERAL CHEMISTRY RESULTS

ATI I.D. : 809034

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01

DATE RECEIVED : 09/07/88

REPORT DATE : 10/10/88

PARAMETER	UNITS	06	08
CARBONATE	MG/L	<1	<1
BICARBONATE	MG/L	242	324
HYDROXIDE	MG/L	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	242	324
CHLORIDE	MG/L	196	290
CONDUCTIVITY, (UMHOS/CM)		980	1420
FLUORIDE	MG/L	0.32	0.29
NITRATE AS NITROGEN	MG/L	0.13	0.94
PH	UNITS	7.5	7.0
SULFATE	MG/L	82	79
TOTAL DISSOLVED SOLIDS	MG/L	710	938

Analytical Technologies, Inc

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01 ATI I.D. : 809034

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	80903406	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		242	244	1	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		242	244	1	NA	NA	NA
CHLORIDE	MG/L	80903408	290	290	0	778	500	98
CONDUCTIVITY(UMHOMS/CM		80902101	571	585	2	NA	NA	NA
FLUORIDE	MG/L	80903408	0.29	0.29	0	1.17	1.00	88
NITRATE AS NITROGEN	MG/L	80903408	0.94	0.91	3	1.75	1.0	90
PH	UNITS	80903406	7.5	7.5	0	NA	NA	NA
SULFATE	MG/L	80903401	61	61	0	165	100	104
TOTAL DISSOLVED SOLIDS	MG/L	80903406	710	700	1	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809034

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01

DATE RECEIVED : 09/07/88

REPORT DATE : 10/10/88

PARAMETER	UNITS	01	02	03	04	05
SILVER	MG/L	-	<0.010	<0.010	-	-
ARSENIC	MG/L	-	<0.005	<0.005	-	-
BARIUM	MG/L	-	0.15	0.12	-	-
CALCIUM	MG/L	63	52	56	40	59
CADMIUM	MG/L	-	0.004	0.004	-	-
CHROMIUM	MG/L	-	<0.02	<0.02	-	-
COPPER	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
IRON	MG/L	<0.030	0.033	0.035	<0.030	<0.030
HARDNESS	MG/L	319	290	301	176	259
MERCURY	MG/L	-	<0.0002	<0.0002	-	-
POTASSIUM	MG/L	5.1	4.2	4.2	4.3	5.0
MAGNESIUM	MG/L	39.3	39.0	39.2	18.4	27.1
MANGANESE	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010
SODIUM	MG/L	160	186	176	166	197
LEAD	MG/L	-	<0.002	<0.002	-	-
SELENIUM	MG/L	-	<0.005	<0.005	-	-
ZINC	MG/L	<0.010	<0.010	<0.010	<0.010	<0.010

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809034

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01

DATE RECEIVED : 09/07/88

REPORT DATE : 10/10/88

PARAMETER	UNITS	06	08
SILVER	MG/L	-	<0.010
ARSENIC	MG/L	-	0.015
BARIUM	MG/L	-	0.10
CALCIUM	MG/L	37	81
CADMIUM	MG/L	-	0.010
CHROMIUM	MG/L	-	<0.02
COPPER	MG/L	<0.010	0.017
IRON	MG/L	0.062	0.414
HARDNESS	MG/L	163	337
MERCURY	MG/L	-	<0.0002
POTASSIUM	MG/L	4.1	7.8
MAGNESIUM	MG/L	17.1	32.8
MANGANESE	MG/L	<0.010	0.074
SODIUM	MG/L	178	197
LEAD	MG/L	-	<0.002
SELENIUM	MG/L	-	<0.005
ZINC	MG/L	0.025	0.047

Analytical Technologies, Inc

METALS - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : ADEQ K-2
PROJECT NAME : 52-1015-01 ATI I.D. : 809034

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	80903504	<0.010	<0.010	NA	1.00	1.000	100
ARSENIC	MG/L	80807502	0.046	0.047	2	0.095	0.050	98
BARIUM	MG/L	80907801	<0.06	<0.06	NA	1.04	1.00	104
CALCIUM	MG/L	80903503	59	59	0	151	100	92
CADMIUM	MG/L	80903504	<0.003	<0.003	NA	0.486	0.500	97
CHROMIUM	MG/L	80903504	<0.02	<0.02	NA	1.94	2.000	97
COPPER	MG/L	80903504	<0.010	<0.010	NA	1.02	1.000	102
IRON	MG/L	80903504	0.160	0.165	3	2.08	2.000	96
HARDNESS	MG/L	80902801	NA	NA	NA	NA	NA	NA
MERCURY	MG/L	80903403	<0.0002	<0.0002	NA	0.0051	0.0050	102
POTASSIUM	MG/L	80902804	5.0	5.1	2	24.7	20.00	99
MAGNESIUM	MG/L	80903401	39.3	39.6	0.8	88.4	50.00	97
MANGANESE	MG/L	80903504	0.048	0.049	2	2.10	2.000	103
SODIUM	MG/L	80903402	186	186	0	577	400.0	98
LEAD	MG/L	80810016	<0.002	<0.002	NA	STDA	CC=	.999
SELENIUM	MG/L	80903403	<0.005	<0.005	NA	0.044	0.050	88
ZINC	MG/L	80902801	0.035	0.034	3	0.582	0.500	109

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903401

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)1cac	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	1.1
TOLUENE	0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	1.3
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	0.6
ORTHO & PARA XYLENE	0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	91
BROMOFLUOROBENZENE (%)	103

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903402

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)1bdb	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	1.8
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	0.6
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	0.3
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	102
BROMOFLUOROBENZENE (%)	104

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903403

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)1bdb(DUPL)	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	1.3
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	0.5
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE (%)	90
BROMOFLUOROBENZENE (%)	95

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903404

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-3)18bbc	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	0.8
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	7.8
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	8.8
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	99
BROMOFLUOROBENZENE (%)	97

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903405

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)17add	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	0.7
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	89
BROMOFLUOROBENZENE (%)	83

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903406

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/8
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/8
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)19cdc	DATE ANALYZED	: 09/15/8
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	0.9
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	0.5
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	95
BROMOFLUOROBENZENE (%)	91

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903407

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: RINSATE #1	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	93
BROMOFLUOROBENZENE (%)	83

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903408

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: (A-1-2)24baa#5	DATE ANALYZED	: 09/15/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	83
BROMOFLUOROBENZENE (%)	72

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80903409

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/07/88
PROJECT #	: ADEQ K-2	DATE RECEIVED	: 09/07/88
PROJECT NAME	: 52-1015-01	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 09/14/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	17.6 B
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	85
BROMOFLUOROBENZENE (%)	75

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	ATI I.D.	: 809034
PROJECT #	: ADEQ K-2	DATE EXTRACTED	: 09/14/88
PROJECT NAME	: 52-1015-01	DATE ANALYZED	: 09/14/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	4.9
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	89
BROMOFLUOROBENZENE (%)	86

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	ATI I.D.	: 809034
PROJECT #	: ADEQ K-2	DATE EXTRACTED	: 09/15/88
PROJECT NAME	: 52-1015-01	DATE ANALYZED	: 09/15/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	8.3
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	94
BROMOFLUOROBENZENE (%)	88

Analytical Technologies, Inc.
San Diego • Phoenix • Seattle

Chain of Custody

DATE 9/7/88 PAGE 1 OF

PROJ. MGR. Grant Buma
COMPANY Kleinfelder
ADDRESS 4120 E. McDowell Rd. Phoenix, AZ 85008

SAMPLERS (SIGNATURE) K. Marotta - MPI, [illegible] - MPI
(PHONE NO.) 241-1770

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418	General Minerals	Title 22 metals	PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE	NO_3-N			NUMBER OF CONTAINERS
(A-1-2)1cac	9/7/88	8:25am	water	1						✓	✓				✓	✓						✓			5
A-1-2)1bdb	9/7/88	9:10am	water	2						✓	✓				✓	✓			✓			✓			6
A-1-2)1bdb(Dup1)	9/7/88	9:10am	water	3						✓	✓				✓	✓			✓			✓			6
(A-1-3)18bbc	9/7/88	10:45am	water	4						✓	✓				✓	✓						✓			5
(A-1-2)17add	9/7/88	11:25am	water	5						✓	✓				✓	✓						✓			5
(A-1-2)19ccc	9/7/88	1:30pm	water	6						✓	✓				✓	✓						✓			5
RINSATE #1	9/7/88	1:35pm	water	7						✓	✓														[illegible]
A-1-2)24bcc #5	9/7/88	4:30pm	water	8						✓	✓				✓	✓			✓			✓			6
Trip Blank				9																					

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT: ADEQ K-2	TOTAL NO. OF CONTAINERS	40
PO NO. 52-1015-01	CHAIN OF CUSTODY SEALS	N
SHIPPING ID. NO.	REC'D GOOD CONDITION/COLD	Y
VIA: HAND	CONFORMS TO RECORD	Y
	LAB NO. 809034	

SPECIAL INSTRUCTIONS/COMMENTS:
Headspace on 7.1
Call Ron Turner on General Minerals

INVOICE TO:

RELINQUISHED BY	RELINQUISHED BY
Karen M. Marotta 6:25pm (Signature) (Time)	(Signature) (Time)
Karen M. Marotta 9/7/88 (Printed Name) (Date)	(Printed Name) (Date)
Malcolm Pirnie, Inc. (Company)	(Company)
RECEIVED BY	RECEIVED BY (LABORATORY)
(Signature) (Time)	Mike Aitchison (Signature) (Time)
(Printed Name) (Date)	Michael Aitchison 9/7 (Printed Name)
(Company)	A.T.I. ANALYTICAL TECHNOLOGIES, INC

ATI LABORATORIES: SAN DIEGO (619) 458-9141•PHOENIX (602) 438-1530•SEATTLE (206) 228-8335 DISTRIBUTION: WHITE, CANARY - ANALYTICAL TECHNOLOGIES, INC • PINK - ORIGINATOR

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

OCTOBER 12, 1988

KLEINFELDER AND ASSOCIATES
4920 E. McDOWELL ROAD
SUITE 101
PHOENIX, AZ 85008

RECEIVED
OCT 13 1988
KLEINFELDER
PHOENIX

Accession: 809054

Date Received: 9/9/88

Attention: GRANT BUMA

Project: ADEQ K-2 52-1015-01

Note: For 8010/8020 analysis, samples taken from locations 5 and 7 had to be analyzed at a dilution of ten due to foaminess.

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW/jlf

Note: Samples will be disposed of within 30 days unless otherwise notified.

Analytical Technologies, Inc

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : ADEQ K-2

DATE RECEIVED : 09/09/88
REPORT DATE : 10/12/88

ATI I.D. : 809054

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SAMPLE POINT #1	SOIL	09/08/88
02	SAMPLE LOCATION #2	SOIL	09/08/88
03	SAMPLE LOCATION #3	SOIL	09/09/88
04	SAMPLE LOCATION #4	SOIL	09/09/88
05	SAMPLE LOCATION #5	SOIL	09/09/88
06	SAMPLE LOCATION #29	SOIL	09/09/88
07	SAMPLE LOCATION #7	SOIL	09/09/88
08	SAMPLE LOCATION #10	SOIL	09/09/88
09	SAMPLE LOCATION #34	SOIL	09/09/88

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	9

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from th date of this report. If an extended storage period is required, please contac our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809054

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : ADEQ K-2

DATE RECEIVED : 09/09/88
REPORT DATE : 10/12/88

PARAMETER	UNITS	01	02	06
SILVER (IN EP TOX)	MG/L	<0.010	<0.010	0.025
ARSENIC (IN EP TOX)	MG/L	<0.005	0.045	0.046
BARIUM (IN EP TOX)	MG/L	0.43	0.75	0.85
CADMIUM (IN EP TOX)	MG/L	<0.003	0.007	0.023
CHROMIUM (IN EP TOX)	MG/L	<0.02	<0.02	<0.02
MERCURY (IN EP TOX)	MG/L	<0.0002	<0.0002	<0.0002
LEAD (IN EP TOX)	MG/L	<0.02	0.10	0.29
SELENIUM (IN EP TOX)	MG/L	<0.005	<0.005	<0.005

Analytical Technologies, Inc

METALS - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : ADEQ K-2

ATI I.D. : 809054

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER (IN EP TOX)	MG/L	80905406	0.025	0.024	4	1.04	1.000	102
ARSENIC (IN EP TOX)	MG/L	80817101	<0.005	<0.005	NA	0.025	0.025	100
BARIUM (IN EP TOX)	MG/L	80905406	0.85	0.86	1	22.38	20.00	108
CADMIUM (IN EP TOX)	MG/L	80905406	0.023	0.023	0	0.530	0.500	101
CHROMIUM (IN EP TOX)	MG/L	80905406	0.05	0.05	0	STDA	CC=	0.9
MERCURY (IN EP TOX)	MG/L	80905406	<0.0002	<0.0002	NA	0.0052	0.0050	104
LEAD (IN EP TOX)	MG/L	80905406	0.29	0.29	0	10.52	10.00	102
SELENIUM (IN EP TOX)	MG/L	80905402	<0.005	<0.005	NA	0.052	0.050	104

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905401

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/08/8
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/8
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE POINT #1	DATE ANALYZED	: 09/19/8
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.1
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	4.0
TRICHLOROFLUOROMETHANE	<0.100
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	101
BROMOFLUOROBENZENE (%)	94

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905402

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/08/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #2	DATE ANALYZED	: 09/20/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	0.2
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	9.6
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	<0.250
ORTHO & PARA XYLENE	<0.250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	107
BROMOFLUOROBENZENE (%)	109

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905403

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #3	DATE ANALYZED	: 09/20/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	0.2
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	4.2
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	<0.250
ORTHO & PARA XYLENE	<0.250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	105
BROMOFLUOROBENZENE (%)	101

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905404

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #4	DATE ANALYZED	: 09/19/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.1
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	4.9
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	98
BROMOFLUOROBENZENE (%)	91

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905405

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #5	DATE ANALYZED	: 09/20/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	<0.100
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	0.4
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	<0.250
ORTHO & PARA XYLENE	<0.250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	100
BROMOFLUOROBENZENE (%)	104

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905406

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #29	DATE ANALYZED	: 09/19/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.07
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.8
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	95
BROMOFLUOROBENZENE (%)	89

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905407

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #7	DATE ANALYZED	: 09/20/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	0.2
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	0.6
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	<0.250
ORTHO & PARA XYLENE	<0.250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	101
BROMOFLUOROBENZENE (%)	92

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905408

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #10	DATE ANALYZED	: 09/20/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.07
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.05
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	0.2
ORTHO & PARA XYLENE	0.06

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	97
BROMOFLUOROBENZENE (%)	102

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80905409

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/09/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/09/88
PROJECT NAME	: ADEQ K-2	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SAMPLE LOCATION #34	DATE ANALYZED	: 09/19/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.2
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.1
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	99
BROMOFLUOROBENZENE (%)	88

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	ATI I.D.	: 809054
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/14/88
PROJECT NAME	: ADEQ K-2	DATE ANALYZED	: 09/19/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	1.4
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	100
BROMOFLUOROBENZENE (%)	94

Analytical Technologies, Inc.
San Diego • Phoenix • Seattle

Chain of Custody

DATE 9/8/88 PAGE 8 OF

PROJ. MGR. Grant Buma
COMPANY Kleinfelder
ADDRESS 4920 E. McDowell Rd. Phoenix, AZ 85008

SAMPLERS (SIGNATURE) Karen M. Mouatta - MPI (PHONE NO.) 241-1770

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418			PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE				NUMBER OF CONTAINERS
Sample point #1	9/8/88	3:30pm	SOIL	1						✓	✓								✓						2
Sample location #2	9/8/88	4:45pm	SOIL	2						✓	✓								✓						2
Sample location #3	9-9-88	8:50A	SOIL	3						✓	✓														1
Sample location #4	9-9-88	9:50A	SOIL	4						✓	✓														1
Sample location #5	9-9-88	11:45A	BENTHAL SLUDGE	5						✓	✓														1
Sample location #29	9-9-88	10:50A	SOIL	6						✓	✓								✓						2
Sample location #7	9-9-88	12:50 P	SOIL	7						✓	✓														1
Sample location #10	9-9-88	3:30 P	SOIL	8						✓	✓														1
Sample location #34	9-9-88	3:45 P	SOIL	9						✓	✓														1

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT: ADEQ K-2	TOTAL NO. OF CONTAINERS	12
PQ NO. 52-105-01	CHAIN OF CUSTODY SEALS	Y
SHIPPING ID. NO.	REC'D GOOD CONDITION/COLD	Y
VIA: hand	CONFORMS TO RECORD	Y
	LAB NO. 809054	

SPECIAL INSTRUCTIONS/COMMENTS:

INVOICE TO:

RELINQUISHED BY	RELINQUISHED BY
(Signature) (Time)	[signature] 6:15 (Signature) (Time)
(Printed Name) (Date)	Gregory J Doza 9/8/88 (Printed Name) (Date)
(Company)	Malcolm Pirnie (Company)
RECEIVED BY	RECEIVED BY (LABORATORY)
(Signature) (Time)	Julie C. Baltazar 6:15 (Signature) (Time)
(Printed Name) (Date)	Julie Baltazar 9-9-88 (Printed Name)
(Company)	ATI ANALYTICAL TECHNOLOGIES, INC.

C-50

ATI LABORATORIES: SAN DIEGO (619) 458-9141•PHOENIX (602) 438-1530•SEATTLE (206) 228-8335 DISTRIBUTION: WHITE, CANARY · ANALYTICAL TECHNOLOGIES, INC. • PINK · ORIGINATOR

Analytical Technologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

OCTOBER 12, 1988

KLEINFELDER AND ASSOCIATES
4920 E. McDOWELL ROAD
SUITE 101
PHOENIX, AZ 85008

RECEIVED
OCT 13 1988
KLEINFELDER
PHOENIX

Accession: 809064

Date Received: 9/12/88

Attention: RON TURNER

Project: 52-1015-01

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW/jlf

Note: Samples will be disposed of within 30 days unless otherwise notified.

Analytical Technologies, Inc

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/12/88
REPORT DATE : 10/12/88

ATI I.D. : 809064

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SITE #30	SOIL	09/12/88
02	SAMPLE #4	AQUEOUS	09/12/88
03	DUPLICATE #4	AQUEOUS	09/12/88
04	SITE #9	SOIL	09/12/88
05	SITE #11	SOIL	09/12/88
06	SITE #12	SOIL	09/12/88
07	SITE #13	SOIL	09/12/88
08	DUPLICATE B	SOIL	09/12/88
09	SITE #24	SOIL	09/12/88
10	TRIP BLANK	AQUEOUS	09/12/88

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	7
AQUEOUS	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

GENERAL CHEMISTRY RESULTS

ATI I.D. : 809064

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/12/88
REPORT DATE : 10/12/88

PARAMETER	UNITS	02	03
CARBONATE	MG/L	<1	<1
BICARBONATE	MG/L	144	152
HYDROXIDE	MG/L	<1	<1
TOTAL ALKALINITY (AS CACO3)	MG/L	144	152
CHLORIDE	MG/L	339	363
CONDUCTIVITY, (UMHOS/CM)		1360	1370
FLUORIDE	MG/L	0.35	0.35
NITRATE AS NITROGEN	MG/L	4.0	4.1
PH	UNITS	7.9	7.9
SULFATE	MG/L	85	88
TOTAL DISSOLVED SOLIDS	MG/L	888	880

Analytical Technologies, Inc

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

ATI I.D. : 809064

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CARBONATE	MG/L	80911502	<1	<1	NA	NA	NA	NA
BICARBONATE	MG/L		400	400	0	NA	NA	NA
HYDROXIDE	MG/L		<1	<1	NA	NA	NA	NA
TOTAL ALKALINITY	MG/L		400	400	0	NA	NA	NA
CHLORIDE	MG/L	80902804	316	317	0	828	500	102
CONDUCTIVITY (UMHOMS/CM		80903503	780	766	2	NA	NA	NA
FLUORIDE	MG/L	80905607	0.39	0.40	2	1.28	1.00	89
NITRATE AS NITROGEN	MG/L	80911801	2.1	2.1	0	4.1	2.0	100
PH	UNITS	80914902	8.1	8.1	0	NA	NA	NA
SULFATE	MG/L	80906301	1.7	1.7	0	23	20	107
TOTAL DISSOLVED SOLIDS	MG/L	80906303	104	122	16	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809064

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/12/88

REPORT DATE : 10/12/88

PARAMETER	UNITS	02	03
CALCIUM	MG/L	40	39
COPPER	MG/L	0.023	0.040
IRON	MG/L	0.130	0.154
HARDNESS	MG/L	223	221
POTASSIUM	MG/L	4.7	4.8
MAGNESIUM	MG/L	29.8	30.1
MANGANESE	MG/L	<0.010	<0.010
SODIUM	MG/L	219	218
ZINC	MG/L	0.011	0.028

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809064

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/12/88
REPORT DATE : 10/12/88

PARAMETER	UNITS	01	07	08
SILVER (IN EP TOX)	MG/L	0.012	0.012	0.011
ARSENIC (IN EP TOX)	MG/L	0.032	0.020	0.022
BARIUM (IN EP TOX)	MG/L	0.62	0.72	0.72
CADMIUM (IN EP TOX)	MG/L	0.011	0.016	0.016
CHROMIUM (IN EP TOX)	MG/L	<0.02	<0.02	<0.02
MERCURY (IN EP TOX)	MG/L	<0.0002	<0.0002	<0.0002
LEAD (IN EP TOX)	MG/L	0.15	0.14	0.17
SELENIUM (IN EP TOX)	MG/L	<0.005	<0.005	<0.005

Analytical Technologies, Inc

METALS - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

ATI I.D. : 809064

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER (IN EP TOX)	MG/L	80905406	0.025	0.024	4	1.04	1.000	102
ARSENIC (IN EP TOX)	MG/L	80906401	0.032	0.032	0	STDA	CC=	.99
BARIUM (IN EP TOX)	MG/L	80905406	0.85	0.86	1	22.38	20.00	108
CALCIUM	MG/L	80906402	40	40	0	95	50.00	110
CADMIUM (IN EP TOX)	MG/L	80905406	0.023	0.023	0	0.530	0.500	101
CHROMIUM (IN EP TOX)	MG/L	80905406	0.05	0.05	0	STDA	CC=	0.9
COPPER	MG/L	80903504	<0.010	<0.010	NA	1.02	1.000	102
IRON	MG/L	80905604	1.87	1.87	0	4.05	2.000	109
HARDNESS	MG/L	80904201	NA	NA	NA	NA	NA	NA
MERCURY (IN EP TOX)	MG/L	80905406	<0.0002	<0.0002	NA	0.0052	0.0050	104
POTASSIUM	MG/L	80903503	3.9	4.0	3	24.2	20.00	102
MAGNESIUM	MG/L	80905604	53	53	0	152	100.0	99
MANGANESE	MG/L	80905603	0.316	0.317	0.3	2.34	2.000	101
SODIUM	MG/L	80903503	35.6	35.6	0	74.1	40.00	96
LEAD (IN EP TOX)	MG/L	80905406	0.29	0.29	0	10.52	10.00	102
SELENIUM (IN EP TOX)	MG/L	80905402	<0.005	<0.005	NA	0.052	0.050	104
SELENIUM (IN EP TOX)	MG/L	80906407	<0.005	<0.005	NA	0.057	0.050	114
ZINC	MG/L	80903504	0.030	0.031	3	0.580	0.500	110

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 10$$

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906402

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SAMPLE #4	DATE ANALYZED	: 09/16/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	93
BROMOFLUOROBENZENE (%)	81

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906403

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: DUPLICATE #4	DATE ANALYZED	: 09/16/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	86
BROMOFLUOROBENZENE (%)	85

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906410

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: TRIP BLANK	DATE ANALYZED	: 09/16/88
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	93
BROMOFLUOROBENZENE (%)	74

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: KLEINFELDER	ATI I.D.	: 809064
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/16/88
PROJECT NAME	: (NONE)	DATE ANALYZED	: 09/16/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.2
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.2
CHLOROFORM	<0.2
CHLOROMETHANE	<0.2
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	8.3
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<2.0
VINYL CHLORIDE	<0.2
META XYLENE	<0.5
ORTHO & PARA XYLENE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	92
BROMOFLUOROBENZENE (%)	88

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906401

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #30	DATE ANALYZED	: 09/23/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	<0.100
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	10.4
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	<0.250
ORTHO & PARA XYLENE	<0.250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	111
BROMOFLUOROBENZENE (%)	109

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906404

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #9	DATE ANALYZED	: 09/23/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	<0.100
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	6.2
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	<0.250
ORTHO & PARA XYLENE	<0.250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	111
BROMOFLUOROBENZENE (%)	107

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906405

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #11	DATE ANALYZED	: 09/23/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	<0.100
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	1.8
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	0.7
ORTHO & PARA XYLENE	0.3

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	105
BROMOFLUOROBENZENE (%)	98

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906406

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #12	DATE ANALYZED	: 09/22/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	0.05
1,1,1-TRICHLOROETHANE	0.09
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	1.5
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	0.07
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	95
BROMOFLUOROBENZENE (%)	95

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Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906407

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #13	DATE ANALYZED	: 09/24/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.05
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.3
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	92
BROMOFLUOROBENZENE (%)	90

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906408

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: DUPLICATE B	DATE ANALYZED	: 09/24/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	0.03
1,1,1-TRICHLOROETHANE	0.1
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.1
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	0.06
ORTHO & PARA XYLENE	0.1
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE (%)	95
BROMOFLUOROBENZENE (%)	100

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80906409

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/12/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/12/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #24	DATE ANALYZED	: 09/24/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.04
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.1
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	98
BROMOFLUOROBENZENE (%)	101

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	ATI I.D.	: 809064
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/14/88
PROJECT NAME	: (NONE)	DATE ANALYZED	: 09/23/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.4
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	103
BROMOFLUOROBENZENE (%)	110

Analytical Technologies, Inc.
San Diego ● Phoenix ● Seattle

Chain of Custody

DATE 9-12-88 PAGE 1 OF 1

PROJ. MGR. GRANT BUMA
COMPANY KLEINFELDER
ADDRESS E. McDowell
Phoenix

SAMPLERS (SIGNATURE) (PHONE NO.)

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418			PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE	~~NO3~~	Tiffezz Metals	General Minerals	NUM. OF CONTAINERS
SITE #30	9-12-88	8:15A	SOIL	1						X	X								X						2
SAMPLE #4	9-12-88	8:50A	WATER	2						X	X											X	X	X	~~1~~ 5
DUPLICATE #4	9-12-88	8:52A	WATER	3						X	X											X	X	X	~~2~~ 5
SITE #9	9-12-88	9:45A	SOIL	4						X	X														1
SITE #11	9-12-88	10:52A	SOIL	5						X	X														1
SITE #12	9-12-88	12:40P	SOIL	6						X	X														1
SITE #13	9-12-88	1:20P	soil	7						X	X								X						2
Duplicate B	9-12-88	1:30P	soil	8						X	X								X						
SITE #24	9-12-88	2:45	soil	9						X	X														1

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT:	TOTAL NO. OF CONTAINERS	22
PO NO.	CHAIN OF CUSTODY SEALS	N
SHIPPING ID. NO.	REC'D GOOD CONDITION/COLD	Y
VIA: hand	CONFORMS TO RECORD	Y
	LAB NO. 809064	

SPECIAL INSTRUCTIONS/COMMENTS:
sample #4 headspace in 1 bottle

INVOICE TO:

RELINQUISHED BY	RELINQUISHED BY
[signature] 5:30P	
(Signature) (Time)	(Signature) (Time)
RITA H. NEILL 9/12/88	
(Printed Name) (Date)	(Printed Name) (Date)
Malcolm Pirnie, Inc	
(Company)	(Company)
RECEIVED BY	RECEIVED BY (LABORATORY)
	Julie C. Bellman 5:
(Signature) (Time)	(Signature) (Time)
	Julie Bellman 9-12
(Printed Name) (Date)	(Printed Name) ATI
(Company)	ANALYTICAL TECHNOLOGIES, INC.

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ATI LABORATORIES: SAN DIEGO (619) 458-9141•PHOENIX (602) 438-1530•SEATTLE (206) 228-8335 DISTRIBUTION: WHITE, CANARY - ANALYTICAL TECHNOLOGIES, INC. ● PINK - ORIGINATOR

AnalyticalTechnologies, Inc.
San Diego • Phoenix • Seattle

Chain of Custody

DATE 9/2/88 PAGE 2 OF 2

PROJ. MGR. Grant Buma
COMPANY Kleinfelder
ADDRESS Other Sheet.
SAMPLERS (SIGNATURE) (PHONE NO.)

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES (601)/8010	AROMATIC VOLATILES (602)/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418.			PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE				NUM OF CONTAINERS
TripBlank	9/2/88		H2O	10						X	X													2

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT:	TOTAL NO. OF CONTAINERS	2
PO NO.	CHAIN OF CUSTODY SEALS	N
SHIPPING ID. NO.	REC'D GOOD CONDITION/COLD	Y
VIA: hand	CONFORMS TO RECORD	Y
	LAB NO. 809064	

SPECIAL INSTRUCTIONS/COMMENTS:

INVOICE TO:

RELINQUISHED BY	RELINQUISHED BY
(Signature) 5:30 P (Time)	(Signature) (Time)
(Printed Name) RITA H. NEILL (Date) 9/2/88	(Printed Name) (Date)
(Company) Malcolm Pirnie, Inc	(Company)
RECEIVED BY	RECEIVED BY (LABORATORY)
(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) ATI
(Company)	ANALYTICAL TECHNOLOGIES, INC

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AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

OCTOBER 20, 1988

KLEINFELDER & ASSOCIATES
4920 E. McDOWELL ROAD
SUITE 101
PHOENIX, AZ 85008

RECEIVED
OCT 20 1988
KLEINFELDER

Accession: 809074

Date Received: 9/13/88

Attention: RON TURNER

Elizabeth Proffitt
Project Manager

Robert V. Woods
Laboratory Manager

RVW/clf

Note: Samples will be disposed of within 30 days unless otherwise notified.

Analytical Technologies, Inc

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/13/88
REPORT DATE : 10/20/88

ATI I.D. : 809074

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SITE #17	SOIL	09/13/88
02	SITE #14	SOIL	09/13/88
03	DUPLICATE A	SOIL	09/13/88
04	SITE #20	SOIL	09/13/88
05	SITE #19	SOIL	09/13/88

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from th
date of this report. If an extended storage period is required, please contac
our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

METALS RESULTS

ATI I.D. : 809074

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/13/88
REPORT DATE : 10/20/88

PARAMETER	UNITS	02	03	04	05
SILVER (IN EP TOX)	MG/L	0.013	0.012	0.010	<0.010
ARSENIC (IN EP TOX)	MG/L	0.010	0.006	0.007	0.023
BARIUM (IN EP TOX)	MG/L	0.56	1.05	0.82	1.05
CADMIUM (IN EP TOX)	MG/L	0.014	0.017	0.019	0.009
CHROMIUM (IN EP TOX)	MG/L	<0.02	<0.02	<0.02	<0.02
MERCURY (IN EP TOX)	MG/L	<0.0002	<0.0002	<0.0002	<0.0002
LEAD (IN EP TOX)	MG/L	0.19	0.17	0.21	0.09
SELENIUM (IN EP TOX)	MG/L	<0.005	<0.005	<0.005	<0.005

Analytical Technologies, Inc

METALS - QUALITY CONTROL

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

ATI I.D. : 809074

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER (IN EP TOX)	MG/L	80907405	<0.010	<0.010	NA	1.018	1.000	102
ARSENIC (IN EP TOX)	MG/L	80907405	0.023	0.025	8	0.073	0.050	100
BARIUM (IN EP TOX)	MG/L	80907405	1.05	0.99	6	21.6	20.0	103
CADMIUM (IN EP TOX)	MG/L	80907405	0.009	0.010	10	0.508	0.500	102
CHROMIUM (IN EP TOX)	MG/L	80905406	0.05	0.05	0	STDA	CC=	0.9
MERCURY (IN EP TOX)	MG/L	80907405	<0.0002	<0.0002	NA	0.0049	0.0050	98
LEAD (IN EP TOX)	MG/L	80907405	0.09	0.09	0	10.6	10.0	105
SELENIUM (IN EP TOX)	MG/L	80907405	<0.005	<0.005	NA	0.049	0.050	98

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 1$$

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80907401

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/13/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/13/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #17	DATE ANALYZED	: 09/27/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.02
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.05
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	0.07
ORTHO & PARA XYLENE	0.08

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	107
BROMOFLUOROBENZENE (%)	95

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80907402

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/13/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/13/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #14	DATE ANALYZED	: 09/27/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.02
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.3
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	0.06
ORTHO & PARA XYLENE	0.09
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE (%)	98
BROMOFLUOROBENZENE (%)	91

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80907403

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/13/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/13/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: DUPLICATE A	DATE ANALYZED	: 09/27/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.01
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	0.04
ORTHO & PARA XYLENE	0.06

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	101
BROMOFLUOROBENZENE (%)	99

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80907404

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/13/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/13/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #20	DATE ANALYZED	: 09/27/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.02
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.3
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	108
BROMOFLUOROBENZENE (%)	98

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80907405

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/13/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/13/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #19	DATE ANALYZED	: 09/27/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM.	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	<0.100
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	0.03
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.5
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	101
BROMOFLUOROBENZENE (%)	130 *

* Result out of limits due to sample matrix interference

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	ATI I.D.	: 809074
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/14/88
PROJECT NAME	: (NONE)	DATE ANALYZED	: 09/27/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.025
ETHYLBENZENE	1.5
METHYLENE CHLORIDE	<0.010
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.025
TOLUENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.5
TRICHLOROFLUOROMETHANE	<0.010
VINYL CHLORIDE	<0.025
META XYLENE	<0.025
ORTHO & PARA XYLENE	

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	114
BROMOFLUOROBENZENE (%)	101

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DATE 9-13-88 PAGE 1 OF 1

PROJ. MGR. GRANT BUMA
COMPANY KLEINFELDER
ADDRESS

SAMPLERS (SIGNATURE) [signature] (PHONE NO.) 241-1770

ANALYSIS REQUEST

	SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418			PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE				NUMBER OF CONTAINERS
1	site #17	9-13-88	9:00A	Soil							X	X														1
2	site #14	9-13-88	12:10P	Soil							X	X								X						2
3	Duplicate A	9-13-88	12:30P	Soil							X	X								X						2
4	site #20	9-13-88	2:50P	Soil							X	X								X						2
5	site #19	9-13-88	3:55P	Soil							X	X								X						2

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT:	TOTAL NO. OF CONTAINERS	9
PQ NO.	CHAIN OF CUSTODY SEALS	N
SHIPPING ID. NO.	REC'D GOOD CONDITION/COLD	Y
VIA:	CONFORMS TO RECORD	Y
	LAB NO.	809074

SPECIAL INSTRUCTIONS/COMMENTS:
Duplicate A = haz 4 oz of the container soil jar. JB

INVOICE TO:

RELINQUISHED BY	RELINQUISHED BY
(Signature) (Time)	[signature] 6:00P (Signature) (Time)
(Printed Name) (Date)	RITA H NEILL 9-13-88 (Printed Name) (Date)
(Company)	MALCOLM PIRNIE, INC (Company)
RECEIVED BY	RECEIVED BY (LABORATORY)
(Signature) (Time)	Julie C. Baltazar 6:21 (Signature) (Time)
(Printed Name) (Date)	Julie Baltazar 9-13 (Printed Name)
(Company)	ATI ANALYTICAL TECHNOLOGIES, INC.

C-83

ATI LABORATORIES: SAN DIEGO (619) 458-9141•PHOENIX (602) 438-1530•SEATTLE (206) 228-8335 DISTRIBUTION: WHITE, CANARY - ANALYTICAL TECHNOLOGIES, INC. • PINK - ORIGINATOR

AnalyticalTechnologies, Inc. 2113 S. 48th Street Suite 107 Tempe, AZ 85282 (602) 438-1530

OCTOBER 6, 1988

KLEINFELDER & ASSOCIATES
4920 E. McDOWELL ROAD
SUITE 101
PHOENIX, AZ 85008

Accession: 809081

Date Received: 9/14/88

Attention: RON TURNER

Project: 52-1015-01

Elizabeth Proffitt
Elizabeth Proffitt
Project Manager

Robert V. Woods
Robert V. Woods
Laboratory Manager

RVW/clf

Note: Samples will be disposed of within 30 days unless otherwise notified.

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

Analytical Technologies, Inc

CLIENT : KLEINFELDER
PROJECT # : 52-1015-01
PROJECT NAME : (NONE)

DATE RECEIVED : 09/14/88
REPORT DATE : 10/05/88

ATI I.D. : 809081

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	SITE #26	SOIL	09/14/88

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 80908101

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	DATE SAMPLED	: 09/14/88
PROJECT #	: 52-1015-01	DATE RECEIVED	: 09/14/88
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 9/14/88
CLIENT I.D.	: SITE #26	DATE ANALYZED	: 09/29/88
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
BENZENE	<0.250
BROMODICHLOROMETHANE	<0.100
BROMOFORM	<0.100
BROMOMETHANE	<0.100
CARBON TETRACHLORIDE	<0.100
CHLOROBENZENE	<0.250
CHLOROETHANE	<0.100
CHLOROFORM	<0.100
CHLOROMETHANE	<0.100
DIBROMOCHLOROMETHANE	<0.100
1,2-DICHLOROBENZENE	<0.250
1,3-DICHLOROBENZENE	<0.250
1,4-DICHLOROBENZENE	<0.250
DICHLORODIFLUOROMETHANE	<0.100
1,1-DICHLOROETHANE	<0.100
1,2-DICHLOROETHANE	<0.100
1,1-DICHLOROETHENE	<0.100
1,2-DICHLOROETHENE(TOTAL)	<0.100
1,2-DICHLOROPROPANE	<0.100
CIS-1,3-DICHLOROPROPENE	<0.100
TRANS-1,3-DICHLOROPROPENE	<0.100
ETHYLBENZENE	<0.250
METHYLENE CHLORIDE	<1.000
1,1,2,2-TETRACHLOROETHANE	<0.100
TETRACHLOROETHENE	<0.100
TOLUENE	<0.250
1,1,1-TRICHLOROETHANE	<0.100
1,1,2-TRICHLOROETHANE	<0.100
TRICHLOROETHENE	<0.100
TRICHLOROFLUOROMETHANE	<5.0
VINYL CHLORIDE	<0.100
META XYLENE	2.2
ORTHO & PARA XYLENE	2.6

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	99
BROMOFLUOROBENZENE (%)	132

Analytical Technologies, Inc

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 8010/8020)

CLIENT	: KLEINFELDER	ATI I.D.	: 809081
PROJECT #	: 52-1015-01	DATE EXTRACTED	: 09/14/88
PROJECT NAME	: (NONE)	DATE ANALYZED	: 09/29/88
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE(TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.4
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.010
META XYLENE	<0.025
ORTHO & PARA XYLENE	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	106
BROMOFLUOROBENZENE (%)	112

Analytical Technologies, Inc.
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DATE 9/14 PAGE 1 OF

PROJ. MGR. GRANT BUMA
COMPANY KLEINFELDER
ADDRESS

SAMPLERS (SIGNATURE) Rita H Neill (PHONE NO.) 241-1770

ANALYSIS REQUEST

SAMPLE ID.	DATE	TIME	MATRIX	LAB ID.	BASE/NEU/ACID CMPDS. GC/MS/ 625/8270	VOLATILE CMPDS. GC/MS/ 624/8240	PESTICIDES/PCB 608/8080	POLYNUCLEAR AROMATIC 610/8310	PHENOLS, SUB PHENOLS 604/8040	HALOGENATED VOLATILES 601/8010	AROMATIC VOLATILES 602/8020	TOTAL ORGANIC CARBON 415/9060	TOTAL ORGANIC HALIDES 9020	PETROLEUM HYDROCARBONS 418			PRIORITY POLLUTANT METALS (13)	CAM METALS (18) TTLC/STLC	EP TOX METALS (8)	SWDA-INORGANICS PRIMARY/SECONDARY	HAZARDOUS WASTE PROFILE				NUMBER OF CONTAINERS
SITE #26	9-14-88	8:35A	SOIL	1							X	X													1

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT: 52-1015-01	TOTAL NO. OF CONTAINERS	1
PO NO.	CHAIN OF CUSTODY SEALS	Y
	REC'D GOOD CONDITION/COLD	
SHIPPING ID. NO.	CONFORMS TO RECORD	
VIA: hand	LAB NO. 809081	

SPECIAL INSTRUCTIONS/COMMENTS:
9/19 - Per Rita - analysis request should be 8010/8020 Not TOC KM

INVOICE TO:

RELINQUISHED BY	RELINQUISHED BY
Rita H Neill 13:40	
(Signature) (Time)	(Signature) (Time)
RITA H. NEILL 9-14-88	
(Printed Name) (Date)	(Printed Name) (Date)
MALCOLM PIRNIE, INC	
(Company)	(Company)
RECEIVED BY	RECEIVED BY (LABORATORY)
	K L Meinders 1340
(Signature) (Time)	(Signature) (Time)
	K.L. Meinders 9/14
(Printed Name) (Date)	(Printed Name) ATI
(Company)	ANALYTICAL TECHNOLOGIES, INC.

C-88

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APPENDIX D
ANALYTICAL DATA EXCEEDING MAXIMUM CONTAMINANT LEVELS OR ADHS ACTION LEVELS

APPENDIX D

Analytical Data Exceeding Maximum Contaminant Levels

This appendix lists wells where chemical concentrations exceeded the EPA maximum contaminant level (MCL) or the Arizona Department of Health Services (ADHS) Action Level guidelines.

In cases where the EPA has not established an MCL, or where the ADHS Action Level guideline was lower, the ADHS guideline was used.

WELLS IN WHICH VOCs HAVE BEEN DETECTED ABOVE MCLs OR ADHS ACTION LEVELS

ENVIS Site Number	Legal Well Designation	Owner
1001	(A-1-2)12caa	Holsum Bakery
1004	(A-1-2)12baa	RID #114
1009	(A-1-2)1cac	Greenwood Mem. Park
2001	(A-1-2)9bbb1	RID #109
2002	(A-1-2)9bbb2	RID #109
2003	(A-1-2)10aba	RID #111
2004	(A-1-2)10cbc	RID #92
2005	(A-1-2)9aab	RID #110
2027	(A-1-2)9dbd	APS MW-1
3001	(A-1-2)8aa1	Van Buren Tank Farm
to	to	
3011	(A-1-2)8aa11	Van Buren Tank Farm
3013	(A-1-2)8baa1	RID #108
3015	(A-1-2)7bba	Prohoroff
3016	(A-1-2)8ada	Cons. West Steel Div.
3020	(A-1-2)8aa13	Van Buren Tank Farm
3021	(A-1-2)8aa14	Van Buren Tank Farm
3022	(A-1-2)8aa15	Van Buren Tank Farm
4027	(A-1-1)12bba	Evans
8001	(A-1-2)23aaa	City of Phx. III-1
8002	(A-1-2)23aad	City of Phx. III-2
8003	(A-1-2)23adb	City of Phx. III-3
8004	(A-1-2)23aab	City of Phx. III-4
8005	(A-1-2)23abb	City of Phx. III-5
8006	(A-1-2)23bab	City of Phx. III-6
8007	(A-1-2)23bbb	City of Phx. III-7
8011	(A-1-2)14cdd	RID #97
8014	(A-1-2)14aad	RID #99
9001	(A-1-3)18caa	City of Phx. DM-4
9002	(A-1-3)6dcd	Univ. Park R-G #1
9003	(A-1-3)18bbc	RID #104

RID = Roosevelt Irrigation District
APS = Arizona Public Service Co.

KLEINFELDER

Chemical Information

trichloroethene

ID Number 80.02 STORET Number 39180
CAS Number 79-01-6 MCL and ADHS Action Level = 5.0 ug/L

Synonyms : trichloroethylene
TCE
ethylene trichloride
triclene

Site	Date	Sample ID	Result	Units
1001	07/17/87	660	80	ug/L
1004	07/14/87	1004	54	ug/L
2001	07/15/87	604	17.1	ug/L
2002	05/12/86	640	28	ug/L
2003	05/12/86	641	10	ug/L
2005	05/12/86	646	35	ug/L
3002	10/26/87	619	200	ug/L
3003	10/26/87	620	48	ug/L
3005	04/22/85	613	6.3	ug/L
3006	04/22/85	614	7.8	ug/L
3007	04/22/85	615	89.4	ug/L
3008	04/22/85	616	139	ug/L
3009	04/22/85	617	48.2	ug/L
3010	12/10/87	622	21	ug/L
3013	07/16/87	608	14.1	ug/L
3013	05/12/86	639	33	ug/L
3016	07/14/87	596	6.1	ug/L
3020	06/24/87	656	1500	ug/L
3021	06/24/87	657	59	ug/L
3022	06/24/87	658	130	ug/L
8005	01/15/85	684	5.2	ug/L
9002	09/23/86	944	190	ug/L
9003	09/07/88	9003	8.8	ug/L

Chemical Information

tetrachloroethene

ID Number 75.01 STORET Number 34475
CAS Number 127-18-4 ADHS Action Level = 1.0 ug/L

Synonyms : PCE
perchloroethylene
perchloroethene
tetrachloroethylene
1,1,2,2-tetrachloroethene
ethylene tetrachloride

Site	Date	Sample ID	Result	Units
1001	07/17/87	660	51	ug/L
1004	07/14/87	1004	6.3	ug/L
1009	09/07/88	1009	1.1	ug/L
2001	07/15/87	604	15.1	ug/L
2002	05/12/86	640	36	ug/L
2003	05/12/86	641	4.1	ug/L
2004	05/12/86	643	1.2	ug/L
2005	05/12/86	646	38	ug/L
3001	10/26/87	618	12	ug/L
3002	10/26/87	619	31	ug/L
3003	10/26/87	620	400	ug/L
3005	04/22/85	613	24.9	ug/L
3006	04/22/85	614	27.3	ug/L
3007	04/22/85	615	323	ug/L
3008	04/22/85	616	519	ug/L
3009	04/22/85	617	65.3	ug/L
3010	12/10/87	622	98	ug/L
3011	12/10/87	623	110	ug/L
3013	07/16/87	608	31.3	ug/L
3013	05/12/86	639	50	ug/L
3015	05/12/86	638	50	ug/L
3020	06/24/87	656	590	ug/L
3021	06/24/87	657	300	ug/L
3022	06/24/87	658	800	ug/L
4027	09/02/86	4027	41	ug/L
8005	10/02/84	8005	3.9	ug/L
8005	01/15/85	8005	7	ug/L
8005	04/29/85	8005	1.2	ug/L
8006	07/29/85	8006	2	ug/L
8007	10/02/84	8007	7.5	ug/L
8007	01/15/85	8007	2	ug/L
8007	07/29/85	8007	6.5	ug/L

Chemical Information

tetrachloroethene (continued)

Site	Date	Sample ID	Result	Units
8011	05/12/86	642	1.1	ug/L
8014	07/14/87	600	9.6	ug/L
9001	2nd Qtr.	9001	2.0	ug/L
9002	09/23/86	944	11	ug/L
9003	09/07/88	9003	7.8	ug/L

KLEINFELDER

Chemical Information

1,1-dichloroethene

ID Number 6.00 STORET Number 34501
CAS Number 75-35-4 MCL and ADHS Action Level = 7.0 ug/L

Synonyms : 1,1-DCE
1,1-dichloroethylene
asym-dichloroethylene
DCE
VCE

Site	Date	Sample ID	Result	Units
1001	07/17/87	660	16.1	ug/L
2001	07/15/87	604	31	ug/L
2002	05/12/86	640	20	ug/L
3002	10/26/87	619	38	ug/L
3003	10/26/87	620	61	ug/L
3005	04/22/85	613	26.6	ug/L
3007	04/22/85	615	97.5	ug/L
3008	04/22/85	616	206	ug/L
3009	04/22/85	617	90.7	ug/L
3013	05/12/86	639	29	ug/L
3015	05/12/86	637	22	ug/L
3020	06/24/87	656	160	ug/L
3021	06/24/87	657	60	ug/L
3022	06/24/87	658	160	ug/L
4027	09/02/86	4027	7.2	ug/L

KLEINFELDER

Chemical Information

trans-1,2-dichloroethene

ID Number 78.00 STORET Number 34546
CAS Number 156-60-5 ADHS Action Level = 70 ug/L

Synonyms : acetylene dichloride
1,2-dichloroethylene
1,2-dichloroethene

Site	Date	Sample ID	Result	Units
3005	04/22/85	613	106	ug/L
3009	04/22/85	617	78	ug/L
3020	06/24/87	656	120	ug/L

KLEINFELDER

Chemical Information

1,2-dichloroethane

ID Number 10.00 STORET Number 34531
CAS Number 107-06-2 MCL and ADHS Action Level = 5.0 ug/L

Synonyms : 1,2-DCA

Site	Date	Sample ID	Result	Units
3005	04/22/85	613	80.7	ug/L
3006	04/22/85	614	12.6	ug/L
3009	04/22/85	617	5.1	ug/L
3010	12/10/87	622	34	ug/L
3020	06/24/87	656	7.8	ug/L

KLEINFELDER

Chemical Information

1,1,2,2-tetrachloroethane

ID Number 2.00 STORET Number 34516
CAS Number 79-34-5 ADHS Action Level = 0.50 ug/L

Synonyms : PCA
tetrachloroethane

Site	Date	Sample ID	Result	Units
3001	10/26/87	618	24	ug/L
3002	10/26/87	619	220	ug/L
3011	12/10/87	623	110	ug/L

KLEINFELDER

Chemical Information

vinyl chloride

ID Number 82.00 STORET Number 39175
CAS Number 75-01-4 MCL and ADHS Action Level = 2.0 ug/L

Synonyms : chloroethylene

Site	Date	Sample ID	Result	Units
8001	04/29/85	8001	2.1	ug/L
8002	01/15/85	8002	3.8	ug/L
8004	04/29/85	8004	5.6	ug/L
8005	10/02/84	8005	4.2	ug/L
8005	01/15/85	684	11.0	ug/L
8005	04/29/85	8005	4.8	ug/L
8005	11/04/87	627	2.9	ug/L
8006	04/29/85	8006	2.6	ug/L
8006	07/29/85	8006	2.9	ug/L
8007	10/02/84	8007	4.6	ug/L
8007	01/15/85	8007	4.4	ug/L
8007	04/29/85	8007	1.6	ug/L
8007	07/29/85	8007	7.0	ug/L
8007	04/10/86	8007	2.4	ug/L

KLEINFELDER

Chemical Information

trichlorofluoromethane

ID Number 83.00 STORET Number 34488
CAS Number ADHS Action Level = 1.0 ug/L

Synonyms : Freon 11
fluorotrichloromethane
trichloromonofluoromethane

Site	Date	Sample ID	Result	Units
2002	05/12/86	640	22	ug/L
2005	05/12/86	646	3.3	ug/L
3013	05/12/86	639	4.3	ug/L
3020	06/24/87	656	19	ug/L
3021	06/24/87	657	3.3	ug/L
8004	04/29/85	8004	3	ug/L
8005	10/02/84	682	13	ug/L
8005	01/15/85	8005	2.1	ug/L
8005	04/10/86	8005	2.1	ug/L
8006	10/02/84	8006	1.4	ug/L
8006	01/15/85	8006	1.4	ug/L
8006	11/04/87	8006	1.1	ug/L
8007	10/02/84	8007	8	ug/L
8007	01/15/85	8007	7.2	ug/L
8011	05/12/86	642	1.2	ug/L

KLEINFELDER

Chemical Information

methylene chloride

ID Number 68.00 STORET Number 34423
CAS Number 75-09-2 ADHS Action Level = 4.7 ug/L

Synonyms : dichloromethane
methylene dichloride
methylene bichloride
Freon 30
methane dichloride

Site	Date	Sample ID	Result	Units
8003	10/02/84	680	90	ug/L
8007	10/02/84	8007	21.5	ug/L
8007	01/15/85	8007	34	ug/L

KLEINFELDER

Chemical Information

1,2-dichloropropane

ID Number 11.00 STORET Number 34541
CAS Number 78-87-5 ADHS Action Level = 1.0 ug/L

Synonyms : propylene dichloride

Site	Date	Sample ID	Result	Units
8003	07/13/84	679	2.4	ug/L
8005	01/15/85	8005	1.2	ug/L
8005	09/26/85	8005	1.57	ug/L

KLEINFELDER

Chemical Information

benzene

ID Number 41.00 STORET Number 34030
CAS Number 71-43-2 MCL and ADHS Action Level = 5.0 ug/L

Synonyms : Benzol

Site	Date	Sample ID	Result	Units
2027	01/24/86	659	56	ug/L
3001	10/26/87	618	10	ug/L
3002	10/26/87	619	1200	ug/L
3003	10/26/87	620	9	ug/L
3004	10/26/87	621	61	ug/L
3005	04/22/85	613	240	ug/L
3005	03/13/87	609	150	ug/L
3006	03/13/87	610	53	ug/L
3007	04/22/85	615	22.1	ug/L
3008	04/22/85	616	7.4	ug/L
3009	04/22/85	617	30	ug/L
3009	03/13/87	612	11	ug/L
3010	12/10/87	622	205	ug/L
3011	12/10/87	623	15	ug/L
3013	07/16/87	608	8.6	ug/L
3013	05/12/86	639	66	ug/L
3022	06/24/87	658	10	ug/L

KLEINFELDER

Chemical Information

ethylbenzene

ID Number 61.00 STORET Number 34371
CAS Number 100-41-4 ADHS Action Level = 680 ug/L

Synonyms :

Site	Date	Sample ID	Result	Units
3002	10/26/87	619	840	ug/L

KLEINFELDER

Chemical Information

toluene

ID Number 76.00 STORET Number 34010
CAS Number 108-88-3 ADHS Action Level = 2000 ug/L

Synonyms :

Site	Date	Sample ID	Result	Units
3020	06/24/87	656	3000	ug/L

KLEINFELDER

Chemical Information

xylenes

ID Number 509.00 STORET Number
CAS Number ADHS Action Level = 440 ug/L

Synonyms : O/P-xylene
meta-xylene

Site	Date	Sample ID	Result	Units
3002	10/26/87	619	590	ug/L
3020	06/24/87	656	3400	ug/L

KLEINFELDER

Chemical Information

chloromethane

ID Number 55.00 STORET Number 34418
CAS Number 74-87-3 ADHS Action Level = 0.50 ug/L

Synonyms :

Site	Date	Sample ID	Result	Units
8001	04/29/85	8001	1.6	ug/L
8002	10/02/84	8002	1	ug/L
8002	01/15/85	8002	2.6	ug/L
8002	04/29/85	8002	2.1	ug/L
8003	01/15/85	8003	0.6	ug/L
8004	04/29/85	8004	3.4	ug/L
8004	07/29/85	8004	1.36	ug/L
8005	04/29/85	686	5.6	ug/L
8006	07/29/85	8006	1.1	ug/L
8007	04/29/85	8007	2.7	ug/L

KLEINFELDER

Chemical Information

chloroform

ID Number 54.00 STORET Number 32106
CAS Number 67-66-3 ADHS Action Level = 3.0 ug/L

Synonyms : trichloromethane

Site	Date	Sample ID	Result	Units
1001	07/17/87	660	3.2	ug/L
1004	07/14/87	1004	3.4	ug/L
3002	10/26/87	619	93	ug/L
3008	04/22/85	616	3.1	ug/L
3020	06/24/87	656	6.6	ug/L
3021	06/24/87	657	3.9	ug/L
3022	06/24/87	658	10	ug/L
8001	09/01/86	697	110	ug/L

APPENDIX E
COMMENTS ON THE DRAFT
PHASE I REPORT

APPENDIX E

Comments on the Draft Phase I Report

This appendix contains comments made by reviewers of the draft Phase I Report. The comments have been indexed alphanumerically. The responses to these comments are included in Appendix F under the corresponding alphanumeric designation.

COMMENTS FROM
ADOT FACILITY

Illegible
Sloan

ARIZONA DEPARTMENT OF TRANSPORTATION

206 South Seventeenth Avenue Phoenix, Arizona 85007

ROSE MOFFORD
Governor

CHARLES L. MILLER
Director

December 23, 1988

RECEIVED
DEC 29 1988
KLEINFELDER

Mr. Jim McDonald
Department of Environmental Quality
2005 North Central Avenue, Room 400A
Phoenix, Arizona 85004

Dear Mr. McDonald:

In response to the information found in the "Draft Phase I Report, West Van Buren Area, Phoenix, Arizona, Task Assignment K-2", the following comments are provided:

A-1 1. The ADOT facility at 1745 West Madison Avenue is not a vehicle maintenance facility as stated in this report. This facility is a materials testing lab.

A-2 2. There are no storage tanks located at this facility.

A-3 3. Wastes generated at this facility are transported off-site for reclamation or disposal. The use of Bud's Oil Service for waste treatment was stopped in September 1985. All wastes generated from this facility are now being treated by the Rinchem Company, Inc.

A-4 4. The questionnaire for this facility was submitted to the Department of Environmental Quality.

A-5 5. Of the three volatile organic compounds listed as found in Wells (A-1-2)12baa and (a-1-2)12caag, only TCE is used in this facility. Less than one gallon of TCE waste is generated monthly at this facility. This waste is transported off-site for treatment/disposal by the Rinchem Company, Inc.

If you have questions regarding these comments or the ADOT facility at 1745 West Madison Avenue, please contact Mike Malone at 255-7744.

Sincerely,

Charles L. Miller

CLM:vn
cc: Mike Malone

COMMENTS FROM
A T & T TECHNOLOGIES, INC.

W. T. Hicks
Manufacturing Vice President
Phoenix Works

DEC 1988
RECEIVED
Office of
Waste Program

AT&T
Network Systems

505 North 51st Avenue
Phoenix, AZ 85043
602 233-5555
Address Mail to:
P.O. Box 13369
Phoenix, AZ 85002

RECEIVED
DEC 23 1988
KLEINFELDER
PHOENIX

December 20, 1988

Mr. Paul Scheidig, Ombudsman
Arizona Department of Environmental Quality
2205 North Central Avenue
Phoenix, Arizona 85004

COMMENTS OF AT&T TECHNOLOGIES, INC., ON THE
DRAFT PHASE I REPORT, WEST VAN BUREN AREA

AT&T Technologies, Inc. (AT&T), appreciates the opportunity to submit these comments in response to the Draft Phase I Report on the West Van Buren Area, prepared for the Arizona Department of Environmental Quality (ADEQ) by its contractor, Kleinfelder (hereinafter Report). AT&T has always been sensitive to protection of the environment, employee safety and community safety, and is seriously concerned that the Phoenix Works has been, in our view, misidentified as one of the companies with the "greatest potential of being contributors of chemicals to the ground water" in the West Van Buren study area.

GENERAL COMMENTS ON THE REPORT

B-1 AT&T recognizes, as the Report itself makes clear, that this is a preliminary report, based on an admittedly incomplete investigation of the West Van Buren area and the companies doing business in that area. However, the identification of priority potentially responsible parties (PPRPs) for the alleged groundwater contamination in the West Van Buren area, and in particular the release of PPRP-specific information to the press and public, appears to AT&T to have been less than fair to the PPRPs. The process used to identify PPRPs seems to concentrate heavily on "potential" contribution to the alleged contamination, based almost solely on use of chemicals and geographic location, without a careful examination of the facility's disposal practices.

As AT&T understands the process, there were four steps: first, identifying facilities that potentially used, handled or disposed of chemicals observed in the groundwater; second, any facility that had a previous "environmental investigation" by a

federal, state or local agency, or with "unusual operational practices observed in the field" advanced into a higher priority classification (single asterisk); third, "notable field practices" advanced a facility into the next group (double asterisk); and finally, "the facility's proximity to areas of observed chemicals within the ground water was reviewed to determine its hydrogeologic potential for contribution to observed chemicals", advancing the facility into the PPRP list of sixteen. (Report, pp. 5-2, 5-3.)

B-2 No definition is supplied of a "notable" field practice. "Unusual operational practices observed in the field" apparently include "improper drum storage, stained ground in the vicinity of previously documented spills of unknown wastes in non-designated disposal areas or unlisted disposal facilities". (Page 5-2, item 2.c.) However, the report does not identify any "notable" waste handling and disposal procedures, much less any "unusual operational practices observed in the field" at AT&T's Phoenix Works. Nor is the Phoenix Works' proximity to allegedly contaminated groundwater enough.

B-3 To establish liability under the Arizona Hazardous Substances Spill Response Law, there must be a demonstration that a release of a hazardous substance from a facility into the environment (in this case groundwater) has occurred. The mere presence of contaminated groundwater within a quarter-mile of a facility does not establish liability against that facility. Nor does the use of a hazardous substance at a facility constitute a release to the environment, again, in this instance, groundwater.

B-4 Kleinfelder has recommended further investigation of the PPRPs, but such investigation must focus on the demonstrations required by statute to establish liability.[1] The following description of AT&T's manufacturing and waste disposal practices indicates some of the reasons that AT&T is concerned about the approach taken to identification of PPRPs.

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1 AT&T suggests that the ADEQ should promptly disavow one of the Report's recommendations: "If a listed facility cannot demonstrate, beyond a reasonable doubt, that it is not a contributor of chemicals to the ground water, then it should cooperate with additional sampling." (Page 7-1, emphases supplied.) This attempt to impose the burden of proof, normally born only by the prosecutor in a criminal action, on PPRPs is wholly inappropriate in any civil or administrative context.

MANUFACTURING PROCESSES AT AT&T'S PHOENIX WORKS [2]

AT&T's Phoenix Works is located on 120 acres, bounded on the west by 51st Avenue and on the south by Van Buren Street, and is within the West Van Buren study area. The Phoenix Works was built on property formerly used as a ranch, and began operations in 1968. The major products manufactured there are: exchange cable, used to connect one telephone company central office to another and to connect homes and businesses with the central office; and switchboard cable, connectorized cable, cords and wire, used to interconnect equipment within central offices and at homes and businesses.

The manufacturing processes at the Phoenix Works begin with wire draw, where copper rod is reduced into wire. The wire is then delivered to the pulp insulating area, where paper pulp insulation is applied to the copper wire, or to the plastic insulating area, where a coating of polyethylene or polyvinyl chloride is applied to the wire. Both pulp and plastic insulation are applied in several colors, to provide for identification in the finished cable.

The next step in the cable manufacturing process is twisting, where two wires having the same gauge but different colors are twisted together, then wound on a single reel. At the stranding machines, paired wires are grouped together to form units that are wrapped with a colored tape for identification and then wound onto a spool. Each unit is tested for electrical integrity.

At the cabler, units are assembled into a core that may contain 4,200 pairs of wires. First the core is formed, then spirally wrapped with strips of paper or plastic and wound on large spools. Following inspection, the pulp cores are sent to drying units and then stored in a climate-controlled room to prevent moisture from reentering the cable until it is sheathed and jacketed.

Sheathing protects the cable core from physical damage during installation and service. At the sheathing line, waterproofing materials, Mylar^{R}, corrugated aluminum and/or corrugated steel is formed around the core, followed by the

---

2 The information in this section is adapted from an 1984 AT&T brochure on the Phoenix Works, available on request at the plant. A copy is attached as Exhibit A hereto. The manufacturing processes and materials have not significantly changed from those described in the brochure.

extrusion of a plastic jacket. The cable passes on through a water trough where the plastic cools and hardens, and then the cable is wound on shipping reels. After final testing, each end of the cable is sealed, and the cable is ready for shipment to customers.

Similar processes, utilizing the same basic materials and equipment, are followed to create cord, wire and smaller cable products, which then have a variety of end connections affixed and are packaged for shipment to customers.

RAW MATERIALS, WASTE STREAMS AND DISPOSAL PRACTICES AT THE PHOENIX WORKS [3]

The major raw materials used at the Phoenix Works include copper, plastic (PVC and PIC), wood pulp, city water, 50% aqueous sodium hydroxide (NaOH), concentrated sulphuric acid (H_2SO_4), ink, methyl ethyl ketone (MEK) and 1,1,1,-trichloroethane (TCA). The paper insulation is made from wood pulp. City water, H_2SO_4 and NaOH are used to produce deionized water for plant operations, the H_2SO_4 and NaOH to recharge the cation and anion exchange resin beds that are the primary components of the water treatment system. MEK is used as a vehicle, thinner and solvent cleaner for the color coding inks. TCA is used in vapor degreasing of machine parts.

Process byproducts include excess copper, plastic and paper insulation from scrapped pieces of cable. Excess copper and plastic are processed on site and sold to recyclers; excess paper insulation is sent to a landfill as a non-hazardous waste. Waste TCA from the operation of vapor degreasers and waste MEK-ink solution from color coding operations are shipped to solvent reclaiming facilities as hazardous wastes. Liquid laboratory wastes from testing and other laboratory operations are collected in a laboratory waste collection tank and shipped to a TSD facility for disposal. Excess plating solution (10% H_2SO_4) and waste H_2SO_4 and NaOH from the water treatment processes are treated on-site by tank neutralization. The water treatment sludge from tank neutralization is discharged to the city sewer system as suspended solids, by permit.

AT&T's annual reports to the Arizona Department of Health Services and the ADEQ from 1981 to the present confirm

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3 The material in this section is adapted from a report on an inspection of the Phoenix Works' hazardous waste practices, prepared by an EPA contractor and available from EPA Region IX files or the files of the Arizona Department of Health Services. A copy is attached as Exhibit B hereto.

that AT&T has been disposing of its wastes properly. Copies are attached as Exhibit C. The waste solvents AT&T generates appear to be the only wastes that could be implicated in the alleged groundwater contamination in the area, but AT&T's reports (and manifests supporting those reports) show that AT&T's waste solvents have mostly been reclaimed. Solvent wastes have not been disposed of on site at the Phoenix Works, and have been primarily sent to reclaimers since the plant commenced operations.[4]

Similarly, there are no "unusual operational practices" at AT&T's Phoenix Works, nor does the Report mention such practices. Indeed, the description by EPA's inspection contractor of AT&T's waste storage and handling practices demonstrates that no such practices exist. The EPA inspection report stated in part (pp. 6-7):

> The hazardous waste storage facility was surrounded by a six-foot high security fence with a locked gate. It consisted of a covered two-tier drum rack which was open on all four sides. Each vertical section of drum rack held 24 drums (3 drums deep, 4 drums wide by 2 tiers high). There were 3 sections of rack totaling about 50 feet in length. The estimated storage capacity was stated to be about 60 drums. At the time of inspection there were about 7 drums of (TCA) waste and 13 drums of MEK waste in storage waiting to be picked up by recyclers.
>
> The company stores containerized waste on site for less than 90 days to escape the necessity of meeting additional regulations pertaining to hazardous waste storage facilities. The earliest date noted on the drums of accumulated wastes in storage was about 4 weeks prior to the inspection date. During the accumulation period, accumulation dates and the words "Hazardous Waste" are clearly marked on the drums. In addition, the labels contained the following information: statement per 40-CFR-262.32(b); DOT shipping name of contents; the UN/NA number; and the DOT hazard designation of the waste.
>
> All drums in the waste storage area were on racks and in good condition. No signs of leaks or spills were noted. The

---

4 Because the Phoenix Works is closed for the Christmas holidays and because some of the environmental personnel involved in waste disposal from 1968 to 1980 are no longer at the Works, AT&T has not submitted evidence of its waste-handling practices in those years with these comments. AT&T respectfully requests permission to supplement these comments with additional materials, and will do so early in 1989.

containers were stored closed and were compatible with wastes stored in them. The drums in storage are inspected weekly for leaks and any deterioration. Wastes incompatible with (TCA) and MEK are not placed in the storage area.

As stated above, solvent wastes have been separated and disposed of, primarily by reclamation, since the Phoenix Works began operation in 1968. Appropriate containers, labels and other precautions have always been used, and hazardous waste disposal operations have always been under the supervision of a qualified person.

AT&T's Phoenix Works has not disposed of hazardous wastes on site. The only significant chemical spill was of diesel fuel, and that spill was properly taken care of.

Proximity to Groundwater Chemicals

The Report states (p. 5-3):

"The facility's proximity to areas of observed chemicals within the groundwater was reviewed to determine its hydrogeologic potential for contribution to observed chemicals. A total of 16 facilities were advanced to the highest priority classification."

This is apparently the only reason that AT&T's Phoenix Works was so identified. However, none of the chemicals allegedly found in the
B-5 wells purportedly upgradient of the Phoenix Works, (TCE, PCE, 1,1-DCE, trans-DCE and benzene, see p. 5-24) are used at the Phoenix Works nor are they breakdown products of chemicals used at the Phoenix Works. Therefore, their presence in purportedly upgradient wells provides no information whatsoever about the hydrogeologic potential for the Phoenix Works's contribution to observed chemicals. Indeed, the map identified as Plate 2 in the Report indicates that AT&T's Phoenix Works is located outside the boundary of the plume shown. AT&T does not believe that this alleged geographic proximity supports the Report's selection of the Phoenix Works as a PPRP.

The February 1988 Diesel Fuel Spill

As part of the removal of an underground diesel fuel storage tank, the remaining fuel in the tank was transferred to another container. During this process, a diesel fuel line was
B-6 discovered to be leaking. Surface soil sampling and analysis detected Total Petroleum Hydrocarbons (TPHC) in excess of the ADEQ action levels in the soils, which have, through an extensive excavation process, been removed. AT&T's consultants, Western Technologies, Inc., performed a thorough program of soil sampling during remediation. Their report was provided to the ADEQ, and

all points raised by the ADEQ have received responses. While the ADEQ has not yet closed its file on this spill and cleanup, there is no evidence that the diesel fuel has contaminated or is likely to contaminate groundwater in the area, much less that a February 1988 B-6 spill bears any casual relationship to the contaminants allegedly present in nearby wells. This spill is being handled under the ADEQ's UST program, and AT&T will continue to cooperate with the ADEQ to agree on the level of remediation required.

The 1980 "Flooding"

AT&T is unsure what the reference to "flooded sumps located on site being subsequently pumped into an irrigation area" means. There are two possibilities, neither of which involved pumping.

(1) Until there was a storm sewer system serving the area, the Phoenix Works had a stormwater catchbasin in its reel yard. After a heavy storm had come, if the basin was full, the basin was allowed to drain by gravity into the irrigation system of the Salt River Basin Irrigation Project. The Phoenix Works was restricted by contract in the herbicides and pesticides it could use because of this agreement. AT&T has not as yet B-7 located a copy of the contract.

(2) In about 1979 or 1980, a complaint was made to the Arizona Department of Health Services that there was standing water in the reel yard at the Works. A DHS inspector, believed to be named Barry Ringel, visited the plant, and was shown the place where irrigation water from a neighboring farmer's alfalfa field had broken through the berm between the field and the reel yard and was in fact standing on AT&T's property. The water was drained into the irrigation system. The inspector may have prepared a report on this incident, but AT&T does not have a copy.

These matters involved rain water and irrigation water, not hazardous substances.

The Sodium Hydroxide "Spill"

As described above, the Phoenix Works uses sodium hydroxide to regenerate the resins in the water treatment plant. The NaOH supply line is located above ground and is insulated with fiberglass and an aluminum cover to prevent freezing. The line developed a leak at an expansion joint, discovered in the spring of 1984 when the NaOH began to leak out of the insulation. The line was immediately shut down, the insulation stripped and the leak repaired. The insulation and aluminum cover had been attacked for a length of about fifteen feet.

Having determined that the best procedure would be to replace the damaged insulation and cover, AT&T personnel stripped the old insulation and cover, removed the bad expansion joint and all soils that had come in contact with the NaOH, and packed it all in four 55 gallon drums for ultimate disposal at a TSD facility of Chemical Waste Management, Inc. The TSD facility was backlogged on its pre-acceptance testing, and it appeared that AT&T might have to store the drums longer than 90 days. AT&T therefore sought and was granted a one-month extension of the ninety-day period. Copies of the letter evidencing this extension and the manifest showing acceptance of the drums by Chemical Waste Management, Inc., are attached hereto as Exhibit D. Sodium hydroxide does not appear to be implicated in any way in the alleged groundwater contamination in the West Van Buren area.

None of these specific incidents demonstrates an actionable release under the Arizona statute. The rainwater or irrigation water drainage cannot be said, even in the broadest sense, to equate to releases of a hazardous substance. In both the diesel and NaOH spill cases, AT&T acted promptly and properly to remediate the spill, in compliance with company policy and Arizona regulations.

CONCLUSION

Because AT&T's Phoenix Works does not employ notable or unusual field practices, and because its alleged proximity to areas of observed chemicals in the groundwater has been shown to be without significance, AT&T believes that the Phoenix Works was misidentified as a PPRP in the Report. AT&T respectfully requests the ADEQ to consider these comments in evaluating the

Draft Phase I Report and in determining its future course of action with respect to the West Van Buren study area.

Respectfully submitted,

AT&T TECHNOLOGIES, INC.

BY _____
W. T. Hicks
Manufacturing Vice President

BY _____
D. G. Skiles, P.E.
Environmental Engineering Manager

OF COUNSEL:

James G. Derouin, Esq.
Meyer, Hendricks, Victor,
Osborn & Maledon
Suite 4000
2700 North Third Street
Phoenix, Arizona 85004
602-263-8700

Terry A. Thompson, Esq.
AT&T, Room 3WA138
One Oak Way
Berkeley Heights, N.J. 07922
201-771-2001

AWECO ARIZONA WELDING EQUIPMENT CO.

4030 WEST LINCOLN STREET + MAIL POST OFFICE BOX 352 + PHOENIX, ARIZONA 85001 + TELEPHONE 269-2151

RECEIVED
DEC 27 1988
KLEINFELDER
PHOENIX

December 20, 1988

Mr. Jim McDonald
Department of Environmental Quality
Room 400 A
2005 N. Central Avenue
Phoenix, Arizona 85004

Dear Mr. McDonald:

This letter will serve as an official response to Mr. Norm Weiss' letter to AWECO dated November 23, 1988, which notified us that our facility had been identified as a potential source of environmental contamination. Although we understand the position ADEQ has taken because of known groundwater pollution in the Maryvale area, it is almost inconceivable that such a small (former) consumer of suspected contaminates would even be considered as a possible source. Perhaps this response will assist you in the decision to drop our company as a potential pollution source.

Arizona Welding Equipment Company is a business engaged in the wholesale/retail distribution of welding equipment, industrial gases and related supply materials. We are not a "welding operation" as identified in the Draft Report. The only actual welding that occurs on our property would be the demonstration of certain welding processes to our customers. Actual welding would not even represent 1% of our day to day operations. We are located on Lincoln Street in two seperate and distinct facilities which perform different functions for our company as follows:

4030 W. Lincoln Street - This facility houses our administrative offices, retail store and warehouse. We do not use, consume, store or have any other reason to have chemical substances named in your Draft at this site.

3918 W. Lincoln Street - AWECO's plant, or filling station, is engaged in the pumping of industrial gases such as oxygen, nitrogen and argon into high pressure cylinders. We also manufacture acetylene fuel gas for use in industrial welding and cutting operations by our customer base. At this location we formerly used very small quantities of paint thinner to store our brushes and rollers used in painting cylinders. We also formerly consumed small quantities of 1,1,1 trichloroethane used to remove oil contaminants from cylinders. And finally, this facility currently has a 7,000 gallon underground acetone storage tank. The acetone withdrawn from this tank is put directly into acetylene cylinders in small quantities prior to their being filled with acetylene. These are the only possible pollutants used by this facility mentioned in the Draft Report and we would like to address each as a separate matter.

COMMENTS FROM
ARIZONA WELDING EQUIPMENT COMPANY

C-1

1. Paint thinner - On June 3, 1986 a field service unit of the Office of Waste and Water Quality Management visited the filling station to conduct a hazardous waste inspection. We were then using approximately two (2) gallons per week and the inspector noted several violations in our handling of this product, all of which were of an administrative nature. No violations were noted regarding the disposal of or spillage of this product at the site. All violations were satisfactorily corrected within 35 days and subsequently AWECO discontinued the use of this product in November 1986 and all residual product was properly removed from the property by Rinchem Company, Inc..

C-2

2. 1,1,1 Trichloroethane - The above stated inspection also determined that AWECO was using approximately five (5) pounds per week of the 1,1,1 Trichloroethane in our cylinder cleaning procedure. This cylinder cleaning operation consisted of one man working inside our building, wearing rubber gloves, who dipped an industrial cleaning rag into a small container of 1,1,1 trichloroethane (perhaps one gallon or less) and wiped down an industrial gas cylinder which had picked up oil or other hydrocarbon contaminates at one of our customer's locations. The employee used the small quantity of 1,1,1 trichloroethane until it was gone or had simply evaporated. At no time whatsoever were even small quantities of this product disposed of at the site other than the small usage described above. Again, violations were of an administrative nature and no violations were noted regarding unauthorized disposal at the site. All violations were satisfactorily corrected within 35 days and AWECO discontinued the use of this product in July 1987 and all residual product was also removed from our property by Rinchem Company, Inc.. In the case of both paint thinner and 1,1,1 trichloroethane, AWECO worked very closely with and cooperated fully with the Compliance Officer, Hazardous Waste Compliance Unit, Office of Waste and Water Quality Management. It should also be noted that Violations 8 through 14 noted by the Office of Waste and Water Quality Management were found to be not applicable to AWECO as we were classified as a small hazardous waste generator.

C-3

3. Acetone - As previously noted, the filling station has a 7,000 gallon underground acetone storage tank on the site. Although there is no reason to suspect a leak, we have scheduled soil core samples to be taken around the tank and discharge line on December 19 & 20, 1988. These core samples will be taken and analyzed by Earth Technology of Tempe. Unfortunately, we will not have the test results prior to the due date of this letter of response. However, as soon as they become available, we shall so advise your office. In any event, this tank will be excavated and removed from the site by a qualified contractor and the excavation inspected and approved prior to filling it in. This will be accomplished during January 1989.

C-4 In summation, we would submit that AWECO's use of paint thinner and 1,1,1 trichloroethane was very minimal. Although we may have committed violations regarding the labeling, storage and employee training regarding these products, we have never disposed of the chemicals by dumping them at the site. The acetone tank is being addressed this month and we are very confident that the integrity of this storage tank is good and that it has not been a source of pollution. As previously stated, we will forward test reports to your office as soon as they become available.

As always, AWECO stands ready to fully cooperate with your office as we continually have with other state and local agencies concerned with hazardous materials. Your inspections of our facilities are welcome, in fact, we encourage you to further scrutinize our buildings and property. After that has occured, we are confident you will be comfortable in removing AWECO from your list of possible pollution sources.

Very truly yours,

W. A. Meyer
President

WAM/kb

COMMENTS FROM
ATLANTIC RICHFIELD COMPANY
(Van Buren Tank Farm)

cc Kleinfelder

ARCO

Legal
515 South Flower Street
Mailing Address: Box 2679-T A
Los Angeles, California 90051
Telephone 213 486 3511

RECEIVED
DEC 21 1988
KLEINFELDER

December 13, 1988

Sandra Eberhardt
Arizona Department of Environmental Quality
2005 North Central Avenue
Phoenix, AZ 85004

Re: Kleinfelder Draft Phase I Report
West Van Buren Area

Dear Ms. Eberhardt:

As we discussed on the telephone yesterday, I am enclosing a copy of a letter dated July 25, 1988 which confirmed the Department's position that the Atlantic Richfield Company (ARCO) did not need to respond to the request for information relating to the captioned matter. This was agreed upon by the Department and ARCO because the information requested previously had been submitted voluntarily to the Department by ARCO.

D-1 As I noted in our telephone conversation, page 5-40 of the draft Kleinfelder report states that information relating to ARCO was not available because the questionnaire had not been returned. You indicated that the final version of the draft report would be corrected. You may designate the sender of the July 25, 1988 letter as the local ARCO contact person. He is Allyn L. Lawrence, ARCO Products Company, 5333 West Van Buren, P.O. Box 6535, Phoenix, AZ 85005.

Thank you very much for your attention to this matter. As I explained, ARCO has attempted to cooperate fully with the Department, and is sensitive to the inference that it was not responsive to the request for information.

Please contact me if you have questions. ARCO may be filing substantive comments on the draft report in the near future.

Sincerely,

John C. Laager
Senior Attorney

JCL:er

Enclosure

ARCO Petroleum Products Company
Motor Transport Department
5333 West Van Buren
Mailing Address: Box 6535
Phoenix, Arizona 85005
Telephone 602 278 8524

July 25, 1988

DEC 1988
RECEIVED
Office of
Waste Program

Sandra Eberhardt
Arizona Department of Environmental Quality
2005 North Central Avenue
Phoenix, Arizona 85004

Dear Mrs. Eberhardt:

This letter will confirm our telephone conversation of July 25, 1988 regarding your request for information. As we discussed your office has already received this information in a letter to Ronald L. Miller, PhD; dated August 12, 1988.

Should you have any questions you can call me at 278-8524.

Sincerely;

Allyn L. Lawrence
Terminal Superintendent

bcc: Jess Womack
T. T. Potter

COMMENTS FROM
BUD'S OIL SERVICE, INC.

Bud's Oil Service, Inc.
1340 West Lincoln Street
Phoenix, Arizona 85007-3420 • (602) 258-6155

RECEIVED
JAN 3 1989
KLEINFELDER

DEC 1988
RECEIVED
Office of
Waste Programs

29 December 88

Mr. Jim McDonald
ARIZONA DEPARTMENT OF
ENVIRONMENTAL QUALITY
2005 North Central Avenue
Room 400A
Phoenix, Arizona 85004

Re: Draft Phase I Report
West Van Buren Area
Phoenix, Arizona
Task Assignment K-2

Dear Mr. McDonald,

BOS has reviewed the above entitled draft and would like to take this opportunity to offer its comments.

E-1 BOS has been listed as a high priority PRP because the facility stores large volumes of chlorinated hydrocarbons prior to recycling. BOS has consulted professional engineers who have stated that the migration rate of chlorinated hydrocarbons in "typical" Arizona hydrology is 1×10^{-6} cm/sec or 31 cm per year assuming constant hydraulic and/or hydrolic pressure. BOS has stored chlorinated hydrocarbons at its facility since 1979. The groundwater is 70 feet below grade. Given the foregoing information, it is not probable that any chlorinated hydrocarbons from the BOS facility could have contaminated groundwater.

E-2 BOS stores chlorinated hydrocarbons in drums in an enclosed building with a sealed concrete floor. Tank storage areas also have coated concrete pads and secondary containment. These factors would contribute to a reduction in the normal rate of migration indicated above. The facility has never used underground tanks, underground plumbing, surface impoundments or dry wells, all of which are primary sources of groundwater contamination.

E-3 The Arizona Department of Health Services (now ADEQ) took soil samples in December of 1986 and found no solvents present at a depth of 3 feet.

E-4 Studies done concurrently with this one have only listed, as suspected potential responsible parties, those sites that are either located

E-4 within the plume or around its perimeter. Inasmuch as BOS is one mile from the perimeter of the plume, we question the high priority status given this facility.

E-5 BOS feels that based on the permeability of chlorinated hydrocarbons in Arizona soils, the facility's practice of storing chlorinated hydrocarbons on sealed concrete pads in contained areas, and the distance of the facility from the perimeter of the plume that, at the very least, it should be reduced to a low priority facility.

Very truly yours,

BUD'S OIL SERVICE, INC.

Stephen H. Hogg
President

SHH:v

COMMENTS FROM CHEMRESEARCH CO., INC.

ChemResearch Co., Inc.

Engineering Plating

1122 West Hilton | Phoenix, Arizona 85007 (602) 253-4175 | TELECOPIER (602) 254-0428

RECEIVED
DEC 30 1988
KLEINFELDER
PHOENIX

12-27-88

Ref: West Van Buren area draft phase I report.

Arizona Department of Environmental Quality
Jim McDonald
Central Palm Plaza Building
2005 N. Central Ave.
Phoenix, Arizona 85004

Dear Mr. McDonald;

On behalf of ChemResearch Co. Inc., I would like to thamk you for this opportunity to respond to the West Van Buren area Draft Phase I report. After reviewing this report we find some information very perplexing. With your assistance we can resolve these questions. This would allow us to better understand the needs of the ADEQ, while clarifying ChemResearch's position and enabling us to work closer with the department on resolving this ground water contamination question.

There are three areas of concern to us which were either not covered entirely in the report or were not reported correctly. We would appreciate a written response to the following questions.

1-All wells not identified for location on map supplied by ADEQ.

F-1 According to the report well number (A-1-2) 18 caa is located 4,000 feet upgradient and well number (A-1-2) 18 dad located 2,000 feet upgradient of ChemResearch were not defined on the well maps we recieved. No analytical data was found in regards to these wells in the report.

2-Date not reported correctly on contained chrome spill.

F-2 This spill was reported to the the city of phoenix waste water department when it occured in November of 1984. Since this date ChemResearch has had no other chemical releases.

3-Report incorrectly reports our primary waste as being TCE.

F-3 The West Van Buren report states our primary waste as TCE. By the ADEQ's definition TRICHLOROETHENE is abbreviated as TCE. ChemResearch Co. Inc., in the past and presently uses TETRACHLOROETHENE which is defined by ADEQ as PCE, and the trade name as PERCHLOROETHYLENE.

We again thank you for the oportunity you have provided us to help with resolving these questions. If we may be of further assistance please contact Richard Burge or Loren Foote at 253-4175 between the hours of 6:00 AM and 3:00 PM Monday through Friday.

Sincerely

Richard Burge
Environmental Manager

COMMENTS FROM
CITY OF PHOENIX

City of Phoenix
Environmental Services

RECEIVED
JAN 6 1989
KLEINFELDER
PHOENIX

December 28, 1988

Mr. Jim McDonald
Arizona Department of Environmental Quality
Room 400 A
2005 North Central Avenue
Phoenix, AZ 85004

HAND DELIVERED

Re: City of Phoenix Response to Draft Phase I Report, West Van Buren, Phoenix, Arizona

Dear Mr. McDonald:

Thank you for the opportunity to comment on the above-referenced report. As you know, the City of Phoenix has a very strong interest in the process of investigating suspected groundwater contamination in the area designated as the West Van Buren WQARF Study Site. As a unit of local government, the City is vitally concerned about the quality of the environment in this area, most of which lies within the boundaries of the City of Phoenix. As the owner and operator of a facility that is suspected of being a contributor to localized groundwater contamination, the City is also concerned about the integrity of the process used to identify potentially responsible parties and the procedures for responding to groundwater pollution.

Enclosed are specific comments on the report. Following are some general comments.

A. Overall Quality of the Report

In general, the City of Phoenix is concerned about the overall quality of the report. While most of our effort went into reviewing the information on the City facilities in the report, a casual review of other sections indicated that the same problems were present throughout: (1) errors of fact; (2) lack of scientific plausibility; and (3) internal inconsistencies. Following is a brief description of each.

(1) Errors of Fact

G-1 All of the locations in the report (text, plates, figures, appendices, etc.) where information of City facilities is presented contain a high percent of erroneous data. For example, the 27th Avenue landfill is

G-1

mislocated by one mile (Figure 4); the number of wells at the landfill is overstated (Plate 2); the groundwater quality data are inaccurate (page 4-6); the characterization that concentrations of VOC's are "consistently above published limits" (p. 4-6) is wrong; people who have not worked for the City for over 2 1/2 years are listed as facility contacts (Appendix A), etc. We have attempted to correct these errors in our comments. Given the large number of factual errors in City information, we cannot help but be quite concerned over the fact that the rest of the report may contain as many errors. If it does, the validity of the conclusions is greatly undermined.

(2) Lack of Scientific Plausibility

G-2

The report does not present a scientific rationale for many of its findings. In fact, the report is undermined by its failure to put forth scientifically plausible linkages between potential sources and contaminated wells. For example, sources of chemicals are postulated to be upgradient and offgradient (see comments regarding p. 4-8) from contaminated wells; high priority facilities are linked to contaminated wells over a mile and one-half away, even when intervening wells are clean (Sub-Zero); a five-mile contaminated groundwater plume postulated to start from the western vicinity of the Reynolds Plant along Van Buren contains an area (over a mile square encompassing the 43rd to 51st Avenue and south of Van Buren to Buckeye Road area) immediately "downgradient" from Reynolds which has at least eight wells in which no contamination has been found; local groundwater flow direction assumptions are wrong; etc. We feel strongly that the report's conclusions must be able to stand up to scientific scrutiny, given that these reports form the scientific basis for future legal action. As is, the report would not stand up to scientific scrutiny.

(3) Internal Inconsistencies

G-3

One would expect that even if the facts are wrong and the science insufficient, at least the plates, figures, and text should support each other and be internally consistent. In a casual perusal of the report, we found this not to be the case (see comments for p. 4-8 as a good example). For example, data from one well is actually data from three wells (p. 4-8); in a discussion which is supposed to characterize chemicals in a particular plume (Durango Curve), they fail to mention that the chemicals were found only once out of three times, suggesting that the chemicals were not so characteristic, groundwater flow directions, always postulated to be east to west, suddenly become north to south or west to east at the same site; wells which the text says are not contaminated with VOC's show up as contaminated (Figure 4, well 8059); the 23rd Avenue Wastewater Treatment Plant is listed three times (Appendix A), each with different information and two different priorities (medium and No.); etc.

The credibility of this report, (as was the Eastlake report) and its conclusions are severely undermined by these problems. The City is concerned that these problems will undermine the State's efforts to determine responsible parties (RP's) and get them to take appropriate actions.

G-4 We have read the Draft West Central Phoenix Area report and feel that the State has made a good first effort there to identify RP's - the study was focused around the areas of elevated levels of groundwater contamination; the linkages between the facilities and the contaminated groundwater are scientifically plausible; the discussion of the flow systems and contamination demonstrates an adequate scientific understanding; the report is well written; and the methodology for decision-making clear cut.

We would like to suggest that both the Eastlake and West Van Buren final reports incorporate the methodology used in the West Central Phoenix Study, in addition to correcting all the errors of fact, errors of science and the internal inconsistencies.

B. Use of the terms "downgradient" and "upgradient" and distances:

G-5 Many of the facilities listed as "highest priority" are so listed due to proximity to a contaminated well and being "upgradient" to the well. We have several comments on this:

G-6 (1) Based upon City and other studies, local flow directions are extremely variable and independent of "regional" flow. Flow directions are as follows for following sites: 27th Avenue landfill -- north April-September, northwest rest of year; 19th Avenue landfill -- northwest; West Van Buren Tank Farm -- southwest and northwest depending upon time of year. The text needs to emphasize this much more and the firmness of the conclusions needs to be qualified given this uncertainty.

(2) There is inconsistency in use of the term upgradient. Arizona Welding Equipment (p. 5-22) is listed as 2,200 feet "potentially upgradient" (I measure about 800 feet); Bud's Oil (p. 5-25) is listed as 6,000 feet "directly upgradient"; and Sub-Zero (p. 5-37) is listed as 8,800 feet "upgradient". Given that in most cases you do not know what is upgradient, these should all be appropriately qualified.

(3) The distances (proximity) to contaminated wells is often irrelevant (i.e., Bud's Oil -- 6,000, Sub-Zero 8,800; etc.). There is no plausible way to make a linkage at those distances.

C. Health Impact

G-7 The report should state more emphatically that there is no public health threat due to ingestion of contaminated groundwater from municipal supply wells. Also, the report should give a perspective on the level of contamination by indicating (in text and on figures and plates) which areas (wells)

G-7 are consistently above drinking water standards and which ones are below standards. Related to that, we do not feel that one well (particularly when it does not exceed drinking water standards) should be identified as a "plume" (as on Plate 2). Many of the so-called discrete plumes so identified

G-8 probably are representative of general background quality throughout the whole region and not due to one or two specific "sources", but years of tens or hundreds of facilities' discharges.

D. 23rd Avenue Wastewater Treatment Plant

G-9 City data do not suggest that this facility should be considered a medium-priority facility for groundwater contamination. Our impression is that it was misclassified due to a misunderstanding regarding data on a RCRA manifest.

If you have any questions, please call me at 256-5669.

Sincerely,

for Susan Keith
Water Quality Advisor

SK/ms/0745S

Enclosure

cc: George Britton
Ron Jensen
Paul Hendricks
Bruce Henning
Craig Reece

CITY OF PHOENIX COMMENTS -- WEST VAN BUREN
DRAFT PHASE 1 REPORT

EXECUTIVE SUMMARY

Page 1:

G-10 There is no clear statement of the criteria used for determining "significant levels" of contamination. Terminology is undefined and inconsistent. Is "elevated" to be equated with "detection limits"? If so, the term "significant levels" becomes meaningless as wells throughout the whole area appear to occasionally contain VOC's at detection limits. "Significant levels" needs to be redefined so as to be meaningful and to provide a focus for the investigation.

Pages 1 to 2:

G-11 Why the inordinate interest in VOC's, particularly when near detection limits? Why aren't high concentrations of metals or nitrates discussed?

Pages 3 to 4:

G-12 Several soil analyses show very low VOC levels, hardly evidence of a significant or determinable source. All facility soils data for TCE were within the range of "background".

Page 7, Paragraph 1:

G-13 This paragraph is misleading. The municipal supply wells will remain out of use; no future health impacts are foreseen. This should be included in the text.

CHAPTER 1

Page 1-1, Paragraph 2:

G-14 There are no municipal supply wells in the West Van Buren area.

Page 1-2, Paragraph 1:

G-15 Objectives A and B were not attained for the 27th Avenue Landfill as the data and boundary information provided to ADEQ by the City were not incorporated into the report.

CHAPTER 2

Page 2-6, Paragraph 2:

G-16 The upper unit is not a single unconfined aquifer; numerous inhomogenities create locally anomalous hydrologic conditions.

G-17 Page 2-6, Paragraph 2:

Steady state conditions do not exist in this area, nor are they even approximated. ADEQ has considerable data that demonstrates the significant influence of local pumping regimes on gradient and flow direction. The entire report is flawed by the assumption of a constant westerly flow direction. The report should indicate the historical and current uncertainty of flow directions, and should use flow data from local studies (such as ours) to supplement the report.

G-18 Page 2-6, Paragraph 5:

Note that SMCL"s are not health-related, but relate to aesthetic concerns.

G-19 Pages 2-6 to 2-7:

Documented levels of TDS exceed 2,000 ppm in the West Van Buren area.

CHAPTER 3

G-20 Page 3-1, Paragraph 2:

Current zoning does not correlate to land use, historic or present. Historical land use information does not seem to be sought or considered in this study.

G-21 Page 3-3, Paragraph 1:

OSHA does not maintain transporter lists, but they should have been asked for enforcement data and industrial accident information that would be indicative of improper management and handling of hazardous chemicals. The Arizona Attorney General's Office or the U.S. Attorney's Office should be contacted to check the files for investigation and enforcement information.

G-22 Page 3-3, Paragraph 2:

Did ADEQ make available the recent 27th Avenue Landfill monitoring results?

G-23 Page 3-3, Paragraph 3:

The discussion of ADHS mortality studies should note that groundwater is not considered a potential source of the alleged excess cancer mortality.

G-24 Page 3-7:

Additional information should have been obtained from those facilities currently conducting their own site investigations.

G-25 Page 3-7, Paragraph 2:

Were aerial photographs used to determine historical sites of chemical and petroleum use and/or disposal?

Page 3-8:

The use of field recon information appears to be subjective and inconsistent, e.g., although stained soil was a criterion, some sites with noticeable soil staining did not get even an asterisk (Black and Gold Paving, Ray and Bob Trucks, Salvage City, Inc.). Places with drums were not prioritized (Pioneer Distributing Co., Phoenix Generator).

G-26 Hazardous substance tanks are not distinguished from petroleum tanks; the former should have received more intense scrutiny. Using a criterion of "when visible" misses abandoned tanks and sites with multiple UST's.

Reliance on a field reconnaissance of this type ignores former uses of abandoned lots, vacant or cleared buildings, etc.

Page 3-10:

G-27 There is a conflict between paragraphs 3 and 4; it is first stated that all wells selected for sampling were previously located, then notes that 6 of 16 could not be located. What was the extent of the efforts to locate? The scope of well sampling should have been expanded significantly to more adequately support the conclusions of this report.

Page 3-17, Van Buren Tank Farm:

G-28 Replace "owners" with owner/operators. The City of Phoenix and several other operators lease their portion of the property from Southern Pacific Pipelines.

Page 3-17, APS:

G-29 Biphenyl (not biphenol) transformers.

Why was there no further site investigation done for the facilities listed on these pages? Was private data generated by several of these firms included in this study? If so, why is there no mention of data integration?

Page 3-18, 27th Avenue Landfill:

G-30 It is only an assumption that leachate is occurring. The report should simply list the chemicals associated with the disposal of municipal solid waste.

Page 3-19:

G-31 Elaborate on what private data was utilized, and how. Why were the recent monitoring results from the 27th Avenue Landfill not included? The final report should include data (water quality and flow direction, at a minimum) from the local studies.

CHAPTER 4

Page 4-1, Paragraph 3:

G-32 Current zoning is misleading and changes frequently. Historical land use patterns and information is of greater significance. Zoning often does not

G-32 relate to land use, particularly in residential areas that were formerly agricultural or industrial.

G-33 Page 4-2, Paragraph:

19th Avenue Landfill.

G-34 Page 4-3, Paragraph 3:

What is meant by "normal background levels" for VOC's? Please define.

G-35 Pages 4-4 to 4-9:

We assume that these discussions are meant to characterize the "dispersion" areas on Plate 2, and justify where these boundaries were chosen. The discussion does neither; instead it focuses on data from one well, often times a well which is not characteristic. The Plate 2 plumes are a significant factor to future decision making. As such, much more thought needs to go into the boundaries and the text discussion. Ranges of concentrations and averages should be included. Flow data should be integrated.

G-36 Page 4-5, Paragraph 2:

Why attempt to interpret chemical dispersion when the flow directions and changes in concentration are unknown?

G-37 Page 4-6, 27th Avenue and Lower Buckeye Road:

Following is a rewrite of this section, using data submitted to ADEQ by the City of Phoenix.

The City of Phoenix 27th Avenue Landfill is located between 27th and 35th Avenues south of Lower Buckeye Road. Seven monitor wells have been installed by the City of Phoenix on the eastern and northern boundaries of the landfill. The oldest of these wells have been sampled since 1980. Several volatile organic compounds have been intermittently detected in the monitor wells. Data from 1986 through 1988 indicate that the following compounds were detected at least once in a well:

Chemical	Maximum	Minimum	# of Detections
1,1,1 trichloroethane	2.3	0.2	4
1,1 dichloroethane	47.1	0.2	18
1,1 dichloroethene	0.7	0.3	3
1,2 dichloroethane	2.4	0.3	3
1,2 dichloropropane	1.0	0.3	7
1,4 dichlorobenzene	3.3	0.06	5
benzene	4.1	0.8	3
chlorobenzene	0.3	0.3	1
chloroethane	22.2	22.2	1
chloromethane	0.9	0.9	1
ethylbenzene	1.9	0.7	3
m-xylenes	2.7	0.3	5
o,p-xylenes	3.4	0.3	6

methylene chloride	2.0	0.3	9
tetrachloroethene	12.4	0.2	14
toluene	8.9	0.4	9
trans 1,2 dichloroethane	38.7	0.2	15
trichloroethane	19.9	0.2	14
trichlorofluoromethane	0.9	0.5	2
vinyl chloride	7.4	0.2	16

G-37

Sampling of selected wells located outside of the landfill to the south, west, and north in 1986 and 1988 detected no volatile organic compounds. Detectable concentrations of VOC's have been reported previously in some of the off-site wells. No conclusions can be drawn at this time about the magnitude or extent of the landfill's influence on ground-water quality. A study is currently underway to evaluate the influence of the landfill on water quality.

Page 4-8:

G-38 As a general comment, there are severe inconsistencies between the text, the data, and the plates throughout the report. Examination of just one area illustrates this point. (We did not review other sections to this level of detail.)

25th Avenue near the Durango Curve I-10

	TEXT (ACTUAL)	COMMENTS/PROBLEMS
G-39	"Chemicals in the groundwater were indicated by data for well (A-1-2) 13 bdb between the Durango Curve of Interstate-10 and 25th Avenue.	(1) There are three wells at this location, not one according to Plate 2. One is clean (Well 2). The data presented in the text (as being from one well) is actually a composite of data from wells 1 and 3. As per Plate 2, Well 1 contained the VC, trans 1,2-DCE and 1,1 DCA (the later referred to in the text as 1, 1,-dichloroethene); Well 3 contained the TCE and PCE, please make text consistent with Plate.
G-40		(2) Why does the composite data for the 2 wells indicate the chemicals in the groundwater? As can be inferred from Plate 2, these chemicals were not found in 2 of the 3 wells (i.e., each was found only once, in either Well 1 or 3). The text implies that the composite data are representative of chemicals in groundwater in the area, when in reality, if Plate 2 is correct, the data are not representative.
G-41	"It is possible that the source of these chemicals is near Well (A-1-2)12caa and Well (A-1-2)14aad.	(1) Well (A-1-2)12 caa is due north one mile. You have stated that groundwater flows to the west . How can you then make a possible linkage? (2) Well (A-1-2)14aad is to the west one-half mile. This is "downgradient" to you. Why are you hypothesizing a source(s) for the plume (plate 2) which are off or upgradient?
G-42		(3) Plate 2 includes wells (A-1-2)14aad and (A-1-2)13bdb in a large "dispersion" plume that goes from 15th Avenue to west of 27th Avenue, with well (a-1-2)14aad being the furthest "downgradient" well in

G-42 the plume. Theoretically, this well being the furthest downgradient, should have the lowest chemical concentrations of all the wells. But if you look at Plate 2 TCE values, it has the highest values (except for well (A-1-3)18bbc).

G-43 Table 4-2

Listed detection limits and state action levels if different from MCL's. The table should also reference the margin of error in sampling method quantifications.

G-44 Data was processed for only 8 of 16 wells. The study was therefore based on 8 samples, plus historical data. Was data from ongoing private studies included in the study?

G-45 The table lists no VOC's in wells (A-1-1) 13 add (Envis #5001) and well (A-1-2) 24 baa (Envis #8059). If the wells are clean, the table should note this.

G-46 Page 4-14, bottom:

The fact that two wells located 9,000 feet apart show levels of 3 VOC's slightly above detection limits cannot be considered significant, indicative of a single source, or even relevant to the study.

G-47 Page 4-22 Paragraph 2:

The study is incomplete in that 647 identified facilities did not provide a questionnaire response.

G-48 Page 4-22, Paragraph 1:

The "background" soils data showed a range in concentration of TCE of 0.08 to 10.4 mg/kg. All facility soil samples fell within the range of "background". There needs to be some discussion of this somewhere.

CHAPTER 5

G-49 Page 5-1:

We much prefer the methodology used in the West Central Phoenix study, which resulted in scientifically defensible conclusions regarding facilities. We feel that the methodology used in the West Van Buren area has not resulted in defensible conclusions regarding facilities causing groundwater contamination.

G-50 Page 5-1, Paragraph 3:

Define "unusual" chemical handling and storage procedures.

G-51

Page 5-2:

Item 3 - Should be listed before Item 2.
Item 2a - Field reconnaissance will not detect old facilities and prior disposal practices. The study should have focused on the areas of known problems and nearby facilities.
Items 2b, 2c - Clarify what facilities require additional investigation; the PRP's on the list of 155 sites.

G-52

Page 5-2, Paragraph 3:

The study did not consider all environmental problems, just groundwater quality problems.

G-53

Page 5-2, Paragraph 1:

Define "unusual" and notable." These observations do not necessarily relate to the degree of environmental damage.

G-54

Page 5-2, Paragraph 2:

In what process is such data "typically used"?

G-55

Pages 5-2, 5-3, Item 3:

The questionnaires were vague and easy to evade. It is not clear what dates were intended to be covered. The questionnaire missed prior owners and past practices.

Prior compliance notices advanced facilities, but enforcement has been notoriously ineffective. The study focused on meaningless compliance issues, i.e., wastewater pretreatment or manifest violations, instead of disposal, etc.

G-56

Page 5-3, Item 4:

The study's findings show little relationship between a facility's prioritization and proximity to groundwater contamination.

G-57

Page 5-4, Paragraph 1:

This paragraph is too general and too regional, more detailed information is readily accessible. There is no mention of transport rates in the report. The term "migration routes" is ambiguous.

G-58

Page 5-4, Paragraph 2:

Compliance files should indicate that the problem has been or is being taken care of.

G-59

Page 5-4, Paragraph 4:

The report needs less focus on the handling of chemicals and more on chemical disposal practices.

G-60 Page 5-5, Paragraph 2:

Emphasize the low rate of returned questionnaires.

G-61 Page 5-5, Paragraph 5:

How were overlying facilities differentiated in cases where contamination appeared to migrate from off-site?

G-62 Page 5-6, Paragraph 1:

How can eight groundwater samples confirm the prioritization of 16 facilities? The data collected do not confirm prioritization. The data suggest the opposite -- that low levels of contamination are characteristic of the whole area, and that there are numerous indiscernible sources.

The report is misleading in implying that multiple data points from the same well or adjacent wells gave consistent results. There are numerous instances of significant variation from one year or sampling round to the next. Such variations may be due to changes in flow direction and water level caused by fluctuations in the local pumping regime.

G-63 Page 5-9, top:

Inorganic constituents should be compared with ambient levels. Trichlorofluoromethane is an organic chemical.

G-64 Page 5-12, Item 5.4:

How was this discussion applied, if at all, to this study?

G-65 Table 5-1:

The listing of chemicals detected in wells should have considered and discussed detection frequency and the number of analyses within the set that were at or below detection limits. This raises the question of the various analytical methodologies and their ability to distinguish closely related isomers and congemers, and the relative acceptability of analytical methodologies. The entire sampling process is undermined by the lack of QA/QC data and information.

G-66 We were unable to find supporting data in this report for the indicated occurrence of tetrachloroethane and trichlorofluoromethane in well (A-1-2) 14cdd or methylene chloride and 1,2-dichloropropane in well (A-1-2) 23adb.

G-67 Page 5-16, Paragraph 1:

What about inorganics? Also, the general geographic area criteria does not seem to have been applied very stringently (i.e., Bud's Oil, 6,000 feet; Sub-Zero, 8,000 feet).

G-68 Page 5-17; 27th Avenue Landfill:

The location of the 27th Avenue Landfill shown on Figure 4 is incorrect.

Contact is:

Bruce E. Henning, P.E.
City of Phoenix, Public Works
101 South Central, No. 500
Phoenix, AZ 85004
(602) 256-5621

G-69 This summary should note that the City is currently conducting an ongoing and comprehensive study of groundwater quality in the vicinity of the landfill, and reporting the results of this investigation to ADEQ.

G-70 The facility does not store hazardous materials. Materials intercepted prior to disposal are separated and sent to a hazardous waste site. The "liquid wastes" noted were septage. What are the "RCRA records" that show dumping of liquid waste?

G-71 We are confused regarding the use of the term "RCRA compliance records". This is not a RCRA facility and RCRA compliance was not an issue in the 1979 cease and desist order.

G-72 Well (A-1-2) 23bbb is located in a junk yard off gradient to (west of) the landfill.

G-73 Page 5-40 West Van Buren Tank Farm:

The last sentence under Literature and Records Search is misleading. A summary report for this facility has been submitted to ADEQ and indicates that there is no on-site evidence of VOC disposal. As contamination is limited to hydrocarbons, this site should be removed from the West Van Buren PRP list.

G-74 Page 5-41, City of Phoenix Petroleum Stores:

This information is incorrect. There are no underground storage tanks at this facility. The contractor has confused this site with the City of Phoenix Petroleum Stores facility at 2239 West Lower Buckeye Road.

G-75 Page 5-47, Table 5-2:

Clarify -- is the Alkire Park well 18bad or 18bbc, as indicated in the paragraph below? This well is not utilized for irrigation and is presently inactive. Well No. 196 and 179 are abandoned.

G-76 Page 5-48, Paragraph 1:

Include in the hydrology discussion; beef up the discussion on local influences on flow directions to set the stage for ambiguity regarding "upgradient - downgradient distinctions.

G-77 Page 5-48, Paragraph 3:

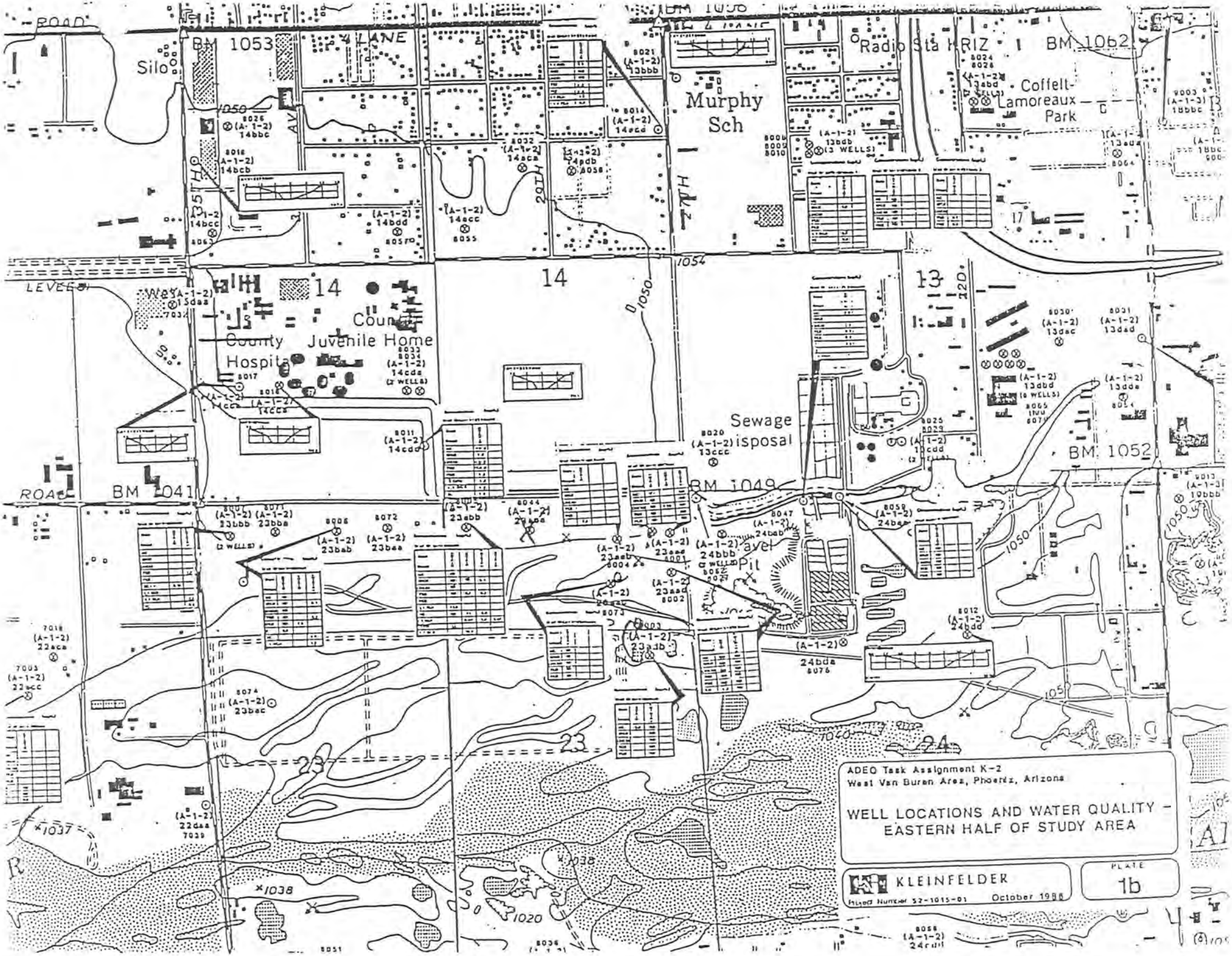
Local groundwater is not used for drinking water and should be indicated not to be a primary route of exposure.

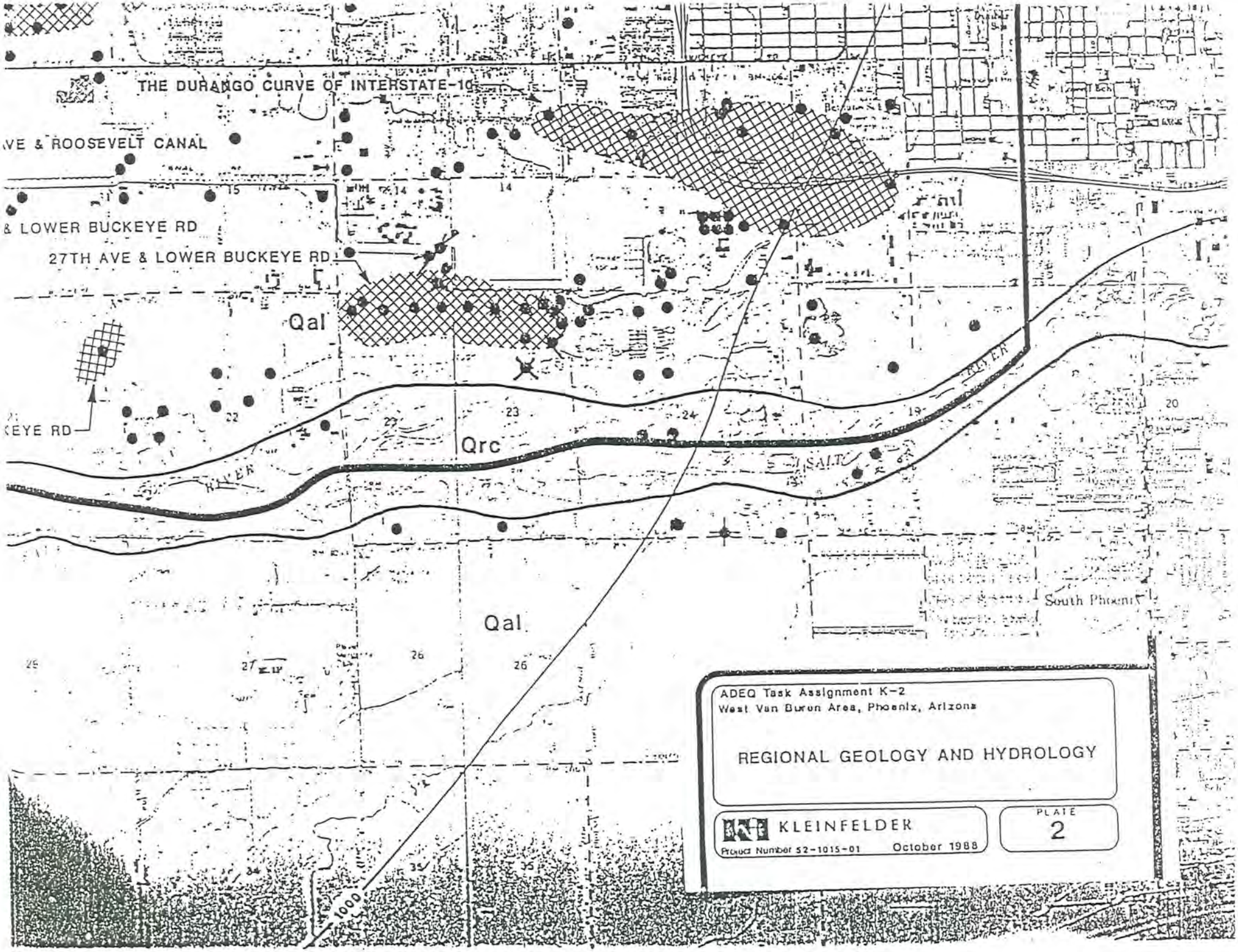
Plate 1B and Plate 2:

G-78 The City has accurate information on well locations for the 27th Avenue Landfill area. Your plates show many more wells than are actually there. See attached revisions.

Plate 2:

G-79 Neither the text nor Plates 1A and 1B justify many of the "dispersion" areas. These seem to be drawn independent of flow direction and water quality data. For example, the West Van Buren "plume" as shown on Plate 2 is bisected by an area of "clean" wells from 43rd Avenue to past 51st Avenue on Plate 1A and 1B. Also, Plate 2 is misrepresentative in that it suggests that all wells plotted in the plume are contaminated when in reality (or as per Plates 1A and 1B) only a fraction have data indicating contamination. Much more thought needs to be put into how to characterize the contaminated areas. Additionally, the Plate should distinguish between different levels of contamination, as did the West Central Phoenix report.


ADEO Task Assignment K-2
West Van Buren Area, Phoenix, Arizona
WELL LOCATIONS AND WATER QUALITY - EASTERN HALF OF STUDY AREA
KLEINFELDER
Project Number 52-1015-01
October 1988
PLATE
1b
Silo
BM 1053
Murphy Sch
Radio Sta KRIZ
BM 1062
Coffelt-Lamoreaux Park
County Juvenile Home
County Hospital
Sewage Disposal
BM 1052
BM 1049
BM 1041
Gravel Pit
LEVEE
ROAD
14
13
23
24


THE DURANGO CURVE OF INTERSTATE-10
VE & ROOSEVELT CANAL
& LOWER BUCKEYE RD
27TH AVE & LOWER BUCKEYE RD
KEYE RD
Qal
Qrc
Qal
RIVER
SALT
South Phoenix
ADEQ Task Assignment K-2
West Van Buren Area, Phoenix, Arizona
REGIONAL GEOLOGY AND HYDROLOGY
KLEINFELDER
Project Number 52-1015-01
October 1988
PLATE
2

COMMENTS FROM REVLON, INC.

G-80 For 19th Avenue, 23rd Avenue and 27th Avenue Landfills:

Change Owner to: Bruce Henning
City of Phoenix
101 South Central, No. 500
Phoenix, AZ 85004

G-81 23rd Avenue WWTP:

The facility is not a generator of hazardous materials. The ID refers to a one-time shipment of old photochemical materials that were removed from the site. This facility does not warrant a "higher priority" classification and should be downgraded. Also, this facility is listed twice elsewhere (p. 20).

Other Facilities:

G-82 1. Standard Oil used to have petroleum tanks located on the northwest corner of 19th Avenue and McDowell Road.

G-83 2. A chemical company was formerly located at 23rd Avenue and Lower Buckeye Road.

G-84 3. A used oil refinery was formerly located between 19th and 22nd Avenues north of Lower Buckeye Road.

G-85 4. The Glenn Weinburger Construction Debris Landfill, listed as Glenn Weinburger Topsoil, at 3410 South 39th Avenue (278-9155) should be investigated as a potential source of contaminants.

0740S

REVLON
4301 West Buckeye Road
Phoenix, Arizona 85043
(602) 352-5001

William G. Batting
Senior Vice President
and General Manager

DEC 1988
RECEIVED
Office of
Waste Program

December 20, 1988

Mr. James McDonald
Department of Environmental
Quality
Rm. 400A
2005 North Central Avenue
Phoenix, Arizona 85004

Re: Draft Phase I Report, West Van Buren Area, Phoenix, Arizona - Revlon, Inc., 4301 West Buckeye Road, Phoenix, Arizona 85043

Dear Mr. McDonald:

This letter will constitute the comments of Revlon, Inc. on the Draft Phase I Report for the West Van Buren area. As will be detailed below, Revlon, Inc. does not agree with the report's identification of our facility at 4301 West Buckeye Road as "a potential source of environmental contamination." While we acknowledge your statement that this identification "does not represent a decision or administrative finding of culpability or liability by ADEQ, the contractor or any other party", we believe that the identification of the Revlon facility as a potential source of contamination is a result of (a) factual errors, (b) misinterpretation of data and (c) inadequate analysis of methods of handling materials and their potential pathways in the environment. Accordingly, we request that Revlon's name be removed from the list of potential sources. Our comments are set forth more specifically below.

H-1 1. The report apparently makes the conclusion that Revlon is a potential source of environmental contamination based merely upon the fact that Revlon uses chemicals and generates hazardous waste. There is no discussion of the ways in which these chemicals are handled at the site, nor any analysis of any possible pathways of contamination. There is, in short, absolutely no evidence to support the report's conclusion that Revlon is a potential source of groundwater contamination. We believe that a more detailed review of use and handling of chemicals and wastes at the Revlon facility will show that such materials are handled properly, and that no release to the environment could have taken place.

2. With respect to the finding of trace amounts of four chemicals in a soil sample;

a. The sample report itself showed no readings of toluene above detectable limits.

b. Each of the four chemicals in question is only used in our laboratory, and in very small quantities;

c. While not processed at the Revlon plant, toluene is found as an ingredient in nail enamel, which is manufactured elsewhere, and is only handled on impervious surfaces;

H-2

d. These readings are several orders of magnitude below any level of concern, significantly below the Arizona Department of Health Services guidelines, and below any applicable standard for soil clean-up in any state. Even the New Jersey ECRA standards, which are generally acknowledged to be the most stringent in the country, would not require action to be taken with readings at this low level.

e. We were not given the opportunity of splitting samples, no trip blank was utilized in that batch of samples, and the quality of the samples themselves is therefore suspect.

3. A list is attached (Exhibit A) of those chemicals on the SARA list of "extremely hazardous chemicals" that can be found at the Revlon Phoenix plant. As can be seen, only two such chemicals have been used at the Revlon Phoenix plant outside the laboratory. These two are:

Phenyl Mercuric Acetate. This chemical is used in small quantities in certain products. A total of 5.5 kilograms was used from 1979 through 1988. A minimal amount of this substance remains on site, stored in a container inside the plant on an impervious surface.

H-3

Formaldehyde. Formaldehyde is used in a 37% aqueous solution in the laboratory. The solution was used until 1984 for sanitizing demineralized water equipment,and is still used in small quantities as an ingredient in a few products. At present there is on hand at the plant 170 kilograms of the formalin solution, well below the SARA limits.

The draft report on page 3-18 lists two chemicals, 1,2-Benzeisothiazin-3-one, and 1,1-dioxide salts, as being present at the Revlon facility. We have no record of these substances being ever present at our plant.

H-4

The mention on page 5-30 of the report that our facility

H-4 has four registered underground storage tanks in the same reference to "extremely hazardous substances" is misleading. No extremely hazardous chemicals or substances are stored in underground storage tanks at the Revlon Phoenix plant. The underground tankage at the Revlon Phoenix plant is used exclusively for storage of ethyl alcohol.

H-5 4. It is most inappropriate to confuse the fact that the Phoenix plant generates hazardous waste with the conclusion that the plant might be a source of groundwater contamination. Actual generation of hazardous waste takes place within the plant building and on impervious surfaces. The storage area is under RCRA interim status and a Part B application has been submitted and is pending. The storage area has been inspected by DEQ on several occasions, and there is absolutely no record or history of leakage of any hazardous waste from this area.

H-6 5. The draft report overemphasizes minor administrative violations issued in 1986. On May 21, 1986 the Arizona Department of Health Services, following an inspection at the Revlon Phoenix facility, cited the plant for violations of the hazardous waste regulations. These violations were corrected within two months of receipt of the letter, and a document certifying corrective action was submitted to the department on July 8, 1986. Copies of the citation and our response are enclosed as Exhibit B. It is thus inappropriate to state that these violations were "corrected by 1987" as the draft report does on page 5-30. In addition, none of these violations, which were quickly and easily corrected, involved any possibility of leakage of material or waste, and could generally be categorized as "paper work" violations. Specifically, the violations concerned technical deficiencies in certain procedures, failure to post certain signs and to provide certain communication devices, and the need for an additional inspection log. As stated above, all of these violations were corrected within two months.

H-7 6. The Revlon Phoenix plant is indeed a manufacturer of cosmetic products, but not of chemicals. No reactive chemistry is conducted at the plant. The plant blends various chemicals and other substances to form cosmetic products, and, in addition repackages certain other products made elsewhere.

H-8 7. While the percentages of chemicals used in our cosmetic products and the methods in which they are blended are considered to be trade secrets by Revlon, the identity of such chemicals is not considered a trade secret. All chemicals stored at the plant have been identified to all appropriate authorities, including the investigating team on this project. Each ingredient in a cosmetic product is required to be identified, not only to your agency, but to consumers on the ingredient panel of the product package. There are, thus, no chemical components stored on this site that have not been disclosed to the project team because of trade secret claims.

In our annual reports to your agency we disclose to you the percent ranges of each ingredient in our nail enamel formulations. Because of the competitive nature of our industry we have requested that this breakdown of percentages be kept confidential. However, the identity of each ingredient in those products is a matter of public record. It is thus incorrect to state that any chemical component at the site can not be identified by your department.

H-8

8. A remedial plan with respect to the reported leakage from ethyl alcohol tanks has been submitted to and approved by your department. A copy of this plan, and your department's response thereto, is attached as Exhibit C. There is no evidence of any groundwater involvement from this leak. It did not involve any chemical of concern to the West Van Buren groundwater study, or any other toxic chemical. In any event, the leakage has been stopped, and the approved plan will be executed in early January.

H-9

9. The net worth listed for Revlon clearly refers to Revlon's assets worldwide, and probably predates the acquisition of Revlon by MacAndrews & Forbes, after which a great deal of restructuring took place. We suspect this figure may not be current. Even if it were, we fail to see how our company's net worth is relevant to the issue of whether the Revlon Phoenix plant is a cause of environmental contamination.

H-10

10. In October 1988 the Revlon Phoenix plant received a report that chemicals had been buried on the property in 1979. An investigation was immediately initiated, and drums containing approximately 60 gallons of nail enamel were found near the parking lot at the plant. Chemical Waste Management was retained to remove the drums and soils. The clean-up site was inspected by your department, and the release was reported immediately to your department and to the National Response Center. All of the nail enamel that might have leaked from those drums has been recovered, and the hole has been refilled with clean earth. A copy of our report to your department on this incident is attached as Exhibit D.

H-11

We mention this incident for two reasons. First, it shows the "worst case" of any potential migration of chemicals from our facility. After years of investigation and questioning of past employees, this is the only known incident of disposal of any hazardous material on site, or of leakage away from an impervious surface. In this case, we were able to remediate the situation properly, and to assure that none of the contamination could have come close to affecting any groundwater in the area. Second, we believe that our response to this situation is illustrative of our general approach to the environment at the facility. We take most seriously our responsibility to the community at large and to our immediate neighbors. As soon as we had any reason to suspect that there might be leakage of chemicals we took appropriate actions to rectify the situation,

H-11 and to inform state and federal agencies with jurisdiction in the area.

In conclusion, we believe that it is inappropriate to identify the Revlon Phoenix plant as a potential source of contamination, and that any detailed investigation of our operation will confirm this fact. Certainly there are many plants in the Phoenix area that use hazardous chemicals or generate hazardous waste. However, strict adherence to the RCRA requirements and the Arizona DEQ regulations enacted thereunder can assure the public that these materials can be handled without the threat of harm to the environment or to the public at large. We strongly believe that our record shows such precautions have been properly undertaken. We respectfully request that you remove our facility from the list of potential sources of contamination, that you revise the draft report in accordance with the comments set forth above, and that you attach a copy of this letter as an exhibit to your final phase I report.

As always, if I or any member of my staff can be of help to you in this project please do not hesitate to call me, or Mr. Richard E. Seplow, our Director of Regulatory Affairs.

Very truly yours,

William G. Batting

William G. Batting
Senior Vice President
and General Manager

WGB/np/1648G

COMMENTS FROM
REYNOLDS ALUMINUM

REYNOLDS ALUMINUM
Reynolds Metals Company • P.O. Box 27003 • Richmond, Virginia 23261

DEC 1988
RECEIVED
Office of
Waste Program

December 22, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RECEIVED
DEC 29 1988
KLEINFELDER

Mr. Jim McDonald
Department of Environmental Quality
Room 400-A
2005 North Central Avenue
Phoenix, AZ 85004

RE: Comments on the Draft Phase I Report
West Van Buren Area, Task Assignment K-2

Dear Mr. McDonald:

Having reviewed the above mentioned draft report, we feel it is imperative that Reynolds set the record straight on erroneous information contained in the report.

Reynolds is very concerned that after submitting substantial amounts of information to the ADEQ about the history and operation of our former manufacturing facility in Phoenix, the report still contains inaccurate and misleading statements. At best, a factually flawed data base will lead to misleading, inaccurate or perhaps totally incorrect conclusions. Reynolds believes that all inaccurate, misleading or incorrect statements contained in the draft report should be removed or corrected. Placing the "correct" information in an appendix as suggested in the transmittal letter is, we believe, totally inappropriate. The final report should be a complete and accurate document that contains only factually correct information.

I-1 Page 3-18: Reynolds has no historical information supporting the conclusion that polychlorinated biphenols (PCBs) were "used" at the former plant site. PCBs are the dielectric material contained in transformers that are located at nearly all manufacturing locations like our former plant site. The dielectric fluids were not directly used in any of our manufacturing operations. The statements on PCBs on page 3-18 should indicate that the PCBs were contained in transformers.

I-2 Page 4-5: While the ADEQ has obtained analytical data showing the presence of VOCs at various locations within the "Van Buren Street plume" there are wells within the plume that show no evidence of contamination. We believe that it is extremely important to include this information in the final report to portray an accurate picture of the factual situation. Finalizing this investigative report with only partial information will diminish from the quality and accuracy of the final report and adversely affect any users ability to draw proper conclusions.

I-3 Page 5-32: Reynolds takes great exception to the totally inaccurate and misleading statement concerning the "discovery" of 44 drums of TCA during plant closure activities. From 1982 through 1984, Reynolds undertook the colossal task of closing the former extrusion plant. This involved removal and returning to vendors unused raw materials, and the shipment of waste materials to offsite disposal facilities. Our closure activities also included the removal of accumulated tank bottoms from our open top degreasing dip tanks. During the closure efforts we accumulated drums of dirt, debris, metal shavings, etc., some of which were identified as containing residual TCA. At no time during closure activities did workers discover or otherwise "uncover" drums of TCA or any other waste materials.

I-4 Further references in this section to TCA generation are, we believe, misleading. During 1982 and 1983, Reynolds reported the generation and offsite disposal of still bottoms from our degreasing operation. Still bottoms, as opposed to pure TCA, contain heavy distillate fractions including greases, oils, wax, dirt, etc.* While there is some carry over of TCA into the still bottoms, i.e., 10% or less, the TCA quantities in the report are more accurately described as still bottoms. Additionally, references made about monthly generation rates of TCA from 200 to 400 gallons would be better described as still bottoms.

In conclusion, Reynolds believes there are serious factual errors in the draft report. We believe that these incorrect or inaccurate statements should be corrected in the body of the final report and the corrections not merely attached as an appendix. Reynolds is, of course, willing to discuss any of the issues raised in this letter with employees of the ADEQ or their designated representatives.

If you have any questions or need any further clarification, or if you wish to arrange a meeting to discuss our comments, please feel free to call me at 804/281-2918.

Sincerely,

C. R. Bent, P.E.
Corporate Environmental
Control Department

CRB:sspr
cc: L. C. Tropea
J. McKinnon
J. Passeri
C. Grace

---

* In fact, on page 9 of the CERCLA Site Inspection Report (April 22, 1987) prepared by Mr. Louis Parsons, he states "...still bottoms were 6-10% trichloroethane, 82-85% oils and 5-8% wax".

COMMENTS FROM
SALT RIVER PROJECT

Kleinfelder

SALT RIVER PROJECT

POST OFFICE BOX 52025
PHOENIX, ARIZONA
85072-2025
(602) 236-5900

December 27, 1988

RECEIVED
DEC 29 1988
KLEINFELDER

Mr. Jim McDonald
Department of Environmental Quality
Room 400A
2005 North Central Avenue
Phoenix, AZ 85004

Dear Mr. McDonald:

Attached are Salt River Project's comments on the Draft Phase 1 Report, West Van Buren, Phoenix Arizona, Task Assignment K-2, prepared for the Arizona Department of Environmental Quality (ADEQ) by Kleinfelder. SRP appreciates the opportunity to review the draft report and provide comments to the ADEQ.

Sincerely,

Alfred H. Qöyawayma, Manager
Environmental Services Department

CLP/AHQ/laf
Attachment

Salt River Project (SRP) has received the Draft Phase I Report, West Van Buren, Phoenix, Arizona, Task Assignment K-2, prepared by Kleinfelder, along with the Arizona Department of Environmental Quality's (ADEQ) transmittal letter dated November 23, 1988, soliciting comments on the Draft Report. Salt River Project was named in this draft report as a potential source of contamination in the West Van Buren Study Area (study area) along with other owner/operators of the Van Buren Tank Farm, located at 51st Avenue and Van Buren Avenue, which is within the study area. SRP appreciates the opportunity to comment on the draft report. The following comments should not, however, be deemed an indication that SRP considers itself an involved or responsible party with respect to any future investigative or remedial activities that may be undertaken in the study area. As recognized by the ADEQ in its transmittal letter, the report does not represent an administrative finding of culpability or liability against SRP or any other party.

General Comments

SRP, in conjunction with other owner/operators of the Van Buren Tank Farm, retained ENSR (formerly ERT, Inc.) to study the potential impact of activities performed at the Tank Farm on the underlying groundwater. That study is now complete, and the report due to be submitted to your agency in early 1989.

The ENSR report indicates that the Tank Farm has not contributed to the volatile organic compounds (VOCs) contamination in the groundwater that is associated with the West Van Buren Study Area. Likewise, the Kleinfelder study appears to show the VOCs originate from activities miles upgradient from the Van Buren Tank Farm.

J-1 The Water Quality Assurance Revolving Fund (WQARF) and studies financed by the Fund may be used "For the reasonable and necessary costs of monitoring, assessing, identifying, locating and evaluating the degrading, destruction, loss of or threat to the waters of the state resulting from a release of hazardous substance to the environment." A.R.S. 49-282 B.4. The definition of hazardous substance in A.R.S. 49-201(16) references the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) definition of hazardous substance. Hazardous substances include those substances listed in the Clean Water Act, the Clean Air Act, the Federal Toxic Substances Control Act, and the Resource Conservation and Recovery Act . Petroleum products, such as the fuel products stored at the Tank Farm, are explicitly excluded from this hazardous substance definition by CERCLA Section 101(14) and Section 104 (a)(2). Compounds such as benzene, toluene, and xylene (BTX) found in fuels are fractional distillates of the petroleum refining process, and are considered to be included in the petroleum products exclusion, as their

J-1 presence in petroleum products is not as additives, but as an integral part of the refining process itself. See United States v. Carolawn Co., 14 Envtl.L.Rep. 20696 [21 ERC 2124] (D.S.C. June 15, 1984). Thus, petroleum products are not currently regulated under the WQARF program.

There is no history of products other than distillate petroleum products handled by SRP at the Tank Farm. Nevertheless, SRP will continue to voluntarily participate in the joint investigation at the Van Buren Tank Farm being undertaken by the owner/operators because SRP is committed to responding to any environmental harm it may have caused, as well as preventing future harm where possible.

SRP also believes, however, that others should be responsible for environmental damage caused by their activities. It is not just, nor is it economically feasible, for SRP to bear the burden of responding to environmental damage which SRP has not caused.

The ENSR report to be submitted shows that the Van Buren Tank Farm has not contributed in the West Van Buren Area VOC contamination. On the basis of the ENSR report and the site investigation conducted by SRP at the Tank Farm, we have concluded beyond reasonable doubt that SRP has not contributed to the groundwater contamination in this area.

SRP is aware of ADEQ's draft policy on groundwater contamination migration from off-site releases. SRP largely supports ADEQ's intention not to hold owners/operators liable for contamination at their facilities due to the activities of others.

SRP trusts that in light of the evidence, ADEQ will release the owners/operators of the Tank Farm from further obligation under the WQARF process for contamination not caused by the owners/operators.

Specific Comments

J-2 SRP requests that the Kleinfelder report reference the ENSR study done for the Van Buren Tank Farm, and highlight the conclusions of that report in the final Kleinfelder report.

J-3 SRP believes that the phrase used on page 3-17 to list chemicals at the Tank Farm, "Fuels and BTX chemicals" is misleading. It gives the perception that BTX chemicals are stored in large quantities on site. The BTX compounds are a fractional distillate of the petroleum created by the refining process. An accurate phrase to describe products held at the site would be "Distillate Petroleum Fuels (Diesel fuels and gasolines)".

J-4 Page 5-43, Salt River Project, Contact: SRP has provided the name of a contact person to ADEQ on the Van Buren Tank Farm project, Deborah A. Jamieson of our law department.

J-5 We request that the phrase "no questionnaire returned" be eliminated from the description. The phrase is misleading and implies that SRP has been uncooperative. On the contrary, SRP has conveyed the data requested in the questionnaire in earlier documents and is providing additional data in the ENSR report soon to be submitted to ADEQ.

J-6 Also, on page 5-43, a more accurate description of our activities at the Van Buren Tank Farm is: "The Salt River Project facility stores and distributes #2 distillate fuel for its electrical generating operations within Arizona.

J-7 Lastly, on page 5-43, separator water will be discharged into the sewer system when number 2 distillate fuel is again transported from the facility. Currently, the facility is not being used.

J-8 Utilization of the regional geologic and hydrologic information in section 2.3.4 ("Hydrologic Conditions Underlying the West Van Buren Area") is unsupported. Regional information may not hold true for the study area, and while it is fitting to use in section 2.3.2 (Regional Hydrogeology), section 2.3.4 information is, as yet, undeveloped, and the Kleinfelder report should so state.

J-9 SRP notes, on page 5-28, that ADEQ proposes to develop criteria for soil cleanup resulting from diesel product spillage. SRP has an interest in this proposed criteria, and SRP believes these "private party" remediations are support ADEQ's policies to protect the environment.

SRP appreciates the opportunity to provide comments on the Draft Report. We look forward to a continued productive exchange of pertinent technical information at the Tank Farm. If you have any questions concerning these comments, please contact Cynthia Parker of the Environmental Services Department at 236-2077.

COMMENTS FROM
SOUTHWEST GAS CORPORATION

RECEIVED
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PHOENIX

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DEQ DIRECTOR

SOUTHWEST GAS CORPORATION

Andrew W. Bettwy, Senior Attorney

HAND DELIVERED

December 20, 1988

DEC 1988
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Office of
Waste Program

Jim McDonald
Department of Environmental Quality
Room 400A
2005 North Central Avenue
Phoenix, Arizona 85004

Re: Kleinfelder Draft Phase I Report
West Van Buren Area
Phoenix, Arizona

Dear Mr. McDonald:

This letter is prompted by the above-referenced Report (the "Report") and Norm Weiss' November 23, 1988 transmittal letter to Southwest Gas Corporation ("Southwest").

The Report identifies the "facility" located at Nine South 43rd Avenue in Phoenix as a "potential source of environmental contamination."

K-1 Unfortunately, Kleinfelder's disclaimers notwithstanding, the matching up of the names of current owners of record with the locations of the "facilities" identified in the Report has advanced an unwarranted inference publicly that the current owners of record are "suspected polluters." (See appended December 3, 1988 article in Arizona Republic.)

Southwest first acquired rights to the property located at Nine South 43rd Avenue in 1984, and Southwest has no knowledge of any information which would support a determination that Southwest is a "responsible party" within the contemplation of A.R.S. Section 49-283.

Against that backdrop, and with the objective of providing meaningful comments by December 28, 1988, Southwest respectfully requests that Kleinfelder and Arizona's Department of Environmental Quality make available to Southwest whatever information either may have, if any, which constitutes evidence that Southwest is responsible for the release of any hazardous substance at the "facility" located at Nine South 43rd Avenue in Phoenix.

A representative of Southwest will be contacting you to arrange a time to meet and to receive and to review whatever information may be available. Since the December 28 deadline is fast approaching, Southwest is hopeful the meeting can be held later this week.

Thank you for the courtesy and cooperation.

Respectfully,

Andy Bettwy
Senior Attorney

c Ronald L. Miller, Ph.D. (HAND DELIVERED)
Steven J. Silver, Esq. (HAND DELIVERED)
Grant Buma, CPG (HAND DELIVERED)
Jeremiah D. Jackson, Ph.D., PE (HAND DELIVERED)

VALLEY & STATE

THE ARIZONA REPUBLIC
SATURDAY, DECEMBER 3, 1988
**

B

Suspected polluters

Arizona Department of Transportation, 1745 W. Madison Ave.
Arizona Public Service Co., 408 S. 43rd Ave.
Arizona Welding Equipment, 4030 W. Lincoln St.
AT&T Technologies Inc., 505 N. 51st Ave.
Bud's Oil Service Inc., 1340 W. Lincoln St.
Chem Research Co., 1101 W. Hilton Ave.
Penn Athletic Products Division, 306 S. 45th Ave.
Revlon Inc., 4301 W. Buckeye Road
Reynolds Metals Co., 3501 W. Van Buren St.
Sav-Trac of Arizona Inc., 2620 W. Durango St.
Southwest Gas Corp., 9 S. 43rd Ave.
Sub-Zero Freezer Co. Inc., 3865 W. Van Buren St.
Tritech Manufacturing, 5144 W. McKinley Ave.
27th Avenue Landfill, 2800 S. 27th Ave.
Van Buren Tank Farm, 51st Avenue and Van Buren Street
Van Waters & Rogers Inc., 50 S. 45th Ave.

16 entities implicated in water pollution

Firms, Phoenix, state suspected in Maryvale ills

By Dee J. Hall
The Arizona Republic

Phoenix, the Arizona Department of Transportation and 14 companies with west Phoenix facilities are suspected of contributing to ground-water contamination in Maryvale, state environmental officials said Friday.

Operators of the 16 facilities could be liable for the cost of cleaning up the pollution, which could run in the tens of millions of dollars, said Paul Scheidig, an ombudsman with the Arizona Department of Environmental Quality.

"These are the 16 highest-probability sites that could be tapped (for the cost of cleanup)," Scheidig said.

"It's possible not all 16 will be tapped in the future, and it's very possible that other parties may be named."

He estimated the eventual cleanup costs of the pollution under Maryvale at $10 million to $20 million.

The preliminary results of the state's investigation involved only the southern part of Maryvale, Scheidig said. The possible sources of ground-water pollution between McDowell and Camelback roads from Interstate 17 to 83rd Avenue will be identified in a report to be released Dec. 15, he said.

The Maryvale area of Phoenix already has been targeted as a state "superfund" site because of its contaminated ground water. The area also is being studied by state and federal health officials because of a higher-than-normal number of childhood-leukemia deaths.

However, Scheidig emphasized that the contamination has not seeped into the drinking water. Drinking wells in that area have been closed by the city, and Phoenix officials say repeated scientific tests of the drinking water in the area have shown it to be safe.

"None of the water that is used

— See 16 SUSPECTED, page B3

16 suspected in pollution at Maryvale

— 16 SUSPECTED, from page B1

for drinking water in the Maryvale area is coming from the contaminated sites," Scheidig said.

But because contamination eventually can seep into deeper ground-water layers that can move underground, "all the ground water in that area has the potential to be drinking water" at some point, he said.

Contamination of the ground water stems from several chemicals. They include industrial solvents such as trichloroethylene, or TCE, and tetrachloroethane, TCA, as well as gasoline components such as benzene, toluene and xylene. The contaminants either are known to cause or suspected of causing cancer, Scheidig said.

The Environmental Quality Department will hold a public hearing on the Maryvale ground-water problem Dec. 15 at 7 p.m. at the Embassy Suites Hotel, 3210 Grand Ave.

The operators of some of the west-side facilities said they were surprised by the notification that they may have contributed to the pollution.

Southwest Gas Corp.'s office, warehouse and vehicle-storage complex at 9 S. 43rd Ave. was listed by the state as a possible source of TCE and TCA contamination, company spokesman Garth Andrews said. However, Southwest Gas does not use those compounds at that facility, Andrews said.

That sentiment was echoed by Susan Keith, water-quality adviser for Phoenix, which is suspected of contributing to the problem with its 27th Avenue landfill near the Salt River.

The Transportation Department also made the list, with its Central Materials Laboratory at 1745 W. Madison Ave.

"We do not use the specifically cited chemicals," spokesman Mark Bonan said.

The reaction was similar from American Telephone & Telegraph Co. and Arizona Public Service Co. officials.

Scheidig said the response of those on the list is predictable, given the high cost of cleanup bills they face if found to be responsible.

One company that was not surprised to land on the list was Southern Pacific Pipe Lines Inc., which operates a gasoline tank farm at 51st Avenue and Van Buren Street.

The farm is the entrance point for refined petroleum in the state and is owned and operated by 12 entities, including nine oil companies, Maricopa County, Phoenix and the Salt River Project, said Tom Jensen, manager of environmental engineering for Southern Pacific in Los Angeles.

"We have been working with the state since 1987 to determine the problems, if any, of the tank (farm)," Jensen said.

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SOUTHWEST GAS CORPORATION

Andrew W. Bettwy, Senior Attorney

HAND DELIVERED

December 28, 1988

Jim McDonald
Department of Environmental Quality
Room 400A
2005 North Central Avenue
Phoenix, Arizona 85004

Re: Kleinfelder Draft Phase I Report
West Van Buren Area
Phoenix, Arizona

Dear Mr. McDonald:

This letter is a follow-up to Southwest Gas Corporation's December 20, 1988 letter to you regarding the above-referenced Report.

When the undersigned delivered to Mr. Steven J. Silver a copy of Southwest's December 20 letter, Mr. Silver was kind enough to spend some time and to explain some of the procedures being implemented by the Department of Environmental Quality and its contractor Kleinfelder in an effort to identify potential sources of environmental contamination in the area designated as the West Van Buren Area.

Among other things, Mr. Silver informed the undersigned that the Department is not - at this stage of the identification process - conducting face-to-face meetings to discuss the Kleinfelder's Draft Phase I Report.

Southwest has no doubt that time and personnel constraints may render next-to-impossible the ability to conduct such meetings. However, Southwest's concern continues.

10851 North Black Canyon Highway Phoenix Arizona 85029 602-395-4167

K-2 As indicated in Southwest's December 20 letter, Southwest has no knowledge of information which constitutes evidence that Southwest is responsible for the release of any hazardous substance at the "facility" located at Nine South 43rd Avenue in Phoenix.

K-3 Southwest respectfully requests that, unless and until information surfaces which warrants naming Southwest as a "suspected polluter", reference to Southwest Gas Corporation in any further publications be deleted.

Southwest is as much or more interested as any other Arizonan in doing its share to assure the safest and healthiest environment possible, and Southwest conducts its day-to-day business in Arizona in a fashion consistent with that objective. Moreover, in that spirit, Southwest remains ready and willing to cooperate with all agencies of government to that end.

Southwest seeks only to avoid having its reputation sullied by innuendos. If Southwest were ever to be determined to be a "responsible party" within the contemplation of A.R.S. Section 49-283, Southwest would be required to respond accordingly; however, while the investigation continues, unnecessary damage to business reputation should be avoided in the public interest - i.e., in the interest of engendering spirited and wholehearted cooperation among all interested Arizonans.

Respectfully,

Andy Bettwy

cc: Ronald L. Miller, Ph.D.
Steven J. Silver, Esq.
Grant Buma, CPG
Jeremiah D. Jackson, Ph.D., PE

COMMENTS FROM
SOUTHERN PACIFIC PIPE LINES, INC.

Southe Pacific Pipe Lines, Inc.

888 South Figueroa Street
Los Angeles, California 90017
213/614-1095

December 21, 1988

ENG 13-1 (10190 - 4361)

Mr. Bill Engstrom
ARIZONA DEPARTMENT OF ENVIRONMENTAL
QUALITY
Central Palm Plaza Building
2005 North Central Avenue
Phoenix, AZ 85004

RE: VAN BUREN TANK FARM

Dear Mr. Engstrom:

Enclosed please find six (6) sets of the Final Summary Site Assessment Report ("the Report") prepared for the Owners/ Operators of Van Buren Tank Farm. The report includes a total of three (3) volumes which are as follows:

- Volume I; Final Report.
- Volume II; Borings and Well Completion Logs.
- Volume III; Laboratory Data.

Upon completion of the enclosed report, by ENSR (formerly ERT, Inc.) it was evident that localized areas of phase separated hydrocarbons exist on the groundwater within the tank farm site. Where appropriate Owners/Operators have undertaken remediation efforts.

L-1 In addition to the aforementioned findings, it was apparent that the Van Buren Tank Farm has not contributed to the chlorinated hydrocarbon contaminated groundwater associated with the West Van Buren Study Area. Thus, there is additional hard evidence in support of our letter to you of October 13, 1988.

In closing, the Owners/Operators emphasize that we are not Potentially Responsible Parties (PRP's) of the larger West Van Buren Study Area, because the facilities at the Tank Farm have not caused or contributed to the chlorinated hydrocarbon contamination of the area.

Should you have further questions or comments regarding the enclosed, please contact me at 213/486-7781 or Mr. S.M. Ferrara at 213/486-7785.

Sincerely,

T. F. Jensen /SMF

T.F. Jensen
Manager - Environmental Engineering

SMF/rr

Enclosures

C88341/SMF

COMMENTS FROM
TRITECH MANUFACTURING, INC.

SCOTT, ALLARD & BOHANNAN, INC.
ENVIRONMENTAL & CHEMICAL CONSULTANTS

3001 W. Indian School Rd., Ste. 212 Phoenix, AZ 85017 (602) 263-0045

Recd Dec. 16, 1988

TRITECH MANUFACTURING, INC.
COMMENTS REGARDING DRAFT PHASE I REPORT
WEST VAN BUREN AREA
PHOENIX, ARIZONA
(KLEINFELDER REPORT)

December 15, 1988

Job No. 88358SJ

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Attachment A - TCA Purchases in 1987 and 1988

Attachment B - Police Report Regarding Vandalism

Attachment C - Letter from City of Phoenix Regarding March 23, 1987 Discharge

Attachment D - Tritech Response to City of Phoenix Letter

Attachment E - City of Phoenix Letter Dated June 11, 1987

Attachment F - Costs of Vandalism

Attachment G - Drywell Investigation

Attachment H - Information Regarding Naturally Occurring Nickel and Zinc

Attachment I - Drywell Water Test Results

TRITECH MANUFACTURING, INC.
COMMENTS REGARDING
DRAFT PHASE I REPORT
WEST VAN BUREN AREA
PHOENIX, ARIZONA
(KLEINFELDER REPORT)

Job No. 88358SJ

1. INTRODUCTION

On November 23, 1988, a copy of the Draft Phase I Report, West Van Buren Area, Phoenix, Arizona was provided to Tritech Manufacturing, Inc. Tritech and its environmental engineering consultant have extensively reviewed the report. As a result of that review, the following comments are offered and are intended to correct misinterpretations of information gathered by the State's contractor, Kleinfelder.

2. MANAGEMENT OF HAZARDOUS WASTES

Tritech generates F003, F006, D006, and D007 hazardous wastes. These wastes are stored on site less than 90 days and are disposed of as follows:

Hazardous Waste No.	Waste Type	1987 Quantity	Disposal Method
F003	Flammable liquid, N.O.S.	Five 55-gallon drums	Incineration (out-of-state)
F006	Solid, N.O.S., ORM-E	Ten 55-gallon drums	EPA approved disposal site
D006 D007	Solid, N.O.S., ORM-E	Ten 55-gallon drums	EPA approved disposal site

The only on-site treatment is treatment of plating waste waters prior to discharge to City of Phoenix sewers. All accumulated heavy metal sludges from the waste water treatment are disposed as hazardous wastes as indicated above. At no time has Tritech transported hazardous wastes or disposed of hazardous wastes

on-site. Tritech utilizes the services of licensed and EPA approved hazardous waste transporters and disposal sites.

3. USE OF TCA

As noted in the Tritech response to the ADEQ July 13, 1988 questionnaire, from three to five drums of 1,1,1-trichloroethane (TCA) are purchased and used by Tritech per year. It should be noted that TCA is purchased and used for military contract work only. A summary of Tritech purchases of TCA over the past two years is as follows:

Purchase Date	Quantity Purchased
4/06/87	585 lb (1 drum)
6/08/87	585 lb (1 drum)
6/30/87	585 lb (1 drum)
10/01/87	585 lb (1 drum)
12/02/87	585 lb (1 drum)
7/25/88	585 lb (1 drum)
9/19/88	585 lb (1 drum)
10/10/88	585 lb (1 drum)

Copies of invoices from Van Waters & Rogers to substantiate the above are included in Attachment A.

Thus, only small quantities of TCA are purchased and/or maintained on site. As was noted in the Draft Report, TCA is lost by evaporation during degreasing operations. As noted in the ADEQ Questionnaire response, spent TCA sludges are "barreled up" (placed in drums) and disposed of as hazardous waste. No TCA is discharged to the ground.

4. VANDALISM ACT

On March 23, 1987, Tritech suffered a burglary and vandalism to its wastewater treatment system. Chemical metering pumps were stolen and the treatment system was contaminated with chromic

acid. See City of Phoenix Police Department report, Attachment B. When the system was activated and not realizing an act of vandalism had occurred, an overflow into the system discharge tank was created. This overflow was then inadvertently discharged to the City of Phoenix sewer.

The City of Phoenix initiated a spot check of the discharge that same day and elevated concentrations of hexavalent chromium were found. The discharge line from Tritech to the City sewer was immediately plugged. See Attachment C, April 10, 1987 letter from the City of Phoenix. In accordance with that letter, a written response was prepared by Tritech regarding the incident and corrective action taken. See Attachment D. In addition, IDF, Inc. was contracted to batch treat the wastewaters prior to disposal to the City sewer, and then only after complete chemical analyses were performed and permission was received from the City for disposal. The sewer line was re-plugged after each batch discharge. This process was agreed to by the City of Phoenix as noted in their letter of June 11, 1987. See Attachment E. Following the successful batch treatment of the wastes generated due to the vandalism, a Pretreatment Discharge Permit from the City of Phoenix was applied for and re-implemented.

Thus, no illegal dumping of chromium wastes in a manhole occurred. An act of uncontrolled vandalism caused the effluent violations. Tritech has incurred extensive costs correcting the problem caused by the vandalism. A summary of those costs, totaling $159,221.82, are presented in Attachment F and have been accepted and partially reimbursed by Tritech's insurance company.

5. DRY WELL CONTAMINATION

In May 1988, an investigative boring was drilled adjacent the drywell located to the north of the Tritech main building. In order for a drywell to function correctly as a storm water runoff

control device, it must be placed in a site lower than the general grade of the rest of the site. Because of concerns regarding inadvertent chemical spills in this area and the likelihood that such spills or their residues would migrate to this same low spot, Tritech commissioned this investigation.

A copy of the report prepared by Scott, Allard & Bohannan, Inc. is provided in Attachment G.

It was concluded that, because elevated cyanide concentrations were found in the soil samples at a depth of 40 feet, the drywell may have received cyanide accumulated from spills over a period of time.

Furthermore, low levels of total nickel and zinc were detected during analyses of the soil samples. It was concluded that, because of the low levels found, the measured levels of nickel and zinc may indicate naturally occurring concentrations of these metals. In order to substantiate that the measured levels were naturally occurring concentrations, Dr. Wallace H. Fuller of the University of Arizona was contacted. In accordance with Dr. Fuller's response, the concentrations of total nickel and zinc measured in the subsurface soil samples were well within the range of naturally occurring nickel and zinc in Arizona soils. See Attachment H.

It should be noted that the drywell investigation showed no elevated concentrations (most not above the analytical instrument detection limit) of the eight E.P. Toxicity metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver. If indeed the facility had experienced a chromium spill, elevated E.P. Toxicity chromium levels would have been found.

Further and of special note, chemical analyses of the subsurface soil samples in the vicinity of the drywell also include gas

chromographic tests via SW-846 Test Method 8010 for 27 halogenated volatile organic compounds. The test included analyses for 1,1,1-trichloroethane, trichloroethylene, methylene chloride, and many more. Concentrations of all 27 organic compounds in all soil samples did not exceed the analytical instrumentation detection limit or 5 parts per billion.

Thus, the facility did not allow "wastes to build up and spill into the drywell subsequent to the permit revocation" by the City of Phoenix Wastewater Department.

Samples of standing waters in the drywell have been periodically obtained and tested. Such samples have been "split" with the City of Phoenix. Unfortunately, very poor correlation of test results have occurred in that the City of Phoenix field tests and laboratory results do not compare with the results of the split sample performed by a City of Phoenix approved independent laboratory selected by Tritech. Test results showed the following:

	Cyanide Concentration		
	City of Phoenix		Tritech
Date Sampled	Field Test	Lab Test	Independent Lab
8/13/87	6.0 ppm	6.1 ppm	<0.03 ppm

An additional test of the drywell waters was conducted in January 1988, and a concentration of 0.2 ppm of cyanide was found.

All support data can be found for the above in Attachment I.

6. GENERAL COMMENTS

Sulfuric acid, not formic acid, is used to anodize parts. Only reagent grade formic acid is maintained at the Tritech facility and only in laboratory quantities.

The Draft Report indicated the following about the Tritech facility:

M-1 A. No soil testing was conducted in the vicinity of the Tritech plant while the contractor deemed it necessary to test soils at 20 other sites. No record exists that anyone during the time of the Kleinfelder study visited the plant or requested information. The tight security maintained at Tritech following the 1987 vandalism would prevent any unauthorized entry.

M-2 B. Tritech is not listed as being involved with any other ongoing investigation (see page 3-16 of Draft Report).

M-3 C. No abnormalities regarding Tritech were found via examination of aerial photographs (see page 4-2).

The inclusion in the Draft Report of financial data regarding Tritech is not understood. How is the net worth of Tritech relevant to whether Tritech did or did not cause environmental contamination?

7. CONCLUSION

The Draft Report makes the conclusion that Tritech is a potential source of contamination based merely upon the facts that Tritech uses chemicals, plates parts, and generates hazardous waste. There is no discussion of the manner in which the chemicals are managed at Tritech. There is no discussion of the possible routes contaminants would follow. In short, there is no evidence to support the conclusion of the Draft Report that Tritech is a potential source of environmental contamination to groundwater in the West Van Buren area.

APPENDIX F

RESPONSE TO COMMENTS

APPENDIX F

Response to Comments

This appendix contains the responses to the comments included in Appendix E. The alphanumeric designation of the responses corresponds with the alphanumeric index for each comment.

Response to Comments
from the
Arizona Department of Transportation

Comment A-1

This change has been made in Appendix A.

Comments A-2, A-3, and A-5

This information has been added to the facility descriptions contained in ADEQ files.

Comment A-4

The questionnaire was resubmitted by ADOT.

Response to Comments
from
A T & T Technologies, Inc.

Comment B-1

Facility descriptions are no longer included in the final Phase I Report.

Comment B-2

"Notable" practices, as used in this report, are defined in Section 3.3 of the final Phase I Report.

Comment B-3

This report was not intended to establish liability but simply determine where further investigation is warranted.

Comment B-4

This noted statement has been modified in the final Phase I Report.

Comment B-5

This information has been noted. More site-specific hydrogeologic data (i.e. gradients) will be collected as part of Phase II of the investigation.

Comment B-6

No response required.

Comments B-7 and B-8

This clarification of the "flooding" and the sodium hydroxide "spill" is appreciated and will be appropriately included in the data files.

Response to Comments
from
Arizona Welding Equipment Company

Comments C-1 through C-4

This information will be incorporated into the facility description which will become part of ADEQ's records.

Response to Comments
from
Atlantic Richfield Company

Comment D-1

The information on this facility, as provided in the 3-volume ENSR report, has been included in the facility description, and is part of ADEQ's records.

Response to Comments
from
Bud's Oil Service, Inc.

Comment E-1

"Typical" migration rates, which were reportedly given by professional engineers, appear to be low. In addition, "typical" values may not be valid at this site.

Comments E-2 through E-5

The information provided has been entered into ADEQ's records.

Response to Comments
from
ChemResearch Company, Inc.

Comment F-1

Wells (A-1-3)18caa and (A-1-2)13dad are located, with accompanying analytical data, on Plate 2b of the final Phase I Report. These wells are also discussed in the text.

Comment F-2

The questionnaire stated that this spill occurred in 1987. The more recent information stating that 1984 is the correct date has been entered in ADEQ's records..

Comment F-3

This error has been corrected in the facility description.

Response to Comments
from the
City of Phoenix

Comment G-1

Although some errors undoubtedly occur in any draft report, we disagree with the wholesale conclusion regarding errors of fact. These specific items are addressed in more detail in subsequent specific responses.

Comment G-2

The purpose of this report was to identify areas of ground water degradation based on available information. In addition, facilities were identified where "further investigation is warranted" based on available information. These reports are not intended to be "the scientific basis for future legal action". It is the next phase of investigation in which each of these facilities and areas of ground water degradation will be thoroughly investigated and more precisely characterized. Phase I is only intended as a starting point, not an end.

Comment G-3

Some inconsistencies existed in the "draft" report and efforts were taken to eliminate them before releasing the final report.

Comment G-4

Comparing the two study areas (i.e., West Van Buren (WVB) and West Central Phoenix (WCP)) is not a valid comparison for report purposes. On a per square mile basis, the WCP study had over twice the funding as the WVB study. Additionally, there were half the facilities in the WCP study as there were in the WVB study. (See also response to Comment G-49.)

Comment G-5

As is discussed on Pages 5-1 through 5-3 of the draft report, the listing of "highest priority" facilities was <u>not</u> based solely on proximity to contaminated wells.

Comment G-6

The discussion of gradients does indeed need clarification. The text will be appropriately modified in the final report. Recommended activities for the next phase of work include measuring site-specific ground water flow direction. As for the linkage to contaminated wells, conclusions were not drawn in the draft report; instead, affected well locations are referenced for the reader's information.

Comment G-7

Although the draft report makes this point, the final report emphasizes that there are no active municipal supply wells in the area. In addition, the text, figures, and plates in the final report identify wells which exceed MCLs or ADHS guidelines. Additionally, the consistency of water quality data for a particular well will be investigated further in the next phase of work.

Comment G-8

"Plumes" are not identified, defined, or delineated anywhere in the text or on plates. In the Explanation on Plate 2 of the draft report, these areas were described as "Approximate area(s) of Ground Water Chemical Dispersion". It is the commenter's opinion that one well's degraded water quality is ". . . representative of general background quality throughout the whole region . . ."

Comment G-9

This has been clarified in the final Phase I Report.

Comment G-10

The use of these terms have been clarified and made more consistent in the final report. However, since VOCs are not naturally occurring, any concentration above detection limits may be considered "elevated".

Comment G-11

As directed by ADEQ, the study focused on VOCs; however, other contamination was noted when observed in the available historical data. (Please refer to the Summary Reports, published during Spring 1988.)

Comment G-12

TCE concentrations exceeded ADHS Soil Cleanup Level guidelines in fourteen of the soil samples taken. This does not seem insignificant. However, the fact that two of these samples were "background" samples, does cast some doubt on the meaningfulness of the results from the other samples.

Comments G-13 and G-14

This has been clarified in the final Phase I Report.

Comment G-15

As previously discussed, this phase of the project was not intended to be a site-specific study (i.e., site characterization). That type of intensive investigation will be undertaken in the next phase of study for those areas identified in the initial phase.

Comment G-16

The City may have meant to refer to page 2-5, paragraph 2. The purpose of this chapter is to give an overview of conditions, based on published information, and not a detailed lithologic interpretation. As noted at the end of the paragraph, this information was taken from a USGS reference.

Comment G-17

The term "steady state" may have been inappropriately used in the draft. A better term would be "static" conditions, which may only occur in theory for an area so large. The final report clarifies and reemphasizes the wide variations in flow directions and gradients.

Comment G-18

This has been pointed out in the final Phase I Report.

Comment G-19

As stated in the second paragraph on page 2-7, TDS " . . . ranges from about 650ppm to 2400ppm . . ."

Comment G-20

Zoning was used as an indicator of present land use, under the assumption that there is a relationship between land use and zoning. As mentioned in the last paragraph of page 3-1, aerial photographs were also used for evaluating land-use characteristics, both historic and present. In addition, site reconnaissance (see Chapter 3 of the draft) provided present land use information, and questionnaire responses, in some cases, provided past owner/operator information.

Comment G-21

Good suggestion. This suggestion will be incorporated in future records searches.

Comment G-22

According to Malcolm Pirnie, ADEQ only provided data from 1986 for the 27th Avenue Landfill. Subsequent to the City comments, additional (more recent) data were requested from the City. The City's consultant provided the data for the 27th Avenue Landfill but, again, there were no provided data more recent than 1986 .

Comment G-23

This suggestion has been incorporated, where appropriate, into the final Phase I Report.

Comment G-24

In order "to avoid duplication of effort" and to conserve limited resources, Kleinfelder was directed by ADEQ not to spend time or resources investigating those sites already under investigation by other programs. (See pages 3-16 through 3-19 of the draft report.) Those investigations will be reviewed for quality and results during a subsequent phase of study.

Comment G-25

As stated in the third sentence of this paragraph "the aerial photographs were used in identifying potential sites of chemical releases into the ground water".

Comment G-26

Stained soil was noted when observed. Given the scope of work, budgetary allowances, and size of the study area, it was not possible to observe all drums, USTs, and soils at all facilities. As noted on Page 3-8 of the draft report, "the field reconnaissance was not comprehensive due to limited access to many of the private and commercial facilities".

Comment G-27

Paragraph 3 states that "all wells which had previously been located in the field were considered". It does not state that all wells which were selected for sampling were previously located in the field. In developing the sampling plan, additional wells not previously field-located were included; some of these were subsequently not located during sampling.

Comment G-28

This phraseology has been incorporated into the final Phase I Report.

Comment G-29

"Biphenol" has been changed to "biphenyl" in the final Phase I Report. Detailed site investigations were not part of the scope of work for this first phase of study. Several of these facilities have or are currently conducting investigations. However, as previously stated "in order to avoid duplication of effort" and to conserve limited project resources, Kleinfelder was directed by ADEQ not to spend additional time or resources investigating those sites already under investigation.

Comment G-30

The text does not state that "leachate is occurring", but mentions "various chemicals associated with landfill leachate". To avoid misinterpretation, the report's statement will be modified to reflect this comment.

Comment G-31

The use of pertinent data is more thoroughly discussed in the final Phase I Report. (See also response to Comment G-24.) In addition, the City again submitted data for the 27th Avenue Landfill. However, no data for 1987 or 1988 were included in the recent submittals.

Comment G-32

Zoning may indeed change frequently. However, it was beyond the scope of work to update the most recent zoning maps made available by the City and County. As previously mentioned, historical land use was observed on the aerial photographs (see Appendix A of the Summary Report), and site reconnaissance assisted with interpreting land use maps. (See also response to Comment G-20.)

Comment G-33

This error has been corrected in the final Phase I Report.

Comment G-34

This phrase has been clarified in the final Phase I Report.

Comment G-35

As stated on page 4-4 "the following paragraphs discuss the locations at which VOCs were historically observed." It is inappropriate to assume that "these discussions are meant to characterize the 'dispersion' areas on Plate 2 . . ." or to refer to these areas as "plumes". As described in the Explanation on Plate 2 of the draft report these are "approximate areas of ground water chemical dispersion." Question marks have been added to these approximate boundaries on Plate 2 to help avoid misinterpretation of the cross-hatched areas. As previously mentioned, characterization and detailed data analysis of these areas may be conducted in subsequent phases of this study.

Comment G-36

More interpretation was perhaps inferred than is justified. The text has been clarified so that only a description of readily available data is given.

Comment G-37

This input is appreciated and has been incorporated, as appropriate, into ADEQ's records and into the final Phase I Report.

Comment G-38

The inconsistencies will be remedied in the final Phase I Report. (See also response to Comment G-3).

Comment G-39

Well (A-1-2)13bdb is discussed as one well. There are indeed three wells. However, they all have the same legal well designation which is (A-1-2)13bdb. They are listed on Plate 1b of the draft report as:

(A-1-2)13bdb 1
(A-1-2)13bdb 2
(A-1-2)13bdb 3

Because of the close proximity of these wells to each other, and the scale of Plate 2, the three wells are within the area represented by one dot. In addition, the ADWR Well Registry lists this as one well owned by APS. This information has been corrected and clarified in the final Phase I Report.

Comment G-40

The intent was to indicate that historical data noted the presence of chemicals in the ground water at this location. This information leads to the recommendation (see Chapter 7) that further investigation may be warranted at this location.

Comment G-41

Ground water gradients and flow directions vary significantly in the West Van Buren Area. Because of that, and taking a conservative approach, it is "possible" that the sources of these chemicals may be near Well (A-1-2)12caa and Well (A-1-2)14aad. Whether or not this is true will be investigated in subsequent phases of this study.

Comment G-42

The furthest downgradient well does not necessarily have to have the lowest observed chemical concentrations of all wells. An example would be in the case where a high concentration of chemicals was released as a "slug" at some point in time. As the slug moves downgradient, its peak concentration will move based upon hydrogeological factors.

Comment G-43

This suggestion was considered in preparation of the final Phase I Report. Throughout the final report, State action levels and MCLs are discussed, defined, and used where appropriate. An assessment of sampling error is alluded to with travel blank analysis.

Comment G-44

The conclusions of the Phase I Report were not "based on 8 samples". These samples were only used to supplement historical data, along with records searches, field reconnaissance, etc. (See also response to Comment G-61.)

Comment G-45

As the heading and the note at the bottom of the table indicate, this table lists "detected volatile organic compounds." If they are not listed in the table then they were not detected.

Comment G-46

The sentence has questionable relevance, and it has been deleted in the final Phase I Report.

Comment G-47

ADEQ is planning to pursue obtaining responses from those facilities which did not respond to the questionnaire during this initial phase of work. This specific activity is recommended in Chapter 7 of the final Phase I Report.

Comment G-48

This has been clarified in the final Phase I Report.

Comment G-49

It may be misleading to compare vis-'a-vis the West Central Phoenix Study to the West Van Buren Study due to their specific differences, as indicated in the following table (data reflect details contained in draft Phase I Report):

	West Van Buren	West Central Phoenix
Questionnaires sent	850	292
Facilities listed for subsequent study	155	33
Areas of degraded ground water	12	4
Wells in which VOCs have been detected historically	33	17

Basically, the two studies do follow similar methods for listing and evaluating facilities. Thus, they do not differ in approach and direction, although they do differ in scope and funding. (See also response to Comment G-4.)

Comment G-50

This has been clarified in the final Phase I Report.

Comment G-51

Based on the sequence of events of this phase of the study, items 2 and 3 are in the correct order (although item 2c occurred during approximately the same time as item 3).

Field reconnaissance may not necessarily detect old facilities and prior disposal practices. Appendix A has been rewritten to indicate which investigative activities are planned for specific facilities in Phase II of this investigation.

Comments G-52 and G-53

These have been clarified in the final Phase I Report.

Comment G-54

"Typically used" refers to methods typically used by the US EPA. This has been clarified in the final Phase I Report.

Comment G-55

Item 4 of the questionnaire (See appendix B) asks how long the company has been at this location. The cover letter also asks for "present and past" information. Item 5 of the questionnaire asks for the name and business of previous occupants.

Past compliance issues may indeed be meaningful. Compliance history is helpful in understanding the extent and nature of in-house attitudes towards environmental protection, and hence the potential for uncontrolled releases.

Comment G-56

As noted on page 5-3, facility proximity to observed ground water contamination was used as <u>one</u> input in the assessment. One cannot rely completely on proximity due to the limitations of the database; although, many facilities do in fact show a spatial relationship to the observed contamination.

Comment G-57

The paragraph was <u>intended</u> to be "regional". As previously mentioned, detailed site specific investigations will be carried out in future phases of this study. The discussion has been clarified in the final Phase I Report.

Comment G-58

Agreed.

Comment G-59

(No response necessary.)

Comment G-60

This is noted on page 4-22, and has been restated in Section 5 of the final Phase I Report.

Comment G-61

The full range of available information (i.e., chemical usage, compliance violations, aerial photograph analysis, field reconnaissance, historic and recent ground water quality data, questionnaire response, regional hydrogeologic data, etc.) was used in evaluating facilities. Off-site migration will be investigated more thoroughly during subsequent phases of investigation.

Comment G-62

As stated on page 5-6 of the draft report, the ground water samples were only used to "help confirm the prioritization of facilities." It's agreed that the data may not, per se, confirm the prioritization of facilities. It is also agreed that variations in chemical concentrations may be due to changes in flow direction and water levels. It could also be due to sampling techniques and laboratory error. The text has been clarified in the final Phase I Report.

Comment G-63

Trichlorofluoromethane is indeed an organic chemical. (The text does not state otherwise.) To avoid reader confusion, the paragraph in question has been moved.

Comment G-64

This discussion was included to make the reader aware of the numerous variables that could affect chemical migration.

Comment G-65

This table, as stated in the text, is a summary of VOCs historically detected in the ground water. No other assumptions are stated or implied. The table was not intended to be used

for statistical analysis or for any definitive conclusions, but merely to indicate the range and location of chemicals observed in the ground water.

Comment G-66

Supporting data for these two wells and these four parameters were given in Appendix D of the draft report and are found on Plate 2 of the final Phase I Report. (Note: Table 5-1 listed "tetrachloroethene", not "tetrachloroethane.")

Comment G-67

As directed by ADEQ, this phase of the study focused primarily on VOCs.

Comments G-68 through G-74

The facility descriptions have been corrected or modified where appropriate. The facility descriptions are included in ADEQ's files.

Comment G-75

As stated in draft Table 5-2, the Alkire Park well is (A-1-3)18bad. The other information given in this comment has been included in the final Phase I Report.

Comment G-76

This comment was incorporated in the final Phase I Report.

Comment G-77

This point has been clarified in the final Phase I Report. (The intention of this paragraph was to list potential exposure pathways, rather than those most probable.)

Comment G-78

As specified in the draft legends, the Plates were intended to show "wells of record". Thus, this information includes wells that have been there in the past. The City may wish to use the Phase I Report to assist in determining the disposition of the wells which were apparently there in the past, according to historical records. If these wells did exist and were not properly abandoned, they could be acting as conduits for contaminant migration into the underlying aquifers.

The wells were located on the plates based on the legal well designation, which identifies the well location to the nearest 10-acre parcel. Considering the scale of the map, the locations given in the draft appear reasonable.

Comment G-79

No attempt was made to "characterize the contaminated areas." As stated previously on the Explanation of draft Plate 2, these are "approximate areas of ground water chemical dispersion." As is pointed out in Section 7, subsequent work is needed to more accurately refine the estimate of chemical distribution within the ground water. (See also response to Comment G-35.)

Comments G-80 and G-81

This information is included in the final Phase I Report. The appendix has been modified as appropriate.

Comments G-82, G-83, G-84 and G-85

This information will be used in subsequent phases of this study.

Response to Comments
from
Revlon, Inc.

Comment H-1

A more detailed review of the use and handling of chemicals and wastes at the Revlon facility is planned for Phase II of this investigation.

Comment H-2

The results of the soil sampling are discussed in more detail in the final Phase I Report.

Comment H-3

The facility description has been appropriately amended to reflect this information.

Comment H-4

This inadvertent association has been clarified in the facility description.

Comment H-5

The generation of hazardous waste was only one of several criteria (i.e., chemicals used, proximity to chemicals observed in the ground water, etc.) used in evaluating facilities.

Comment H-6

This information has been used to correct the improper emphasis in the facility description.

Comments H-7 through H-9

No response required.

Comment H-10

All financial data have been removed from the final Phase I Report.

Comment H-11

Revlon's diligent response and cleanup is commendable. However, this incident brings up the question of whether or not there may be more drums buried at the facility. It may be desirable to conduct physical testing (e.g., magnetic survey) to confirm that there are no more drums buried on the property.

Response to Comments
from
Reynolds Metal Company

Comment I-1

The facility description has been appropriately amended.

Comment I-2

The appearance of the "plume" has been appropriately changed on Plate 1 of the final Phase I Report. Further characterization of the "plume" is planned for Phase II of the investigation. Please note that neither the draft nor the final Phase I Reports referred to "plumes".

Comments I-3 and I-4

The facility description has been appropriately amended.

Response to Comments
from the
Salt River Project

Comment J-1

ADEQ has jurisdiction over ground water pollution issues. The WQARF process will be utilized to coordinate remediation activities within its' study areas to provide the most efficient and cost effective means.

Comment J-2

The ENSR report has been reviewed and the information included, where appropriate, in the final Phase I Report.

Comment J-3

The facility description has been appropriately amended.

Comment J-4

No response required.

Comment J-5

Based on the 3-volume report by ENSR, the objective of the questionnaire has been accomplished. The phrase "no questionnaire returned" has been deleted from the facility description.

Comments J-6 and J-7

These suggestions have been included in the facility description.

Comment J-8

This has been clarified in the final Phase I Report. More site-specific hydrogeologic studies are planned for Phase II of this investigation.

Comment J-9

(No response necessary.)

Response to Comments
from
Southwest Gas Corporation

Comment K-1

Requires no response.

Comment K-2

Thank you for the comment.

Comment K-3

Specific reference to Southwest Gas Corporation as being a potential source of contamination has been removed from the Phase I Report. Neither the draft nor the final Phase I Reports referred to Southwest Gas Corporation as a "suspected polluter."

Response to Comment
from
Southern Pacific Pipe Lines, Inc.

Comment L-1

The results and data in ENSR report will be incorporated into Phase II activities.

Response to Comments
from
Tritech Manufacturing, Inc.

Comment M-1

The soil sampling effort conducted during Phase I of this investigation was not comprehensive due to time and budgetary constraints. Recommended Phase II activities at Tritech include detailed records search.

Comment M-2

Tritech was not listed in the draft Phase I Report as being involved with any on-going investigation because it is not conducting any investigation in cooperation with ADEQ. In fact, the Compliance Order (No. D-2-89) issued to Tritech on January 13, 1989 describes, in detail, Tritech's status.

Comment M-3

As discussed in Chapter 5, aerial photographs are only one of many investigative techniques used in this initial phase of activity.