

APPENDIX A

Glossary

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GLOSSARY

Ambient Concentrations – concentration in environmental media that include both naturally occurring concentrations of chemicals, and anthropogenic concentrations of chemicals from human-made, non-site sources.

Artesian - water rising to the surface by internal hydrostatic pressure, water level is above the ground surface.

Benicia Screening Levels (BSLs) – concentrations of organic and inorganic chemicals of interest calculated using site-specific information and exposure scenarios, and intended to represent those concentrations in soil that are protective given the exposure scenarios assumed. They are used as screening levels for site investigation data, and for identification of locations at the Benicia Arsenal where chemicals in soil do not present a human health concern given the assumed land use.

Conceptual Site Model – links contaminant sources, release mechanisms, exposure pathways and routes and receptors summarizing our understanding of the contamination problem. The CSM should answer:

Are there any ecological concerns? Is there potential for land use other than residential/industrial? Are there secondary human exposure pathways (like local fish consumption, raising livestock)? Are there unusual site conditions (large areas of contamination, high dust levels, indoor air contamination)?

Data Quality Objectives - criteria that data collection should satisfy to achieve the project objectives

Ground Penetrating Radar (GPR) - produces an underground cross-sectional image of the soils and subsurface features. The system sends radar pulses into the surface, then it receives and processes the reflected energy.

Inert Waste – a subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste.

Investigation Derived Waste – waste generated during field activities such as soil cuttings, water, plastic bags, and nitrile gloves.

Landfill – a waste management unit at which waste is discharged in or on land for disposal. It does not include surface impoundment, waste pile, land treatment unit, injection well, or soil amendments

Method Detection Limit (MDL) – the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. It is determined from analysis of replicate samples of a given matrix containing low levels of the analyte that have been processed through the entire preparation procedure.

Method Quantitation Limit (MQL) – The lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Risk Based Screening Level – a series of risk based screening level of soil and groundwater tables used for comparison with environmental data collected at a site.

Volatilization – the transfer of a chemical substance from a liquid phase to a gaseous phase.

Parkerization – Parkerize - "Parkerize" and "Parkerizing" are terms derived from the former Parker Chemical Co., which was the inventor of the process. Parkerizing or Phosphating is a metal finish that really gained in popularity during World War II (WWII) when the US Government was looking to replace the typical blued finish on most small arms with a rust resistant and anti-reflective coating that would be both durable and abrasion resistant and hold up in all weather extremes. The Parkerizing technique is a phosphate etching process that produces a hard matte or dull finish. Today, the most common types used are the original WW2 type, known as grey oxide and the black manganese, still in use by many Military and Civilian manufacturers in many countries on a wide variety of products. Today, there are commonly two types of parkerizing: 1) using manganese phosphate to turn metal into a dark charcoal, almost black; and 2) using zinc phosphate to turn metal to a lighter gray. These Parkerizing finishes offered much more protection from harsh weather than the older process of bluing, and is very simple to apply and maintain. Parkerizing was much easier to use than the older process of bluing because the parts you want to Parkerize do not have to be polished, they can be acid dipped, sanded, bead blasted or sand blasted. In fact a lot of nicks and scratches that would show up on a blued item would not even be seen after Parkerizing. A green/gray color has also been associated with parkerizing, which meant that something had to be done to contaminate the phosphate. This material was most likely Cosmoline.

Parkerizing an immersion process requiring the solution to be heated to approximately 190-210 degrees and the dipping time can range from 5-45 minutes or so, depending on the hardness of the metal and the desired thickness of the coating.

Preliminary Remediation Goals - risk based concentrations presented in a EPA Region IX document that are derived from standardized equations combining exposure information assumptions with EPA toxicity data, considered to be protective for humans over a lifetime.

pH - pH is defined as the negative logarithm of the hydrogen ion concentration. The pH scale goes from 0 to 14 with pH 7 as the neutral point. As the amount of hydrogen ions in the soil increases, the soil pH decreases thus becoming more acidic.

Purge Water – water removed from monitoring wells prior to sample collection.

Soil Gas - Soil is composed of particles ranging in size from as much as an inch in diameter (gravel) down to less than a thousandth of an inch (clay). Between the particles are "interstitial"

spaces (pores) which can contain liquids (normally water) or air. The air in these spaces is called "soil gas".

Specific Conductance (SC) – a numerical expression of the ability of the water to carry an electric current. It can be used to assess the degree of mineralization, salinity, or estimate the total dissolved solids concentration of a water sample.

Stoddard solvent - Stoddard solvent (CAS # 8052-41-3) is a colorless, flammable liquid that smells and tastes like kerosene. It will turn into a vapor at temperatures of 150–200 °C. Stoddard solvent is a petroleum mixture that is also known as dry cleaning safety solvent, petroleum solvent, and varnoline; its registered trade names are Texsolve S® and Varsol 1®. It is a chemical mixture that is similar to white spirits. Stoddard solvent is used as a paint thinner; in some types of photocopier toners, printing inks, and adhesives; as a dry cleaning solvent; and as a general cleaner and degreaser.

Total Dissolved Solids (TDS) – the amount of solids that remain when a water sample is evaporated to dryness.

Total Organic Carbon (TOC) – a measure of the total organic matter present. Organic matter is naturally occurring in animals, plants, and man. Organic matter may also be man made and in products such as pesticides, fuels, solvents, and paints. Too much organic matter could place a significant oxygen demand and impact the soil/water quality. Synthetic organics either do not biodegrade or biodegrade very slowly.

Total Suspended Solids (TSS) – a measure of the undissolved solids that are present. Sources of TSS include sediment from erosion of exposed land and dirt from impervious areas.

White Lead – A heavy, white, poisonous powder, insoluble in water. Essentially basic lead carbonate, a mixture of lead carbonate and lead hydroxide used in paint pigments.

APPENDIX B

**March 5, 2001
Norcal Geophysical Consultants
Survey Report**



REC'D MAR 07 2001

LETTER OF TRANSMITTAL

TO: Brown and Caldwell
9616 Micron Avenue, Suite 600
Sacramento, CA 95827-2627

ATTN: Dave Zuber

REF: Geophysical Investigation
Benicia Arsenal Environmental Restoration Project
Benicia, California

VIA: MAIL:() PRIORITY:() EXP:() UPS: **RED.(X)** 2ND:() GRD:() FED.X:()

ENCLOSED PLEASE FIND THE FOLLOWING/COMMENTS:

Two (2) copies of final report for the above referenced.

BY: Donald J. Kirker

DATE: March 5, 2001



**GEOPHYSICAL INVESTIGATION
BENICIA ARSENAL ENVIRONMENTAL RESTORATION PROJECT
BENICIA, CALIFORNIA**

NORCAL Job Number 00-141.28

A report prepared for

**Brown and Caldwell
9616 Micron Avenue, Suite 600
Sacramento, CA 95827-2627**

by

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March 5, 2001



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1.0 INTRODUCTION

This report presents the findings of the geophysical investigations performed by NORCAL Geophysical Consultants, Inc. at Landfill 1, Landfill 2, and Quarry 3 at the Benicia Arsenal in Benicia, California. The field survey was performed on November 8, 9, 10, 14, and 15, 2000, January 9 and 29, 2001, and February 8 and 13, 2001, by NORCAL Geophysicist Donald J. Kirker. Field assistance was provided by Geophysicist David J. Bissiri and Geophysical Technician Travis Black. Logistical support was provided by Brown and Caldwell personnel Wendy Linck and Brad Ziegler.

The geophysical investigations were conducted under the guidelines presented in Brown and Caldwell's scope of work, Task Order 3, Exhibit A, dated November 1, 2000. All geophysical work performed at the Benicia Arsenal was governed by the Brown and Caldwell Quality Assurance Program Plan (QAPP) dated February 1999.

1.1 SCOPE OF WORK

The Brown and Caldwell scope of work for Task Order 3 includes conducting vertical magnetic gradient (VMG), electromagnetic (EM31), and EM61 surveys at Landfill 1, Landfill 2, and Quarry 3. This scope of work also includes conducting geophysical surveys over 4 test pit locations and 3 proposed borehole sites at Landfill 1, 5 test pit locations and 3 proposed borehole sites at Landfill 2, and 4 test pit locations and 3 proposed borehole sites at Quarry 3.

As the field surveys progressed, modifications were made to the initial scope of work by Brown & Caldwell. The modified scope of work includes obtaining additional EM31 data over expanded survey areas at Landfill 1 and Landfill 2. These modifications also include changing the number of proposed trench and test pit locations at each site. At Landfill 1, subsurface investigations were conducted over 14 proposed trenches. At Landfill 2, subsurface investigations were conducted over 7 proposed trenches and 2 proposed test pits. Subsurface investigations were conducted over 5 proposed trenches at Quarry 3.

1.2 PURPOSE

Historical information, provided by Brown and Caldwell, indicates that Landfill 1, Landfill 2, and Quarry 3 were previously used as disposal areas. However, the location of these disposal areas and their general limits are only speculated. Therefore, the purpose of the geophysical investigation is to obtain subsurface information, within each designated survey area, that will aid in verifying the lateral



extent of the disposal areas and to determine the approximate locations of buried metallic and nonmetallic debris, as well as possible buried unexploded ordinance (UXO).

In addition to the landfill investigations, subsurface surveys were conducted over proposed trenches and/or test pits at Landfill 1, Landfill 2, and Quarry 3. The purpose of these investigations was to locate detectable utilities in the vicinity of each proposed trench and test pit location to minimize the potential for encountering utilities.

1.3 SITE DESCRIPTION

1.3.1 Landfill 1

The survey area at Landfill 1 measures approximately 540 by 264 feet, as shown on Plate 1. It is bound by a chain link fence and Tyler Street to the north, a chain link fence and Polk Street to the west, and Building 89 to the east. The survey area is open to the south. Ground cover consists of asphalt. Two fire hydrants are located along the northern boundary of the survey area. The location of the fire hydrants, as well as other utility vaults, indicates that various utilities, such as fire water and steam, may trend west-east along the north boundary. The survey area is generally free of above ground cultural objects. Information, provided by Brown and Caldwell, indicates that ash and various nonmetallic debris may have been disposed of in this survey area.

1.3.2 Landfill 2

The survey area at Landfill 2 covers approximately 97,166 square feet, as shown on Plate 2. It occupies the graded area north of Bayshore Road and Adams Street, and a very small hill south of Adams Street. North of Adams Street, the survey area is bound by a chain link fence and is covered by gravel. The survey area south of Adams Street is open and covered with grass. Several metal garbage cans and a portable structure are located in the center of the survey area. With exception to these features, the survey area is generally free of above ground cultural objects. As indicated by Brown and Caldwell, it is unknown as to what kind of debris or to what extent the debris may be buried at this site.

1.3.3 Quarry 3

The survey area at Quarry 3 is shown on Plate 3. It is soil covered and measures approximately 90 by 60 feet. It is bound by a bowl shaped escarpment to the west, north, and east, and an asphalt covered alley to the south. A wood pole and small metal debris are located along the south boundary of the site. The survey area is free of above ground cultural objects and



debris. Information, provided by Brown and Caldwell, indicates that this site was formerly a rock quarry. It is not known if debris was disposed of in this area.

1.4 STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.



2.0 METHODOLOGY

2.1 EQUIPMENT

For this investigation, we used the vertical magnetic gradient (VMG), electromagnetic (EM31), EM61 metal detector, electromagnetic line locating (EMLL), and ground penetrating radar (GPR) methods. VMG surveys are used to determine the presence of buried ferrous objects. The affect that ferrous metal will have on the VMG readings is dependent upon the depth and mass of the metal object.

EM31 surveys are used to determine shallow conductivity variations that may be due to buried foreign objects or changes in subsurface materials. The EM31 records two different measurements. These are referred to as terrain conductivity (TC) and in-phase component (IPC). TC values indicate the electrical conductivity of the subsurface to a depth of approximately 12 to 15 feet. These values can be affected by ferrous and nonferrous metal. IPC values are also affected by the electrical conductivity of the subsurface. However, they are particularly sensitive to the presence of both ferrous and non-ferrous metal objects to depths of approximately 7 to 10 feet. The affect that ferrous or nonferrous metal will have on the respective TC or IPC readings is dependent upon the depth and size of the metal object.

EM61 surveys are used to determine the presence of buried near surface ferrous and nonferrous metal objects. This method is particularly useful in detecting buried metal that may represent possible unexploded ordinance (UXO) at shallow depths. The ability for the EM61 to detect small ferrous and/or nonferrous metal is dependent upon the depth and size of the metal object, and the spacing between data acquisition points.

The EMLL method was used to investigate the proposed trenches and test pits at each site for detectable utility alignments. The ground penetrating radar (GPR) method was used in conjunction with the EMLL at Landfill 1 to investigate for detectable utilities and potential subsurface obstructions. Standing water and saturated soils precluded the use of GPR at Landfill 2 and Quarry 3. Descriptions of the VMG, EM31, EM61, EMLL, and GPR methods are provided in Appendix A of this report.

2.2 EQUIPMENT FUNCTIONAL CHECKS

At the beginning and end of each field day, we performed equipment functional checks, as recommended by the instrument manufacturers to ensure proper equipment function. These functional checks included testing the power supply, as well as obtaining several readings at a predetermined



location or along a common data traverse. Proper functioning of the equipment was verified by determining that the trends observed in the data were repeatable. The results of these tests indicated that our equipment was functioning properly and accurately throughout the duration of the survey.

During EM data acquisition we periodically checked the instrument console to ensure that the station coordinates were recorded accurately and that the transmitter/receiver coil orientation was maintained in a northing or easting direction. During the VMG data acquisition we made periodic checks of the magnetometer to ensure that the sensors were properly oriented and that the station coordinates were recorded accurately. During the EM61 data acquisition we periodically checked the instrument console to ensure that the station coordinates were recorded accurately. In addition, we made field notes (diagrams) regarding surface features and metal that were in close proximity to specific measurement stations. The EMLL was used over known utilities to ensure proper functioning of the equipment. VMG, EM31, and EM61 data were down-loaded to a portable laptop computer at the end of each day and displayed in spreadsheet form. We reviewed the data to monitor quality, repeatability, and field survey parameters. There are no recorded data to monitor for the EMLL instrumentation.



3.0 DATA ACQUISITION AND ANALYSIS

3.1 DATA ACQUISITION

3.1.1 Horizontal Control

Prior to proceeding with the geophysical work, we established a survey grid at each survey area to provide horizontal control. The survey grid was based on a rectangular coordinate system with the origin (0E,0N) located to the southwest. An existing structure or fence was chosen on which to base the survey grid. We established each grid using a fiberglass measuring tape and marking paint. The marking paint was used to mark the grid nodes at 6 foot intervals on the ground. Each 60 by 60 foot grid node was labeled with its respective northing and easting coordinate. The location of each survey area is shown on Plates 1 through 3. The specific locations of the marked grid nodes are shown on the respective contour maps, Plates 4 through 20.

3.1.2 Landfill Investigations

At Landfill 1, Landfill 2, and Quarry 3, we obtained VMG, EM31 TC, EM31 IPC, and EM61 data within the designated survey areas, as specified in the initial scope of work. Station intervals for each method were specified in the Brown and Caldwell scope of work for Task Order 3. At Landfill 1 and 2, we obtained additional EM31 TC and EM31 IPC data within expanded survey areas.

At Landfill 1, VMG data were obtained every 2 to 3 feet along east-west trending traverses spaced 6 feet apart. This resulted in a total of 4,961 VMG measurement points. TC and IPC data were obtained at 6 foot intervals (stations) along east-west trending traverses spaced 6 feet apart. This resulted in a total of 2,554 measurement points for the initial survey area, and 2,184 for the expanded survey. EM61 data were obtained at 3 foot intervals (stations) along east-west trending traverses spaced 3 feet apart. This resulted in a total of 9,409 EM61 measurement points.

At Landfill 2, VMG data were obtained every 2 to 3 feet along south-north trending traverses spaced 6 feet apart, resulting in a total of 4,937 measurement points. TC and IPC data were obtained at 6 foot intervals along south-north trending traverses spaced 6 feet apart. This resulted in a total of 2,703 measurement points for the initial survey area, and 448 for the expanded survey. EM61 data were obtained at 3 foot intervals (stations) along south-north trending traverses spaced 3 feet apart. This resulted in a total of 8,939 measurement points.

At Quarry 3, TC and IPC data were obtained at 6 foot intervals along west-east trending traverses spaced 6 feet apart. This resulted in a total of 155 measurement points. VMG data were



obtained every 2 to 3 feet along these same traverses, resulting in a total of 322 measurement points. EM61 data were obtained at 3 foot intervals (stations) along south-north trending traverses spaced 3 feet apart. This resulted in a total of 539 measurement points.

3.1.3 Trench/Test Pit Investigations

For the proposed trench and test pit surveys, the EMLL system and GPR method, where applicable, were operated along both north-south and east-west trending traverses with the trench and test pits positioned at their intersection. Each traverse was approximately 20 to 30 feet long. Detected utilities within these areas were identified and marked with spray paint on the ground surface.

3.2 DATA ANALYSIS

3.2.1 Landfill Investigations

Preliminary data analysis was performed in the field to monitor data quality and field survey parameters. Final analysis and data presentation were completed in our Petaluma, California office.

We transferred the TC, IPC, VMG, and EM61 data to a personal computer and contoured the data sets using the software package SURFER (Version 7.0) by Golden Software. To grid the data we used the Kriging method. Kriging is a geo-statistical gridding method that interpolates irregularly spaced data into an XYZ formatted uniformly spaced grid. This method attempts to express trends in the data. This can prove to be useful when creating contour maps that will be used to interpret the location of landfill debris and fill material. These gridded data are then used to produce electromagnetic terrain conductivity, electromagnetic in-phase component, vertical magnetic gradient, and EM61 contour maps. The contour intervals for each map were selected based upon the specific intensities, as well as for clarity of presentation. These contour maps were then analyzed to determine potential locations that may represent buried landfill material.

3.2.2 Trench/Test Pit Investigations

The EMLL instrumentation indicates the presence of buried metal by emitting an audible tone. There are no recorded data to analyze. The locations of buried objects detected with the EMLL method were marked on the ground surface with pink marking paint.

We examined the GPR records for reflection patterns characteristic of utilities and other buried debris. For this survey, we estimate the depth of detection to average approximately two to three feet. This limited depth of investigation is probably caused by masking effects that bay mud and fill material have on the GPR signal.

4.0 RESULTS

The results of the geophysical investigation at Landfill 1, Landfill 2, and Quarry 3, are presented on Plates 4 through 20. These plates are the respective Vertical Magnetic Gradient (VMG), EM31 Terrain Conductivity (TC), EM31 In-phase Component (IPC), and EM61 Metal Detector Contour Maps for each site.

4.1 CONTOUR MAPS

4.1.1 Contour Presentation

To better illustrate the contour maps shown on Plates 4 through 20, each map has been presented using color contours or shaded regions. The specific contour lines on the VMG and EM61 contour maps have been color coded. For the VMG maps, contours representing values greater than 0 nT/m are colored red. Contours representing values less than 0 nT/m are colored blue. The EM61 maps also use red and blue contours. The red contours represent values greater than 10 millivolts (mV). The blue contours represent values less than 10 mV.

To illustrate how TC and IPC values trend through each site, we have shaded the contours on those respective maps. TC values less than 60 to 80 milliSiemens per meter (mS/m) are shaded blue while TC values greater than 110 to 150 mS/m are shaded yellow. The values in between represent a transition from blue to yellow. IPC values less than 0 ppt are shaded light blue while IPC values greater than 2 to 14 ppt are shaded yellow. The values in between represent a transition from blue to yellow.

4.1.2 Contour Distribution

The VMG, TC, and IPC contour maps show the respective variations in the vertical magnetic gradient, electromagnetic terrain conductivity, and electromagnetic in-phase values within each survey area. The EM61 contour map shows the variations in the response from buried metal objects throughout the survey area. Each contour map is characterized by a series of contour lines that represent specific values. Areas that lack contour lines, or where the contours are spaced far apart, indicate a minimal change or variation in the respective values. This is indicative of relatively uniform conditions. Areas where contours are closely spaced indicate variations that are not uniform and probably caused by more local sources.

In areas where there are significant quantities of above or below ground metal objects, the measured values are relatively large. These areas are characterized by numerous closely spaced

contours. If the source of the anomaly is linear (e.g. fence, underground utilities, etc.), then the contours tend to parallel the object, and are closely spaced in close proximity to the object. If the below ground source is localized (e.g. UST's, buried drum, metal debris, etc.), then the contours tend to form circular or elliptical closures that enclose the object. The larger the object and the closer it is to the geophysical instrument, the more contours there are in a given area. Variations that cannot be attributed to known above and below ground objects (fences, vehicles, buildings, utility alignments, etc.) are caused by unknown buried objects and are considered anomalous.

Buried landfill material is often characterized by circular to elliptical contour closures. These closures can vary from large circular closures that cover broad areas, to clusters of small closures that occur in zones. If the composition of the landfill is generally homogenous and nonmetallic, the contours tend to form large closures representing low values. If the fill material consists of both nonmetallic and metallic debris that varies significantly throughout the landfill, the contours tend to occur as numerous small closures representing both high and low values.



5.0 INTERPRETATION

Based on our interpretation of the contour maps, we have created the Geophysical Results Maps for Landfill 1, Landfill 2, and Quarry 3, Plates 21 through 23, respectively. Each map shows the limits of each survey area, the location of above ground features in close proximity to the site, and the locations of the interpreted VMG, TC, IPC, and EM61 anomalies. The interpreted anomalies could not be associated with above ground features or known below ground objects, such as utility alignments. Therefore, each anomaly is probably caused by buried unknown subsurface features.

5.1 LANDFILL 1

5.1.1 Geophysical Surveys

Our interpretation of the results for the VMG, TC, IPC, and EM61 surveys at Landfill 1 are shown on Plate 21. The results of the VMG survey define numerous VMG anomalies that represent buried ferrous metal objects and debris. These anomalies are primarily located along the north and east boundaries of the site, and in the northwest quadrant. The east central portion of the site exhibits an absence of VMG anomalies. The VMG anomalies along the north and east boundaries probably represent isolated buried metal. Since some of these anomalies are situated relatively close to known utilities and a building, they may also represent effects from these features. The anomalies in the northwest quadrant are generally distributed throughout the area. The distribution of these anomalies suggests accumulations of metal debris along south to north trending alignments. These alignments are typical of metal debris that has been deposited in landfill cells or trenches. The absence of anomalies in the east central portion indicates an area that is probably free of buried ferrous metal.

The results of the EM31 TC survey indicate a general increase in terrain conductivity values from the perimeter to the center of the survey area. The highest TC values (>150 mS/m) are evident in the east central portion of the site and are manifested by broad circular closures that define two large zones of highly conductive subsurface material. These zones correspond with the area that exhibits an absence of VMG anomalies. Therefore, we believe that they may represent native bay mud or imported fill material. The lowest TC values are evident in the west half and along the east boundary of the site. They generally form large zones that correspond with VMG anomalies described above. Some of these zones also extend into the expanded area where no VMG data was obtained. It has been our experience that low conductive zones such as these may represent buried metallic debris, as indicated by the VMG, and zones of possible nonmetallic refuse. The TC results also define several



east to west trending linear anomalies along the southern boundary in the expanded area. These are indicative of utility alignments or possible subsurface railroad spurs. It should be noted, that not all VMG anomalies have corresponding TC anomalies. This may indicate that the metal debris, as defined by the VMG method, may be buried at a depth or scattered in sufficient quantity that it is beyond the detection capabilities of the EM31.

The results of the EM31 IPC survey define several anomalous areas that are indicative of buried metal objects. They are located near the west and north perimeters, and along the north and south boundaries of the expanded survey area. The anomalies along the west and north perimeters generally correspond with portions of VMG anomalies previously described and probably represent effects from the same subsurface sources. The anomalies in the expanded area suggest both isolated and linear trending subsurface sources. The isolated anomalies are generally spaced every 60 to 70 feet from west to east across the site. These anomalies may represent effects from remnant footings used to support a former structure. The linear trending anomalies, as described above, are indicative of utility alignments or possible subsurface railroad spurs.

The results of the EM61 survey indicate numerous localized EM61 anomalies scattered throughout the site. The intensities of the EM61 anomalies, as shown on Plates 8 and 9, vary considerably through the site. The high intensity anomalies are indicative of metal that may be buried relatively close to the surface. The low intensity anomalies probably represent smaller metal or metal buried at greater depths. As mentioned above, the EM61 is sensitive to small, near surface ferrous and nonferrous metal objects, including small scrap and UXO. However, it can not be determined if these anomalies represent buried UXO.

5.1.2 Proposed Trench Surveys

The results of the proposed trench surveys are shown on Plate 21. As described above, the EMLL and GPR methods were systematically used over 14 proposed trenches. During the course of this investigation, we detected an electric, water, and undifferentiated utility alignment. The surface trace of these utilities were marked with spray paint on the ground surface and are shown on Plate 21.

5.2 LANDFILL 2

5.2.1 Geophysical Surveys

Our interpretation of the results for the VMG, TC, IPC, and EM61 surveys at Landfill 2 are shown on Plate 22. The results of the VMG survey define several small zones of VMG anomalies that represent buried ferrous metal objects and debris. These zones (anomalies) are located along the

north and south boundaries of the site. The central portion of the survey area exhibits an absence of VMG anomalies. The intensity and areal extent of the anomalies that comprise these zones, as shown on Plates 16 and 17, suggests small accumulations of localized buried metal objects. The linear zone to the south may represent effects from an abandoned utility or former railroad spur. The absence of anomalies in the central portion indicates an area that is probably free of buried ferrous metal. The results of the VMG survey do not define significant areas of buried metal that could be indicative of large landfill cells or trenches.

The results of the EM31 TC survey, as shown on Plate 12, indicate a decrease in terrain conductivity values from the perimeter of the survey area to the center. This decrease is manifested by large broad circular closures that define a significant zone of low conductive material that extends from the center to the southwest corner of the site. It has been our experience that low conductive zones such as this may represent buried, nonmetallic debris or refuse. It should be noted, however, that bedrock is typically less conductive than surface soils and fill material. Since bedrock is evident in the nearby cut-slope to the north, this zone may also represent an area of shallow bedrock. In addition, this area generally corresponds with the absence of VMG anomalies, as mentioned above. This is further evidence that this zone may represent shallow bedrock and not accumulations of landfill debris.

The results of the EM31 IPC survey (Plate 13) generally corresponds with the results of the EM31 TC survey. There is a decrease in IPC values in the center and southwest corner of the survey area. Since the VMG method did not detect buried metal in this area, we believe that the decrease in IPC values is representative of the change in subsurface lithology. As mentioned above, EM31 IPC values are usually sensitive to the presence of buried metal objects. However, they are also affected by the electrical properties of the subsurface. There are no other IPC anomalies shown on this map that may represent buried metal objects. It should be noted, that the IPC method did not define anomalies that correspond with the detected VMG anomalies. Therefore, we believe that the metal debris, as defined by the VMG method, is probably buried at a depth or scattered in sufficient quantity that it is beyond the detection capabilities of the EM31.

The results of the EM61 survey indicate numerous localized EM61 anomalies located throughout the site. The majority of these anomalies are generally concentrated near the north boundary. The intensities of the EM61 anomalies, as shown on Plate 8, vary considerably through the site. The high intensity anomalies are indicative of metal that may be buried relatively close to the



surface. The low intensity anomalies probably represent smaller metal or metal buried at greater depths. Most of the EM61 anomalies near the north boundary correspond with the previously mentioned VMG anomalies and probably represent the same source. If this is the case, then most of the buried metal in this area is probably isolated and very shallow. As mentioned above, the EM61 is sensitive to small, near surface ferrous and nonferrous metal objects, including small scrap and UXO. However, it can not be determined if these anomalies represent buried UXO.

5.2.2 Proposed Trench Surveys

The results of the proposed trench and test pit surveys are shown on Plate 22. As described above, the EMLL method was systematically used over 7 proposed trenches and 2 test pit locations. During the course of this investigation, we detected isolated near surface metal debris. No detectable utility alignments were defined near the proposed trench and test pits.

5.3 QUARRY 3

5.3.1 Geophysical Surveys

Our interpretation of the results for the VMG, TC, IPC, and EM61 surveys at Quarry 3 are shown on Plate 23. The results of the VMG survey define the location of eight VMG anomalies that represent buried ferrous metal objects. They are defined in isolated areas around the perimeter of the quarry, and in a linear zone to the south. The intensity and areal extent of the isolated anomalies, as shown on Plates 16 and 17, are typical of localized buried metal objects. The linear VMG anomaly to the south may represent buried near surface metal associated with the downed utility pole. The results of the VMG survey do not define anomalous areas that could represent large accumulations of buried landfill material.

The results of the EM31 TC survey indicate a decrease in terrain conductivity values from the perimeter of the quarry to the center. This decrease is manifested by broad circular closures that define a large zone of low conductive material in the north central portion of the quarry. As mentioned above, low conductive zones typically represent buried, nonmetallic debris or refuse. However, low conductive zones are also indicative of shallow bedrock. Since bedrock is very shallow adjacent to the quarry, as indicated by local outcrops and the quarry escarpment, this zone may also represent shallow bedrock.

The results of the EM31 IPC survey define two anomalous areas that are indicative of buried metal objects. They are located near the east and south perimeters of the survey area. Both of these anomalies correspond with portions of two VMG anomalies previously described, and probably represent the same isolated source. There are no additional IPC anomalies shown on this map,



including IPC anomalies that correspond with the remaining VMG anomalies. Therefore, we believe that the metal debris, as defined by the VMG method, may be buried deeper than the detection capabilities of the EM31. Since the VMG is more sensitive to small metal objects, the buried metal at this site may be too small to be detected by the EM31 IPC method.

The results of the EM61 survey indicate several localized EM61 anomalies scattered throughout the site. They are generally concentrated to the northwest and east portions of the survey area. The intensities of the EM61 anomalies, as shown on Plate 20, vary considerably through the site and probably represents near surface metal and/or metal that is buried at greater depths. Some of the EM61 anomalies correspond with the previously mentioned VMG anomalies and probably represent the same source. As mentioned above, the EM61 is sensitive to small, near surface ferrous and nonferrous metal objects, including small scrap and UXO. However, it can not be determined if these anomalies represent buried UXO.

5.3.2 Proposed Trench Surveys

The results of the proposed trench surveys are shown on Plate 23. As described above, the EMLL method was systematically used over 5 proposed trench locations. During the course of this investigation, we detected one linear feature that may represent an undifferentiated utility alignment. The surface trace of this possible utility was marked with spray paint on the ground surface.

6.0 ILLUSTRATIONS

AVAILABLE FOR VIEWING
IN THE CITY ATTORNEY'S OFFICE

PLATES 1-23



Appendix A
GEOPHYSICAL METHODS AND LIMITATIONS



Appendix A

GEOPHYSICAL METHODS

Vertical Magnetic Gradiometer (VMG)

A magnetic gradiometer measures the vertical gradient of the earth's magnetic field. It consists of two total field magnetic sensors separated vertically by one-half meter. The magnetic field strength is measured simultaneously at both of these sensors. The difference in magnetic intensity between these measurements is proportional to the vertical gradient of the earth's magnetic field. Because the vertical gradient is constant with respect to time, the effect of diurnal variations is eliminated. Therefore, a gradiometer provides higher sensitivity and better resolution of near surface sources than total field magnetometers. Areas with significant amounts of buried metal typically produce anomalously steep magnetic gradients. Since it is sensitive to ferrous metal sources both above and below ground, site and vicinity surface conditions can affect survey results.

We used a Geometrics G-856 Cesium magnetometer to obtain the vertical magnetic gradient data. The instrument features a built-in memory that stores the vertical magnetic gradient and survey grid information. The information can be down loaded to a computer for further processing.

Electromagnetic (EM31)

The electromagnetic method is used to measure variations in subsurface electrical conductivity. The electromagnetic system utilizes two coils separated by a specified distance. One of these coils transmits a time-varying electromagnetic signal (primary magnetic field) which induces current flow in the earth. This in turn creates a secondary magnetic field which is detected by the receiver coil. The secondary signal is complex and has both quadrature and in-phase components. The amplitude of the quadrature component is proportional to the electrical conductivity of the subsurface materials. The in-phase component is proportional to conductivity, but is also affected by electrical properties associated with metal objects. The instrument displays the quadrature component in units of milliSiemens/meter (mS/m). Since this measurement represents the conductivity of the volume of material sampled, rather than individual layers, it is an apparent value and is referred to as terrain conductivity (TC). The instrument displays the in-phase component (IPC) value in units of parts per thousand (ppt).



We performed the electromagnetic survey using a Geonics EM31-DL ground conductivity meter connected to an Omnidata data recorder. The EM31 has a fixed coil separation of 12 feet. This results in a total depth of investigation of approximately 7 to 10 feet, depending upon local site conditions. The data recorder automatically stores TC and IPC values as well as station locations and annotations regarding cultural features.

Electromagnetic Induction (EM-61)

The EM-61 is a high sensitivity, high resolution time-domain metal detector. It is used to detect both ferrous and non-ferrous metallic objects. The unit consists of a transmitter and receiver coil, which are mounted on a coil assembly. The coil assembly can be mounted on a trailer or worn as a harness.

The system operates by transmitting a pulsed primary magnetic field at predetermined intervals. This primary field induces eddy currents into nearby below-ground metallic objects. The decay of these eddy currents is measured by the receiver coil at a relatively long time after termination of the primary pulse. This decay creates a response that is practically independent of the electrical conductivity of the ground. The response from these secondary fields, measured in millivolts (mV), are recorded and displayed by an integrated data logger as two channels of information.

Our instrumentation for this investigation consisted of a Geonics EM-61 HH Time-Domain metal detector connected to an Omnidata data recorder. The data recorder automatically stores EM61 values as well as station locations and annotations regarding cultural features. This information can be transferred to a lap-top computer for further processing and interpretation.

Electromagnetic Line Location (EMLL)

Electromagnetic line location techniques are used to locate the magnetic field resulting from an electric current flowing on a line. These magnetic fields can arise from currents already on the line (passive) or currents applied to a line with a transmitter (active). The most common passive signals are generated by live electric lines and re-radiated radio signals. Active signals can be introduced by connecting the transmitter to the line at accessible locations or by induction.

The detection of underground utilities is affected by the composition and construction of the line in question. Utilities detectable with standard line location techniques include any

continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or in accessible utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that are not detectable using standard electromagnetic line location techniques include those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and pipes with insulated connections.

Buried objects can also be detected, without direct contact, by using the induction mode. This is used to detect buried near surface metal objects such as rebar, manhole covers, UST's, and various metallic debris. The induction mode is used by holding the transmitter-receiver unit above the ground and continuously scanning the surface. The unit utilizes two orthogonal coils that are separated by a specified distance. One of the coils transmits an electromagnetic signal (primary magnetic field) which in turn produces a secondary magnetic field about the subsurface metal object. Since the receiver coil is orthogonal to the transmitter coil, it is unaffected by the primary field. Therefore, the secondary magnetic fields produced by buried metal object will generate an audible response from the unit. The peak of this response indicates when the unit is directly over the metal object.

Our instrumentation for this investigation consisted of a Radio Detection RD-400 and a Fisher TW-6 inductive pipe and cable locator.

Ground Penetrating Radar (GPR)

Ground penetrating radar is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The method is particularly sensitive to variations in electrical conductivity and electrical permittivity (the ability of a material to hold a charge when an electrical field is applied).

The GPR system operates by radiating electromagnetic pulses into the ground from a transducer (antenna) as it is moved along a traverse. Since most earth materials are transparent to electromagnetic energy, the signal spreads downward into the subsurface. However, when the signal encounters a variation in electrical permittivity, a portion of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, all of the incident energy is reflected. The reflected signals are received by the same transducer and are printed in cross-section form on a graphical recorder. Changes in subsurface reflection character on the



GPR records can provide information regarding the location of buried debris, underground utilities, and variations in the shallow stratigraphy.

For this investigation, we used a Geophysical Survey Systems, Inc. SIR-2000 Subsurface Interface Radar Systems equipped with a 500 megahertz (MHz) transducer. This transducer is near the center of the available frequency range and is used to provide high resolution at shallow depths.

LIMITATIONS

VMG, EM31, and EM61 Techniques

There are inherent limitations associated with VMG, EM31, and EM61 techniques that may not allow for the detection of all subsurface features of interest. These limitations are related to the construction of the object, its size and depth of burial, and its proximity to other above or below ground features. In general, as the distance between a subsurface object and the respective geophysical instrument increases, the intensity of the associated field decreases, thereby making detection more difficult. In addition, above and below ground objects, such as chain link fences, buildings, debris, railroad spurs, utilities, above ground electric lines, etc., typically produce interference that may mask effects from nearby buried features (targets).

Apart from the physical limitations of the instruments and the unwanted effects from secondary objects, the ability to detect subsurface features is also dependent upon the density of data acquisition points. If the distance between data acquisition points is significantly larger than the size of the subsurface feature, then this object may not be detectable.

EMLL Techniques

The detection of underground utilities is dependent upon the composition and construction of the line of interest, as well as depth. Standard line locating techniques (EMLL) and ground penetrating radar (GPR) are typically used in conjunction with each other to detect various utilities. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or in accessible utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities



that may not be detectable using standard electromagnetic line location techniques include certain abandoned utilities, utilities not exposed at the ground surface, or those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. Pipes generally deeper than about five to seven feet may not be detected.

GPR Techniques

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Typically, the GPR depth of detection will be reduced as the clay content in the subsurface increases. Therefore, it is possible that targets, such as below ground utilities, buried greater than 2 to about 4 feet, may not be detectable by the GPR technique.



Appendix B
DAILY FIELD REPORTS



DAILY FIELD REPORT

Date: 11-8-00 Client/Location: BROWN & CALDWELL / BENICIA
Personnel: DJK TB Equipment: EM 31
Project Description: LANDFILL INVESTIGATIONS

TIME

NOTES

7:00: ARRIVE PETALUMA OFFICE, MOB VEHICLE
- LEAVE FOR BENICIA ARSENAL

9:00: ARRIVE LANDFILL 1
- COULD NOT WORK IN AREA BECAUSE OF NUMEROUS
PARKED VEHICLES

9:15: ARRIVE LANDFILL 2, SET UP GRID FROM 0E TO 216E

11:30: ARRIVE QUARRY 3, SET UP GRID, OBTAIN EM-31
DATA ON 6X6 FOOT GRID

1:00: PROCEED BACK TO LANDFILL 1, SET UP GRID IN
AREAS FREE OF PARKED VEHICLES

2:30: PROCEED BACK TO LANDFILL 2, OBTAIN EM31
DATA ON 6X6 FOOT GRID FROM 0E TO 186E
- DOWN LOAD DATA INTO LAPTOP COMPUTER

4:00: LEAVE SITE

FIELD DAY SUMMARY MOB: 2.5 HOURS FIELD: 7 HOURS

Non Kirker Signature
NORCAL Representative

Signature
CLIENT Representative



DAILY FIELD REPORT

Date: 11-9-00 Client/Location: BROWN & CALDWELL / BENICIA
Personnel: DJK TB Equipment: EM 31 MAG
Project Description: LANDFILL INVESTIGATIONS

TIME	NOTES
<u>7:00:</u>	<u>ARRIVE PETALUMA OFFICE</u> <u>- LEAVE FOR BENICIA ARSENA</u>
<u>8:30:</u>	<u>ARRIVE LANDFILL 1</u> <u>- COMPLETE GRID SET UP</u> <u>- OBTAIN EM 31 DATA ON A 6X6 FOOT GRID</u> <u>OVER ENTIRE SITE</u> <u>- OBTAIN CESIUM MAG DATA ON 6X2 FOOT</u> <u>GRID OVER DESIGNATED SURVEY AREA</u> <u>* MULTIPLE READINGS WERE OBTAINED WITH</u> <u>BOTH THE EM 31 AND MAG OVER A SINGLE</u> <u>STATION OR ALONG A TRAVERSE AT THE</u> <u>BEGINNING AND END OF THE SURVEY TO</u> <u>CHECK DATA REPEATABILITY AND TO ENSURE THAT</u> <u>THE EQUIPMENT WAS FUNCTIONING PROPERLY.</u>
<u>4:00</u>	<u>LEAVE SITE</u>

FIELD DAY SUMMARY MOB: 2.5 HOURS FIELD: 7.5 HOURS

Don Kiker Signature
NORCAL Representative

CLIENT Representative



DAILY FIELD REPORT

Date: 11/10/00 Client/Location: BROWN & CALDWELL / BENECIA ARSENAL
Personnel: TWB Equipment: S. MAG
Project Description: MAGNETICS INVESTIGATION OF SUSPECTED LANDFILL AREAS

TIME	NOTES
0830	Arrive @ office - MOR
0845	Leave for site -
1000	Arrive on site - Benecia Arsenal - SITE 2
1015	SET UP - SITE 2
1045	Begin data collection
1215	Complete data acquisition
1230	Lunch
1245	Setup - QUARRY
1300	Begin data collection
1340	Complete data acquisition
1350	Calibration line - SITE 2 - LINE 60E ST 0N - 216N
1400	Wrap for day - Pack up
1415	Leave site
1515	Arrive @ office - Demob

FIELD DAY SUMMARY SITE 2 - 180x222 / QUARRY - 60x90 ; S. MAG DATA ACQUIRED

Trent Back Signature
NORCAL Representative

Signature
CLIENT Representative



DAILY FIELD REPORT

Date: 1-9-01 Client/Location: B+C / BENICIA

Personnel: DJK Equipment: EM31

Project Description: LANDFILL DETECTION

TIME	NOTES
6:30:	ARRIVE PETALUMA OFFICE, MOB VEHICLE
7:00:	LEAVE FOR BENICIA
8:00:	ARRIVE B+C OFFICE, BENICIA ARSENAL
8:25:	HEALTH & SAFETY MEETING
8:30:	ARRIVE LANDFILL 2
	- ESTABLISH GRID SOUTH OF PREVIOUS SURVEY AREA. GRID EXTENDS FROM FENCE ACROSS ADAM ST. TO ESCARPMENT
9:30:	TUNE IN EM31
9:40:	COLLECT EM31 DATA OVER EXPANDED AREA
10:30:	COLLECT OVERLAP DATA IN AREA PREVIOUSLY SURVEYED
11:05:	DOWNLOAD DATA INTO PORTABLE LAPTOP COMPUTER
	- COMPLETE DAILY FIELD REPORT
11:30:	LEAVE SITE

FIELD DAY SUMMARY MOB: 2.5 HOURS FIELD: 3.5 HOURS

Don Kirker Signature
NORCAL Representative

Signature
CLIENT Representative



DAILY FIELD REPORT

Date: 1-29-01 Client/Location: BIC / BENICIA ARSENAL
Personnel: DJK Equipment: EMLL
Project Description: UTILITY DETECTION

TIME

NOTES

7:30: ARRIVE PETALUMA OFFICE, MOB VEHICLE
8:00: LEAVE FOR BENICIA
9:00: ARRIVE LANDFILL 2, BENICIA ARSENAL
- LOCATE SIX PROPOSED TRENCHES AND TWO PROPOSED
POT HOLES.
- INVESTIGATE EACH LOCATION FOR DETECTABLE
UTILITIES USING THE EMLL EQUIPMENT.
10:45: ARRIVE QUARRY 3
- LOCATE FIVE PROPOSED TRENCHES
- INVESTIGATE EACH LOCATION FOR DETECTABLE UTILITIES
USING THE EMLL EQUIPMENT.
- UPDATE SITE MAP
11:30: LEAVE SITE
NOTE: SATURATED SOIL, MUD, AND STANDING WATER
PRECLUDED USE OF GPR AT LANDFILL 2 AND
QUARRY 3

FIELD DAY SUMMARY MOB: 2.5 HOURS FIELD: 2.5 HOURS

Don Kiker Signature
NORCAL Representative

Signature
CLIENT Representative



DAILY FIELD REPORT

Date: 2/13/01 Client/Location: Brown & Caldwell / Landfill 12 - Parking Lot
BENICIA ARSENAL

Personnel: D. BISSIRI / T. BLACK Equipment: METAL DETECTION - LINE LOCATION EQUIPMENT
(FOR D. KIRKER)

TIME NOTES

0745 DEPART NORCAL OFFICE

0900 ARRIVE SITE (AHEAD OF SCHEDULE)

0930 START APPOINTED TIME - MEET BRAD ZIEGLER OF BEC
INVESTIGATE PROPOSED TRENCHES: <0017>; <0027>; <0037>; <0047>;
<001A>*; <0057>; <0067>; <0077>; <0087>
NOTE TRENCH 002 MAY INCLUDE POSSIBLE UST

1100 BREAK FOR LUNCH

1430 RETURN FROM LUNCH - RESUME INVESTIGATION @ TRENCH <0097>; <0107>;
<0117>; <0127>; <0137>; <0147>

1745 PACK EQUIPMENT / LEAVE SITE

* <001A> A.K.A <0157>

NOTE: TRENCH 014 CEASED ON REINFORCED CONCRETE PAD ON VAULT
RECAVATE WITH CAUTION.

NOTE: 006 SHIFTED 5 FEET NORTH, SUCH THAT SW CORNER IS 5' NORTH OF ELECTRIC LINE

NOTE: TRENCH 001 COMBINED W/001A TO RUN "L" SHAPED TRENCH OVER CONDUIT

FIELD DAY SUMMARY COMPLETED 7.5 HRS FIELDWORK / 15 PROPOSED TRENCHES

David Bissiri Signature
NORCAL Representative
DAVID BISSIRI

Brad Ziegler Signature
Representative
BRAD ZIEGLER

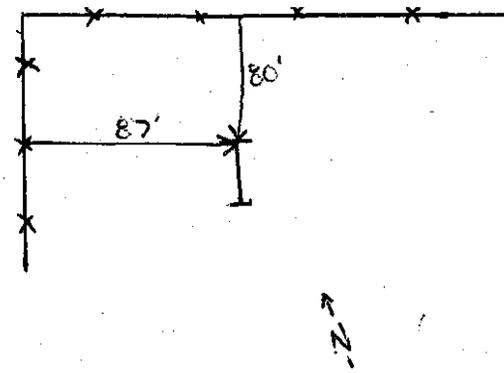


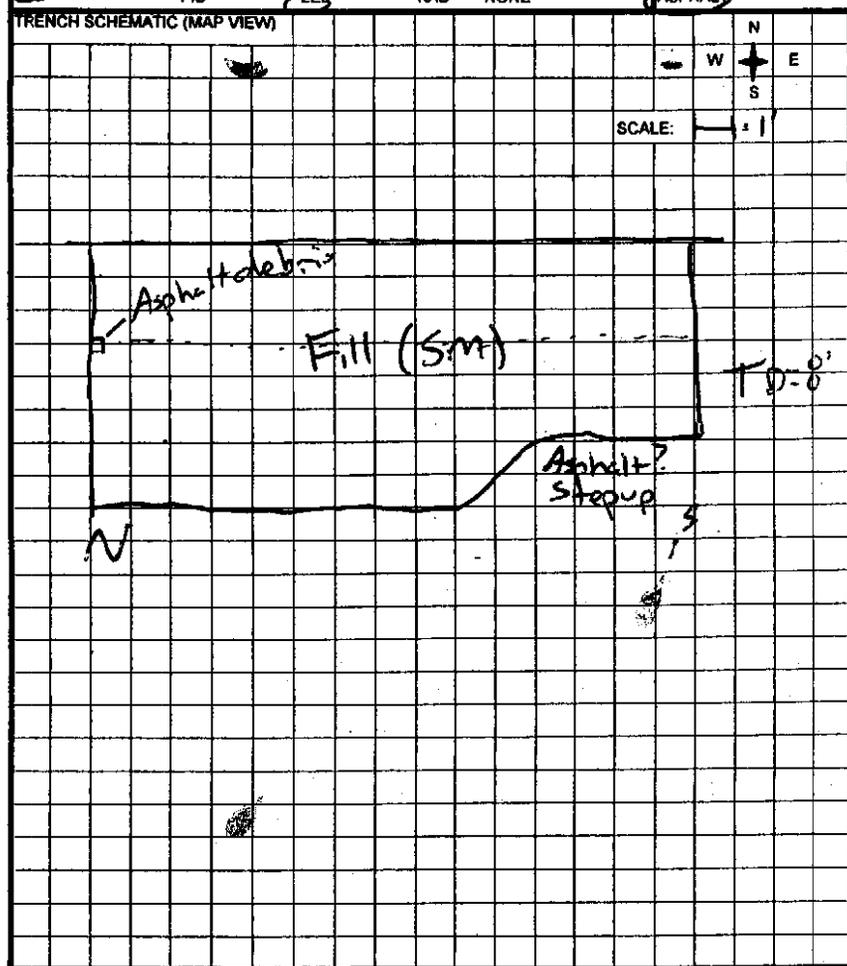
Appendix C
CD-R

APPENDIX C

**Trench Logs/Test Pits for Fillsite 1 and 2
and Quarries 1 and 3**

Fillsite 1

CLIENT USACE LOCATION Benicia - LFI PROJECT NAME Benicia XUSACE JOB NUMBER 00701 EXCAVATION CONTRACTOR Nelson EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> LB <input type="checkbox"/> FID <input checked="" type="checkbox"/> LB <input type="checkbox"/> RAD <input type="checkbox"/> NONE SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	TRENCH NUMBER L001TR001 SHEET 1 OF 1 DRILLING START TIME 1040 FINISH TIME 1130 DATE 2/13/01 DATE 2/13/01	LOCATION OF TRENCH 
---	--	---



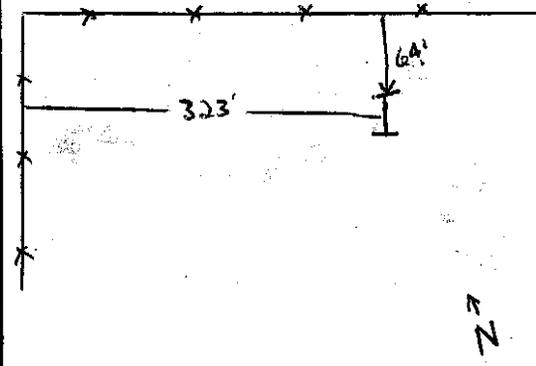
FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

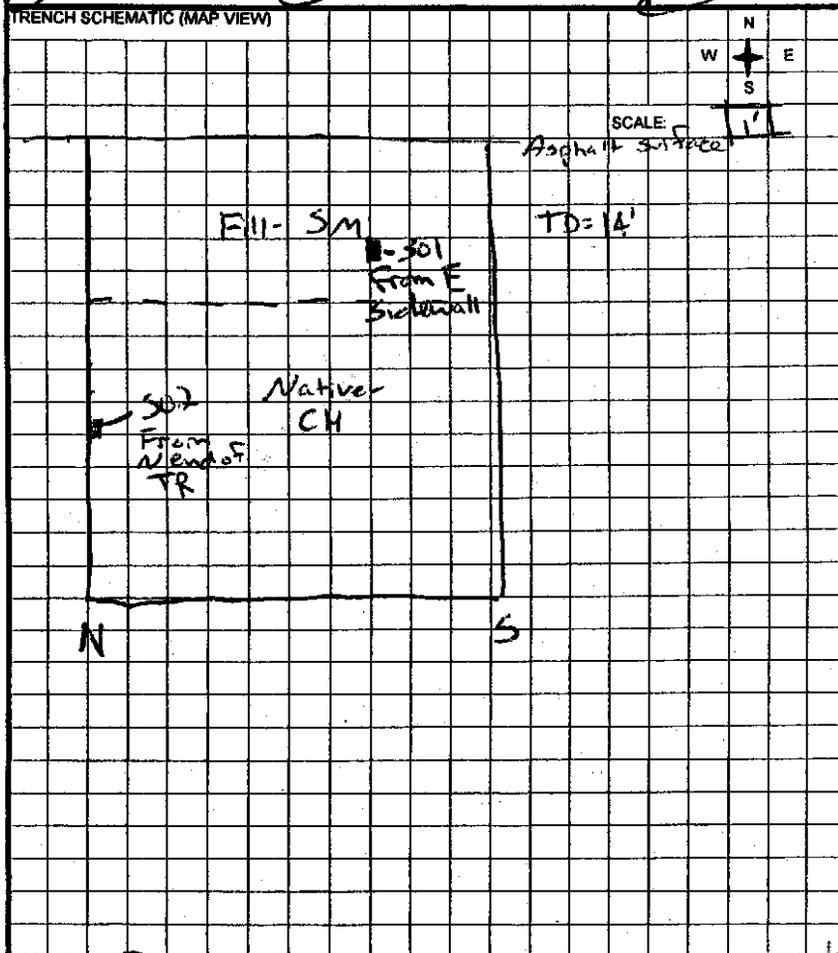
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0	0-2" Asphalt surface
2	2"-6" Road base material
6	6"-8" Loose, unconsolidated fill material, sandy silt & gravel, (25, 35, 40) nonplastic, low dry strength, low toughness, moist, no odor, high-med perm
5	Several pieces of asphalt debris, varying in size, also some brick debris 7 3/4" by 3" by 3" water filling in trench at 3' by 3" well graded fill material w/ varying sizes (SM) Trench backfilled with excavated soil
0	
5	Water Parameters temp = 59.1° F pH = 6.16 EC = 1210 um/cm
0	BZ = 0 ppm while trenching LEL = 0% X

3/2 Jg 2/13/01

CLIENT USACE	TRENCH NUMBER L001TR002	LOCATION OF TRENCH 
LOCATION Benicia LEI	SHEET 1 OF 1	
PROJECT NAME Benicia USACE	DRILLING	
JOB NUMBER 00701	START TIME 1212	FINISH TIME 1330
EXCAVATION CONTRACTOR Nielson	DATE 2/13/01	DATE 2/13/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____	
<input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL	<input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____		
<input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE		
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____		
<input checked="" type="checkbox"/> FID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEI <input type="checkbox"/> RAD <input type="checkbox"/> NONE		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-2' Asphalt surface

2"-6" Road base material

6"-5' Sandy silt w/ gravel (Loose unconsolidated fill material) (25, 35, 40) non plastic, low dry strength, low toughness, dry, no odor, high med perm. assorted pieces of asphalt varying in size throughout this layer, no additional detail Ux/Ox water

5'-14' Silty clay (native) (0, 30, 70) med plasticity, med dry strength, med toughness, dry, no odor, low perm. Sharp contact silt fill + native layers (CH)

5'- Trench backfilled & compacted with excavated soil

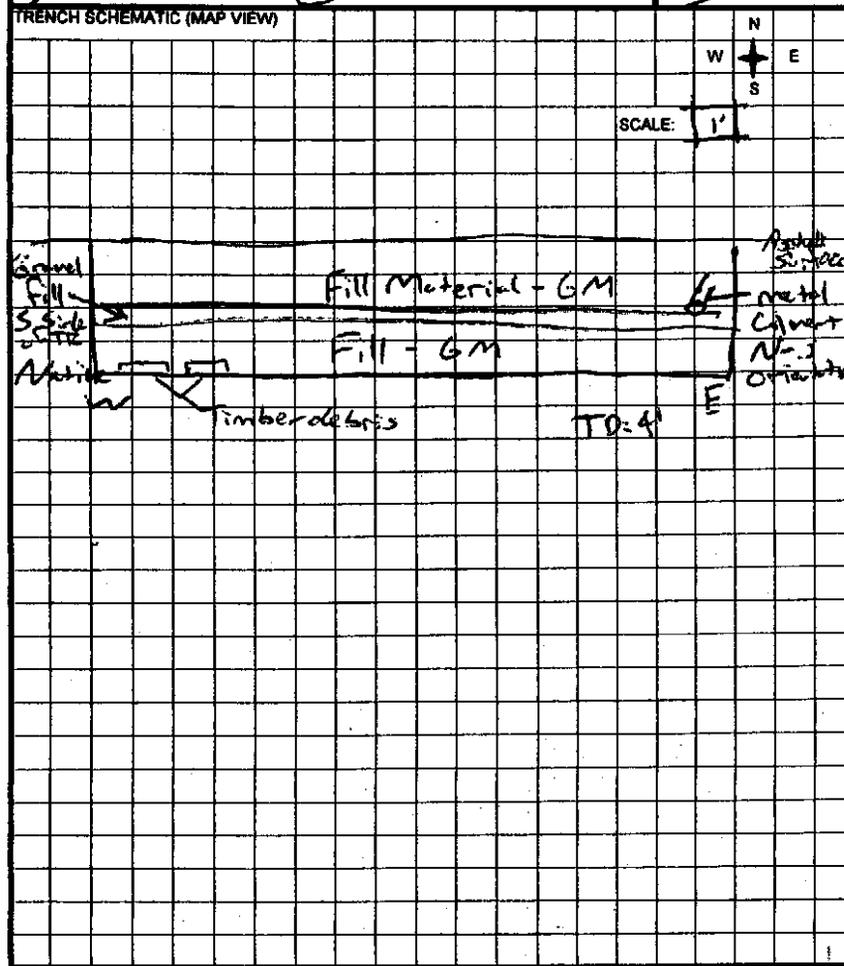
- Soil samples collected with drive sampler

BZ: 0 ppm

LEL: 0%

323' 2/13/01

<p>CLIENT USACE</p> <p>LOCATION Benicia LEI</p> <p>PROJECT NAME Benicia USACE</p> <p>JOB NUMBER 00701</p> <p>EXCAVATION CONTRACTOR Nielson</p> <p>EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOPE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL</p> <p>SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE</p> <p>MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> FID <input type="checkbox"/> RAD <input type="checkbox"/> NONE</p>	<p>TRENCH NUMBER L001TR003</p> <p>SHEET 1 OF 1</p> <p>DRILLING</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>START TIME 1500</td> <td>FINISH TIME 1615</td> </tr> <tr> <td>DATE 2/13/01</td> <td>DATE 2/13/01</td> </tr> </table>	START TIME 1500	FINISH TIME 1615	DATE 2/13/01	DATE 2/13/01	<p>LOCATION OF TRENCH</p>
START TIME 1500	FINISH TIME 1615					
DATE 2/13/01	DATE 2/13/01					
<p>SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET</p>						



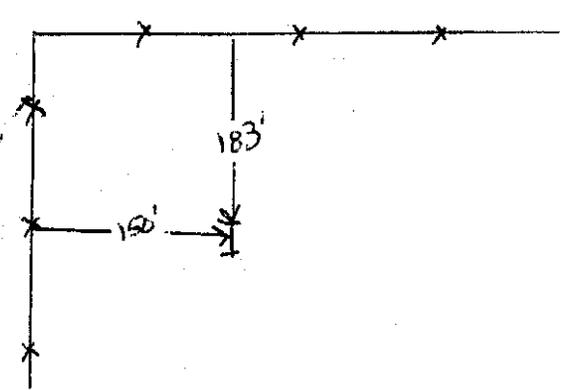
FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

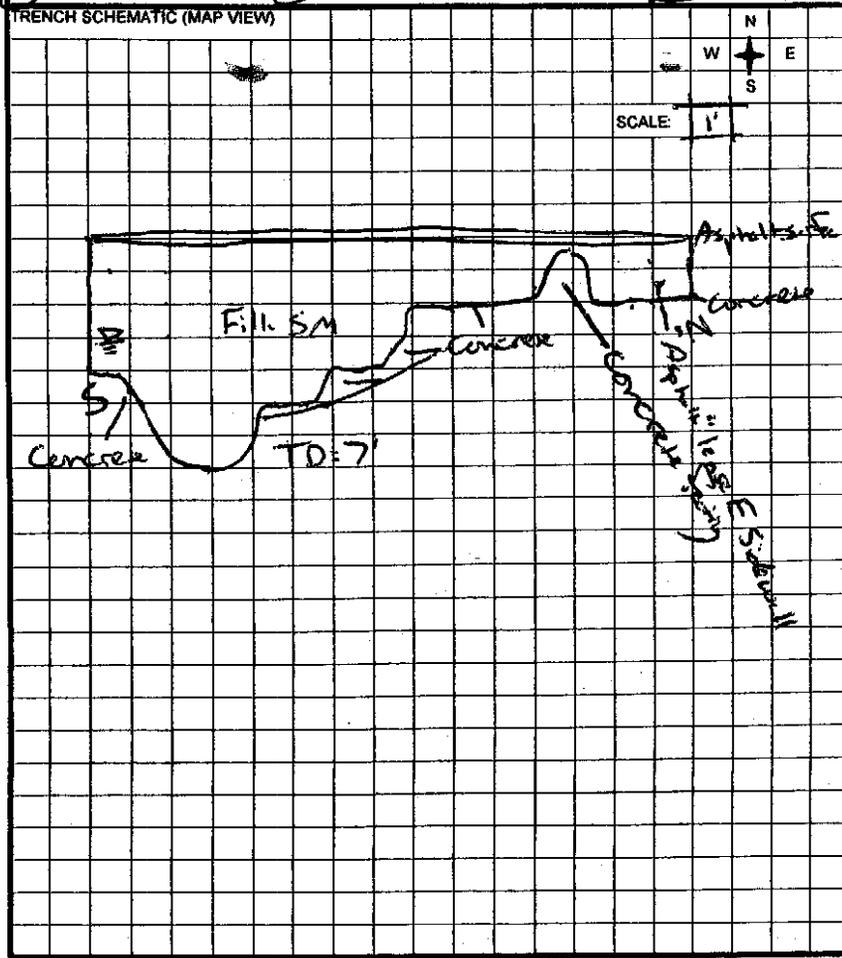
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0	0-2' Asphalt surface
	2'-6" Asphalt base material
	6"-2' Loose unconsolidated fill material, sand & gravel of varying sizes (40, 30, 25), non plastic, low dry strength, low toughness, dry, no odor high-meat petm, well graded fill material w/ varying sizes & angularity (GM)
5	2' 2.5' Gravel fill on S side of trench (not present on N sidewall) - (Railroad base material)
	2' 2.5' - 4' same as 6"-2'
	4' bay mud - native (CH)
0	metal cabinet at E end of trench 1' off of Eastern extent of trench along N-S at 2' base
	- No creosote odor (ovm = oppal associated w/ wood debris)
5	- Trench back filled with excavated soil
	BZ = 0 ppm
0	LEL = 0%

3038 2/13/01

CLIENT USACE LOCATION Benicia PROJECT NAME Benicia USACE JOB NUMBER 00701 EXCAVATION CONTRACTOR Nielson EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ BACKHOE HAND SHOVEL SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ SPLIT SPOON GRAB NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ PID FID <u>LE</u> RAD NONE	TRENCH NUMBER LOG1TR005 SHEET 1 OF 1 DRILLING START TIME 1240 FINISH TIME 1310 DATE 2/14/01 DATE 2/14/01	LOCATION OF TRENCH 
SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE DIRT <u>DRY</u> WET	FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/wt), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION SAMPLE TYPE: INTERVAL: DESCRIPTION	

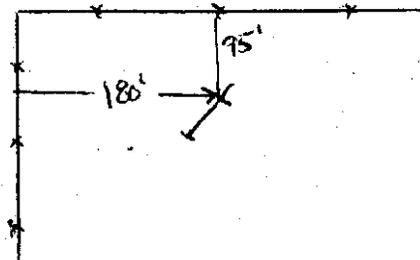


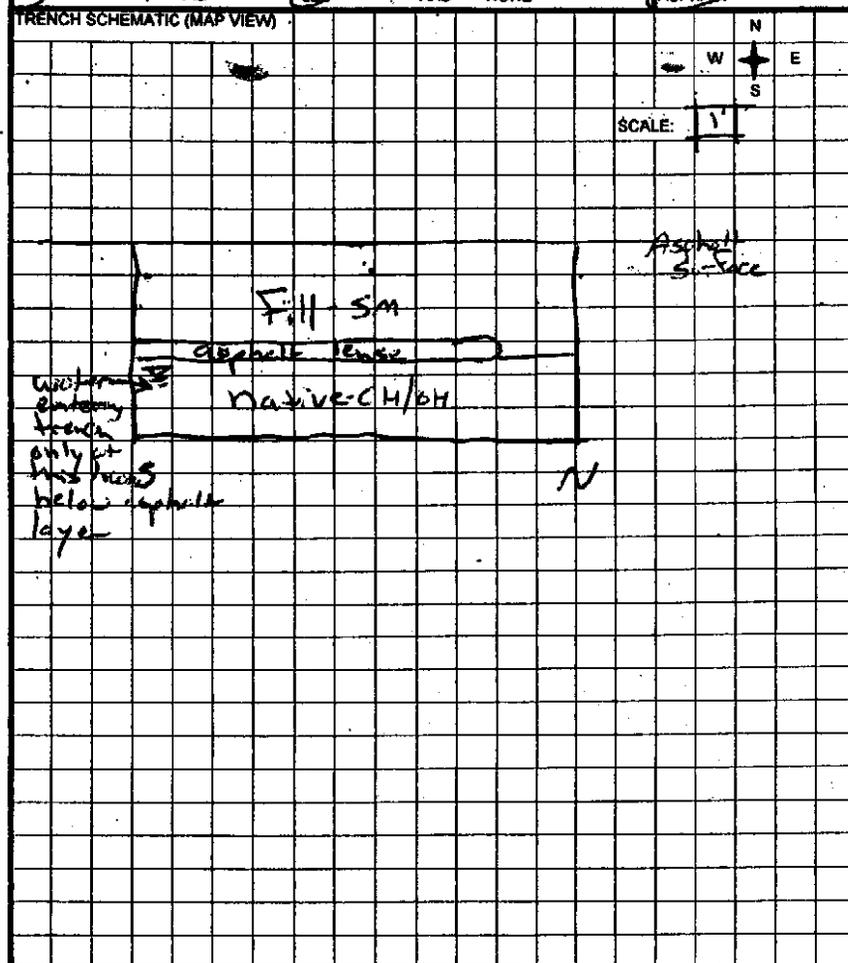
0-2' Asphalt Surface - 2"-6" Asphalt road base
~~2"-6" Asphalt road base - Loose unconsolidated fill material, sandy~~
 6"-7' silt w/ gravel (25, 35, 45) fine sand, well graded
 slightly plastic, low toughness, dry, no odor
 soft, high-neel perm. Well graded fill material varying sizes
 water entering trench at 3' bgs angularity (SM)
 No debris, no wax/OE

Excavation depth limited due to concrete obstructions
 in trench including concrete footing
 - Trench back filled with excavated soil

BZ=Open
 LEL=0%

130' x 183' 2/14/01

CLIENT USACE	TRENCH NUMBER LOCITR006	LOCATION OF TRENCH 
LOCATION Benicia	SHEET 1 OF 1	
PROJECT NAME Benicia USACE	DRILLING	
JOB NUMBER 05761	START TIME 1545	FINISH TIME 1630
ECAVATION CONTRACTOR Nielson	DATE 2/14/01	DATE 2/14/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL <input type="checkbox"/> OTHER _____	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE		
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g_m/g_s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 0-2" asphalt surface

2"-6" Asphalt road base

6"-3' Loose unconsolidated fill material of sandy silt w/ gravel (25, 35, 45) fine sand-silt, well graded, nonplastic, dry, no odor, weak cementation, higher med perm, distinct contact b/t fill and asphalt layer below. (SM)

5 3'-3.5' asphalt base material (3 plus sample collected only extends from S of trench to 2' from N end of trench (CH-BH)

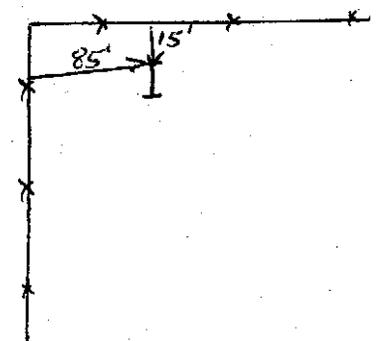
0 3.5'-6' Native - bay mud silty clay (10, 25, 65) (CH) silt/clay, low plasticity, moderately graded, clay to clump, decaying organic odor, weak cementation, med-low perm

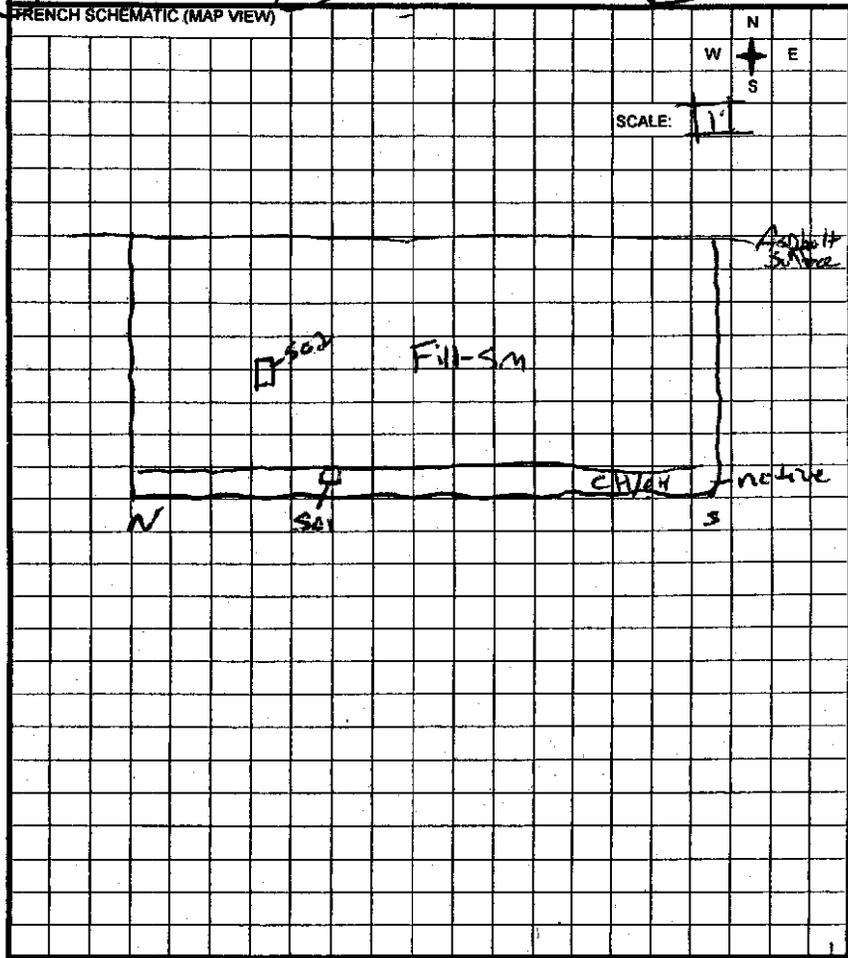
5 higher entering trench at ~4' only from S end (South end of excavation; no additional water entering trench from any location)

Trench backfilled with excavated soil

0 BZ: 0 ppm
LEL: 0%

30386 2/14/01

CLIENT USACE LOCATION Benicia PROJECT NAME Benicia USACE JOB NUMBER 00761 EXCAVATION CONTRACTOR Nielson EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ BACKHOE HAND SHOVEL SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ SPLIT SPOON GRAB NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PTP <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE	TRENCH NUMBER LOGITR007 SHEET 1 OF 1 DRILLING START TIME 1435 FINISH TIME 1530 DATE 02/14/01 DATE 2/14/01 SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE DIRT <input checked="" type="checkbox"/> WET	LOCATION OF TRENCH 
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FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

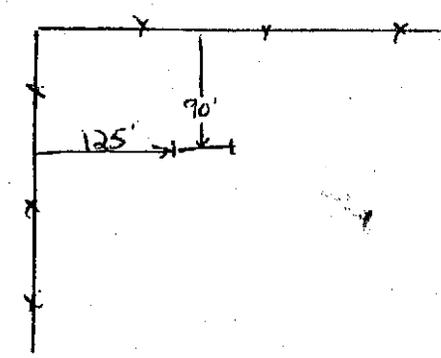
0-2' Asphalt surface
 2'-6" Asphalt road base
 6"-7" Sandy silt w/ gravel (25, 35, 45) well sorted
 slightly plastic, low dry strength, dry, no odor
 high-med perm
 loose unconsolidated fill material, no rebar, no ux-lax
 fill of varying sizes and angularity (SM)
 7-8' Native - bity mud, silty clay (10 25, 65) silt/clay
 low plasticity, moderately graded, damp-moist
 organic (decomposing) odor, weak cementation, med-low perm (CH/OH)

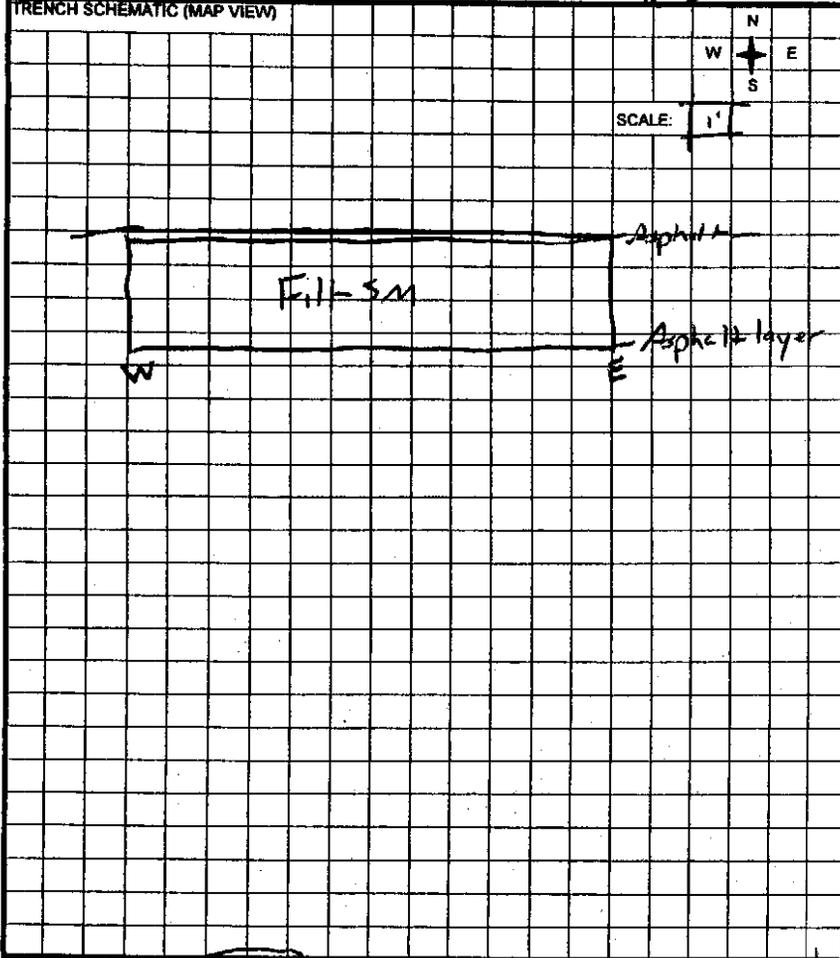
- Soil & Water Samples Collected
 - Soil Samples collected with drive sampler

pH: 8.9
 EC: 1130
 Temp: 63.8 °F

BZ = 0 ppm
 LEL = 0%

3038 2/14/01

CLIENT USACE		TRENCH NUMBER L001TROOS	LOCATION OF TRENCH 
LOCATION Benicia, CA		SHEET 1 OF 2	
PROJECT NAME Benicia USACE		DRILLING	
JOB NUMBER 0201		START TIME 08:50	FINISH TIME 09:30
ECAVATION CONTRACTOR Nielsen		DATE 2/14/01	DATE 2/14/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____	
<input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL <input type="checkbox"/> OTHER _____		<input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input type="checkbox"/> DRY <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____			
<input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE			
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____			
<input checked="" type="checkbox"/> PIP <input type="checkbox"/> FID <input checked="" type="checkbox"/> CED <input type="checkbox"/> RAD <input type="checkbox"/> NONE			



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g_s/w_t), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGY, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 0-2" Asphalt surface

2"-6" Asphalt road base

6"-3.5' Local unconsolidated fill material, sandy silt w/ gravel (2.5-3.5%) non plastic, low dry strength, low toughness, clay, no odor, high med perm. water entering trench at 3.5'

5 No refuse, no UXO/OS

Water sample collected

Asphalt layer at 3.5' by running length of trench

Fill of varying sizes and angularity (SM)

Native or sandstone bedrock not encountered in trench.

0 Excavation stopped at asphalt layer

pH: 6.42

Temp: 56.5°F

EC: 1040 uS/cm

5 Excavation continued at 1135. See sheet 2 of 2

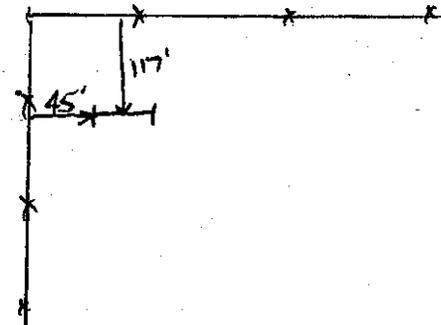
0 BZ = Open

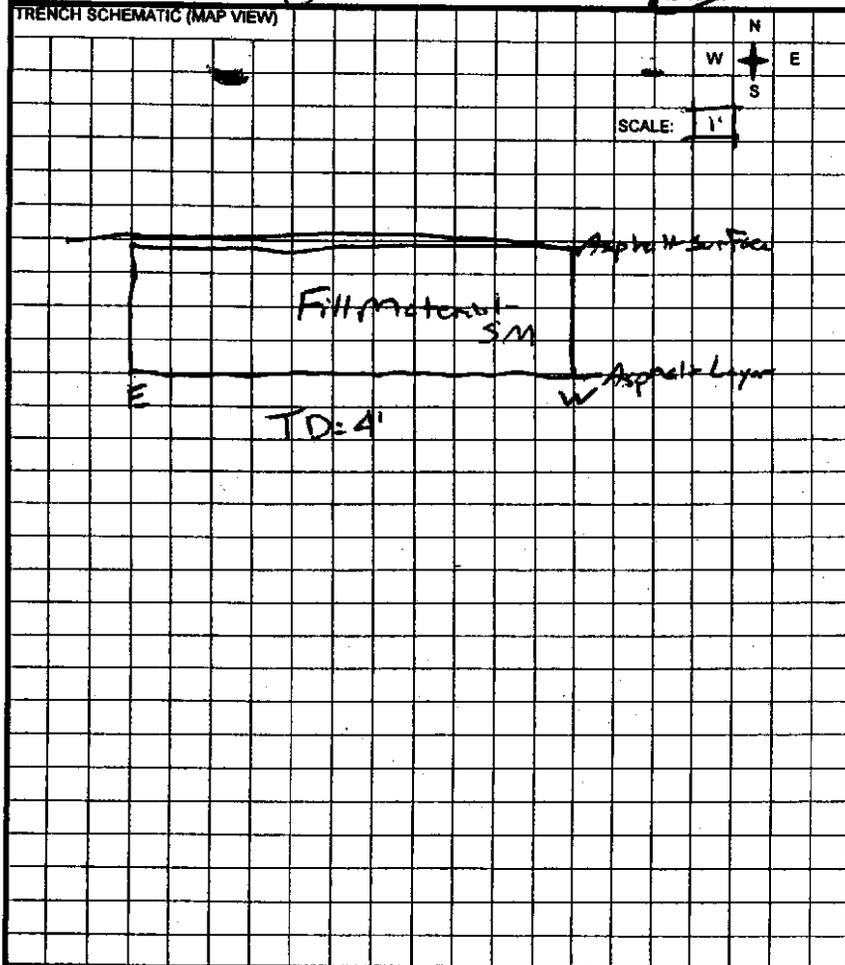
LEL = 0%

8038 2/14/01

CLIENT USACE		TRENCH NUMBER LOOITR008		LOCATION OF TRENCH	
LOCATION Benicia					
PROJECT NAME Benicia USACE					
JOB NUMBER 00761		SHEET 2 OF 2			
EXCAVATION CONTRACTOR Nielson		DRILLING			
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____		START TIME		FINISH TIME	
<input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL		1135		1200	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____		DATE		DATE	
<input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE		2/14/01		2/14/01	
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____			
<input checked="" type="checkbox"/> FID <input type="checkbox"/> FID <input checked="" type="checkbox"/> <input type="checkbox"/> RAD <input type="checkbox"/> NONE		<input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input type="checkbox"/> DRY <input type="checkbox"/> WET			
TRENCH SCHEMATIC (MAP VIEW)		FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION			
		COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/sr), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION			
		SAMPLE TYPE: INTERVAL: DESCRIPTION			
		0 3.5' - total area under consolidated fill material, silty silt w/ gravel (25, 35, 45), nonplastic, low clay content, low toughness, wet no odor, high-moist perm			
		6' Bay Mud - (native) silty clay (10, 25, 65) med/low plasticity moderately graded moist, decaying organic odor, med-low perm (CM/OH)			
		0 Sample collected from 6'3" bay			
		5			
		0 BZ: opp			

30 35 2/14/01

CLIENT USACE	TRENCH NUMBER L001TR010	LOCATION OF TRENCH 
LOCATION Benicia	SHEET 1 OF 1	
PROJECT NAME Benicia USACE		
JOB NUMBER 00701	DRILLING	
EXCAVATION CONTRACTOR Nielsen	START TIME 0935	FINISH TIME 0955
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL	SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PD <input type="checkbox"/> FID <input checked="" type="checkbox"/> LRL <input type="checkbox"/> RAD <input type="checkbox"/> NONE		



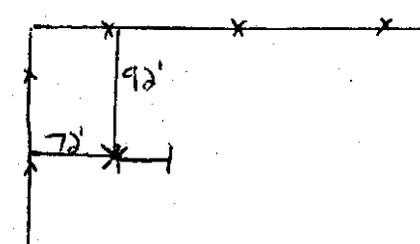
FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

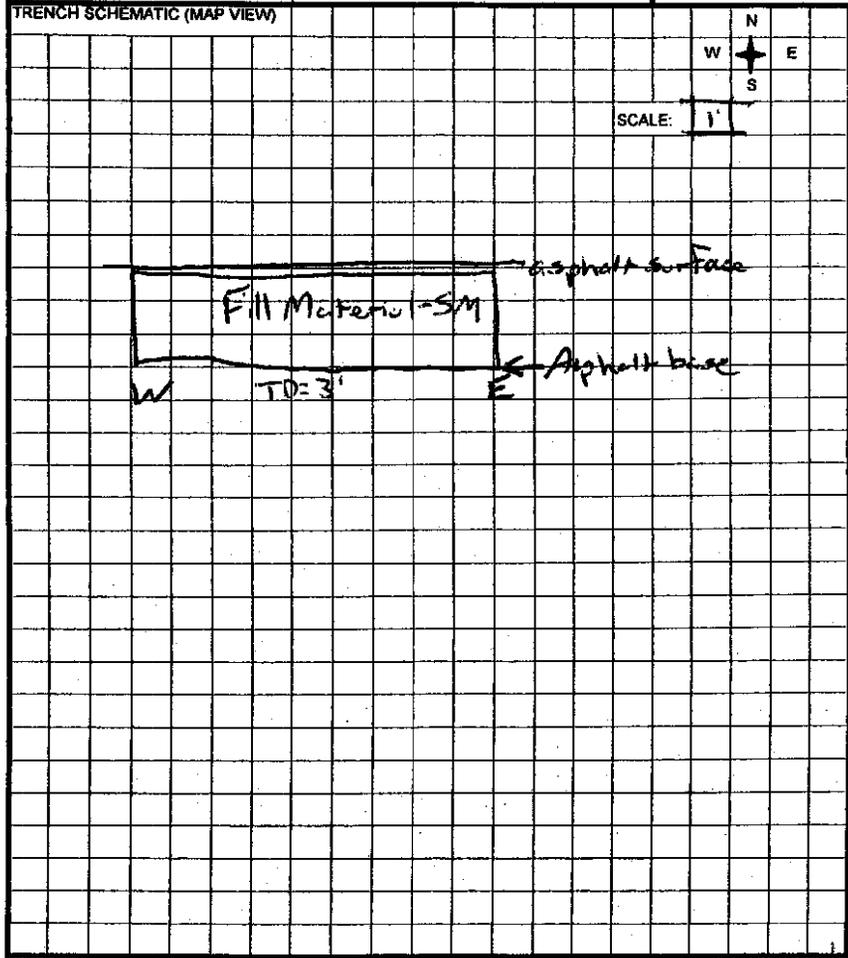
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0	0-2" Asphalt surface
	2-6" Asphalt road base
	6"-4' Loose unconsolidated fill material Silty sand w/ gravel (25, 35, 45)
	non-plastic, low clay strength, low toughness, dry, no odor, high-med perme, no debris, no UG/OE, water entering trench at ~ 3' bgs
5	Asphalt layer at 4' bgs
	Fill of varying sizes and angularity (SM)
	Trench backfilled with excavated soil
0	
5	
0	Size Open
	LEL 20'

RL 2/14/01

CLIENT USACE LOCATION Benicia LFI PROJECT NAME Benicia USACE JOB NUMBER 00701 EXCAVATION CONTRACTOR Nielsen EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> RID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	TRENCH NUMBER LOGITR015 SHEET 1 OF 1 DRILLING START TIME 1420 FINISH TIME 1450 DATE 2/13/01 DATE 2/13/01	LOCATION OF TRENCH 
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FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/sf), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 0-2' Asphalt surface
 2-6" Road base material
 6"-3' loose uncompacted fill material w/ asphalt debris of various sizes. Sandy silt & gravel (25, 35, 40), nonplastic, low dry strength, low toughness, moist, no odor, high need perm water filling in trench at 3' bgs
 3' Asphalt layer short runs length of trench also present in TPool

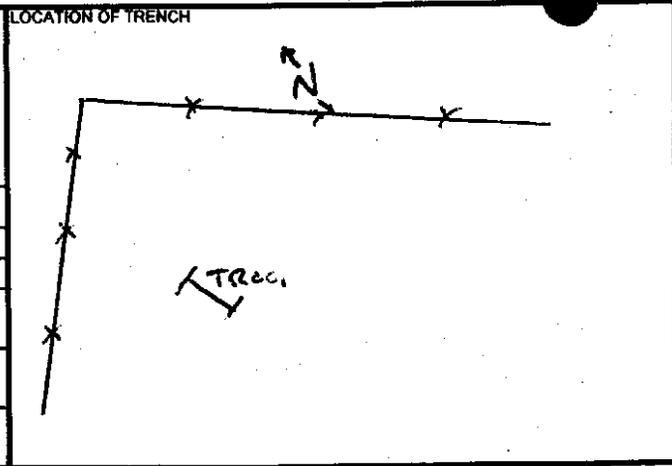
0 - Fill of varying sizes of angularity (SM)
 - Trench backfilled with excavated soil

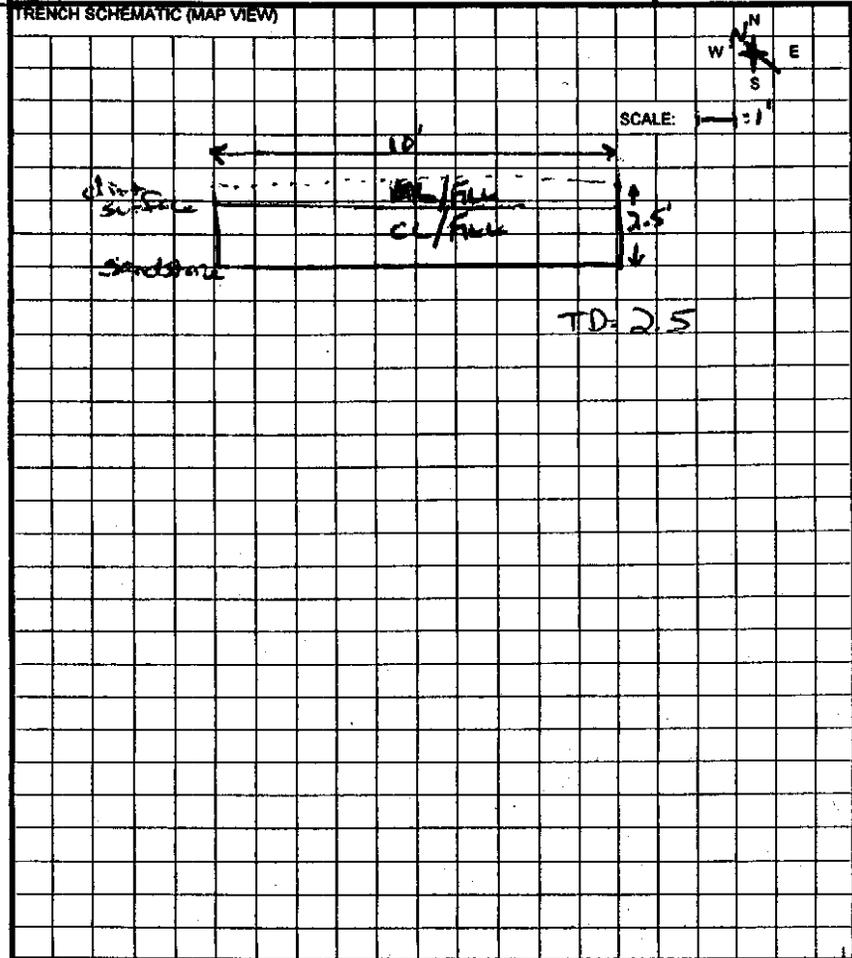
0 BZ = 0 ppm
 LEL = 0%

B03 2/13/01

Fillsite 2

CLIENT: **USACE**
 LOCATION: **Benicia LF2**
 PROJECT NAME: **Benicia USACE**
 JOB NUMBER: **00701**
 EXCAVATION CONTRACTOR: **Nielson Construction**
 EXCAVATOR TYPE (CIRCLE ONE) OTHER: OTHER: _____
 BACKHOE HAND: _____ SHOVEL: _____
 SOIL SAMPLING METHOD (CIRCLE ONE) OTHER: _____
 SPLIT SPOON GRAB: _____ NONE
 MONITORING INSTRUMENT (CIRCLE ONE) OTHER: _____
 PID FID: _____ LEL RAD: _____ NONE: _____

TRENCH NUMBER: **L002TR001**
 LOCATION OF TRENCH: 
 SHEET **1** OF **1**
 DRILLING
 START TIME: **0920** FINISH TIME: **0930**
 DATE: **02/05/01** DATE: **02/05/01**
 SURFACE CONDITIONS (CIRCLE ONE) OTHER: _____
 ASPHALT CONCRETE DIRT DRY WET: _____



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION **(C,S,S,S) silt, clay**

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-6" Fill - silt/sandy silt w/ gravel (ML) - SY 3/2
 (15, 25, 25, 15) nonplastic, low clay strength, low toughness, dry, no odor, no definite structure (fill material), soft, high perm, well sorted

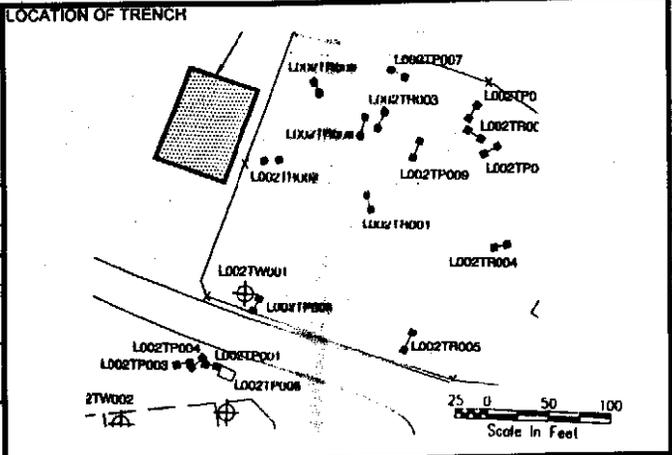
6"-2' Fill - clayey silt w/ gravel (CL) - 10YR 3/3
 (25, 35, 15, 25) slightly plastic, low clay strength, low toughness, dry, no odor, no definite structure. Soft, high perm. Asphalt debris also present approx 0.5"-3" diameter, upper contact sharp

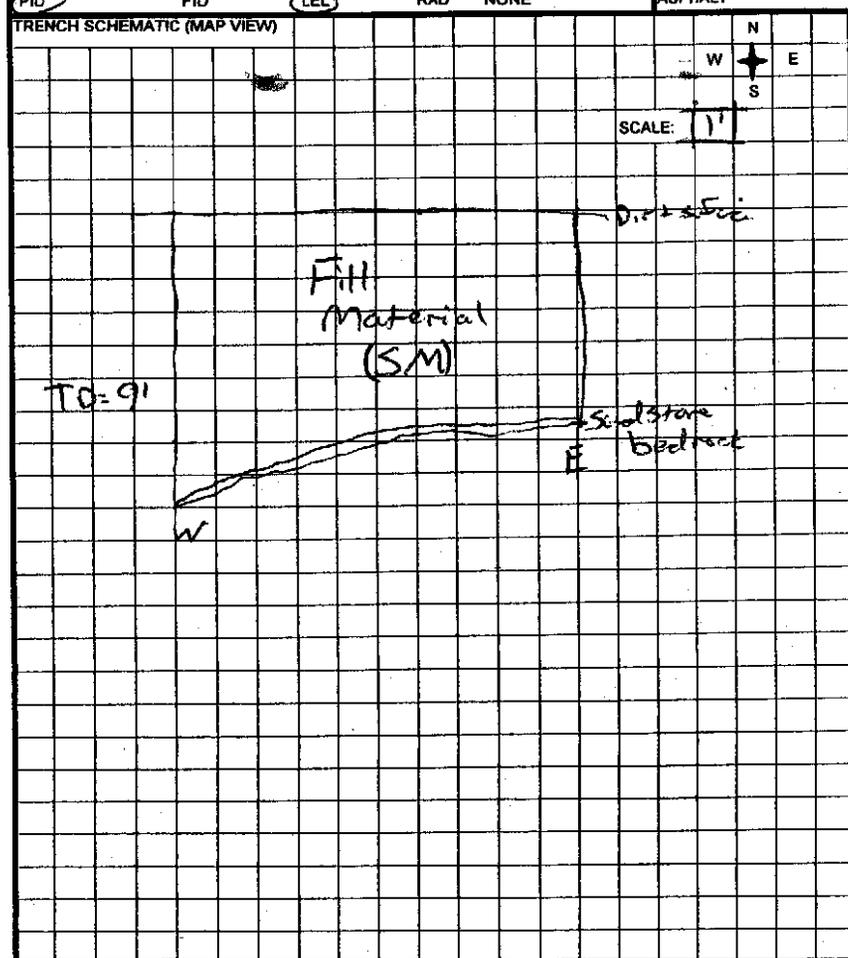
2' Sandstone layer 10YR 6/1 nonplastic, med dry strength, med toughness, dry, no odor, low perm. No distinguishable weathered sandstone layer. Sharp contact b/t fill and sandstone.

No water in trench, no refuse, no UXO/DE
 TD: 2.5

0
 SZ: open
 LEL: 0.1

BOB 2/5/01

CLIENT USACE	TRENCH NUMBER LO02TR002	LOCATION OF TRENCH 
LOCATION Benicia CA	SHEET 1 OF 1	DRILLING
PROJECT NAME Benicia USACE		
JOB NUMBER 00701	START TIME 1150	FINISH TIME 1216
EXCAVATION CONTRACTOR Nielson	DATE 2/5/61	DATE 2/5/61
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL <input type="checkbox"/> OTHER _____	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRTY <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE	MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s/m), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-6.5/9 Loose unconsolidated fill material, sandy silt w/ gravel (SM) 10YR 4/4 (15, 35, 25, 25) nonplastic, low clay strength, low toughness, dry, no odor, high perm, well sorted

6.5/9 Weathered sandstone bedrock 10YR 7/3 Material encountered at 9' 5" at W end of slope exposed to ~6.5' by 5' at E end (native) Small amount of water (<1%), no refuse, no rocks

0 Trench backfilled with excavated soil.

0 BZ = 0ppm
LEL = 0%

BZ = 0 2/5/61

CLIENT: **USACE**

LOCATION: **Benicia, CA**

PROJECT NAME: **Benicia USACE**

JOB NUMBER: **00701**

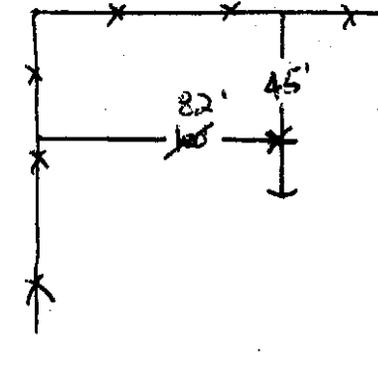
EXCAVATION CONTRACTOR: **Nielson Construction**

EXCAVATOR TYPE (CIRCLE ONE) OTHER: BACKHOE HAND SHOVEL OTHER

SOIL SAMPLING METHOD (CIRCLE ONE) OTHER: SPLIT SPOON GRAB NONE OTHER

MONITORING INSTRUMENT (CIRCLE ONE) OTHER: PID FID LE RAD NONE OTHER

TRENCH NUMBER: **L 002 TR003**

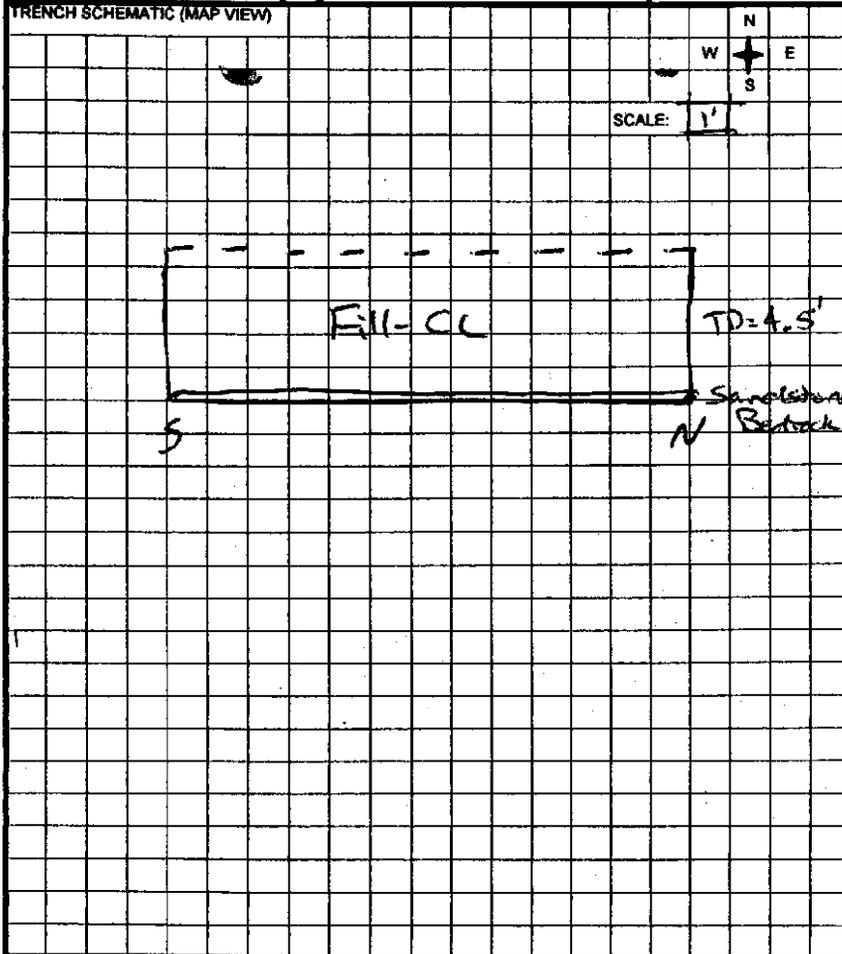
LOCATION OF TRENCH: 

SHEET **1** OF **1**

DRILLING

START TIME	FINISH TIME
DATE 2/5/01	DATE 2/5/01

SURFACE CONDITIONS (CIRCLE ONE) OTHER: ASPHALT CONCRETE DIRT DRY WET



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/w), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL DESCRIPTION

0-4' Fill material Clayey silt w/ gravel (30, 10, 60) 7.5YR2.5/1 slightly plastic, low dry strength, low toughness, clay, (CL) no odor, high med perm, well sorted ~~unconsolidated~~ fill materials. Sharp contact b/t fill and sandstone layer - 1' of water in trench, ~~no water~~ no water/OE

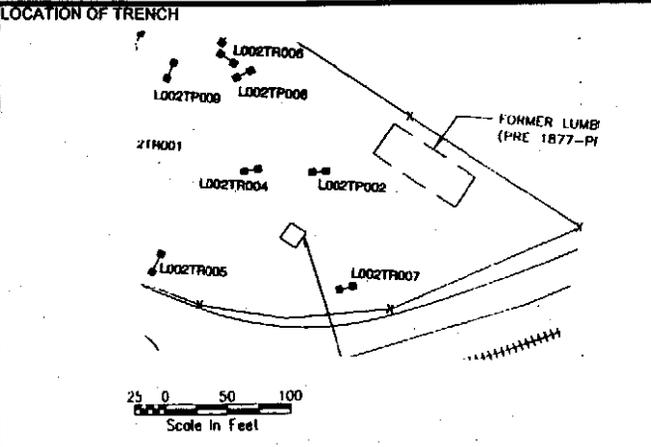
5' 1' x 2' metal cast pipe + 3.5 x 2 x 1 concrete block w/ 8" metal rod cemented in concrete.

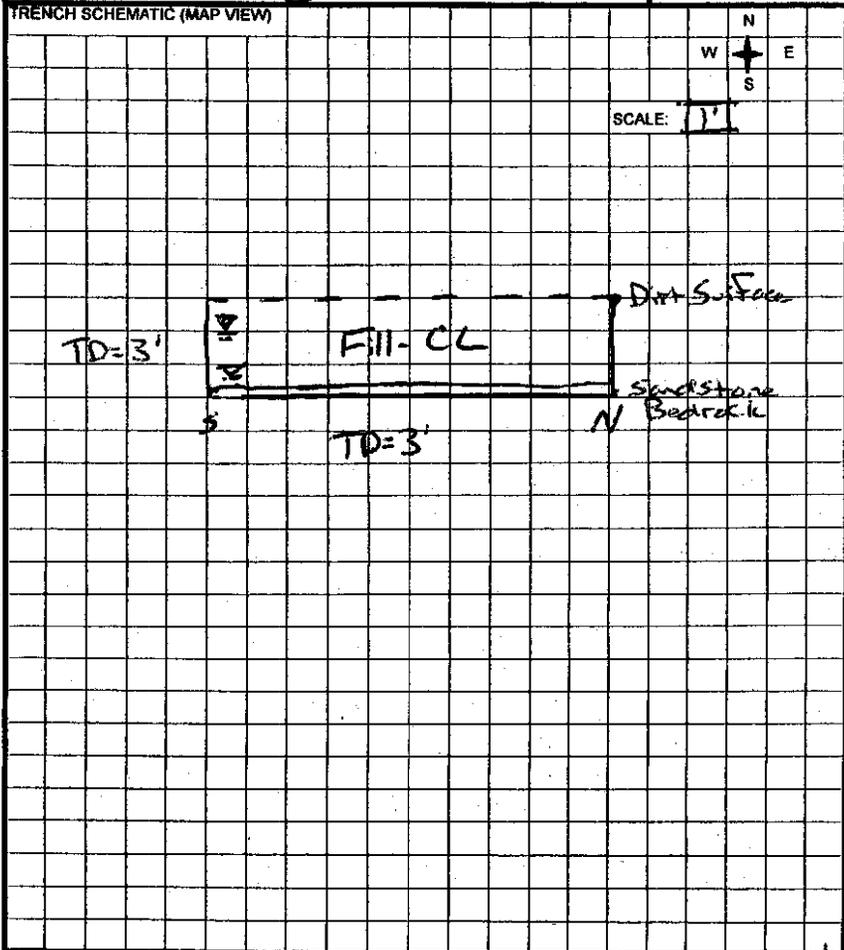
4' Sandstone bedrock becoming increasingly competent as excavation deepened

0' Trench backfilled with excavated soil

0' BZ = gravel LEL 50'

BR 2/5/01

CLIENT USACE		TRENCH NUMBER L002TR004	LOCATION OF TRENCH 
LOCATION Benicia, CA		SHEET 1 OF 1	
PROJECT NAME Benicia USACE		DRILLING	
JOB NUMBER 00701		START TIME 145	FINISH TIME 1425
ECAVATION CONTRACTOR Nielsen Construction		DATE 02/05/01	DATE 02/05/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input type="checkbox"/> DRY <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE			
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE			



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION **(c, s, s)**

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION, SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-3' Unconsolidated fill material clayey silt & gravel (25, 35) 20, 201 SYR (6/3 low plasticity, low dry strength, low toughness, dry, no odor, med perm, well sorted (CL))

3' Sandstone bedrock 2.5YR 4/4 nonplastic, med dry strength, med toughness, dry, no odor, low perm. Approx 6" of weathered sandstone. Increasingly compact as excavation 2' of water in excavation, no refuse material, no water

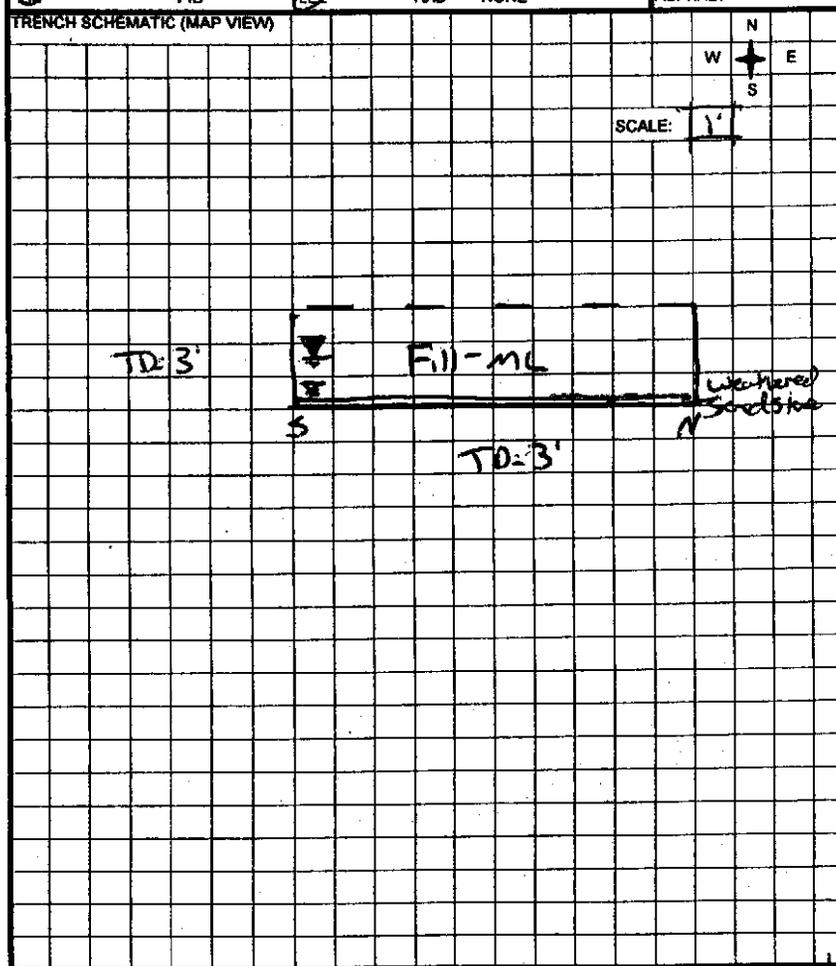
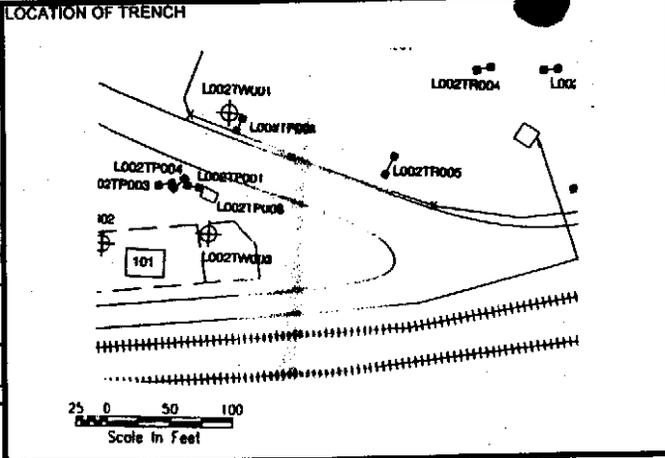
Water Parameters
pH 4.60
Temp 54.9°F
EC 3590 us/cm

BZ2 0ppm
LEL = 0%

Bul 35 2/5/01

CLIENT: USACE
 LOCATION: Benicia CA
 PROJECT NAME: Benicia USACE
 JOB NUMBER: 00701
 EXCAVATION CONTRACTOR: Neilson Construction
 EXCAVATOR TYPE (CIRCLE ONE): OTHER _____
 BACKHOE HAND SHOVEL
 SOIL SAMPLING METHOD (CIRCLE ONE): OTHER _____
 SPLIT SPOON GRAB NONE
 MONITORING INSTRUMENT (CIRCLE ONE): OTHER _____
 FID LEL RAD NONE

TRENCH NUMBER: L002TR005
 SHEET 1 OF 11
 DRILLING
 START TIME: 1125
 FINISH TIME: 1140
 DATE: 02/05/01
 DATE: 02/05/01
 SURFACE CONDITIONS (CIRCLE ONE): ASPHALT CONCRETE
 OTHER: WET



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION (C, S, S, S)

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION, SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

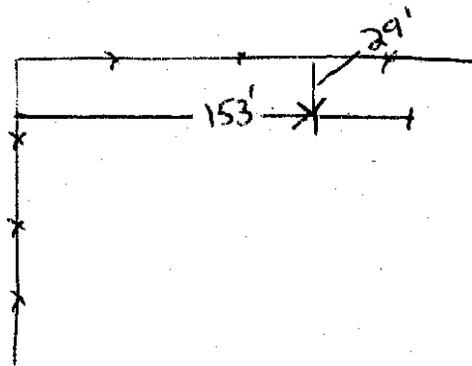
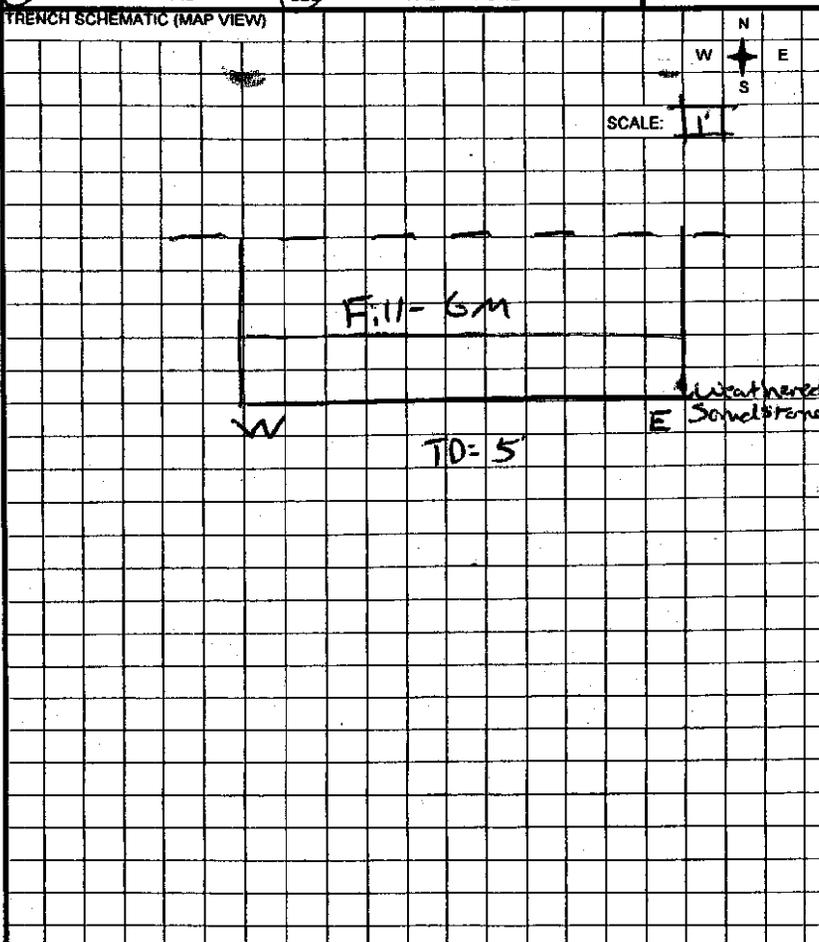
SAMPLE TYPE: INTERVAL: DESCRIPTION

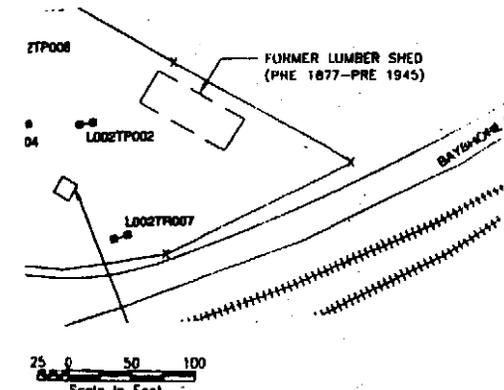
0-3' Unconsolidated fill material; silty sand w/ gravel (MU) (10, 40, 35, 15) 7.5YR 5/4 nonplastic, low clay strength, low toughness, dry, no odor, high perm, well sorted

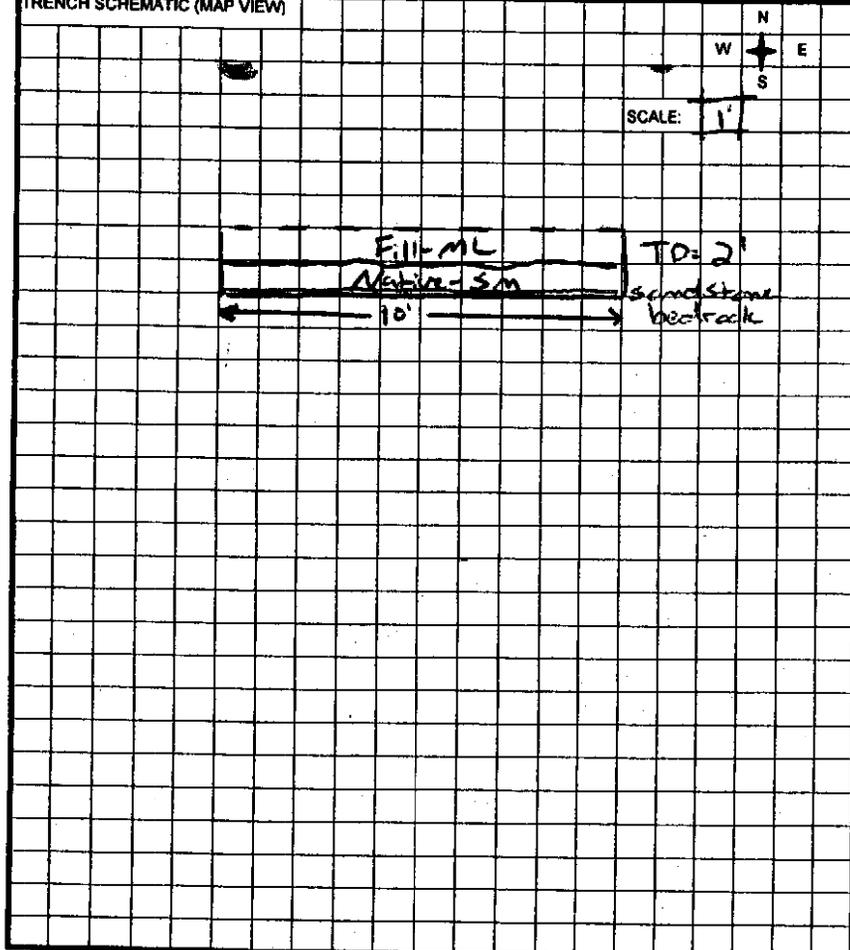
3' Weathered sandstone bedrock GLEY 2 3/5 PB, nonplastic, low clay strength, low toughness, dry, no odor, low perm. some water present but source most likely is recent rain water 1.5' of water in trench, no refuse, no OX/OF ~6" of weathered sandstone with sandstone becoming increasingly competent as excavation increased

- Trench backfilled completely with gravel. Excavated soil will be drummed

BZ = oppm
 LEL = 0.1
 BZ = 25/01

CLIENT USACE		TRENCH NUMBER LOO2TR006		LOCATION OF TRENCH 	
LOCATION Benicia CA		SHEET 1 OF 1			
PROJECT NAME Benicia USACE		DRILLING			
JOB NUMBER 00701		START TIME 10:50		FINISH TIME 11:15	
EXCAVATION CONTRACTOR Nielson Construction		DATE 02/05/01		DATE 02/05/01	
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL		MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="checkbox"/> ASPHALT <input checked="" type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	
TRENCH SCHEMATIC (MAP VIEW) 		FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION (C, S, S, S)			
		COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (G _{max}), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION			
		SAMPLE TYPE: INTERVAL: DESCRIPTION			
		0 - 3' Fill material sandy silt & gravel (GM) S ₁ R 4/4 non plastic, low clay strength, low toughness, clay well sorted/unconsolidated, high perm. (10, 40, 25, 25)			
		5 - 3'-5' Weathered sandstone bedrock layer 26LE13/16BT 5YR 3/2 non plastic, med-high clay strength, high toughness, clay, low perm. Some water present but source is most likely recent rains. 1" of water in excavation, pieces of metal (pipes) at ~2' bgs. No UxO/OE As excavation deepens, sandstone become increasingly competent			
		5 Water pH 3.08 temp 56.8°F EC 4190 us/cm			
		0 BZ= open LEL=0% BL 3m 2/5/01			

CLIENT USACE LOCATION Benicia, CA PROJECT NAME USACE Benicia JOB NUMBER 00701 ECAVATION CONTRACTOR Neilson Construction EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE HAND SHOVEL SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON GRAB NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID FID <input checked="" type="checkbox"/> LEL RAD NONE	TRENCH NUMBER L002TR007 SHEET 1 OF 1 DRILLING START TIME 10:25 FINISH TIME 10:35 DATE 02/05/01 DATE 02/05/01	LOCATION OF TRENCH  <p style="font-size: small;">ZTPO08 D4 L002TR002 L002TR007 FORMER LUMBER SHED (PHE 1877-PRE 1945) BAYSHORE F Scale in Feet: 0, 25, 50, 100</p>
SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY WET		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION **(C, S, Sg)**

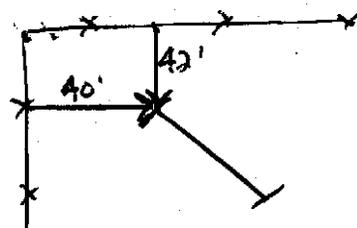
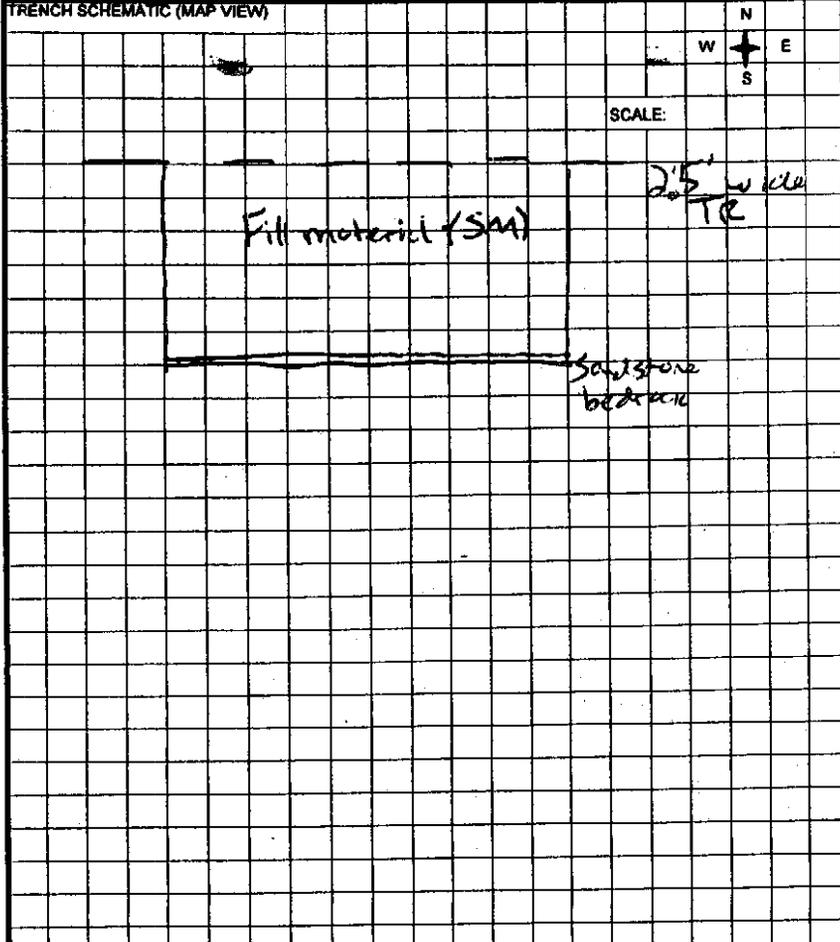
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (if any), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

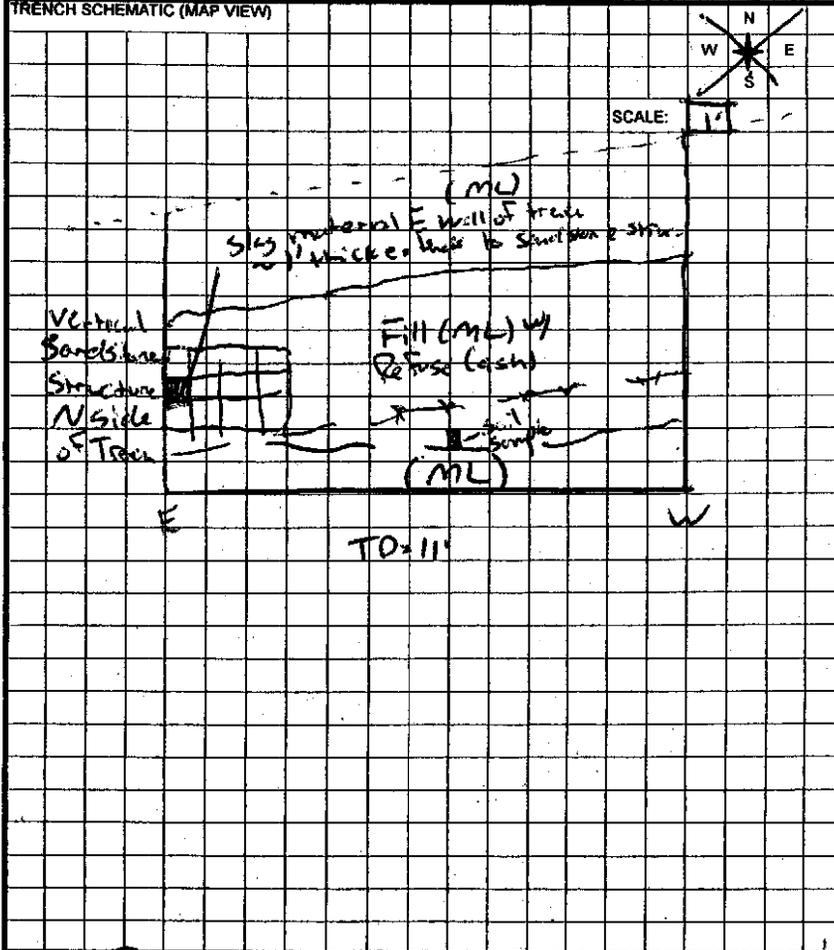
0	0-1' Fill Material silt/sand/silt/gravel (ML) 5YR 5/4 nonplastic, low clay strength, low toughness, clay, no odor, soft, high perm, well sorted - unconsolidated Fill material, (asphalt debris also present ~.5" - 2" diameter) Unconsolidated fill material - Asphalt debris mixed in fill material
5	1-2' Native soil sandy silt (SM) 7.5YR 6/3 nonplastic, low clay strength, low toughness, clay, no odor, soft, med perm.
0	2' Sandstone bedrock
5	
0	

BZ Open
LEL = 0%

320 300 2/5/01

<p>CLIENT USACE</p> <p>LOCATION Benicia LF2</p> <p>PROJECT NAME Benicia USACE</p> <p>JOB NUMBER 00701</p> <p>EXCAVATION CONTRACTOR Nelson</p> <p>EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL</p> <p>SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE</p> <p>MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input checked="" type="checkbox"/> LEV <input type="checkbox"/> RAD <input type="checkbox"/> NONE</p>	<p>TRENCH NUMBER L002TR009</p> <p>SHEET 1 OF 1</p> <p>DRILLING</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>START TIME</td> <td>FINISH TIME</td> </tr> <tr> <td>0946</td> <td>1010</td> </tr> <tr> <td>DATE</td> <td>DATE</td> </tr> <tr> <td>02/03/01</td> <td>02/03/01</td> </tr> </table> <p>SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="checkbox"/> ASPHALT <input checked="" type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET</p>	START TIME	FINISH TIME	0946	1010	DATE	DATE	02/03/01	02/03/01	<p>LOCATION OF TRENCH</p>  <p style="text-align: right; font-size: 2em;">2</p> <p>NTS</p>														
START TIME	FINISH TIME																							
0946	1010																							
DATE	DATE																							
02/03/01	02/03/01																							
<p>TRENCH SCHEMATIC (MAP VIEW)</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr><td></td><td></td><td>N</td><td></td></tr> <tr><td></td><td>W</td><td>+</td><td>E</td></tr> <tr><td></td><td></td><td>S</td><td></td></tr> </table> <p>SCALE: 2.5' = 1" TR</p>  </div>			N			W	+	E			S		<p>FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION</p> <p>COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/sf), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION</p> <p>SAMPLE TYPE: INTERVAL: DESCRIPTION</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%; text-align: center;">0</td> <td>0 to 4.5' loose unconsolidated fill material, silty sand (SM) (20, 45, 35) nonplastic, low clay strength, low toughness, dry, no odor, high-med perm, no water, no refuse or metal debris, no odors, no URA/OF</td> </tr> <tr> <td style="text-align: center;">5</td> <td>6' Layer of fractured bedrock material, dry but some water entering TB at 6' bgs, med toughness, low-med perm sharp contact b/t sandstone + fill</td> </tr> <tr> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td></td> </tr> <tr> <td style="text-align: center;">0</td> <td></td> </tr> </table> <p style="text-align: right;">BZ: open BR 36 2/18/01</p>		0	0 to 4.5' loose unconsolidated fill material, silty sand (SM) (20, 45, 35) nonplastic, low clay strength, low toughness, dry, no odor, high-med perm, no water, no refuse or metal debris, no odors, no URA/OF	5	6' Layer of fractured bedrock material, dry but some water entering TB at 6' bgs, med toughness, low-med perm sharp contact b/t sandstone + fill	0		5		0	
		N																						
	W	+	E																					
		S																						
0	0 to 4.5' loose unconsolidated fill material, silty sand (SM) (20, 45, 35) nonplastic, low clay strength, low toughness, dry, no odor, high-med perm, no water, no refuse or metal debris, no odors, no URA/OF																							
5	6' Layer of fractured bedrock material, dry but some water entering TB at 6' bgs, med toughness, low-med perm sharp contact b/t sandstone + fill																							
0																								
5																								
0																								

CLIENT USACE		TRENCH NUMBER L002TP001		LOCATION OF TRENCH 	
LOCATION Benicia, CA		SHEET 1 OF 1			
PROJECT NAME Benicia USACE		DRILLING			
JOB NUMBER 00701		START TIME 1315		FINISH TIME 1400	
ECAVATION CONTRACTOR Nielson Construction		DATE 02/05/01		DATE 02/05/01	
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____		ASPHALT _____		CONCRETE _____	
<input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL <input type="checkbox"/> OTHER _____		<input type="checkbox"/> ASPHALT <input checked="" type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> OTHER SS432 <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET			
SOIL SAMPLING METHOD (CIRCLE ONE) <input checked="" type="checkbox"/> OTHER Drive Sampler		MONITORING INSTRUMENT (CIRCLE ONE) <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LED <input type="checkbox"/> RAD <input type="checkbox"/> NONE		SURFACE CONDITIONS (CIRCLE ONE) <input type="checkbox"/> ASPHALT <input checked="" type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> OTHER SS432 <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-4' Loose unconsolidated fill material sandy silt w/ gravel (20, 30, 50), slightly plastic, low dry strength, low toughness, dry, no odor, weak cementation, med-high perm. Well graded material (ML) 7.5 YR 4/3

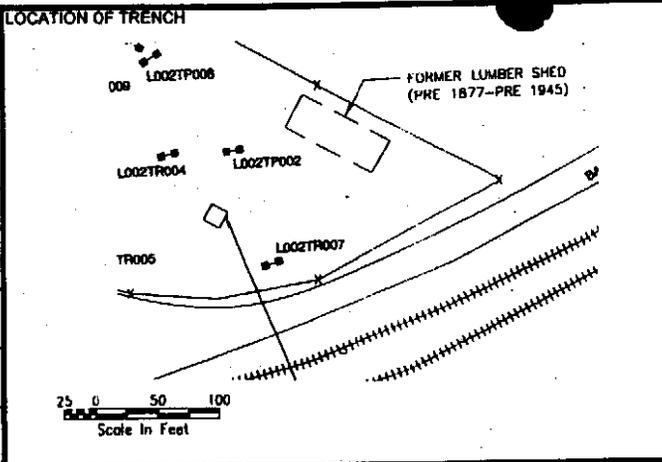
4-8.5' Predominately unconsolidated fill (see above) w/ refuse material - burnt ash. 6.5-8' pottery (broken fragments) mixed with burnt ash material

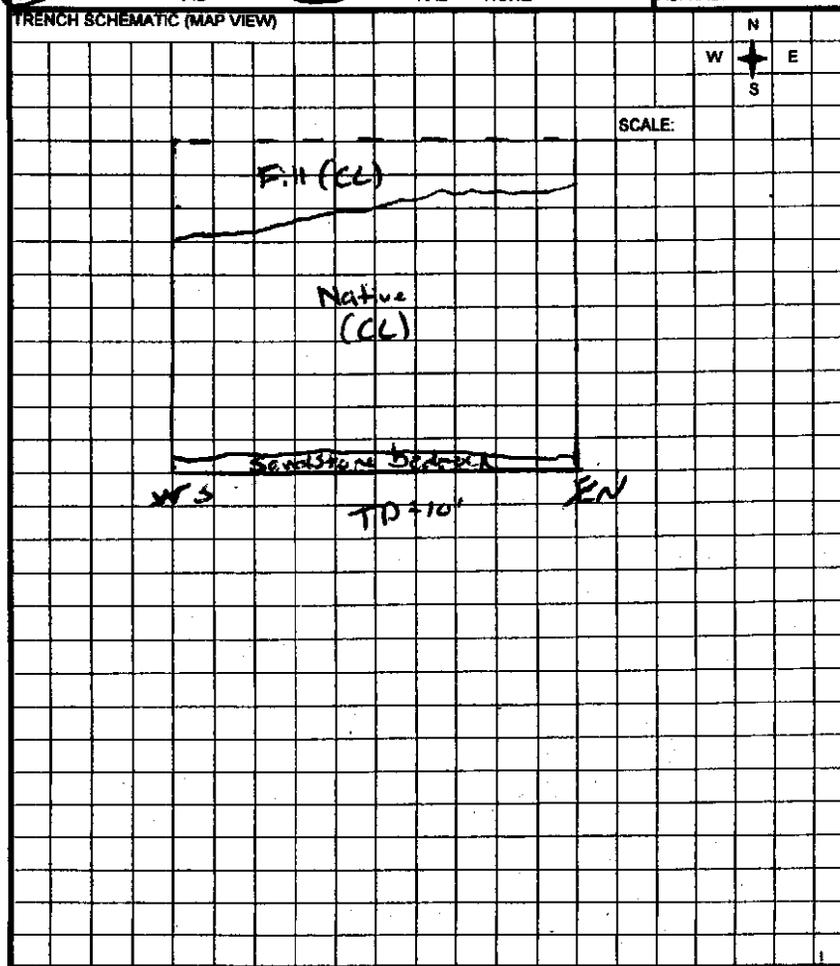
8.5-11' Native soil, sandy silt laterally continuous through trench, non plastic, medish strength, med toughness, dry, no odor, med perm. (5, 35, 60) (ML) No weather, no Uxs/OE, no odors

LEL=0%
BZ= upper of Stone wall N75W
Attitude of TR: N85E

1303 c 2/5/01

CLIENT: **USACE**
 LOCATION: **Benicia USACE**
 PROJECT NAME: **Same**
 JOB NUMBER: **00701**
 EXCAVATION CONTRACTOR: **Nielson Construction**
 EXCAVATOR TYPE (CIRCLE ONE): OTHER _____
 BACKHOE HAND _____ SHOVEL _____
 SOIL SAMPLING METHOD (CIRCLE ONE): OTHER _____
 SPLIT SPOON GRAB _____ NONE _____
 MONITORING INSTRUMENT (CIRCLE ONE): OTHER _____
 PID FID _____ LEI RAD _____ NONE _____

TRENCH NUMBER: **L002TR003**
 LOCATION OF TRENCH: 
 SHEET **1** OF **1**
 DRILLING:
 START TIME: **0945** FINISH TIME: **1015**
 DATE: **02/05/01** DATE: **02/05/01**
 SURFACE CONDITIONS (CIRCLE ONE): OTHER _____
 ASPHALT _____ CONCRETE _____ DIRT DRY WET _____



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION **(C, 35, 5)**

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (per %), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

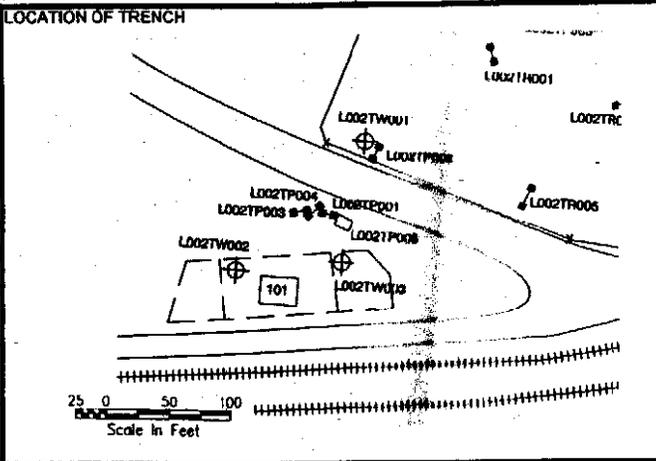
SAMPLE TYPE: INTERVAL: DESCRIPTION

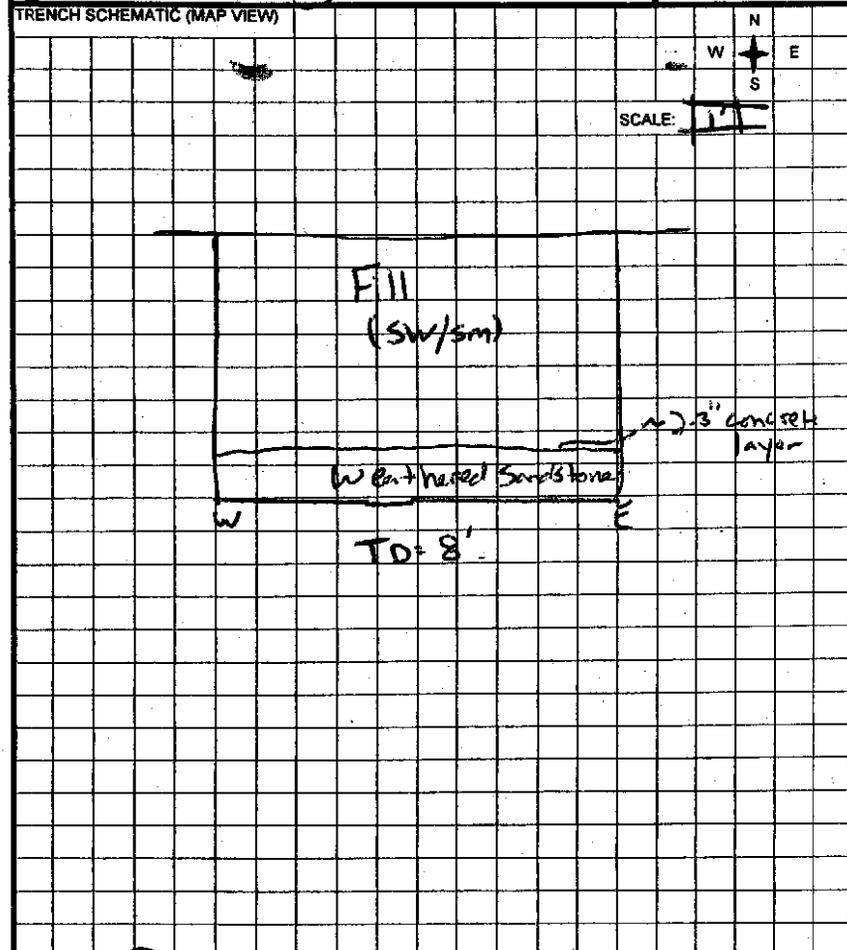
0-2' Fill silt+ sandy silt / clayey silt w/ gravel (CL) 5YR 5/4
 non plastic, low dry strength, low toughness, clay, no odor, soft, high perm, well sorted (20, 25, 20, 25), some asphalt debris present but not as much encountered as at TR001, uncompacted fill mat.

2-10' Native silty clay w/ gravel (CL) 10YR 4/3
 med plasticity, low dry strength, low toughness, clay, no odor, soft, med-low perm, well sorted, (35, 25, 10, 30) Native soil encountered at ~3' bgs at ~~end~~ end of TR and rises to 1.5' - 2' at EN end
 GW seep slowly into excavation at one location / one side (E) of TR ~ 8' bgs. Sloping upward to N

10' Sandstone / bedrock layer 10YR 7/6
 Water at 9.5' bgs / No loose material, no water ~1' of weathered sandstone and as excavation deepened, Sandstone became increasingly competent
 Water: pH 4.06
 Temp 56.5 F
 EC 4.78 uS/cm
 LEL = 0% BZ = 0 ppm

3836 2/5/01

CLIENT USACE	TRENCH NUMBER L002 TP 003	LOCATION OF TRENCH 
LOCATION Benicia, CA	SHEET 1 OF 1	
PROJECT NAME Benicia USACE	DRILLING	
JOB NUMBER 00701	START TIME 1500	FINISH TIME 1515
EXCAVATION CONTRACTOR	DATE 2/6/01	DATE 2/6/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> BACKHOE <input type="radio"/> HAND <input type="radio"/> SHOVEL	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> ASPHALT <input type="radio"/> CONCRETE <input checked="" type="radio"/> DIRTY <input type="radio"/> DRY <input type="radio"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> SPLIT SPOON <input type="radio"/> GRAB <input type="radio"/> NONE	MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> FID <input checked="" type="radio"/> LEL <input type="radio"/> RAD <input type="radio"/> NONE	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/sf), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 - 2.5' Loose unconsolidated fill material Silty sand (SW/Sm) (20, 50, 30) non plastic, dry, no odor, weak cementation, high-moist perm. Sharp contact b/t fill / sandstone bedrock. Contact not visible on north side of trench = not laterally continuous but contact rises in elevation to W following surface elevation slope

5 - 6.5 - 8' Weathered sandstone becoming increasingly competent w excavation increased

8' Sandstone bedrock
No odor / no U20, OE / no water / no refuse

0
TD Trench = 8.0' bgs

Bearing N75E

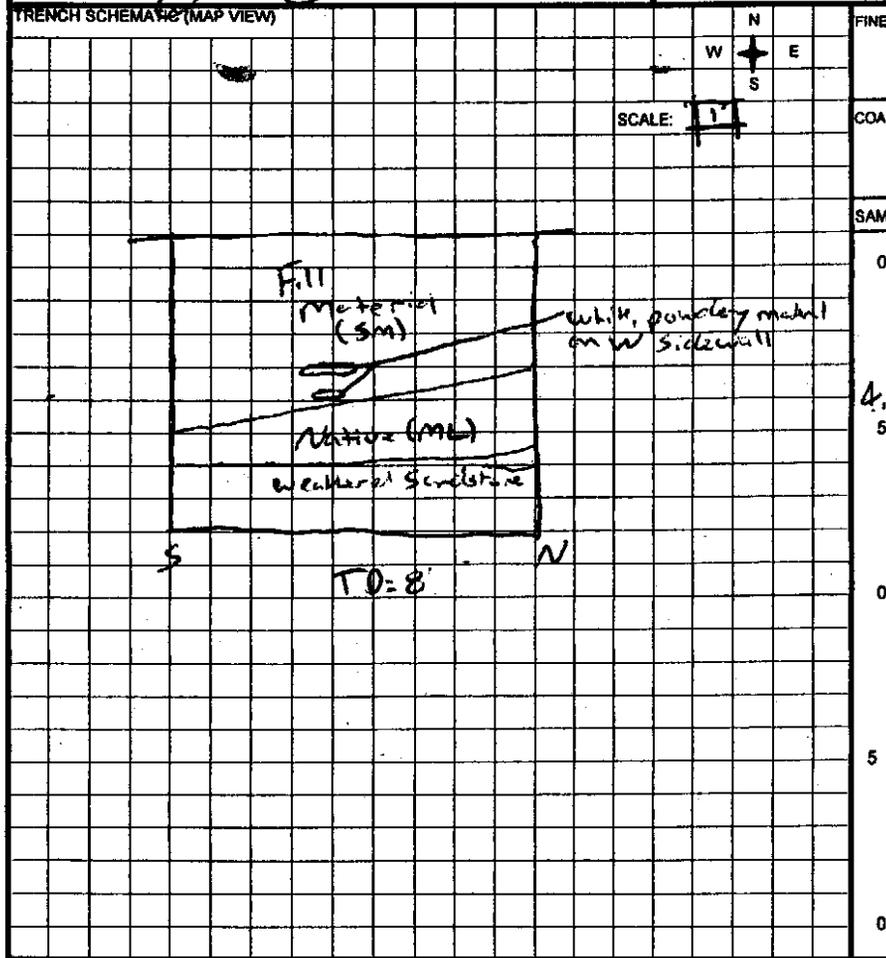
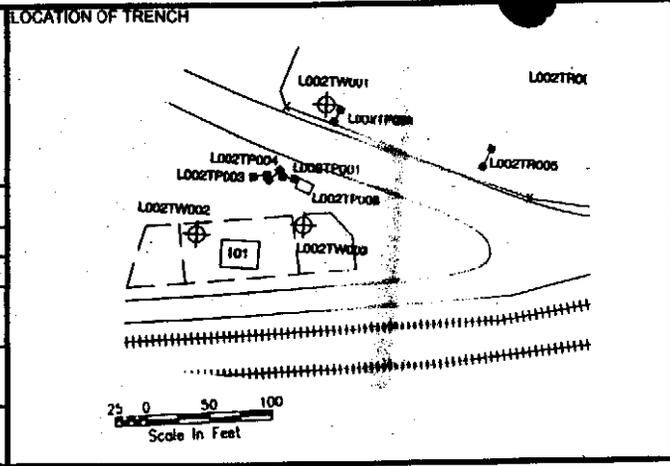
5
Trench backfilled with excavated soil

0
BL = open
LEL = 0%

BL 3 - 2/6/01

CLIENT: USACE
 LOCATION: Benicia CA
 PROJECT NAME: Benicia USACE
 JOB NUMBER: 00701
 EXCAVATION CONTRACTOR: Nielson
 EXCAVATOR TYPE (CIRCLE ONE) OTHER: OTHER: _____
 BACKHOE HAND SHOVEL:
 SOIL SAMPLING METHOD (CIRCLE ONE) OTHER: _____
 SPLIT SPOON GRAB NONE:
 MONITORING INSTRUMENT (CIRCLE ONE) OTHER: _____
 PID: RAD NONE:

TRENCH NUMBER: L002TP004
 SHEET OF: _____
 DRILLING: _____
 START TIME: 1515
 FINISH TIME: 1530
 DATE: 2/6/01
 DATE: 2/6/01
 SURFACE CONDITIONS (CIRCLE ONE) OTHER: _____
 ASPHALT CONCRETE DRY WET



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-5.5 Loose unconsolidated fill material, silty sand (20, 45, 35), non-plastic, dry, no odors, weak cementation, high-med perm. Fill of varying sizes (well graded) (SM)

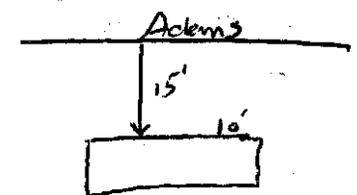
4.5-5.5-7 Native soil, sandy silt laterally continuous through trench, non-plastic, med dry strength, dry, no odor, soft, med-perm (15, 35, 56) (ML)

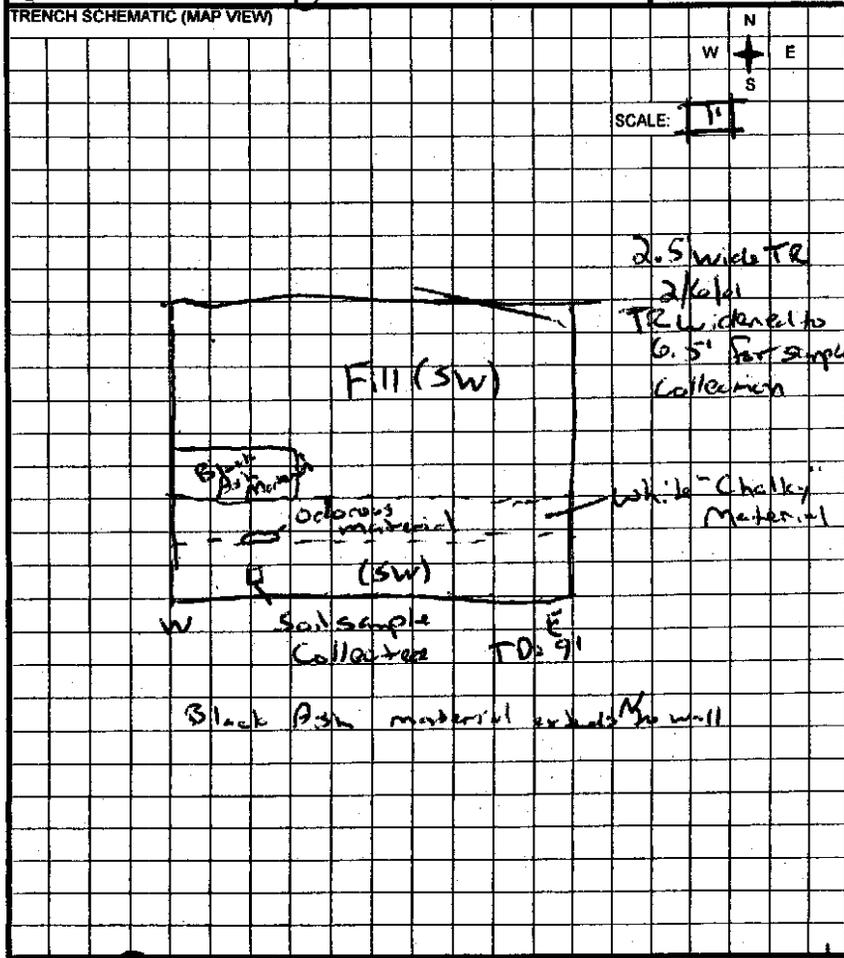
7.5-8 Weathered bedrock - sandstone becoming increasingly competent. No water, no Ump/OE, no odors, no refuse material

TAGLINE ASIDE/Bearing - N34E

BZ: oppm
 LEL01

Bl 35 2/6/01

CLIENT USACE		TRENCH NUMBER L002 TD 005	LOCATION OF TRENCH 
LOCATION Benicia, CA		SHEET 1 OF 2	
PROJECT NAME Benicia USACE		DRILLING	
JOB NUMBER 00701		START TIME 1450	FINISH TIME 1600
EXCAVATION CONTRACTOR Nielson		DATE 02/06/01	DATE 02/06/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRTY <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER Drive Sampler			
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> RAD NONE			



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/sf), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

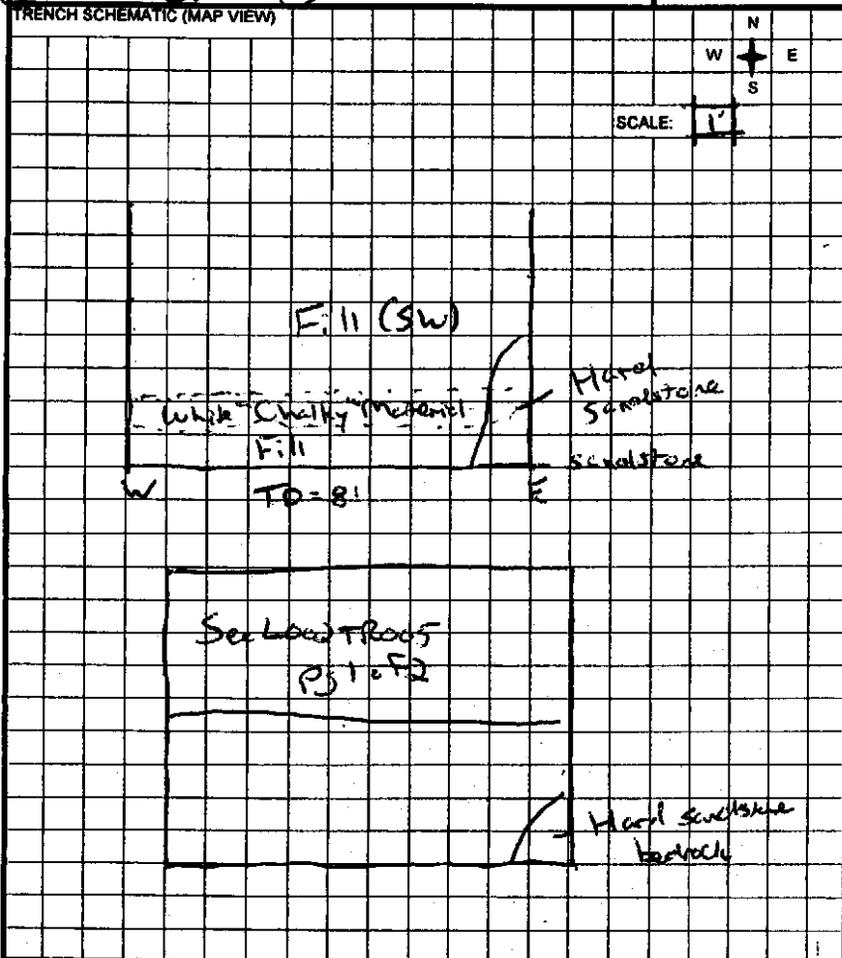
SAMPLE TYPE: INTERVAL: DESCRIPTION

0-8' Loose unconsolidated fill material, sandy silt w/ gravel (20, 45, 35), non plastic, dry, weak cementation, high-med perm, well graded (SW). A strong odor was encountered ~ 5.5' bgs. Front of USA reported that he over smelled like Cosmoval. The source of the odor was a moist fabric like material which was surrounded by deteriorated wood and metal pipes. Material may have been a wood. Several chunks of concrete/sandstone excavated from N sidewall of excavation ~ 4' bgs. At 7' bgs more odorous material encountered - soil on top. Visible in separate stockpile. Material described

8-9' Native soil, sandy silt laterally continuous through trench, non plastic, med-dry strength, med toughness, dry, no odor, med perm (SW)
- Trench expanded to S. See 2 of 2

LEW 01
BZ during excavation ~ 0 p.m.
A.H. was FTR is N78W
BRZ 2/6/01

CLIENT USACE		TRENCH NUMBER TPO05 LOW FLOOR	LOCATION OF TRENCH Adams
LOCATION Benicia CA		SHEET 2 OF 2	
PROJECT NAME Benicia USACE			
JOB NUMBER 002e		DRILLING	
EXCAVATION CONTRACTOR Nielson		START TIME 1400	FINISH TIME 1445
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ BACKHOE HAND SHOVEL		DATE 2/7/01	DATE 2/7/01
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ SPLIT SPOON GRAB NONE		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE DIRT DRY WET	
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ PIP LEL RAD NONE			



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

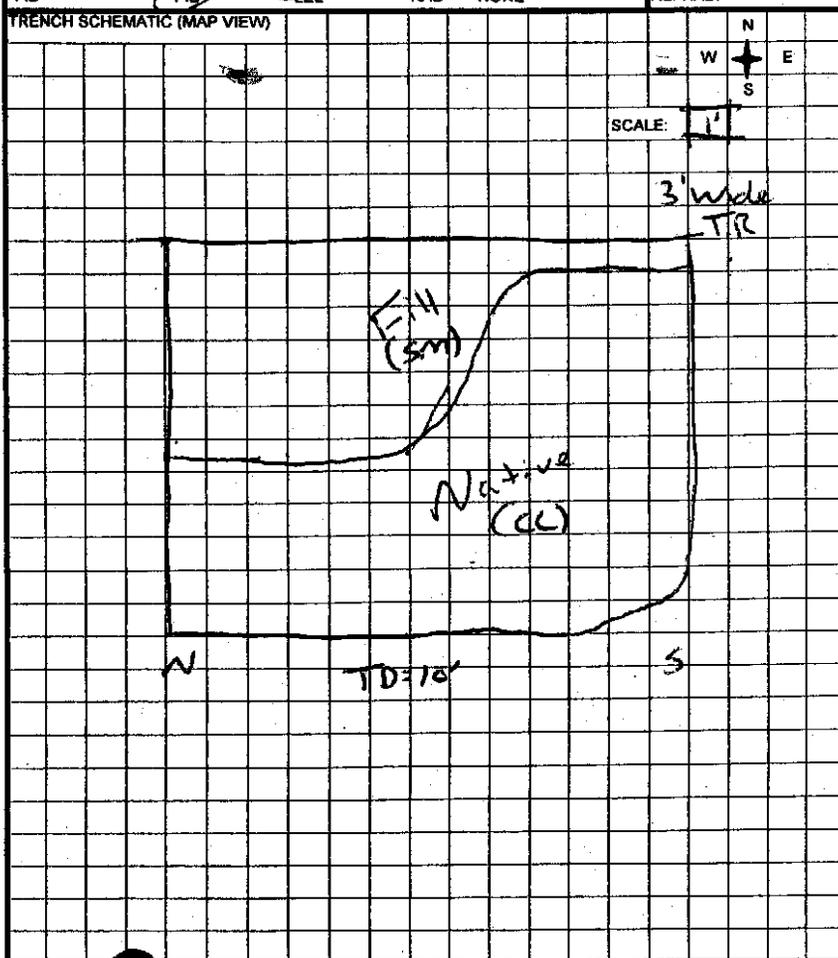
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-8 Louse unconsolidated Fill material: Sandy silt w/ gravel (20, 45, 35), non plastic, low dry strength, low toughness, dry, no odor, high-med perm., sharp contact b/w fill + sandstone material. no native soil before sandstone. Well graded (SW). Several large pieces of metal located at W end of excavation ~ 7' bgs. No additional odors material encountered. No water or URE/OE encountered. No additional black ash material. White Chalky material continues through trench. Excavation stopped due to sloping of equipment.

0 BZ during excavation = 0 ppm
LEL: 0% 523 2/7/01

CLIENT USACE	TRENCH NUMBER LOWTR006	LOCATION OF TRENCH	
LOCATION Benicia, CA	SHEET OF		
PROJECT NAME Benicia USACE	DRILLING		
JOB NUMBER 00701	START TIME 1505		FINISH TIME 1530
EXCAVATION CONTRACTOR Nielson	DATE 2/7/01		DATE 2/7/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOP <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET		
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE	MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input type="checkbox"/> PID <input checked="" type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

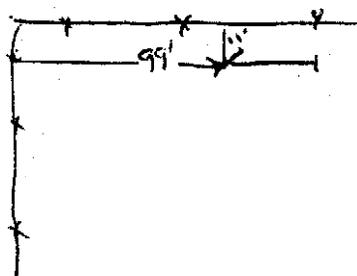
0-1/7 Loose unconsolidated fill material, sandy silt silty sand w/ gravel (25, 40, 35) non plastic, low dry strength, low toughness, dry, no odor, high-med perm sharp contact b/t fill-native soil, well sorted (SM)

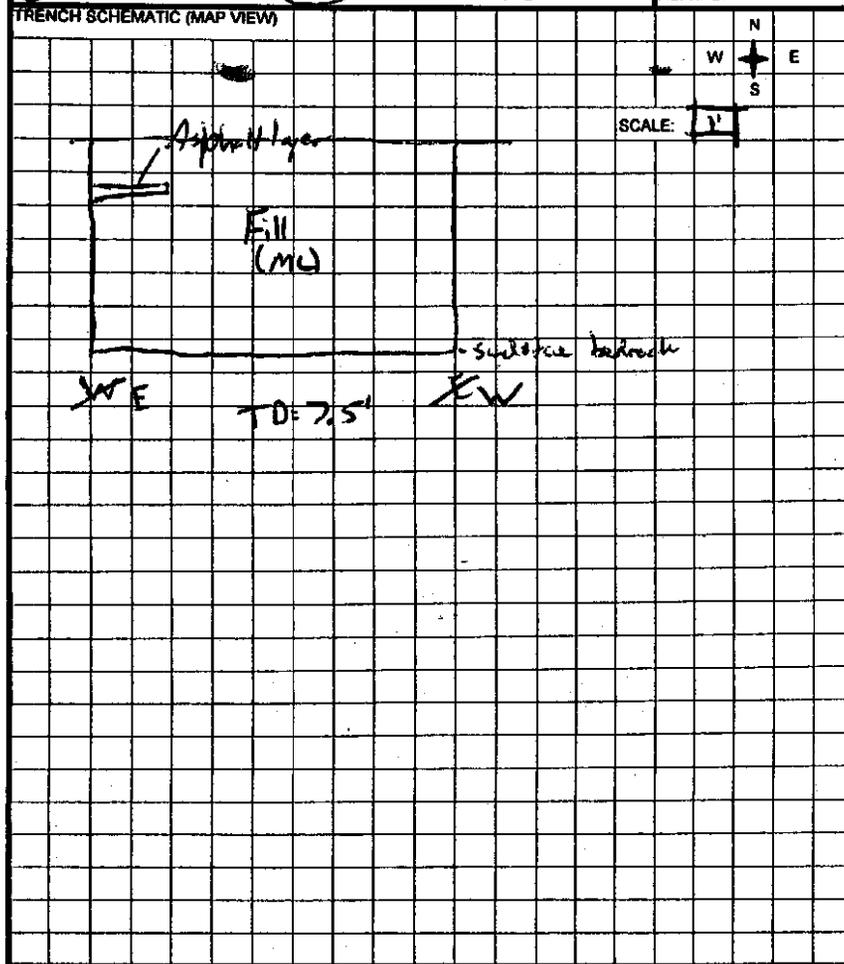
5 1/7-10 Native soil: clayey silt w/ gravel (25, 15, 60) (CL) slightly plastic, med dry strength, med toughness, soft dry, no odor, med perm sharp contact b/t native soil layers / fill material

0 Trench backfilled with excavated soil.

0 BZ = 0ppm LEL

BR 301 2/7/01

CLIENT USACE		TRENCH NUMBER L002TR007	LOCATION OF TRENCH 
LOCATION Benicia, CA		SHEET 1 OF 1	DRILLING
PROJECT NAME Benicia USACE			
JOB NUMBER 00701		START TIME 0925	FINISH TIME 0945
ECAVATION CONTRACTOR Nielson		DATE 2/8/01	DATE 2/8/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____	
<input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL		<input type="checkbox"/> ASPHALT <input checked="" type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input type="checkbox"/> GRASS <input type="checkbox"/> WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____		MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____	
<input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE		<input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

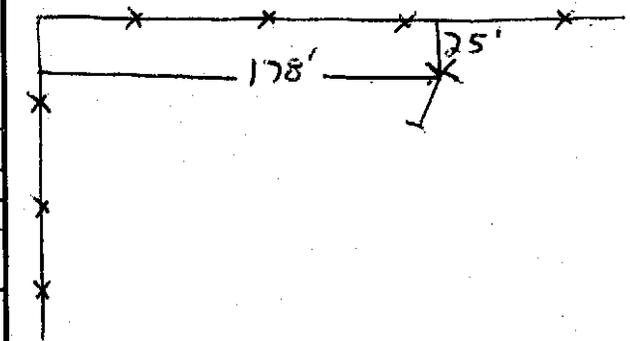
0 0.75' loose unconsolidated fill material of sandy silt w/ sand (20, 35, 45) slightly plastic, low clay strength, low toughness, dry, no odor - high - red perm, well graded (ML) large blocks of asphalt (quarter meter sized) w/ asphalt continuous at E end of TR at 1.5' bgs w/ 6" thick water entering TR at 6.5' bgs

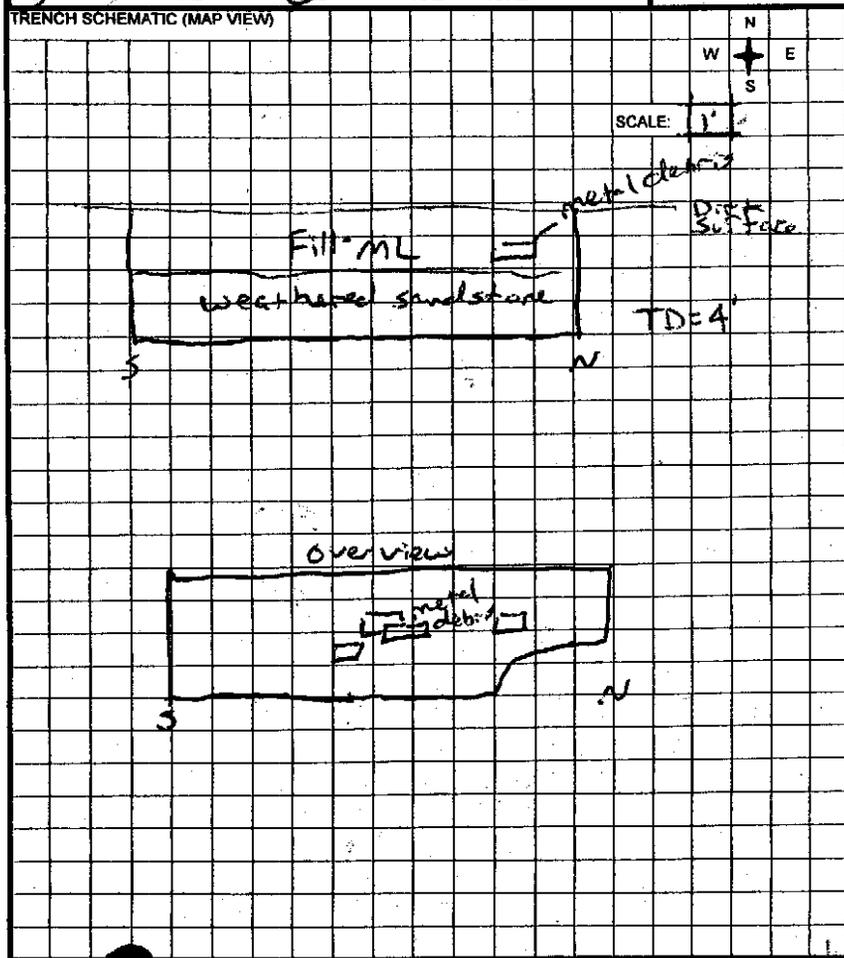
5 Excavated to bedrock surface. No DKO/E. No debris with exception of asphalt layer. Asphalt may have been an old road.

7.5 Weathered Sandstone very similar to sandstone at TR002

0 BZ = 0ppm
LEL = 0%

BZ 3/2/8/01

CLIENT USACE LOCATION Benicia LF2 PROJECT NAME Benicia USACE JOB NUMBER 00701 EXCAVATION CONTRACTOR Nelson EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE HAND SHOVEL SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON GRAB NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> FID FID <input checked="" type="checkbox"/> LA RAD NONE	TRENCH NUMBER L002TR008 SHEET 1 OF 1 DRILLING START TIME 1145 FINISH TIME 1220 DATE 2/8/01 DATE 2/8/01	LOCATION OF TRENCH 
SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY WET		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-2 loose unconsolidated fill metals, clay, silt & gravel (25, 15, 60) slightly plastic, low dry strength, low toughness, dry, no odor, high-med perm, very loose, well sorted (MC)

2-4 weathered sandstone bedrock very similar to TR006 bedrock, high-med dry strength

4 sandstone bedrock becoming increasingly competent as excavation increases, no odor, no water, no URO/OE

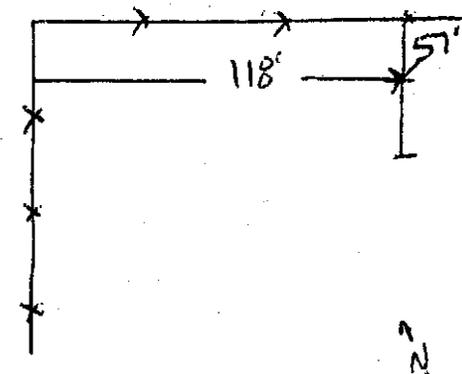
4 pieces of channel iron removed from ~1.5' bgs
1 additional ~1.5' piece of scrap metal ~1.5' bgs

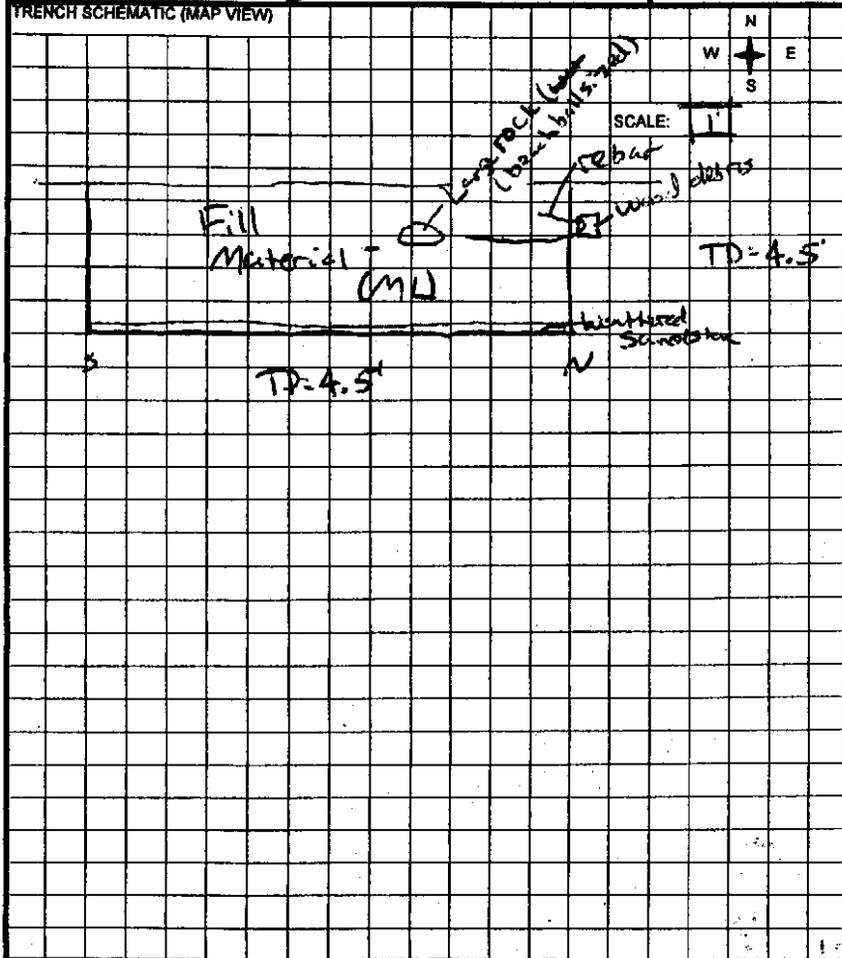
Trench widened 2' to E chasing additional metal debris

Trench backfilled with excavated soil

BZ = 0 ppm
EL = 0.1'

(323) 2/8/01

CLIENT USACE		TRENCH NUMBER LOG2TP009	LOCATION OF TRENCH 
LOCATION Benicia LFD		SHEET 1 OF 1	DRILLING
PROJECT NAME Benicia USACE			
JOB NUMBER 00701		START TIME 1030	FINISH TIME 1100
ECAVATION CONTRACTOR Nielson		DATE 2/8/01	DATE 2/8/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE HAND _____ SHOVEL _____		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY WET	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON GRAB _____ NONE _____		MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID FID <input checked="" type="checkbox"/> LFL RAD NONE	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (p₂₀₀), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

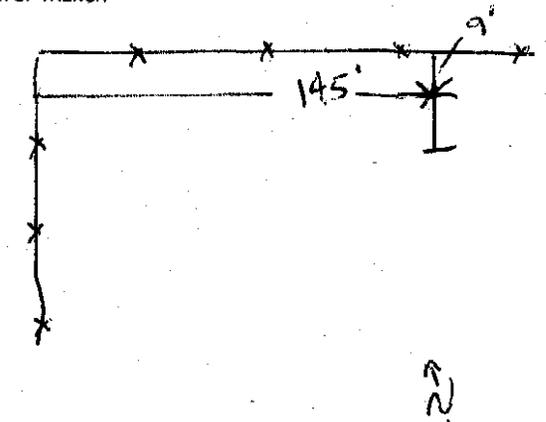
0 - 4.5 Loose ~~unconsolidated~~ fill material, clayey silt (ML) (35, 25, 40), slightly plastic, low dry strength, low toughness, dry, no odor, high-med perm, well sorted large pieces of wood ranging perpendicular to TR possible a railroad tie ~1.5' long. Large piece of rebar also removed in vicinity of F₁ wood at N end of TR at ~1.5' bgs. Water entering TR at 4.5' bgs, no odor, no u/c/OE

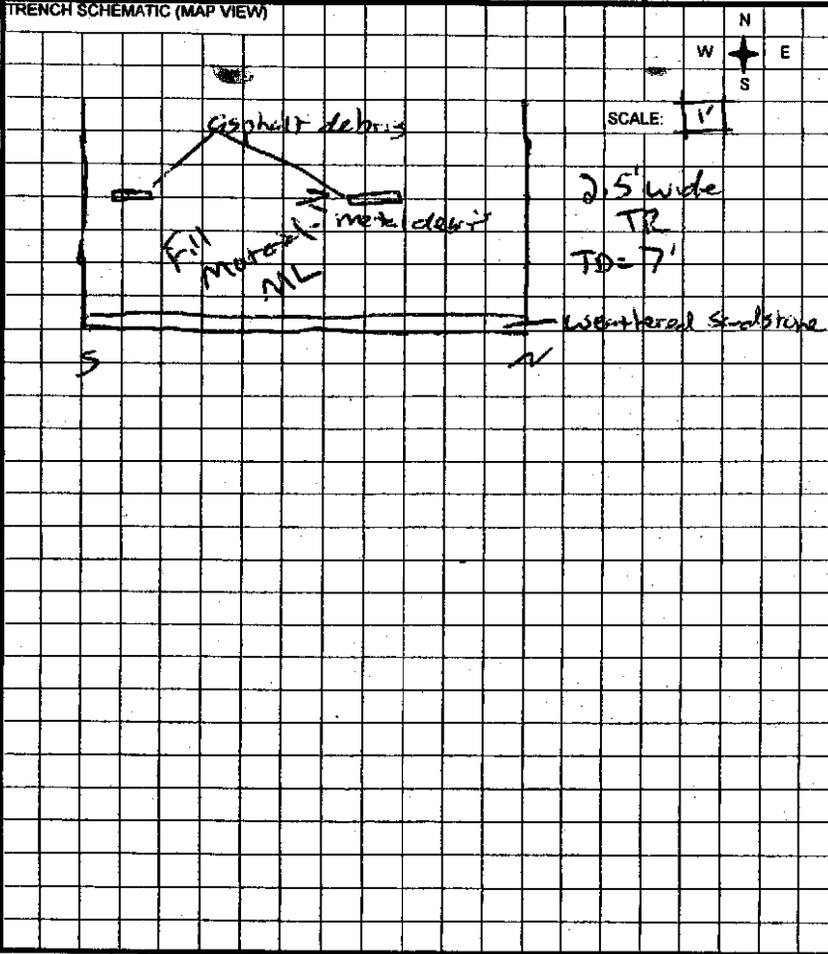
4.5 Weathered sandstone bedrock becoming increasingly competent as excavation increases. Water entering TR at 4.5' bgs

- Trench backfilled with excavated soil. Debris placed in LFL bins

BZ = 0ppm
LEL = 0%

BE 3/8 2/8/01

CLIENT USACE		TRENCH NUMBER LD02 TP010	LOCATION OF TRENCH 
LOCATION Benicia LF2		SHEET 1 OF 1	
PROJECT NAME Benicia USACE		DRILLING	
JOB NUMBER 00701		START TIME 11:05	FINISH TIME 11:40
EXCAVATION CONTRACTOR Nilsen		DATE 2/8/01	DATE 2/8/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL	OTHER _____		
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input type="checkbox"/> NONE	OTHER _____		
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PD <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY WET		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g_s/g_t), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL DESCRIPTION

0-6.5 Loose unconsolidated fill material, sandy silt (ML) (25, 30, 45), low dry strength, low toughness, clay, well sorted, no odor, high-mud perm., Asphalt debris at ~2.0' bgs (watermelon sized) metal debris at ~2.0' bgs at center of TR. No water, no ure/a/E metal debris rebar shaped ~1.5' in length

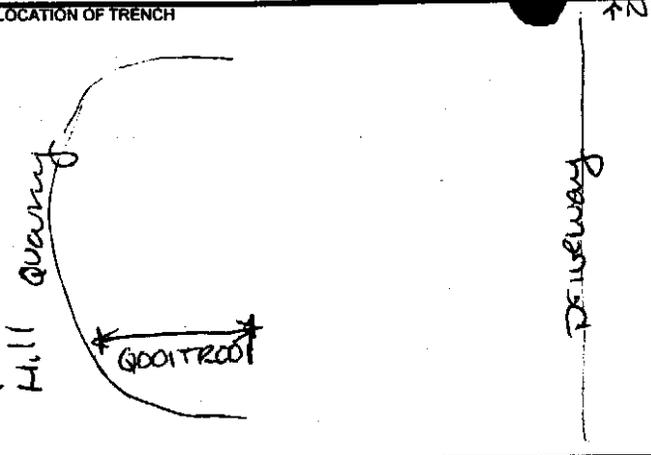
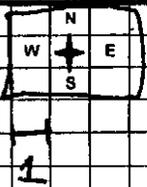
6.5-7' Weathered sandstone becoming increasingly competent w/ penetration increases. No water, no odors

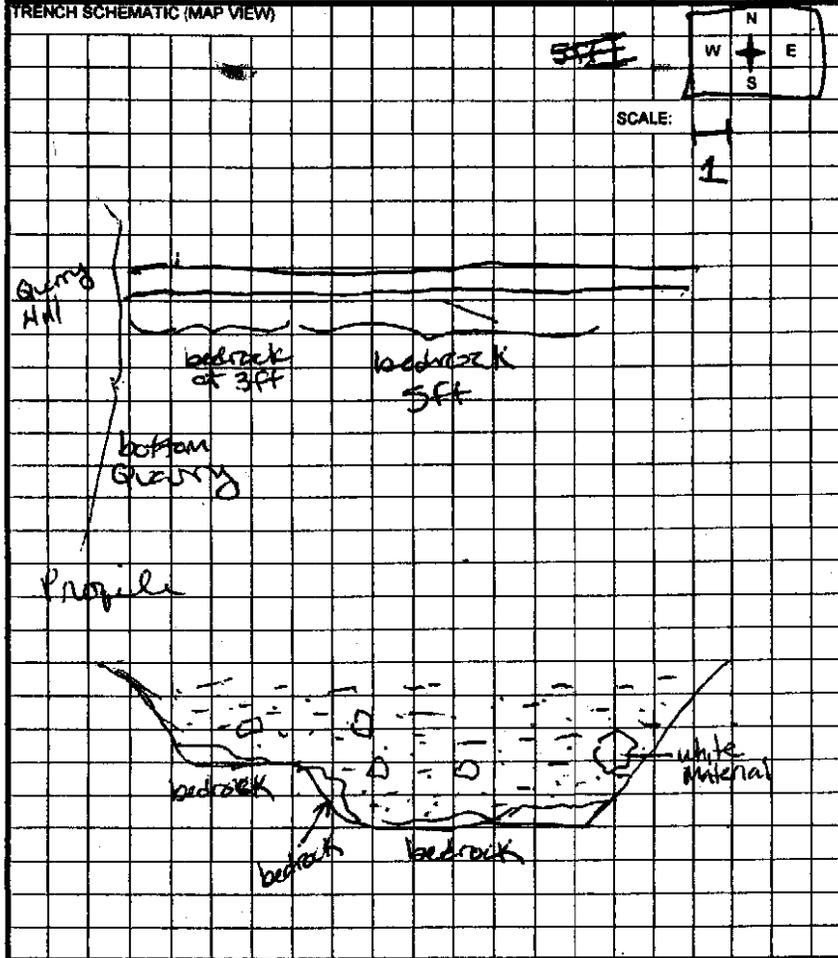
- Trench backfilled with excavated soil. Debris placed in LFI bins.

BZ = 0 ppm
LEL = 0%

SD 3 / 2/8/01

Quarry 1

CLIENT USACE		TRENCH NUMBER Q001TR001	LOCATION OF TRENCH 
LOCATION Quarry		SHEET 1 OF 1	DRILLING
PROJECT NAME		START TIME 1000	
JOB NUMBER 95701 00736.003		DATE 10-29-02 10-29-02	
EAVATION CONTRACTOR Amounts		SURFACE CONDITIONS (CIRCLE ONE) <input checked="" type="radio"/> DIRT <input type="radio"/> ASPHALT <input type="radio"/> CONCRETE <input type="radio"/> WET	
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> BACKHOE <input type="radio"/> HAND <input type="radio"/> SHOVEL		MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> PID <input type="radio"/> FID <input type="radio"/> LEL <input type="radio"/> RAD <input type="radio"/> NONE	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> SPLIT SPOON <input type="radio"/> GRAB <input type="radio"/> NONE		TRENCH SCHEMATIC (MAP VIEW) 	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

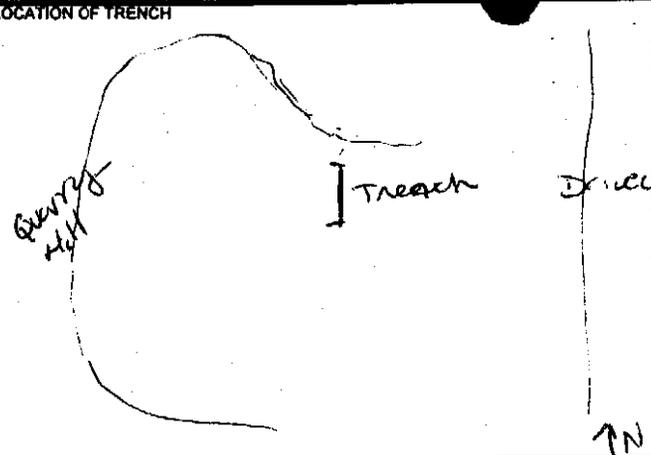
SAMPLE TYPE: INTERVAL: DESCRIPTION

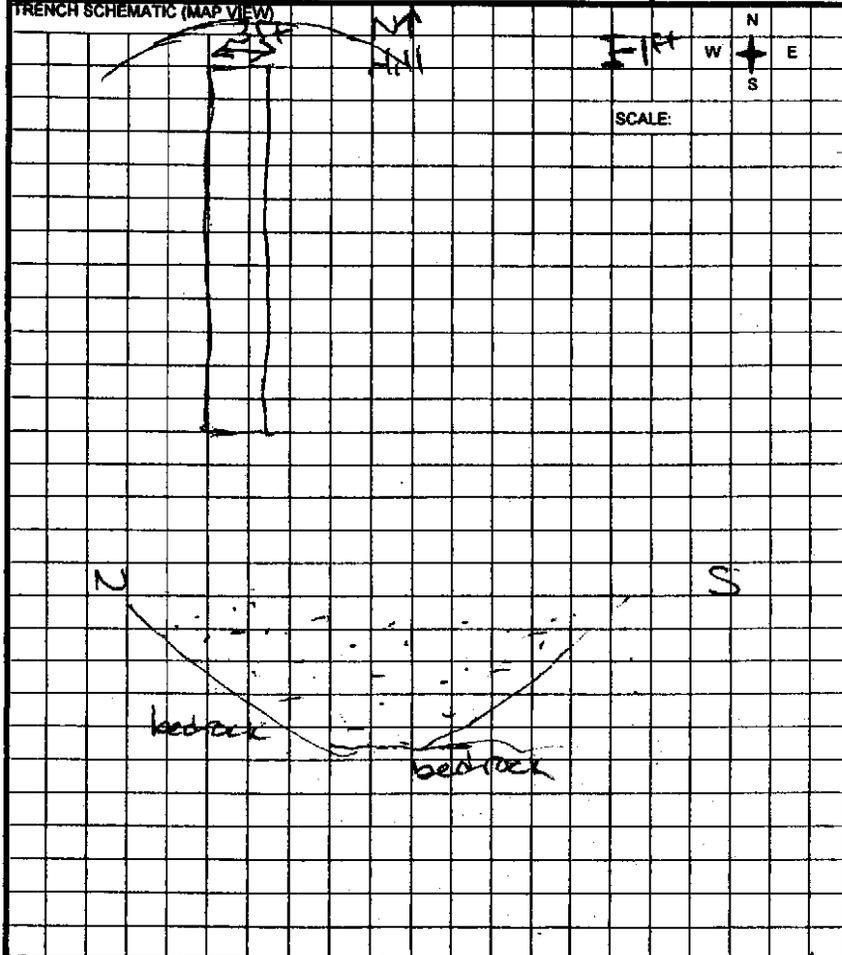
Surface - tall grassy weeds

0-10" ~~bedrock~~ ^{Fill} Silty sand (ML); dark brown (10YR 4/1); fine grained; non-to-medium plasticity; red stiff to soft; dry; 5-10% white stiff blocky material from coarse gravel size to fine silt size - can crumble easily; appears to have wood pieces integrated in large gravel size pieces, maybe clay?

Bedrock

TD = 5.0'

CLIENT USACE	TRENCH NUMBER Q001TR003	LOCATION OF TRENCH 
LOCATION Benicia, CA	SHEET 1 OF 1	
PROJECT NAME Quarry 3 Access	DRILLING	
JOB NUMBER 00701 05736.003	START TIME 1320	FINISH TIME 1350
EXCAVATION CONTRACTOR Nelson Construction	DATE 10/29/02	DATE 10/29/02
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE HAND SHOVEL	MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PR FID LEL RAD NONE	
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ SPLIT SPOON GRAB NONE	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT CONCRETE <input checked="" type="checkbox"/> DIRT DRY WET	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (p/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 **0-0.2' Full passing weeds**

0.2-4.5' Fill composed of sandy silt w/ dark brown (4YR3/2), (0,40,100) nonplastic med stiff to stiff, dry; plant roots horizontal stratification

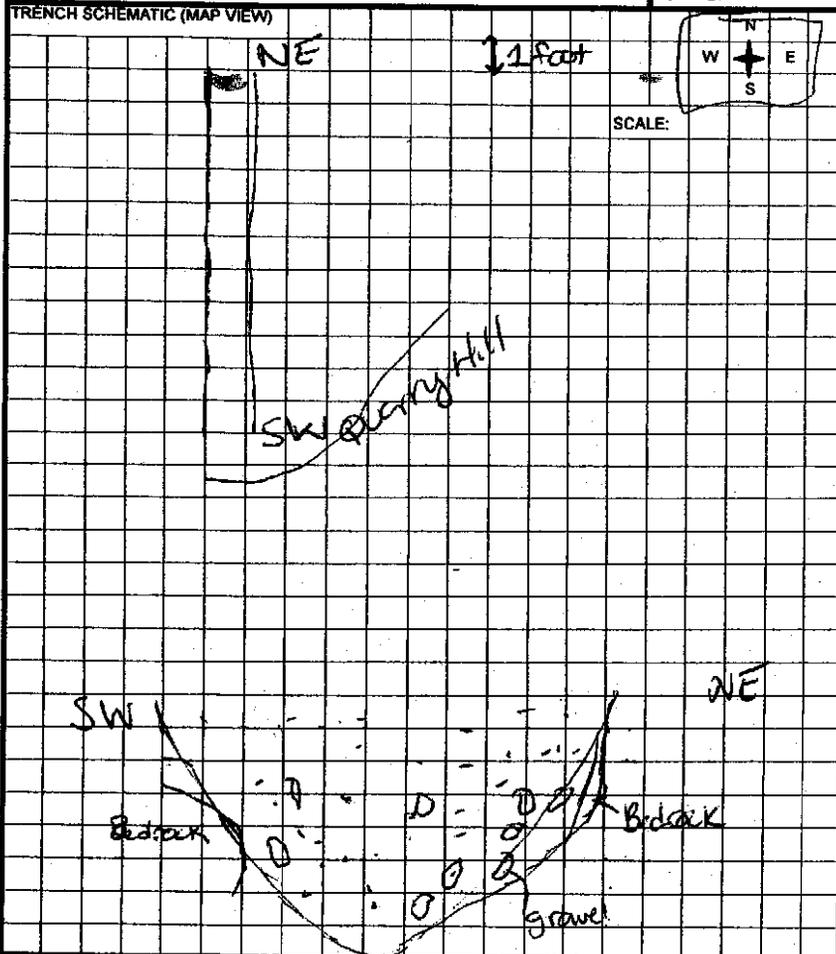
5

0

5

0

CLIENT USACE		TRENCH NUMBER 0001-TR004	LOCATION OF TRENCH
LOCATION Benicia, CA		SHEET 1 OF 1	
PROJECT NAME Quarry 1			
JOB NUMBER 00701 00736.003		DRILLING	
ECAVATION CONTRACTOR Nelson		START TIME 1440	FINISH TIME 1505
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ BACKHOE <input checked="" type="checkbox"/> HAND _____ SHOVEL _____		DATE 10/29/02	DATE 10/29/02
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ SPLIT SPOON _____ GRAB _____ NONE _____		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ ASPHALT _____ CONCRETE _____ DIRT <input checked="" type="checkbox"/> DRY _____ WET _____	
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ PI <input checked="" type="checkbox"/> FID _____ LEL _____ RAD _____ NONE _____			



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

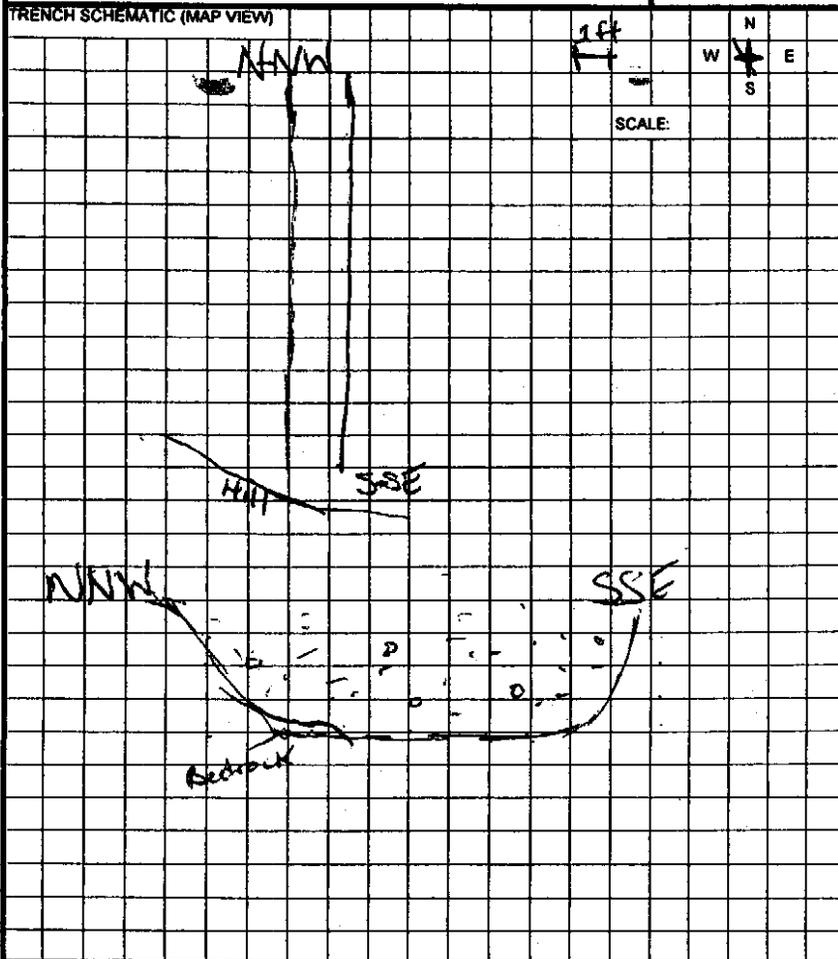
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/100), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0	0.0-0.2	Yell grassy weeds
0	0.2-	Fill: Sandy Silt (MC); dark brown (10YR 3/3); (10, 40, 50); non-plastic; med stiff to stiff; dry; fine to coarse sand; fine to medium gravel-bedrock fragments
5		trace very stiff clay; plant roots
0	TD = 8 ft	

CLIENT: USACE
 LOCATION: Benicia, CA
 PROJECT NAME: Quarry 1
 JOB NUMBER: 00701 00736.003
 EXCAVATION CONTRACTOR: Nelson Construction
 EXCAVATOR TYPE (CIRCLE ONE): BACKHOE HAND SHOVEL
 SOIL SAMPLING METHOD (CIRCLE ONE): SPLIT SPOON GRAB
 MONITORING INSTRUMENT (CIRCLE ONE): PID FID LEL RAD NONE

TRENCH NUMBER: Q001TR005
 LOCATION OF TRENCH: [Hand-drawn diagram of trench location with 'Dugout' and 'trench' labels]
 SHEET: 1 OF 1
 DRILLING: START TIME 1510, FINISH TIME 1540
 DATE: 10/25/02, 10/29/02
 SURFACE CONDITIONS (CIRCLE ONE): ASPHALT CONCRETE DIRT DRY WET



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

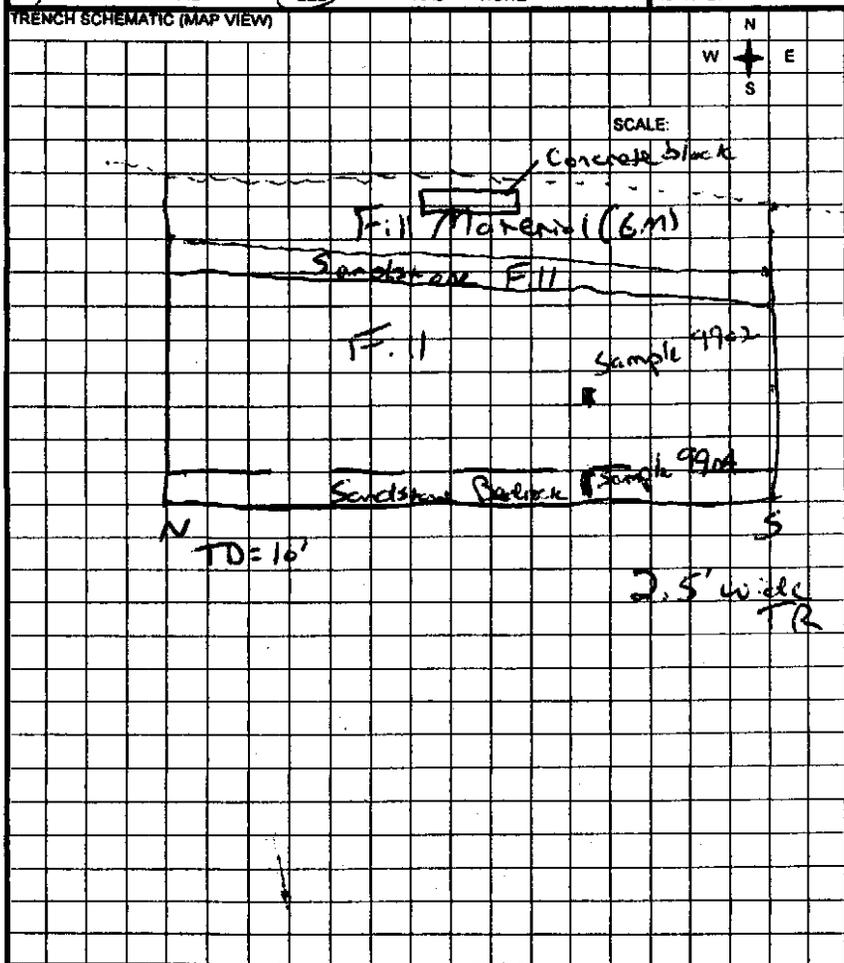
COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/sf), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-0.2 Tall grasses, weeds
 0.2-4ft. Fill: Sandy silt (m) dark (TP) brown (10YR 3/3); (8, 4.5, 5.0); med stiff to stiff; dry to slightly moist; fine to coarse sand; fine gravel; plant roots; subangular sand & gravel; horizontal stratification; trace carbonates/bedrock fragments.

Quarry 3

CLIENT USACE		TRENCH NUMBER Q003 TR001	LOCATION OF TRENCH
LOCATION Benicia Q3			
PROJECT NAME Benicia USACE			
JOB NUMBER 00701	SHEET 1 OF 1		
EXCAVATION CONTRACTOR Neils	DRILLING		
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ OTHER _____		START TIME 1345	FINISH TIME 1520
<input checked="" type="checkbox"/> BACKHOE HAND SHOVEL			
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER Drive Sampler	DATE 2/8/01	DATE 2/8/01	
SPLIT SPOON GRAB NONE			
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____		
<input checked="" type="checkbox"/> PH <input type="checkbox"/> FID <input checked="" type="checkbox"/> LEL <input type="checkbox"/> RAD NONE	ASPHALT	CONCRETE <input checked="" type="checkbox"/> DIR <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g_s/M), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-2' Unconsolidated fill material silty sand w/ gravel (6M) (25, 45, 30), non plastic, weak dry strength, & low toughness dry, no odor. Large flat block of concrete ~ 1' x 2' x 2' at 1' below center of TR. Small fragments of asphalt (< golf ball size) at 1' 5". Additional smaller flat blocks of concrete as trench continues south.

2-3' Sandstone Fill intermixed with 0-2' Fill (Crushed sandstone)

3-9/10' 0-2' Fill

9/10' Sandstone bedrock becoming increasingly competent as trench deepens. No refuse with the exception of concrete and small pieces of asphalt debris, no odor, no water, no UH/OE. Sharp, distinct contact between fill/sandstone layers.

9902 - Sample of Fill material

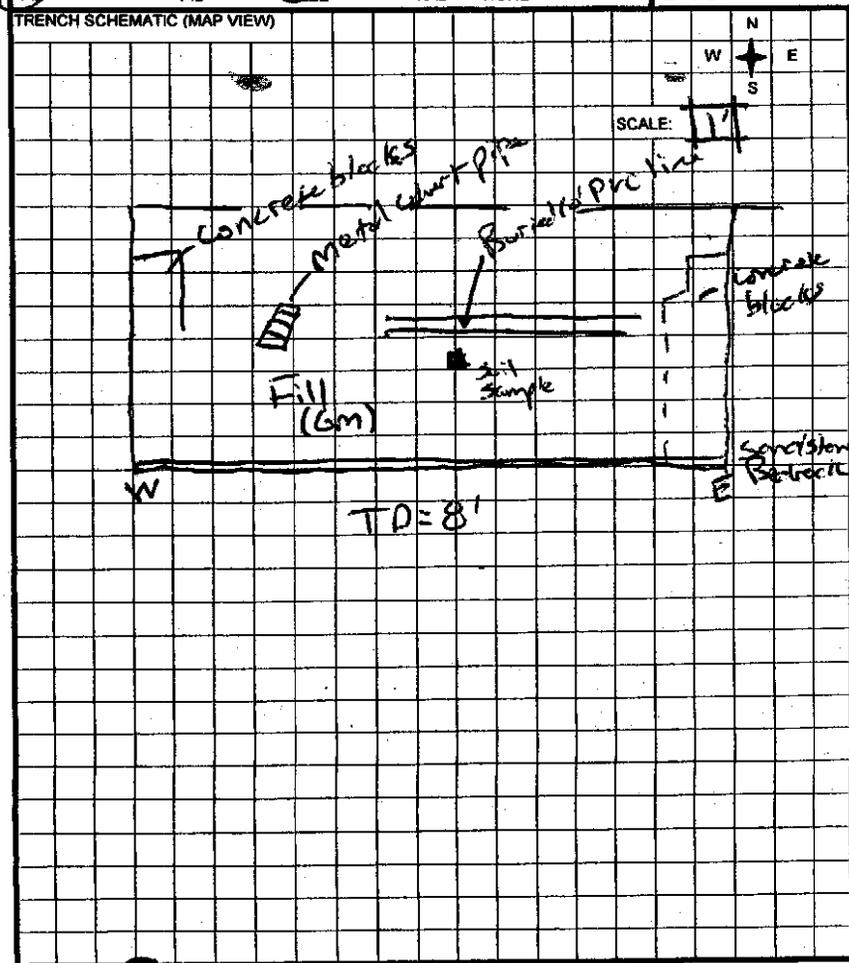
9904 - Sample of bedrock

BZ = 0 ppm (1358)

LEL = 0%

3035 2/8/01

CLIENT USACE		TRENCH NUMBER Q003TR062	LOCATION OF TRENCH
LOCATION Benicia Q3			
PROJECT NAME Benicia USACE			
JOB NUMBER 00701		SHEET 1 OF 1	
EXCAVATION CONTRACTOR Nielson		DRILLING	
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____		START TIME 0810	FINISH TIME 0900
BACKHOE HAND SHOVEL		DATE 2/12/01	DATE 2/12/01
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____			
SPLIT SPOON GRAB (NONE)			
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____	
PID FID TR RAD NONE		ASPHALT CONCRETE DB DRY WET	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-8 Loose unconsolidated soil material silty sand w/ gravel (25, 45, 30), non plastic, weak dry strength, low cohesion, dry, no odor, no water, no ure, or oil well graded fill w/ varying sizes & angularity (GM) large concrete blocks located at West E ends of TR. Blocks also present on surface buried ~ 5-6" by. Large (16") PVC line away located to the N side of TR; Metal curb pipe ~ 3.5" by 3" Back of fragments throughout TR

8 Surface bedrock becoming increasingly competent as excavation continues increases

0-5

5

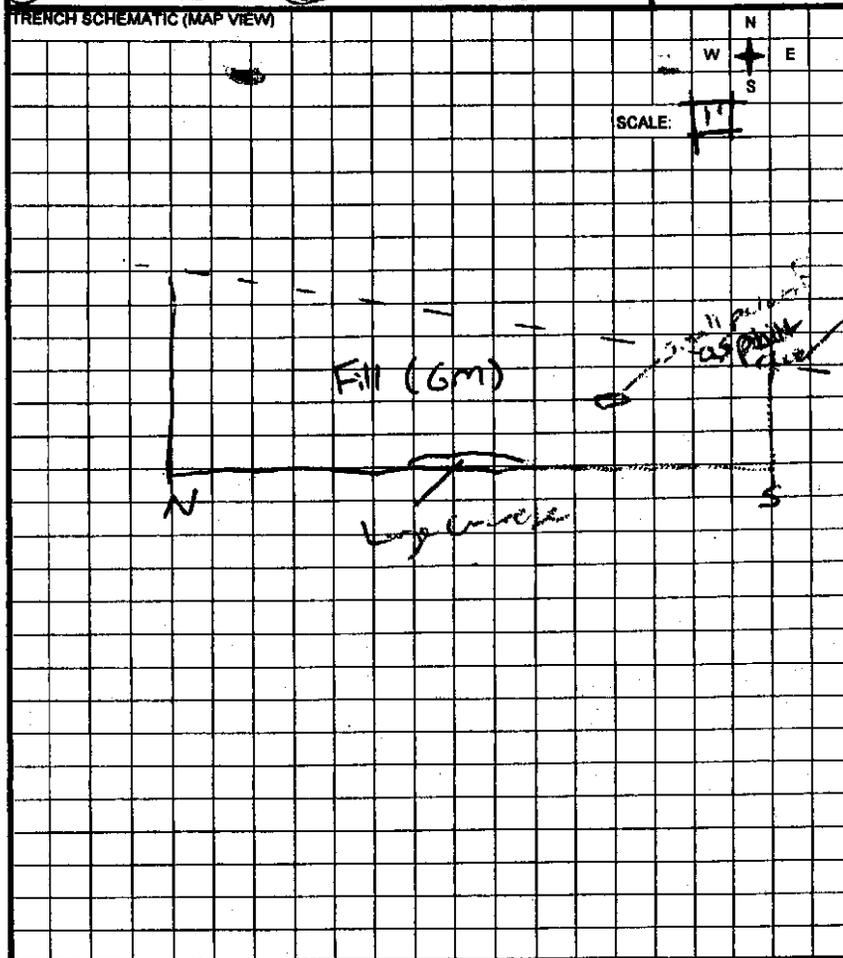
0-8

B2 = 6 ppm @ 0816

Raining during trenching

BL 36 2/12/01

CLIENT USAACE		TRENCH NUMBER Q03TR003	LOCATION OF TRENCH
LOCATION Benicia Q3			
PROJECT NAME Benicia USAACE			
JOB NUMBER 00701		SHEET 1 OF 1	
EXCAVATION CONTRACTOR Nielsen		DRILLING	
		START TIME 1333	FINISH TIME 1445
		DATE 2/12/01	DATE 2/12/01
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> BACKHOE <input type="checkbox"/> HAND <input type="checkbox"/> SHOVEL			
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> GRAB <input checked="" type="checkbox"/> NONE			
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> FID <input checked="" type="checkbox"/> LED <input type="checkbox"/> RAD <input type="checkbox"/> NONE		SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="checkbox"/> ASPHALT <input checked="" type="checkbox"/> CONCRETE <input type="checkbox"/> DRY <input type="checkbox"/> WET	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m³), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 - 3/6 loose unconsolidated fill mixing silty soil & gravel (25, 45, 30) non plastic weak cementation, weak dry strength, low toughness, dry, no odor, large blocks of concrete debris at bottom center of trench. Small lens of asphalt debris 4' N of S end of 2' bss, various concrete & brick fragments throughout trench

3/6 sandstone bedrock becoming increasingly competent as trench deepens, no additional refuse, no water, no u/x/O/E

Sharp, distinct contact between soilstone/fill layers

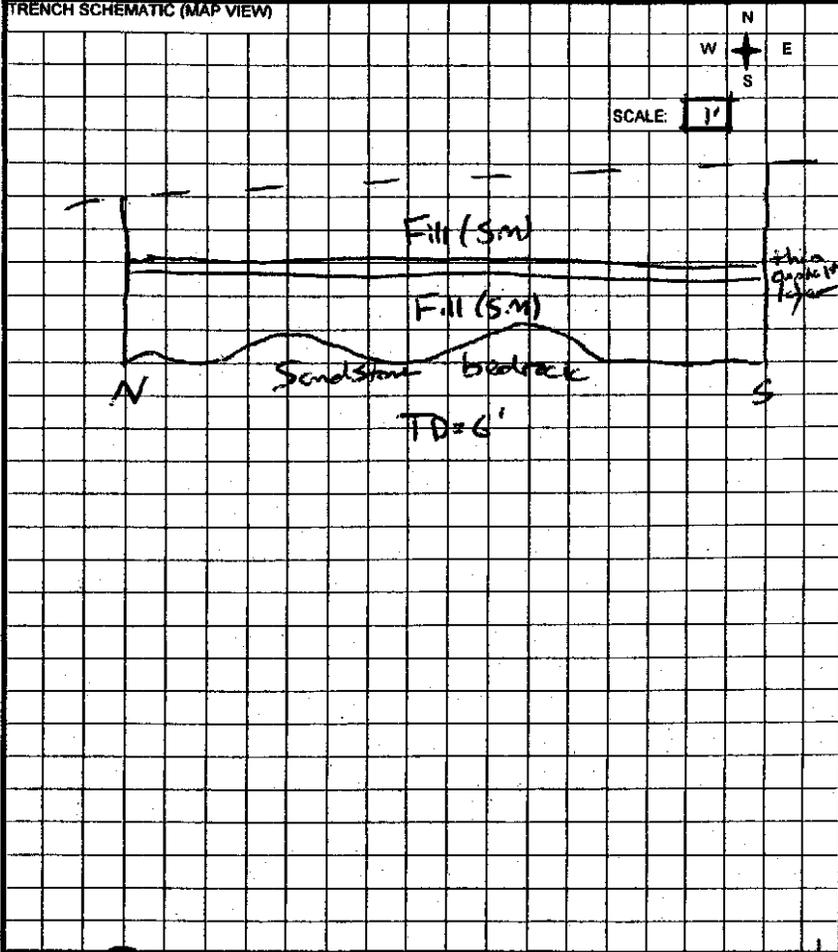
LEL = 0%

BZ = 0 ppm

Raining while trenching

BZ 308 2/12/01

CLIENT USACE		TRENCH NUMBER Q003TR004	LOCATION OF TRENCH
LOCATION Benicia			
PROJECT NAME Benicia USACE			
JOB NUMBER 00701		SHEET 1 OF 1	
EXCAVATION CONTRACTOR Nielson		DRILLING	
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ OTHER _____ <input checked="" type="radio"/> BACKHOE <input type="radio"/> HAND <input type="radio"/> SHOVEL		START TIME 1420	FINISH TIME 1530
SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input type="radio"/> SPLIT SPOON <input type="radio"/> GRAB <input checked="" type="radio"/> NONE		DATE 2/15/01	DATE 2/15/01
MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="radio"/> EID <input type="radio"/> FID <input checked="" type="radio"/> LEI <input type="radio"/> RAD <input type="radio"/> NONE	SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="radio"/> ASPHALT <input type="radio"/> CONCRETE <input checked="" type="radio"/> DIRT <input type="radio"/> DRY <input type="radio"/> WET		



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/g), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0 - 2 1/4' **Loose unconsolidated Fill material, Sandy silt & gravel, (25, 35, 45), non plastic, weak cementation well graded, clay, no odor, high-reed perm. Some asphalt debris, some smaller concrete debris. Fill material of varying sizes and angularity (SM)**

5' **2-4" thick asphalt layer running length of trench**

2 1/4 - 5/6' **Sandstone bedrock**

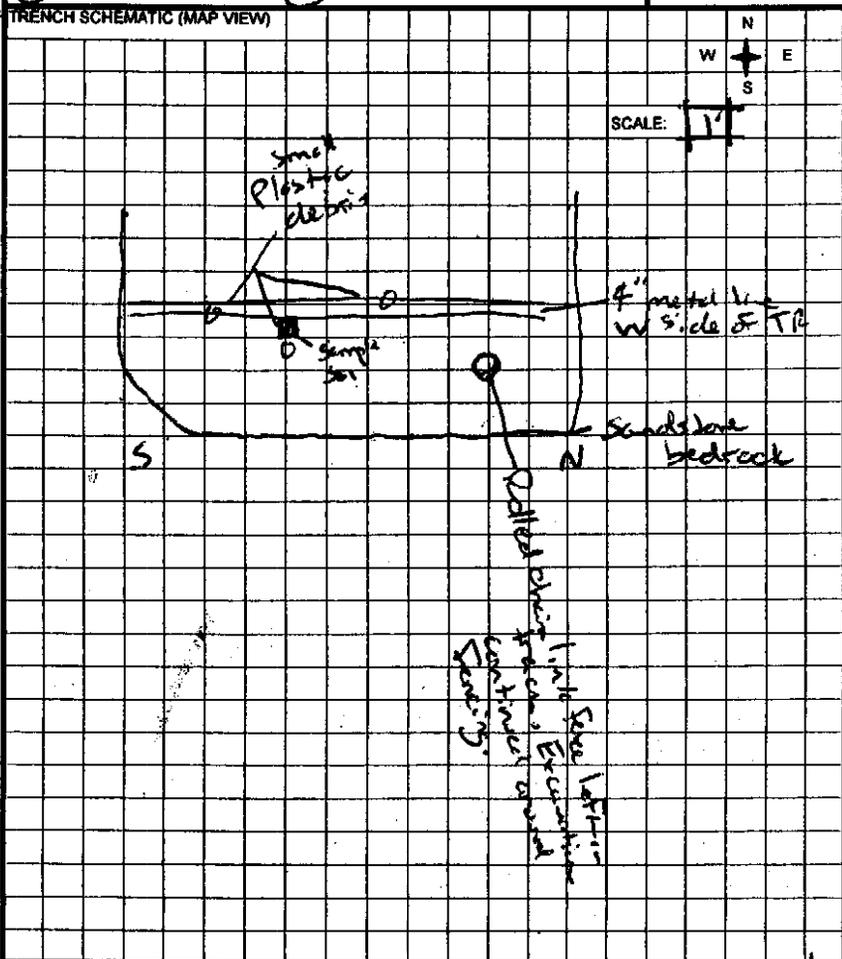
Sharp, distinct contact between Fill material and Sandstone bedrock

0 - **Fill of varying sizes & angularity; very loosely compacted (SM)**

BZ=0 ppm

BQ 3/ 2/15/01

CLIENT USACE		TRENCH NUMBER 2003TR005	LOCATION OF TRENCH
LOCATION Benicia			
PROJECT NAME Benicia USACE			
JOB NUMBER 00701		SHEET 1 OF 1	
EXCAVATION CONTRACTOR Nielson		DRILLING	
EXCAVATOR TYPE (CIRCLE ONE) OTHER _____ OTHER _____		START TIME 1310	FINISH TIME 1410
BACKHOE HAND SHOVEL		DATE 2/15/01	DATE 2/15/01
SOIL SAMPLING METHOD (CIRCLE ONE) <input checked="" type="radio"/> OTHER Drive Sampler			
SPLIT SPOON GRAB NONE			
MONITORING INSTRUMENT (CIRCLE ONE) <input checked="" type="radio"/> FID <input checked="" type="radio"/> TEL _____ RAD NONE _____		SURFACE CONDITIONS (CIRCLE ONE) ASPHALT CONCRETE <input checked="" type="radio"/> DIRT <input checked="" type="radio"/> DRY _____ WET _____	



FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/s), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL DESCRIPTION

0-8' Loose unconsolidated fill material, sandy silt & gravel (25, 35, 45), non-plastic, low dry strength, dry, no odor, well sorted, high-med perm. Large concrete block @ 10' bgs - removed from TR. Colored chain link fence @ 4.5' bgs - removed from TR. Additional colored chain link fence @ 6.5' bgs - left in TR. 13' of a 4" steel line w/ 6' of line in concrete (4' bgs). Some plastic debris, tree roots from adjacent trees in TR. Fill material of varying sizes + angularity; very loose (SM).

8' Sandstone bedrock increasingly competent as excavation increases. Distinct contact b/w fill + sandstone layer.

Trench extended additional 12' SW during additional metal lines. Additional metal lines removed having same size as previously removed lines. Trench extended to extent of lines.

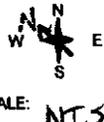
- Trench backfilled with excavated soil.

BZ: Dgm
LEL: 2/15/01

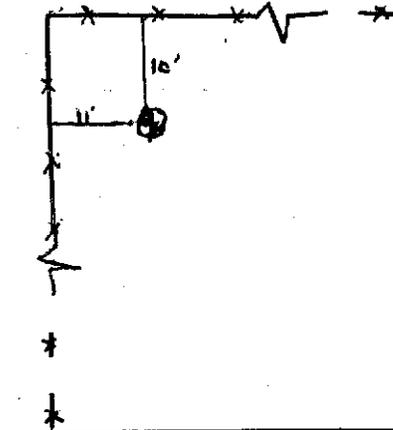
APPENDIX D

Fillsite 2 Boring Logs

LOCATION OF BORING



SCALE: NT 3



Adams St.

CLIENT USACE	BORING NUMBER L002TW001	
LOCATION Benicia		
PROJECT NAME Benicia USACE		
JOB NUMBER 00701	SHEET 1 OF 2	
DRILLING CONTRACTOR Gregg Drilling	DRILLING	
RIG TYPE (CIRCLE ONE) <input checked="" type="checkbox"/> MSA <input type="checkbox"/> DP <input type="checkbox"/> MUD <input type="checkbox"/> ARCH <input type="checkbox"/> NONE	START TIME 0954	FINISH TIME 1228
DRILLING METHOD, FLUID USED 8" auger	DATE 6/7/01	DATE 6/8/01
SOIL SAMPLING METHOD (CIRCLE ONE) <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CC <input type="checkbox"/> ACETATE <input type="checkbox"/> NONE	WELL CONSTRUCTION	
MONITORING INSTRUMENT (CIRCLE ONE) <input checked="" type="checkbox"/> PTD <input type="checkbox"/> FID <input type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE	START TIME	FINISH TIME
SURFACE CONDITIONS (CIRCLE ONE) <input type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input checked="" type="checkbox"/> DRY <input type="checkbox"/> WET	DATE	DATE

WELL CONSTRUCTION		SOIL SAMPLING					DEPTH (FEET)	INSTRUMENT READING (ppm)	USCS GROUP SYMBOL
ANNULUS	CASING	SAMPLER USED	BLOWS/6" INTERVAL	INTERVAL SAMPLED	RECOVERY	ANALYTICAL SAMPLE (A,B,C)			
		SS							
			18					ml	0-5
			15					ml	5-8.5
			30					ml	8.5-21.5
			31						
			43						
			33						
			30						
			33						
			41						
			44						
			78						
			79						
			86						
			79						
			53						

FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION

COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSSELL COLOR, COLOR, GRADATION (G_w), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION

SAMPLE TYPE: INTERVAL: DESCRIPTION

0-5 Sandy silt w/ gravel 7.5 YR 6/3 lt brown (20, 35, 45), non plastic, weak, lowk, dry well graded, angular, high-med perm slow dilatancy

5-8.5 Sandy silt, dk bluish gray, 4/10 B6 GLEY2 (15, 35, 50), non plastic, med clay strength, slow dilatancy, high toughness, damp no odor, med perm, homogeneous, gradual contour

8.5-21.5 sandy silt ^ 5 YR 5/4 non plastic, (0, 25, 75) med high clay strength, slow dilatancy, damp, no odor, low perm, homogeneous Refusal @ 21.5' bss. Will return 6/8/01 with larger rig. 6/8/01 Currently no water in boring

ANALYTICAL SAMPLE ID (SEE ABOVE FOR LOCATION)

A	_____	D	_____
B	_____	E	_____
C	_____	F	_____

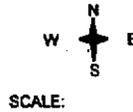
LOCATION OF BORING <div style="text-align: center;"> W E S </div> SCALE: _____	CLIENT USACE LOCATION Benicia, CA PROJECT NAME Benicia USACE JOB NUMBER 00701 DRILLING CONTRACTOR Gregg Drilling RIG TYPE (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> HSA <input type="checkbox"/> DP <input type="checkbox"/> MUD <input type="checkbox"/> ARCH <input type="checkbox"/> NONE DRILLING METHOD, FLUID USED B-61 Rig - 8" auger SOIL SAMPLING METHOD (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> CC <input type="checkbox"/> ACETATE <input type="checkbox"/> NONE MONITORING INSTRUMENT (CIRCLE ONE) OTHER _____ <input checked="" type="checkbox"/> PID <input type="checkbox"/> FID <input type="checkbox"/> LEL <input type="checkbox"/> RAD <input type="checkbox"/> NONE SURFACE CONDITIONS (CIRCLE ONE) OTHER _____ <input type="checkbox"/> ASPHALT <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> DIRT <input type="checkbox"/> DRY <input type="checkbox"/> WET	BORING NUMBER LOG2T0001 SHEET 2 OF 2 DRILLING <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>START TIME</td> <td>FINISH TIME</td> </tr> <tr> <td>0954</td> <td>1208</td> </tr> <tr> <td>DATE</td> <td>DATE</td> </tr> <tr> <td>6/7/01</td> <td>6/8/01</td> </tr> </table> WELL CONSTRUCTION <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>START TIME</td> <td>FINISH TIME</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>DATE</td> <td>DATE</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	START TIME	FINISH TIME	0954	1208	DATE	DATE	6/7/01	6/8/01	START TIME	FINISH TIME			DATE	DATE		
START TIME	FINISH TIME																	
0954	1208																	
DATE	DATE																	
6/7/01	6/8/01																	
START TIME	FINISH TIME																	
DATE	DATE																	

WELL CONSTRUCTION		SOIL SAMPLING					DEPTH (FEET)	INSTRUMENT READING (ppm)	USCS GROUP SYMBOL	FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION	COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (p/w), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION
ANNULUS	CASINGS	SAMPLER USED	BLOWS/BLOWIS ⁸ INTERVAL	INTERVAL SAMPLED	RECOVERY	ANALYTICAL SAMPLE (A,B,C)					
		SS				NA					
			24					20	0	ML	6/8/01 B-61 Rig
			21						0		21.526 Sandy silt 26 LEY 3/5B Dark bluish gray
			20+						0		(0,25,75) non plastic, high-med dry strength, slow dilatancy, damp/low-med toughness, no odor, low perm, homogeneous, gradational contact
			X						0		
			X						0		
			X					25	0	ML	26.036.5 Sandy silt 26 LEY 3/5B Dark bluish gray
			50+ (5")						0		(0,20,80), non-plastic, high dry strength, no dilatancy, damp, high toughness, no odor, low perm, homogeneous
			X						0		
			X						0		
			50+ (5")						0		
			X						0		
			X						0		
			50+ (6")						0		
			X						0		
			X						0		
			50+ (5")						0		
			X						0		
			X						0		
			50+ (5")						0		
			X						0		
			X						0		
			50+ (1")						0		
			X						0		
			X						0		
			50+ (4")						0		
			X						0		
			X						0		

ANALYTICAL SAMPLE ID (SEE ABOVE FOR LOCATION)

A _____	D _____
B _____	E _____
C _____	F _____

LOCATION OF BORING

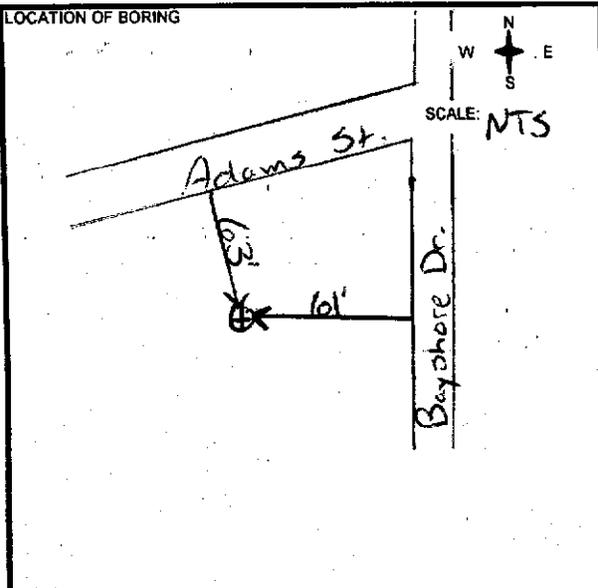


CLIENT USACE	BORING NUMBER L602Twood	
LOCATION Benicia, CA		
PROJECT NAME Benicia USACE		
JOB NUMBER 00761	SHEET 1 OF 2	
DRILLING CONTRACTOR Greag Drilling	DRILLING	
RIG TYPE (CIRCLE ONE) <input checked="" type="radio"/> DP <input type="radio"/> MUD <input type="radio"/> ARCH <input type="radio"/> NONE	START TIME 1230	FINISH TIME 1500
DRILLING METHOD, FLUID USED B-61 Rig - 8" auger	DATE 6/8/01	DATE 6/8/01
SOIL SAMPLING METHOD (CIRCLE ONE) <input checked="" type="radio"/> SPLIT SPOON <input type="radio"/> CC <input type="radio"/> ACETATE <input type="radio"/> NONE	WELL CONSTRUCTION	
MONITORING INSTRUMENT (CIRCLE ONE) <input checked="" type="radio"/> PDS <input type="radio"/> FID <input type="radio"/> LEL <input type="radio"/> RAD <input type="radio"/> NONE	START TIME	FINISH TIME
SURFACE CONDITIONS (CIRCLE ONE) ASPHALT <input checked="" type="radio"/> CONCRETE <input type="radio"/> DIRT <input checked="" type="radio"/> DRY <input type="radio"/> WET	DATE	DATE

WELL CONSTRUCTION		SOIL SAMPLING					DEPTH (FEET)	INSTRUMENT READING (ppm)	USCS GROUP SYMBOL	FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION	COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g/m), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION
ANNULUS	CASING	SAMPLER USED	BLOWS/8" INTERVAL	INTERVAL SAMPLED	RECOVERY	ANALYTICAL SAMPLE (A,B,C)					
										<p>SAMPLE TYPE: INTERVAL: DESCRIPTION</p> <p>0-7" concrete</p> <p>7"-11" HC (asphalt)</p> <p>11"-2' HC base material, silty sand w/ gravel</p> <p>2.5 YR S/1 reddish grey, (35, 45, 20), non plastic low dry strength, slow-no dilatancy, low toughness, dry, no odor, well graded, high-med perm</p> <p>2'-6' Sandy silt 10 YR 6/4 Brownish yellow (15, 35, 50), non plastic, low dry strength, no-low dilatancy, low toughness, dry, no odor, well-med graded, high-med perm homogeneous</p> <p>6'-11' Sandy silt 10 YR 5/6 yellowish brown (0, 35, 65), non plastic, med dry strength, no dilatancy, low toughness, ^{damp} dry, no color, med graded, med perm, laminated (layers < 1/4" thick)</p> <p>11'-14' same as 6'-11' except high dry strength, poor-med graded</p> <p>14'-15' change in color to bluish grey</p> <p>6LEY2 6/10B</p>	
			HA		HA				0		
			X	5"	X				5		
			X	5"	X				10		
			X	4"	X				15		
			X	4"	X				20		

ANALYTICAL SAMPLE ID (SEE ABOVE FOR LOCATION)

A	_____	D	_____
B	_____	E	_____
C	_____	F	_____



CLIENT USACE	BORING NUMBER 2002TWOOD
LOCATION Benicia, CA-LF2	
PROJECT NAME Benicia USACE	
JOB NUMBER 00701	SHEET 2 OF 2
DRILLING CONTRACTOR Greag	DRILLING
RIG TYPE (CIRCLE ONE) <input checked="" type="checkbox"/> HS OTHER _____	START TIME 1230
DP MUD ARCH NONE	FINISH TIME 1500
DRILLING METHOD, FLUID USED B-61 - 8" auger	DATE 6/8/01
SOIL SAMPLING METHOD (CIRCLE ONE) <input checked="" type="checkbox"/> SPLIT SPOON OTHER _____	DATE 6/8/01
CC ACETATE NONE	WELL CONSTRUCTION
MONITORING INSTRUMENT (CIRCLE ONE) <input checked="" type="checkbox"/> PID FID LEL RAD NONE	START TIME
SURFACE CONDITIONS (CIRCLE ONE) ASPHALT <input checked="" type="checkbox"/> CONCRETE DIRT <input checked="" type="checkbox"/> WET	FINISH TIME
	DATE
	DATE

WELL CONSTRUCTION		SOIL SAMPLING					DEPTH (FEET)	INSTRUMENT READING (ppm)	USCS GROUP SYMBOL	FINE GRAINED AND ORGANIC SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, SIZE DISTRIBUTION, PLASTICITY, DRY STRENGTH, DILATANCY, TOUGHNESS, MOISTURE, ODOR, STRUCTURE, CONSISTENCY, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, CONTACT DESCRIPTION	COARSE GRAINED SOIL DESCRIPTION: GROUP NAME, MUNSELL COLOR, COLOR, GRADATION (g _m), SIZE DISTRIBUTION, PLASTICITY, SHAPE, ANGULARITY, MOISTURE, ODOR, STRUCTURE, CEMENTATION, RELATIVE PERMEABILITY, LOCAL GEOLOGIC NAME, MINERALOGY, CONTACT DESCRIPTION
ANNULUS	CASINGS	SAMPLER USED	BLOWS/IN INTERVAL	INTERVAL SAMPLED	RECOVERY	ANALYTICAL SAMPLE (A,B,C)					
			50	0-2"				28	0	15'-16.5' Colors stratified: bluish gray GLEY2 6/10B + brown 7.5 YR 5/4. Thicknesses of 1-3 mm	
			50	2-3"				5	0	16.5'-17.5' sandy silt, bluish gray GLEY2 5/5B (0.3%) nonplastic, low-med dry strength, no dilatancy, med toughness, clay, no odor, poorly graded, med-low perm, some stratification with 15-16.5'	
			50	3-4"				5	0		
			50	4-5"				5	0		
			50	5-6"				5	0		
			50	6-7"				5	0	17.5'-21.5' Change in color to dark bluish gray GLEY2 3/10B6, homogeneous	
			50	7-8"				5	0	21.5'-25' Change in color to dark greenish gray GLEY2 3/5B6, homogeneous	
			50	8-9"				5	0	25'-37' Change to high dry strength, low perm.	
			50	9-10"				5	0	Refusal @ 37'	
			50	10-11"				5	0		
			50	11-12"				5	0		
			50	12-13"				5	0		
			50	13-14"				5	0		
			50	14-15"				5	0		
			50	15-16"				5	0		
			50	16-17"				5	0		
			50	17-18"				5	0		
			50	18-19"				5	0		
			50	19-20"				5	0		
			50	20-21"				5	0		
			50	21-22"				5	0		
			50	22-23"				5	0		
			50	23-24"				5	0		
			50	24-25"				5	0		
			50	25-26"				5	0		
			50	26-27"				5	0		
			50	27-28"				5	0		
			50	28-29"				5	0		
			50	29-30"				5	0		
			50	30-31"				5	0		
			50	31-32"				5	0		
			50	32-33"				5	0		
			50	33-34"				5	0		
			50	34-35"				5	0		
			50	35-36"				5	0		
			50	36-37"				5	0		
			50	37-38"				5	0		
			50	38-39"				5	0		
			50	39-40"				5	0		
			50	40-41"				5	0		
			50	41-42"				5	0		
			50	42-43"				5	0		
			50	43-44"				5	0		
			50	44-45"				5	0		
			50	45-46"				5	0		
			50	46-47"				5	0		
			50	47-48"				5	0		
			50	48-49"				5	0		
			50	49-50"				5	0		

ANALYTICAL SAMPLE ID (SEE ABOVE FOR LOCATION)

A _____

B _____

C _____

D _____

E _____

F _____

APPENDIX E

IDW Manifests

Soil Generated from Fillsite 1 and Fillsite 2

TPS Technologies Soil Recycling

Non-Hazardous Soils

Date of Shipment: 3-16-01	Responsible for Payment: IWM, Inc.	Transporter Truck #: 142	Facility #: A04	Given by TPS: 00835	Load #: 1018
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Generator's Name and Billing Address: U.S. Army Corps of Engineers 1325 J Street Sacramento, CA 95814	Generator's Phone #: (916) 557-7986	Generator's US EPA ID No: Non-Haz N/A
	Person to Contact: Bruce Handel	
	FAX#:	Customer Account Number with TPS:

Consultant's Name and Billing Address: Brown & Caldwell 2701 Prospect Park Dr., Ste. 100 Rancho Cordova, CA 95670	Consultant's Phone #: (916) 444-0123	Customer Account Number with TPS:
	Person to Contact: Brad Ziegler	
	FAX#:	Customer Account Number with TPS:

Generation Site (Transport from): (name & address) Benicia Arsenal Env. Restoration 940 Tyler Street Benicia, CA	Site Phone #:	BTEX Levels
	Person to Contact: Brad Ziegler	
	FAX#:	TPH Levels

Designated Facility (Transport to): (name & address) Bay Soil Remediation Services 20 Recycling Lane Richmond, CA 94801	Facility Phone #: (510) 235-8778	Facility Permit Numbers
	Person to Contact: David Crilley	
	FAX#:	

Transporter Name and Mailing Address: PSC 395 W. CHANNEL RD BENICIA CA, 94510	Transporter's Phone #: 510-940-7472	Transporter's US EPA ID No.:
	Person to Contact: FRAN BOURET	
	FAX#:	Transporter's DOT No.:

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>			74,000	30,000	44,000
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>		Investigation Derived Waste			22.00

List any exception to items listed above: **Primary Source UST, Suspected Source is Industrial Prod. using chlorinated solvents, see attached analysis (on file).**

Generator's and/or consultant's certification: *I/We certify that the soil referenced herein is taken entirely from those soils described in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.*

Print or Type Name: R. Martin Fehring <small>Generator <input checked="" type="checkbox"/> Consultant <input type="checkbox"/></small>	Signature and date: <i>R. Martin Fehring</i>	Month Day Year: 03 16 01
---	--	-------------------------------------

Transporter's certification: *I/We acknowledge receipt of the soil described above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that this soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.*

Print or Type Name: RAYMOND J. BELL	Signature and date: <i>Raymond J. Bell</i>	Month Day Year: 03 16 01
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Discrepancies:

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:

Print or Type Name: David Crilley	Signature and date: <i>David Crilley</i>	
--	--	--

TPS Technologies Soil Recycling

Non-Hazardous Soils

Manifest

Date of Shipment: 3-16-01	Responsible for Payment: IWM, Inc.	Transporter Truck #: 142	Facility #: A04	Given by TPS: 00835	Load #: 099
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Generator's Name and Billing Address: U.S. Army Corps of Engineers 1325 J Street Sacramento, CA 95814	Generator's Phone #: (916) 557-7986	Generator's US EPA ID No. Non-haz, N/A
	Person to Contact: Bruce Handel	
	FAX#:	Customer Account Number with TPS:

Consultant's Name and Billing Address: Brown & Caldwell 2701 Prospect Park Dr. Ste. 100 Rancho Cordova, CA 95670-6025	Consultant's Phone #: (916) 444-0123	Customer Account Number with TPS:
	Person to Contact: Brad Ziegler	
	FAX#: (916) 635-8805	Customer Account Number with TPS:

Generation Site (Transport from): (name & address) Benicia Arsenal Env. Restoration 940 Tyler Street Benicia, CA	Site Phone #:	BTEX Levels
	Person to Contact: Brad Ziegler	
	FAX#:	TPH Levels
		AVG. Levels

Designated Facility (Transport to): (name & address) Bay Soil Remediation Services 20 Recycling Lane Richmond, CA 94801	Facility Phone #: (510) 235-8778	Facility Permit Numbers
	Person to Contact: David W. Crilley	
	FAX#: (510) 231-4154	

Transporter Name and Mailing Address: PSC 395 W. CHANNEL RD BENICIA CA 94510	Transporter's Phone #: 800-800-7472	Transporter's US EPA ID No.:
	Person to Contact: FRED BOURLET	
	FAX#:	Transporter's DOT No.:
		Customer Account Number with TPS:

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>			74,000	30,000	44,000
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>		→ Investigation derived waste			22,000

List any exception to items listed above: **PRIMARY SOURCE NOT SUSPECTED SOURCE IS INDUSTRIAL PROCESS. USING CHLORINATED SOLVENTS, SEE ATTACHED LAB ANALYSIS (ON FILE)**

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils described in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: R. Martin Fahning for SAC - DISTRICT	Signature and date: <i>R. Martin Fahning</i>	Month: 03 Day: 16 Year: 01
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Transporter's certification: I/We acknowledge receipt of the soil described above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that this soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name: Raymond J. Bell	Signature and date: <i>Raymond J. Bell</i>	Month: 03 Day: 16 Year: 01
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Discrepancies:

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:

Print or Type Name: David Crilley	Signature and date: <i>David Crilley</i>	
--	--	--

Generator and/or Consultant

Transporter

Recycling Facility

TPS Technologies Soil Recycling

Non-Hazardous Soils

Manifest

Date of Shipment:	Responsible for Payment: IWM, Inc.	Transporter Truck #: 111/113	Facility #: A04	Given by TPS: 00835	Load #: 002
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Generator's Name and Billing Address: U.S. Army Corps of Engineers 1325 J Street Sacramento, CA 95814	Generator's Phone #: (916) 557-7986	Generator's US EPA ID No. Non-haz, N/A
	Person to Contact: Bruce Handel	
	FAX#:	Customer Account Number with TPS:

Consultant's Name and Billing Address: Brown & Caldwell 2701 Prospect Park Dr., Ste. 100 Rancho Cordova, CA 95670-6025	Consultant's Phone #: (916) 444-0123	Customer Account Number with TPS:
	Person to Contact: Brad Ziegler	
	FAX#: (916) 635-8805	

Generation Site (Transport from): (name & address) Benicia Arsenal Env. Restoration 940 Tyler Street Benicia, CA	Site Phone #:	BTEX Levels
	Person to Contact: Brad Ziegler	TPH Levels
	FAX#:	AVG. Levels

Designated Facility (Transport to): (name & address) Bay Soil Remediation Services 20 Recycling Lane Richmond, CA 94801	Facility Phone #: (510) 235-8778	Facility Permit Numbers
	Person to Contact: David W. Crilley	
	FAX#: (510) 231-4154	

Transporter Name and Mailing Address: IWM, Inc. 950 Ames Avenue Milpitas, CA 95035-6303	Transporter's Phone #: (408) 942-8955	Transporter's US EPA ID No.: CAD988652627
	Person to Contact: Jay De Leon	Transporter's DOT No.:
	FAX#: (408) 942-1499	Customer Account Number with TPS:

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>					
Sand <input type="checkbox"/> Organic <input type="checkbox"/> Clay <input type="checkbox"/> Other <input type="checkbox"/>	0 - 10% <input type="checkbox"/> 10 - 20% <input type="checkbox"/> 20% - over <input type="checkbox"/>	Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other <input type="checkbox"/>			\$5,000	840	160
							12.58

List any exception to items listed above: PRIMARY SOURCE NOT SUSPECTED SOURCE IS INDUSTRIAL PROCESS
USING UNIDENTIFIED SOLVENTS - SEE ATTACHED LAB ANALYSIS (ON FILE)

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils described in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: <u>R. Martin Fahning</u> Generator <input checked="" type="checkbox"/> Consultant <input type="checkbox"/>	Signature and date: <u>[Signature]</u>	Month Day Year: <u>3/30/01</u>
--	--	--------------------------------

Transporter's certification: I/We acknowledge receipt of the soil described above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that this soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name: <u>Bill Penn</u>	Signature and date: <u>[Signature]</u>	Month Day Year: <u>3/30/01</u>
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Discrepancies:

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:	
Print or Type Name:	Signature and date: <u>[Signature]</u> <u>3/30/01</u>

Generator and/or Consultant

Transporter

Recycling Facility

Cosmoline/Soil Removed at Fillsite 2

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802. WITHIN CALIFORNIA, CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CA C 0 0 2 3 3 1 7 1 3 7 8 2 9 2		Manifest Document No.		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.			
3. Generator's Name and Mailing Address US Army Corps of Engineers 325 J Street, Sacramento, CA 95814						A. State Manifest Document Number 99178292					
4. Generator's Phone (916) 557-7906						B. State Generator's ID					
5. Transporter 1 Company Name IWM, Inc			6. US EPA ID Number D and 03/20/01 CA 2 9 8 3 6 5 3 6 2 7			C. State Transporter's ID (Reserved)					
7. Transporter 2 Company Name Crosby & Overton						8. US EPA ID Number CA 0 9 8 2 5 2 4 4 8 0					
9. Designated Facility Name and Site Address Crosby & Overton 1610 W. 17th St. Long Beach, CA 90813						10. US EPA ID Number CA D 0 2 8 4 0 9 0 1 9					
11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers		13. Total Quantity		14. Unit	
a. Non-RCRA Hazardous Waste Solid						No.		Est.		Wt/Vol	
						0 0 1		D M		4 0 0	
b.						c.		d.		e.	
c. THE REFERENCED WASTE WAS RECEIVED, HANDLED AND STORED FOR SUBSEQUENT OFF-SITE DISPOSAL, TREATMENT OR REUSE. CROSBY & OVERTON INC OPERATES THIS FACILITY UNDER PERMITS GRANTED TO THEM, BY THE DEPARTMENT OF TOXIC SUBSTANCE CONTROL TOGETHER WITH THE ENVIRONMENTAL PROTECTION AGENCY IN ACCORDANCE WITH THE PROVISIONS OF THE FEDERAL AND STATE REGULATIONS, CROSBY & OVERTON HAS ALL OF THE NECESSARY PERMITS TO ACCEPT THE REFERENCED WASTE AND ALL THE WASTE HAS BEEN HANDLED ACCORDINGLY.						d.		e.		f.	
15. Special Handling Instructions and Additional Information Wear appropriate safety gear when handling material. Site: Benicia Arsenal 24 Hour Emergency (408) 942-8955. 940 Tyler Street, Benicia, CA						16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.					
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name: USACE-S&T R. Martin Fahning District. Signature: On-behalf of the Department of Defense Month/Day/Year: 03/29/01						18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name: ARNOLD Sanchez Signature: Arnold Sanchez Month/Day/Year: 03/29/01					
19. Discrepancy Indication Space						20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. Printed/Typed Name: H. Armenta Signature: H. Armenta Month/Day/Year: 04/10/01					

DO NOT WRITE BELOW THIS LINE.

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS.
 (Generators who submit hazardous waste for transport out-of-state, produce completed copy of this copy and send to DTSC within 30 days.)

Soil Generated from Fillsite 2 Borings

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. **NA**

Manifest Doc. No.

2. Page of 1

91574-DS

Generator's Name and Mailing Address
U.S Army Corps of Engineers
1325 J Street Sacramento, CA 95814

4. Generator's Phone (**916**) **557-7986**

5. Transporter 1 Company Name
IWM, INC.

6. US EPA ID Number
CAD983653627

A. Transporter's Phone
408-942-8955

7. Transporter 2 Company Name
Crosby & Overton

8. US EPA ID Number
CAD028409019

B. Transporter's Phone
570 635-0556

9. Designated Facility Name and Site Address
Crosby & Overton, Inc.
1610 West 17th Street
Long Beach, CA 90813

10. US EPA ID Number
CAD028409019

C. Facility's Phone
562-432-5115

11. Waste Shipping Name and Description

a. **Non-Hazardous Solid Waste**

12. Containers		13. Total Quantity	14. Unit Wt/Vol
No.	Type		
7	DR	EST. 03164	8 P

D. Additional Descriptions for Materials Listed Above

11.a. Waste Approval #
Investigative Derived Waste

APPROVAL # 35996

E. Handling Codes for Wastes Listed Above
14-01

5. Special Handling Instructions and Additional Information

Wear Appropriate Safety Gear When Handling
24-Hour Emergency 408-942-8955

Site: Landfill 2
Benicia Arsenal Env.
~~440 Tyler Street~~
Benicia, CA

GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name
R. Martin Fahning

Signature
R. Martin Fahning on behalf of the DOD

Month Day Year
19 12 10

Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name
B. J. Penn

Signature
B. J. Penn

Month Day Year
19 12 10

Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name
W. C. Bailey

Signature
W. C. Bailey

Month Day Year
09 21 10

Discrepancy Indication Space

Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name
KEI DURAN

Signature
KEI DURAN

Month Day Year
12 25 10

APPENDIX F

Legend for Analytical Result Tables

APPENDIX F
LEGEND FOR ANALYTICAL RESULT TABLES

Abbreviations

Abbreviation	Explanation
MG/KG	Milligrams per Kilogram
MG/L	Milligrams per Liter
UG/L	Micrograms/Liter

Data Qualification Flags

Flag	Qualification
J	The analyte was positively identified. The value is an estimated quantity.
J+	The analyte was positively identified with high bias; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified with low bias; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analyte identification is presumptive. Reported value is an estimated concentration.
R	The material was analyzed for and was reported as detected by the laboratory. The data are unusable. The analyte may or may not be present.
U	The analyte was not detected above the reported sample quantitation limit.
UJ	The material was analyzed for, but not detected above the stated MDL.
(blank)	Unqualified result.

**Data Qualification
Reason Codes**

Code	Explanation
1	Holding time exceeded.
2	Result was less than 5 times (ten times for common lab contaminants) the concentration found in the associated method blank. Result flagged as not detected (UJ) and detection limit raised to the concentration reported for the sample.
3	Surrogate recovery outside of acceptance criteria. (3H if high bias or 3L for low bias)
4	MS/MSD recovery outside of acceptance criteria. (4H if high bias or 4L for low bias)

**Data Qualification
 Reason Codes**

Code	Explanation
5	MS/MSD precision outside acceptance criteria.
6	LCS recovery outside of acceptance. (6H if high bias or 6L for low bias)
7	Result was less than 5 times (10 times for common lab contaminants) the concentration found in an associated equipment or trip blank. Result flagged as not detected (UJ) and detection limit raised to the concentration reported for the sample.
8	Field duplicate precision outside of control limit.
B	LCS.LCSD precision outside limits.
D	Lab Duplicate precision outside of limits.
F	MSA Correlation Coefficient <0.995, or MSA not done.
H	High bias.
I	Interferences present during analysis.
L	Low bias.
P	First column vs. confirmation column (or detector) precision is outside of control limit.
Q	Initial calibration did not meet QC requirements.
S	Initial calibration verification or continuing calibration verification problems.
T	Trace level concentration above the method detection limit (MDL) but below the practical quantitation limit (PQL).
V	Second-source standard calibration verification did not meet QC requirements.
X	Internal Standard Recovery problem.
Y	Initial and continuing calibration blank problem.