INDEPENDENT REMEDIAL ACTON REPORT
Bellefield Office Park
Bellevue, Washington

Prepared for:

Spieker Properties, Inc.

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EXECUTIVE SUMMARY

The Bellefield Office Park is located west of Interstate 405, south of S.E. 8th. Street and east of 112th Avenue S.E. in Bellevue, Washington. Twelve one- to two story office buildings with associated parking lots, bridges, roadways and landscaped areas are present on the site. The office park is approximately 54 acres in size and is generally flat lying.

Development of the office park occurred over the Mercer Slough peat bog. Site development began in 1970 by importing and placing fill on top of the peat; dredging existing and new channels to improve drainage; and constructing buildings, bridges and pavements. The existing buildings were constructed between 1974 and 1982.

The imported fill was reportedly demolition wood debris from wood-frame residences that were demolished as a result of the construction of Interstate 405 located approximately one-quarter mile east of the site. Historic information indicates that some degree of fill control was used by the property owners to select primarily buoyant materials (such as wood) to create "floating" building pads that would later support the roadways and parking lots on the property. In addition to buoyant materials, unknown amounts of asphaltic debris and concrete rubble have been placed on the site.

Subsurface soil directly underlying the site typically consists of a variable thickness of wood demolition debris and sand, 4 to 30 feet thick. Beneath the fill are deposits of highly compressive organic peat; deposits of soft silt, with occasional sand and gravel; alternating layers of alluvial silt, sand, and gravel; and glacial till.

The low lying Mercer Slough receives stormwater runoff from paved areas (e.g. parking lots and roadways) located within and surrounding the slough, including runoff from I-405. The slough is dissected by several surface water channels, two of which surround the office. Flow in the slough is generally towards the south with discharge into Lake Washington. Ground-water levels lie at or within several feet of the ground-surface.

Based on the site's reported history as a landfill, EPA completed a Preliminary Site Assessment (PSA) and, in 1986, designated the site as a **No Further Action Site**. In 1989, the Washington State Department of Ecology reviewed existing information and **de-listed** the site from Washington State's published list of Confirmed and Suspected Contaminated Sites.

In the normal course of completing the environmental assessments for the property transfer, a maintenance employee voiced concerns about the nature of fill materials that may have been deposited at the site. The employee's descriptions of suspect materials were primarily consistent with the disposition of residential housing demolition debris. However, to address the concerns raised by this information, a testing program to further characterize the site conditions was implemented.

The testing program consisted of sampling and analyzing water and sediments in the Mercer Slough; ground-water through-out the site; and soil samples. Comparison of soil and ground-

water quality data with potential cleanup levels indicates that petroleum hydrocarbons and PCBs were of potential concern at the Bellefield Office Park site. Other constituents (volatiles organic compounds, PAHs and pesticides) were either not detected; were detected below potential cleanup levels (e.g. naphthalene); or were detected at only one location at a relatively low concentration (e.g. 4,4'-DDT).

PCBs and the highest concentrations of petroleum hydrocarbons were detected within the southern portion of the site. PCBs were detected in soil to a depth of 20 feet but at concentrations less than the MTCA Method A cleanup level of 1 mg/kg. Diesel range hydrocarbons were detected at concentrations between 45 mg/kg and 1,400 mg/kg while heavy oil hydrocarbons were detected at concentrations between 440 mg/kg and 9,900 mg/kg. These concentrations exceed the Method A criteria of 200 mg/kg, which was set to protect ground-water quality.

Lower concentrations of petroleum hydrocarbons were detected elsewhere on the property. Diesel range hydrocarbon concentrations were detected at concentrations of between 40 mg/kg and 730 mg/kg while heavy oil hydrocarbons were detected between 240 mg/kg and 920 mg/kg. At most locations on the property, over 80% of the petroleum hydrocarbons are composed of heavy oil hydrocarbons greater than carbon range C24.

The source of the PCBs to soil beneath the site is material that was deposited with the demolition debris. Petroleum hydrocarbon source analysis indicate the primary source of the hydrocarbons was street runoff.

Initial ground-water analyses on the site indicated PCB and petroleum hydrocarbon concentrations above cleanup levels. However, the reported detections were inconsistent with the chemical nature (i.e. solubility and mobility) of these constituents. Review of the data indicated the likely cause of the detections was particulate matter entrained in the samples during collection. To test this finding, several wells were sampled using low flow sampling techniques to minimize the concentration of particulates in the samples. The results of this sampling support the finding that the initial sampling procedures were effecting the laboratory results. Low flow sampling indicate that PCBs and petroleum hydrocarbons are not present in the dissolved state above cleanup levels and are not available to migrate to the slough via ground water flow. This finding is supported by the surface water quality analyses which did not detect PCBs or petroleum hydrocarbons in the Mercer Slough.

The most recent testing supports the previous EPA status for the site of "No Further Action". Because the data indicate little risk to human health and the environment, the site should be confirmed as a "No Further Action Site" by Ecology.

INDEPENDENT REMEDIAL ACTION REPORT
Bellefield Office Park
Bellevue, Washington

INTRODUCTION

This report presents a compilation and analysis of site history, hydrogeologic conditions and environmental quality data for the Bellefield Office Park located in Bellevue, Washington. The purpose of the analysis was to assess the available data to determine whether conditions at the site warrant further action. The report is being submitted to the Washington State Department of Ecology (Ecology) under the Independent Remedial Reporting provisions of the Model Toxics Control Act (MTCA) and to support a request for a "No Further Action Letter".

Much of the data presented in this report was collected by AGRA (formerly RZA-AGRA) as part of a real estate property transfer between Great Western Bank (seller) and Spieker Properties, Inc. (buyer). The property transaction closed on March 1 1995 and Spieker Properties is now the owner of the Bellefield Office Park.

SITE DESCRIPTION

Site Name: The subject property is known as the Bellefield Office Park.

Location: The office park is located west of Interstate 405, south of S.E. 8th Street and east of 112th Avenue S.E. in Bellevue, Washington (Figure 1). The site appears in the King/Pierce/Snohomish counties Thomas Guide (1994 edition) on page 566 Sector E7 and page 596 Sector E1. The site can also be located on the United States Geologic Survey (USGS) Bellevue South Quadrangle, 7.5 Minute Series Topographic Map within Section 5, Township 24 North, Range 5 East (or approximately 122° 11'40" west longitude, 47° 35" 45" north latitude).

Project Owner and contact: On March 1, 1995, Spieker Properties purchased the property. The company contact, mailing address and phone numbers are as follows:

Company Representative: Donald S. Jefferson

Phone number: (206) 453-1600

Mailing Address: Spieker Properties, Inc.
915 188th Ave. S.E.
Suite 110
Bellevue, Washington 98005-3855

Property Use: Twelve one-to two-story office buildings with associated parking lots, bridges, roadways and landscaped areas are present on the site (Figure 2). The office park is approximately 54 acres in size and is generally flat lying.

History and Landuse

Development of the office park occurred over a former peat bog. The existing buildings were constructed between 1974 and 1982 (RZA-AGRA 1994).

Prior to approximately 1916, the area in the vicinity of the site was under water and formed part of Lake Washington. Following construction of the Hiram Chittendon Locks, the lake level was lowered and the site emerged as a peat bog (AGI 1992). Site development began in 1970 by importing and placing fill on top of the peat; dredging existing and new channels to improve drainage; and constructing buildings, bridges and pavements. The imported fill was reportedly demolition wood debris from wood-frame residences that were demolished as a result of the construction of Interstate 405 located approximately one-quarter mile east of the site (RZA-AGRA 1994). Information obtained from AGRA indicates that some degree of fill control was used by the property owners to select primarily buoyant materials (such as wood) to create "floating" building pads that would later support the roadways and parking lots on the property. In addition to buoyant materials, unknown amounts of asphaltic debris and concrete rubble have been placed on the site.

Buildings and bridges in the office park are supported by pile foundations bearing below the peat. Consolidation of the peat deposits caused by filling to develop the site has caused ground settlements (AGI 1992). It is estimated that settlements of 2 to 3 feet or more have occurred since completion of the initial mass filling.

TOPOGRAPHY/GEOLOGY

Topography

Land surface elevations generally range between 14 and 18 feet based on the USGS topographic map "Bellevue South Quadrangle" (Figure 3). The Mercer Slough surrounds the site.

Geology

The Bellefield Office Park is situated along the western edge of a valley which drains from north to south into Lake Washington (Figure 3). Historically, this area was part of a much deeper valley created by glaciation. The valley, carved by the advance of glaciers, was then partially filled by alluvial (river) deposits consisting of silts, sands and gravels. The partially filled valley was inundated with water when downstream drainage was blocked. Lake deposits consisting of silt and peat subsequently filled the valley.

Subsurface Explorations: Geotechnical investigations began in the late 1960's to determine design parameters for development of the site. A series of peat probes were completed in 1969 (Twelker 1969) which defined the general subsurface conditions. These explorations were supplemented with soil borings at the sites of proposed buildings (Twelker 1971,1972, 1973a, 1973b, 1973c, 1974, 1978). In November 1994, AGRA drilled three soil borings (B-1, B-2, and B-3) as part of the property transfer environmental assessments (AGRA 1994).

Site Geology: Subsurface soil directly underlying the site typically consists of a variable thickness of wood demolition debris and sand (4 to 30 feet thick) placed as fill during development of the office park. Beneath the fill are deposits of highly compressive organic peat which varies in thickness from 10 to 90 feet. The peat deposits thicken in the north to south direction. Deposits of soft silt, with occasional sand and gravel, generally underlie the peat and are typically 10 to 30 feet thick. Beneath these layers are alternating layers of alluvial silt, sand, and gravel, 40 to 120 feet thick. Glacial till underlies the alluvial deposits.

Geologic section A-A' (Figure 5) illustrates the geologic conditions beneath the site. The trend of the section is shown on Figure 4. Peat deposits filled in a preexisting valley. Data from the 1969 peat probes indicated that the peat deposits ranged in thickness from 0 to 30 feet near S.E. 8th Street to 8 to over 60 feet near the south property line. The thickest peat deposits were present beneath the south-central portion of the office park.

The three borings (B-1, B-2, and B-3) drilled by AGRA in 1994 indicate that fill, 15 to over 20 feet thick, is present at the boring locations. In the boring logs (appendix A) the fill is described as "sand", "silty sand with wood debris", and "wood chips and construction debris".

Hydrology: As shown in Figures 2 and 3, the site is located in a north-south trending valley. Land surface elevations on the north, east, and west sides of the valley are greater than 50 feet, while elevations in the valley are less than 20 feet.

The low lying Mercer Slough receives stormwater runoff from paved areas (e.g. parking lots and roadways) located within and surrounding the slough, including runoff from I-405. The slough is dissected by several surface water channels, two of which surround the office park (Figures 2 and 3). The topographic relationships of the area also indicate that the slough likely receives ground-water recharge from the surrounding higher areas. In the Puget sound region, topographically higher areas are typically ground-water recharge areas, while lower areas are ground-water discharge areas.

Water levels in Lake Washington are controlled by the Hiram Chittendon Locks at elevations of between approximately 13 and 15 feet above mean sea level (AGI 1992). Surface water runoff at the site is handled by drains located on the adjacent streets, parking areas and sloughs. During periods of high precipitation, ground water levels and water levels in the adjacent slough rise and flood parking lots below an elevation of approximately 16 feet.

RELEASE INFORMATION/SITE CHARACTERIZATION

As part of the Phase 1 site assessment completed by RZA-AGRA (1994), files maintained by governmental agencies were consulted.

- Based on the sites reported history as landfill, the property was evaluated by the Environmental Protection Agency (EPA). A Preliminary Site Assessment (PSA) was completed by EPA in 1986. This PSA was performed in accordance with the requirements of the Federal Government's comprehensive Environmental Response, Recompensation, and Liability Act (also known as CERCLA or Superfund). As a result of the 1986 PSA, the subject property was designated by EPA as a **NO Further Action Site** (EPA 1986).

- In 1989, Ecology reviewed existing historical documentation pertaining to the site and EPA's previous work. Based on this review, Ecology **de-listed** the site from Washington State's published list of Confirmed and Suspected Contaminated Sites (Ecology 1989).

- No underground storage tanks (USTs) or leaking underground storage tanks (LUSTs) are registered with Ecology for the site. This finding was confirmed by interviews with site employees and site reconnaissance (to observe for fill caps and tank vents).

During the site reconnaissance completed by RZA-AGRA, several in-service electrical transformers were observed which potentially could contain polychlorinated biphenals (PCBs). The majority of the transformers exhibited Puget Power stickers certifying that the transformers were "NON PCB" which indicates that the transformers contain less than 1 part per million (ppm) PCBs. Three of the transformers did not contain stickers. Puget Power was contacted and indicated that the three transformers (without stickers) were "NON PCB" containing based on testing completed in August 1988.

In the normal course of completing the environmental assessments for the property transfer, the head maintenance employee for the Bellefield Office Park voiced concerns about the nature of fill materials that may have been deposited at the site. This employee indicated that during periodic (1978-1993) site maintenance and/or new roadway or parking lot construction, he observed suspect material on several parts of the site. The suspect areas are shown on Figure 6. RZA-AGRA reviewed information provided by this employee; interviewed the employee during several site walks; and concluded that the employee's descriptions of suspect materials were primarily consistent with the disposition of residential housing demolition debris. However, to address the concerns raised by this information, a testing program to further characterize the site conditions was implemented.

The testing program consisted of sampling and analysis of:

- Water and sediments in the Mercer Slough;
- Ground-water through-out the site; and
- Soil samples at selected locations.

Sampling locations are shown on Figure 6. The results of the testing program are summarized below.

Results of Sampling in the Mercer Slough

Surface Water Sampling and Analysis in Mercer Slough: The Mercer Slough surrounds the Bellefield Office Park (Figures 2 and 3). AGRA collected water samples from the slough at two downstream locations from the site. Samples were obtained from the east and west channels towards the south end of the site as shown in Figure 6. The samples were analyzed (by North Creek Analytical, Inc.) for a variety of constituents as listed below:

- pH
- Petroleum Hydrocarbons (WTPH-DX)
- Volatile Organic Compounds (EPA Method 8240)
- Semivolatile Organic Compounds (EPA Method 8270)
- Pesticides/PCBs (EPA Method 8081)
- Phenols (Method 420.1)
- Priority Metals (EPA Methods 6010/7000)

The results are summarized in attached Table 1. As indicated in Table 1, no constituents were detected above the laboratory reporting limits in the surface water samples. The pH was measured at 7.2 in both samples.

Bottom Sediment Sampling in Mercer Slough: Three samples of sediment, collected immediately beneath the surface water of the slough, were obtained at locations upstream (north) and downstream (south) of the site (Figure 6). One downstream sediment sample was collected and described by AGRA as being composed of "silts, clays & organics". Two upstream sediment samples were collected. One sample was described as a clean sand, while the second sample was described as being similar to the downstream sediment sample (i.e. composed of "silts, clays and organics"). The three sediment samples were analyzed for a similar range of constituents (by North Creek Analytical, Inc) as were conducted for the slough water samples (see above).

- The pH of the downstream sediment sample was reported to be 6.6. This pH is slightly acidic (a pH of 7 is neutral) which is consistent with the peaty environment in which the sample was collected.

- No volatile organic compounds or phenols were detected in the downstream sediment sample. The upstream sediment samples were not analyzed for these class of compounds because these compounds were not detected in the downstream water or sediment samples.

- Several metals were detected in the downstream sediment sample (chromium, copper, and zinc). No freshwater sediment criteria are available to compare to the sediment data. However, as illustrated in Table 2, the reported metal concentrations are below background concentrations for surficial soil in the Puget Sound Area (Ecology 1994b) and Model Toxics control Act (MTCA) Method B (WAC 173-340-740) cleanup levels for soil (Ecology 1994a)

Table 2 - Metal Concentrations in Mercer Slough Sediment

	Sediment Conc. (mg/kg)	Puget Sound Background (mg/kg)(1)	MTCA Soil Cleanup Level (mg/kg)(2)
Chromium	38	48	400
Copper	16	36	2960
Zinc	37	85	2400

Sources: (1) Ecology (1994b); (2) Ecology (1994a)

- Relatively high petroleum hydrocarbon concentrations (3,380 mg/kg to 4,700 mg/kg) were detected in both the upstream and downstream fine-grained (silt, clay & organic) sediment samples. A lower concentration of petroleum hydrocarbons (approximately 100 mg/kg) was detected in the sandy sediment sample. The data indicate that the source of the hydrocarbons is regional in nature, such as runoff from area parking lots and roadways. Possible sources of hydrocarbons to site sediments and soil is further discussed later in this report.

- Several semivolatile organic compounds were detected, mostly polycyclic aromatic hydrocarbons (PAHs) at concentrations less than 0.5 mg/kg. Lower concentrations of these constituents were detected in the downstream sediment sample as compared to the upstream samples. Similar to the petroleum hydrocarbons discussed above, the data indicate that the source of the detected PAHs is regional in nature.

- No PCBs were detected in the sediment samples. However, low concentration detections of dieldrin, heptachlor, and chlordane were reported. Chlordane was reportedly detected in the upstream sandy sediment sample while dieldrin and heptachlor were detected in the downstream sediment sample. No freshwater sediment criteria are available to compare to the sediment data. However, the reported pesticide concentrations are relatively low and are well below the MTCA-Method B cleanup levels for residential sites (Ecology 1994a) as summarized below in Table 3:

Table 3 - Pesticide Concentrations in Mercer Slough Sediment

	Sediment Conc. (mg/kg)	MTCA Soil Cleanup Level (mg/kg)(1)
Dieldrin	0.0037	0.063
Heptachlor	0.0062	0.222
Chlordane	0.0046	0.769

Source: (1) Ecology (1994a)

Results of Ground-Water Sampling

To collect data to assess ground-water quality beneath the site, AGRA installed and sampled 18 well points at locations shown in Figure 6. Each well point consisted of a 30-inch long, 1.25 diameter, stainless steel, slotted drive point, attached to a 1.25 -inch or 2.0-inch diameter galvanized steel riser pipe. The screen sections were driven to depths of between five and ten feet. This depth was chosen so ground-water samples in contact with the demolition debris could be collected. The typical well point screen depth interval is illustrated on Figure 5.

Samples were submitted to North Creek Analytical (Bothell, WA) for analysis of the following constituents:

- Volatile Organic Compounds (EPA Method 8021);
- Polycyclic Aromatic Hydrocarbons (EPA Method 8310 with selected GC/MS confirmation);
- Pesticides/PCBs (EPA Method 8081); and
- Petroleum Hydrocarbons (WTPH-DX)

The ground-water quality data is summarized in attached Table 4.

Volatile Organic Compounds in Ground Water: Ground-water samples collected on October 23 and 24, 1994 from locations MW-1 to MW-16 were analyzed for volatile organic compounds using EPA Method 8021. This method targets 58 compounds including common fuel components and solvents (e.g. benzene, toluene, ethylbenzene, xylenes, tetrachloroethlyene, trichloroethene etc.). A representative laboratory data sheet which shows the compounds analyzed and reporting limits is presented in Appendix B.

The only volatile compound detected in the sixteen samples was naphthalene (Table 4). This compound was detected in six of the sixteen samples at concentrations between 1.9 ug/l to 16 ug/l (Figure 7). The reporting limit for naphthalene was 1 ug/l.

Five of the six detections occurred in samples obtained from the southern portion of the site. The sixth detection was reported for location MW-9 located within the central portion of the site. Naphthalene was not detected in any of the surface water samples collected from the Mercer Slough (Table 1).

The maximum naphthalene concentration of 16 ug/l is well below available cleanup criteria. The detected concentrations are below the MTCA Method B ground-water cleanup level (based on drinking water ingestion) of 32 ug/l (Ecology 1994a) and ambient freshwater chronic criterion of 620 ug/l (EPA 1986).

Polycyclic Aromatic Hydrocarbons (PAHs) in Ground Water: PAHs, not including naphthalene which is discussed above, were detected in samples from three of sixteen locations; MW-1, MW-2, and MW-3 (see Tables 4 and 5). The detected PAH compounds include acenaphthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene. No PAHs were detected in the surface water samples from the Mercer Slough.

Table 5 lists the detected concentrations and possible cleanup levels. Only benzo(k)fluoranthene and chrysene exceed the available cleanup levels (MTCA Method B) which are based on drinking water ingestion. Benzo(k) fluoranthene was detected in one of the sixteen locations (MW-2) at 0.98 ug/l while chrysene was detected in one of the sixteen locations (MW-1) at 1.5 ug/l.

The detected PAHs in the ground-water samples are likely the result of the compounds being present in soil coupled with particulates being entrained in the samples which were submitted to the laboratory for analysis. The issue is further discussed in a following report section.

PCBs/Pesticides in Ground Water: Pesticides were detected in two of sixteen ground-water sampling locations; MW-2 and MW-6 (Table 4). The pesticides 4,4"-DDD, 4,4'-DDE and 4,4'-DDT were detected in MW-2 while 4,4'-DDD was detected in a sample from MW-6.

The available cleanup levels are listed on Table 4. Concentrations of 4,4"-DDD and 4,4"DDE meet the available criteria. The concentration of 4,4'DDT is below the MTCA Method B cleanup level, but exceeds the ambient freshwater chronic criterion for 4,4'-DDT.

The data indicates that the pesticide detections are local in nature. Pesticides were not detected in ground-water samples at locations immediately adjacent to locations MW-2 and MW-6 and were not detected in surface water samples from the Mercer Slough (Figure 8). The pesticides reportedly detected in ground water are different from those detected in the Mercer Slough sediments.

PCBs were intermittently detected in three of eighteen sampling locations; MW-2, MW-6, and MW-10 (Table 4 and Figure 9). The highest concentrations (3.6 ug/l) of total PCBs were detected at location MW-2. Lower concentrations were detected at locations MW-6 (0.16 ug/l) and MW-10 (0.41 ug/l). PCBs were not detected at well point locations which surround the location where the highest PCB concentrations were detected.

The detections of PCBs are intermittent in nature.

- At location MW-2, the 3.6 ug/l detection occurred in a sample obtained on October 23, 1994 and analyzed by North Creek Analytical, Inc. However, no PCBs were detected (reporting limit of 0.1 ug/l) in a sample collected on November 30, 1994 and analyzed by Freidman & Bruya or in a sample collected on April 12, 1995 and analyzed by North Creek Analytical, Inc.

- At location MW-10, no PCBs were detected in a sample collected on October 23 and analyzed by North Creek Analytical, however North Creek reported a concentration of 0.41 ug/l in a sample collected on November 15, 1994. Friedman & Bruya did not detect PCBs in a sample collected on November 30, 1994 and North Creek did not detect PCBs in a sample collected on April 13, 1995 (reporting limit 0.1 ug/l).

The intermittent detections and nature of PCBs (low solubility and mobility in ground-water environments) indicate that the detections were likely caused by particulates entrained in the collected samples and that the results are not representative of dissolved PCBs with the potential to migrate via ground-water flow. This issue is further discussed in a following report section.

Petroleum Hydrocarbons in Ground Water: Petroleum hydrocarbons in ground-water samples were analyzed using the Washington State Method WTPH-DX. This method quantifies diesel range (C12 to C24) and heavy oil range (C24 to C36) hydrocarbons that will elute through a chromatographic column. The results are presented in Table 4.

Petroleum hydrocarbons were reportedly detected in samples from the eighteen well point locations. Diesel range hydrocarbon concentrations ranged from 0.29 mg/l to 5 mg/l, while heavy-oil range hydrocarbons ranged between less than 0.75 mg/l to 41 mg/l. The typical petroleum hydrocarbon cleanup level for petroleum hydrocarbons is 1 mg/l (based on *"prevention of adverse aesthetic characteristics"* - WAC-173-720). Concentrations in eight of the eighteen sample locations are below the typical cleanup level.

Review of the petroleum hydrocarbon data indicate, however, inconsistent concentrations. For example, the initial concentrations (October 94) in MW-2 (4 mg/l-diesel and 16 mg/l- heavy oil) are higher than the concentrations detected in the November 94 sample (0.5 mg/l-diesel and 3.8 mg/l-heavy oil). Conversely, the initial concentrations (October 94) in MW-11 (0.63 mg/l-diesel and 0.96 mg/l-heavy oil) are substantially lower than the concentrations detected in the November 94 sample (5.3 mg/l-diesel and 41 mg/l-heavy oil).

The variable concentrations and nature of "heavier" petroleum hydrocarbons (low solubility and mobility in ground-water environments) indicate that the detections are likely caused by particulates entrained in the collected samples and that the results are not representative of dissolved petroleum hydrocarbons with the potential to migrate via ground-water flow. This issue is further discussed in a following report section.

Results of Soil Sampling

AGRA collected nine samples from five well point locations and four hand auger locations and nine samples from three borings (B-1, B-2 and B-3). All the samples were analyzed for petroleum hydrocarbons using WTPH-DX. The samples from the borings were also analyzed for PCBs and volatile hydrocarbons (using EPA Method 8021). The results are summarized in Table 6.

Borings B-1, B-2 and B-3 were drilled in the general area where the highest PCB concentrations were detected in a ground-water sample (MW-2). The primary purpose of drilling the borings was to collect and analyze soil samples to provide data to further assess whether PCBs are present at the site. Soil samples were collected using a split-spoon sampler lowered through the center of a hollow stem auger.

Volatile Organic Compounds in Soil: Three samples (one from each boring) were analyzed for the 58 volatile organic compounds targeted using EPA Method 8021. As indicated in Table 6 and Figure 10, no volatile organic compounds were detected in the samples analyzed.

PCBs in Soil: PCBs analyses were made of nine samples collected from the borings. The results of the analyses are summarized in Table 6 and Figure 10.

PCBs were detected in five of the nine samples analyzed. Detected concentrations ranged between 0.11 mg/kg to 0.75 mg/kg which are below the MTCA Method A cleanup level for residential sites of 1.0 mg/kg (WAC 173-340-740). PCBs were detected in samples collected from depths of up to 20 feet.

Petroleum Hydrocarbons in Soil: The results of the petroleum hydrocarbon analyses are summarized in Table 6 and on Figure 11. Petroleum hydrocarbon concentrations in soil samples collected from the well point and hand auger locations ranged between 40 mg/kg and 750 mg/kg for diesel range hydrocarbons and 240 mg/kg to 920 mg/kg for heavy-oil range hydrocarbons. Concentrations of petroleum hydrocarbons in the boring samples ranged between 45 mg/kg and 1,400 mg/kg for diesel range hydrocarbons and 440 mg/kg to 9,900 mg/kg for heavy-oil hydrocarbons. Ten of the eighteen diesel-range sample results and all of the heavy oil range sample results are above the MTCA Method A cleanup level of 200 mg/kg which was set to protect ground-water quality (WAC 173-340-740).

In seventeen of the eighteen samples (approximately 94%), the petroleum hydrocarbons are primarily composed of heavy-oil hydrocarbon. As shown on Table 6, heavy oil hydrocarbons comprise approximately 80% to 93% of the hydrocarbons detected in the samples. In only one sample (SS5/WP15), do the lighter diesel range hydrocarbons comprise a majority of hydrocarbons present.

Discussion of PCB and Petroleum Hydrocarbon Detections in Ground Water

The variability in the analytical results for PCBs and petroleum hydrocarbons, and the solubility/migration characteristics of these compounds indicate that the sampling procedures used during the environmental assessments effected the analytical results. The samples sent to the laboratories were reportedly "turbid" and because PCBs and petroleum hydrocarbons were detected in site soils, the analytical results likely do not reflect the concentrations of dissolved constituents in ground water. PCBs and hydrocarbons (especially heavy oil hydrocarbons) absorb onto soil particles and will be "extracted" from the particles during sample preparation.

The PCB issue was addressed by AGRA and the two analytical laboratories involved in the project (North Creek Analytical, Inc, and Friedman & Bruya, Inc.). The findings of their collective analysis was that the intermittent detections of PCBs in several ground-water samples were *"most likely the result of relic, mobile PCB bearing solid particles (microscopic soil and/or organic particles) suspended in local ground water supplies as the result of soil disturbance during monitoring well installation and are not representative of actual groundwater quality in terms of actual dissolved PCB presence."* A summary of the collective findings are presented in a letter prepared by AGRA to Great Western Bank dated January 13, 1995 (see Appendix C).

To test this finding, Dalton, Olmsted & Fuglevand selected three well locations for resampling using a low flow sampling technique to minimize the suspension of soil particles in the samples submitted to the laboratory for analysis. Wells MW-2, MW-6 and MW-10 were selected to resample because PCBs and relatively high, but variable concentrations of petroleum hydrocarbons were detected in previous samples (see Table 4).

The wells were purged and the samples were obtained using a peristaltic pump. The wells were pumped at a rate of approximately 0.25 liters per minute. During pumping, samples were obtained and field electrical conductivity (Corning Checkmate System) and turbidity (LaMotte Model 2008 Turbidity Meter) measurements were made. When electrical conductivity and turbidity stabilized to within 10%, samples were collected and placed in containers provided by North Creek Analytical, Inc. The filled containers were placed in chilled coolers for transport to the laboratory. Standard chain-of-custody procedures were followed. North Creek Analytical analyzed the samples for PCBs (EPA Method 8081) and petroleum hydrocarbons (WTPH-DX).

Low flow sampling field and laboratory data are summarized in Figure 12 and Table 7. Initial turbidity measurements ranged between 21 and 68 NTUs. After pumping three to seven casing volumes, the final turbidity measurements ranged between 2.9 and 8.3 NTUs. No PCBs or heavy oil hydrocarbons were detected in "low-flow" ground-water samples. Diesel range hydrocarbons were detected at concentrations of between 0.32 and 0.69 mg/l. The diesel range hydrocarbon concentrations are below the MTCA Method A ground-water cleanup criteria of 1 mg/l.

Table 7 - Low flow Sampling Data

Parameter	MW-2	MW-6	MW-10
Conductivity (umohos)	329	754	172
Turbidity (NTUs)	4.9	2.9	8.3
Casing Volumes Purged	7	3	5
Petroleum Hydrocarbons			
Diesel Range (mg/l)	0.4	0.69	0.32
Heavy Oil Range (mg/l)	<0.75	<0.75	<0.75
PCBs (ug/l)	<0.10	<0.10	<0.10

The concentrations of petroleum hydrocarbons and PCBs reported for the low flow sampling event are substantially lower than those previously reported and are more consistent with what would be expected based on the nature of these constituents. For example, two previous analyses of heavy oil hydrocarbons in samples from MW-2 indicated concentrations of 3.8 mg/l and 41 mg/l (see Table 4). Heavy oil petroleum hydrocarbons were not detected in the low flow sample from MW-2 (Table 7). Similar results are indicated by the analyses for MW-6 and MW-10.

Based on this data we conclude that the analyses which detected PCBs and the relatively high concentrations of petroleum hydrocarbons were influenced by the turbidity of the samples and do not represent the concentrations of these constituents which will migrate into the slough via ground-water flow. The variability of the previous results was likely caused by the variability in turbidity of the samples.

Site Characterization Summary and Contaminant Sources

Characterization Summary: The comparison of soil and ground-water quality data with potential cleanup levels indicates that petroleum hydrocarbons and PCBs are of potential concern at the Bellefield Office Park site. Other constituents (volatiles organic compounds, PAHs and pesticides) were either not detected; were detected below potential cleanup levels (e.g. naphthalene); or were detected at only one location at a relatively low concentration (e.g. 4,4'-DDT).

PCBs and the highest concentrations of petroleum and hydrocarbons were detected within the southern portion of the site near borings B-1, B-2 and B-3. PCBs were detected in soil to a depth of 20 feet but at concentrations less than the MTCA Method A cleanup level of 1 mg/kg (Table 6). Diesel range hydrocarbons were detected at concentrations between 45 mg/kg and 1,400 mg/kg while heavy oil hydrocarbons were detected at concentrations between 440 mg/kg and 9,900 mg/kg. These concentrations exceed the Method A criteria of 200 mg/kg, which was set to protect ground-water quality.

Lower concentrations of petroleum hydrocarbons were detected elsewhere on the property. Diesel range hydrocarbon concentrations were detected at concentrations of between 40 mg/kg and 730 mg/kg while heavy oil hydrocarbons were detected between 240 mg/kg and 920 mg/kg.

At most locations on the property, over 80% of the petroleum hydrocarbons are composed of heavy oil hydrocarbons greater than carbon range C24.

Contaminant Sources: The source of PCBs to soil beneath the site is material that was deposited with the demolition debris in the landfill. There is no evidence to suggest that the PCBs originated as a surface spill that migrated from the surface into the subsurface.

In late November 1994, AGRA collected several soil and ground water samples to assess the origins of the petroleum hydrocarbons, including whether some of the hydrocarbons were naturally occurring biogenic material. The samples were submitted to Friedman & Bruya, Inc. for analysis and included the following:

- Ground-water samples from wells MW-2, MW-10, and MW-11; and
- Soil samples from borings B-1 and B-2 (SS-10, B-1, SS-11, B-2).

The results of their analyses are presented in Appendix D and are summarized below:

The samples were initially subjected to gas chromatography (GC) analysis using a flame ionization detector (FID). This analysis indicated the presence of heavy petroleum fractions in all samples, with some variation. These variations included identification of a medium distillate in water from MW-11 and some prominent peaks in soil sample SS-10 B1.

To further differentiate the hydrocarbons, fingerprint GC analysis coupled with Mass Spectrophometry (MS) was used.

- The GC/MS analysis detected the presence of pyrolysis by-products and polynuclear aromatic hydrocarbons (PAHs) typically associated with asphaltic debris in ground-water samples MW-2 and MW-10 and in soil samples SS-10 B-1.

- Organic acids commonly associated with tar and street runoff were detected in soil samples SS- 10 B1 and SS-11 B-2.

- The medium distillate detected in water sample MW-11 consisted of a highly refined petroleum hydrocarbon such as motor oil and diesel fuel.

Friedman & Bruya concluded that there was little indication of naturally occurring biogenic hydrocarbons in the samples, and that with the exception of the sample from MW-11, the origin of the hydrocarbons appeared to be the result of street run-off. These findings are consistent with the results of the WTPH-D analyses which indicate that over 80% of the petroleum hydrocarbons are in the heavy oil range and the upstream sediment analyses which detected substantial concentrations of petroleum hydrocarbons.

Potential Environmental Impacts: The primary potential receptor of any contamination in soil on the Bellefield Office Park site is aquatic life in the Mercer Slough which might migrate to the slough via ground water flow. PCB concentrations in soil are below potential cleanup

levels and it is unlikely that the ground-water (within the debris/peat deposits) will ever be used for drinking water purposes.

As discussed above, the low flow sampling results indicate that PCBs and most of the petroleum hydrocarbons are not present in the dissolved state and are not available to migrate to the slough via ground water flow. This is supported by the analyses of samples of slough water and sediments (Table 1). No PCBs were detected in either the water or sediment samples and petroleum hydrocarbons were not detected in the water samples.

PREVIOUS INVESTIGATIONS

A variety of investigations have been conducted for various purposes on the Bellefield Office Park:

- In the period of 1969 to 1978, a series of geotechnical reports were prepared by N.H Twelker & Associates, Inc. which present data on the geologic conditions beneath the site. The available reports are cited in the references section of this report.

- In 1986, EPA prepared a Preliminary Site Assessment (PSA) under CERCLA (Federal Superfund program). As described above, this assessment resulted in a **"No Further Action"** recommendation for the Bellefield Office Park.

- In 1989, the Washington State Department of Ecology reviewed existing historical documentation for the site. Based on this review, Ecology **de-listed** the site from Washington State's published list of Confirmed and Suspected Contaminated Sites.

- In 1992, Applied Geotechnology, Inc. prepared a report which summarizes the geologic and hydrologic conditions beneath the site. The report was prepared as part of a pavement rehabilitation project.

- In 1993 and 1994, as part of the real estate transaction between Great Western Savings and Spieker Properties, the consulting firm AGRA (formerly RZA-AGRA) prepared a Phase 1 Environmental Assessment report, dated July 25, 1994, which presents their preliminary evaluation of the site history and environmental conditions.

- In 1994, AGRA completed field testing of surface water and sediment in the Mercer Slough, and soil and ground water on the Bellefield Office Park site. The data collected by AGRA is discussed in this report and is summarized in a Project Executive Summary Report prepared by AGRA, dated December 20, 1994.

- In late 1994 and early 1995, additional sampling was completed by AGRA to further assess the sources of petroleum hydrocarbons and detections of PCBs in ground water samples. North Creek Analytical and Friedman & Bruya assisted AGRA in making these

assessments. The results of this work are summarized in letters prepared by AGRA (1995) and Friedman & Bruya (1994).

- In April 1995, Dalton, Olmsted & Fuglevand sampled three wells to further assess the dissolved concentrations of petroleum hydrocarbons and PCBs in ground water using low-flow sampling techniques. This work is described in this report.

SELECTION OF CLEANUP STANDARDS

Cleanup standards referenced in this report are based on the Model Toxics Control Act (MTCA) 173-340 WAC. Both Method A and Method B for soil (WAC 173-340-740) and ground water (WAC 173-340-720) were used.

In addition, available Ambient Water Quality Criteria published by EPA (1986) were compared to the environmental data. This is consistent with WAC 173-340-730 of the MTCA.

REMEDIAL ACTIONS AND RATIONALE

Based on the site characterization data, remedial action at the site has not been recommended:

- The Bellefield Office Park is located in an area which has received in the past and currently receives regional road runoff. This runoff contains petroleum hydrocarbons.

- PCB concentrations in soil are less than the MTCA Method A cleanup criteria of 1 mg/kg.

- Petroleum hydrocarbons which exist in soil are capped by 2 to 3 feet of fill soils, parking lots, and roadways.

- There is little evidence that contaminants are migrating to the Mercer Slough. Volatile organic compounds, PAHs and pesticides were either not detected; were detected below cleanup levels; or were detected at only one location, at a relatively low concentration in ground-water samples. Testing and evaluation of PCBs and petroleum hydrocarbons in ground water indicate only low concentrations of diesel range hydrocarbons are available to migrate, but are present at concentrations below the MTCA Method A criteria of 1 mg/l.

- Testing of surface water samples from the Mercer Slough did not detect contamination above reporting limits.

SAMPLING AND ANALYSIS

Sampling Procedures

Soil Sampling Methods: The borings were drilled using a hollow-stem auger. The drilling and sampling activities were observed and logged by AGRA representatives. Soil samples were obtained using a 2-inch split-spoon sampler using the Standard Penetration Test (SPT).

During drilling the samplers were decontaminated between each sampling run by scrubbing the sampler with a stiff brush in a mixture of detergent and water followed by consecutive rinses in tap water and distilled water. Down-hole drilling equipment such as rods and casing were decontaminated between drilling locations using a steam cleaner.

Near-surface soil samples were collected from hand-auger borings using stainless steel spoons. The hand auger and associated sampling equipment were decontaminated between sampling locations using similar procedures as for the machine auger borings discussed above.

Representative portions of each recovered sample were placed directly into laboratory prepared glass sample jars and were sealed with a Teflon lined screw cap. After collection, the samples were placed into a chilled cooler for transport to the laboratory. AGRA chain-of-custody procedures were maintained during sample handling.

Well Point Installation Procedures: Well points were installed at eighteen locations within the project site as temporary sampling wells. Each well point consisted of a 30-inch long 1.25 inch diameter, stainless steel, slotted drive point, attached to 1.25 or 2.0 inch diameter galvanized steel risers. These risers were typically five feet in length and were joined to the drive point using a high strength drive coupling.

The well points were advanced using a Portable Penetrating Barrel Sampler (PPBS) drive system. The drive system consists of a hydraulically activated, 90lb jackhammer driven by a gasoline powered hydraulic pump. The well points were driven into the ground to the desired depth or until refusal was encountered. Well point refusal was defined as less than 1-inch penetration per minute of driving. If refusal was encountered at a depth of less than five feet, the location of the well point was shifted and redriven. Conversely, if refusal was encountered at a depth greater than five feet, the well points were left in place.

The well points and casings were cleaned prior to insertion by scrubbing with a stiff brush with a solution of phosphate-free detergent and warm water. After washing, the points were rinsed with potable water, methanol or acetone, and finally deionized water.

Well Point Development and Sampling: Upon completion of the well point installation, each well was developed by removing five to seven casing volumes using a 1-inch diameter reusable stainless steel bailer. Prior to collecting samples from each well, AGRA, purged an additional three to five casing volumes.

Samples collected by AGRA were obtained using a stainless steel bailer. After collection, samples were placed in containers provided by the receiving laboratory. Samples were transported to the laboratory in chilled coolers using standard chain-of-custody procedures.

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TABLE 1 - Results of Mercer Slough Bottom Sediment and Surface Water Analyses

Bellefield Office Park
Bellevue, Washington

	Sediment Samples (mg/kg)			Surface Water Samples (mg/l)	
	Upstream(1)	Upstream(2)	Downstream(3)	West Water	East Water
Description	clean sand	silts, clays, organics		---	---
pH	---	---	6.6	7.2	7.2
WTPH-DX					
Diesel	18	480	2400	<0.25	<0.25
Heavy Oil	110	2900	2300	<0.75	<0.75
Volatiles (8240)	---	---	nd	nd	nd
Semivolatiles (8270)					
Benzoic Acid	<0.5	---	1.9	<0.01	<0.01
Benzo(a)anthracene	0.11	---	<0.1	<0.005	<0.005
Benzo(b)fluoranthene	0.21	---	<0.1	<0.005	<0.005
Benzo(ghi)perylene	0.1	---	<0.1	<0.005	<0.005
Benzo(a)pyrene	0.14	---	1.8	<0.005	<0.005
Chrysene	0.18	---	<0.1	<0.005	<0.005
Fluoranthene	0.29	---	<0.1	<0.005	<0.005
Phenanthrene	0.16	---	<0.1	<0.005	<0.005
Pyrene	0.29	---	<0.1	<0.005	<0.005
Others	nd	---	nd	nd	nd
Pesticides/PCBs (8081)					
Dieldrin	<0.002	---	0.0037	<0.00007	<0.00007
Heptachlor	<0.001	---	0.0062	<0.00004	<0.00004
Chlordane (technical)	0.0046	---	<0.001	<0.00015	<0.00015
PCBs	----	----	<0.005	<0.005	<0.005
Others	nd	---	nd	nd	nd
Phenols (420.1)	---	---	<0.5	<0.025	<0.025
Metals (6010/7000)					
Chromium	---	---	38	<0.01	<0.01
Copper	---	---	16	<0.02	<0.02
Zinc	---	---	37	<0.01	<0.01

Notes:

(1) - North H2O (soil) - on laboratory sheets

(2) - sed-upstream - on laboratory sheets

(3) - South Soil on laboratory sheets

(4) - antimony, arsenic, beryllium, cadmium, lead, mercury, nickel, selenium, silver, and thallium were analyzed but were not detected.

---- - not analyzed

nd - not detected

TABLE 4 - SUMMARY OF GROUND-WATER QUALITY DATA

Bellefield Office Park
Bellevue, Washington

	WTPH-DX (mg/l)		WTPH-DX (mg/l)		WTPH-DX (mg/l)		WTPH-DX (mg/l)		Sampled Oct. 23/24, 94								
Date	Oct. 23/24, 94		Nov. 4, 94		April 12/13, 95		Nov. 14, 94(11)		Volatiles (8021) (ug/l)		Sum PAHs	PCBs/Pest.- 8081(ug/l)(8)					
Well	Diesel	Heavy Oil	Diesel	Heavy Oil	Diesel	Heavy Oil	Diesel	Heavy Oil	Naphthalene	Others	(ug/l)	4,4'-DDD	4,4'-DDE	4,4'-DDT	PCB-1242	PCB-1254	PCB-1260
MW-1	0.34	<0.75	----	----	----	----	----	----	<1	nd	4.9(3)	<0.08	<0.06	<0.18	<1	<1	<1
MW-2	4	16	----	----	0.5(7)	3.8(7)	0.40	<0.75	<1	nd	20.1(3)	**0.34**	**0.043**	**0.12**	**1.5(9)(10)**	**1.7(9)(10)**	**0.42(9)(10)**
MW-3	1.1	1.7	0.79(7)	0.95(7)	0.89	4.6	----	----	6.2	nd	3.6(3)	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-4	0.37	<0.75	----	----	----	----	----	----	1.9	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-5	0.27	<0.75	----	----	----	----	----	----	1.4	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-6	2.1	4.8	0.81(7)	1.3(7)	1.1	1.8	0.69	<0.75	2.4	nd	nd(1)	**0.042**	<0.03	<0.09	<0.1	**0.16**	<0.1
MW-7	1.7	4.2	0.4(7)	0.75(7)	1.8	13	----	----	16	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-8	0.89	0.75	----	----	0.85(7)	2.5(7)	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-9	0.76	0.77	----	----	----	----	----	----	2.8	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-10	2.3	5.9	----	----	1.3(7)	2.3(7)	0.32	<0.75	<1	nd	----	<0.08	<0.06	<0.18	0.1(8)(9)	**0.41(8)(9)**	0.1(8)(9)
MW-11	0.63	0.96	----	----	5.3(7)	41(7)	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-12	0.53	<0.75	----	----	----	----	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-13	0.74	<0.75	----	----	----	----	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-14	0.94	1.3	0.4(7)	0.75(7)	0.29(7)	1.4(7)	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-15	0.61	<0.75	----	----	----	----	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-16	0.44	<0.75	----	----	----	----	----	----	<1	nd	nd	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-17	----	----	----	----	0.67	3.40	----	----	----	----	----	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
MW-18	----	----	----	----	0.79	3.60	----	----	----	----	----	<0.04	<0.03	<0.09	<0.1	<0.1	<0.1
Cleanup Levels(2)																	
MTCA Method A	1	1	1	1	1	1	1	1	na	---	(3)	na	na	0.1	0.1	0.1	0.1
MTCA Method B	na	na	na	na	na	na	na	na	32	---	(3)	0.37	0.26	0.26	0.01	0.01	0.01
Freshwater Criteria(4)	na	na	na	na	na	na	na	na	620	---	(3)	na	1050(5)	0.001	0.014(6)	0.014(6)	0.014(6)

Notes:

(1) - Matrix interference caused relatively high reporting limit

(2) - MTCA Levels based on drinking water exposure

(3) - see Table 3

(4) - Freshwater chronic criteria

(5) - Freshwater acute criteria

(6) - For PCB mixtures

(7) - Samples obtained in new well points installed at approximately the same location because of TPH detections in well pipe rinsate blanks.

(8) - Sample for MW-10 pesticide/PCB analysis was collected on 11-15-94. PCB 1254 was not detected in a sample collected on October 23, 1994.

(9) - PCBs were not detected in samples collected on November 30, 1994 and analyzed by Friedman & Bruya, Inc.

(10) - PCBs were not detected in samples collected on April 12 and 13, 1995 using low flow sampling techniques.

(11) - Samples were obtained using a low flow sampling technique (see text)

na - not available

nd - not detected

---- - not tested

TABLE 5 - Results of PAH Analyses in Ground-Water

Bellefield Office Park
Bellevue, Washington

	MW-1	MW-2		MW-3		MTCA-Method B	Freshwater
EPA Method	8310	8310	8270	8310	8270	(ug/l)	Criteria (1)
Acenaphthene	<5	<5	<5	<5	5.7	960	520
Benzo(ghi) perylene	<0.1	2.1	<5	<0.1	<5	na	na
Benzo(k)fluoranthene	<0.1	0.98	<5	<0.1	<5	0.1(4)	na
Chrysene	1.5	<0.1	<5	<0.1	<5	0.1(4)	na
Fluoranthene	2.2	7.7	5.8	1.8	<5	640	3980(2)
Phenanthrene	<5	<5	5.3	<5	<5	na	6.3(3)
Pyrene	1.2	9.3	10.2	1.8	<5	480	na

(1) - Freshwater Chronic Criteria

(2) - Freshwater Chronic Criteria not available. Indicated value is the freshwater acute criteria

(3) - Proposed Criterion

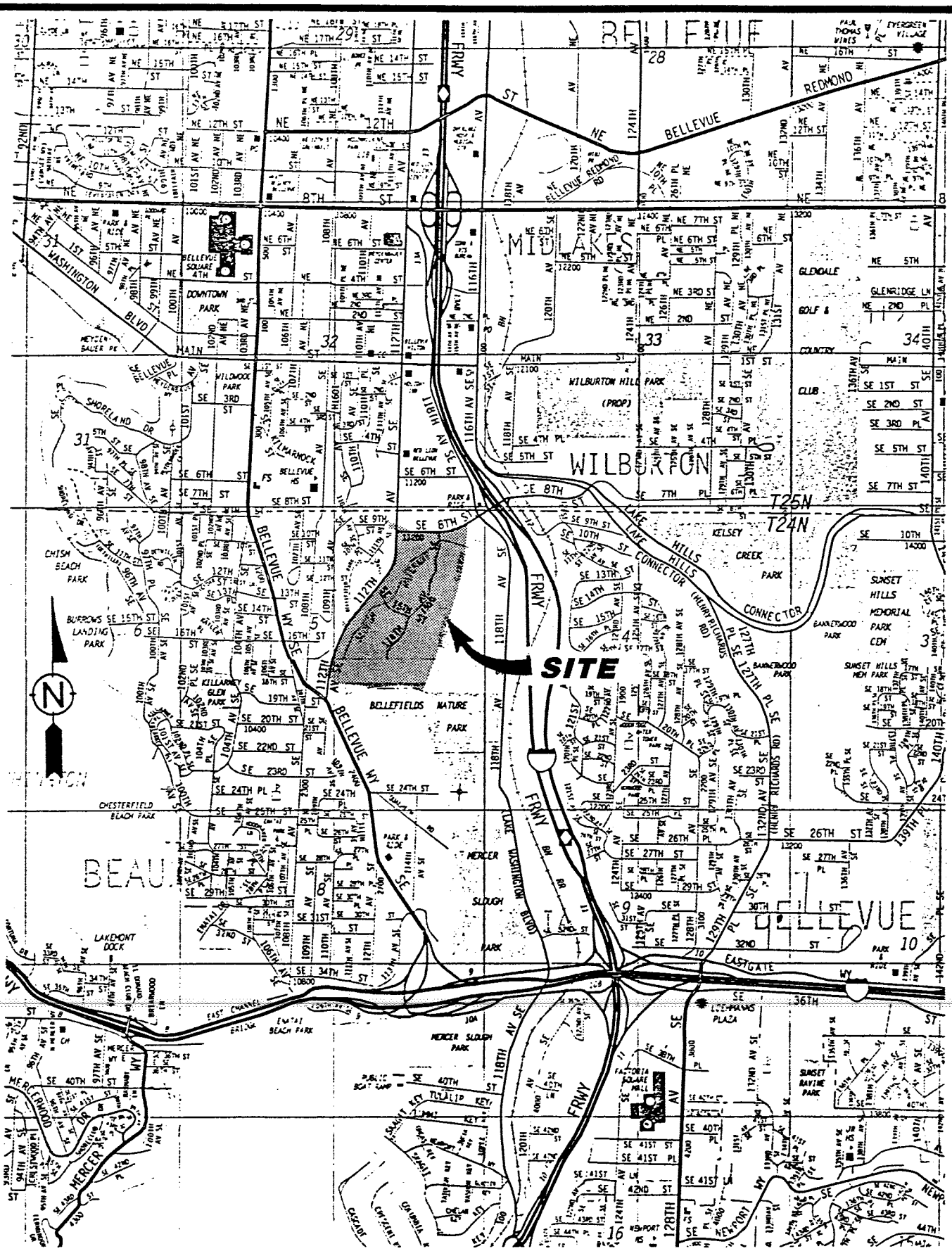
(4) - MTCA Method A Criteria

Sample Number	Depth (Feet)	WTPH-DX (mg/kg)		Percent Heavy Oil	PCBs (mg/kg)	Volatiles 8021
		Diesel	Heavy Oil			
SS-1/WP-12	<5	40	300	88.2	----	----
SS-2/WP14	<5	46	290	86.3	----	----
SS-3/WP-6	<5	60	340	85.0	----	----
SS-4/WP-10	<5	130	490	79.0	----	----
SS-5/WP-15	<5	730	240	24.7	----	----
SS-6	<5	95	710	88.2	----	----
SS-7	<5	110	920	89.3	----	----
SS-8	<5	78	390	83.3	----	----
SS-9	<5	97	590	85.9	----	----
B1/S3	7.5	1400	9900	87.6	0.34	nd
B1/S6	15	120	1500	92.6	<0.05	----
B1/S7	17.5	210	2700	92.8	<0.05	----
B2/S1	2.5	190	1800	90.5	<0.05	----
B2/S4	10	130	1600	92.5	<0.05	nd
B2/S8	20	530	2300	81.3	0.31	----
B3/S1	2.5	45	440	90.7	0.11	----
B3/S3	7.5	1200	5200	81.3	0.66	nd
B3/S7	17.5	1000	5000	83.3	0.75	----
Cleanup Levels(1)						
MTCA Method A	----	200	200		1	----
MTCA Method B	----	----	----		0.13	----

(1) - Model Toxics Control Act Cleanup Levels and Risk Calculation (CLARC II) Update August 31, 1994

---- - not analyzed

nd - not detected



RZA-AGRA
ENGINEERING & ENVIRONMENTAL SERVICES

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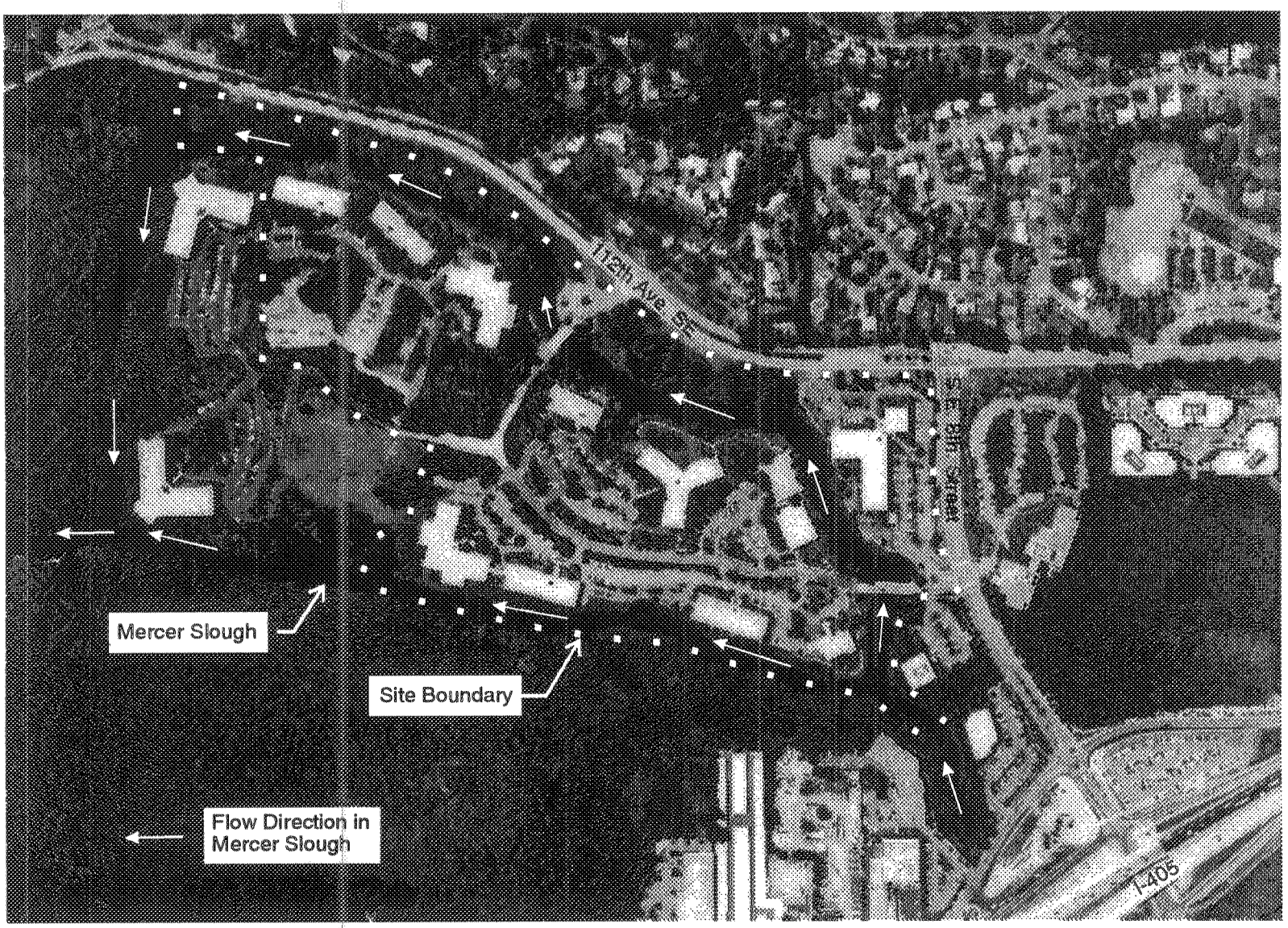
Kirkland, Washington
98034-6918

W.O. ____3____
DESIGN SST
DRAWN DMW
DATE JAN 1994
SCALE N.T.S.

BELLEFIELD OFFICE PARK
11201 SOUTHEAST 8th STREET
BELLEVUE, WASHINGTON

LOCATION MAP

FIGURE 1



Air Photo - Bellevue - 1994
Source - Digital Geographic Systems
(Eugene, OR)

N

0 250 500
Scale in Feet
(approximate)

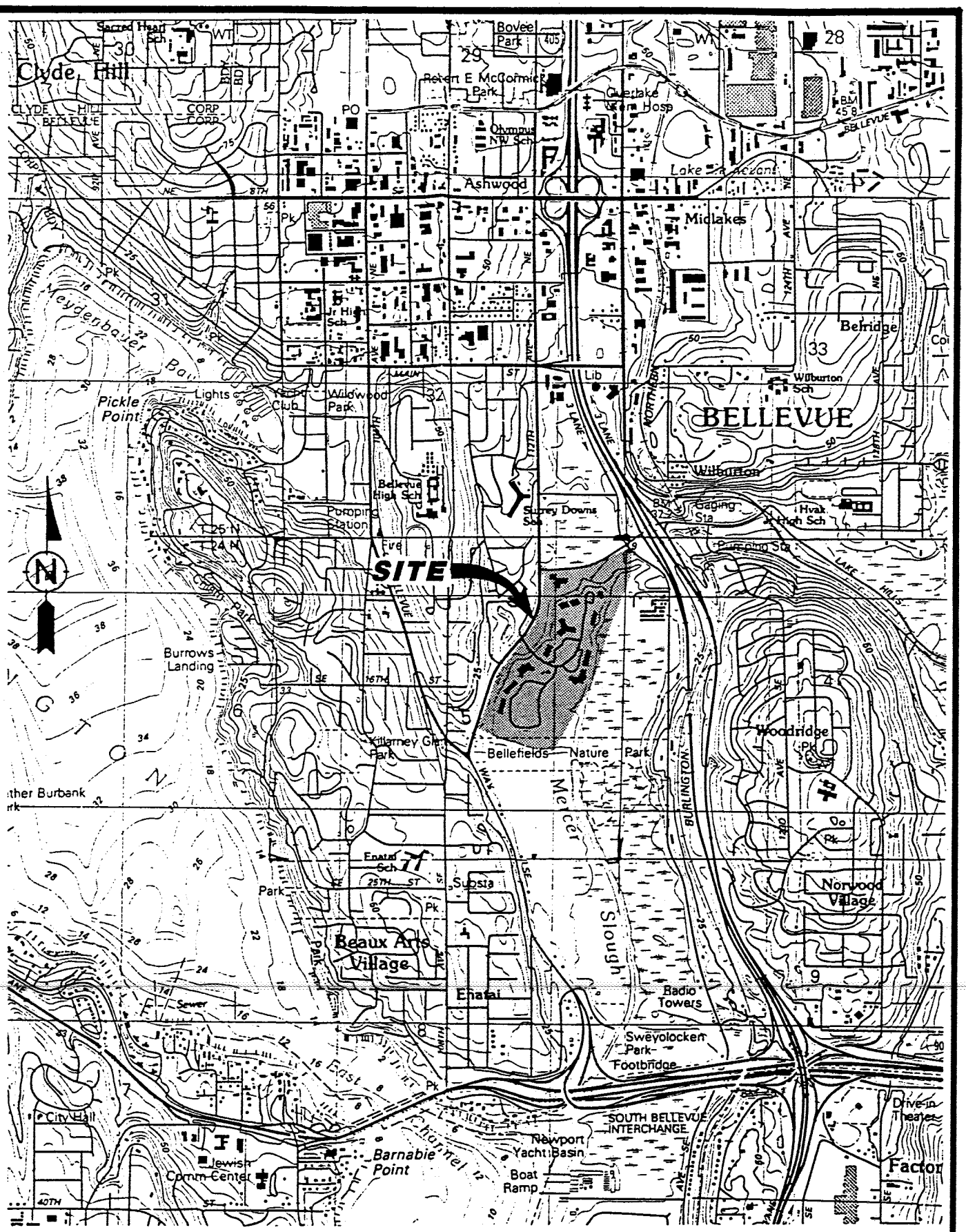
ref: sitefea.cdr

Bellefield Office Park
Bellevue, Washington

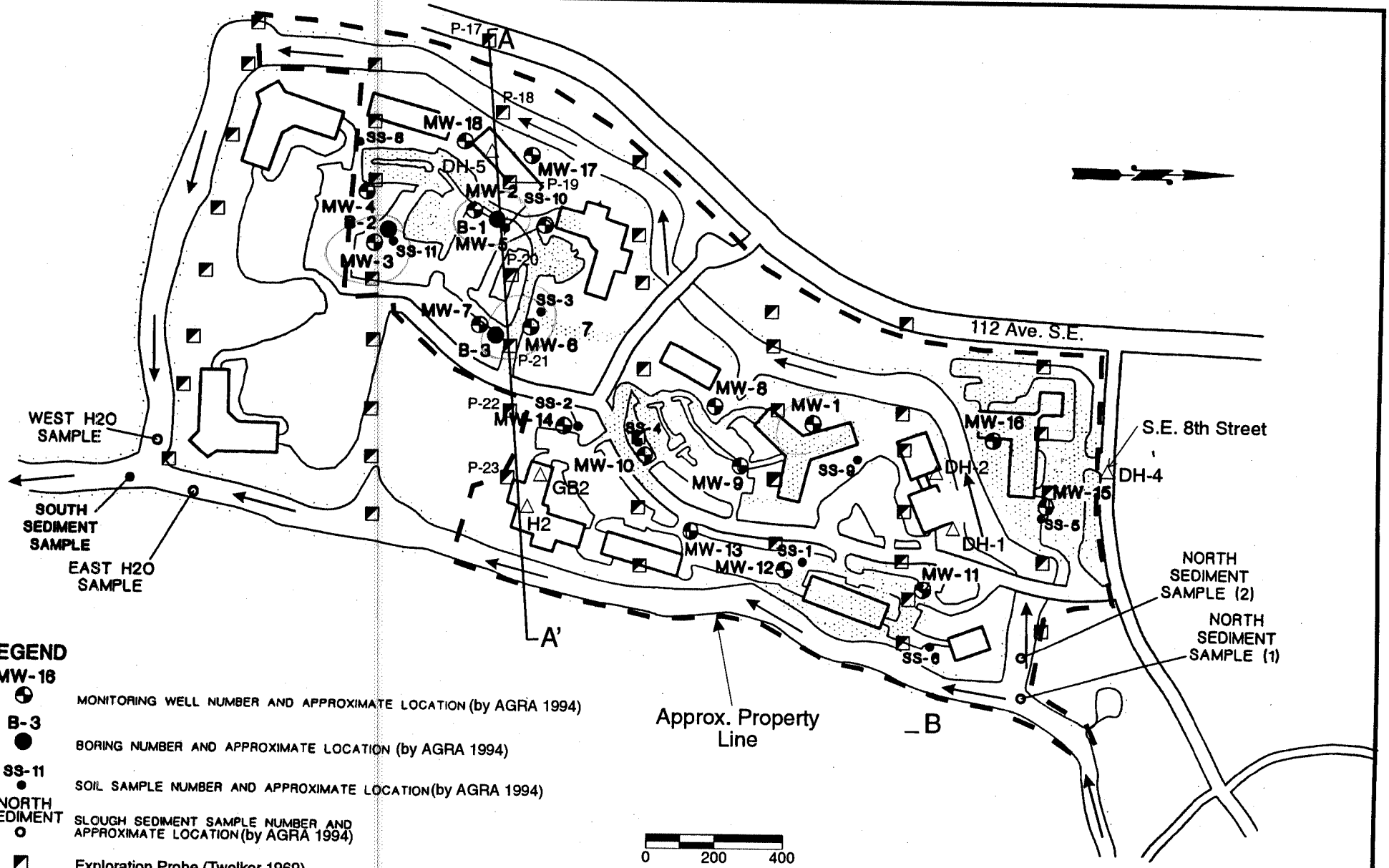
SITE FEATURES

HEW-020 **FIGURE 2** March 1995

Dalton, Olmsted & Fuglevand, Inc.



RZA-AGRA ENGINEERING & ENVIRONMENTAL SERVICES *11335 N.E. 122nd Way* *Suite 100* *Kirkland, Washington* *98034-6918*	W.O. _____ DESIGN SST DRAWN DMW DATE JAN 1994 SCALE N.T.S.	**BELLEFIELD OFFICE PARK** **11201 SOUTHEAST 8th STREET** **BELLEVUE, WASHINGTON** **TOPOGRAPHIC MAP** **FIGURE 3**



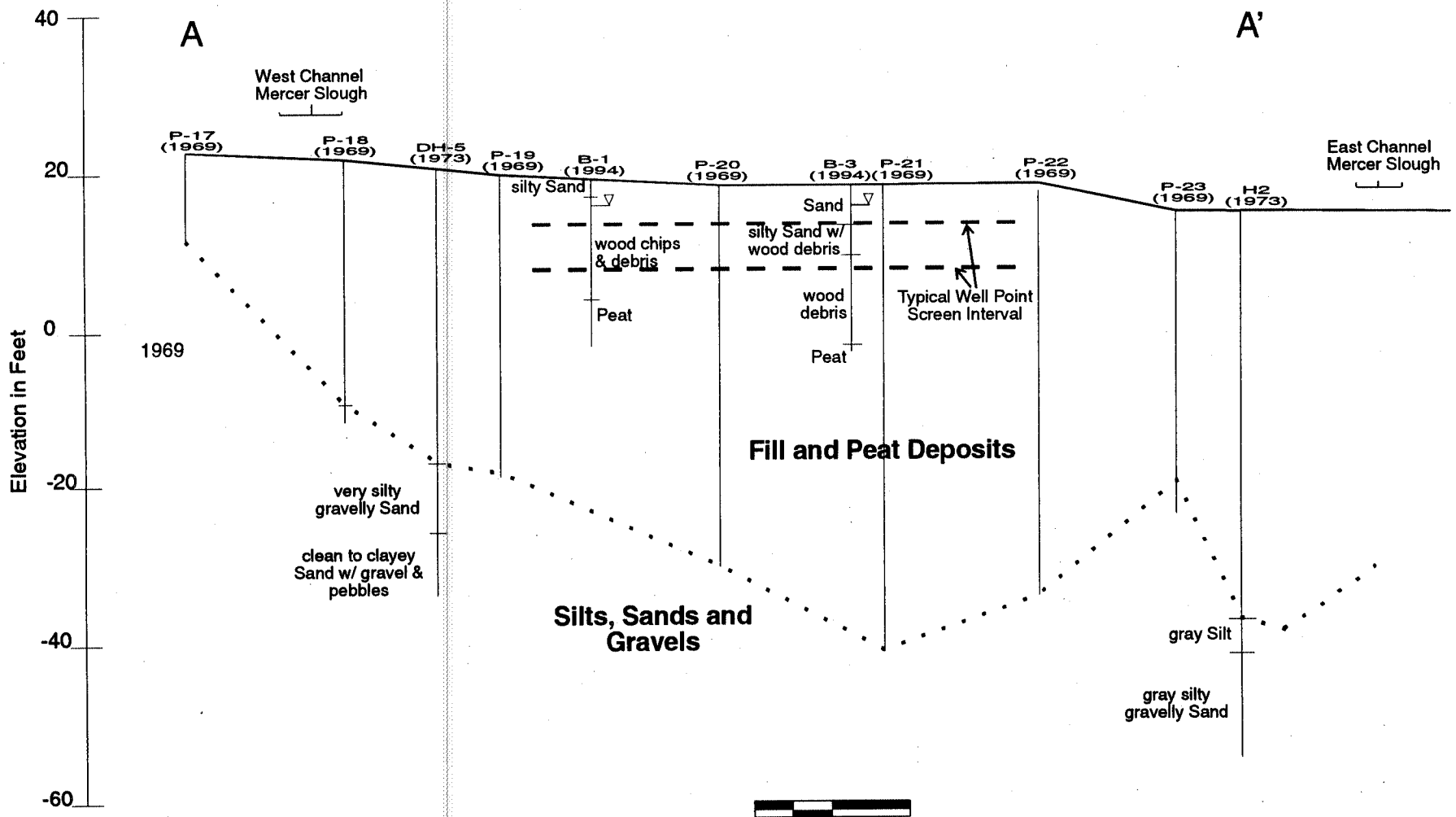
site4.cdr

Bellefield Office Park
Bellevue, Washington

Geologic Section Trends

HEW-020 **FIGURE 4** March 1995

Dalton, Olmsted & Fuglevand, Inc.



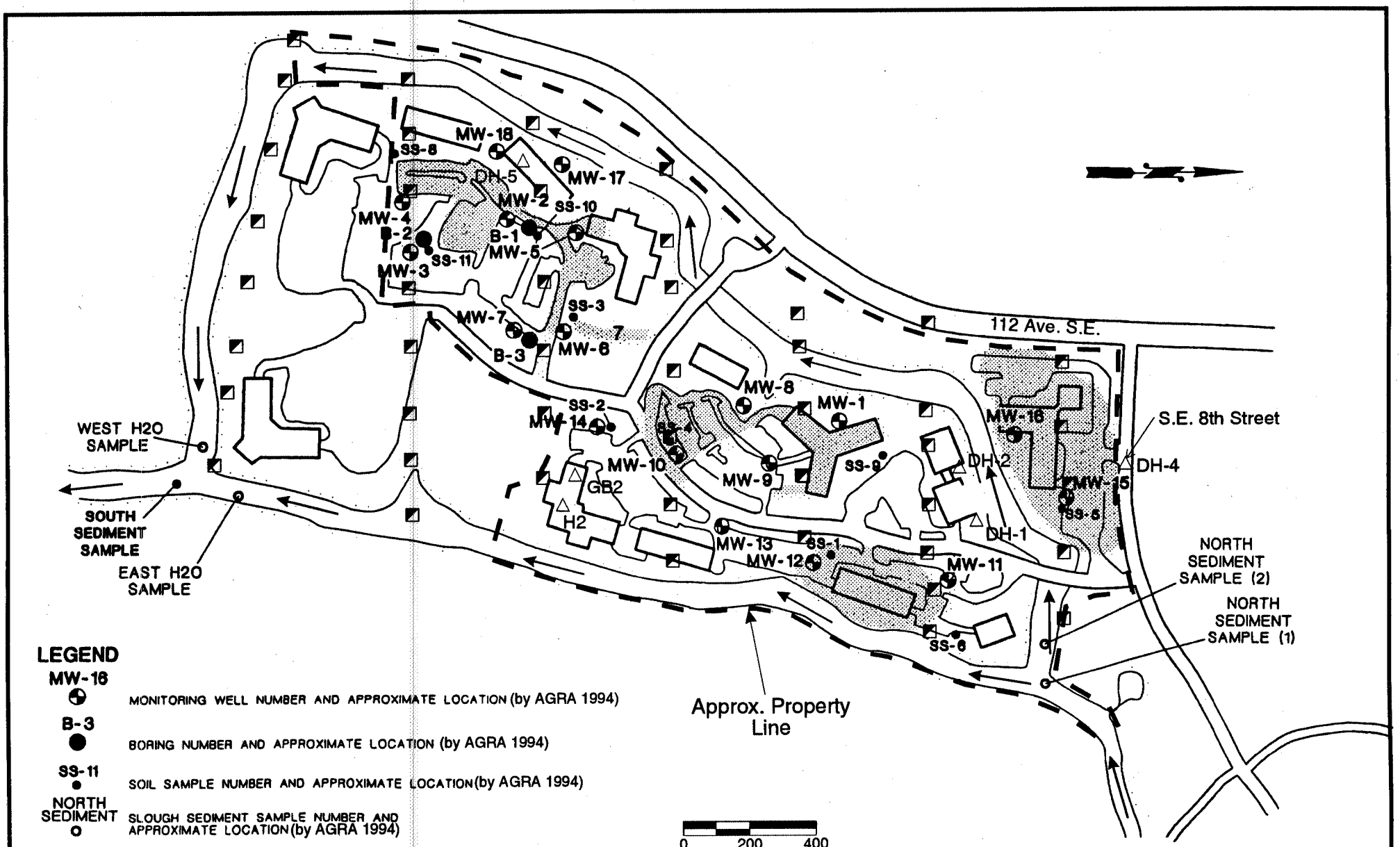
Note: Geologic relationships are approximate because of changes in conditions by filling, peat compression, etc. during the time period between the drilling of probes and borings (1969 to 1994).

Bellefield Office Park
Bellevue, Washington

GEOLOGIC SECTION A-A'

HEW-020 **FIGURE 5** March 1995

Dalton, Olmsted & Fuglevand, Inc.



LEGEND

- MW-16 — MONITORING WELL NUMBER AND APPROXIMATE LOCATION (by AGRA 1994)
- B-3 — BORING NUMBER AND APPROXIMATE LOCATION (by AGRA 1994)
- SS-11 — SOIL SAMPLE NUMBER AND APPROXIMATE LOCATION (by AGRA 1994)
- NORTH SEDIMENT — SLOUGH SEDIMENT SAMPLE NUMBER AND APPROXIMATE LOCATION (by AGRA 1994)
- SUSPECTED AREAS IDENTIFIED BY PARK MAINTENANCE
- Exploration Probe (Twelker 1969)
- Selected Boring Location (Twelker 1972;1973;1978)
- Surface Water Flow Direction

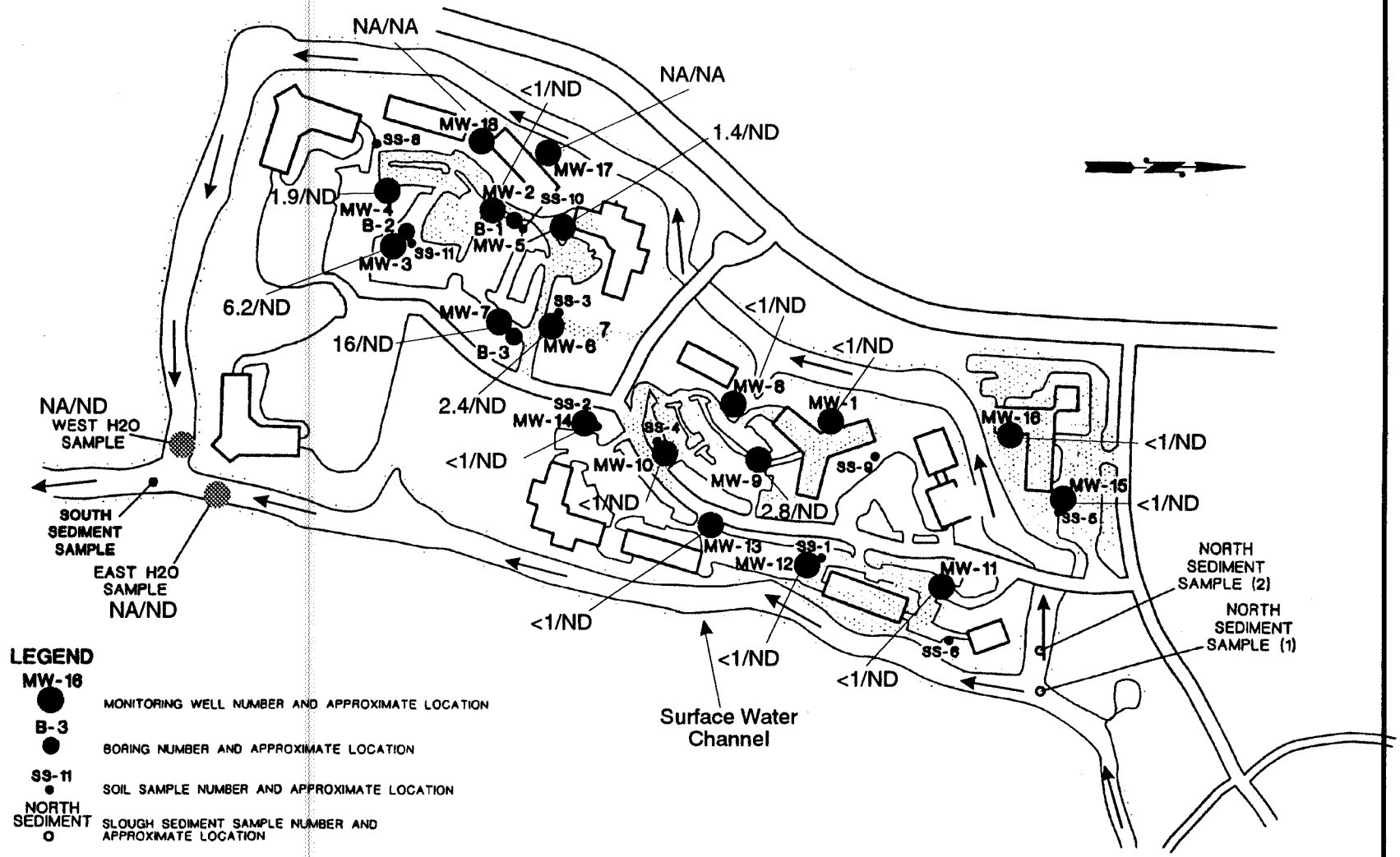
site1.cdr

Bellefield Office Park
Bellevue, Washington

Exploration/Sample Location Map

HEW-020 **FIGURE 6** March 1995

Dalton, Olmsted & Fuglevand, Inc.

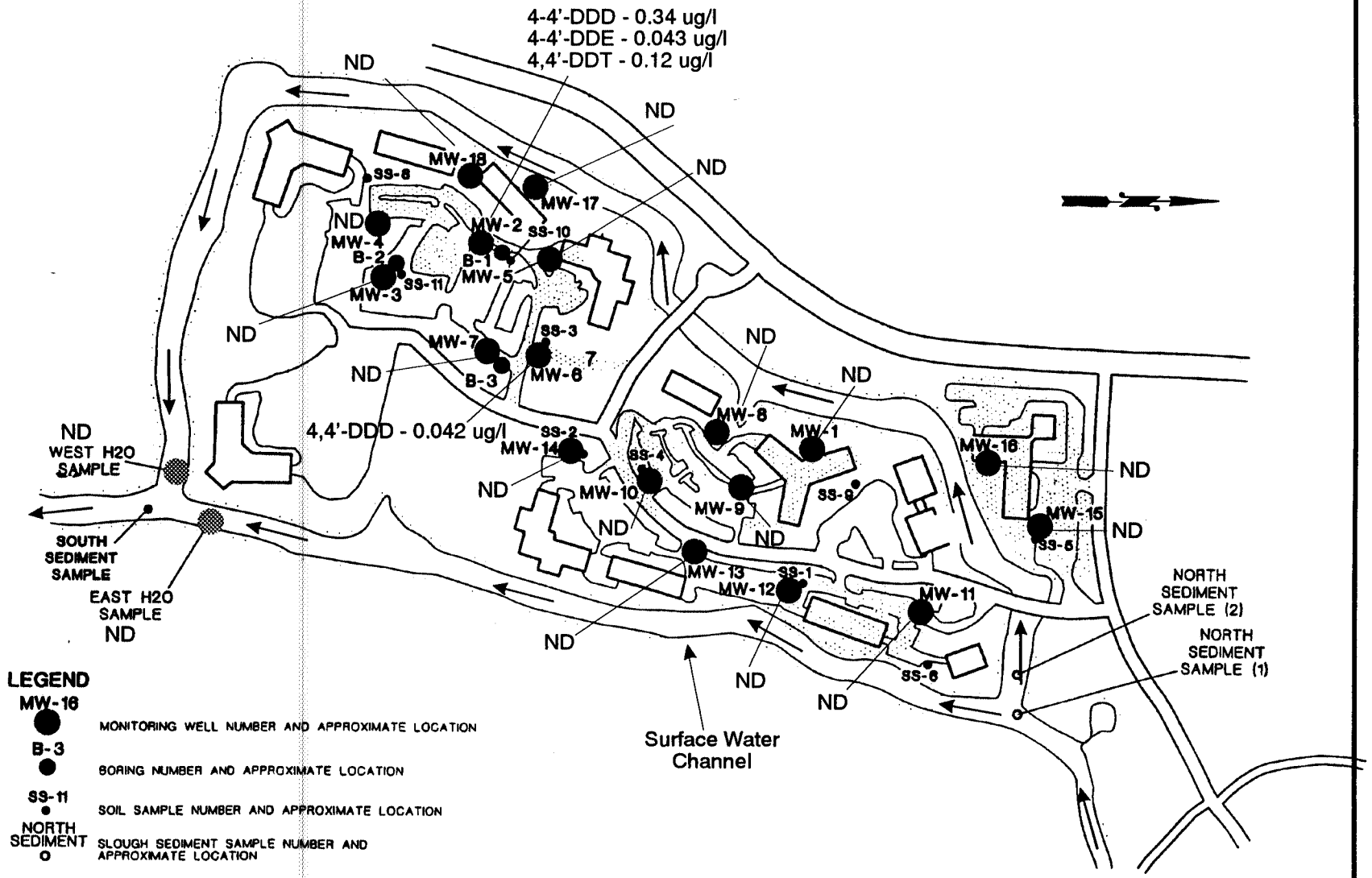


Bellefield Office Park
Bellevue, Washington

Naphthalene/Volatile Concentrations In Surface and Ground Water

HEW-020 **FIGURE 7** April 95

Dalton, Olmsted & Fuglevand, Inc.



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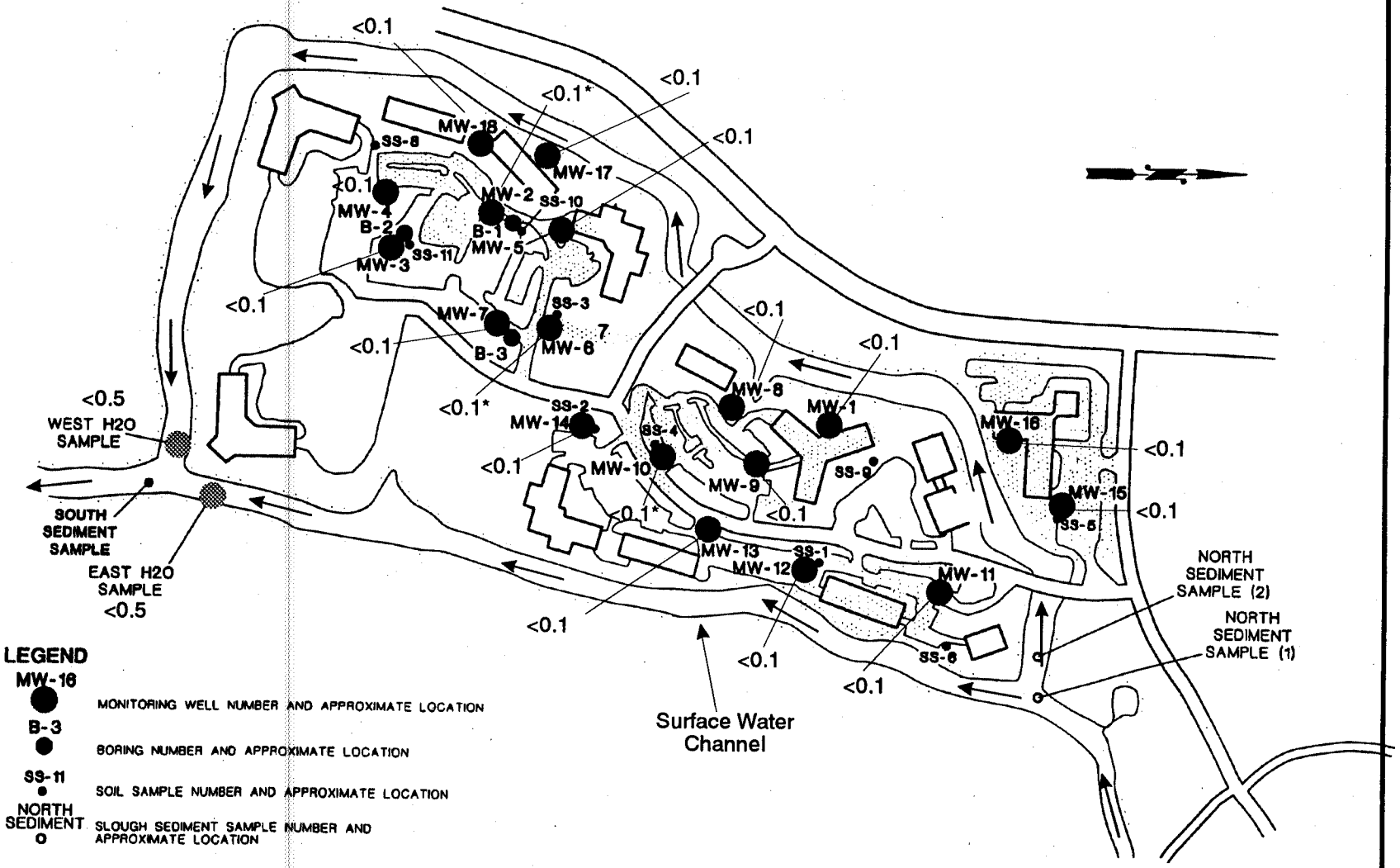
Bellevue, Washington

Pesticide Concentrations in Surface and Ground Water

HEW-020 **FIGURE 8** April 95
Dalton, Olmsted & Fuglevand, Inc.



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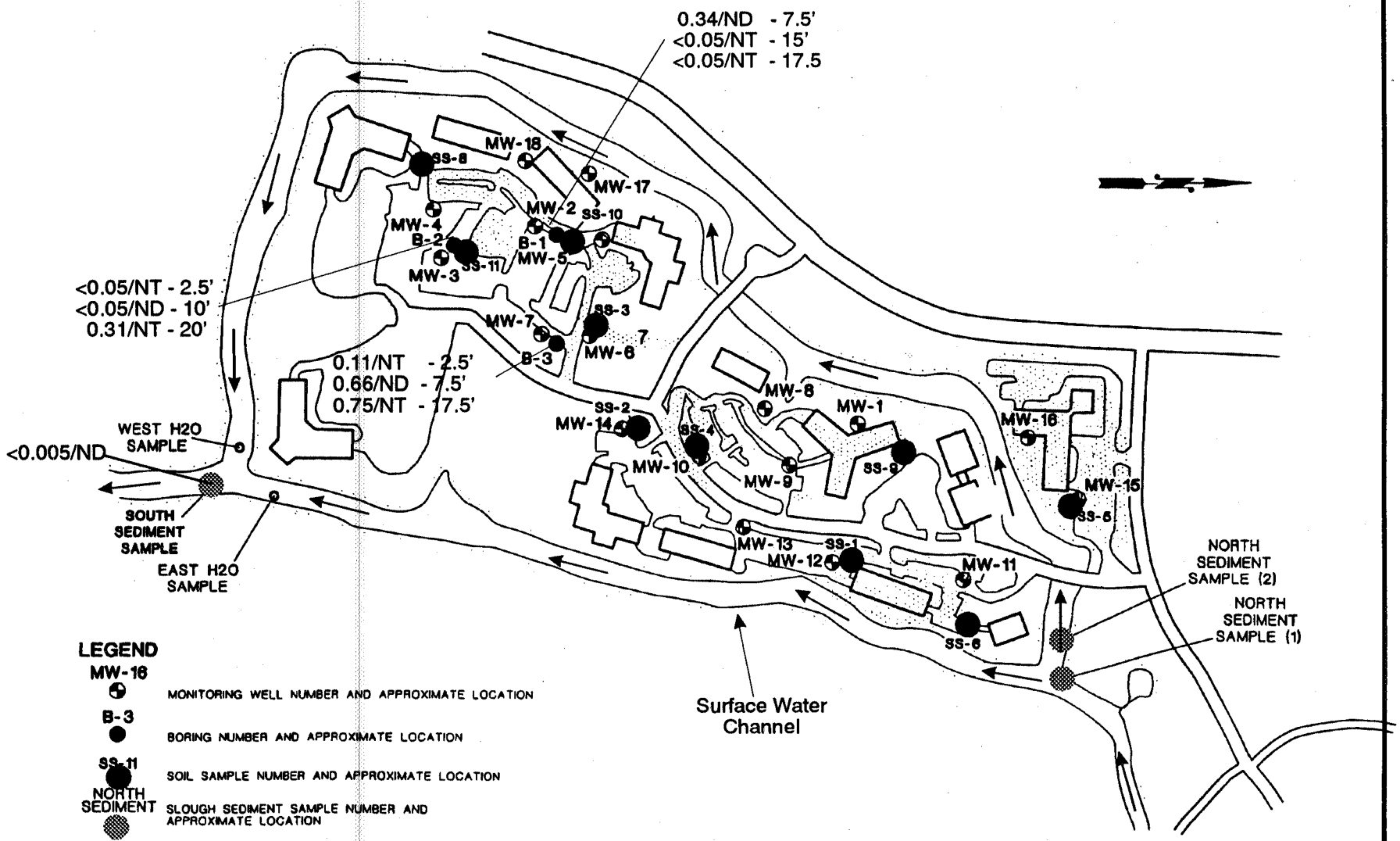
Bellevue, Washington

PCB Concentrations In Surface and Ground Water

HEW-020 **FIGURE 9** April 95

Dalton, Olmsted & Fuglevand, Inc.



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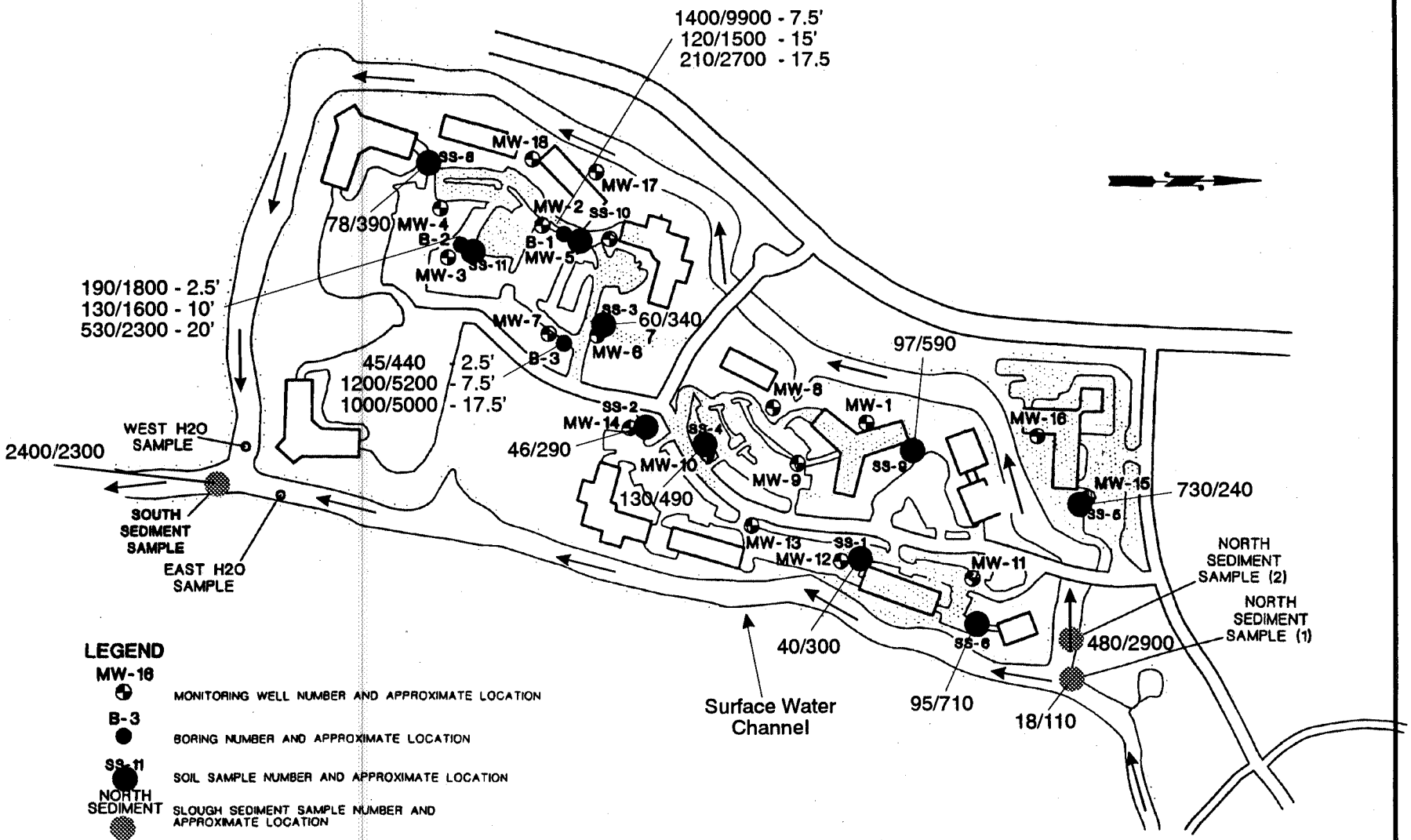
Bellevue, Washington

PCB/Volatile Concentrations in Sediment and Soil

HEW-020 **FIGURE 10** April 95

Dalton, Olmsted & Fuglevand, Inc.



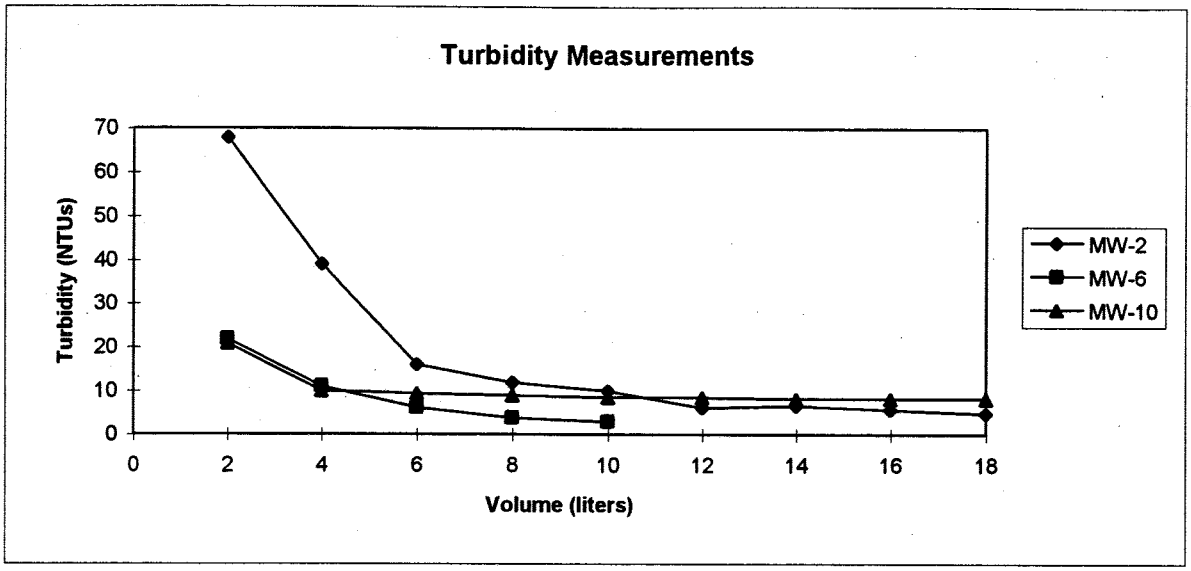
Bellefield Office Park
Bellevue, Washington

TPH CONCENTRATIONS IN SOIL

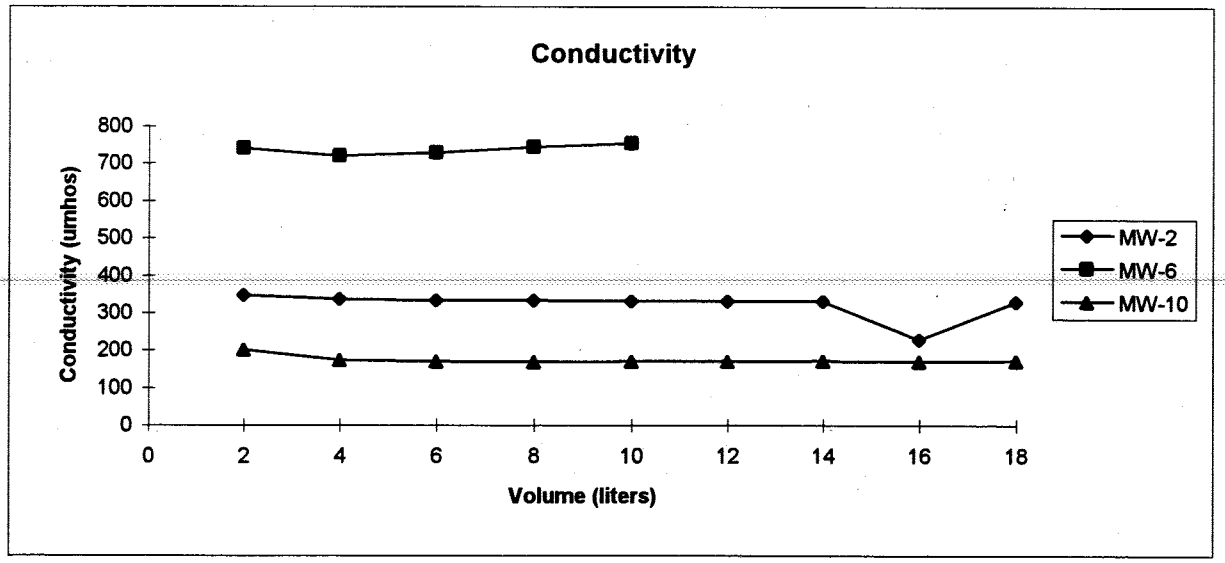
HEW-020 FIGURE 11 April 95
Dalton, Olmsted & Fuglevand, Inc.

FIGURE 12 - Low Flow Turbidity and Conductivity Measurements

Bellefield Office Park
Bellevue, Washington

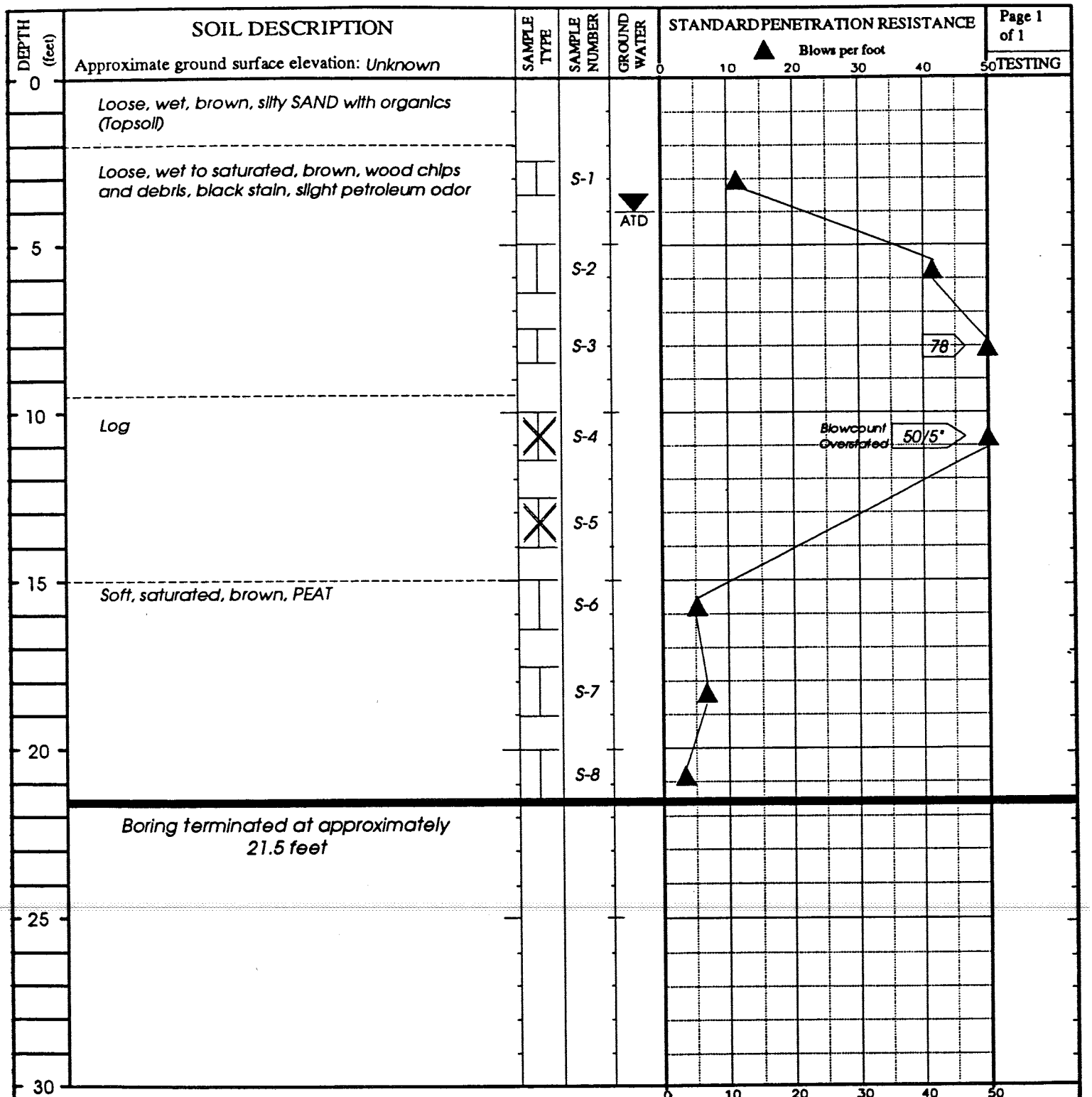


	Turbidity (NTUs)				Conductivity (umohos)		
Volume (liters)	MW-2	MW-6	MW-10	Volume (liters)	MW-2	MW-6	MW-10
2	68	22	21	2	346	740	200
4	39	11	10	4	335	720	173
6	16	6.2	9.4	6	333	728	169
8	12	3.9	9	8	333	744	168
10	10	2.9	8.5	10	331	754	170
12	6.2		8.5	12	331		170
14	6.6		8.3	14	330		171
16	5.7		8.3	16	228		170
18	4.9		8.3	18	329		172



APPENDIX A
BORING LOGS B-1, B-2 AND B-3

PROJECT: *Bellfield Business Park* W.O. *11-09378-02* BORING NO. *B-1*



LEGEND

2-inch OD split-spoon sample

Sample not recovered

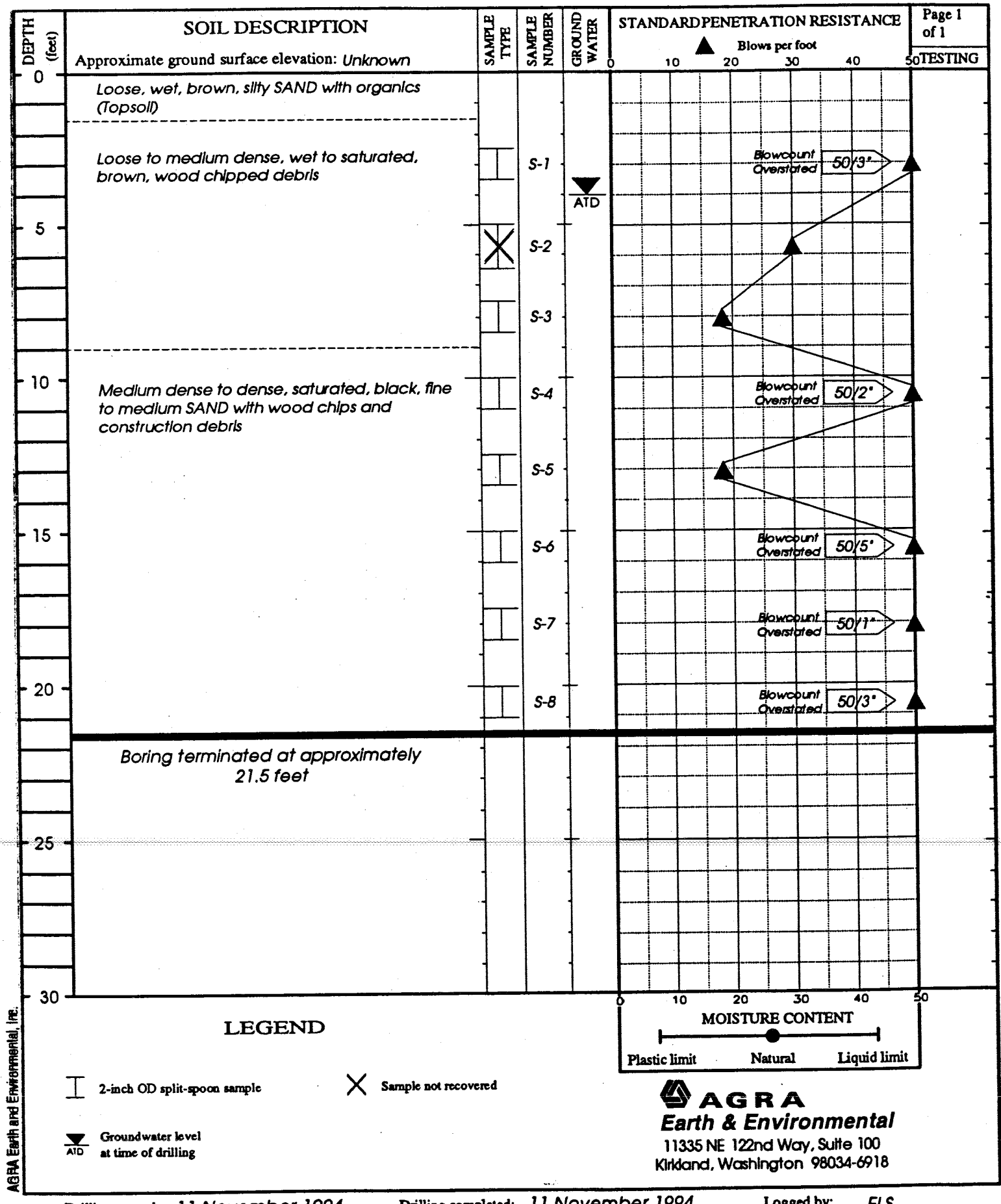
ATD Groundwater level at time of drilling

AGRA Earth and Environmental, Inc.

AGRA
Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *11 November 1994* Drilling completed: *11 November 1994* Logged by: *ELS*

PROJECT: *Bellfield Business Park* W.O. *11-09378-02* BORING NO. *B-2*



LEGEND

2-inch OD split-spoon sample

Sample not recovered

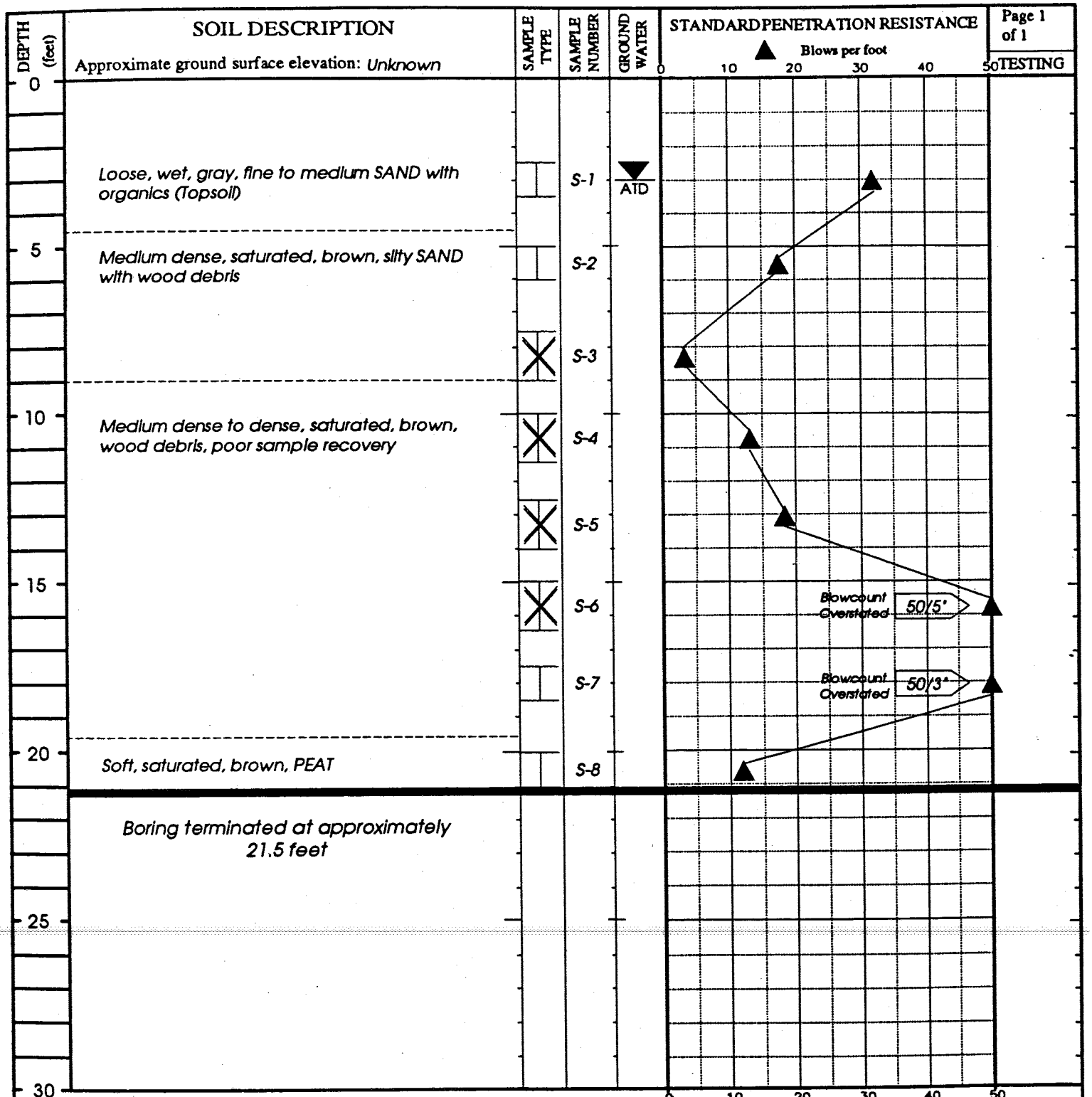
ATD Groundwater level at time of drilling

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

AGRA Earth and Environmental, Inc.

Drilling started: *11 November 1994* Drilling completed: *11 November 1994* Logged by: *ELS*

PROJECT: *Bellfield Business Park* W.O. *11-09378-02* BORING NO. *B-3*



LEGEND

I 2-inch OD split-spoon sample

X Sample not recovered

ATD Groundwater level at time of drilling

AGRA Earth and Environmental, Inc.

AGRA
Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *11 November 1994* Drilling completed: *11 November 1994* Logged by: *ELS*

APPENDIX B
REPRESENTATIVE LABORATORY DATA SHEETS

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2992
East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

AGRA Earth & Environmental	Client Project ID:	BBP, #11-09378-02	Sampled:	Oct 23, 1994
11335 NE 122nd Way, #100	Sample Descript:	Water, MW-2	Received:	Oct 24, 1994
Kirkland, WA 98034	Analysis Method:	EPA 8021	Analyzed:	Oct 28, 1994
Attention: Rob Cousins	Sample Number:	410-1398	Reported:	Oct 31, 1994

VOLATILE ORGANIC COMPOUNDS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Benzene	1.0	N.D.
Bromobenzene	1.0	N.D.
Bromochloromethane	1.0	N.D.
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
n-Butylbenzene	1.0	N.D.
sec-Butylbenzene	1.0	N.D.
tert-Butylbenzene	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	1.0	N.D.
Chloroform	1.0	N.D.
Chloromethane	1.0	N.D.
2-Chlorotoluene	1.0	N.D.
4-Chlorotoluene	1.0	N.D.
Dibromochloromethane	1.0	N.D.
1,2-Dibromo-3-chloropropane	1.0	N.D.
1,2-Dibromoethane	1.0	N.D.
Dibromomethane	1.0	N.D.
1,2-Dichlorobenzene	1.0	N.D.
1,3-Dichlorobenzene	1.0	N.D.
1,4-Dichlorobenzene	1.0	N.D.
Dichlorodifluoromethane	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	1.0	N.D.
1,1-Dichloroethene	1.0	N.D.
cis-1,2-Dichloroethene	1.0	N.D.
trans-1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
1,3-Dichloropropane	1.0	N.D.
2,2-Dichloropropane	1.0	N.D.
1,1-Dichloropropene	1.0	N.D.
Ethyl Benzene	1.0	N.D.
Hexachlorobutadiene	1.0	N.D.
Isopropylbenzene	1.0	N.D.
p-Isopropyltoluene	1.0	N.D.
Methyl ethyl ketone	10	N.D.
Methylene chloride	5.0	N.D.

NORTH CREEK ANALYTICAL

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

AGRA Earth & Environmental	Client Project ID: BBP, #11-09378-02	Sampled: Oct 23, 1994
11335 NE 122nd Way, #100	Sample Descript: Water, MW-2	Received: Oct 24, 1994
Kirkland, WA 98034	Analysis Method: EPA 8021	Analyzed: Oct 28, 1994
Attention: Rob Cousins	Sample Number: 410-1398	Reported: Oct 31, 1994

VOLATILE ORGANIC COMPOUNDS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Naphthalene	1.0	N.D.
n-Propylbenzene	1.0	N.D.
Styrene	1.0	N.D.
1,1,1,2-Tetrachloroethane	1.0	N.D.
1,1,2,2-Tetrachloroethane	1.0	N.D.
Tetrachloroethene	1.0	N.D.
Toluene	1.0	N.D.
1,2,3-Trichlorobenzene	1.0	N.D.
1,2,4-Trichlorobenzene	1.0	N.D.
1,1,1-Trichloroethane	1.0	N.D.
1,1,2-Trichloroethane	1.0	N.D.
Trichloroethene	1.0	N.D.
Trichlorofluoromethane	1.0	N.D.
1,2,3-Trichloropropane	1.0	N.D.
1,2,4-Trimethylbenzene	1.0	N.D.
1,3,5-Trimethylbenzene	1.0	N.D.
Vinyl chloride	1.0	N.D.
o-Xylene	1.0	N.D.
m,p-Xylene	1.0	N.D.

4-Bromofluorobenzene Surrogate Recovery, %: ELCD: 97; PID: 103
Surrogate Recovery Control Limits are ELCD: 69 - 135 %; PID: 60 - 145%.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Please Note:
Report was amended on November 3, 1994.

Shannon Stowell
Project Manager

4101398.RZA <16>

NORTH CREEK ANALYTICAL

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East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S W Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

AGRA Earth & Environmental	Client Project ID:	BBP, #11-09738-02	Sampled:	Oct 24, 1994
11335 NE 122nd Way, #100	Sample Descript:	Water, MW-11	Received:	Oct 24, 1994
Kirkland, WA 98034	Analysis Method:	EPA 8310	Extracted:	Oct 24, 1994
Attention: Rob Cousins	Sample Number:	410-1412	Analyzed:	Oct 27, 1994
			Reported:	Oct 31, 1994

POLYNUCLEAR AROMATIC HYDROCARBONS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acenaphthene	5.0	N.D.
Acenaphthylene	5.0	N.D.
Anthracene	5.0	N.D.
Benzo (a) anthracene	0.10	N.D.
Benzo (a) pyrene	0.10	N.D.
Benzo (b) fluoranthene	0.10	N.D.
Benzo (ghi) perylene	0.10	N.D.
Benzo (k) fluoranthene	0.10	N.D.
Chrysene	0.10	N.D.
Dibenzo (a,h) anthracene	0.10	N.D.
Fluoranthene	0.10	N.D.
Fluorene	5.0	N.D.
Indeno (1,2,3-cd) pyrene	0.10	N.D.
Naphthalene	5.0	N.D.
Phenanthrene	5.0	N.D.
Pyrene	0.50	N.D.

2-Fluorobiphenyl Surrogate Recovery, %: 71
Surrogate Recovery Control Limits are 33 - 115 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Shannon Stowell
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2992
East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

AGRA Earth & Environmental	Client Project ID:	BBP, #11-09738-02	Sampled:	Oct 24, 1994
11335 NE 122nd Way, #100	Sample Descript:	Water, MW-11	Received:	Oct 24, 1994
Kirkland, WA 98034	Analysis Method:	EPA 8081	Extracted:	Oct 25, 1994
Attention: Rob Cousins	Sample Number:	410-1412	Analyzed:	Oct 28, 1994
			Reported:	Oct 31, 1994

ORGANOCHLORINE PESTICIDES AND PCB'S

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Aldrin	0.040	N.D.
alpha-BHC	0.020	N.D.
beta-BHC	0.030	N.D.
delta-BHC	0.020	N.D.
gamma-BHC (Lindane)	0.030	N.D.
Chlordane	0.15	N.D.
4,4'-DDD	0.040	N.D.
4,4'-DDE	0.030	N.D.
4,4'-DDT	0.090	N.D.
Dieldrin	0.070	N.D.
Endosulfan I	0.030	N.D.
Endosulfan II	0.050	N.D.
Endosulfan sulfate	0.070	N.D.
Endrin	0.080	N.D.
Endrin aldehyde	0.080	N.D.
Heptachlor	0.030	N.D.
Heptachlor expoxide	0.030	N.D.
Methoxychlor	5.0	N.D.
Toxaphene	0.50	N.D.
PCB-1016	0.10	N.D.
PCB-1221	0.10	N.D.
PCB-1232	0.10	N.D.
PCB-1242	0.10	N.D.
PCB-1248	0.10	N.D.
PCB-1254	0.10	N.D.
PCB-1260	0.10	N.D.

Tetrachloro-m-xylene Surrogate Recovery, %: 57
Surrogate Recovery Control Limits are 33 - 124 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Shannon Stowell
Project Manager

APPENDIX C
PCB INTERPRETATION MEETING RESULTS
AGRA - January 13, 1995 Letter

AGRA
Earth & Environmental

AGRA Earth &
Environmental, Inc.
11335 NE 122nd Way
Suite 100
Kirkland, Washington
U.S.A. 98034-6918
Tel (206) 820-4669
Fax (206) 821-3914

13 January 1995
11-09378-04

Great Western Bank, A Federal Savings Bank
Legal Department
9200 Oakdale, 7th Floor
Chatsworth, California 91311

Attention: Ms Andrea Vogel

Subject: PCB Interpretation Consensus Meeting Results
Bellefield Office Park Project
11201 SE 8th Street
Bellevue, WA 98005

Dear Ms. Vogel:

As per your request, AGRA Earth & Environmental Inc. (AGRA) is pleased to present the results of the above referenced meeting. Those attending the meeting, held at 9:00 AM, 12 January 1995 at North Creek Analytical's Bothell, Washington facility were:

- Mr. Shannon Stowell, North Creek Analytical (NCA);
- Mr. Dennis Wells, NCA;
- Ms. Melinda Seibel, NCA;
- Mr. Andrew Friedman, Friedman & Bruya Inc.;
- Mr. Daryl Petrarca, AGRA.

BACKGROUND

The purpose of the meeting was to bring together the chemical analysts from Friedman & Bruya Inc. and North Creek Analytical to attempt to reach a consensus opinion on the presence or non-presence of PCB's in soil and groundwater samples obtained from the Bellefield Office Park during subsurface screening work performed by AGRA on the site in October and November 1994.

NCA's analysts had reported the presence of PCB's (below Washington State Model Toxics Control Act (MTCA) clean-up levels)in soil samples B-1/S-3/7.5, B-2/S-8/20, B-3/S-1/2.5, B-3/S-7/17.5. NCA also had reported elevated PCB concentrations(slightly above MTCA method B cleanup levels) in groundwater samples MW-2(23 October 1994), MW-6(23 October 1994), and MW-10(15 November 1995). FBI analysts reported no presence of PCBs in groundwater

samples MW-2,MW-10, MW-11,and soil samples SS-11(B-2), and SS-10 (B-1) obtained 30 November 1994.

In the October 23 1994 groundwater sampling event, a total of 16 temporary monitoring wells were sampled across the property (see attached Figure 1) and only monitoring wells MW-2 and MW-6 exhibited apparent indications of PCBs in groundwater. Monitoring wells MW-17 and MW-18 were later installed in the borings B-1, B-2, B-3 area and also did not exhibit PCBs upon groundwater testing. It should be noted that monitoring well MW-10 groundwater was analyzed at this time and did not exhibit PCB concentrations as reported by NCA. During the 15 November 1994 resampling and analysis event, monitoring well MW-10 groundwater unexpectedly exhibited a PCB concentration of .41 parts per billion (ppb). Because of the apparent sporadic or transitory occurrence of PCB compounds in samples taken from the same location at different times, and other questions concerning the reliability of state testing methods to distinguish naturally occurring hydrocarbons from manmade petroleum product hydrocarbons several soil and groundwater samples were collected for additional confirmation testing. These additional groundwater samples were obtained from Monitoring wells MW-2, MW-10, and MW-11 and submitted on 30 November 1994 to FBI for chemical evaluation (Fingerprinting Analysis). Mr. Andrew Friedman was requested by AGRA to render an opinion on the possible presence of PCBs in the 30 November 1994 soil samples obtained from near borings B-1 and B-2 and groundwater samples obtained from MW-2, MW-10 and MW-11. Mr Friedman reported no PCBs were exhibited in these soil and groundwater samples as evidenced by the Gas Chromatograph/ Electron Capture Detection (GC\ECD) chromatograms generated during analysis. Based upon this analytical data it became AGRA's and Mr. Friedman's opinion that NCA observed PCB concentrations in earlier obtained samples were probably the result of interpreting weathered heavy end petroleum hydrocarbons exhibited on the chromatograms as PCBs.

MEETING RESULTS

Meeting members agreed to review existing GC/ECD chromatograms from past sampling and analysis events performed by each lab in order to provide a consensus opinion stating either;

- PCBs are not present and reported concentrations were probably interpretations caused by the presence of weathered petroleum compounds; or

- PCBs are present as reported in soil and groundwater samples.

After reviewing the Bellefield Office Park project chromatograms in detail, including PCB standards comparison chromatograms used in the original analyses by both NCA and FBI, the meeting members agreed that PCBs were present in samples (October,November 1994)

originally reported by NCA, and not present in soil and groundwater samples obtained on 30 November 1994 analyzed and reported by FBI.

SOIL

It was agreed that PCBs reported from soil samples obtained from various depths in Borings B-1, B-2 and B-3 in fact did exist. These concentrations are below State MTCA cleanup levels.

GROUNDWATER

Groundwater samples obtained from monitoring wells on the subject property appeared to exhibit PCBs intermittently. For example, multiple sampling and analysis of monitoring wells MW-2 and MW-10 exhibited sporadic PCB hits as presented below:

		Sampling Date	PCB- 1242-	1254-	1260 in ppb
•	MW-2	23 October 1994 (NCA)	1.5	1.7	0.42
		30 November 1994 (FBI)	non-detect----------		
•	MW-10	23 October 1994 (NCA)	non-detect----------		
		15 November 1994 (NCA)		0.41	
		30 November 1994 (FBI)	non-detect----------		

Meeting members agreed, that given the ephemeral appearance of PCBs in groundwater samples as described above, the PCB concentrations reported in groundwater analyses are most likely the result of relic, mobile PCB bearing solid particulates (microscopic soil and/ or organic particles) suspended in local groundwater supplies as the result of soil disturbance during monitoring well installation, and are not representative of actual groundwater quality in terms of actual dissolved PCB presence. It was agreed that physically demonstrating this assumption would be difficult. Although collected groundwater samples were extremely turbid, indicating a high level of suspended particulate matter, regulatory agencies would likely balk at the idea of filtering collected samples to remove PCB relic particulates due to possible adherence of non-relic PCBs, if present, to the filtering material, producing artificially low reported concentrations. A second possible method to remove relic particulates would involve centrifuging the groundwater sample, to allow non-representative PCB bearing particulates to

settle out of solution, thereby providing a more representative groundwater sample for anlaysis. There is however uncertainty that centrifuging the groundwater sample would effectively remove possible PCB relic materials based upon the suspected particulate's probable buoyancy parameters.

Given this information it is unlikely that a definitive statement can easily (if at all) be scientifically arrived at as to whether PCBs, which meeting members agree are present in soil samples obtained from borings B-1, B-2, and B-3 on a portion of the site (at levels below state clean-up levels) are present in groundwater samples in a non-relic free phase form.

SUMMARY

Results of studies performed to date by AGRA indicate that PCB containing soils do exist at depths ranging from 2-3 feet to approximately 20 feet on the southwest portion of the property in the area of borings B-1, B-2, B-3. Surface soils (0-3 feet deep) tested on other portions of the site did not exhibit PCB presence. Upon analysis no observed soil PCB concentrations exceeded state clean-up levels and it is unlikely that these materials would require remediation.

Of more importance is the fact that eighteen groundwater wells were tested across the site for the presence of PCBs and only MW-2, MW-6, and MW-10 have produced intermittent evidence of PCB presence as described earlier in this report. At first glance PCB concentrations exhibited by groundwater samples appear to exhibit levels that slightly exceed state groundwater quality criteria. However because what is understood in the scientific community about the fate and transport of PCBs, particularly their lack of water solubility and adsorption characteristics and given their intermittent occurrence in groundwater samples from the site, it is more likely that observed groundwater PCB concentrations are related to the presence of artifact particles with attached PCB compounds rather than dissolved phase PCBs in the ground water which might become bioavailable to the flora and fauna of the site.

In that PCBs were not detected in the surface waters downgradient of the property and most wells sampled on the property did not exhibit PCB contamination it is unlikely that the presence of PCB's, in the soil concentrations detected, present a significant soil or groundwater environmental problem for the subject property.

Meeting members have agreed to sign this document solely indicating their participation in this review meeting and concurrence with the reported meeting findings.

Mr. Dennis Wells, NCA;

Ms. Melinda Seibel, NCA;

Mr. Andrew Friedman, FBI;

Mr. Shannon Stowell, NCA

We appreciate the opportunity to be of service. Should you have any questions, please do not hesitate to call (206-820-4669).

Respectfully submitted,
AGRA Earth & Environmental, Inc.

Daryl S. Petrarca R.E.A.
Associate

James S. Dransfield, P.E.
Senior Associate

JAMES S. DRANSFIELD
STATE OF WASHINGTON
23153
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 12/19/ 95

cc: Steve Mitchell/Great Western Bank

DSP/JSD/lad

APPENDIX D
FRIEDMAN & BRUYA REPORT
December 8, 1994

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Andrew John Friedman
James E. Bruya, Ph.D.
(206) 285-8282

3012 16th Avenue West
Seattle, WA 98119-2029
FAX: (206) 283-5044

December 8, 1994

Daryl Petrarca, Project Leader
AGRA Earth & Environmental, Inc.
11335 NE 122nd Way, Suite 100
Kirkland, WA 98034-6918

Dear Mr. Petrarca:

Enclosed are the results from the testing of material submitted on November 30, 1994 from your 11-09378-02, Redfield Office Park project.

The original GC/FID traces showed a medium boiling, individual peak pattern with a high boiling hump of material in MW-2 and MW-10, a medium petroleum distillate with a symmetrical *n*-alkane pattern, and a high boiling hump of material in sample MW-11, a high boiling hump of material in sample SS-11 (B-2), and a high boiling hump of material with a few prominent individual peaks in sample SS-10 (B-1). No PCB's were detected in any of the GC/ECD chromatograms generated.

The GC/MS was then employed to distinguish whether one, the individual peak patterns were PNA's resulting from pyrolysis (burning) and/or the presence of coal tar, or were other compounds which would be assumed to arise from biological origins, and whether two, the high boiling humps were refined distillates containing mostly alkanes, or were petroleum bases such as tars and asphalts containing a mixture of compound types, including organic acids, or were biological in origin.

The GC/MS results showed that the individual peak patterns in the GC/FID of MW-2, MW-10, and SS-10 (B-1) were indeed PNA's. The GC/MS results also showed that MW-11 contained a highly refined product such as a motor oil, along with a diesel. The high boiling material in MW-2 surprisingly also contained mostly alkanes, suggesting the material in this sample also was highly refined. The high boiling material in SS-10 and SS-11 appeared to contain organic acids as expected in a tar or street run-off. The high boiling material in MW-10 was at a level too low to characterize further in this manner

The TLC of SS-11 and MW-11 supported the difference seen between the refined material in MW-11 and the tar-like material in SS-11. Both contained saturated hydrocarbons at Rf 0.9 (Hexane) at levels high enough to support that these both contain material of petroleum origin. SS-11 may contain material of biological origin. The material in SS-11, (as well as in SS-10), however, is consistent with street asphalt run-off.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

The fractionation of sample MW-11 showed that there was little or no organic material present other than the distilled and refined petroleum products. The fractionation of sample SS-11 showed that there was approximately one third of the material seen in the methylene chloride extractable fraction and the methanol extractable fraction contained virtually none of the material. Two thirds of what was seen in the total extract eluted in the hexane extractable fraction of saturated alkanes. This indicates a probable asphalt, a tar or heavily used motor oil as a source for this material.

This fractionation information can be extrapolated to what is seen in the other samples when compared with their GC/FID traces and what we know from the GC/MS analyses about what types of materials are present. The organics in SS-10 are approximately 95% of the same material that is in SS-11 with approximately 5% pyrogenic PNA's. MW-2 organics consist of approximately 50% pyrogenic PNA's and 50% refined petroleum product such as motor oil. MW-10 organics consist of approximately 80% pyrogenic PNA's and 20% high boiling material. As said before, the high boiling material is at a level too low to characterize its constituents.

In summary, no clear indication of naturally occurring biogenic hydrocarbons was seen in any of the samples. With the exception of MW-11 all of the material present is consistent with a long term input of road run-off accumulating over a long period of time. MW-11 shows the presence of relatively unweathered diesel fuel or heating oil and motor oil. Though this is typical of street run-off, the diesel does not show the usual weathering pattern, suggesting it is of more recent deposition.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Andrew John Friedman
Chemist

sao
Enclosures

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1994
Date Received: November 30, 1994
Project: 11-09378-02, Bellefield Office Park
Date Samples Extracted: November 30, 1994

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
SS-10 (B-1)	The GC trace using the flame ionization detector (FID) showed the presence of high boiling compounds. The patterns displayed by these peaks are indicative of motor oil and tar. The high boiling compounds appeared as a pattern of peaks eluting from n-C_{20} to beyond n-C_{36} showing a maximum near n-C_{28}. The GC/ECD trace showed the presence of halogenated or highly oxidized compounds. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.
SS-11 (B-2)	The GC trace using the flame ionization detector (FID) showed the presence of high boiling compounds. The patterns displayed by these peaks are indicative of motor oil and tar. The high boiling compounds appeared as a pattern of peaks eluting from n-C_{20} to beyond n-C_{36} showing a maximum near n-C_{28}. The GC/ECD trace showed the presence of halogenated or highly oxidized compounds. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1994
Date Received: November 30, 1994
Project: 11-09378-02, Bellefield Office Park
Date Samples Extracted: November 30, 1994

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)

Sample ID	GC Characterization
MW-2	The GC trace using the flame ionization detector (FID) showed the presence of high boiling compounds. The patterns displayed by these peaks are indicative of coal tar and an unidentified product. The high boiling compounds appeared as a ragged pattern of peaks eluting from *n*-C_9 to beyond *n*-C_{36} showing a maximum near *n*-C_{15}. The GC/ECD trace showed the presence of halogenated or highly oxidized compounds.
MW-10	The GC trace using the flame ionization detector (FID) showed the presence of high boiling compounds. The patterns displayed by these peaks are indicative of coal tar and an unidentified product. The high boiling compounds appeared as a ragged pattern of peaks eluting from *n*-C_{12} to beyond *n*-C_{36} showing a maximum near *n*-C_{21}. The GC/ECD trace showed the presence of halogenated or highly oxidized compounds. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.
MW-11	The GC trace using the flame ionization detector (FID) showed the presence of medium and high boiling compounds. The patterns displayed by these peaks are indicative of diesel fuel, as well as motor oil and lube oil. The medium boiling compounds appeared as a regular pattern of peaks eluting from *n*-C_{15} to *n*-C_{22} showing a maximum near *n*-C_{18}. A regular pattern of the *n*-alkanes is seen for the medium boiling product. The high boiling compounds appeared as a pattern of peaks eluting from *n*-C_{20} to beyond *n*-C_{36} showing a maximum near *n*-C_{28}. An irregular pattern of *n*-alkanes was seen in the GC/FID trace. The GC/ECD trace showed the presence of halogenated or highly oxidized compounds. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 8, 1994
Date Received: November 30, 1994
Project: 11-09378-02, Bellefield Office Park
Date Samples Extracted: December 2, 1994
Date Extracts Analyzed: December 2, 1994

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE FOR CONTAMINANT CHARACTERIZATION BY THIN LAYER CHROMATOGRAPHY

Sample ID	TLC Characterization
SS-11 (B-2)	The thin layer chromatographic trace showed the presence of non-polar, moderately polar and highly polar organic compounds, such as those found in tar or asphalt. This characterization is based on the presence of a band of material at Rf 0.9 (hexane), visible with iodine staining only that is indicative of saturated hydrocarbons. A second band of material was seen at Rf 0.1 to 0.4 (hexane), visible under both short and long wave UV light, as well as with iodine staining and is indicative of high boiling aromatic hydrocarbons. Material was also seen streaked from the origin through Rf 1.0 (methylene chloride). A large amount of material was left at the origin. The thin layer chromatographic trace showed an absence of significant concentrations of semi-volatile or non-volatile organic compounds.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

TO: D.R.

Date of Report: December 8, 1994
Date Received: November 30, 1994
Project: 11-09378-02, Bellefield Office Park
Date Samples Extracted: December 2, 1994
Date Extracts Analyzed: December 2, 1994

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLE FOR CONTAMINANT CHARACTERIZATION BY THIN LAYER CHROMATOGRAPHY

Sample ID	TLC Characterization
MW-11	The thin layer chromatographic trace showed the presence of non-polar, moderately polar and highly polar organic compounds, such as those found in diesel and/or motor oil and heavy tar. This characterization is based on the presence of a band of material at Rf 0.9 (hexane), visible with iodine staining only that is indicative of saturated hydrocarbons. A second band of material was seen at Rf 0.2 to 0.6 (hexane), visible under both short and long wave UV light, as well as with iodine staining and is indicative of high boiling aromatic hydrocarbons. Material was also seen streaked from the origin through Rf 1.0 (methylene chloride). A small amount of material was seen at the origin. The bulk of the material was seen in the hexane section, with a large amount of the material at Rf 0.9.
	The thin layer chromatographic trace showed an absence of significant concentrations of semi-volatile or non-volatile organic compounds.

E...l & ...iro...ma.
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918
Tel (206) 820-4669 Fax (206) 821-3914

CHAIN OF CUSTOD

11/30/94

4:20

PROJECT	PROJECT No.
BELLEFIELD OFFICE PARK	11-09378-02
CLIENT	PHONE No.
GREAT WESTERN BANK	
PROJECT MANAGER	PHONE No.
DAVE PETRAEGH	820-4669
SAMPLER'S NAME (please print)	PHONE No.
ROB COUSINS	" "
SAMPLER'S SIGNATURE	

ANALYSIS REQUESTED (circle, check box or write preferred method in box)

SAMPLE I.D.	DATE	TIME	MATRIX	PRESERVATIVE	CONTAINERS No.	CONTAINERS VOL.	BTEX by EPA 602 / 8020	BTEX	BTEX / MTBHO	MTBHO	MTBHO / MTBHO EXTENDED	TPH by EPA 8015 MODIFIED	LUFT 5 EPA METALS	TPH by EPA 418.1	GC / MS EPA 624 / 8240 or EPA 8260 Volatiles	GC / MS EPA 625 / 8270 Semi-volatiles	VOCs EPA 601 / 8010 or EPA 602 / 8020	PCBs EPA 608 / 8080	LEAD EPA 6010 / EPA 7421 Total / Dissolved	TOTAL METALS	PCBs			
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2 SS-11 (B-2)			S		2	4oz																X	55362	
3 MW-2			W		2	L																X	55363	
4 MW-10			W		2	L																X	55370	
5 MW-11	↓		W		2	L																X	55371	
6																								
7																								
8																								
9																								
10																								

SAMPLE RECEIPT	LABORATORY	TURNAROUND TIME	SPECIAL INSTRUCTIONS / ADDITIONAL COMMENTS
TOTAL # CONTAINERS: 10	SHIPPING I.D. / AIRBILL #	☐ 1 HOUR ☐ 24 HOUR ☐ 48HOUR ☐ 2WEEK(standard) ☐ OTHER	ASAP TURNAROUND (AB:PB)
CONDITION OF CONTAINERS: SEALED	CARRIER		
CONDITION OF SEALS	DOT DESIGNATION		

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
1	11-30-94	4:10	1 Kathy Wells FEBL	11/30/94	4:10
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3			3		

PAGE 1 OF 1

AAGRA Environmental Inc (2/94)

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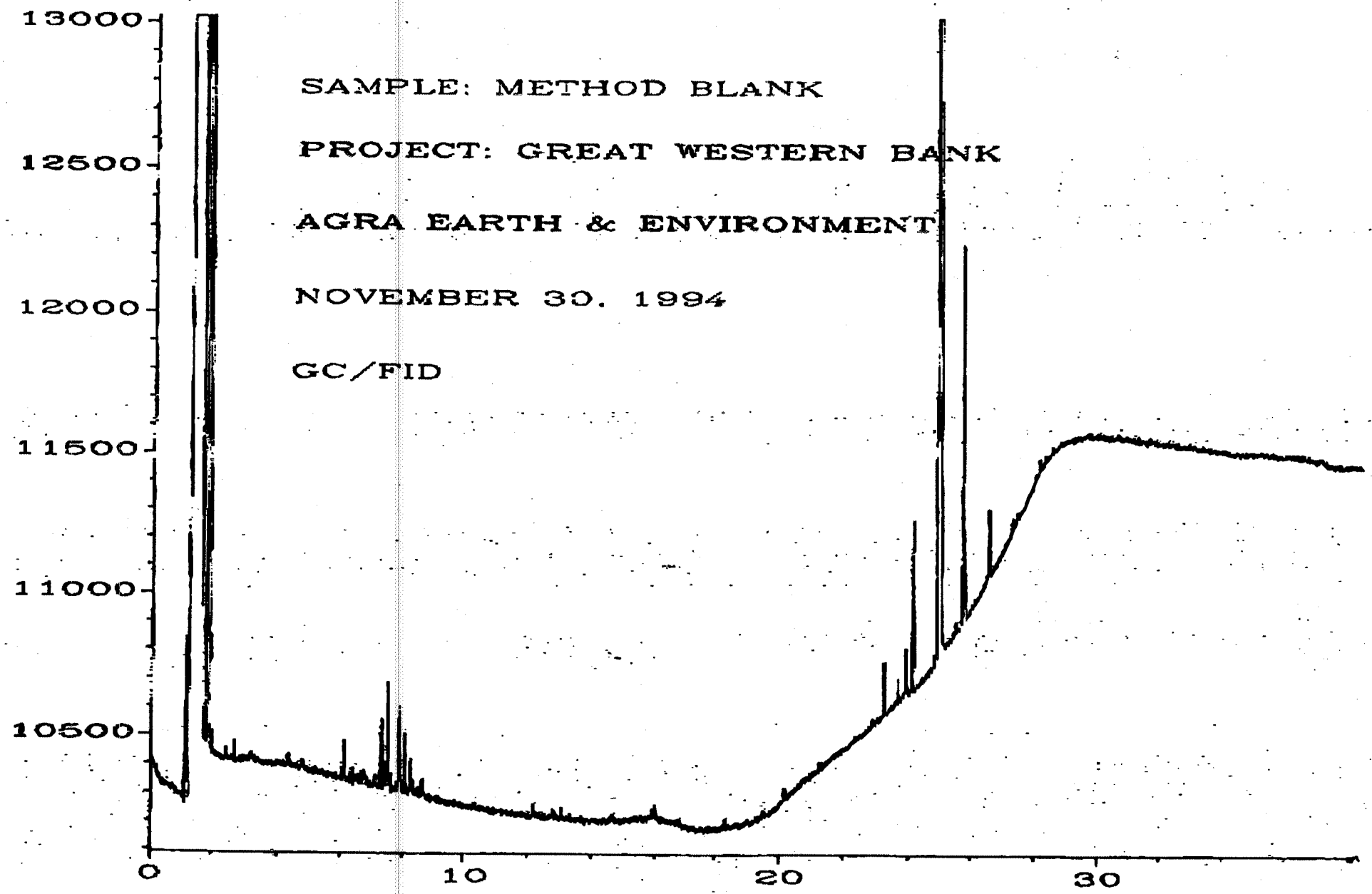
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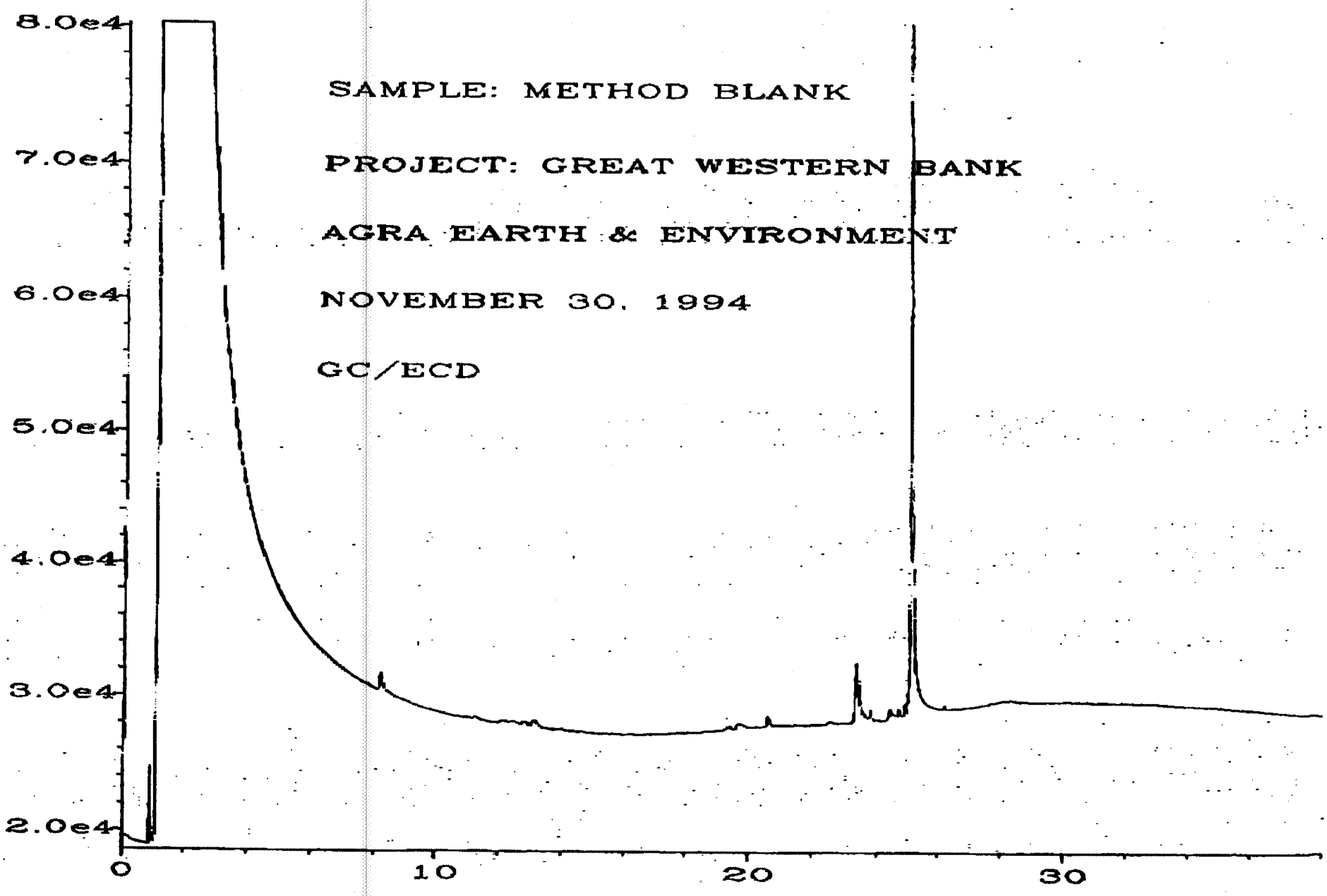
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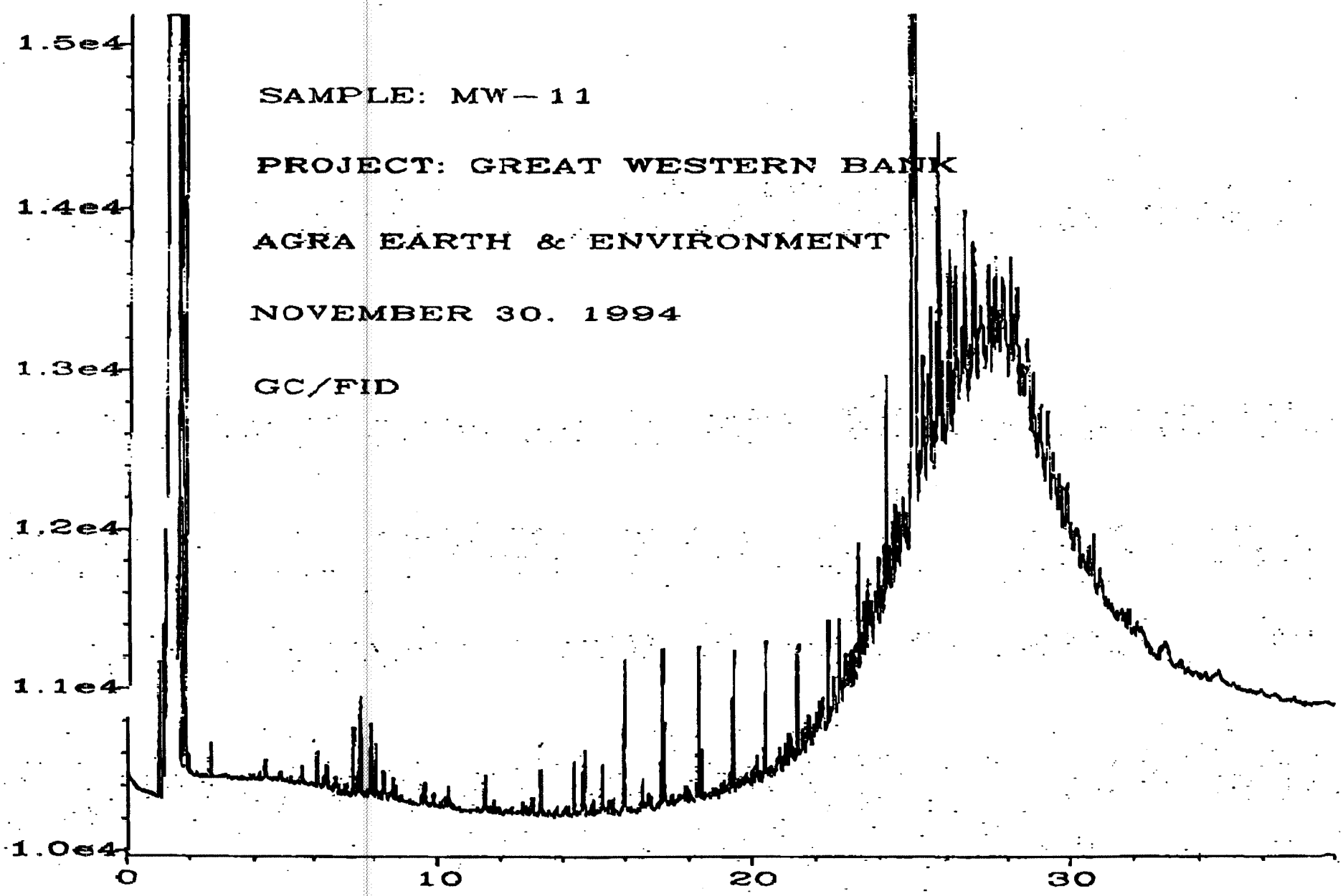
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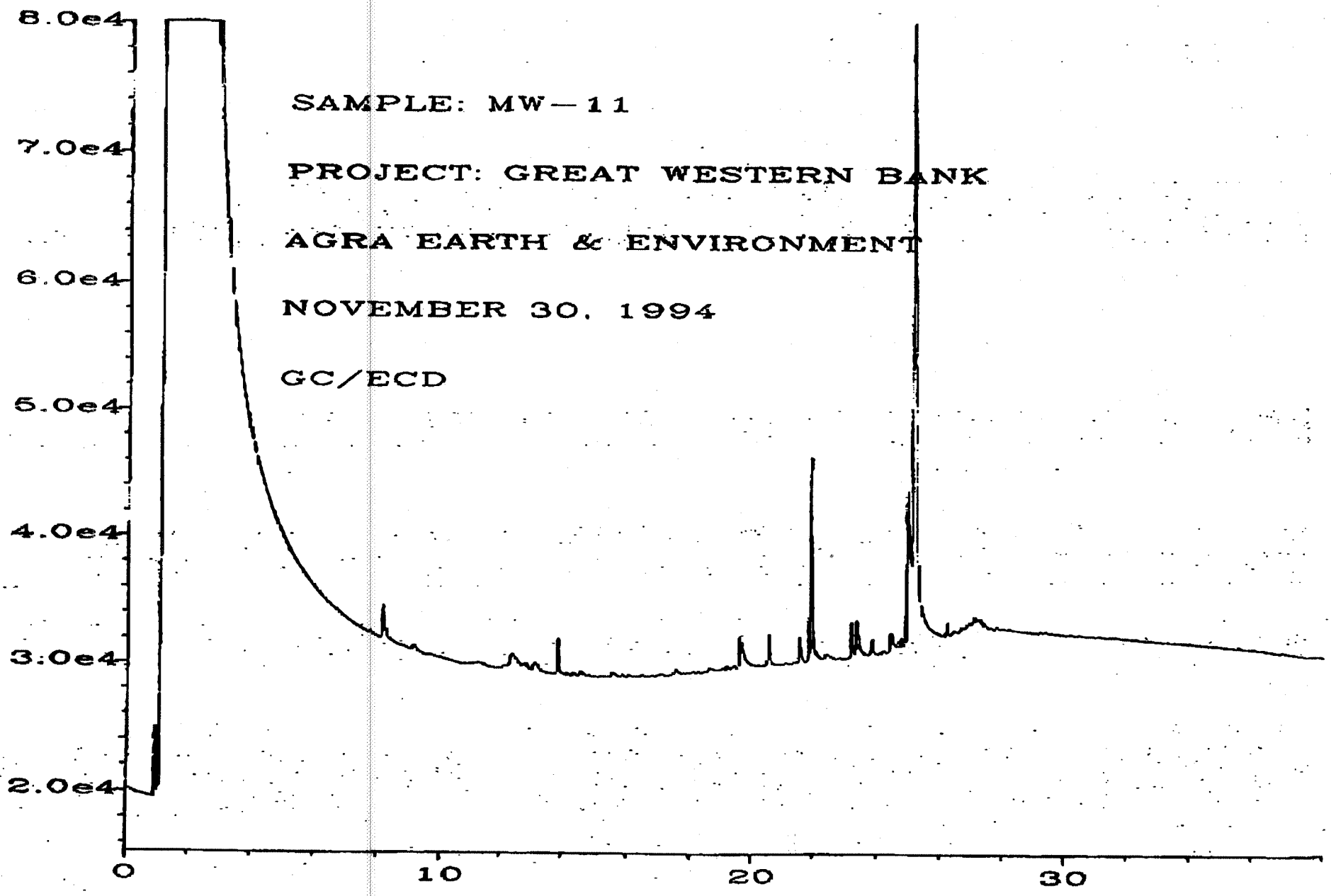
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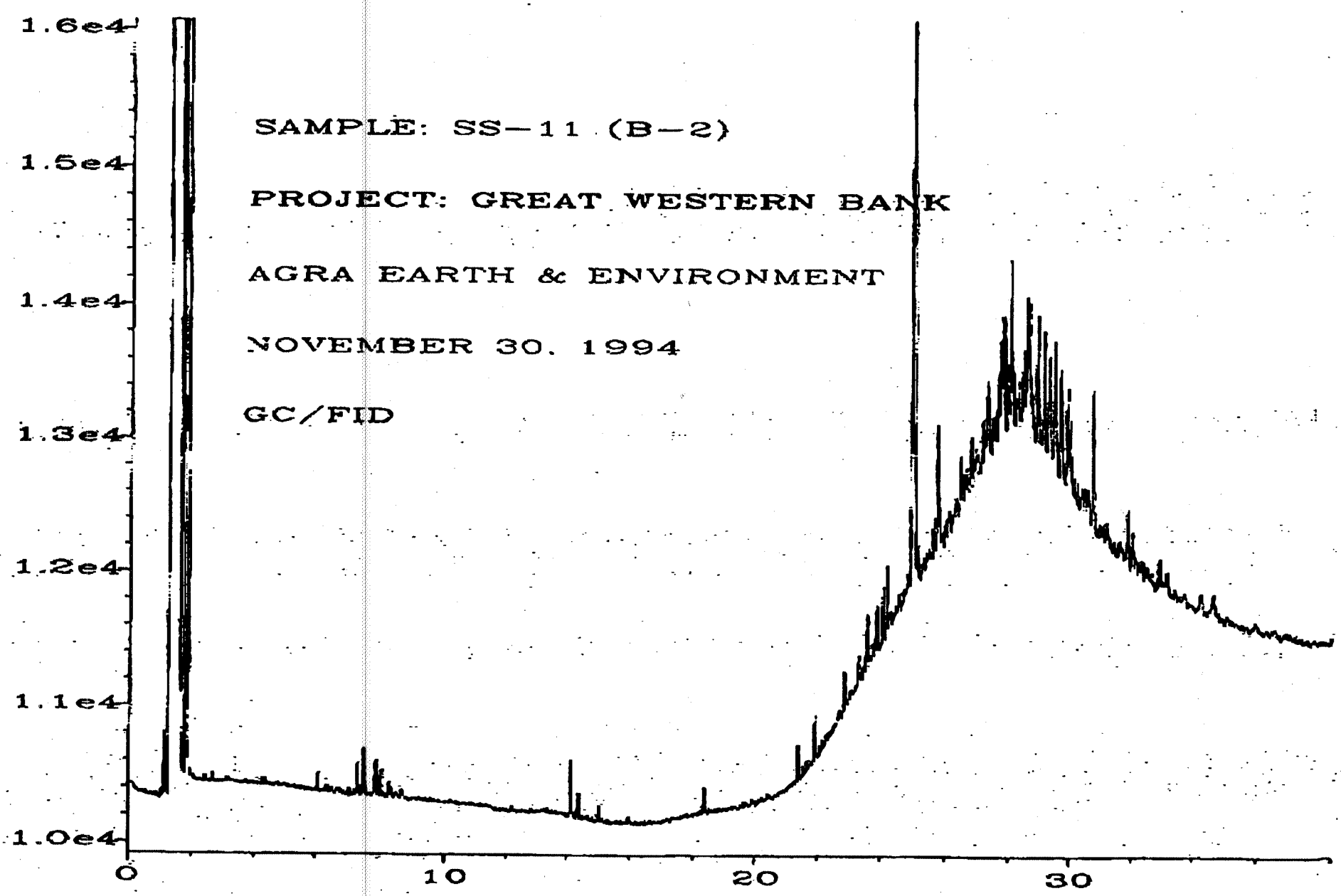
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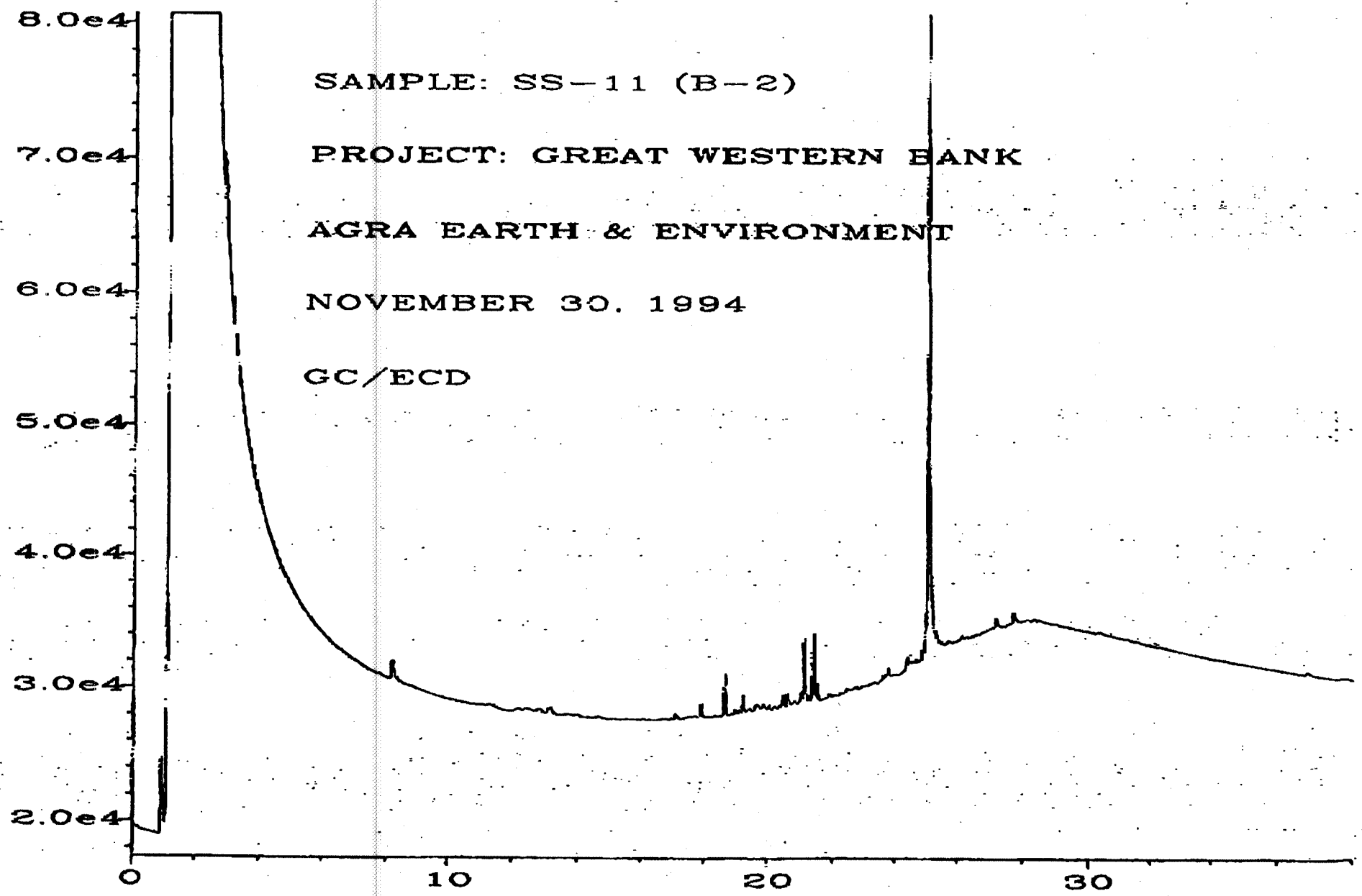
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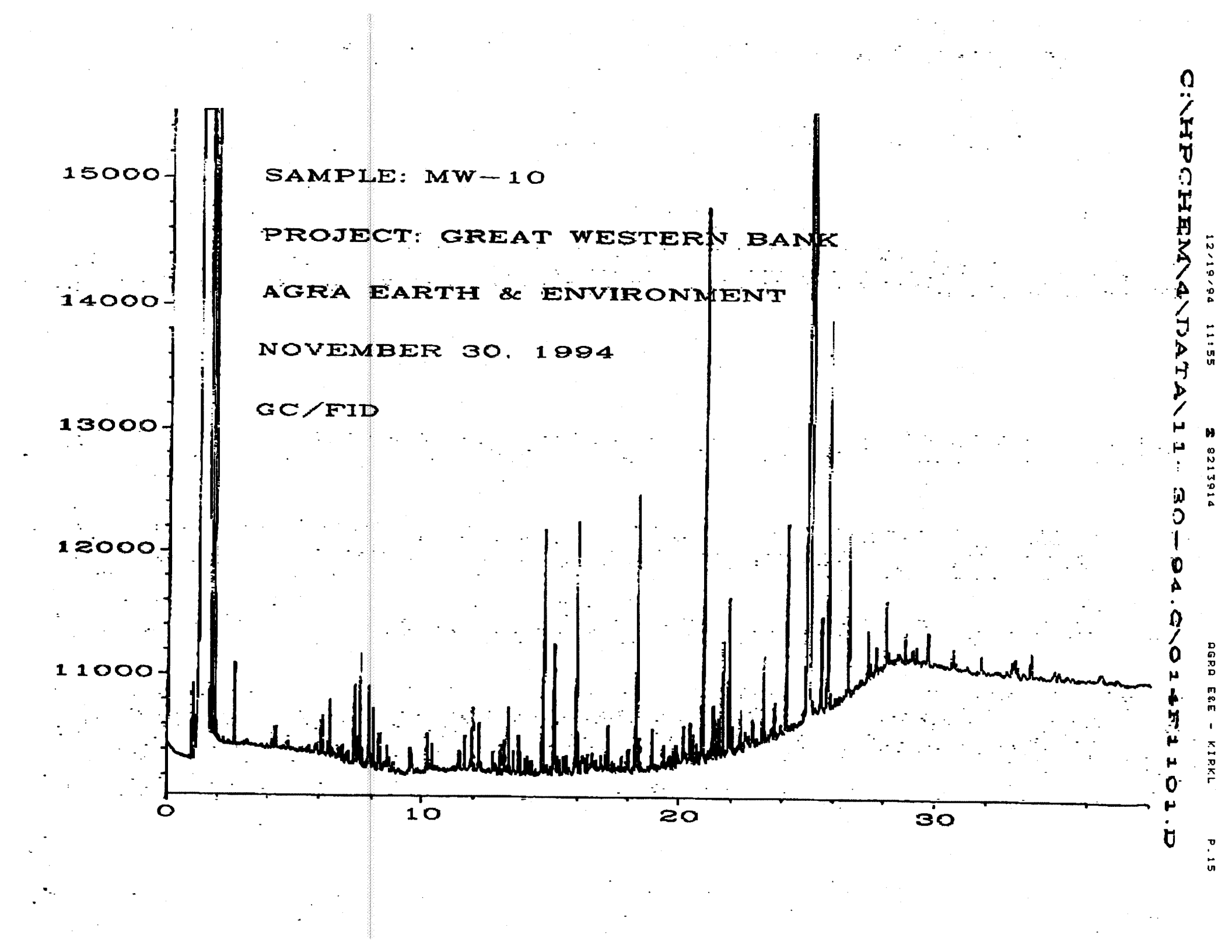
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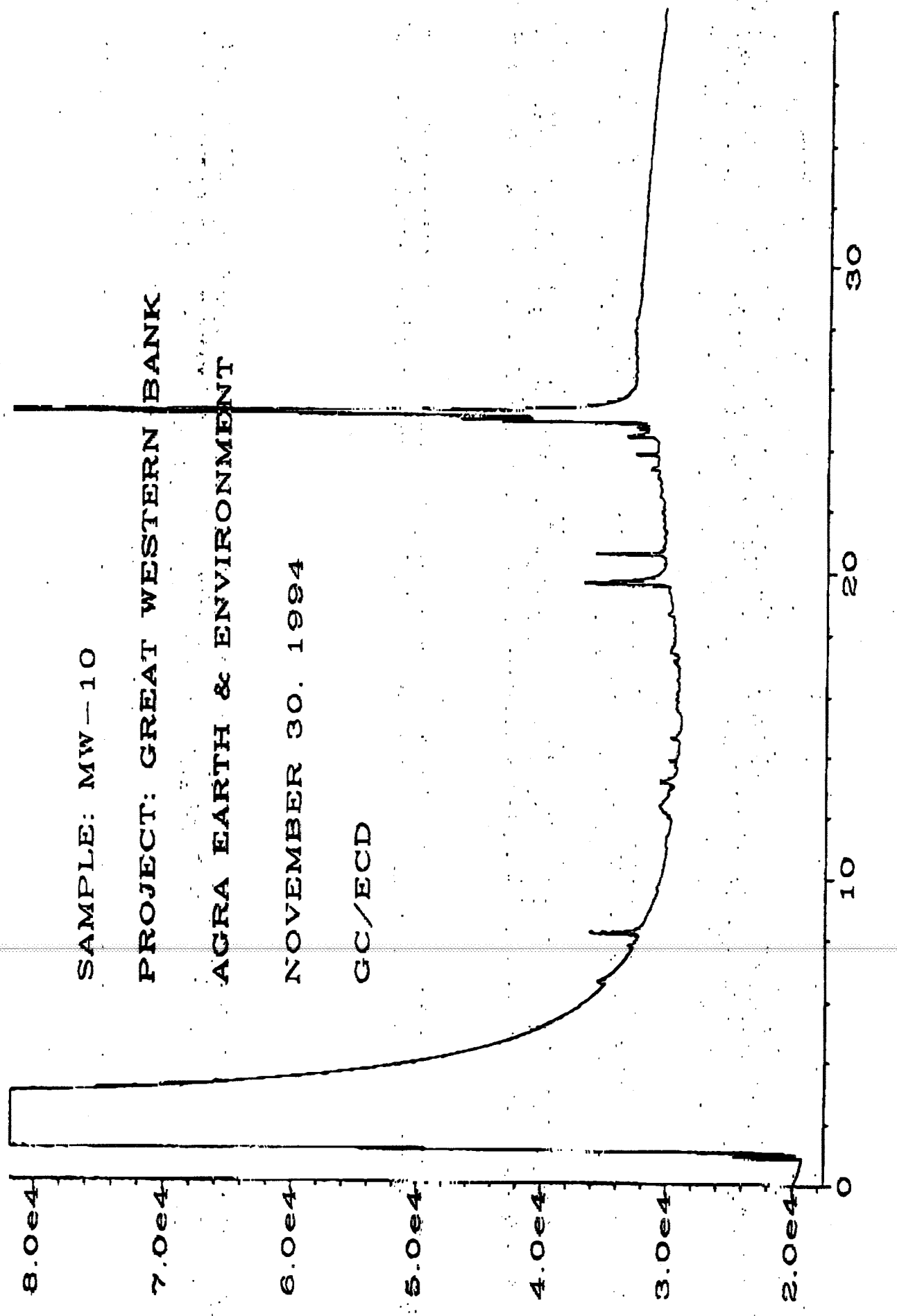

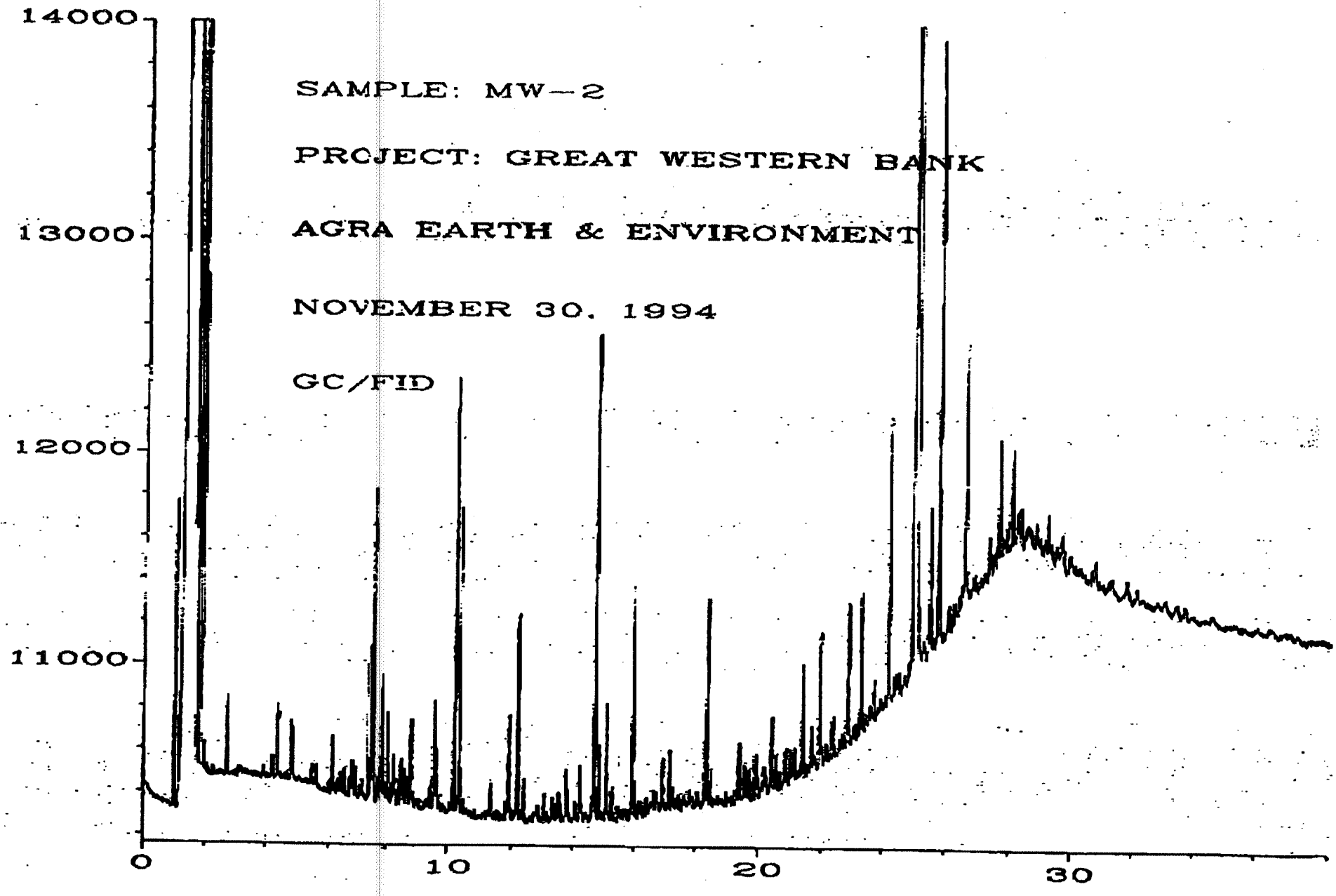
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NOVEMBER 30, 1994
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AGRA E&E - KIRKL
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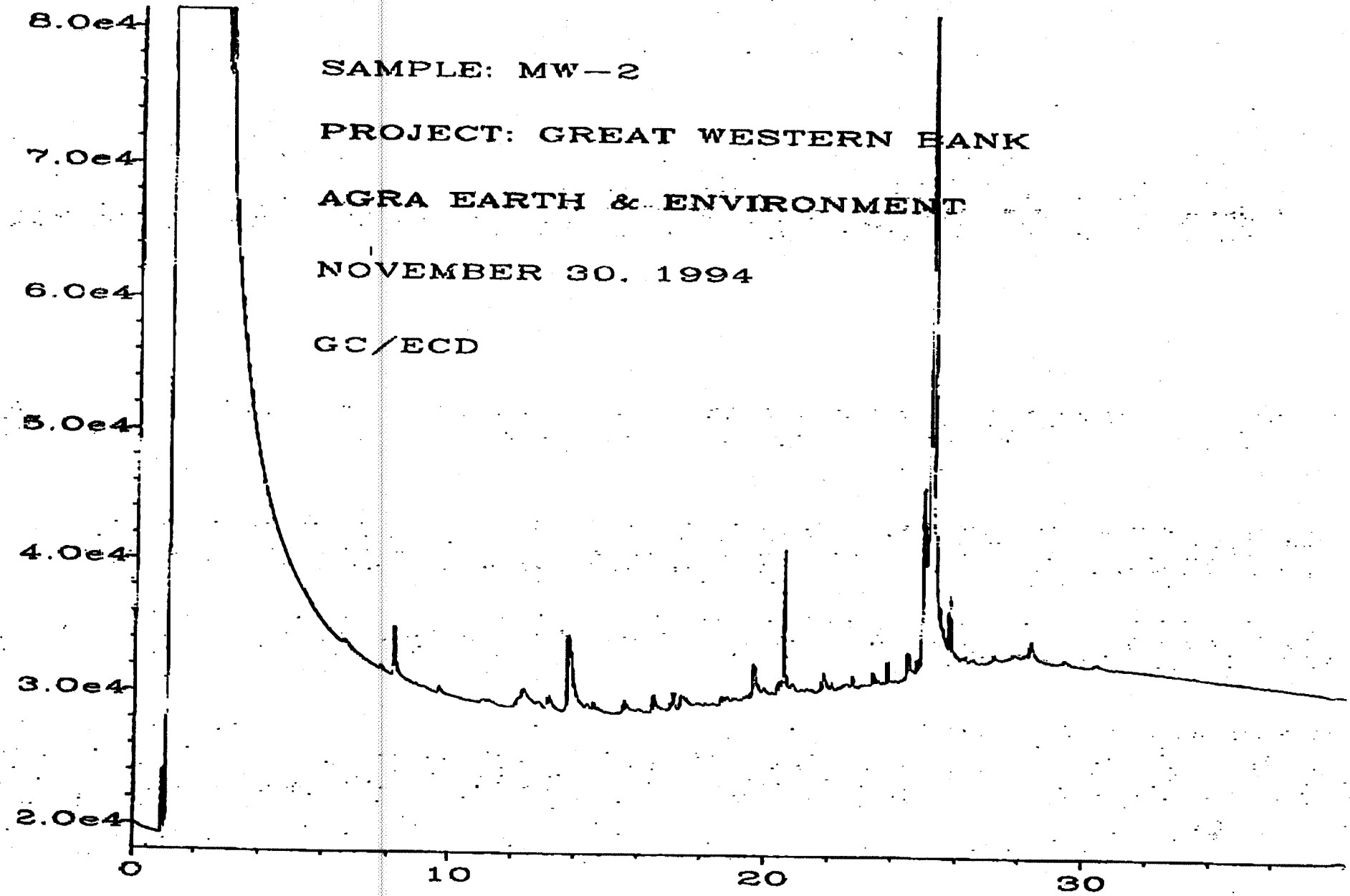
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NOVEMBER 30, 1994
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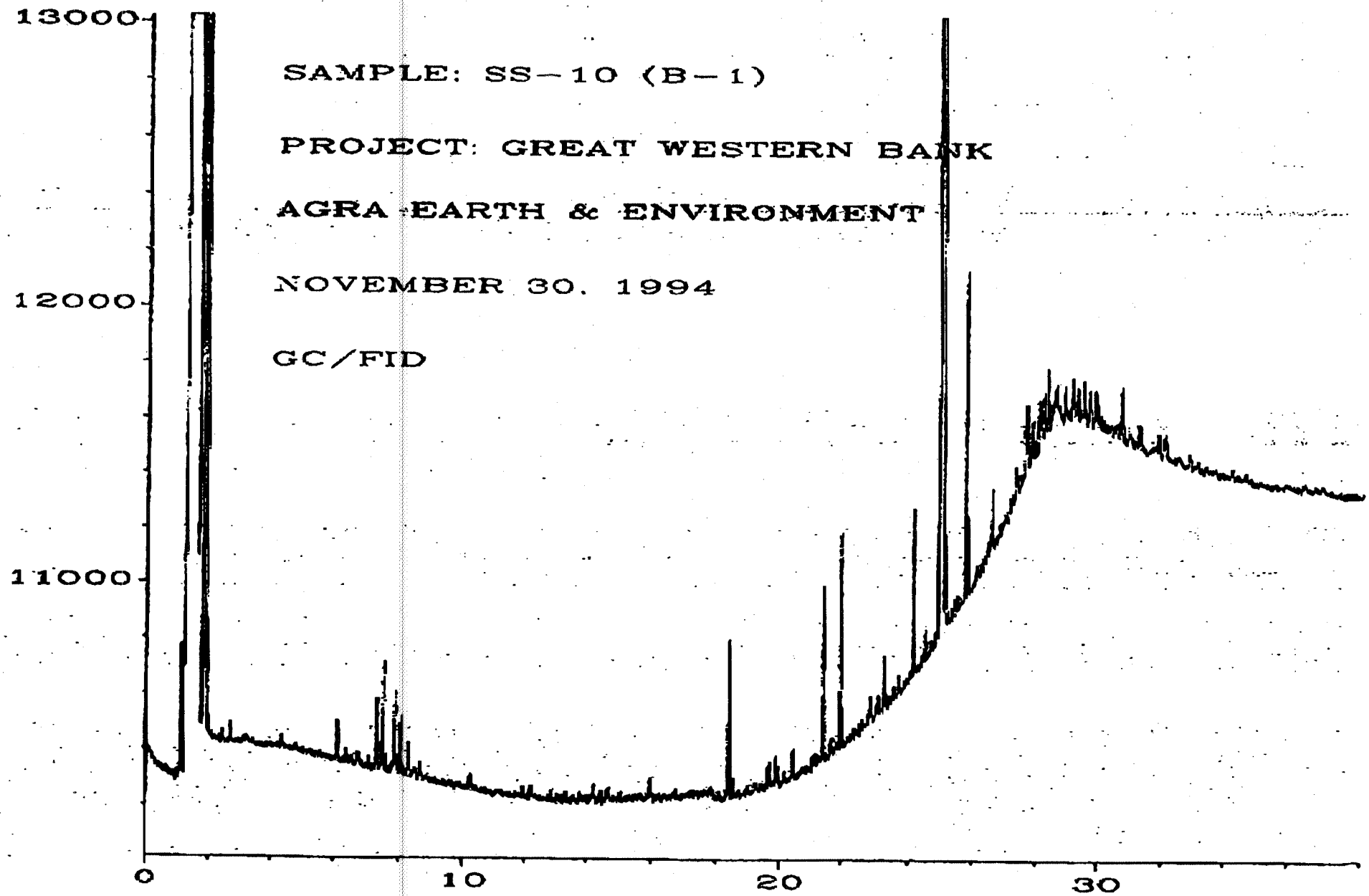

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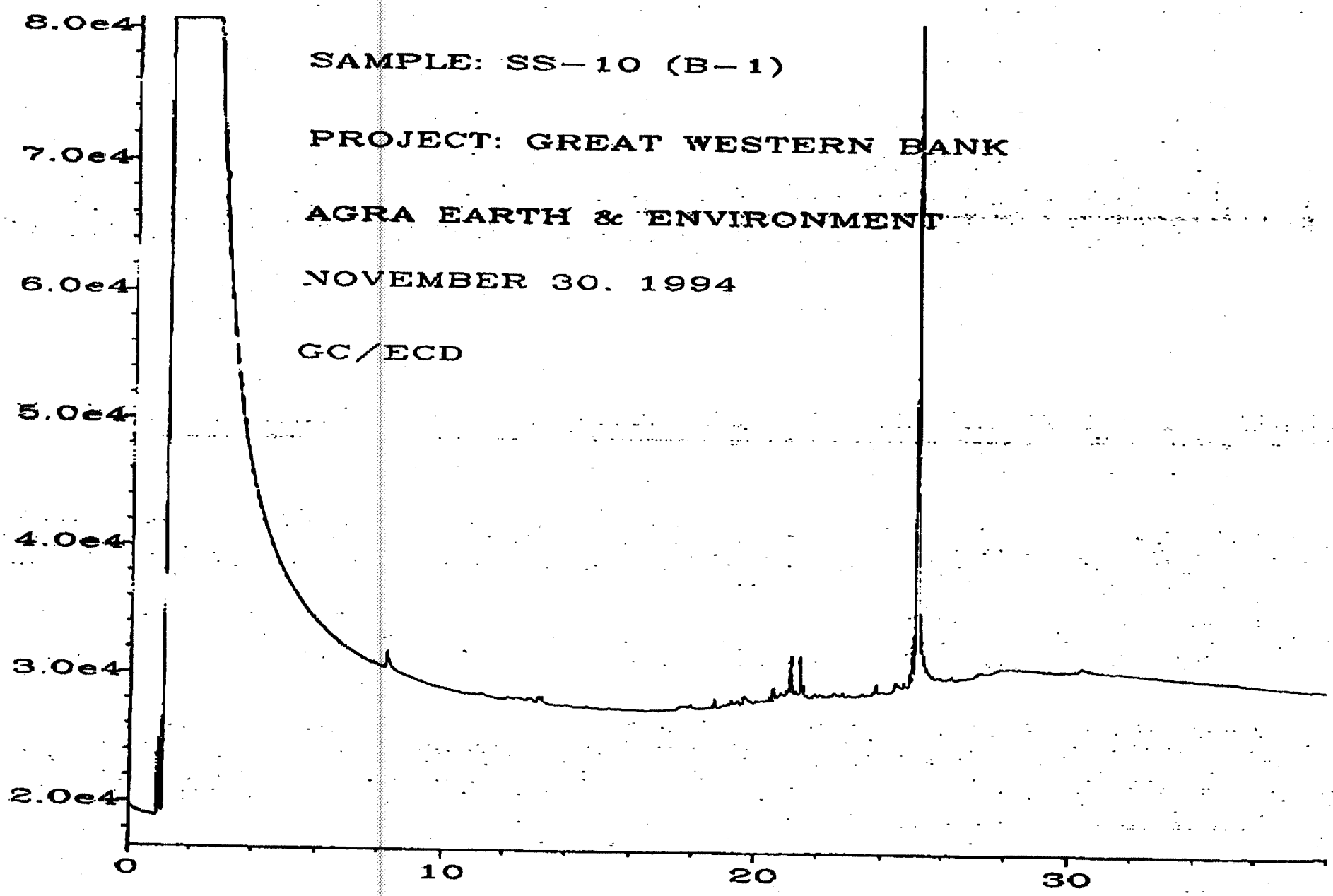
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NOVEMBER 30, 1994
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AGRA E&E - KIRKL
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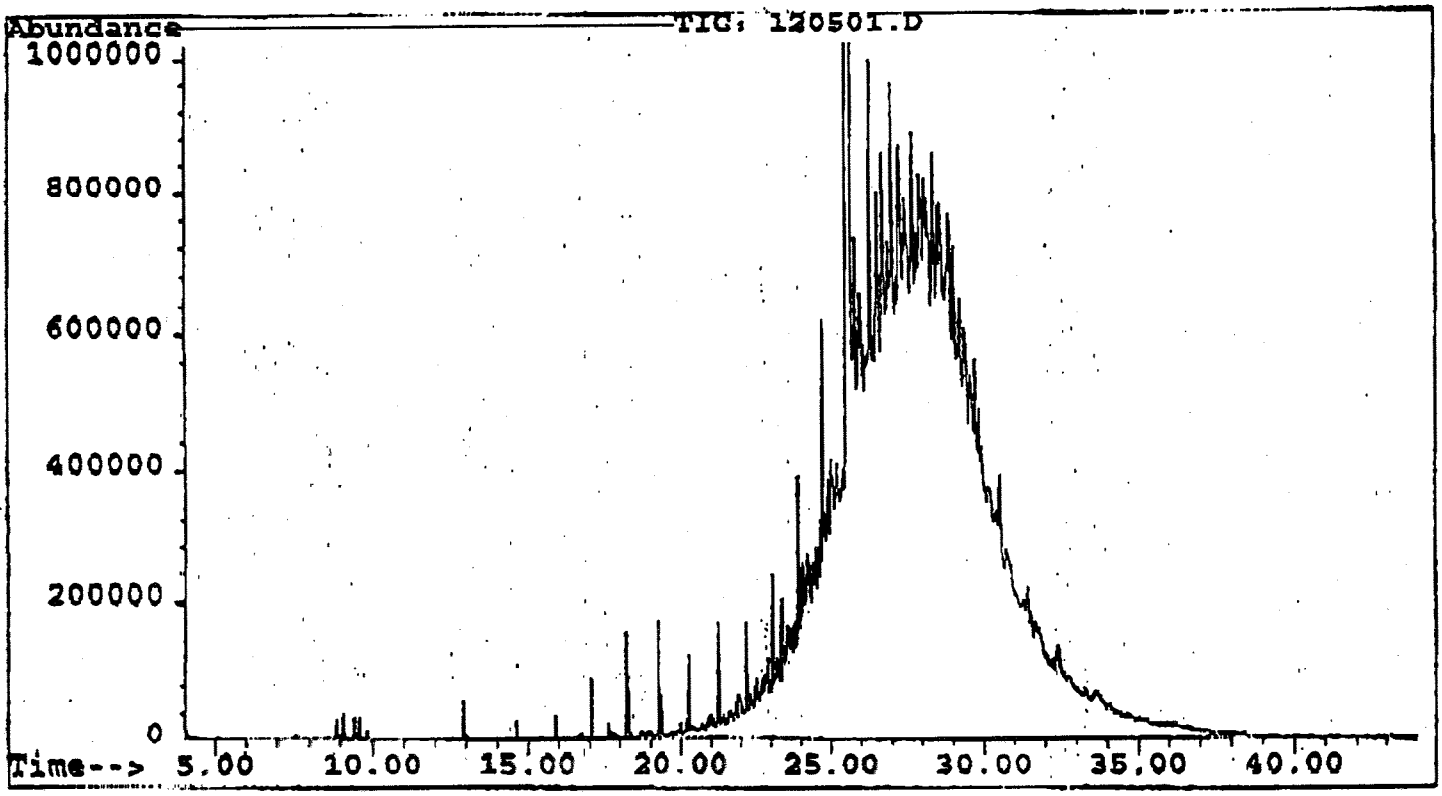

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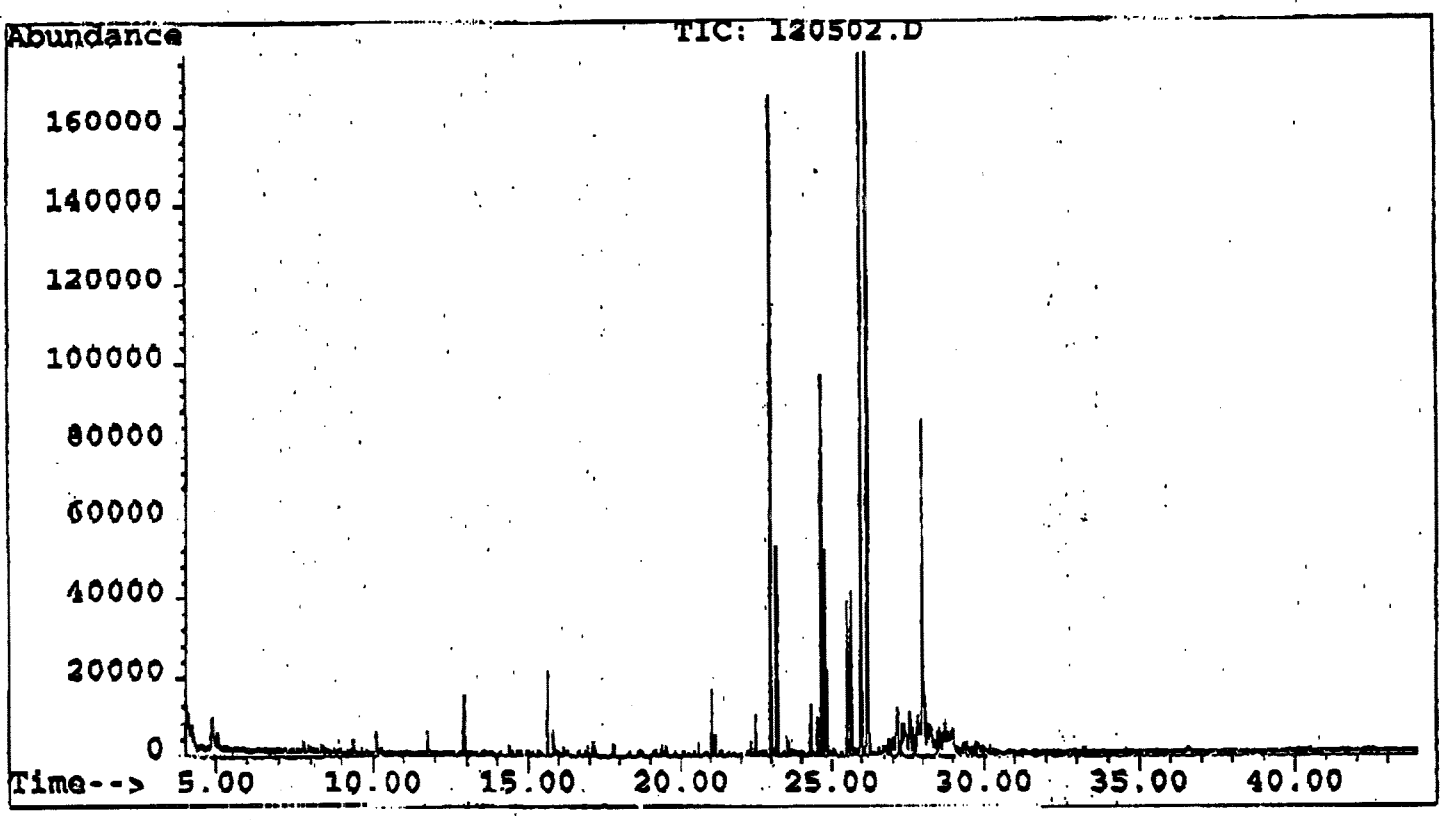

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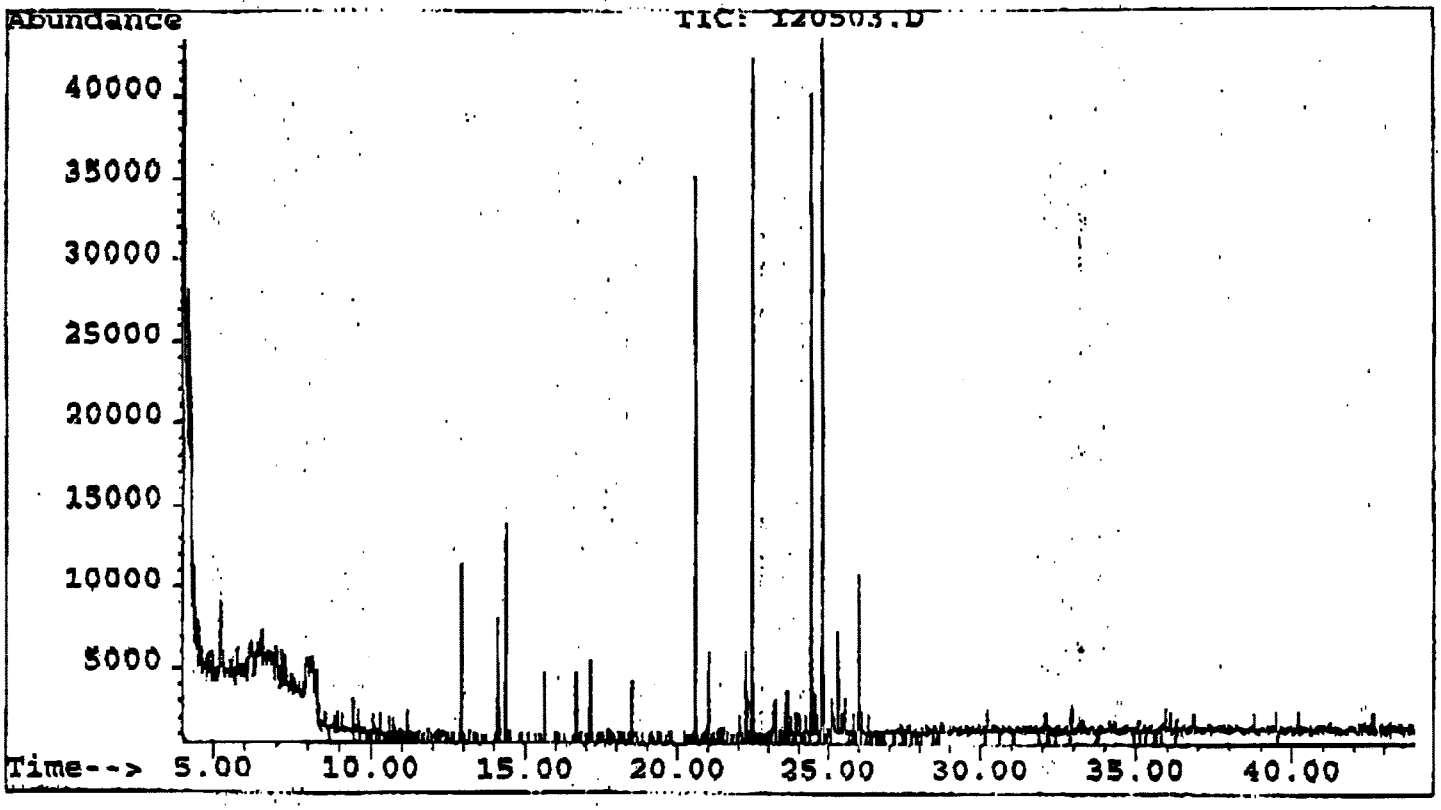

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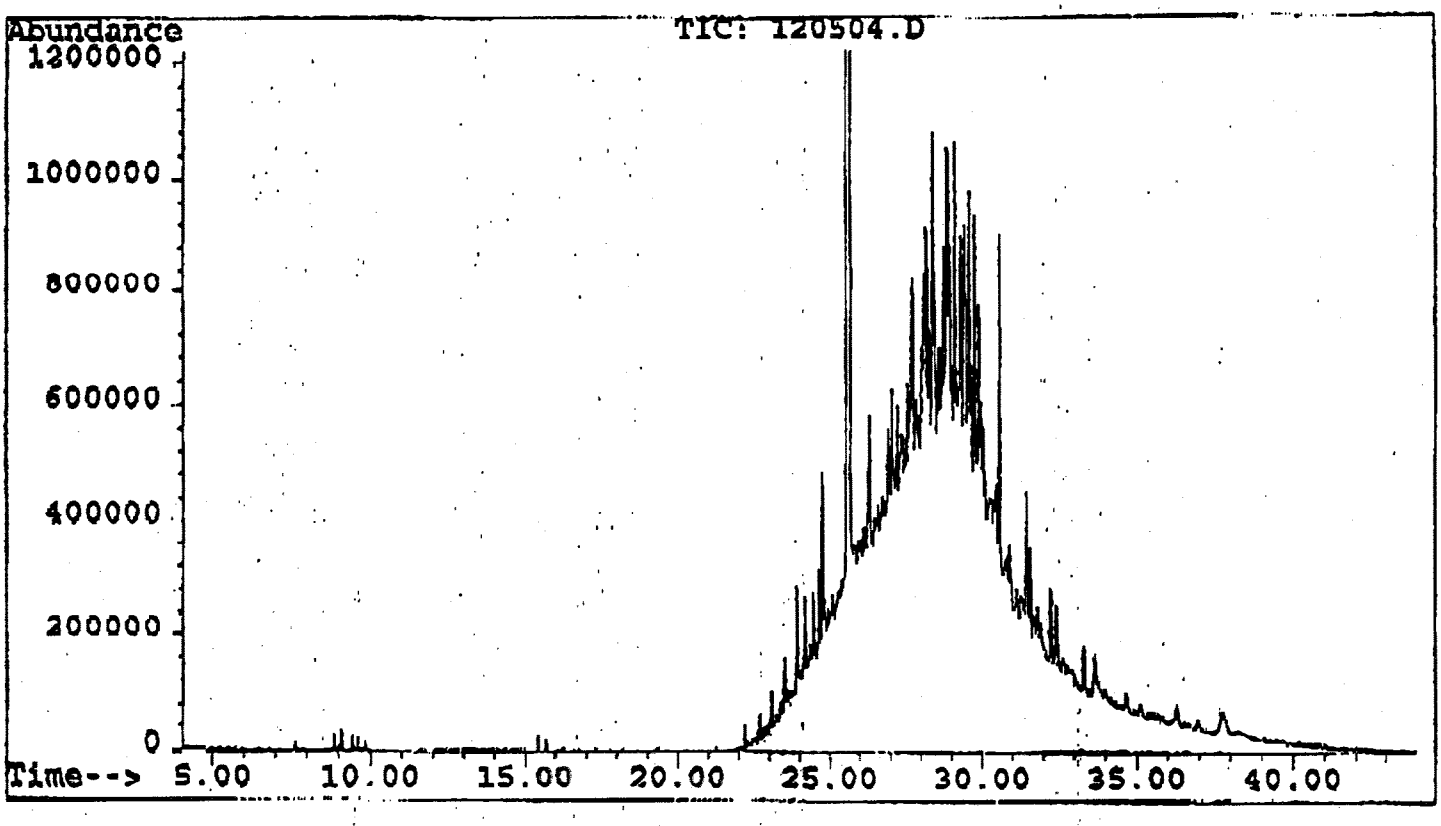

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Instrument : 5972 - In
Sample Name: 55366 S-2
Misc Info :
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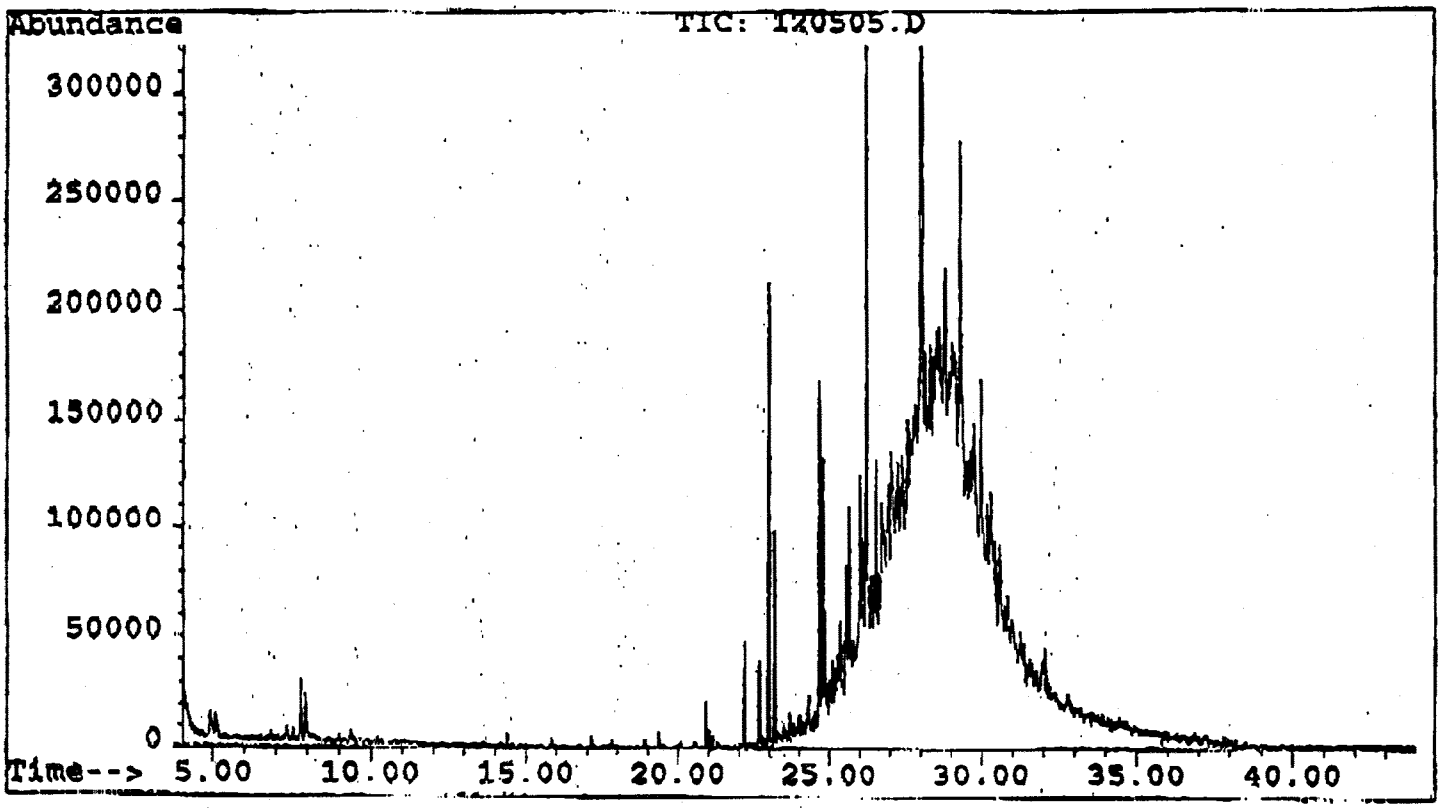

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Instrument : 5972 - In
Sample Name: 55366 S-3
Misc Info :
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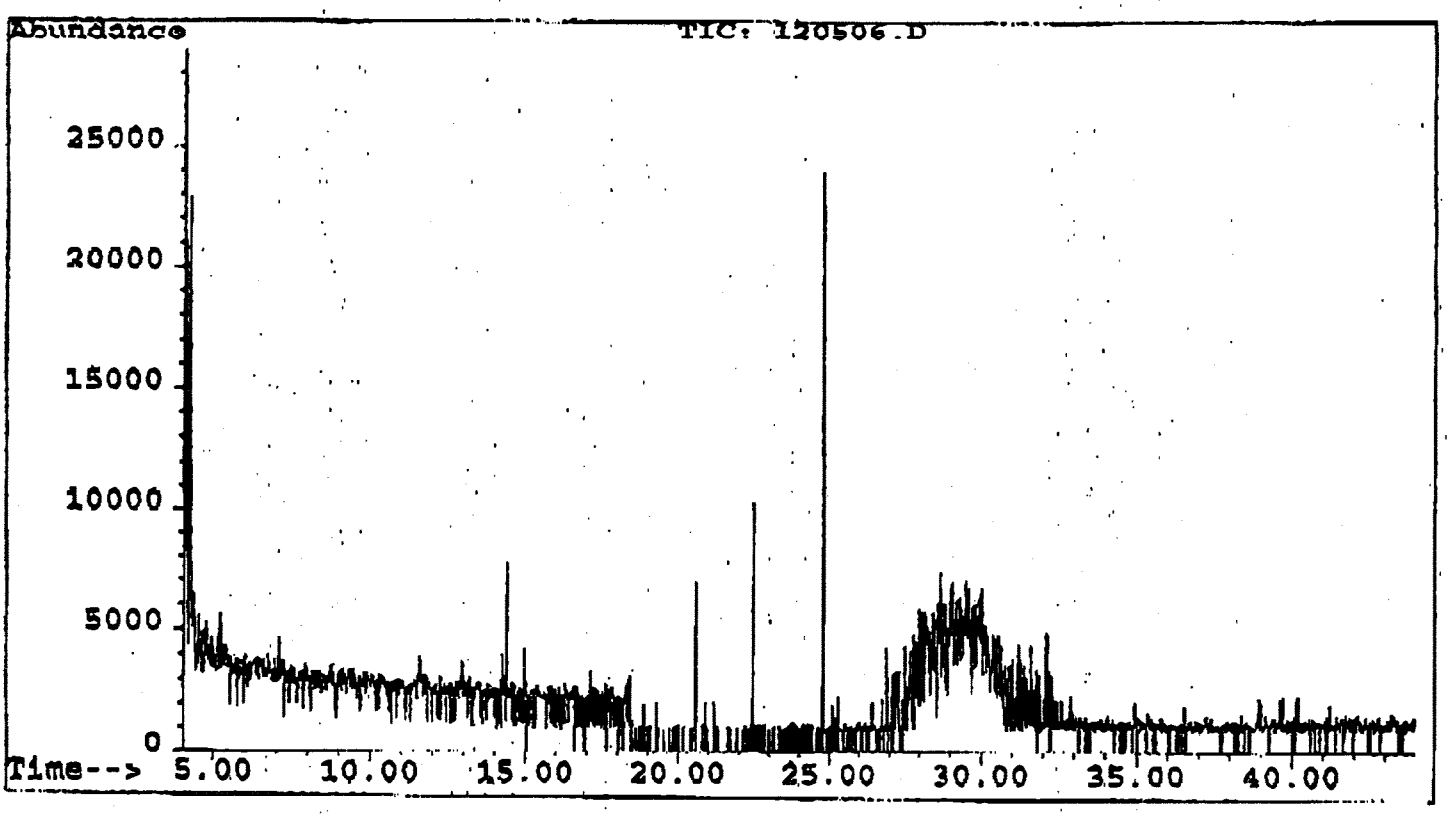

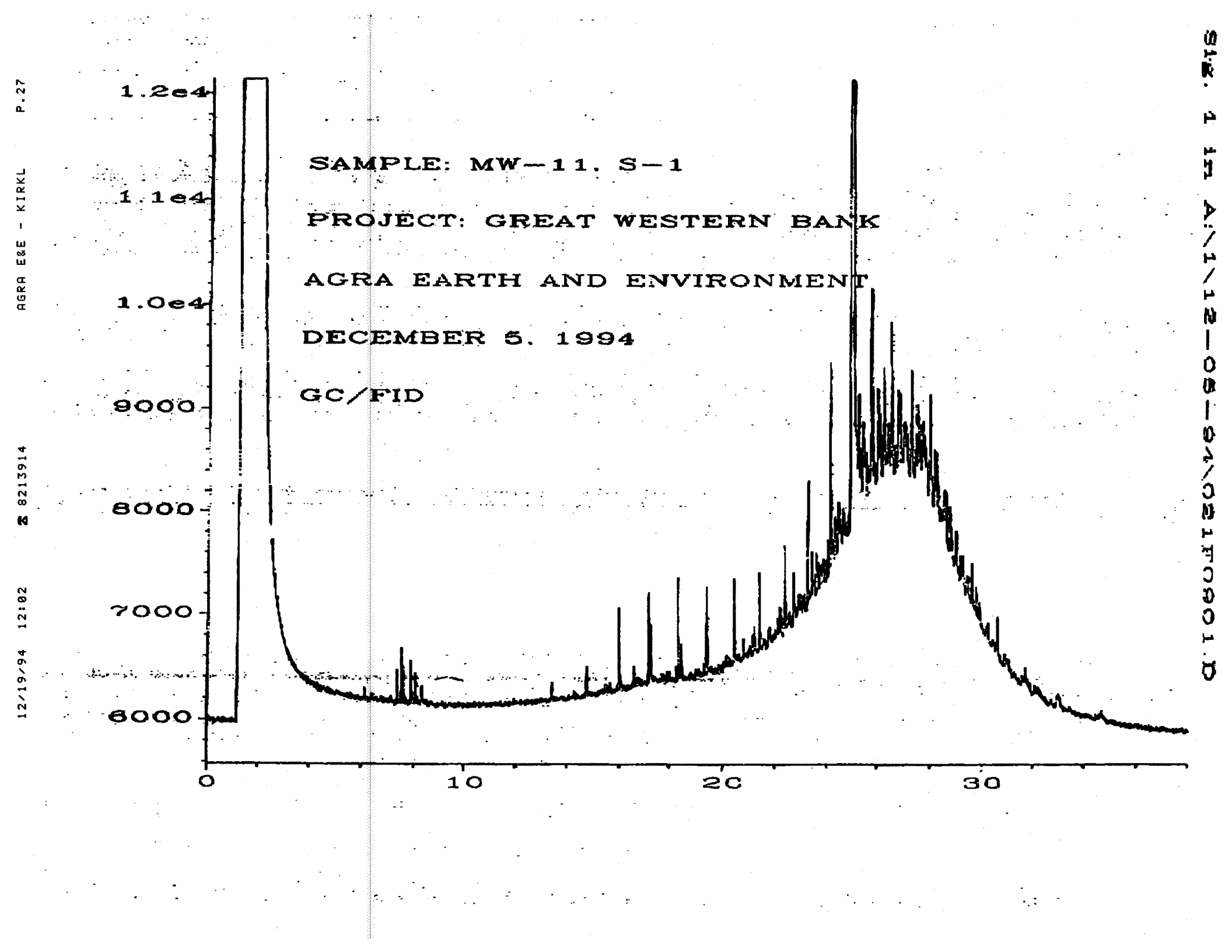
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12/19/94 12:02 # 8213914
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PROJECT: GREAT WESTERN BANK
AGRA EARTH AND ENVIRONMENT
DECEMBER 5. 1994
GC/FID
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7000
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20
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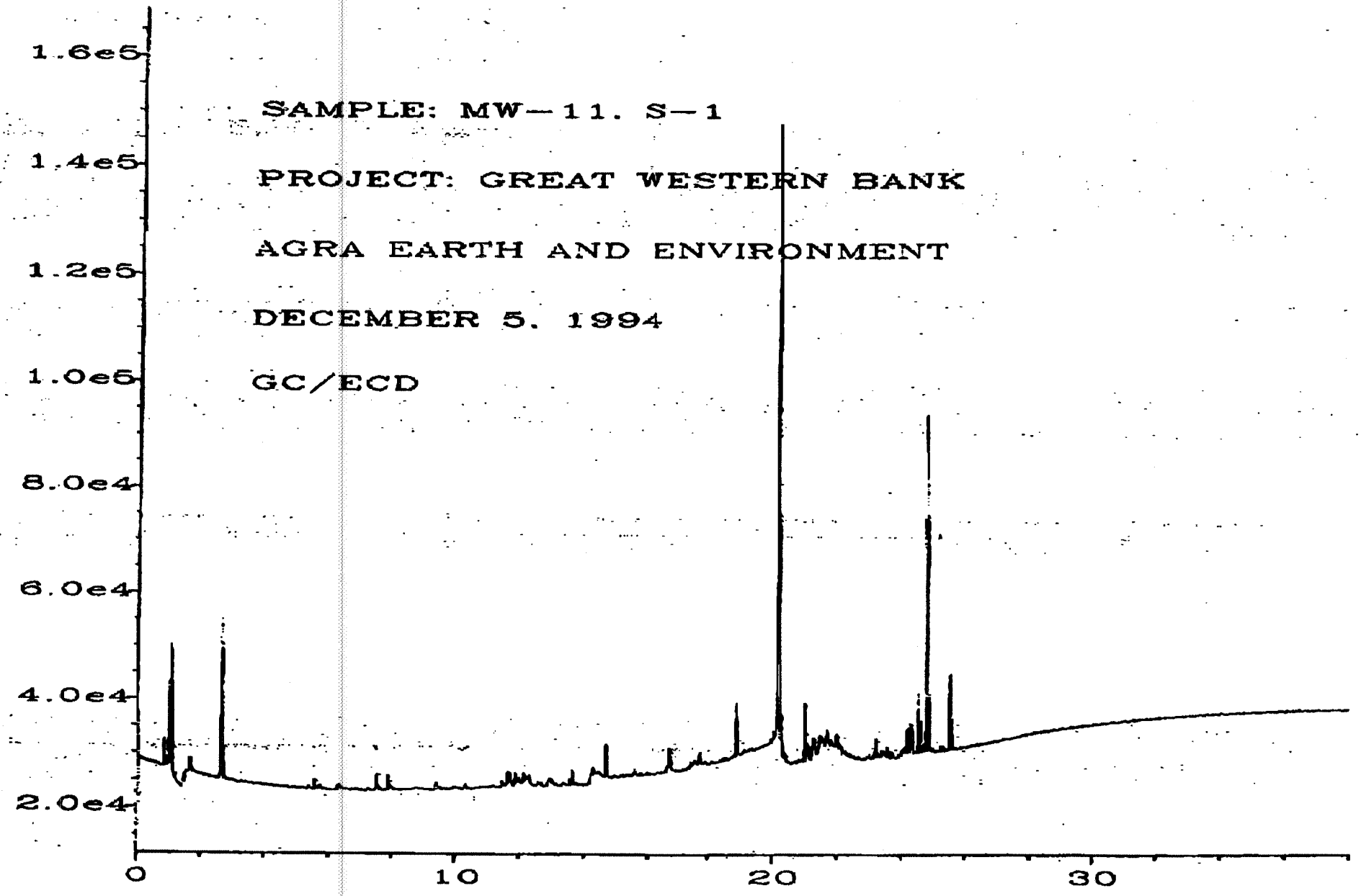
S1:2. 1 17 A:\1\12-05-94\021F0901.D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PROJECT: GREAT WESTERN BANK
AGRA EARTH AND ENVIRONMENT
DECEMBER 5. 1994
GC/ECD
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20
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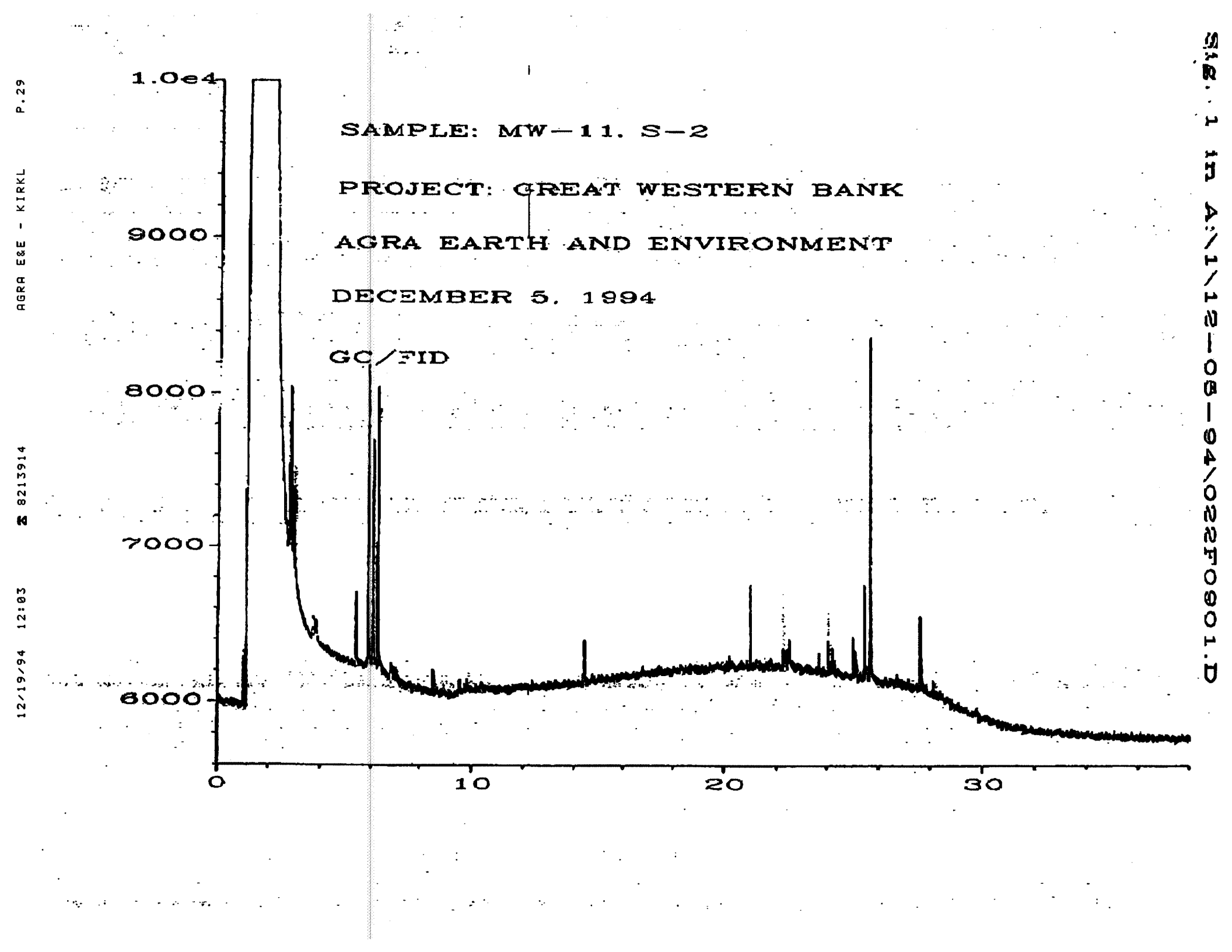
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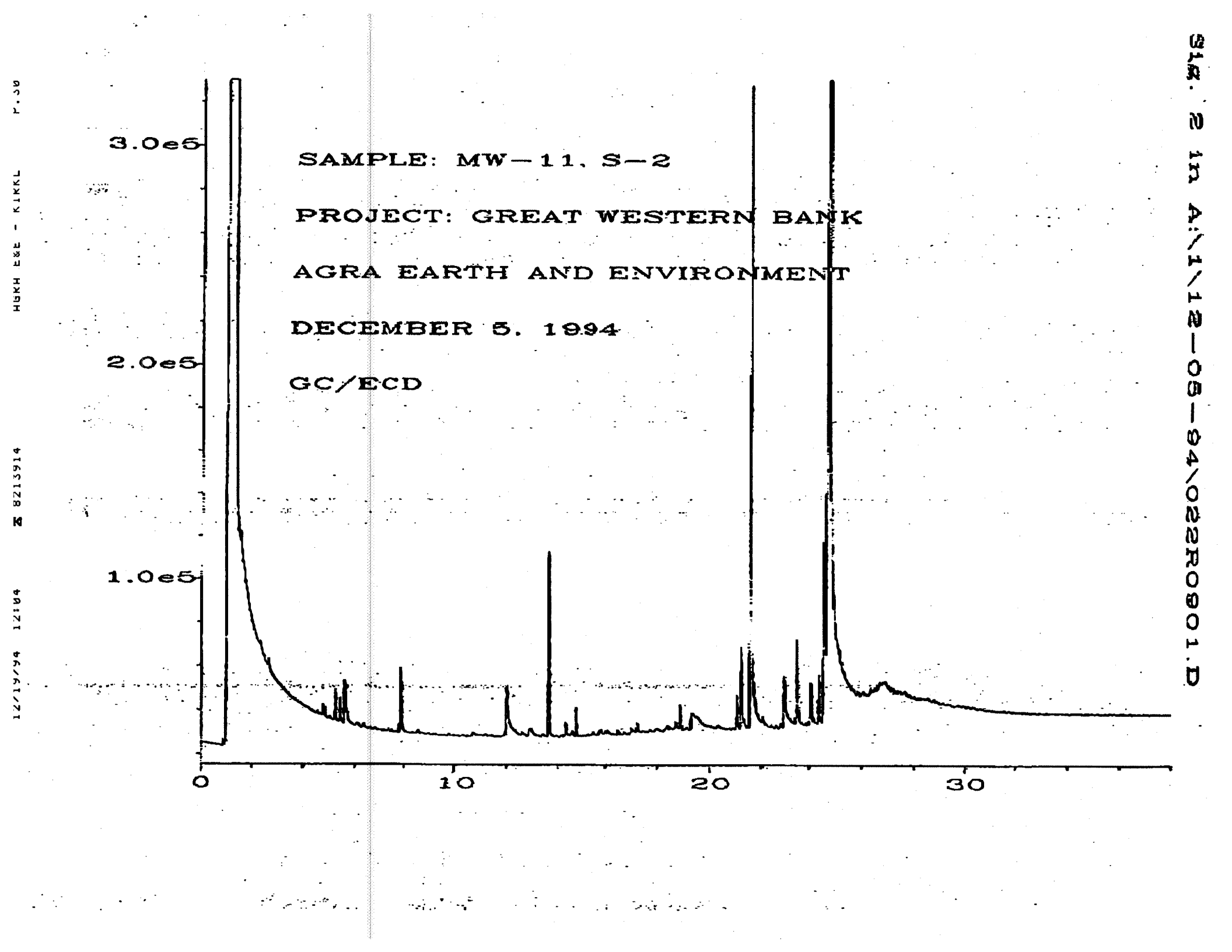
Sig.1 in A:\1\12-05-94\022F0901.D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PROJECT: GREAT WESTERN BANK
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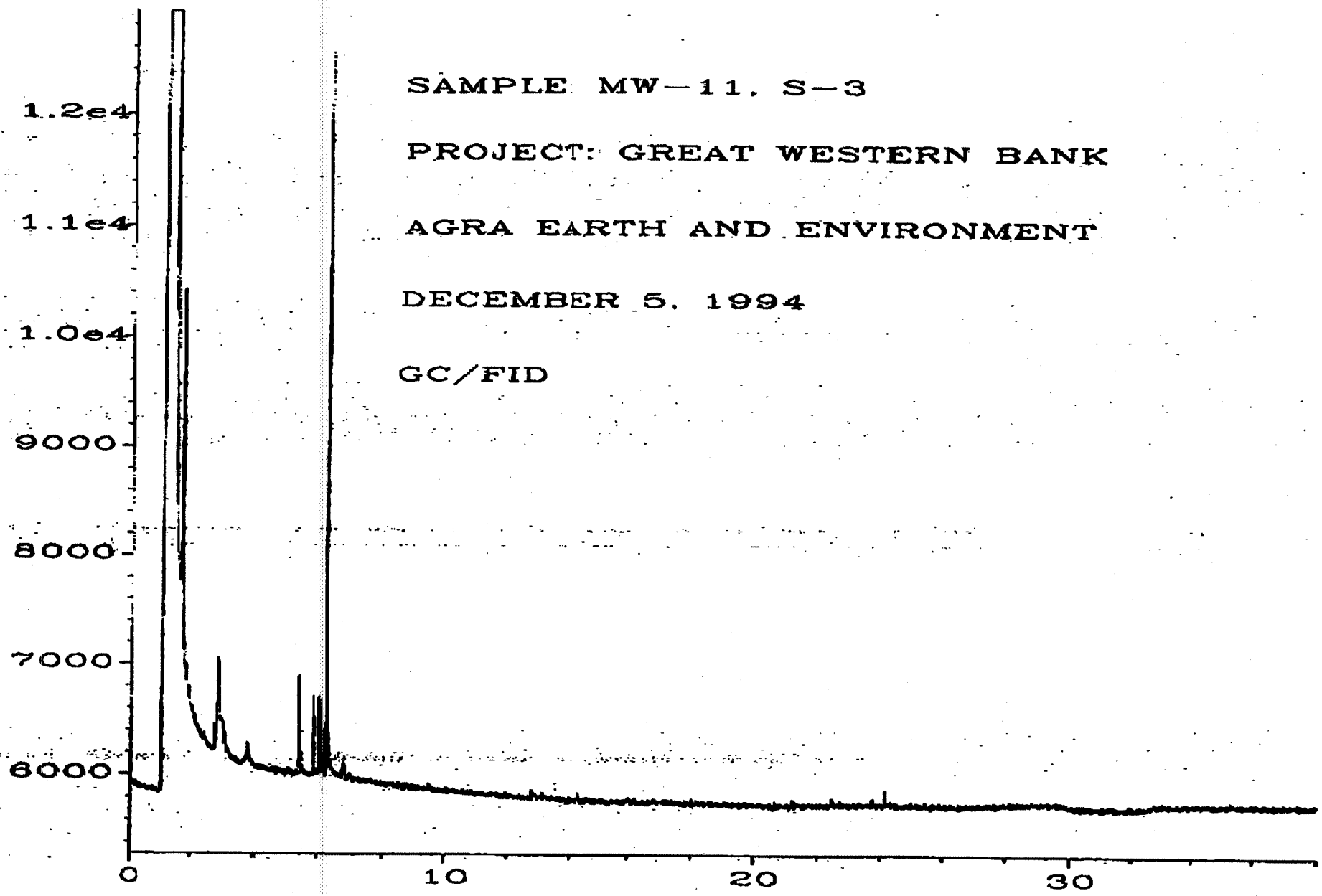
12/19/94 12:04 HSKH E&E - KIKKL P.30
8213914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PROJECT: GREAT WESTERN BANK
AGRA EARTH AND ENVIRONMENT
DECEMBER 5, 1994
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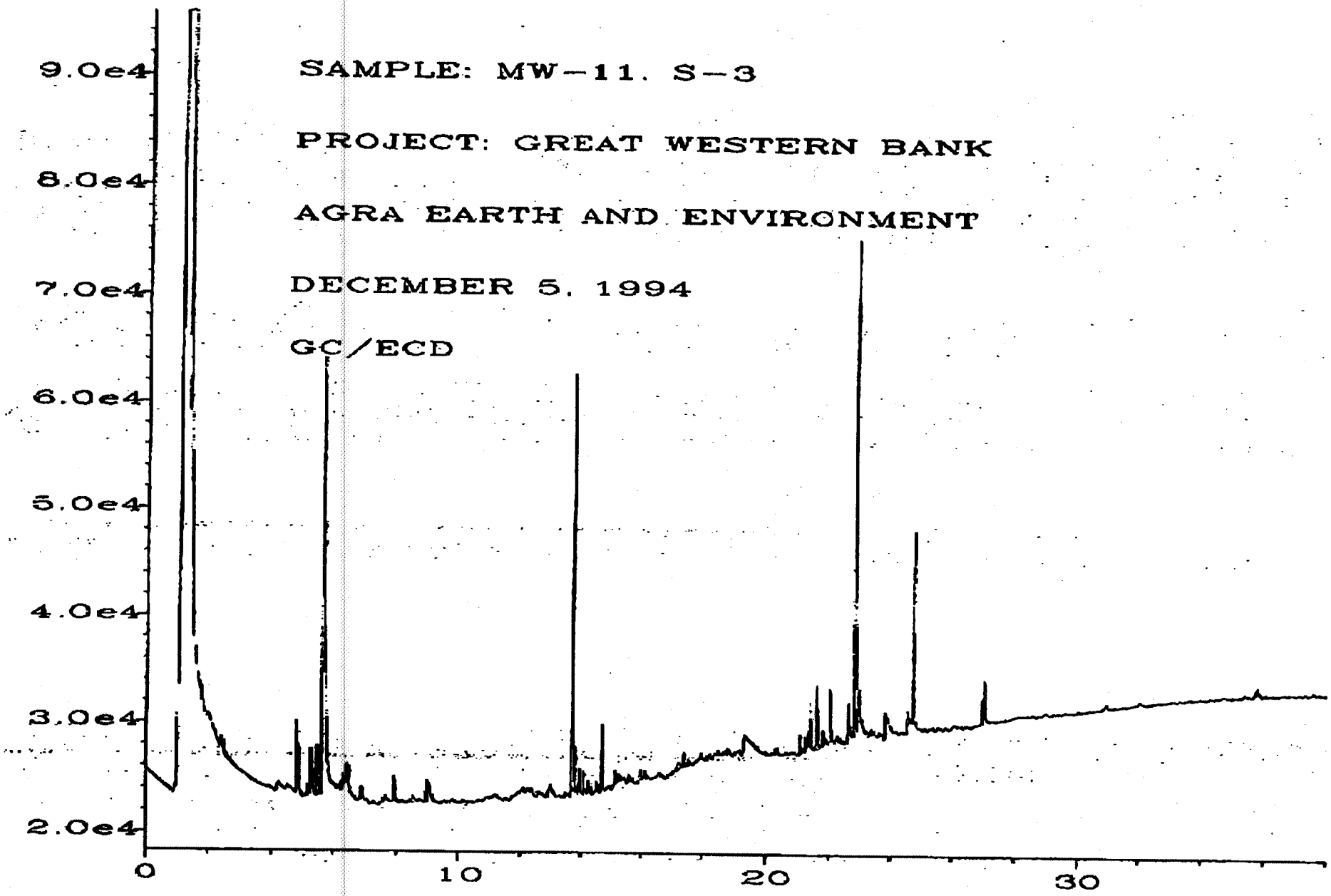
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AGRA EARTH AND ENVIRONMENT
DECEMBER 5. 1994
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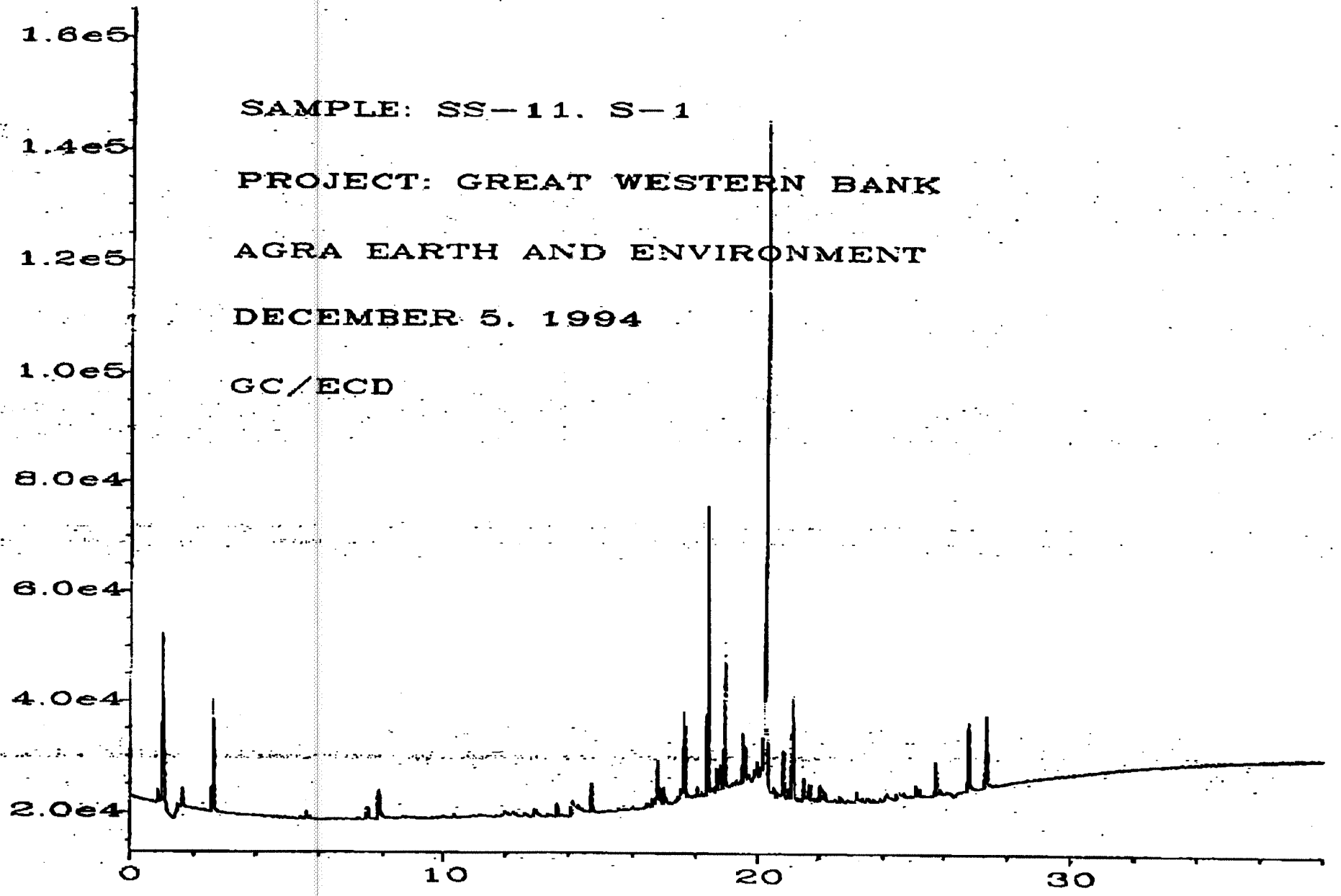
S1,R. 2 in A:\1\12-05-94\023R0001.D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PROJECT: GREAT WESTERN BANK
AGRA EARTH AND ENVIRONMENT
DECEMBER 5. 1994
GC/ECD
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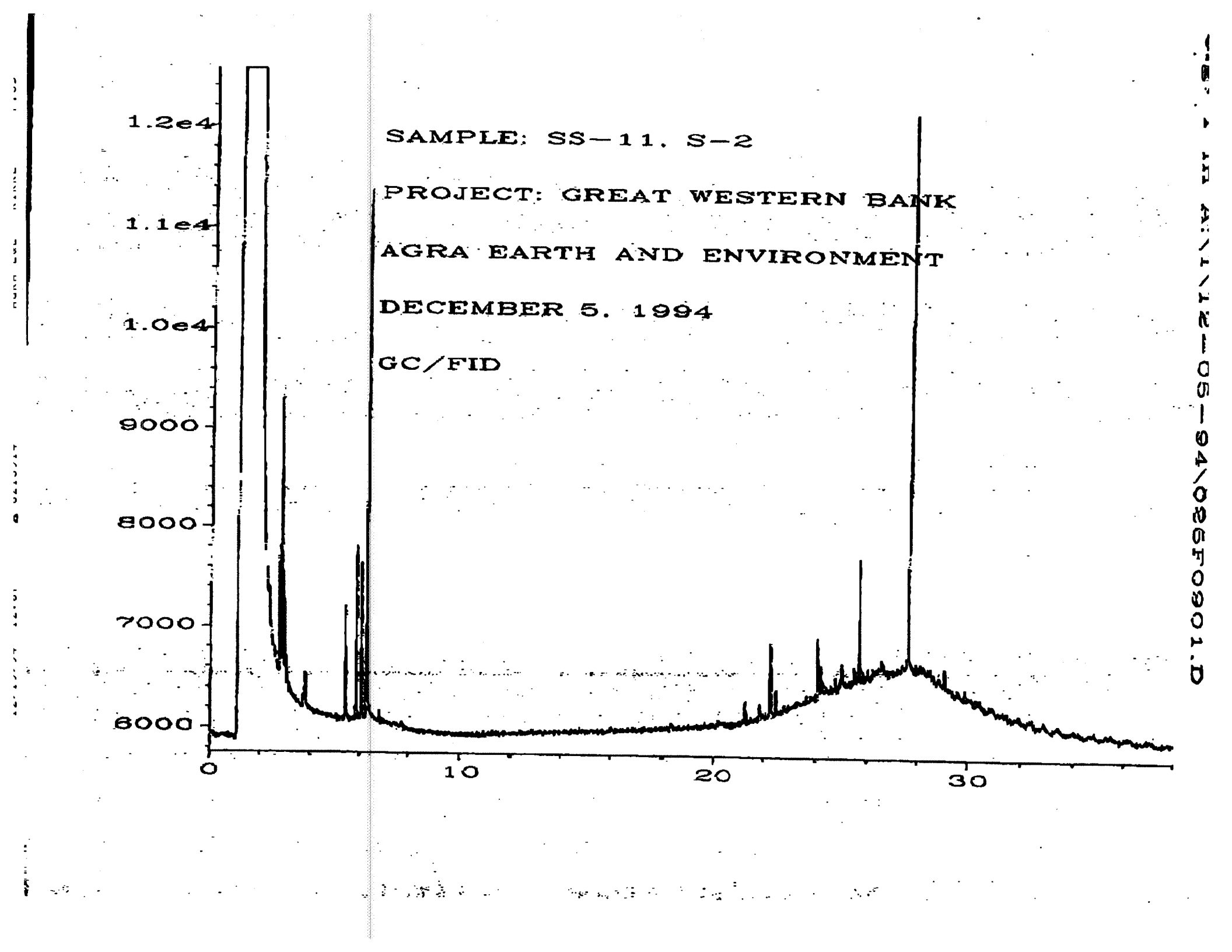
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AGRA EARTH AND ENVIRONMENT
DECEMBER 5. 1994
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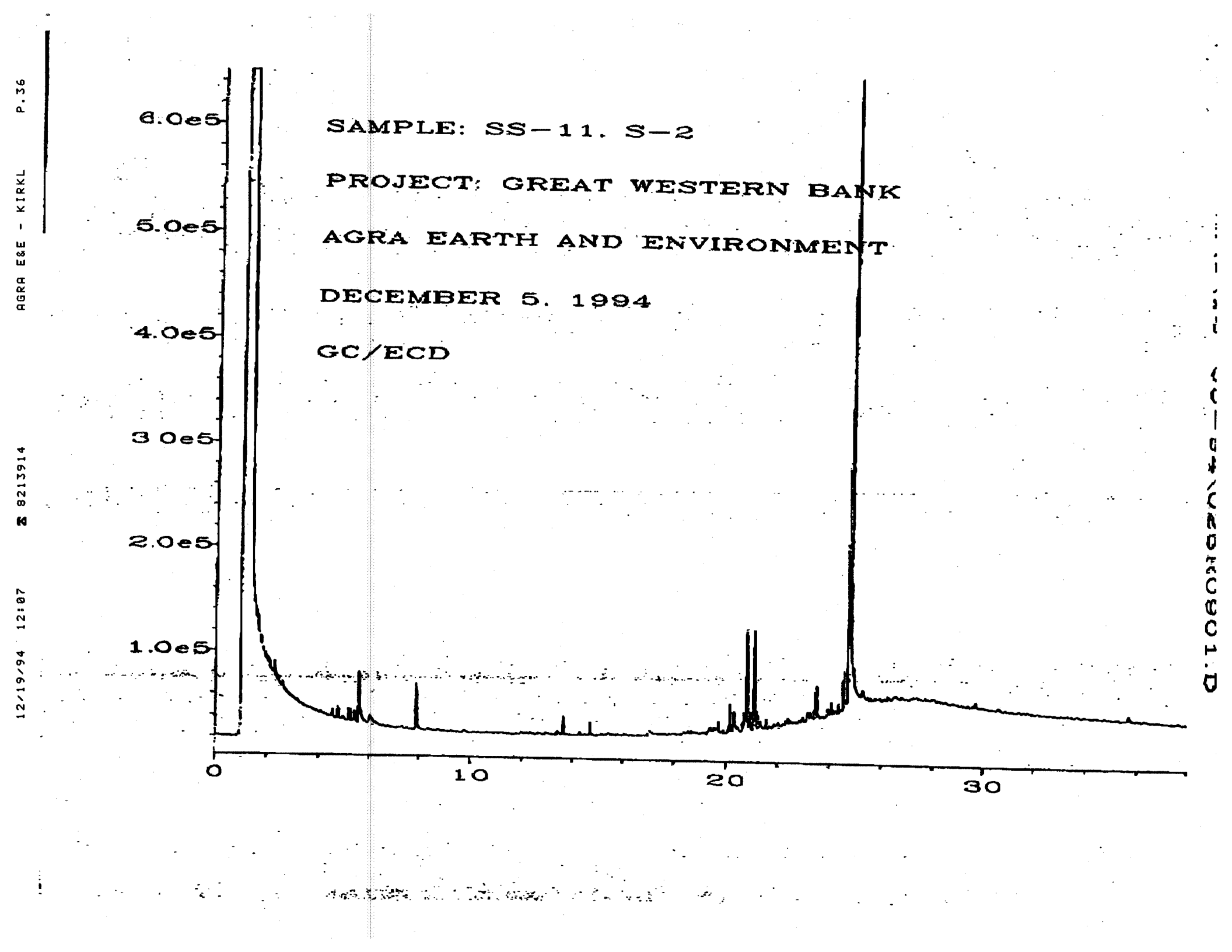
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PROJECT: GREAT WESTERN BANK
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DECEMBER 5. 1994
GC/ECD
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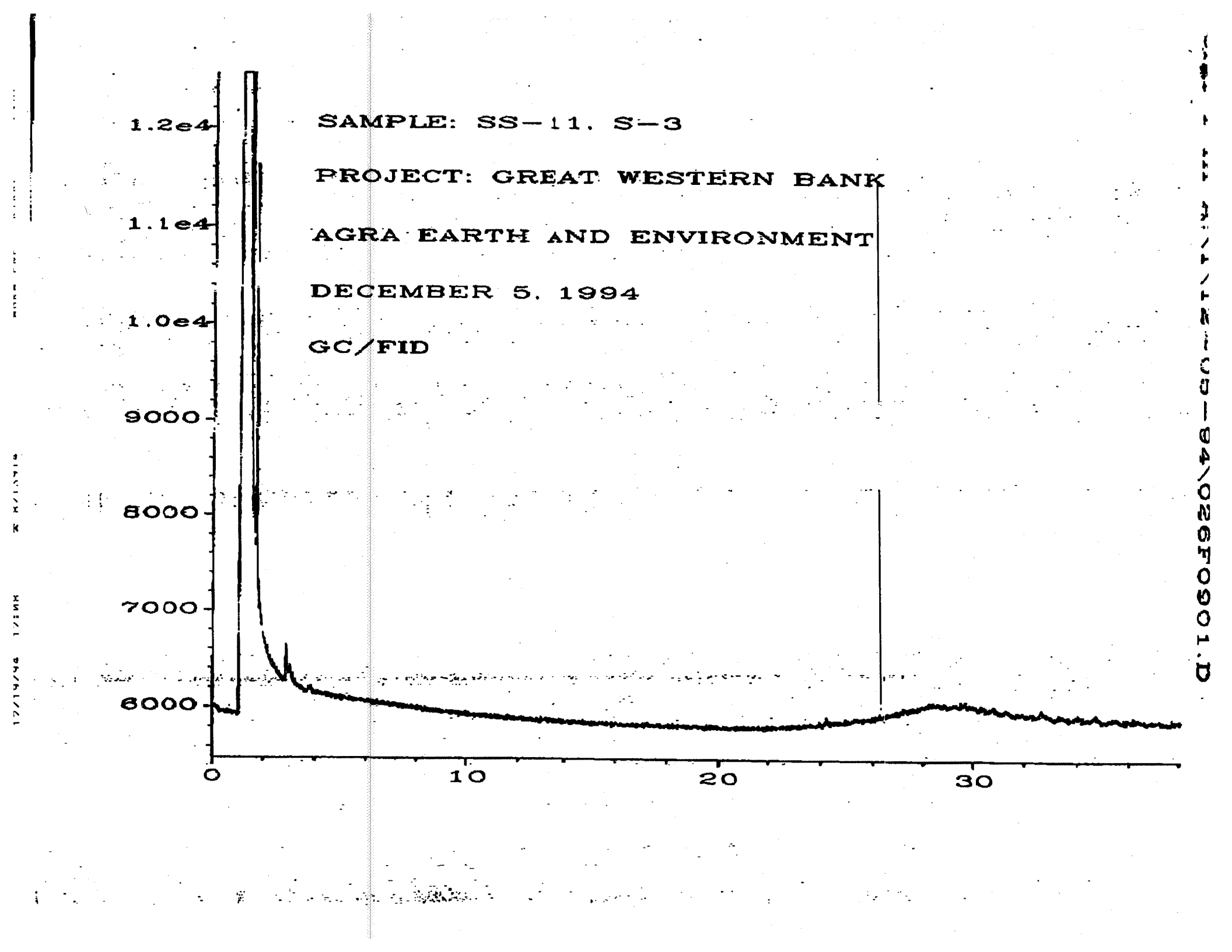
AGRA E&E - KIRKL P.36
12/19/94 12:07 8213914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PROJECT: GREAT WESTERN BANK
AGRA EARTH AND ENVIRONMENT
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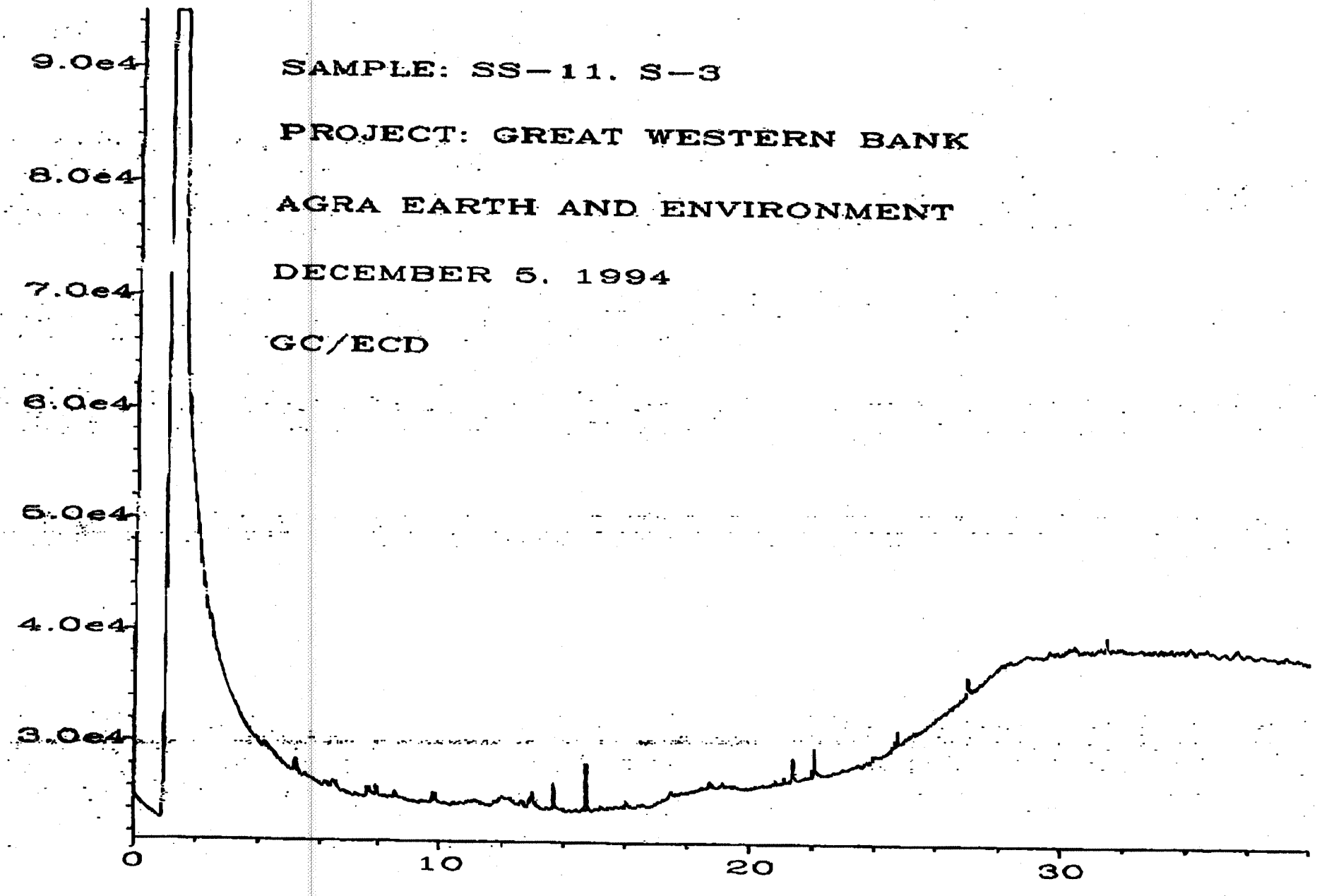
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PROJECT: GREAT WESTERN BANK
AGRA EARTH AND ENVIRONMENT
DECEMBER 5. 1994
GC/ECD
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5.0e4
4.0e4
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