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30 September 2010

Mr. Mark Engdahl
Assistant Manager Environmental Remediation
BNSF Railway Company
2454 Occidental Avenue South, Suite 1A
Seattle, Washington 98134 -1451

Subject: Supplemental Site Investigation - WMW-7 Area
Potential Light Non-aqueous Phase Liquid (LNAPL) Sources
BNSF Railway Company Wishram Railyard
500 Main Street, Wishram, Washington
Ecology Facility Site ID: 1625461
K/J 1096010.00

Dear Mr. Engdahl:

Kennedy/Jenks Consultants has prepared this letter report on behalf of BNSF Railway Company (BNSF) to summarize results of supplemental site investigation activities conducted at the BNSF Railyard located in Wishram, Washington (site). This supplemental investigation was performed to identify potential sources of LNAPL in the vicinity of monitoring well WMW-7. The site location is shown on Figure 1, and the WMW-7 investigation area is shown on Figure 2.

Background and Purpose

Previous site assessment and remediation work performed in the vicinity of WMW-7 is summarized in the *UST Site Assessment Report,* dated February 2004 (Kennedy/Jenks Consultants 2004a), *Site Assessment Report, Wishram Railyard,* dated August 2004 (Kennedy/Jenks Consultants 2004b), and *Remediation Documentation Report, Wishram, Washington*, dated March 2007 (Kennedy/Jenks Consultants 2007). Groundwater monitoring results for WMW-7 are summarized in the *Groundwater Monitoring Report* dated 4 March 2010 (Kennedy/Jenks Consultants 2010a).

Previous investigation work has included collection and analysis of soil samples from soil borings and excavations and collection of groundwater samples from soil borings and monitoring wells. Previous remediation work has included excavation and offsite disposal of approximately 900 tons of petroleum-containing soil west of the Maintenance Building in 2005 (refer to Figure 2) and placement of 200 pounds of oxygen release compound (ORC) into saturated soil at the base of the excavation prior to backfilling. In addition, approximately 750 tons of petroleum-containing soil was excavated and disposed offsite in conjunction with the removal of a 30,000-gallon underground storage tank (UST) from north of the Maintenance Building in 2002 (refer to Figure 2).

Since the completion of the investigation and remediation activities listed above, approximately 1-inch of LNAPL has been observed in monitoring well WMW-7. The purpose of this supplemental investigation is to identify potential sources of LNAPL, possibly including in-place USTs, petroleum-containing soil, piping, and/or other previously unidentified subsurface features.

Groundwater monitoring was performed periodically at WMW-7 between 2004 and 2009 (Kennedy/Jenks Consultants 2010a). Diesel-range petroleum hydrocarbons were detected at concentrations of 548 to 1,900 micrograms per liter (µg/l), above the Washington State Department of Ecology's (Ecology) Model Toxic Control Act (MTCA) cleanup regulation [Washington Administrative Code (WAC) 173-340] Method A groundwater cleanup level of 500 µg/l. Gasoline-range petroleum hydrocarbons were detected at concentrations of 284 to 1,790 µg/l in well WMW-7. The gasoline-range hydrocarbon concentration exceeded the MTCA Method A groundwater cleanup level of 1,000 µg/l during one monitoring event (April 2004) which was performed prior to the remedial action described above. Following the remedial action, gasoline-range hydrocarbons were detected at concentrations of less than 454 µg/l.

Work Performed

Work performed for this investigation included:

1. A subsurface mapping survey using ground penetrating radar (GPR), magnetic, and electromagnetic methods.

2. A subsurface investigation using a direct-push drill rig, including collection and analysis of subsurface soil samples.

The work was performed at the site on 19 and 20 May 2010 and is summarized below.

Subsurface Mapping Survey

The subsurface mapping survey was performed by GeoPotential of Brightwood, Oregon, on 19 May 2010 and was observed by a Kennedy/Jenks Consultants scientist. GeoPotential performed a magnetic survey, GPR survey, and a pipe and cable survey of an approximately 125-foot by 225-foot area including well WMW-7, the BNSF Maintenance Building, and the area around these features. The survey area is depicted in GeoPotential's *Summary Report* (provided in Attachment 1) and on Figure 2. In addition, Figure 3 provides an overview of GeoPotential's survey findings relative to existing site features.

Through performance of the subsurface survey, GeoPotential identified multiple underground anomalous features, including suspected debris pits, a potential former UST pit, a potential abandoned septic tank, a potential abandoned well, and possible water and sewer utility lines. One approximately east-west oriented sewer line was identified to the north of the Maintenance Building, and appears to be the currently active sewer utility. A second possible sewer line was identified to the south of the Maintenance Building, also oriented approximately east-west.

GeoPotential's results did not indicate the presence of existing USTs in the survey area, although one feature was interpreted as a potential former UST pit.

In addition to GeoPotential's survey, screening for conductible underground utilities was also performed by Applied Professional Services, Inc. of Portland, Oregon, to provide clearance prior to drilling activities. A locate request was also submitted to the public utility notification center and to BNSF prior to performing drilling activities.

Subsurface Investigation

The subsurface investigation was performed on 20 May 2010. A total of 10 direct-push borings were advanced to approximately 15 feet below ground surface (bgs). The direct-push drill rig was operated by Cascade Drilling, Inc. of Clackamas, Oregon. A Kennedy/Jenks Consultants scientist observed drilling activities and performed soil logging, field screening, and soil sample collection.

Boring locations were generally based on the Proposal for Consulting Services, dated 9 April 2010 (Kennedy/Jenks 2010b), and included potential LNAPL sources indentified during previous site investigations, including review of historical station maps (Kennedy/Jenks Consultants 2004b, 2007), such as former fueling facilities and possible USTs locations. Some of the proposed boring locations were modified based on the findings of the subsurface survey and accessibility. Boring T-3 was moved approximately 10 feet to the southwest to include a possible "ferric debris pit" anomaly identified by GeoPotential, and boring T-7 was moved approximately 30 feet to the south-southwest to include the possible UST pit anomaly identified by GeoPotential. Borings T-9 and T-10, located inside the Maintenance Building, were shifted to the east to facilitate access by the drill rig.

Soil boring locations are shown on Figure 2. Site features, layout, and boring locations are shown on the photographs included in Attachment 2.

At each boring location, a 2-inch-diameter Macro-core sampler was advanced by pushing against the weight of the drill rig and by hydraulic hammering. The sampler was advance in 3- to 5-foot-depth intervals, with a new acetate liner installed in the sampler prior to each depth interval. For each depth interval, the acetate liner was removed from the sampler and cut open to expose the soil sample. Lithologic logging and field screening, including visual and olfactory observations and water-sheen testing, and soil sample collection for laboratory analyses were performed immediately after the samplers were cut open.

LNAPL was not identified in any of the soil borings, including those in closest proximity to well WMW-7, although petroleum-like odors and iridescent sheens indicative of petroleum hydrocarbons were observed in five of the 10 soil borings. Saturated conditions were encountered in all of the soil borings at depths ranging from 9.5 to 14.5 feet below ground surface (bgs). Soil boring logs are provided in Attachment 3 and include field observations, lithologic logs, notes, and soil sample depths.

At each boring location, one soil sample was selected for laboratory analysis based on field observations. The samples selected for laboratory analysis were those with the greatest field indication (odor, sheen, staining) of potential petroleum hydrocarbon impacts for borings in which potential petroleum hydrocarbon impacts were identified. For borings in which potential petroleum hydrocarbon impacts were not identified, the samples were typically collected near the top of the saturated zone.

A total of 10 soil samples were submitted to Pace Analytical Services, Inc. (Pace) of Seattle, Washington, for analysis of gasoline-range petroleum hydrocarbons by Washington State Department of Ecology (Ecology) Northwest Total Petroleum Hydrocarbons Gasoline (NWTPH-G) Method, diesel- and oil-range petroleum hydrocarbons by Ecology Northwest Total Petroleum Hydrocarbons Diesel Extended (NWTPH-Dx) Method (with silica gel cleanup), and for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260. Samples were stored on ice and submitted under standard chain-of-custody procedures (refer to Attachment 4).

Analytical Results

Gasoline-range petroleum hydrocarbons were detected in five of the 10 soil samples at concentrations of 8.1 to 210 milligrams per kilogram (mg/kg). The gasoline-range concentration detected in samples T-2-11 (161 mg/kg) and T-4-13.5 (210 mg/kg) exceeded Ecology's Method A soil cleanup level for unrestricted land uses of 100 mg/kg based on the MTCA cleanup regulation (WAC 173-340).

Diesel-range petroleum hydrocarbons were detected in four of the 10 soil samples at concentrations of 314 to 683 mg/kg, well below the MTCA Method A soil cleanup level for unrestricted land uses of 2,000 mg/kg.

Oil-range petroleum hydrocarbons and BTEX were not detected in any of the soil samples at concentrations above the laboratory reporting limits. Five of the 10 soil samples did not contain any analytes at concentrations above the laboratory reporting limits, and correspond to the soil borings in which petroleum-like odors and iridescent sheens were not observed.

Based on their review of the chromatograms for the NWTPH-Dx and NWTPH-G analyses, Pace indicated that the diesel-range hydrocarbons detected in the NWTPH-Dx analysis appeared to be weathered diesel, and that gasoline-range hydrocarbons detected in the NWTPH-G analysis appeared to be from a diesel source.

Analytical results are shown in Table 1 and on Figure 2 (detected analytes only). Laboratory report and chain-of-custody documents are provided in Attachment 4. Copies of laboratory-provided chromatograms and interpretation for NWTPH-Dx and NWTPH-G analyses are provided in Attachment 5.

Summary

During this supplemental investigation, gasoline-range petroleum hydrocarbon concentrations above the MTCA Method A soil cleanup level of 100 mg/kg were present in two soil samples collected from borings T-2 (161 mg/kg) and T-4 (210 mg/kg). Boring T-2 is located approximately 10 feet south-southeast of well WMW-7, and boring T-4 is located approximately 65 feet north-northeast of well WMW-7 (north of a large concrete slab). In general, gasoline- and diesel-range petroleum hydrocarbon concentrations were highest in samples collected to the west of the Maintenance Building, but the diesel-range concentrations were all below the MTCA Method A soil cleanup level of 2,000 mg/kg. Pace performed an analysis of the chromatograms and indicated that the detected hydrocarbons appear to be diesel and/or weathered diesel. LNAPL was not observed in any of the soil borings.

The results of this supplemental investigation do not indicate a conclusive, specific source for LNAPL observed in well WMW-7. Suspected potential LNAPL sources, based on previous site investigations and station maps, include former fueling facilities located north of WMW-7 and former UST locations to the east and southeast of WMW-7. Analytical results and field observations of petroleum-like impacts do not appear to specifically correspond to any of the previously suspected LNAPL sources, or to the subsurface features identified during the subsurface mapping survey, although soil borings were not located above all of the possible underground features (no borings were advanced south of the Maintenance Building, where two former pits are suspected).

Two 500-gallon gasoline USTs (removed in approximately 1988) were previously located in the vicinity of the Maintenance Building. Historic station maps suggested that the gasoline USTs may have been located near the southwestern corner of the Maintenance Building (refer to Figure 4) but the location could not be confirmed (Kennedy/Jenks Consultants 2004a). Two pit-like anomalies identified during the subsurface mapping survey (refer to Figures 3 and 4) could represent the former gasoline UST locations. The proximity of the former gasoline USTs to WMW-7 indicate a potential for unidentified impacts to have contributed to the LNAPL observed in WMW-7, although Pace indicated the detected hydrocarbons resemble diesel or weathered diesel rather than gasoline.

In addition to the two gasoline USTs described above, three USTs were previously located east of WMW-7 including one 10,000-gallon gasoline/oil UST (removed 1988), one 600-gallon fuel oil UST (removed 1988), and one 30,000-gallone diesel/oil UST (removed 2002). The locations of the previously-removed USTs in the vicinity of WMW-7, and sample locations from previous site investigation and remediation work, are shown on Figure 4.

Soil samples previously collected from soil borings advanced near the 10,000-gallon and 600-gallon USTs did not indicate petroleum hydrocarbon impacts, so these two USTs do not appear to be likely LNAPL sources. Petroleum hydrocarbon impacts were identified during removal of the 30,000-gallon UST and the associated soil removal action, and soil with diesel- and oil-range petroleum hydrocarbon impacts remained in-place below and around the former

UST location, including beneath the current Wishram Fire Department building (former BNSF boiler house).

The residual petroleum hydrocarbon impacts in the 30,000-gallon UST are a potential source of LNAPL in well WMW-7; however, soil samples collected from soil boring and excavations located between WMW-7 and the former 30,000-gallon UST area do not provide an indication of the presence of LNAPL or a clear migration route.

Based on the results of the current and previous investigations performed in the WMW-7 vicinity, additional site investigation and remediation are needed to fully characterize the extent and source of impacts to soil and groundwater in the vicinity of WMW-7, and to develop and implement an appropriate remedial action to obtain site closure from Ecology. Areas which appear to warrant further investigation include the area around the former 30,000-gallon UST to determine if previously unknown migration pathways are present, and the area south of WMW-7 and the Maintenance Building to determine if previously unknown petroleum hydrocarbon source areas are present.

Please contact us at 253-835-6400 with any questions regarding the content of this letter report.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Dean Malte
Geologist

Ty C. Schreiner
Vice President

Attachments:
Table 1 – Summary of Soil Analytical Results
Figure 1 – Site Location Map
Figure 2 – Site and Sample Location Map
Figure 3 – Summary of Subsurface Mapping Results
Figure 4 – Well MW-7 Vicinity Investigation Summary Map
Attachment 1 – GeoPotential Subsurface Mapping Survey Summary Report
Attachment 2 – Site Photographs
Attachment 3 – Soil Boring Logs
Attachment 4 – Analytical Report and Chain-of-Custody Documents
Attachment 5 – Pace Laboratory NWTPH-Dx and NWTPH-G Chromatograms

References:

Kennedy/Jenks Consultants. 2004a. UST Site Assessment Report, Wishram, Washington. Prepared by Kennedy/Jenks Consultants for BNSF Railway Company. Dated February 2004.

Kennedy/Jenks Consultants. 2004b. Site Assessment Report, Wishram Railyard, Wishram, Washington. Prepared by Kennedy/Jenks Consultants for BNSF Railway Company. Dated August 2004.

Kennedy/Jenks Consultants. 2007. Remediation Documentation Report, Wishram, Washington. Prepared by Kennedy/Jenks Consultants for BNSF Railway Company. Dated March 2007.

Kennedy/Jenks Consultants. 2010a. Groundwater Monitoring Report, BNSF Railway Company, Wishram, Washington, Railyard. Dated 4 March 2010.

Kennedy/Jenks Consultants. 2010b. Proposal for Consulting Services, Supplemental Site Remediation and Investigation, BNSF Railyard, Wishram, Washington. Dated 9 April 2010.

Table

TABLE 1

SUMMARY OF SOIL ANALYTICAL RESULTS
SUPPLEMENTAL SUBSURFACE INVESTIGATION
BNSF Railyard - Wishram, Washington

Analysis / Sample ID	Depth (ft)	T-1-12	T-2-11	T-3-12	T-4-13.5	T-5-14.5	T-6-10.5	T-7-12	T-8-11	T-9-14	T-10-11.5	MTCA Method A[a] Soil Cleanup Level
TPH[b] (mg/kg)[c]												
Gasoline-Range Hydrocarbons		**62.7**	**161**	**67.7**	**210[d]**	<6.2[e]	**8.1**	<5.9	<5.4	<6.3	<6.1	100 / 30[f]
Diesel-Range Hydrocarbons		**545**	**314**	**314**	**683**	<24.9	<24.5	<24.5	<20.4	<21.9	<24.8	2,000
Oil-Range Hydrocarbons		<99.6	<91.9	<97.3	<98.3	<99.7	<97.8	<98.1	<81.6	<87.4	<99.3	2,000
BTEX[g] (µg/kg)[h]												
Benzene		<25.3	<25.3	<22.8	<21.0	<24.8	<27.3	<23.5	<21.7	<25.3	<24.2	30
Toluene		<31.6	<31.6	<28.4	<26.2	<31.0	<34.2	<29.4	<27.1	<31.6	<30.3	6,000
Ethylbenzene		<31.6	<31.6	<28.4	<26.2	<31.0	<34.2	<29.4	<27.1	<31.6	<30.3	7,000
Total Xylenes		<94.7	<94.9	<85.3	<78.6	<93.0	<102	<88.2	<81.4	<94.7	<90.9	9,000

Notes:

(a) Model Toxics Control Act (MTCA) Method A Soil Cleanup Level for unrestricted land uses; Washington Administrative Code (WAC) 173-340, dated February 2001.

(b) Analyses:
- Gasoline-range hydrocarbons by the Northwest Total Petroleum Hydrocarbons Gasoline Extended (NWTPH-Gx) Method.
- Diesel- and oil-range hydrocarbons by the Northwest Total Petroleum Hydrocarbons Diesel Extended (NWTPH-Dx) Method with silica gel cleanup.

(c) mg/kg = milligrams per kilogram

(d) Laboratory note 1n "Sample weight exceeded the method recommendation."

(e) "<" denotes that the analyte was not detected at a concentration greater than the specified reporting limit.

(f) Cleanup level is 100 mg/kg where benzene is not present and 30 mg/kg for gasoline mixtrures that include benzene.

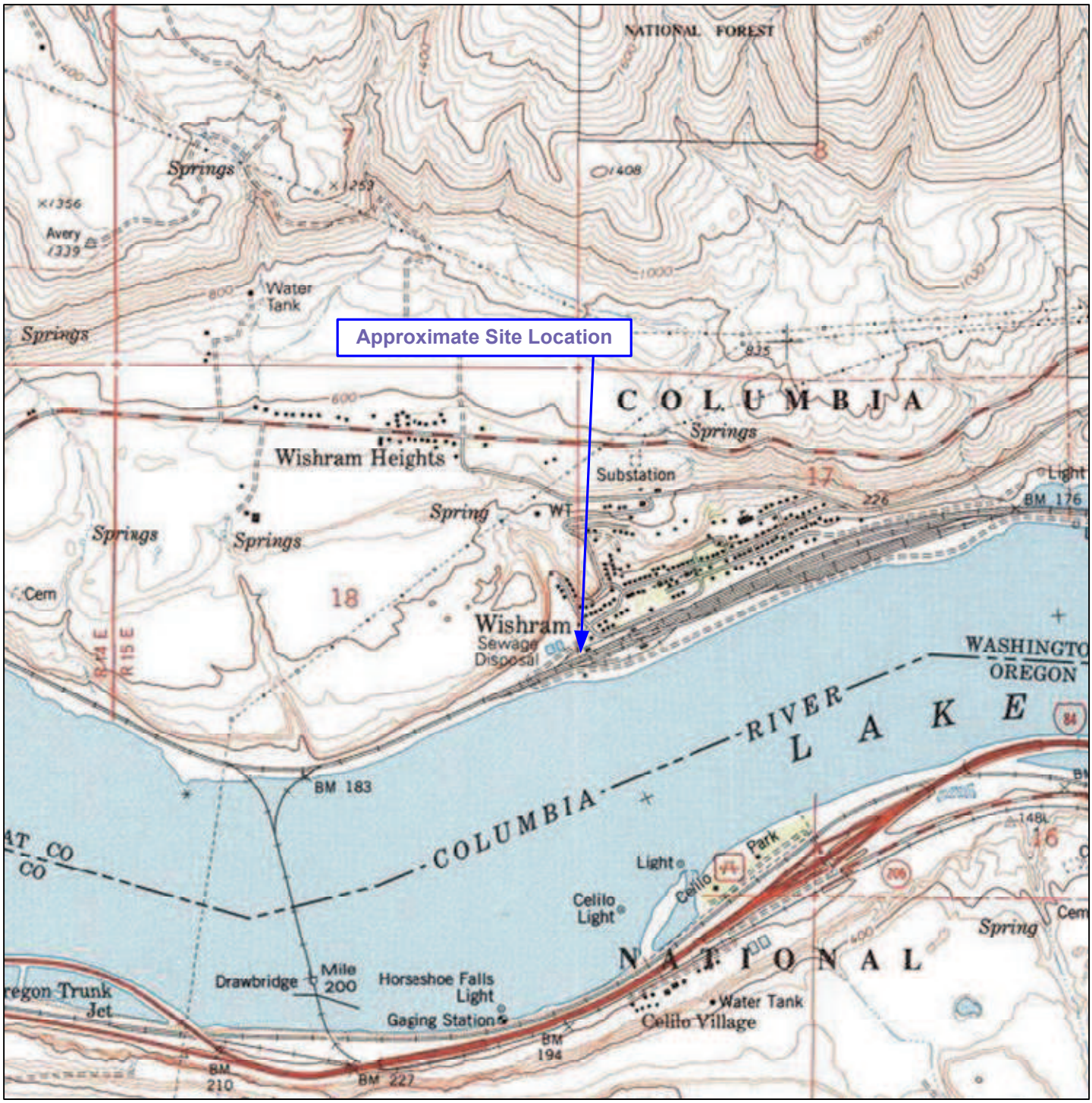
(g) Benzene, toluene, ethylbenzene, and xylenes (BTEX) analyzed by EPA Method 8021B.

(h) µg/kg = micrograms per kilogram

Analytes detected at concentrations greater than the laboratory reporting limit are shown in bold.

Yellow-shaded cells indicate the detected concentration is above the indicated MTCA Method A Cleanup Level.

Figures



Map Source: USGS 7.5 Minute Topographic Quadrangle, Wishram, WA 1994

N
W E
S

0 1/2 1

Approximate Scale in Miles

Kennedy/Jenks Consultants

BNSF RAILWAY COMPANY
WISHRAM, WA

SUBSURFACE INVESTIGATION
SITE LOCATION MAP

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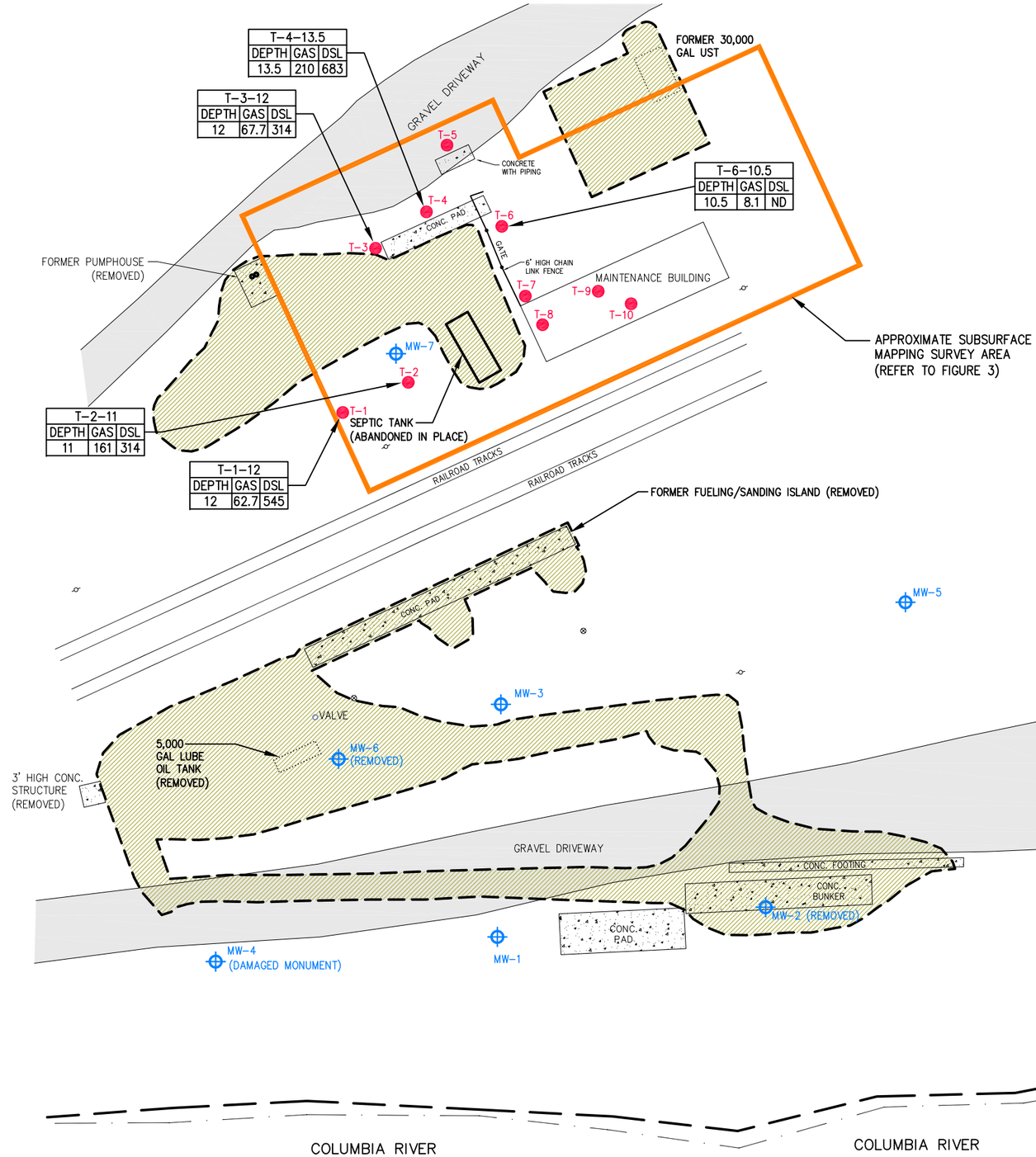
FIGURE 1



LEGEND

- POWER POLE
- MW-4 — MONITORING WELL
- T-1 — SUPPLEMENTAL SOIL BORING LOCATION (APPROXIMATE)
- APPROXIMATE PREVIOUS EXCAVATION AREAS

SAMPLE NUMBER

T-3-12		
DEPTH	GAS	DSL
12	67.7	314

DSL — DIESEL-RANGE PETROLEUM HYDROCARBONS (mg/kg)

GAS — GASOLINE-RANGE PETROLEUM HYDROCARBONS (mg/kg)

SAMPLE DEPTH (FEET BGS)

BGS = BELOW GROUND SURFACE
mg/kg = MILLIGRAMS PER KILOGRAM
ND = ANALYTE NOT DETECTED

NOTES:

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ONLY SAMPLES IN WHICH ONE OR MORE ANALYTES WERE DETECTED ARE SHOWN ON THIS FIGURE. REFER TO TABLE 1 FOR COMPLETE RESULTS.

N

0 25 50

APPROXIMATE SCALE IN FEET

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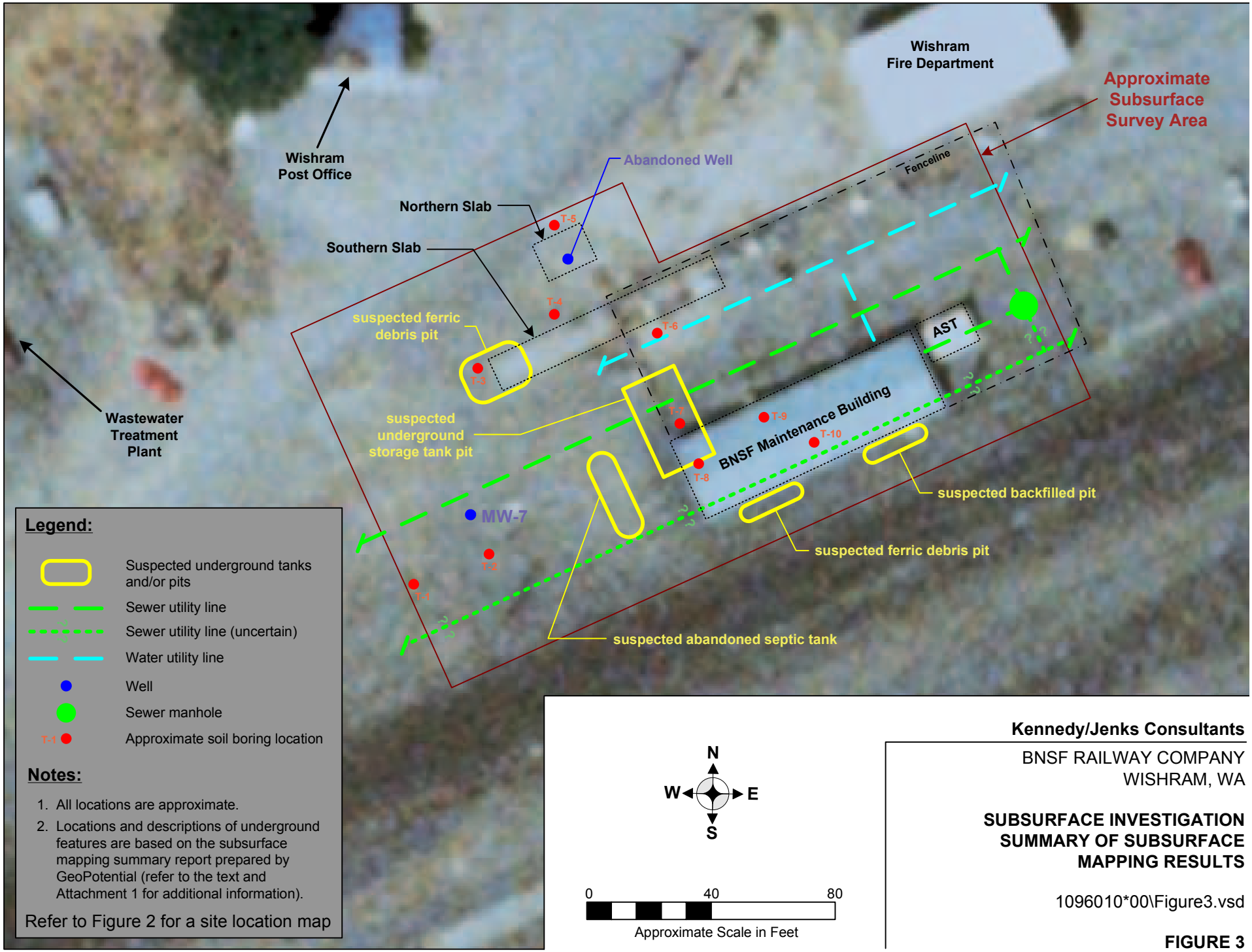
BNSF RAILWAY COMPANY
WISHRAM, WA

SUBSURFACE INVESTIGATION
SITE AND SAMPLE LOCATION MAP

1096010.00\R2 INVESTIGATION\FIG-02

FIGURE 2



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WISHRAM, WA

SUBSURFACE INVESTIGATION
SUMMARY OF SUBSURFACE MAPPING RESULTS

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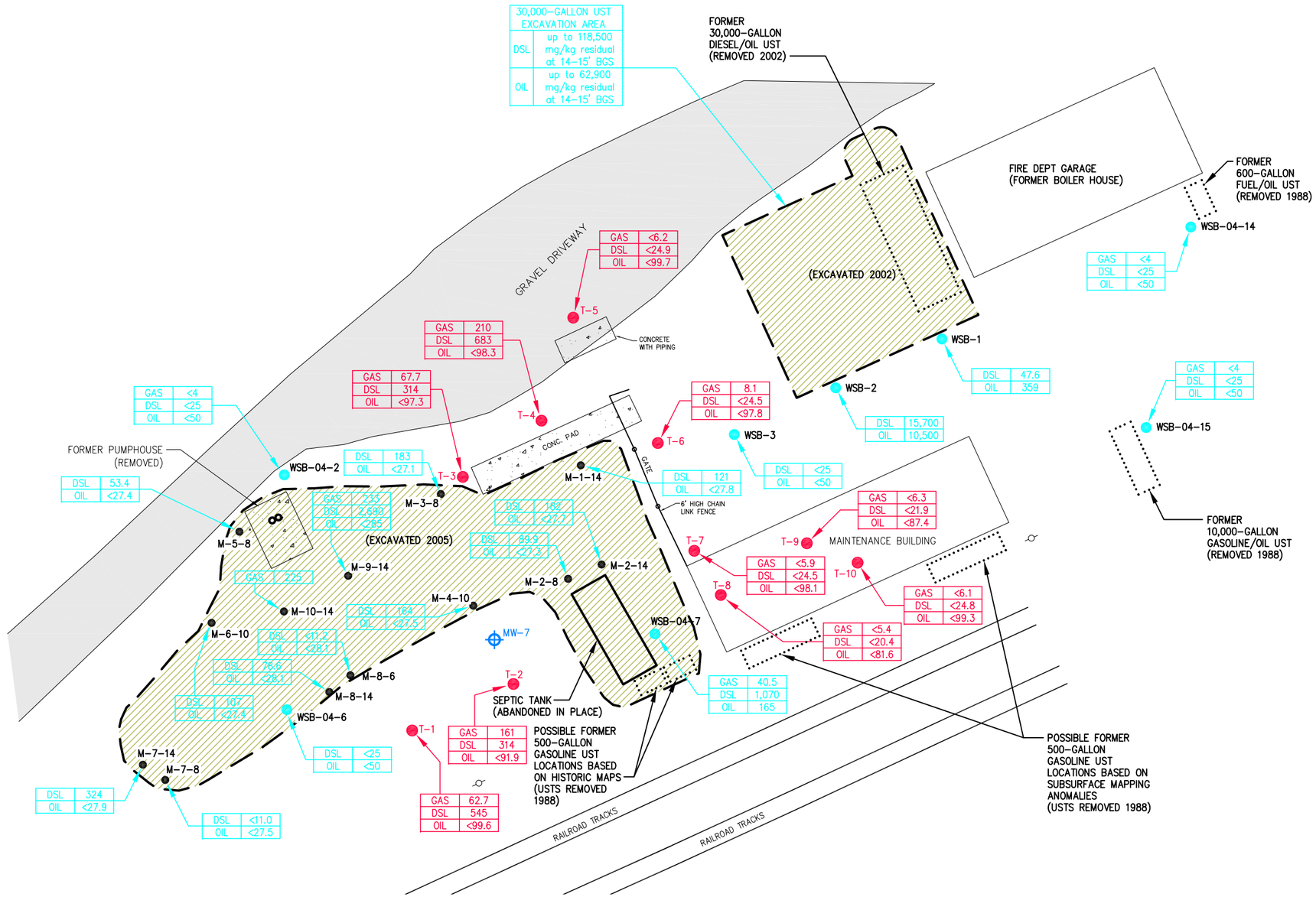
FIGURE 3



LEGEND

- T-1 — CURRENT SOIL BORING LOCATION
- MW-4 — MONITORING WELL
- WSB-7 — PREVIOUS SOIL BORING LOCATION (2003-2004)
- M-9-14 — PREVIOUS EXCAVATION CONFIRMATION SAMPLE (2005)
- PREVIOUS EXCAVATION BOUNDARY (APPROXIMATE)
- POWER POLE
- APPROXIMATE FORMER UST LOCATION
- GAS — GASOLINE-RANGE PETROLEUM HYDROCARBON CONCENTRATION (mg/kg)
- DSL — DIESEL-RANGE PETROLEUM HYDROCARBON CONCENTRATION (mg/kg)
- OIL — OIL-RANGE PETROLEUM HYDROCARBON CONCENTRATION (mg/kg)

NOTES:

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. "<" DENOTES THAT THE LISTED ANALYTE WAS NOT DETECTED AT A CONCENTRATION ABOVE THE INDICATED REPORTING LIMIT.
3. mg/kg = MILLIGRAMS PER KILOGRAM

N

0 15 30

APPROXIMATE SCALE IN FEET

Kennedy/Jenks Consultants

BNSF RAILWAY COMPANY
WISHRAM, WA

MW-7 VICINITY INVESTIGATION SUMMARY MAP

1096010.00\R2 INVESTIGATION\FIG-04

FIGURE 4

Attachment 1

GeoPotential Subsurface Mapping Survey Report

GeoPotential

ENVIRONMENTAL & EXPLORATION GEOPHYSICS

22323 East Wild Fern Lane, Brightwood, Oregon 97011 • PH (503) 622-0154 • FAX (503) 622-0526
WEB http://www.geopotential.biz/ E-MAIL GeoPotential@geopotential.biz

SUMMARY REPORT

SUBSURFACE MAPPING SURVEY TO DETECT UNDERGROUND OBJECTS

BNSF RAILWAY COMPANY WISHRAM, WASHINGTON

CLIENT

Kennedy/Jenks Consultants
32001 32nd Avenue South, Suite 100
Federal Way, WA

DATE OF SURVEY

May 19, 2010

GeoPotential Project Number: 8468

CONTENTS

FIGURES

APPENDICES

SUMMARY

A Subsurface Mapping Survey (SMS) was conducted over the exterior parking lot, driveway, and interior of a Maintenance Building at a BNSF Railroad Yard in Wishram, WA for the purpose of detecting underground storage tanks (USTs), UST pits, utilities and other features of environmental interest.

A Magnetic Survey, a Ground Penetrating Radar (GPR) survey and hand held magnetic and electromagnetic scanners were used for the UST search.

One septic tank, one possible UST pit, two debris pits, a backfilled pit and water and sewer utilities were detected at this site.

INTRODUCTION

Ralph Soule and Carrie Beveridge of GeoPotential conducted the Subsurface Mapping Survey. Matt Padberg was Kennedy/Jenks Consultants on-site representative. Fieldwork was conducted on May 19, 2010. The report was completed and e-mailed to Mr. Padberg on May 24, 2010.

Subsurface mapping surveys are geophysical surveys utilizing geophysical methods and data to detect and locate natural and manmade subsurface features. Magnetic Surveys are used to detect and map the locations of buried **ferrous** (iron-bearing) objects (see Appendix 1). Ground Penetrating Radar (GPR) Surveys are used to map both natural and manmade subsurface features such as USTs, utilities, backfilled pits, etc. (see Appendix 2.). Pipe and cable locators are used to map the locations of buried utilities and piping.

Once subsurface ferrous objects are detected from a magnetic survey then hand held scanners and GPR surveys are used to map the locations, depths, sizes and shapes of the objects.

SURVEY OBJECTIVES

The objectives of this subsurface mapping survey are:

1. Search for UST's or UST pits.
2. Map debris pits.
3. Map ancillary piping and utilities.

SURVEY SITE

The survey area is shown outlined on Figures 1, 2 & 3. The Site consists of a MAINTENANCE BUILDING with a concrete slab on grade foundation, asphalt parking lot/driveway, and gravel storage yard. Historical information verbally provided by Mr. Padberg indicated that USTs had previously been on the site. No current surface features indicative of USTs were observed on the site. Surface features consisted of overhead power and telephone lines, an AST, parked vehicle (trailer), two concrete slabs. Miscellaneous surface ferric objects were stored along the north fence line which prevented this area from being investigated by the SMS. An abandoned water well and a monitoring well and a sewer manhole were also mapped.

Utility locates were done prior to the SMS and located a water and sewer line.

An area around a small concrete structure to the Southwest of the Survey Site (shown on Figure 1.) was also scanned with hand held EM and Magnetic detectors to search for USTs.

SURVEY EQUIPMENT

The following geophysical instruments were used to conduct the survey:

- GEOMETRICS 858G Cesium Vapor Magnetometer (Magnetic Survey).
- Mala RAMAC Ground Penetrating Radar System with a 500 MHz antenna (GPR Survey).
- Schonstedt GA52 Magnetic Gradiometer.
- Aqua-Tronics A6 Pipe & Cable locator.
- Heath Shurlock Pipe & Cable locator.

This equipment and the procedures used to meet the survey objectives of this project have been proven effective in detecting metallic objects and mapping non-metallic features such as disturbed soil from backfilled pits.

Geophysical techniques are excellent at detecting changes in the subsurface caused by natural and manmade objects; however, they are poor at actually identifying subsurface features. Complementary methods may be used to assist in the interpretation; however, the only sure way of identifying a buried feature is by excavation.

Brief descriptions of the magnetic method and the radar method are included in the Appendices.

PROCEDURE

Magnetic Survey

The Magnetic Survey consisted of acquiring magnetic readings along traverses using 5-foot spacing between traverses. Magnetic data were downloaded to a computer, processed and contoured to produce Figure 2. Magnetic Map. In general buried ferriferous objects such as USTs will produce stronger positive magnetic anomalies that are shown as red contours on the Magnetic Map. Surface ferriferous objects such as the AST, chain link fence, etc. will produce predominately negative magnetic anomalies that are shown as blue contours on the magnetic map.

GPR Survey

The GPR Survey consisted of acquiring a number of GPR Profiles across the Site to map utilities and search for a USTs and UST Pits. GPR Profiles were also acquired where possible in the Maintenance Building.

Pipe & Cable Survey

Magnetic and electromagnetic scans were conducted to search for USTs and utilities.

RESULTS

Results were marked on the Site and are shown on Figure 3.

Nine significant subsurface features were detected:

- An abandoned septic tank (7 X 27 feet) was mapped off the west end of the maintenance building.
- A possible UST backfilled pit was mapped off the Northwest corner of the Maintenance Building.
- A pit containing ferric debris was mapped off the West end of the Northernmost concrete slab.
- A pit with ferric debris was mapped along the South edge of the Maintenance Building.
- A second backfilled pit was detected along the South edge of the Maintenance building. Associated with this pit was a 2" diameter standing pipe of unknown function.
- An area of scattered ferric debris was mapped along the railroad tracks in the southwest corner of the Site.
- A water line is interpreted to run from a spigot on the Maintenance Building to the located water line to the North.
- A sewer line is interpreted to extend from the building to the sewer manhole and then North to the located sewer line.
- A second possible sewer line runs under the South side of the Maintenance Building and is possibly connected to the sewer manhole as shown.

The GPR Survey within the Maintenance Building produced no indication of USTs under the building.

The scan around the concrete structure to the Southwest of the site produced no indications of USTs.

LIMITATIONS

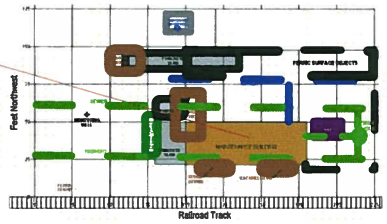
Limitations of magnetometer and GPR surveys can be seen in the Appendices.

Geophysical surveys consist of interpreting geophysical responses from subsurface features. Since a variety of subsurface features can produce identical geophysical responses, it is necessary to confirm the geophysical interpretation with intrusive investigations such as excavating or drilling. In addition, many subsurface features may produce no geophysical response.

Ralph Soule

Ralph Soule
GeoPotential

May 24, 2010



CONCRETE STRUCTURE

N
W E
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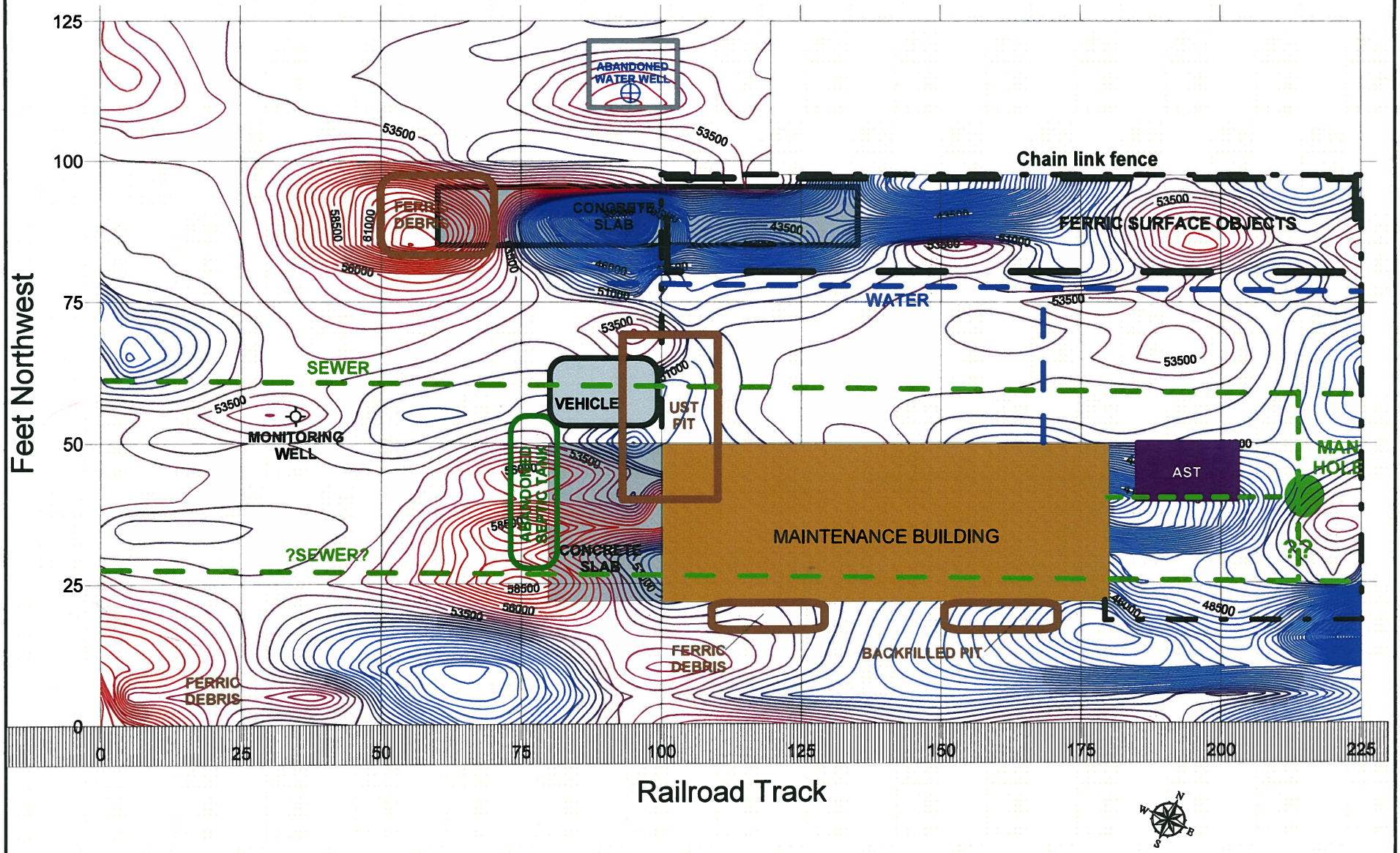
GeoPotential ENVIRONMENTAL & EXPLORATION GEOPHYSICS 22323 East Wild Fern Lane, Brightwood, Oregon 97011• PH (503) 622-0154• FAX (503) 622-0526 WEB http://www.geopotential.biz/ E-MAIL GeoPotential@geopotential.biz	LOCATION: **BNSF RAILWAY COMPANY** **Wishram, Washington**	**Figure 1.** **Aerial Location Photograph**
DATE: **May 19, 2010** *SUBSURFACE MAPPING SURVEY* PROJECT No. **8468**	CLIENT: **Kennedy/Jenks Consultants**	



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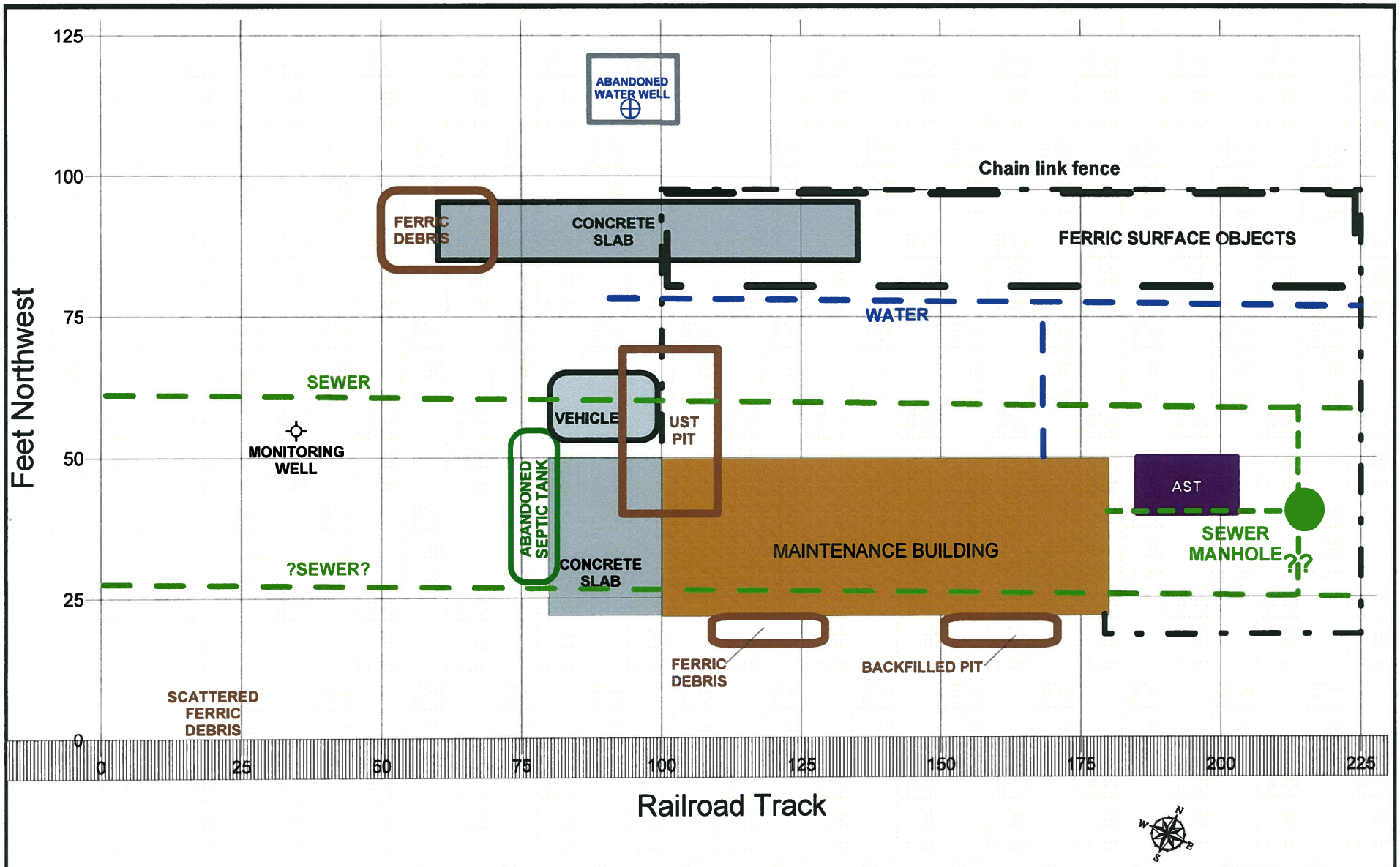
DATE: May 19, 2010 SUBSURFACE MAPPING SURVEY PROJECT No. 8468	CLIENT: Kennedy/Jenks Consultants	



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DATE: May 19, 2010 SUBSURFACE MAPPING SURVEY PROJECT No. 8468	CLIENT: Kennedy/Jenks Consultants	

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APPENDIX A
MAGNETOMETER SURVEYS

The earth's magnetic field, measured in "nano Teslas" (nT), behaves like a bar magnet (a dipolar field), with the strongest magnetic field located at the poles, and the weakest field located near the equator. In the continental United States, the average field intensity varies widely, however, the average value is about 50,000 nT. Also, like the magnetic field around the bar magnet, the earth's magnetic field is inclined. This inclination in the continental United States varies between 60 and 75 degrees, generally depending upon the latitude of the measuring location. The earth's magnetic field varies constantly and, during sunspot activity, quite dramatically. A magnetometer is an electronic device that measures the intensity of the earth's magnetic field.

Naturally occurring geologic features and buried ferrous metal objects such as underground storage tanks, drums, ordnance, pipes and debris filled trenches produce both horizontal and vertical disturbances to the earth's local magnetic field. The objects causing these "anomalies" can be detected quickly and reliably using portable magnetometers.

The intensity of an anomaly is a function of the size, depth of burial and magnetic susceptibility of the object. As a rule of thumb, single drums buried several feet below the surface produce anomalies of about 200 nT relative to the normal undisturbed background and can be detected at a horizontal distance of about 15 feet, while large caches of drums can produce anomalies of many thousands of nT and may be detectable 50 feet away.

Magnetometers generally measure total intensity of the local magnetic field. A magnetic gradiometer is a variant of the magnetometer that measures both the horizontal and the vertical magnetic field at each survey point. It consists of two identical sensors located vertically on a staff and having a fixed separation. The intensity of the magnetic field caused by a buried metal object varies inversely with the distance between the object and the sensor. The relative intensities measured simultaneously at each sensor are used to determine the relative depth of burial of an object.

Relative depth estimates of buried metal objects can be made using a single sensor. In general, for a given object, the deeper the object is buried, the lower the amplitude and the wider the anomaly. Shallowly buried objects produce higher amplitude anomalies with closely spaced contour lines.

Magnetic surveys can only detect **ferrous metal** objects and cannot be used to identify the buried object. Estimates of the total mass of a buried object are difficult due to the physical properties of the object and other factors. Interference caused by observed surface metal objects limits the accuracy of the survey. The anomalies produced by fences, power lines, cars and buildings can easily mask the anomaly caused by an underground target.

Magnetic surveys are cost effective. Using the standard "step and wait" magnetometer, data from approximately 1000 points can be obtained in one field day corresponding to between 1 acre and about 5 acres depending on site conditions and survey goals. More modern cesium magnetometers collect up to 10 readings per second continuously, thus the operator can proceed without stopping. Many modern magnetometers use an audible signal to call attention to anomalous data as it is obtained. At some sites metallic objects can be detected and marked in the field at the time of the survey.

The use of a second, automatically recording "base station" magnetometer is highly recommended due to temporal variations in the earth's magnetic field. These changes must be removed from the field data before an accurate interpretation can be made, particularly when searching for small-buried objects.

Magnetic data are most commonly presented in two contour maps. The TOTAL MAGNETIC FIELD CONTOUR MAP shows the horizontal variation of the total intensity of the magnetic field and, therefore, the areal extent of anomalies. The GRADIOMETER CONTOUR MAPS show the horizontal variation of the vertical gradient of the magnetic field and indicate the relative depth of burial of the objects causing those anomalies. Color versions of these maps may be produced showing only the magnetic highs and lows.

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APPENDIX B
GROUND PENETRATING RADAR SURVEYS

Ground Penetrating Radar (GPR) can be a valuable tool to accurately locate both metallic and non-metallic UST's and utilities, buried drums and hazardous material at some sites. It may detect objects below reinforced concrete floors and slabs. GPR may delineate trenches and excavations and, under some conditions, it may be used to locate contaminant plumes. It has been used as an archaeological tool to look for buried artifacts. It may accurately profile fresh water lake bottoms either from a boat or from a frozen lake surface. GPR may be used to locate voids below roads and runways. GPR has numerous engineering applications. It can be used in non-destructive testing of engineering material, for example, locating rebar in concrete structures and determining the thickness of concrete and other structural material.

GPR uses short impulses of high frequency radio waves directed into the ground to acquire information about the subsurface. The energy radiated into the ground is reflected back to the antenna by features having different electrical properties to that of the surrounding material. The greater the contrast, the stronger the reflection. Typical reflectors include water table, bedrock, bedding, fractures, voids, contaminant plumes and man-made objects such as UST's and metal and plastic utilities. Materials having little electrical contrast like clay and concrete pipes may not produce strong reflections and may not be seen. Data are digitally recorded or downloaded to a laptop computer for filtering and processing.

The frequency of the radar signal used for a survey is a trade off. Low frequencies (250 MHz – 50 MHz) give better penetration but low resolution so that pipes and utilities may not be seen. Pipes and utilities may be seen using higher frequencies (500 MHz) but the depth of penetration may be limited to only a few feet especially in the wet, clayey soils found in many areas of the NW USA. The GPR frequency is dependent upon the antenna. Once an antenna is selected, nothing the operator can do can increase the depth of penetration.

Radar data is ambiguous. Many buried objects produce echoes that may be similar to the echo expected from the target object. Boulders and debris produce reflections that are similar to pipes and tanks. Subtle changes in the electrical properties along a traverse caused by changes in soil type, mineralogy, grain size, and moisture content all produce "noise" that can make interpretation difficult. Interpreting radargrams is an art as much as a science.

Under some conditions, although a UST itself may not be clearly visible in a GPR record, the excavation or trench in which the UST is buried is evident. Usually GPR data is used to compliment data from other "tools". For example, a trench-like reflection but no clear UST reflection, combined with a "tank" shaped magnetic anomaly suggests the presence of a UST. Although the UST itself could not be seen using GPR, the radar showed a trench-like reflection. The magnetic data showed a large ferrous object. We would report a possible UST at that location.

GPR is often used in conjunction with magnetometer surveys. Magnetometer Surveys are very fast and large areas can be covered cost effectively. Magnetic anomalies are marked in the field, and then may be further investigated using radar.

GPR, like other geophysical tools, is excellent at detecting changes across a site, but it is poor at actually identifying the cause of the change. **The only definite way to identify buried objects is through excavation.**

ADVANTAGES - General

- When GPR data is properly interpreted subsurface objects can usually be confidently identified. This often requires the GPR data be combined with other geophysical data, surface features and historical information.
- GPR provides continuous records along traverses which, depending on the goal of the survey, may be interpreted in the field.
- At flat, open sites, for reconnaissance purposes, the antenna can be towed behind a vehicle at several mph.
- Many GPR antennas are shielded and are unaffected by surface and overhead objects and power lines.
- GPR can be used in conjunction with magnetic or EM surveys to accurately locate buried objects.

ADVANTAGES – Site specific

- With a low frequency antenna, in clean, dry, sandy soil, reflections from targets as deep as 100 feet are possible. Geologic features such as bedrock and cross bedding may be seen at some sites.
- The resolution of data is very high particularly for high frequency antennas.
- Shallow, man-made objects generally can be detected.
- Fiberglass UST's and plastic pipes can be detected using GPR.

LIMITATIONS - General

- To acquire the highest quality data, proper coupling between the antenna and the ground surface is necessary. Poor data may be obtained at sites covered with debris, an uneven surface, tall grass and brush. Objects located at curbs are difficult to see.
- Acquiring GPR data is slow. The antenna must be over the target. The signal from the antenna is cone-shaped. Reflections from objects to the side of the antenna may be seen, but their actual location relative to the antenna is not obvious.
- Penetration of the GPR signal is "site specific" and its depth of penetration at a particular site cannot be predicted ahead of time. Near surface conductive material, such as salty or contaminated ground water and wet, clay-rich soil, may attenuate the radar signal, limiting the effective depth of the survey to several feet. Reinforced concrete also can attenuate the signal. Rebar may produce reflections that look like pipes.

- GPR may not be cost-effective for some projects. For a detailed survey mapping underground storage tanks and utilities, it may be necessary to collect data in orthogonal directions at 5-foot line spacing.

LIMITATIONS – Interpretation

- Interpretation can be difficult. Radar data are ambiguous. Subsurface objects can be detected but, in general, they cannot be identified. USTs and utilities have a characteristic reflection, however, large rocks and boulders have a similar reflection.

- The reflection visible in a GPR record is very complex and may be caused by small changes in the electrical properties of the soil. The target in mind may not produce the reflection. Due to "noise", the target may be missed. USTs and deep utilities may be missed if they are under debris and/or other pipes.

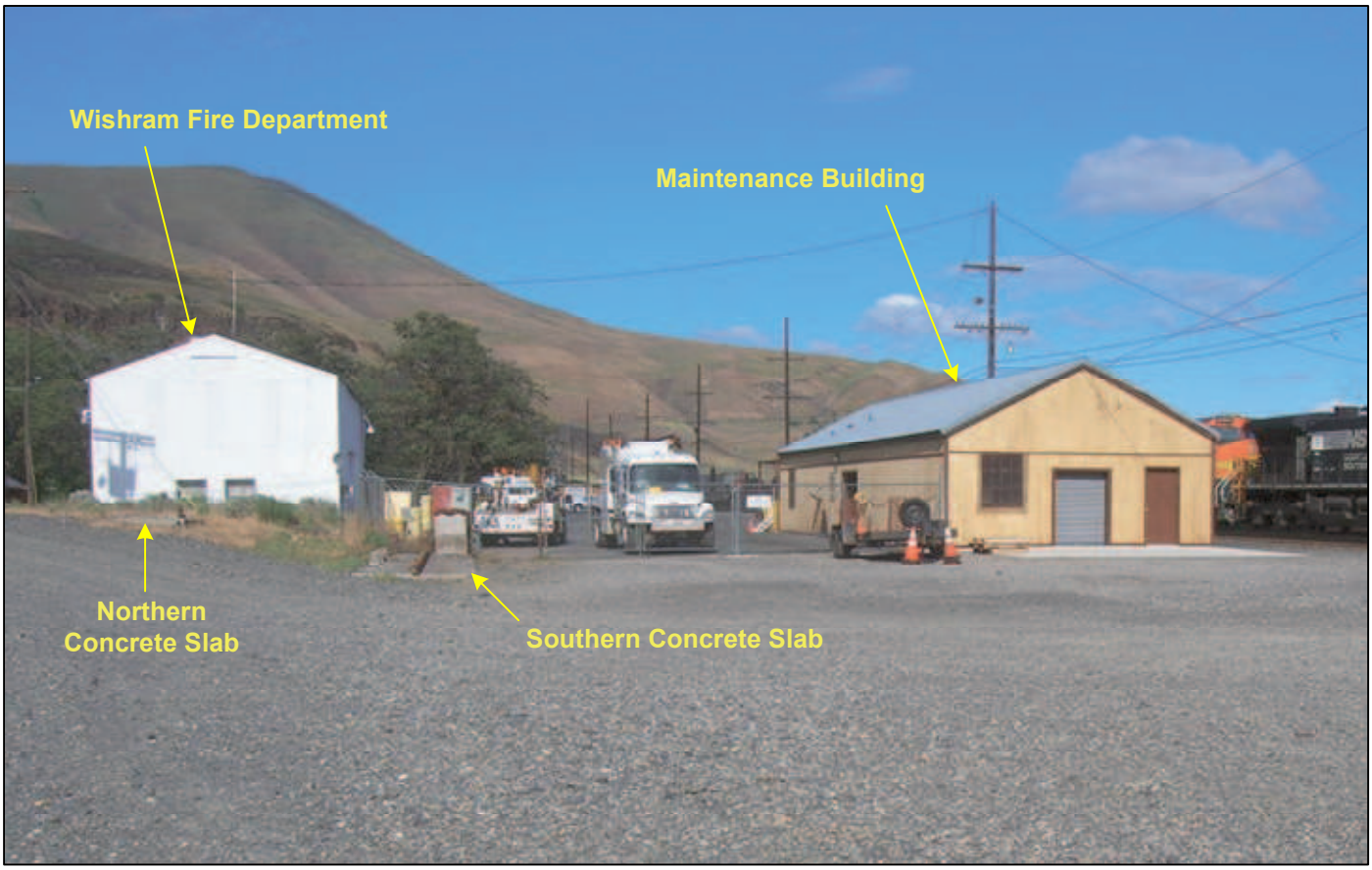
- Other methods may be necessary to aid in the interpretation of the data (use a magnetometer to detect a large metallic mass, then GPR to determine if the object is tank-like, or a utility locator to determine if there are feed lines and fill pipes leading to the object).

- Adequate contrast between the ground and the target is required to obtain reflections. UST's may be missed if they are badly corroded. Utilities made of "earth" materials like clay and concrete may not be detected since their electrical properties are similar to the surrounding soil.

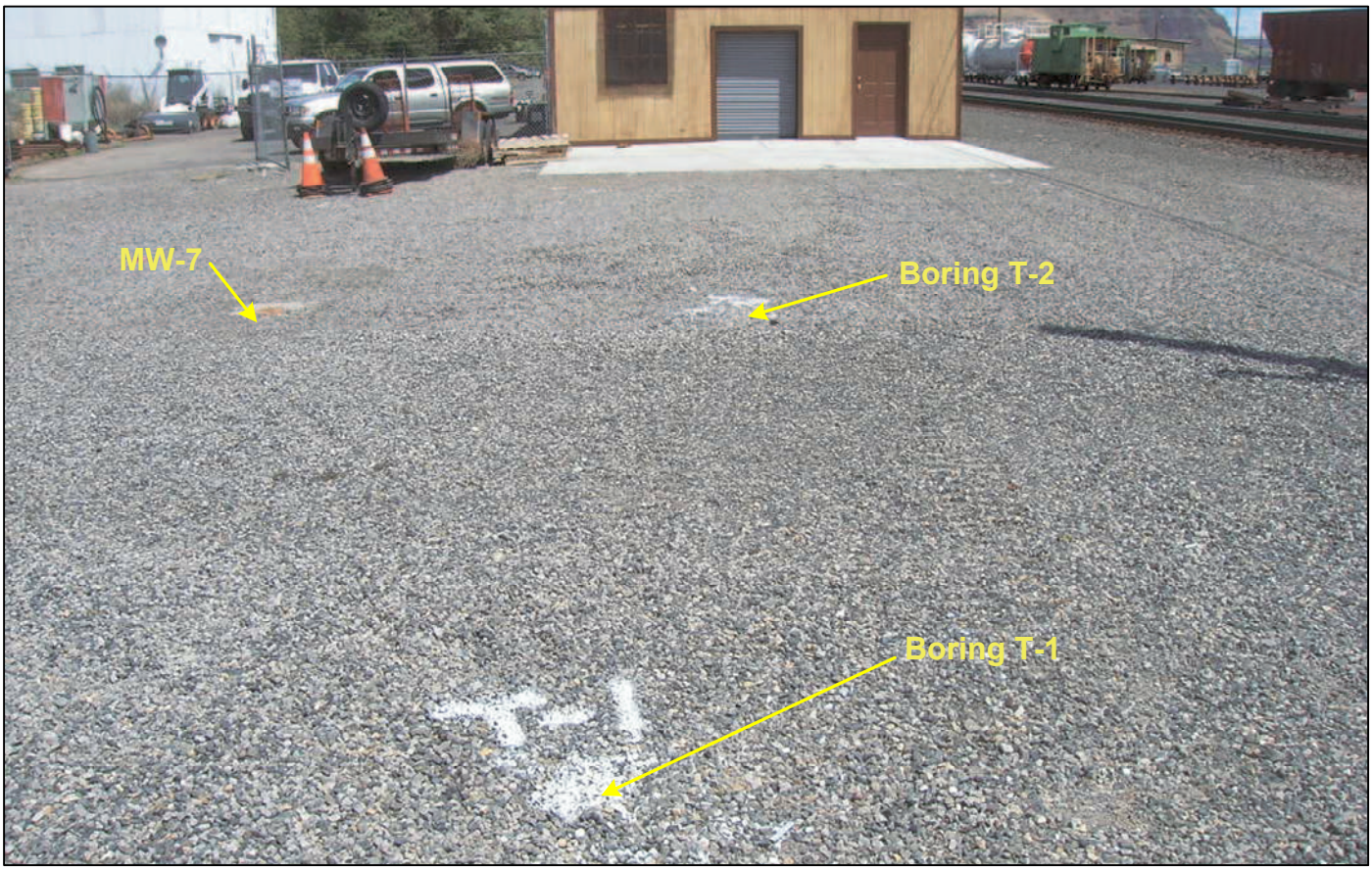
- To determine the depth to an object without "ground truth", assumptions must be made regarding soil properties. Even with ground truth at several locations on the same site, changes in material across a site (therefore changes in signal velocity) can cause errors in depth measurements at other locations.

Attachment 2

Site Photographs

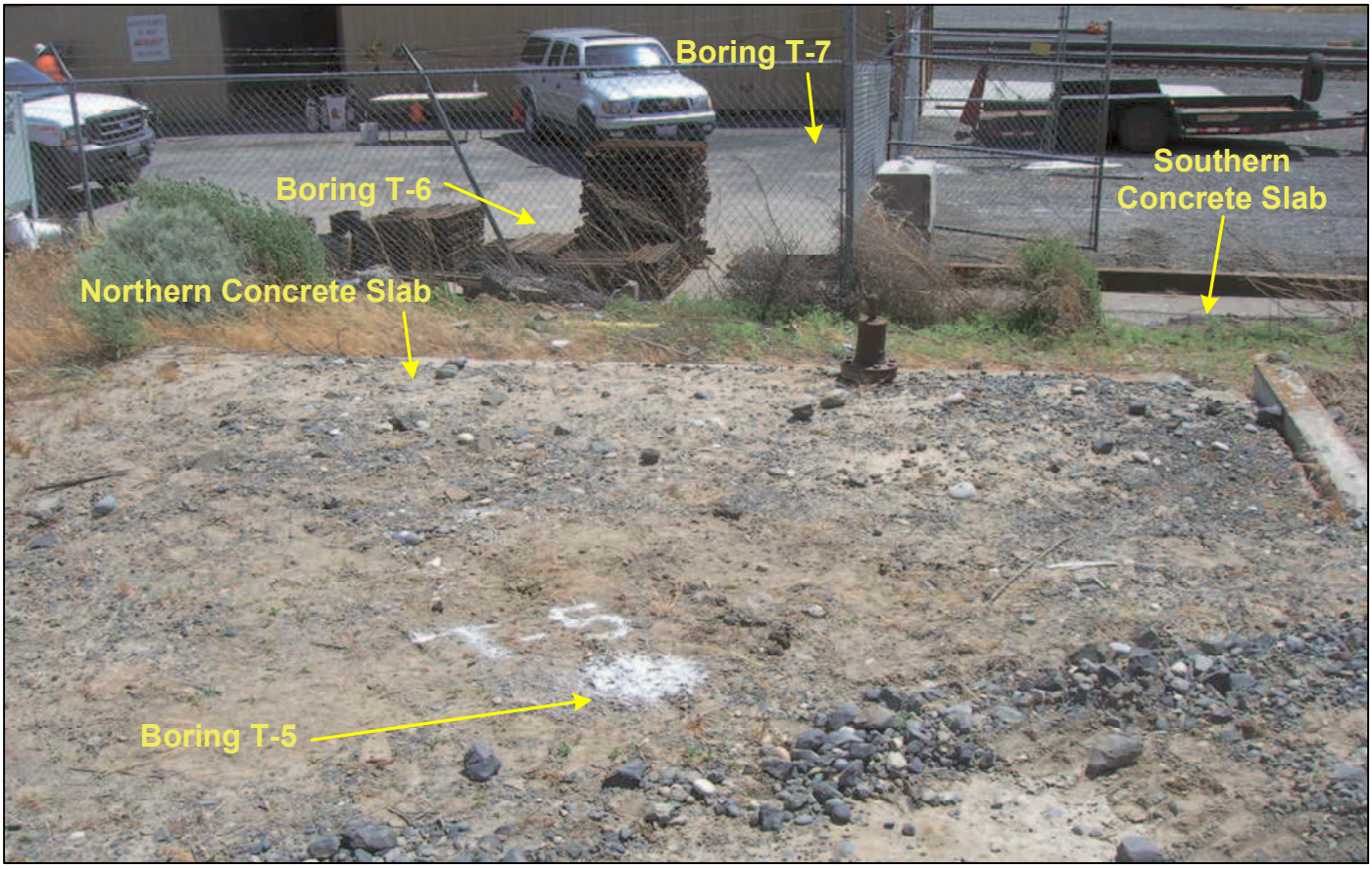


Photograph 1. Site area, view to the east.



Photograph 2. MW-7 area, view to the east.

Photograph 3. Southern slab and T-3 / T-4 area, view to the east.



Photograph 4. Northern slab and T-5 area, view to the south.

Attachment 3

Boring Logs

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: W of Maintenance Bld., 28' W & 10' S of WMW-7				**Boring Name**	T-1
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson			**Project Name**	BNSF Wishram
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"			**Project Number**	1096010.00
ISOLATION CASING: N/A	FROM: N/A	TO: N/A	FT.	ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
BLANK CASING: N/A	FROM: N/A	TO: N/A	FT.	DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
SLOTTED CASING: N/A	FROM: N/A	TO: N/A	FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM: N/A	TO: N/A	FT.	LOGGED BY: M. Padberg	
SEAL: 3/8" bentonite chips	FROM: 0	TO: 15	FT.	SAMPLING METHODS: 5' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.
GROUT: N/A	FROM: N/A	TO: N/A	FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	4						GP	**Poorly graded GRAVEL with sand (fill)** gray to brown, fill material and ballast, fine to medium sand, fine gravel, subrounded to angular, very dense, moist to dry, no odor or iridescent sheen
	5		5					**Poorly graded SAND** brown, fine sand, very dense, moist, no odor or iridescent sheen
	5		10	T-1-12			SP	From 11' bgs, trace iron oxide staining, wet From 11.5' bgs, gray, petroleum-like odor, iridescent sheen
			15					

NOTES

1. bgs = below ground surface

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: W of Maintenance Bld., 10' S of WMW-7, 54' W of bld.		**Boring Name**	T-2
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson	**Project Name**	BNSF Wishram
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"	**Project Number**	1096010.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: M. Padberg	
SEAL: 3/8" bentonite chips	FROM 0 TO 15 FT.	SAMPLING METHODS: 5' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	3.5		0				GP	**Poorly graded GRAVEL with sand (fill)** light gray to grayish brown, fill material and ballast, fine to medium sand, fine gravel, rounded to angular, very dense, moist to dry, no odor or iridescent sheen
	4		5					**Poorly graded SAND** brown, fine sand, very dense, moist, no odor or iridescent sheen
	3.5		10	T-2-11			SP	From 11' bgs, wet, gray, petroleum-like odor, iridescent sheen
			15					

NOTES

1. bgs = below ground surface

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: NW of Maintenance Bld., 5' W of E end of S concrete pad, 40' N of WMW-7			
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson	**Boring Name**	T-3
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"	**Project Name**	BNSF Wishram
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	**Project Number**	1096010.00
BLANK CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 11.0	
SEAL: 3/8" bentonite chips	FROM 0 TO 15 FT.	LOGGED BY: M. Padberg	
GROUT: N/A	FROM N/A TO N/A FT.	SAMPLING METHODS: 5' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	SAMPLES RECOV. (FEET)	SAMPLES PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	3.5		5					**Poorly graded SAND** brown, lenses (<1") of light gray, fine sand, trace coarse sand to fine gravel, dense to very dense, moist, no odor or iridescent sheen
	2		10				SP	At 7' bgs, lense with spongy wood or root fragments and trace silt (1"-2")
	3.5		15	T-3-12				From 11' bgs, wet From 11.5' bgs, grayish brown to gray, slight petroleum-like odor and iridescent sheen

NOTES

1. bgs = below ground surface

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: NW of Maintenance Bld., 18' E & 5' N of NW corner of S concrete pad			**Boring Name** T-4
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson		**Project Name** BNSF Wishram
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"		**Project Number** 1096010.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.		ELEVATION AND DATUM / TOTAL DEPTH: 15.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.		DATE STARTED: 5/20/10 / DATE COMPLETED: 5/20/10
SLOTTED CASING: N/A	FROM N/A TO N/A FT.		INITIAL WATER DEPTH (FT): 11.0
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.		LOGGED BY: M. Padberg
SEAL: 3/8" bentonite chips	FROM 0 TO 15 FT.		SAMPLING METHODS: 5' x 2" acetate liner / WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	2		5				SP	**Poorly graded SAND** brown, fine sand, few lenses with trace fine gravel (1"-2"), subrounded to subangular, dense to very dense, moist, no odor or iridescent sheen
	5		10					From 11' bgs, wet
	5		15	T-4-13.5				From 13.5' bgs, grayish brown to gray, petroleum-like odor and iridescent sheen

NOTES

1. bgs = below ground surface

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: 22' N of NW corner of Bullpen fence, 6' E of NW corner of N concrete pad		**Boring Name**	T-5
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson	**Project Name**	BNSF Wishram
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"	**Project Number**	1096010.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 14.5	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: M. Padberg	
SEAL: 3/8" bentonite chips	FROM 0 TO 15 FT.	SAMPLING METHODS: 5' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	SAMPLES RECOV. (FEET)	SAMPLES PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	4.5						SP	**Poorly graded SAND with gravel (fill)** pale grown to light gray, fill material, fine sand, few medium to coarse sand, fine gravel, trace asphalt, trace glass at 1.5' bgs, very dense, moist to dry, no odor or iridescent sheen
			5					**Poorly graded SAND** brown, fine sand, trace coarse sand and fine gravel, dense, moist, no odor or iridescent sheen
	4						SP	
			10					From 8.5'-9' bgs, lens with increased moisture and some fine gravel
								From 9' bgs, very dense
	5							From 11.5' bgs, increasing moisture
			15	T-5-14.5				From 14.5' bgs, wet

NOTES

1. bgs = below ground surface
2. No petroleum-like odor or iridescent sheen observed in borehole.

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: N-NW of Maintenance Bld., in Bullpen, 8' E & 35' N of NW corner of bld.			
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson		
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"		
ISOLATION CASING: N/A	FROM: N/A	TO: N/A	FT.: N/A
BLANK CASING: N/A	FROM: N/A	TO: N/A	FT.: N/A
SLOTTED CASING: N/A	FROM: N/A	TO: N/A	FT.: N/A
SIZE AND TYPE OF FILTER PACK: N/A	FROM: N/A	TO: N/A	FT.: N/A
SEAL: 3/8" bentonite chips	FROM: 0	TO: 15	FT.: 15
GROUT: N/A	FROM: N/A	TO: N/A	FT.: N/A

Boring Name T-6

Project Name BNSF Wishram

Project Number 1096010.00

ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
INITIAL WATER DEPTH (FT): 9.5	
LOGGED BY: M. Padberg	
SAMPLING METHODS: 5' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	3.5		0				GP	**Asphalt** 2 inches of asphalt
								Poorly graded GRAVEL with sand (fill) dark olive brown, fill material, varies to sand with gravel, fine sand, trace to few medium to coarse sand, fine gravel, subrounded to angular, very dense, moist, no odor or iridescent sheen
	5		5					**Poorly graded SAND** brown, fine sand, dense to very dense, moist, no odor or iridescent sheen At 5.5' bgs, lens with few fine gravel, subangular (2")
							SP	
	5		10	T-6-10.5				From 9.5' bgs, wet From 10.5' bgs, brown to grayish brown, slight petroleum-like odor and iridescent sheen
			15					

NOTES

1. bgs = below ground surface

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: N-NW of Maintenance Bld., in Bullpen, 5' E & 4' N of NW corner of bld.			
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson		
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"		
ISOLATION CASING: N/A	FROM: N/A	TO: N/A	FT.
BLANK CASING: N/A	FROM: N/A	TO: N/A	FT.
SLOTTED CASING: N/A	FROM: N/A	TO: N/A	FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM: N/A	TO: N/A	FT.
SEAL: 3/8" bentonite chips	FROM: 0	TO: 15	FT.
GROUT: N/A	FROM: N/A	TO: N/A	FT.

Boring Name	T-7
Project Name	BNSF Wishram
Project Number	1096010.00
ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
INITIAL WATER DEPTH (FT): 11.5	
LOGGED BY: M. Padberg	
SAMPLING METHODS: 5' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	4						GP	**Asphalt** 2 inches of asphalt. **Poorly graded GRAVEL with sand (fill)** light grayish brown, fill material, fine sand, little medium to coarse sand, fine gravel, subrounded to angular, dense, moist to dry, no odor or iridescent sheen
	4		5				SP	**Poorly graded SAND** brown, fine sand, dense to very dense, moist, no odor or iridescent sheen
	4.5		10	T-7-12				From 11.5' bgs, wet
			15					

NOTES

1. bgs = below ground surface
2. No petroleum-like odor or iridescent sheen observed in borehole.

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: In Maintenance Bld., 5' E & 9' S of NW corner of bld.	
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"
ISOLATION CASING: N/A	FROM N/A TO N/A FT.
BLANK CASING: N/A	FROM N/A TO N/A FT.
SLOTTED CASING: N/A	FROM N/A TO N/A FT.
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.
SEAL: 3/8" bentonite chips	FROM 0 TO 15 FT.
GROUT: N/A	FROM N/A TO N/A FT.

Boring Name	T-8
Project Name	BNSF Wishram
Project Number	1096010.00
ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
INITIAL WATER DEPTH (FT): 14.0	
LOGGED BY: M. Padberg	
SAMPLING METHODS: 3' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.

SAMPLES TYPE	RECOV (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	1.5							**Concrete & Asphalt** 5 inches of concrete, underlain by 1 inch asphalt
	2.5		5				GW	**Well-graded GRAVEL with sand (fill)** brown, borderline sand with gravel, fine to coarse sand, fine gravel, subrounded to angular, dense, dry to moist, no odor or iridescent sheen
	3							**Poorly graded SAND** brown, fine sand, dense to very dense, moist, no odor or iridescent sheen
	3		10	T-8-11			SP	From 8.5' bgs, increasing moisture From 11' bgs, increasing moisture
	3		15					From 12'-14' bgs, trace fine gravel, subrounded to subangular From 14' bgs, wet

NOTES

1. bgs = below ground surface
2. No petroleum-like odor or iridescent sheen observed in borehole.

KJ PNW 1096010.00BORINGS.GPJ KJ.PNW.GDT 8/31/10

F-40.1
(6-87) (3-88) (8-90)

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: In Maintenance Bld., 29' E & 6' S of NW corner of bld.		**Boring Name**	T-9
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson	**Project Name**	BNSF Wishram
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"	**Project Number**	1096010.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 15.0 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 14.5	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: M. Padberg	
SEAL: 3/8" bentonite chips	FROM 0 TO 15 FT.	SAMPLING METHODS: 3' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	1.5							**Concrete & Asphalt** 5 inches of concrete, underlain by 1 inch asphalt
	3		5				GW	**Well-graded GRAVEL with sand (fill)** brown, fine to coarse sand, fine gravel, subrounded to angular, medium dense, dry to moist, no odor or iridescent sheen
	0.5							**Poorly graded SAND** brown, fine sand, dense to very dense, moist, no odor or iridescent sheen
	1		10				SP	
	5			T-9-14				From 12' bgs, increasing moisture
			15					From 14.5' bgs, very moist to wet

NOTES

1. bgs = below ground surface
2. From 6'-9' bgs, tried heavier-weight drill tip, but only got approximately 6" recovery all slough (similar to fill material above) except approximately 0.5" of brown sand at bottom of sample.
3. Exact soil depths from last sample run (12'-15' bgs) difficult to determine due to pushing & slough on the 6'-9' bgs and 9'-12' bgs sample runs. Final run was pushed to 15' bgs total depth.
4. No petroleum-like odor or iridescent sheen observed in borehole.

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

Boring Log

Kennedy/Jenks Consultants

BORING LOCATION: In Maintenance Bld., 38' E & 16' S of NW corner of bld.		**Boring Name**	T-10
DRILLING COMPANY: Cascade	DRILLER: Marcus Johnson	**Project Name**	BNSF Wishram
DRILLING METHOD(S): Direct Push	DRILL BIT(S) SIZE: 2"	**Project Number**	1096010.00
ISOLATION CASING: N/A	FROM N/A TO N/A FT.	ELEVATION AND DATUM	TOTAL DEPTH: 14.5 ft. bgs
BLANK CASING: N/A	FROM N/A TO N/A FT.	DATE STARTED: 5/20/10	DATE COMPLETED: 5/20/10
SLOTTED CASING: N/A	FROM N/A TO N/A FT.	INITIAL WATER DEPTH (FT): 11.0	
SIZE AND TYPE OF FILTER PACK: N/A	FROM N/A TO N/A FT.	LOGGED BY: M. Padberg	
SEAL: 3/8" bentonite chips	FROM 0 TO 14.5 FT.	SAMPLING METHODS: 3' x 2" acetate liner	WELL COMPLETION: ☐ SURFACE HOUSING ☐ STAND PIPE ____ FT.
GROUT: N/A	FROM N/A TO N/A FT.		

SAMPLES TYPE	RECOV. (FEET)	PENETR. RESIST. BLOWS/6"	DEPTH (FEET)	SAMPLE NUMBER	BACKFILL DETAILS	LITHOLOGY	USCS LOG	SAMPLE DESCRIPTION AND DRILLING REMARKS
	1.5							**Concrete** 6 inches of concrete
	2		5				GP	**Poorly graded GRAVEL with sand (fill)** brown, fine to medium sand, little coarse sand, fine gravel, subrounded to angular, medium dense, dry to moist, no odor or iridescent sheen
	2							**Poorly graded SAND** brown, fine sand, dense, moist, no odor or iridescent sheen
	3		10	T-10-11.5	▽		SP	From 11' bgs, wet
	0.5							

NOTES

1. bgs = below ground surface
2. Little recovery on final push (12'-15' bgs), likely due to a large gravel pushed from above (slough). Driller noted very hard drilling.
3. No petroleum-like odor or iridescent sheen observed in borehole.

KJ PNW 1096010.00BORINGS.GPJ KJ PNW.GDT 8/31/10

Attachment 4

Laboratory Analytical Report and Chain-of Custody Documents

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Pace Analytical Services, Inc.
940 South Harney
Seattle, WA 98108
(206)767-5060

May 28, 2010

Galen Davis
BNSF - Kennedy Jenks
32001 32nd Avenue South
Suite 100
Auburn, WA 98001

RE: Project: BNSF Wishram
Pace Project No.: 253766

Dear Galen Davis:
Enclosed are the analytical results for sample(s) received by the laboratory on May 24, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Heidi Geri

heidi.geri@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
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Seattle, WA 98108
(206)767-5060

CERTIFICATIONS

Project: BNSF Wishram
Pace Project No.: 253766

Washington Certification IDs
940 South Harney Street Seattle, WA 98108
Washington Certification #: C1229
Oregon Certification #: WA200007
Alaska CS Certification #: UST-025
California Certification #: 01153CA
Alaska Drinking Water Micro Certification #: WA01230
Alaska Drinking Water VOC Certification #: WA01-09
Florida/NELAP Certification #: E87617

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SAMPLE ANALYTE COUNT

Project: BNSF Wishram
Pace Project No.: 253766

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
253766001	**Trip Blank**	NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
253766002	**T-1-12**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766003	**T-2-11**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766004	**T-3-12**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766005	**T-4-13.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766006	**T-5-14.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766007	**T-6-10.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766008	**T-7-12**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766009	**T-8-11**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S
253766010	**T-9-14**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S

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SAMPLE ANALYTE COUNT

Project: BNSF Wishram
Pace Project No.: 253766

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974-87	CC	1	PASI-S
253766011	**T-10-11.5**	NWTPH-Dx	ERB	4	PASI-S
		NWTPH-Gx	LPM	3	PASI-S
		EPA 8260	LNH	10	PASI-S
		ASTM D2974-87	CC	1	PASI-S

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PROJECT NARRATIVE

Project: BNSF Wishram
Pace Project No.: 253766

Method: **NWTPH-Dx**
Description: NWTPH-Dx GCS SG
Client: BNSF - Kennedy Jenks
Date: May 28, 2010

General Information:
10 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BNSF Wishram
Pace Project No.: 253766

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: BNSF - Kennedy Jenks
Date: May 28, 2010

General Information:
11 samples were analyzed for NWTPH-Gx. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with NWTPH-Gx with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: GCV/1546

S2: Surrogate recovery outside laboratory control limits due to matrix interferences (confirmed by similar results from sample re-analysis).

- T-2-11 (Lab ID: 253766003)
  - 4-Bromofluorobenzene (S)
- T-4-13.5 (Lab ID: 253766005)
  - 4-Bromofluorobenzene (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BNSF Wishram
Pace Project No.: 253766

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: BNSF - Kennedy Jenks
Date: May 28, 2010

Analyte Comments:

QC Batch: GCV/1546

1n: Sample weight exceeded the method recommendation.
- T-4-13.5 (Lab ID: 253766005)
  - Gasoline Range Organics

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PROJECT NARRATIVE

Project: BNSF Wishram
Pace Project No.: 253766

Method: **EPA 8260**
Description: 8260 MSV Medium LL
Client: BNSF - Kennedy Jenks
Date: May 28, 2010

General Information:
11 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

QC Batch: MSV/2421

G2: The sample weight in the container did not meet method specifications.
- T-4-13.5 (Lab ID: 253766005)

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
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Seattle, WA 98108
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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: Trip Blank **Lab ID: 253766001** Collected: 05/20/10 09:52 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	5.0	1	05/24/10 10:00	05/24/10 22:05		
a,a,a-Trifluorotoluene (S)	103	%	50-150	1	05/24/10 10:00	05/24/10 22:05	98-08-8	
4-Bromofluorobenzene (S)	99	%	50-150	1	05/24/10 10:00	05/24/10 22:05	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	20.0	1	05/25/10 09:50	05/25/10 11:53	71-43-2	
Ethylbenzene	ND	ug/kg	25.0	1	05/25/10 09:50	05/25/10 11:53	100-41-4	
Toluene	ND	ug/kg	25.0	1	05/25/10 09:50	05/25/10 11:53	108-88-3	
Xylene (Total)	ND	ug/kg	75.0	1	05/25/10 09:50	05/25/10 11:53	1330-20-7	
m&p-Xylene	ND	ug/kg	50.0	1	05/25/10 09:50	05/25/10 11:53	179601-23-1	
o-Xylene	ND	ug/kg	25.0	1	05/25/10 09:50	05/25/10 11:53	95-47-6	
Dibromofluoromethane (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 11:53	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 11:53	2037-26-5	
4-Bromofluorobenzene (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 11:53	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 11:53	17060-07-0	

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-1-12 **Lab ID: 253766002** Collected: 05/20/10 09:52 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**545**	mg/kg	24.9	1	05/24/10 16:30	05/26/10 19:59		
Motor Oil Range SG	ND	mg/kg	99.6	1	05/24/10 16:30	05/26/10 19:59	64742-65-0	
n-Octacosane (S) SG	85	%	50-150	1	05/24/10 16:30	05/26/10 19:59	630-02-4	
o-Terphenyl (S) SG	84	%	50-150	1	05/24/10 16:30	05/26/10 19:59	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**62.7**	mg/kg	6.3	1	05/24/10 10:00	05/24/10 22:29		
a,a,a-Trifluorotoluene (S)	100	%	50-150	1	05/24/10 10:00	05/24/10 22:29	98-08-8	
4-Bromofluorobenzene (S)	108	%	50-150	1	05/24/10 10:00	05/24/10 22:29	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	25.3	1	05/25/10 09:50	05/25/10 14:10	71-43-2	
Ethylbenzene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 14:10	100-41-4	
Toluene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 14:10	108-88-3	
Xylene (Total)	ND	ug/kg	94.7	1	05/25/10 09:50	05/25/10 14:10	1330-20-7	
m&p-Xylene	ND	ug/kg	63.1	1	05/25/10 09:50	05/25/10 14:10	179601-23-1	
o-Xylene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 14:10	95-47-6	
Dibromofluoromethane (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 14:10	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 14:10	2037-26-5	
4-Bromofluorobenzene (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 14:10	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	60-140	1	05/25/10 09:50	05/25/10 14:10	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**20.9**	%	0.10	1		05/24/10 14:44		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-2-11 **Lab ID: 253766003** Collected: 05/20/10 10:08 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**314**	mg/kg	23.0	1	05/24/10 16:30	05/26/10 20:31		
Motor Oil Range SG	ND	mg/kg	91.9	1	05/24/10 16:30	05/26/10 20:31	64742-65-0	
n-Octacosane (S) SG	85	%	50-150	1	05/24/10 16:30	05/26/10 20:31	630-02-4	
o-Terphenyl (S) SG	86	%	50-150	1	05/24/10 16:30	05/26/10 20:31	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**161**	mg/kg	6.3	1	05/24/10 10:00	05/24/10 23:18		
a,a,a-Trifluorotoluene (S)	96	%	50-150	1	05/24/10 10:00	05/24/10 23:18	98-08-8	
4-Bromofluorobenzene (S)	175	%	50-150	1	05/24/10 10:00	05/24/10 23:18	460-00-4	S2
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	25.3	1	05/25/10 09:50	05/25/10 14:34	71-43-2	
Ethylbenzene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 14:34	100-41-4	
Toluene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 14:34	108-88-3	
Xylene (Total)	ND	ug/kg	94.9	1	05/25/10 09:50	05/25/10 14:34	1330-20-7	
m&p-Xylene	ND	ug/kg	63.3	1	05/25/10 09:50	05/25/10 14:34	179601-23-1	
o-Xylene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 14:34	95-47-6	
Dibromofluoromethane (S)	98	%	60-140	1	05/25/10 09:50	05/25/10 14:34	1868-53-7	
Toluene-d8 (S)	103	%	60-140	1	05/25/10 09:50	05/25/10 14:34	2037-26-5	
4-Bromofluorobenzene (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 14:34	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 14:34	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**18.2**	%	0.10	1		05/24/10 14:55		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-3-12 **Lab ID: 253766004** Collected: 05/20/10 10:28 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**314**	mg/kg	24.3	1	05/24/10 16:30	05/26/10 20:47		
Motor Oil Range SG	ND	mg/kg	97.3	1	05/24/10 16:30	05/26/10 20:47	64742-65-0	
n-Octacosane (S) SG	88	%	50-150	1	05/24/10 16:30	05/26/10 20:47	630-02-4	
o-Terphenyl (S) SG	87	%	50-150	1	05/24/10 16:30	05/26/10 20:47	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**67.7**	mg/kg	5.7	1	05/24/10 10:00	05/24/10 23:43		
a,a,a-Trifluorotoluene (S)	105	%	50-150	1	05/24/10 10:00	05/24/10 23:43	98-08-8	
4-Bromofluorobenzene (S)	125	%	50-150	1	05/24/10 10:00	05/24/10 23:43	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	22.8	1	05/25/10 09:50	05/25/10 14:57	71-43-2	
Ethylbenzene	ND	ug/kg	28.4	1	05/25/10 09:50	05/25/10 14:57	100-41-4	
Toluene	ND	ug/kg	28.4	1	05/25/10 09:50	05/25/10 14:57	108-88-3	
Xylene (Total)	ND	ug/kg	85.3	1	05/25/10 09:50	05/25/10 14:57	1330-20-7	
m&p-Xylene	ND	ug/kg	56.9	1	05/25/10 09:50	05/25/10 14:57	179601-23-1	
o-Xylene	ND	ug/kg	28.4	1	05/25/10 09:50	05/25/10 14:57	95-47-6	
Dibromofluoromethane (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 14:57	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 14:57	2037-26-5	
4-Bromofluorobenzene (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 14:57	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 14:57	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**18.6**	%	0.10	1		05/24/10 14:56		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-4-13.5 **Lab ID: 253766005** Collected: 05/20/10 11:00 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	**683**	mg/kg	24.6	1	05/24/10 16:30	05/26/10 21:03		
Motor Oil Range SG	ND	mg/kg	98.3	1	05/24/10 16:30	05/26/10 21:03	64742-65-0	
n-Octacosane (S) SG	87	%	50-150	1	05/24/10 16:30	05/26/10 21:03	630-02-4	
o-Terphenyl (S) SG	84	%	50-150	1	05/24/10 16:30	05/26/10 21:03	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**210**	mg/kg	5.2	1	05/24/10 10:00	05/25/10 00:07		1n
a,a,a-Trifluorotoluene (S)	96	%	50-150	1	05/24/10 10:00	05/25/10 00:07	98-08-8	
4-Bromofluorobenzene (S)	205	%	50-150	1	05/24/10 10:00	05/25/10 00:07	460-00-4	S2
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	21.0	1	05/25/10 09:50	05/25/10 17:36	71-43-2	
Ethylbenzene	ND	ug/kg	26.2	1	05/25/10 09:50	05/25/10 17:36	100-41-4	
Toluene	ND	ug/kg	26.2	1	05/25/10 09:50	05/25/10 17:36	108-88-3	
Xylene (Total)	ND	ug/kg	78.6	1	05/25/10 09:50	05/25/10 17:36	1330-20-7	
m&p-Xylene	ND	ug/kg	52.4	1	05/25/10 09:50	05/25/10 17:36	179601-23-1	
o-Xylene	ND	ug/kg	26.2	1	05/25/10 09:50	05/25/10 17:36	95-47-6	
Dibromofluoromethane (S)	102	%	60-140	1	05/25/10 09:50	05/25/10 17:36	1868-53-7	G2
Toluene-d8 (S)	103	%	60-140	1	05/25/10 09:50	05/25/10 17:36	2037-26-5	
4-Bromofluorobenzene (S)	106	%	60-140	1	05/25/10 09:50	05/25/10 17:36	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	60-140	1	05/25/10 09:50	05/25/10 17:36	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**21.0**	%	0.10	1		05/24/10 15:34		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-5-14.5 **Lab ID: 253766006** Collected: 05/20/10 10:45 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.9	1	05/24/10 16:30	05/26/10 21:19		
Motor Oil Range SG	ND	mg/kg	99.7	1	05/24/10 16:30	05/26/10 21:19	64742-65-0	
n-Octacosane (S) SG	83	%	50-150	1	05/24/10 16:30	05/26/10 21:19	630-02-4	
o-Terphenyl (S) SG	85	%	50-150	1	05/24/10 16:30	05/26/10 21:19	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.2	1	05/24/10 10:00	05/25/10 00:31		
a,a,a-Trifluorotoluene (S)	100	%	50-150	1	05/24/10 10:00	05/25/10 00:31	98-08-8	
4-Bromofluorobenzene (S)	94	%	50-150	1	05/24/10 10:00	05/25/10 00:31	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	24.8	1	05/25/10 09:50	05/25/10 15:20	71-43-2	
Ethylbenzene	ND	ug/kg	31.0	1	05/25/10 09:50	05/25/10 15:20	100-41-4	
Toluene	ND	ug/kg	31.0	1	05/25/10 09:50	05/25/10 15:20	108-88-3	
Xylene (Total)	ND	ug/kg	93.0	1	05/25/10 09:50	05/25/10 15:20	1330-20-7	
m&p-Xylene	ND	ug/kg	62.0	1	05/25/10 09:50	05/25/10 15:20	179601-23-1	
o-Xylene	ND	ug/kg	31.0	1	05/25/10 09:50	05/25/10 15:20	95-47-6	
Dibromofluoromethane (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 15:20	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 15:20	2037-26-5	
4-Bromofluorobenzene (S)	99	%	60-140	1	05/25/10 09:50	05/25/10 15:20	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 15:20	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**21.2**	%	0.10	1		05/24/10 15:51		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-6-10.5 **Lab ID: 253766007** Collected: 05/20/10 11:17 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.5	1	05/24/10 16:30	05/26/10 21:35		
Motor Oil Range SG	ND	mg/kg	97.8	1	05/24/10 16:30	05/26/10 21:35	64742-65-0	
n-Octacosane (S) SG	78	%	50-150	1	05/24/10 16:30	05/26/10 21:35	630-02-4	
o-Terphenyl (S) SG	86	%	50-150	1	05/24/10 16:30	05/26/10 21:35	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	**8.1**	mg/kg	6.8	1	05/24/10 10:00	05/25/10 00:56		
a,a,a-Trifluorotoluene (S)	96	%	50-150	1	05/24/10 10:00	05/25/10 00:56	98-08-8	
4-Bromofluorobenzene (S)	91	%	50-150	1	05/24/10 10:00	05/25/10 00:56	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	27.3	1	05/25/10 09:50	05/25/10 15:43	71-43-2	
Ethylbenzene	ND	ug/kg	34.2	1	05/25/10 09:50	05/25/10 15:43	100-41-4	
Toluene	ND	ug/kg	34.2	1	05/25/10 09:50	05/25/10 15:43	108-88-3	
Xylene (Total)	ND	ug/kg	102	1	05/25/10 09:50	05/25/10 15:43	1330-20-7	
m&p-Xylene	ND	ug/kg	68.3	1	05/25/10 09:50	05/25/10 15:43	179601-23-1	
o-Xylene	ND	ug/kg	34.2	1	05/25/10 09:50	05/25/10 15:43	95-47-6	
Dibromofluoromethane (S)	101	%	60-140	1	05/25/10 09:50	05/25/10 15:43	1868-53-7	
Toluene-d8 (S)	103	%	60-140	1	05/25/10 09:50	05/25/10 15:43	2037-26-5	
4-Bromofluorobenzene (S)	98	%	60-140	1	05/25/10 09:50	05/25/10 15:43	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	60-140	1	05/25/10 09:50	05/25/10 15:43	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**21.0**	%	0.10	1		05/24/10 15:57		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-7-12 **Lab ID: 253766008** Collected: 05/20/10 11:34 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.5	1	05/24/10 16:30	05/26/10 21:51		
Motor Oil Range SG	ND	mg/kg	98.1	1	05/24/10 16:30	05/26/10 21:51	64742-65-0	
n-Octacosane (S) SG	81	%	50-150	1	05/24/10 16:30	05/26/10 21:51	630-02-4	
o-Terphenyl (S) SG	88	%	50-150	1	05/24/10 16:30	05/26/10 21:51	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	5.9	1	05/24/10 10:00	05/25/10 01:45		
a,a,a-Trifluorotoluene (S)	101	%	50-150	1	05/24/10 10:00	05/25/10 01:45	98-08-8	
4-Bromofluorobenzene (S)	91	%	50-150	1	05/24/10 10:00	05/25/10 01:45	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	23.5	1	05/25/10 09:50	05/25/10 16:05	71-43-2	
Ethylbenzene	ND	ug/kg	29.4	1	05/25/10 09:50	05/25/10 16:05	100-41-4	
Toluene	ND	ug/kg	29.4	1	05/25/10 09:50	05/25/10 16:05	108-88-3	
Xylene (Total)	ND	ug/kg	88.2	1	05/25/10 09:50	05/25/10 16:05	1330-20-7	
m&p-Xylene	ND	ug/kg	58.8	1	05/25/10 09:50	05/25/10 16:05	179601-23-1	
o-Xylene	ND	ug/kg	29.4	1	05/25/10 09:50	05/25/10 16:05	95-47-6	
Dibromofluoromethane (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 16:05	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 16:05	2037-26-5	
4-Bromofluorobenzene (S)	99	%	60-140	1	05/25/10 09:50	05/25/10 16:05	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	60-140	1	05/25/10 09:50	05/25/10 16:05	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**18.9**	%	0.10	1		05/24/10 16:03		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-8-11 **Lab ID: 253766009** Collected: 05/20/10 16:45 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	20.4	1	05/24/10 16:30	05/26/10 22:08		
Motor Oil Range SG	ND	mg/kg	81.6	1	05/24/10 16:30	05/26/10 22:08	64742-65-0	
n-Octacosane (S) SG	91	%	50-150	1	05/24/10 16:30	05/26/10 22:08	630-02-4	
o-Terphenyl (S) SG	94	%	50-150	1	05/24/10 16:30	05/26/10 22:08	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	5.4	1	05/24/10 10:00	05/25/10 02:09		
a,a,a-Trifluorotoluene (S)	102	%	50-150	1	05/24/10 10:00	05/25/10 02:09	98-08-8	
4-Bromofluorobenzene (S)	96	%	50-150	1	05/24/10 10:00	05/25/10 02:09	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	21.7	1	05/25/10 09:50	05/25/10 16:28	71-43-2	
Ethylbenzene	ND	ug/kg	27.1	1	05/25/10 09:50	05/25/10 16:28	100-41-4	
Toluene	ND	ug/kg	27.1	1	05/25/10 09:50	05/25/10 16:28	108-88-3	
Xylene (Total)	ND	ug/kg	81.4	1	05/25/10 09:50	05/25/10 16:28	1330-20-7	
m&p-Xylene	ND	ug/kg	54.3	1	05/25/10 09:50	05/25/10 16:28	179601-23-1	
o-Xylene	ND	ug/kg	27.1	1	05/25/10 09:50	05/25/10 16:28	95-47-6	
Dibromofluoromethane (S)	99	%	60-140	1	05/25/10 09:50	05/25/10 16:28	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 16:28	2037-26-5	
4-Bromofluorobenzene (S)	99	%	60-140	1	05/25/10 09:50	05/25/10 16:28	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	60-140	1	05/25/10 09:50	05/25/10 16:28	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**9.7**	%	0.10	1		05/24/10 16:14		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-9-14 **Lab ID: 253766010** Collected: 05/20/10 16:06 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	21.9	1	05/24/10 16:30	05/26/10 22:55		
Motor Oil Range SG	ND	mg/kg	87.4	1	05/24/10 16:30	05/26/10 22:55	64742-65-0	
n-Octacosane (S) SG	88	%	50-150	1	05/24/10 16:30	05/26/10 22:55	630-02-4	
o-Terphenyl (S) SG	92	%	50-150	1	05/24/10 16:30	05/26/10 22:55	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.3	1	05/24/10 10:00	05/25/10 02:34		
a,a,a-Trifluorotoluene (S)	99	%	50-150	1	05/24/10 10:00	05/25/10 02:34	98-08-8	
4-Bromofluorobenzene (S)	94	%	50-150	1	05/24/10 10:00	05/25/10 02:34	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	25.3	1	05/25/10 09:50	05/25/10 16:51	71-43-2	
Ethylbenzene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 16:51	100-41-4	
Toluene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 16:51	108-88-3	
Xylene (Total)	ND	ug/kg	94.7	1	05/25/10 09:50	05/25/10 16:51	1330-20-7	
m&p-Xylene	ND	ug/kg	63.1	1	05/25/10 09:50	05/25/10 16:51	179601-23-1	
o-Xylene	ND	ug/kg	31.6	1	05/25/10 09:50	05/25/10 16:51	95-47-6	
Dibromofluoromethane (S)	99	%	60-140	1	05/25/10 09:50	05/25/10 16:51	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 16:51	2037-26-5	
4-Bromofluorobenzene (S)	98	%	60-140	1	05/25/10 09:50	05/25/10 16:51	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	60-140	1	05/25/10 09:50	05/25/10 16:51	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**10.5**	%	0.10	1		05/24/10 16:18		

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ANALYTICAL RESULTS

Project: BNSF Wishram
Pace Project No.: 253766

Sample: T-10-11.5 **Lab ID: 253766011** Collected: 05/20/10 14:43 Received: 05/24/10 08:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG	Analytical Method: NWTPH-Dx Preparation Method: EPA 3546							
Diesel Range SG	ND	mg/kg	24.8	1	05/24/10 16:30	05/26/10 23:11		
Motor Oil Range SG	ND	mg/kg	99.3	1	05/24/10 16:30	05/26/10 23:11	64742-65-0	
n-Octacosane (S) SG	82	%	50-150	1	05/24/10 16:30	05/26/10 23:11	630-02-4	
o-Terphenyl (S) SG	83	%	50-150	1	05/24/10 16:30	05/26/10 23:11	84-15-1	
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Gasoline Range Organics	ND	mg/kg	6.1	1	05/24/10 10:00	05/25/10 02:59		
a,a,a-Trifluorotoluene (S)	98	%	50-150	1	05/24/10 10:00	05/25/10 02:59	98-08-8	
4-Bromofluorobenzene (S)	93	%	50-150	1	05/24/10 10:00	05/25/10 02:59	460-00-4	
8260 MSV Medium LL	Analytical Method: EPA 8260 Preparation Method: EPA 5035A/5030B							
Benzene	ND	ug/kg	24.2	1	05/25/10 09:50	05/25/10 17:13	71-43-2	
Ethylbenzene	ND	ug/kg	30.3	1	05/25/10 09:50	05/25/10 17:13	100-41-4	
Toluene	ND	ug/kg	30.3	1	05/25/10 09:50	05/25/10 17:13	108-88-3	
Xylene (Total)	ND	ug/kg	90.9	1	05/25/10 09:50	05/25/10 17:13	1330-20-7	
m&p-Xylene	ND	ug/kg	60.6	1	05/25/10 09:50	05/25/10 17:13	179601-23-1	
o-Xylene	ND	ug/kg	30.3	1	05/25/10 09:50	05/25/10 17:13	95-47-6	
Dibromofluoromethane (S)	100	%	60-140	1	05/25/10 09:50	05/25/10 17:13	1868-53-7	
Toluene-d8 (S)	104	%	60-140	1	05/25/10 09:50	05/25/10 17:13	2037-26-5	
4-Bromofluorobenzene (S)	99	%	60-140	1	05/25/10 09:50	05/25/10 17:13	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	60-140	1	05/25/10 09:50	05/25/10 17:13	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**20.5**	%	0.10	1		05/24/10 16:23		

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940 South Harney
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(206)767-5060

QUALITY CONTROL DATA

Project: BNSF Wishram
Pace Project No.: 253766

QC Batch: OEXT/2211 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3546 Analysis Description: NWTPH-Dx GCS
Associated Lab Samples: 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

METHOD BLANK: 28451 Matrix: Solid
Associated Lab Samples: 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/kg	ND	20.0	05/26/10 18:54	
Motor Oil Range SG	mg/kg	ND	80.0	05/26/10 18:54	
n-Octacosane (S) SG	%	91	50-150	05/26/10 18:54	
o-Terphenyl (S) SG	%	89	50-150	05/26/10 18:54	

LABORATORY CONTROL SAMPLE: 28452

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/kg	500	435	87	56-124	
Motor Oil Range SG	mg/kg	500	460	92	50-150	
n-Octacosane (S) SG	%			85	50-150	
o-Terphenyl (S) SG	%			85	50-150	

SAMPLE DUPLICATE: 28453

Parameter	Units	253766002 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/kg	545	497	9	
Motor Oil Range SG	mg/kg	ND	ND		
n-Octacosane (S) SG	%	85	87	8	
o-Terphenyl (S) SG	%	84	84	3	

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QUALITY CONTROL DATA

Project: BNSF Wishram
Pace Project No.: 253766

QC Batch: GCV/1546 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 253766001, 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

METHOD BLANK: 28246 Matrix: Solid
Associated Lab Samples: 253766001, 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	5.0	05/24/10 14:46	
4-Bromofluorobenzene (S)	%	93	50-150	05/24/10 14:46	
a,a,a-Trifluorotoluene (S)	%	101	50-150	05/24/10 14:46	

LABORATORY CONTROL SAMPLE: 28247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	12.5	12.7	101	54-156	
4-Bromofluorobenzene (S)	%			102	50-150	
a,a,a-Trifluorotoluene (S)	%			105	50-150	

SAMPLE DUPLICATE: 28282

Parameter	Units	253745001 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	1.2J		
4-Bromofluorobenzene (S)	%	96	97	1	
a,a,a-Trifluorotoluene (S)	%	102	103	.3	

SAMPLE DUPLICATE: 28439

Parameter	Units	253766002 Result	Dup Result	RPD	Qualifiers
Gasoline Range Organics	mg/kg	62.7	71.0	12	
4-Bromofluorobenzene (S)	%	108	113	4	
a,a,a-Trifluorotoluene (S)	%	100	102	2	

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QUALITY CONTROL DATA

Project: BNSF Wishram
Pace Project No.: 253766

QC Batch: MSV/2421 Analysis Method: EPA 8260
QC Batch Method: EPA 5035A/5030B Analysis Description: 8260 MSV Medium LL Soil
Associated Lab Samples: 253766001, 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

METHOD BLANK: 28499 Matrix: Solid
Associated Lab Samples: 253766001, 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/kg	ND	20.0	05/25/10 11:08	
Ethylbenzene	ug/kg	ND	25.0	05/25/10 11:08	
m&p-Xylene	ug/kg	ND	50.0	05/25/10 11:08	
o-Xylene	ug/kg	ND	25.0	05/25/10 11:08	
Toluene	ug/kg	ND	25.0	05/25/10 11:08	
Xylene (Total)	ug/kg	ND	75.0	05/25/10 11:08	
1,2-Dichloroethane-d4 (S)	%	105	60-140	05/25/10 11:08	
4-Bromofluorobenzene (S)	%	97	60-140	05/25/10 11:08	
Dibromofluoromethane (S)	%	103	60-140	05/25/10 11:08	
Toluene-d8 (S)	%	102	60-140	05/25/10 11:08	

LABORATORY CONTROL SAMPLE & LCSD: 28500 28501

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/kg	1000	1010	1000	101	100	79-127	1	30	
Ethylbenzene	ug/kg	1000	986	975	99	98	77-126	1	30	
m&p-Xylene	ug/kg	2000	2020	1990	101	100	78-120	2	30	
o-Xylene	ug/kg	1000	1010	1010	101	101	76-123	.1	30	
Toluene	ug/kg	1000	962	963	96	96	77-124	.2	30	
Xylene (Total)	ug/kg	3000	3030	3000	101	100	77-127	1	30	
1,2-Dichloroethane-d4 (S)	%				105	104	60-140			
4-Bromofluorobenzene (S)	%				102	102	60-140			
Dibromofluoromethane (S)	%				105	106	60-140			
Toluene-d8 (S)	%				102	103	60-140			

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QUALITY CONTROL DATA

Project: BNSF Wishram
Pace Project No.: 253766

QC Batch: PMST/1217 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 253766002, 253766003, 253766004, 253766005, 253766006, 253766007, 253766008, 253766009, 253766010, 253766011

SAMPLE DUPLICATE: 28421

Parameter	Units	253766007 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	21.0	21.2	.8	

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QUALIFIERS

Project: BNSF Wishram
Pace Project No.: 253766

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

LABORATORIES

PASI-S	Pace Analytical Services - Seattle

ANALYTE QUALIFIERS

1n	Sample weight exceeded the method recommendation.
G2	The sample weight in the container did not meet method specifications.
S2	Surrogate recovery outside laboratory control limits due to matrix interferences (confirmed by similar results from sample re-analysis).

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Seattle, WA 98108
(206)767-5060

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF Wishram
Pace Project No.: 253766

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
253766002	T-1-12	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766003	T-2-11	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766004	T-3-12	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766005	T-4-13.5	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766006	T-5-14.5	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766007	T-6-10.5	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766008	T-7-12	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766009	T-8-11	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766010	T-9-14	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766011	T-10-11.5	EPA 3546	OEXT/2211	NWTPH-Dx	GCSV/1630
253766001	Trip Blank	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766002	T-1-12	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766003	T-2-11	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766004	T-3-12	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766005	T-4-13.5	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766006	T-5-14.5	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766007	T-6-10.5	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766008	T-7-12	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766009	T-8-11	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766010	T-9-14	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766011	T-10-11.5	NWTPH-Gx	GCV/1546	NWTPH-Gx	GCV/1551
253766001	Trip Blank	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766002	T-1-12	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766003	T-2-11	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766004	T-3-12	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766005	T-4-13.5	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766006	T-5-14.5	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766007	T-6-10.5	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766008	T-7-12	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766009	T-8-11	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766010	T-9-14	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766011	T-10-11.5	EPA 5035A/5030B	MSV/2421	EPA 8260	MSV/2430
253766002	T-1-12	ASTM D2974-87	PMST/1217		
253766003	T-2-11	ASTM D2974-87	PMST/1217		
253766004	T-3-12	ASTM D2974-87	PMST/1217		
253766005	T-4-13.5	ASTM D2974-87	PMST/1217		
253766006	T-5-14.5	ASTM D2974-87	PMST/1217		
253766007	T-6-10.5	ASTM D2974-87	PMST/1217		
253766008	T-7-12	ASTM D2974-87	PMST/1217		
253766009	T-8-11	ASTM D2974-87	PMST/1217		
253766010	T-9-14	ASTM D2974-87	PMST/1217		
253766011	T-10-11.5	ASTM D2974-87	PMST/1217		

Sample Condition Upon Receipt

Pace Analytical

Client Name: Kennedy/Jenks Project # 253766

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other _____

Optional: Proj. Due Date: Proj. Name:

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer Used: Horiba 132013 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature: 3.1 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 5/24/10 AB

Comments:

Chain of Custody Present:	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Sufficient Volume:	☑Yes	☐No	☐N/A	8.
Correct Containers Used:	☑Yes	☐No	☐N/A	9.
-Pace Containers Used:	☑Yes	☐No	☐N/A	
Containers Intact:	☑Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.
Sample Labels match COC:	☑Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL				
All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☑N/A	
exceptions: (VOA) coliform, TOC, O&G, WI-DRO (water)	☑Yes	☐No		Initial when completed:	Lot # of added preservative:
Samples checked for dechlorination:	☐Yes	☐No	☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	15.
Trip Blank Present:	☑Yes	☐No	☐N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased):				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AG 5-24-10 Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2537696

Page: 1 of 1

1313572

Section A Required Client Information:

Company: Kennedy/Jenks
Address: 32001 32nd Ave. S, Ste 100
Federal Way, WA 98001
Email To: Galen Davis
Phone: 2538356400 Fax:
Requested Due Date/TAT: Normal

Section B Required Project Information:

Report To: Galen Davis
Copy To:
Purchase Order No.: TT-9156-K04
Project Name: BNSF Wishram
Project Number: 1096010.00

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Lisa Domenighini
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WA

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: NWTPH-Gx + BTEX	Analysis Test Y/N: NWTPH-Dx w/SG	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Trip Blank	WT		—	—	—	—		4							4		X			
2	T-1-12	SL		—	—	5/20/10	0952		6	2						4		X	X		
3	T-2-11	SL		—	—		1008		5	1						4		X	X		
4	T-3-12	SL		—	—		1028		5	1						4		X	X		
5	T-4-13.5	SL		—	—		1100		6	2						4		X	X		
6	T-5-14.5	SL		—	—		1045		5	1						4		X	X		
7	T-6-10.5	SL		—	—		1117		6	2						4		X	X		
8	T-7-12	SL		—	—		1134		6	2						4		X	X		
9	T-8-11	SL		—	—		1645		5	1						4		X	X		
10	T-9-14	SL		—	—		1606		5	1						4		X	X		
11	T-10-11.5	SL		—	—	↓	1443		5	1						4		X	X		
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Kennedy/Jenks	5/21/10	0815	Jenn Geeas/Pace	5/24/10	08:15	3.1	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Matt Padberg

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5/21/10

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Container Count

253766

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CLIENT: Kennedy / Jenks

COC PAGE 1 of 1

COC ID# 1313572

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	DG9M			Comments
											5/24/16 JT				
1											2	4			Trip Blank
2											1				
3											1				
4											2				
5											1				
6											2				
7											2				
8											1				
9											1				
10											1				
11															Trip Blank? YES
12															

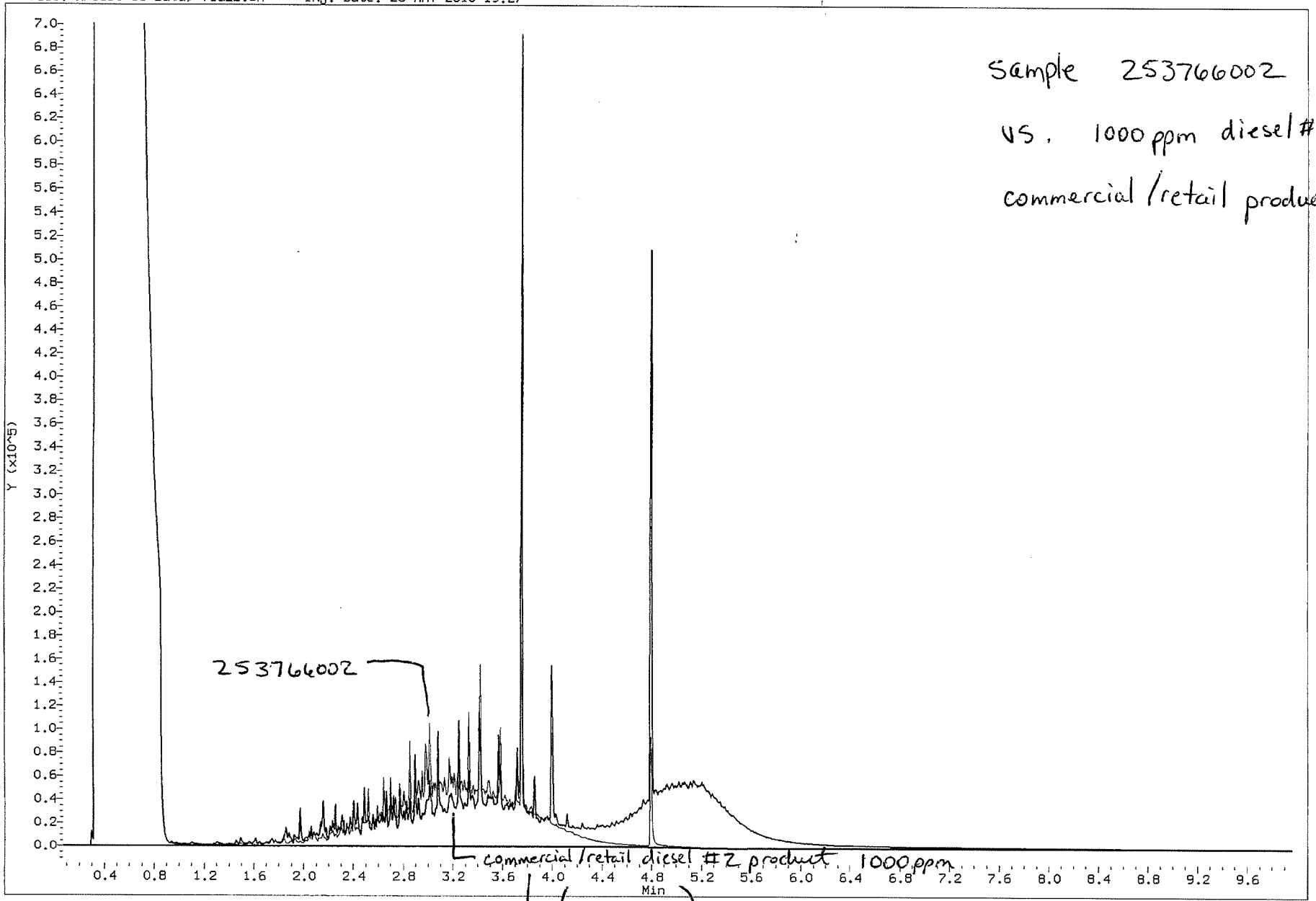
AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic		JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic		R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac		U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic		VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic		VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic		VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic		VG9W	40mL glass vial prewelghted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial		VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial		WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial		WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial		ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial			
BP2O	500mL NaOH plastic			Wipe/Swab			

Attachment 5

Pace Laboratory Chromatograms

NWTPH-Dx Chromatograms

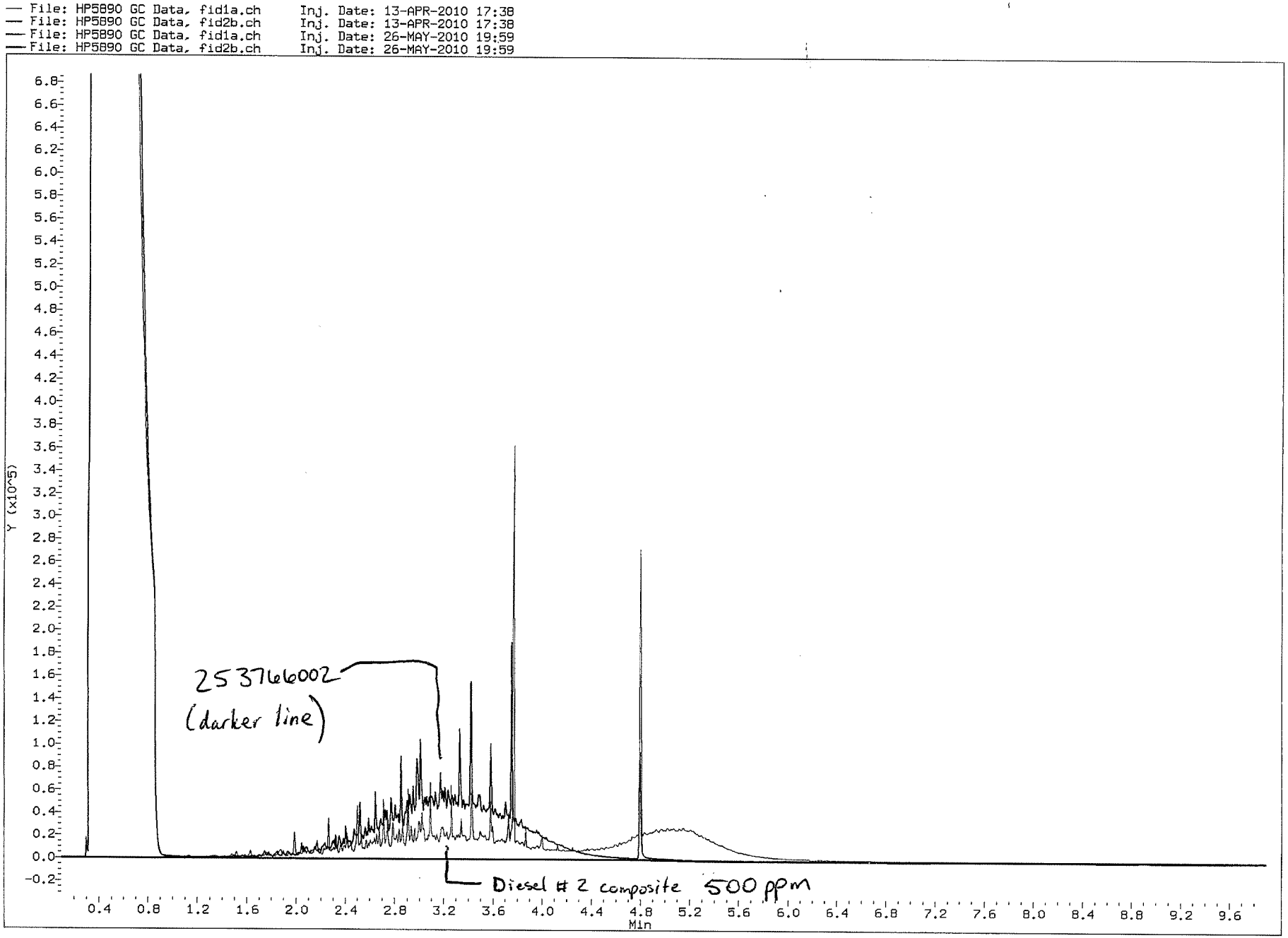
— File: HP5890 GC Data, fid1a.ch Inj. Date: 26-MAY-2010 19:59
— File: HP5890 GC Data, fid2b.ch Inj. Date: 26-MAY-2010 19:59
— File: HP5890 GC Data, fid1a.ch Inj. Date: 26-MAY-2010 19:27
— File: HP5890 GC Data, fid2b.ch Inj. Date: 26-MAY-2010 19:27



Sample 253766002

vs. 1000 ppm diesel #2

commercial/retail product.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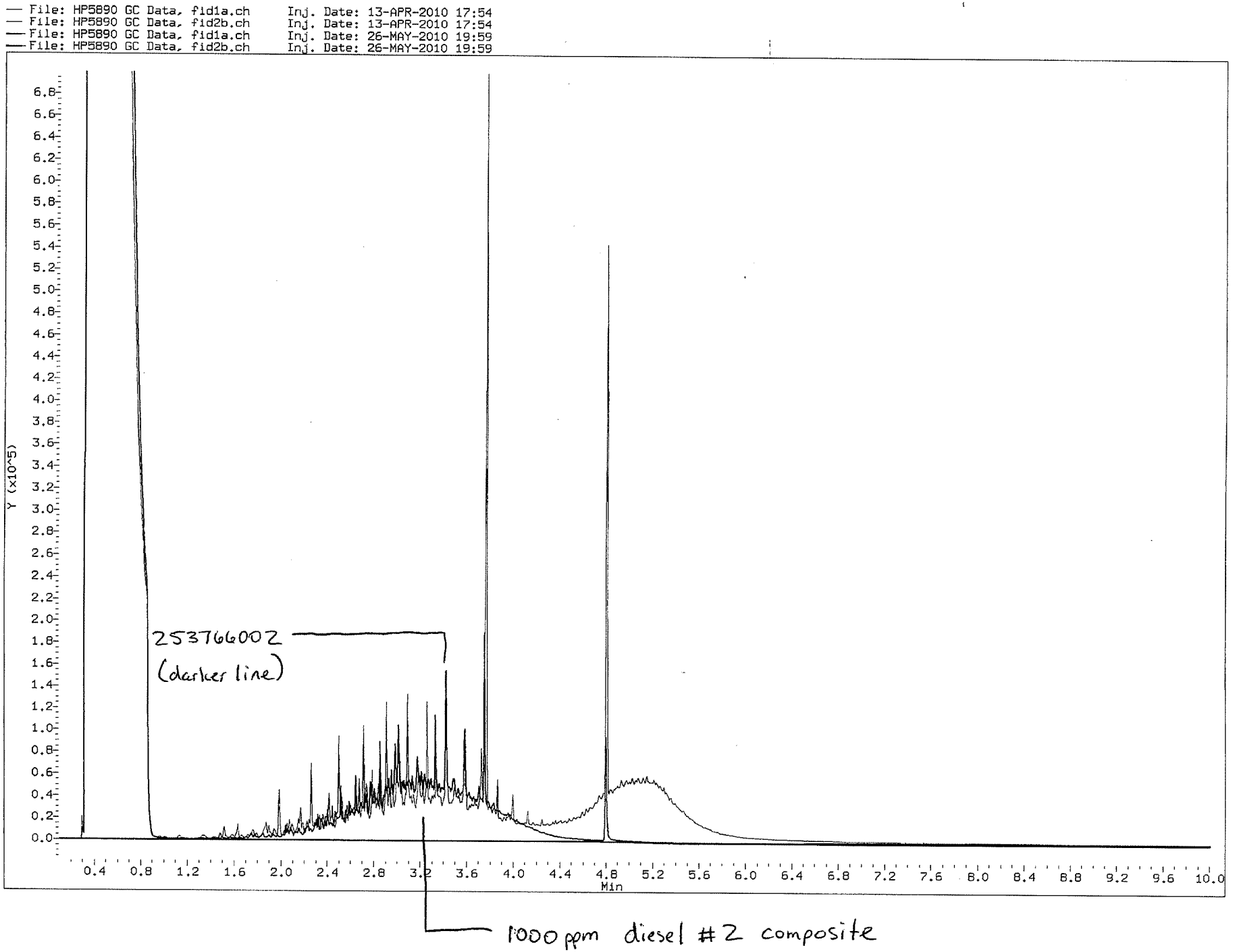
File: HP5890 GC Data, fid1a.ch Inj. Date: 26-MAY-2010 19:59
File: HP5890 GC Data, fid2b.ch Inj. Date: 26-MAY-2010 19:59
Y (x10^5)
6.8
6.6
6.4
6.2
6.0
5.8
5.6
5.4
5.2
5.0
4.8
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
2537166002
(darker line)
Diesel # 2 composite 500 ppm
0.4 0.8 1.2 1.6 2.0 2.4 2.8 3.2 3.6 4.0 4.4 4.8 5.2 5.6 6.0 6.4 6.8 7.2 7.6 8.0 8.4 8.8 9.2 9.6
Min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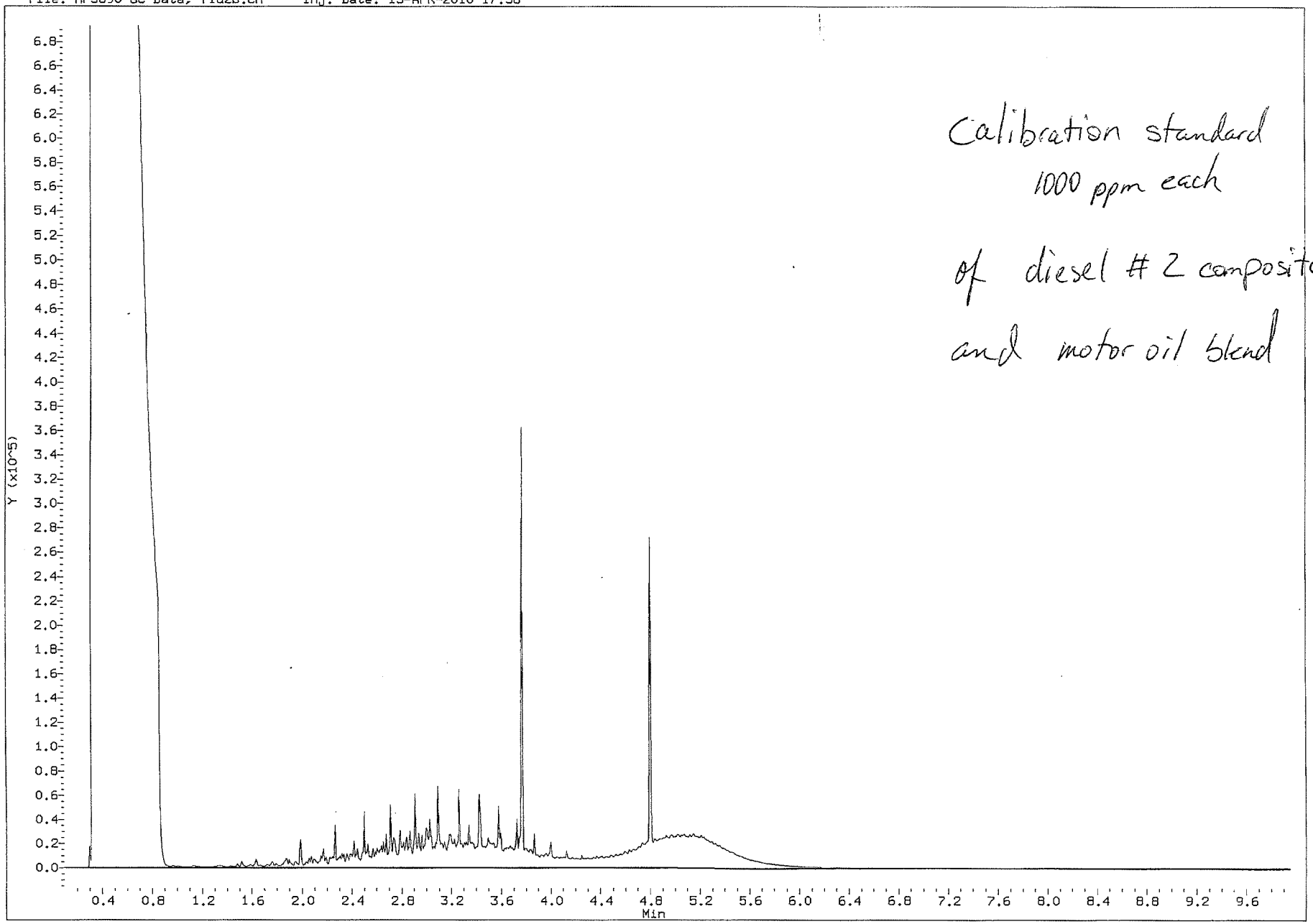
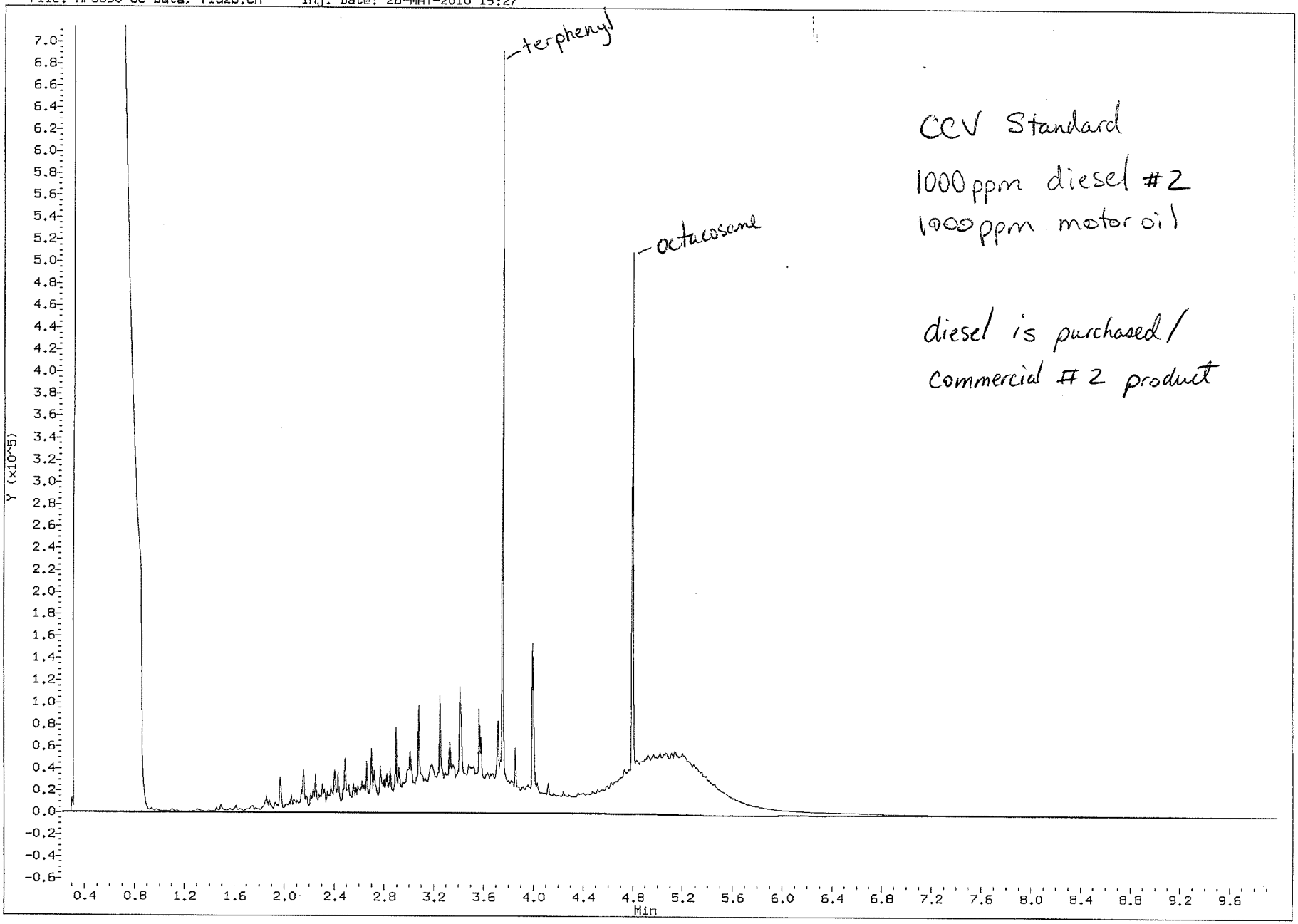
File: HP5890 GC Data, fid1a.ch Inj. Date: 26-MAY-2010 19:59
File: HP5890 GC Data, fid2b.ch Inj. Date: 26-MAY-2010 19:59
Y (x10^5)
Min
253766002
(darker line)
1000 ppm diesel #2 composite

— File: HP5890 GC Data, fid1a.ch Inj. Date: 13-APR-2010 17:38
— File: HP5890 GC Data, fid2b.ch Inj. Date: 13-APR-2010 17:38



Calibration standard
1000 ppm each
of diesel #2 composite
and motor oil blend

— File: HP5890 GC Data, fid1a.ch Inj. Date: 26-MAY-2010 19:27
— File: HP5890 GC Data, fid2b.ch Inj. Date: 26-MAY-2010 19:27



CCV Standard

1000 ppm diesel #2

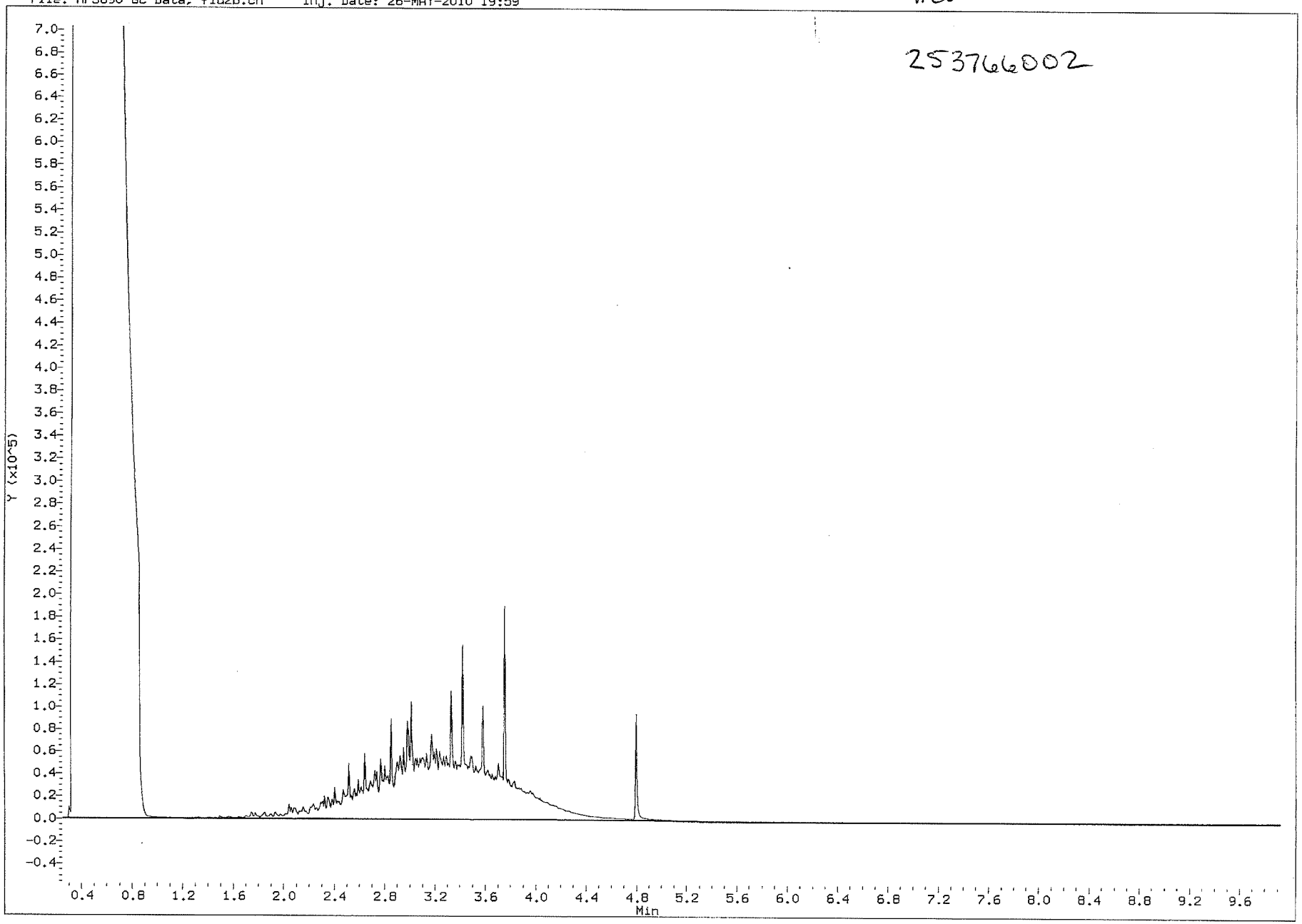
1000 ppm motor oil

diesel is purchased / commercial #2 product

— File: HP5890 GC Data, fid1a.ch Inj. Date: 26-MAY-2010 19:59
— File: HP5890 GC Data, fid2b.ch Inj. Date: 26-MAY-2010 19:59

#28

2537660O2



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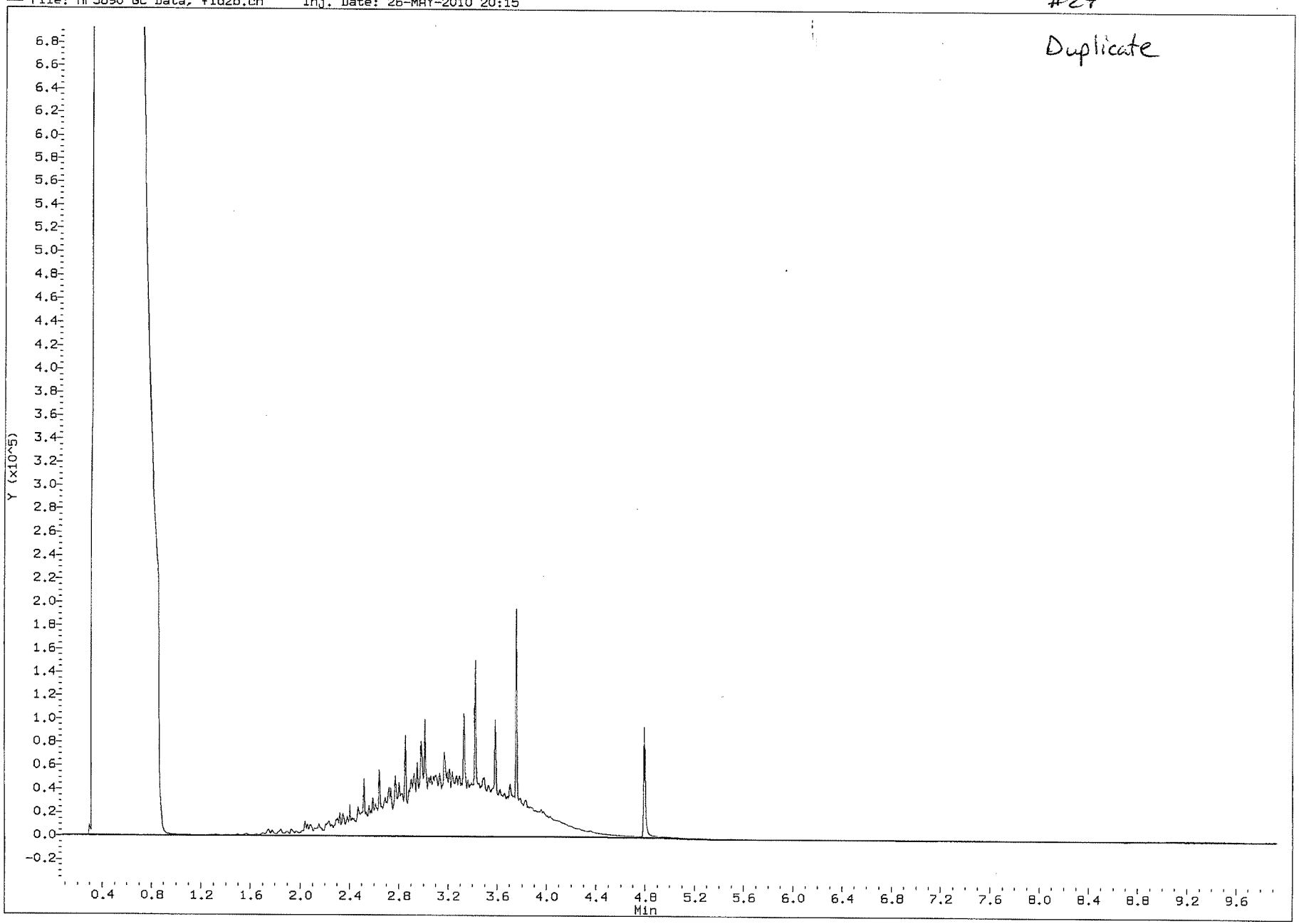
#29

Duplicate



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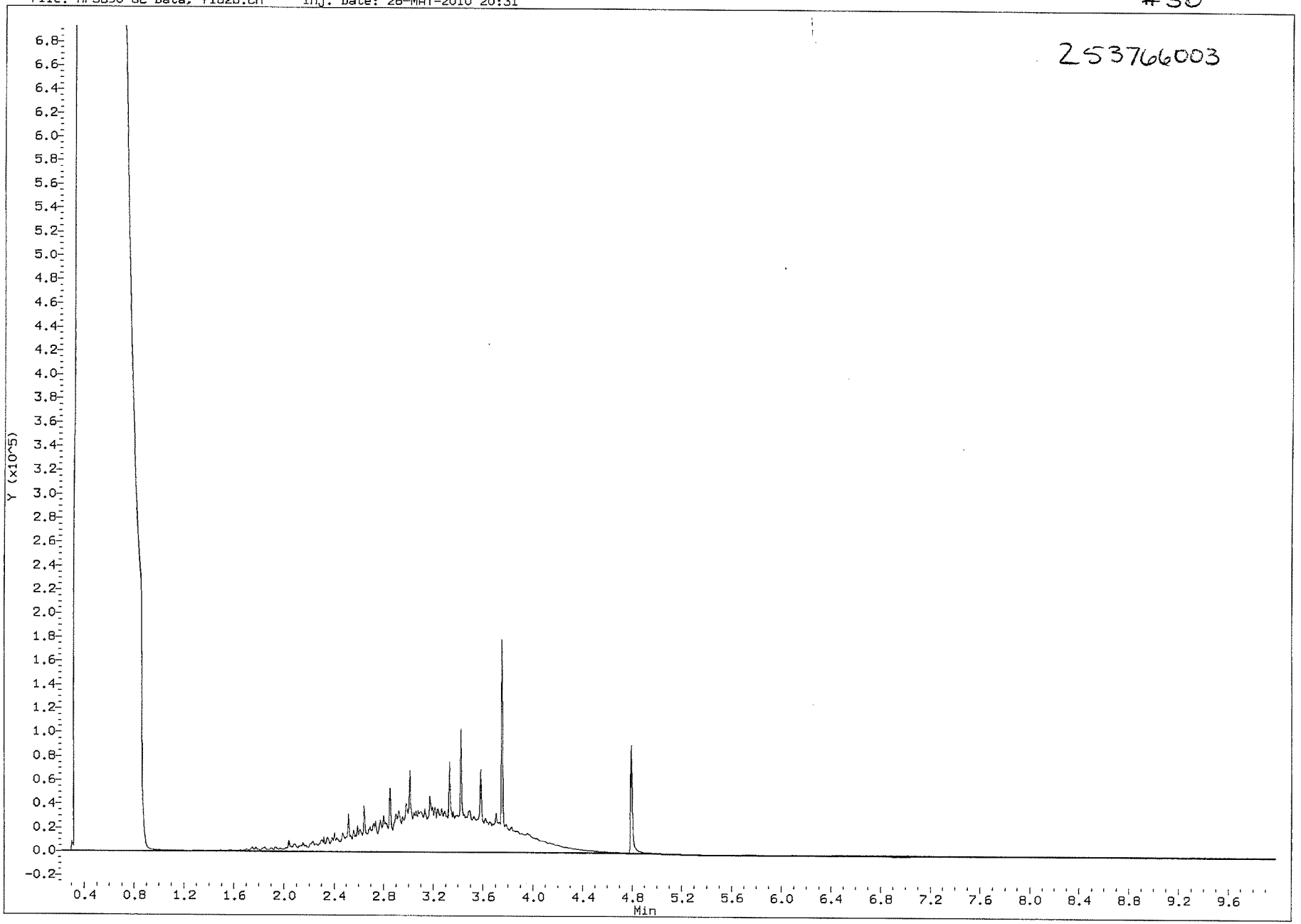
#30

253766003



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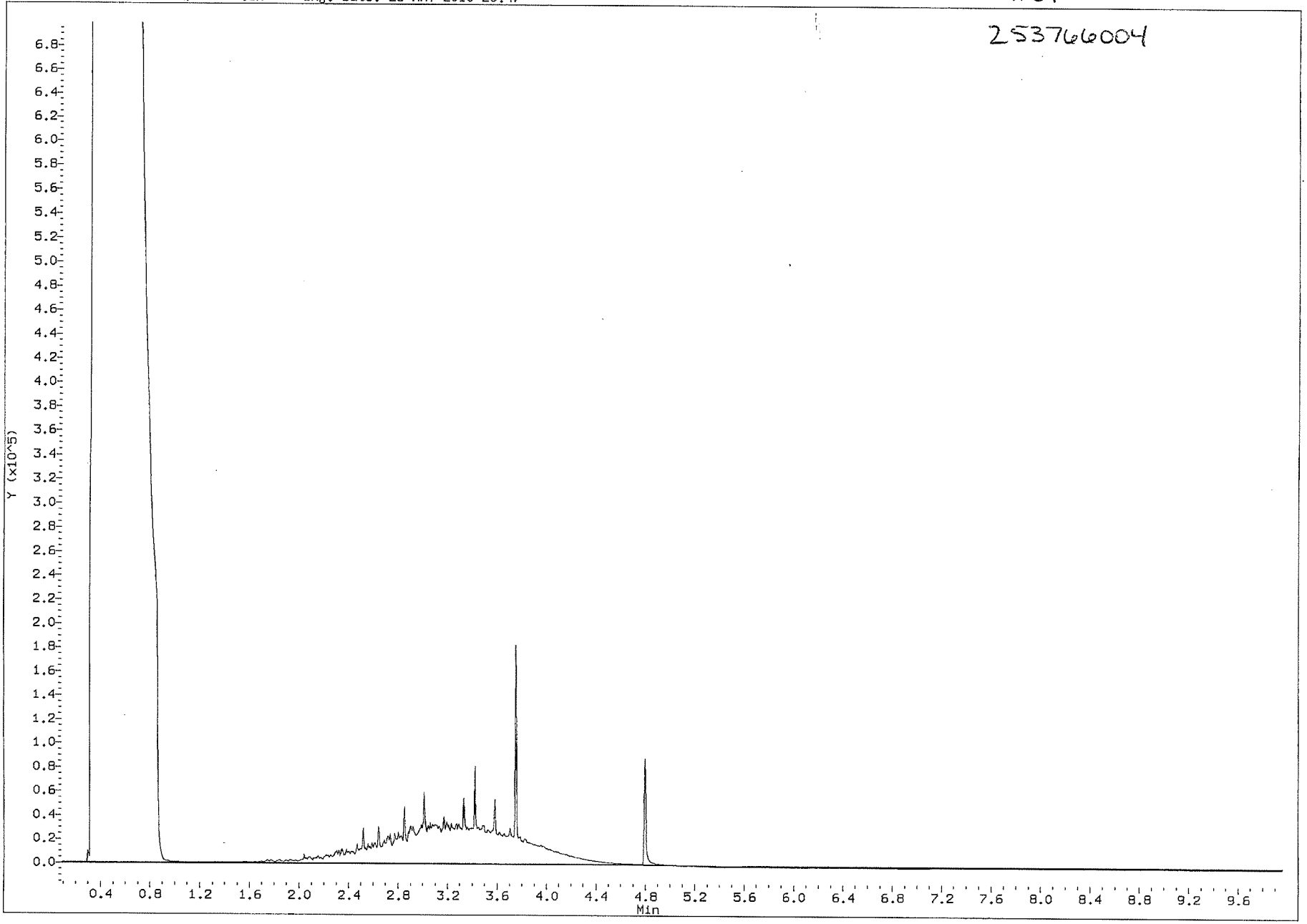
#31

2537660004



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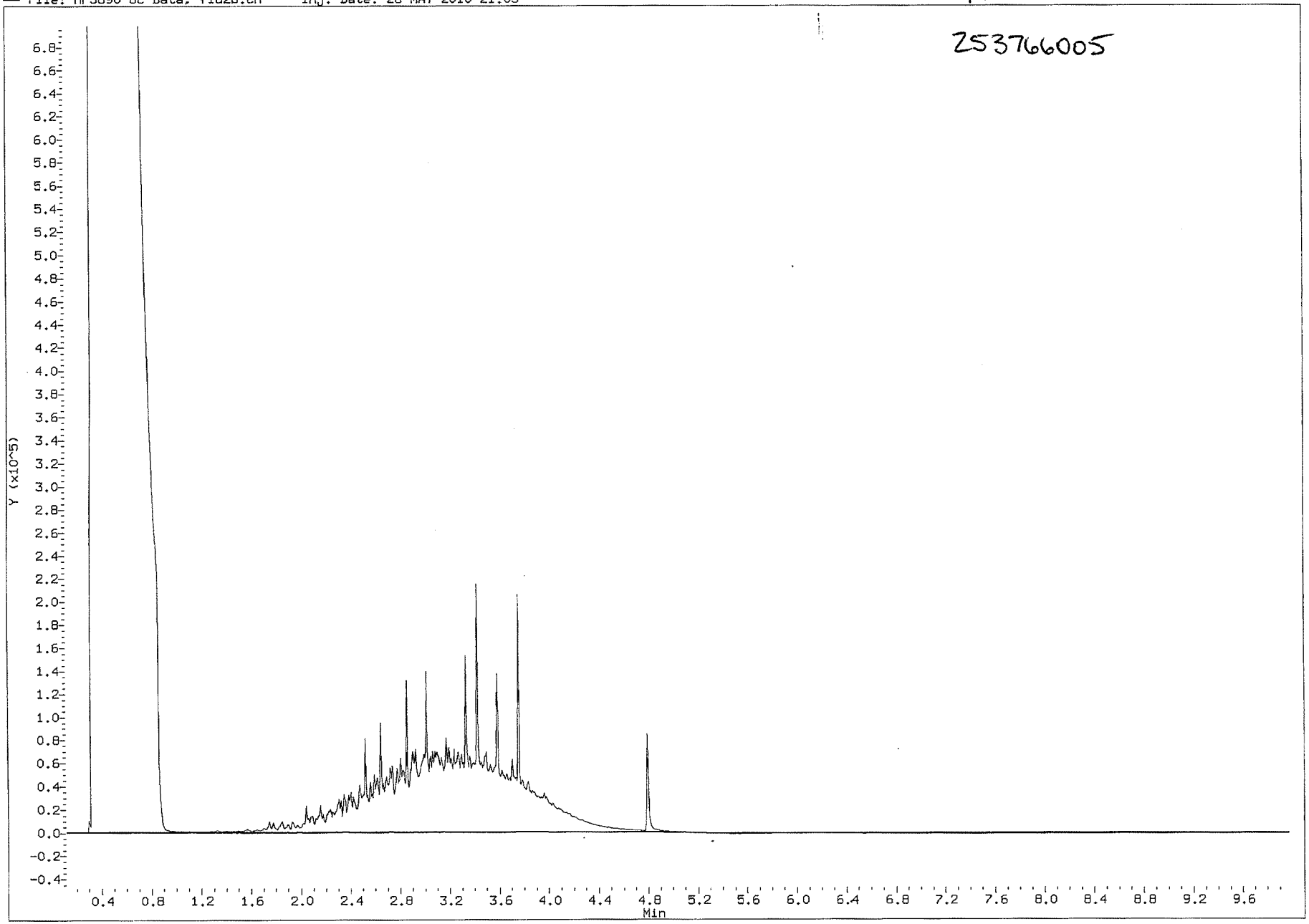
#32

253766005



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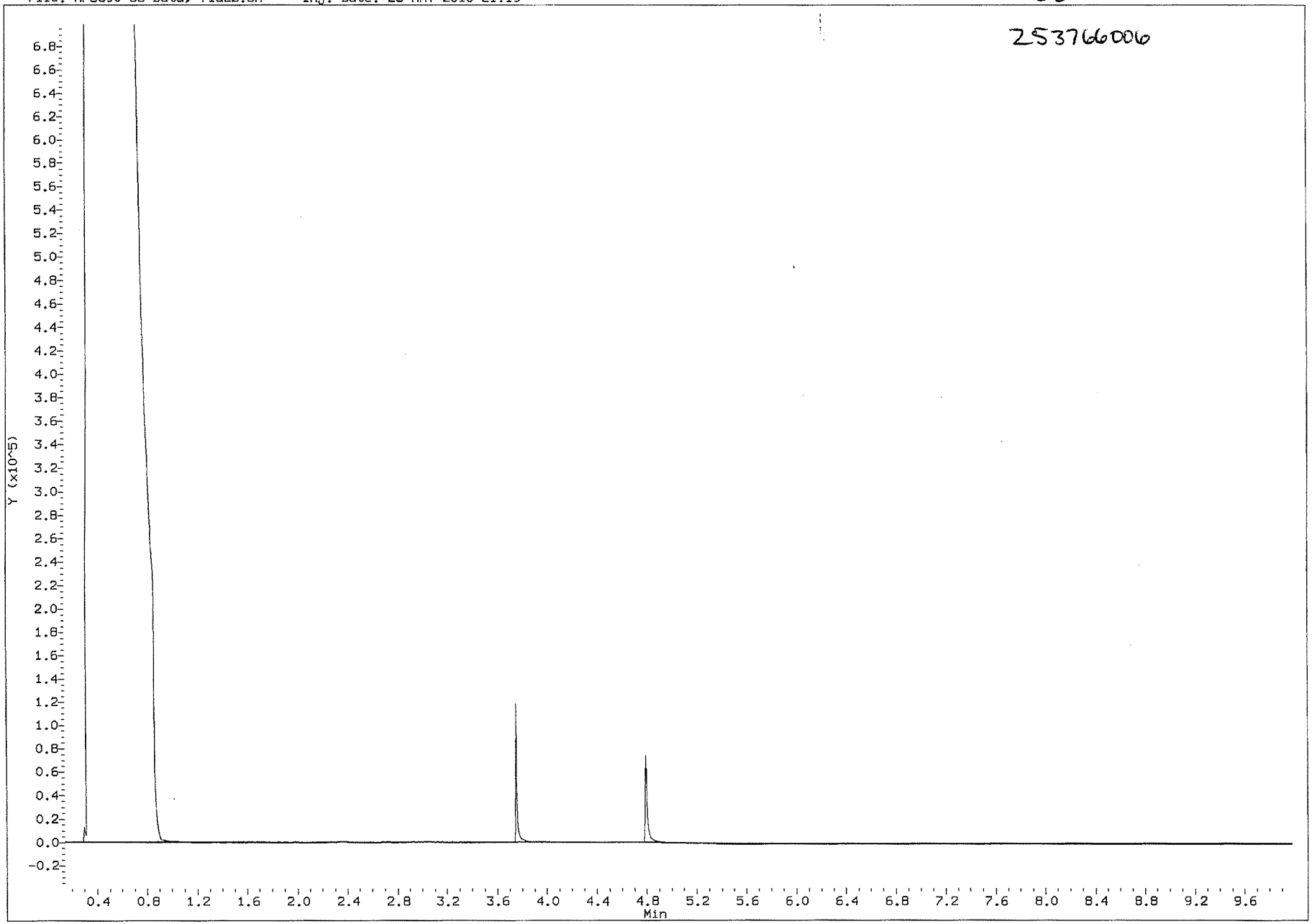
#33

253766006



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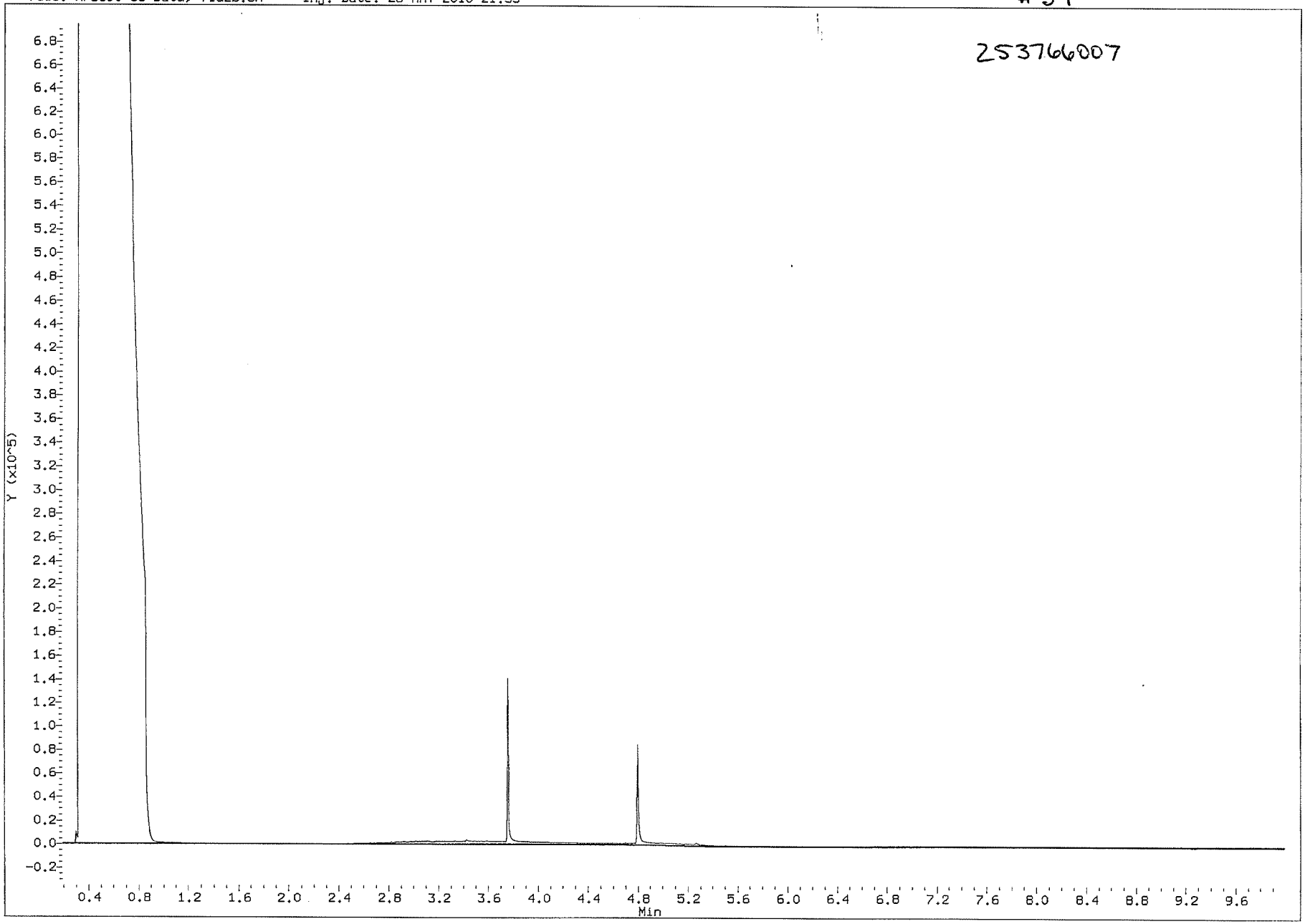
#34

253766007



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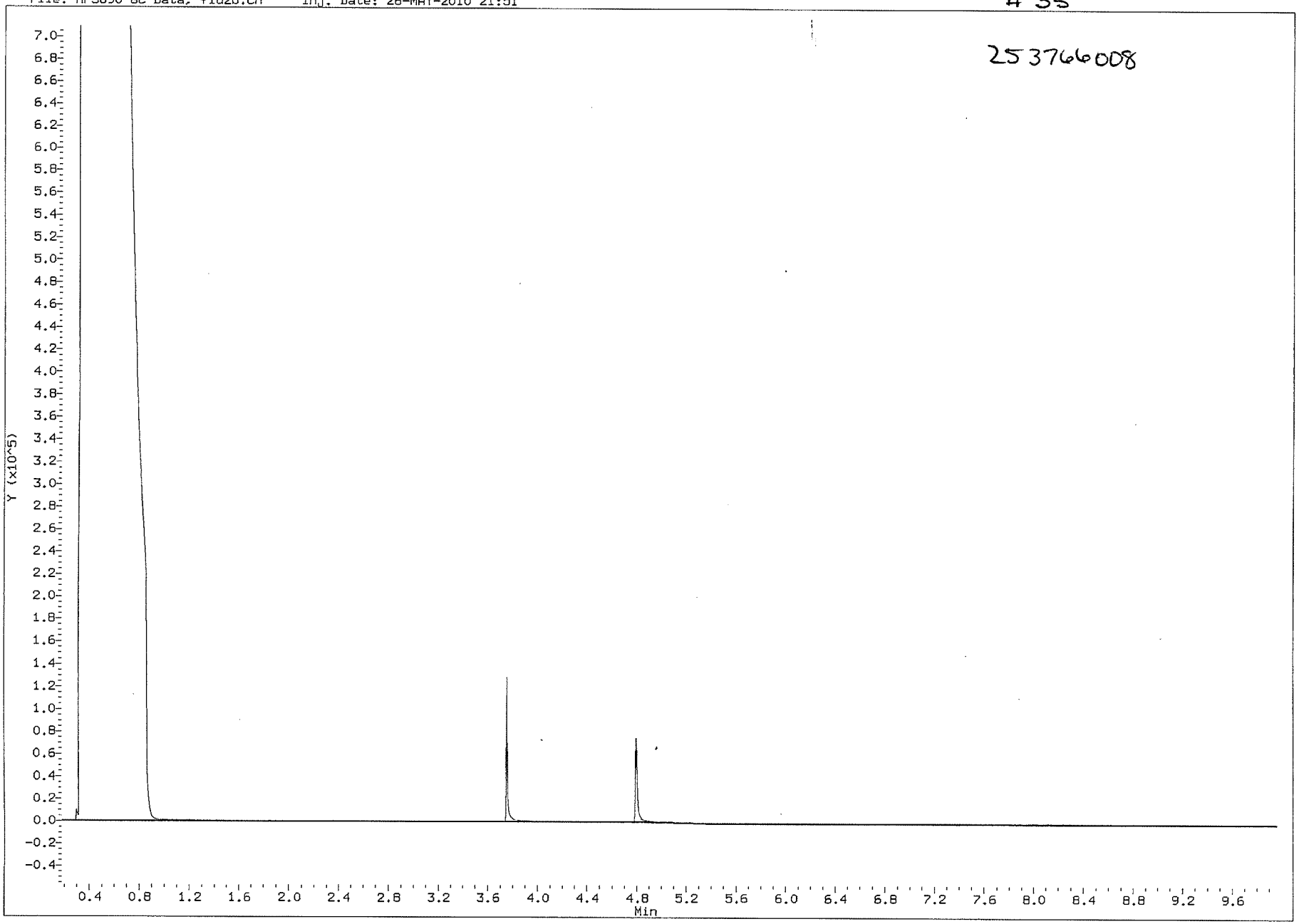
#35

253766008



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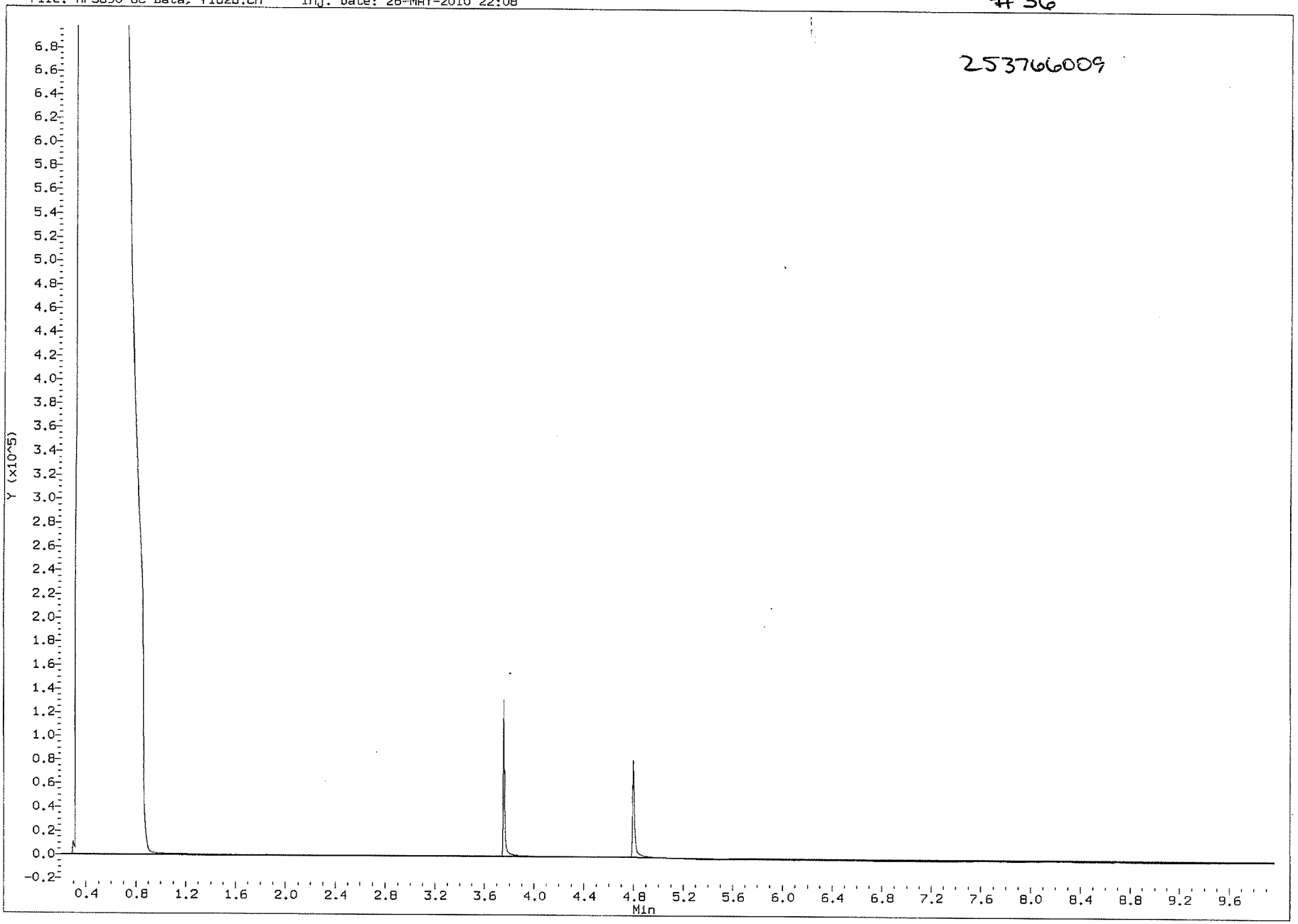
#36

253766009



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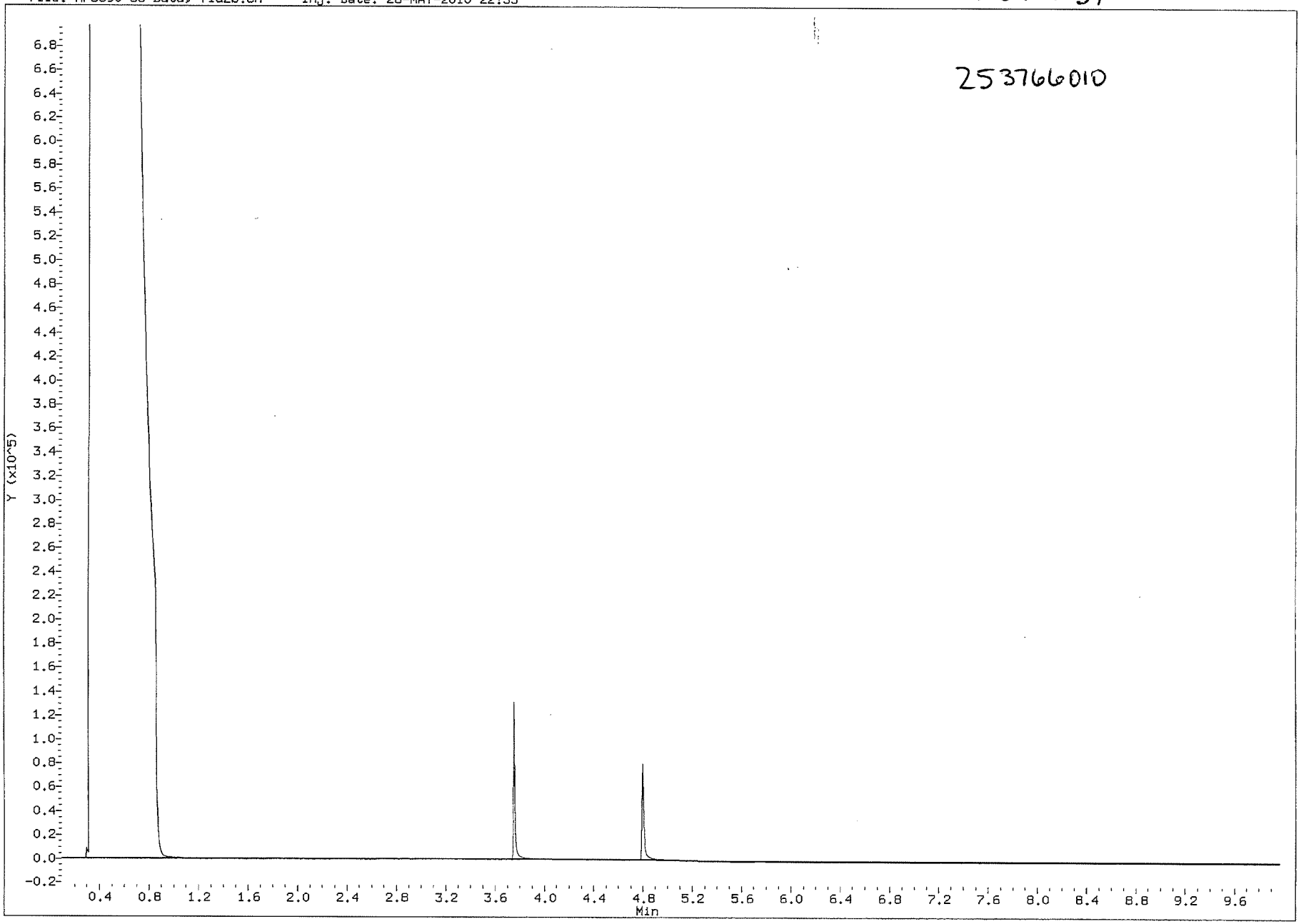
~~#37~~ #39

253766010



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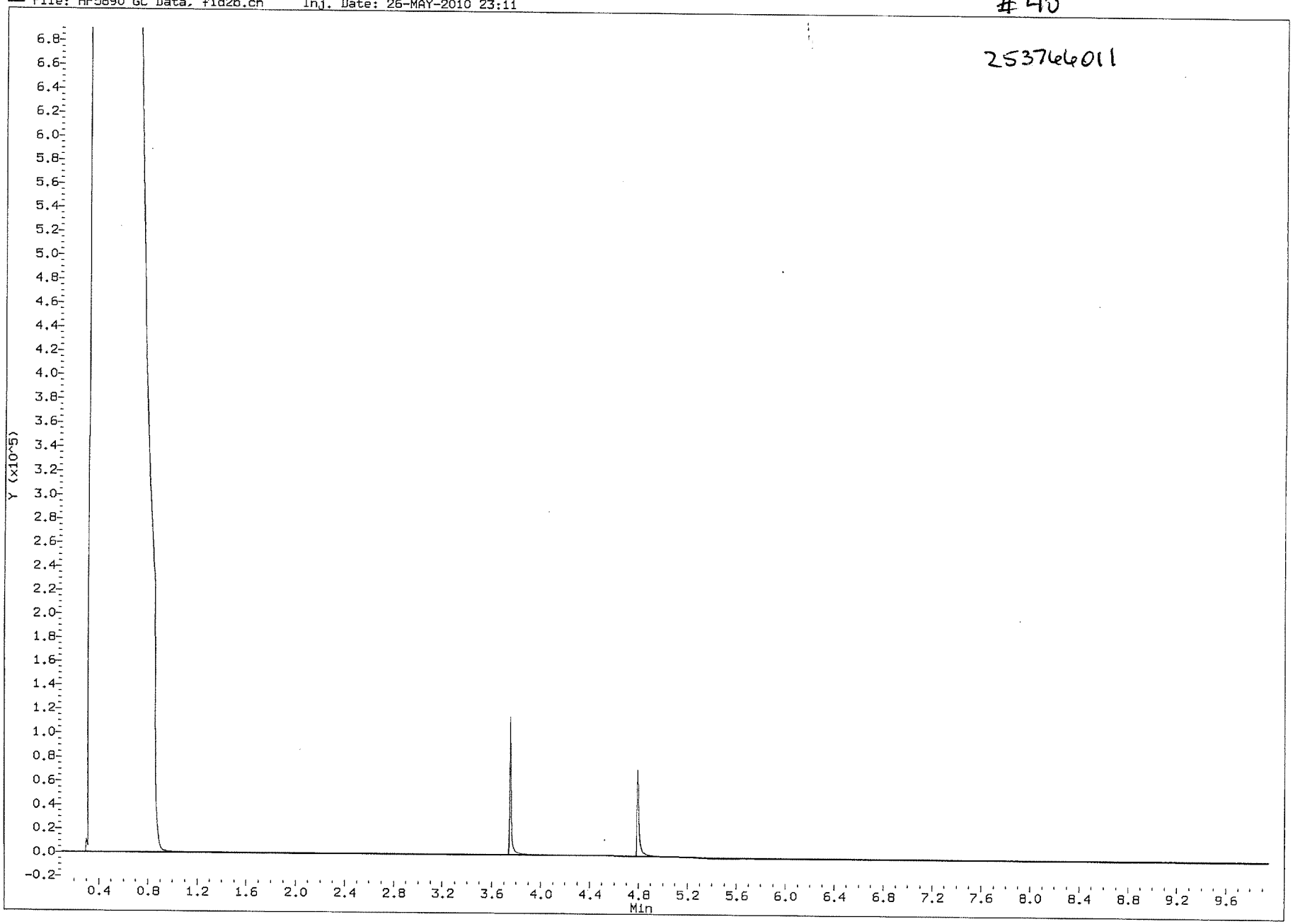
#40

253766011



NWTPH-G Chromatograms

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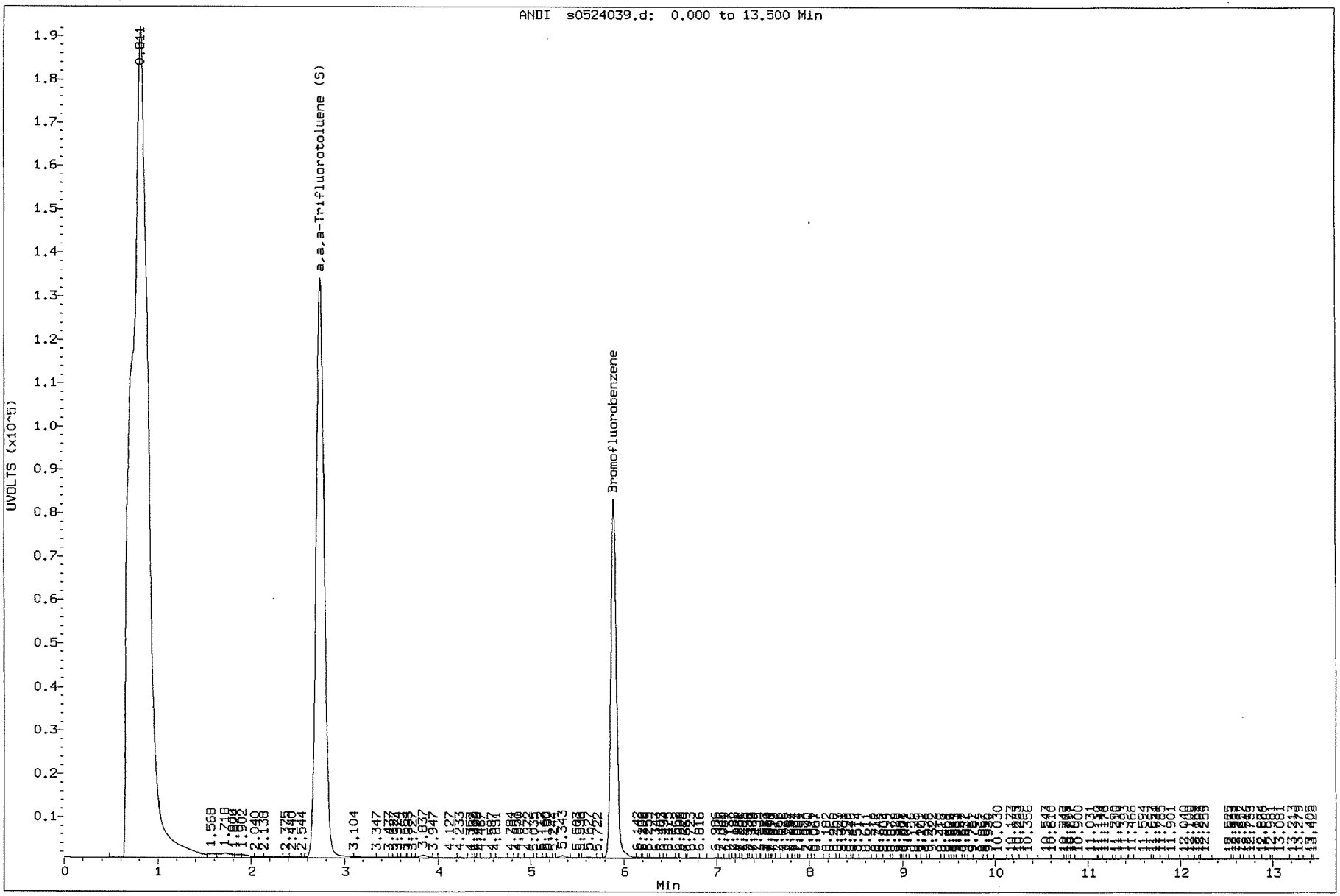

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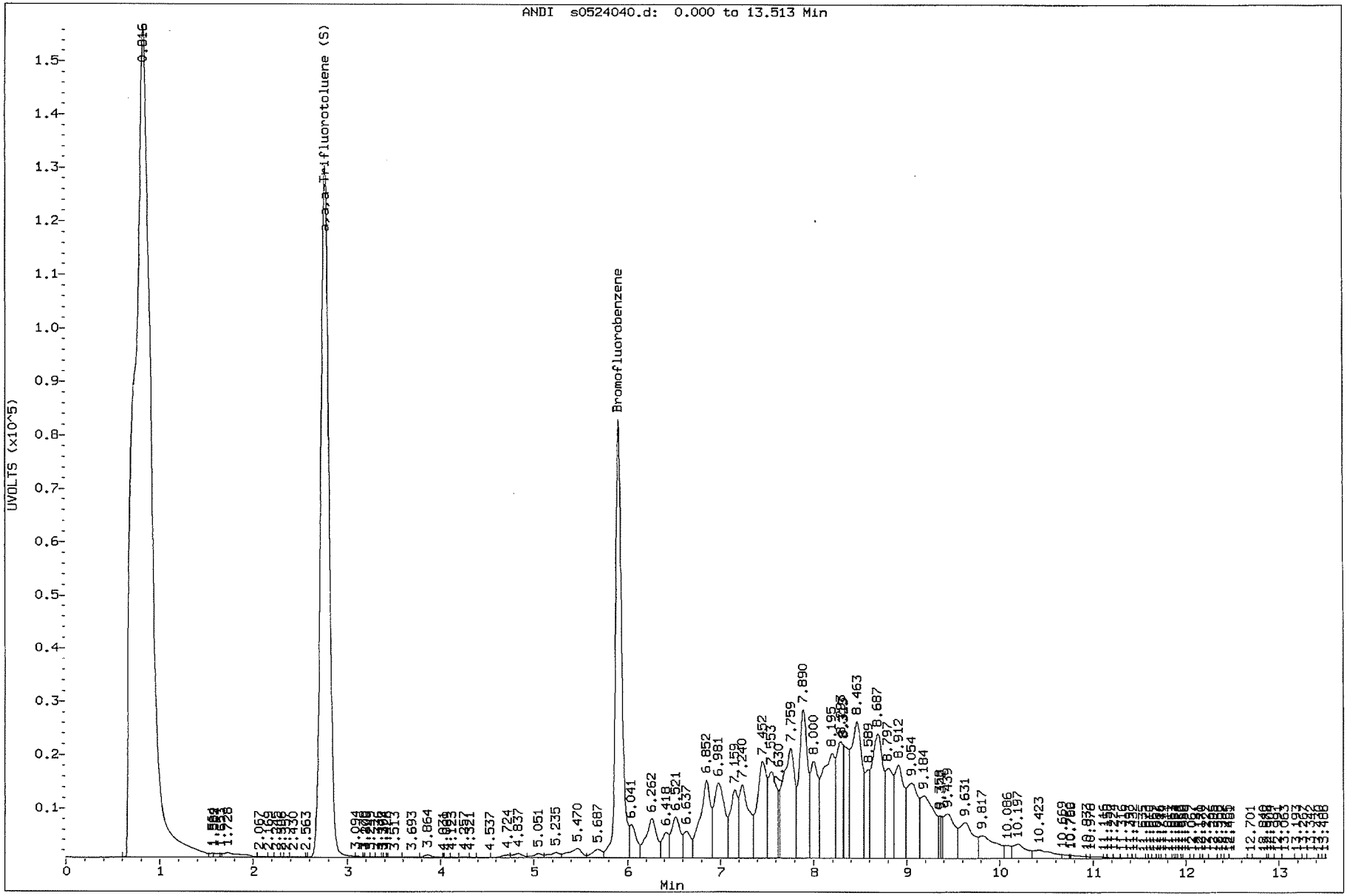

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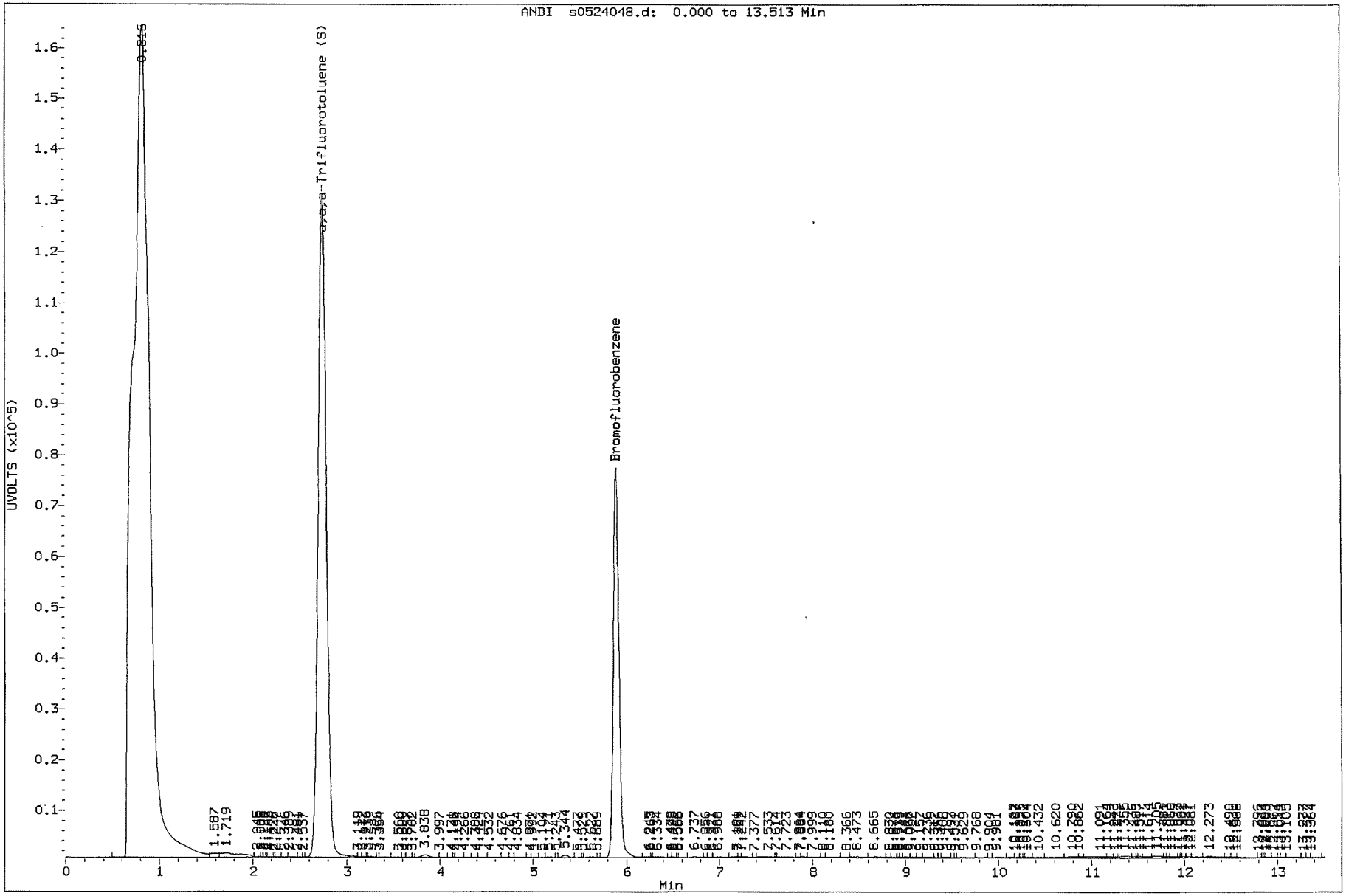

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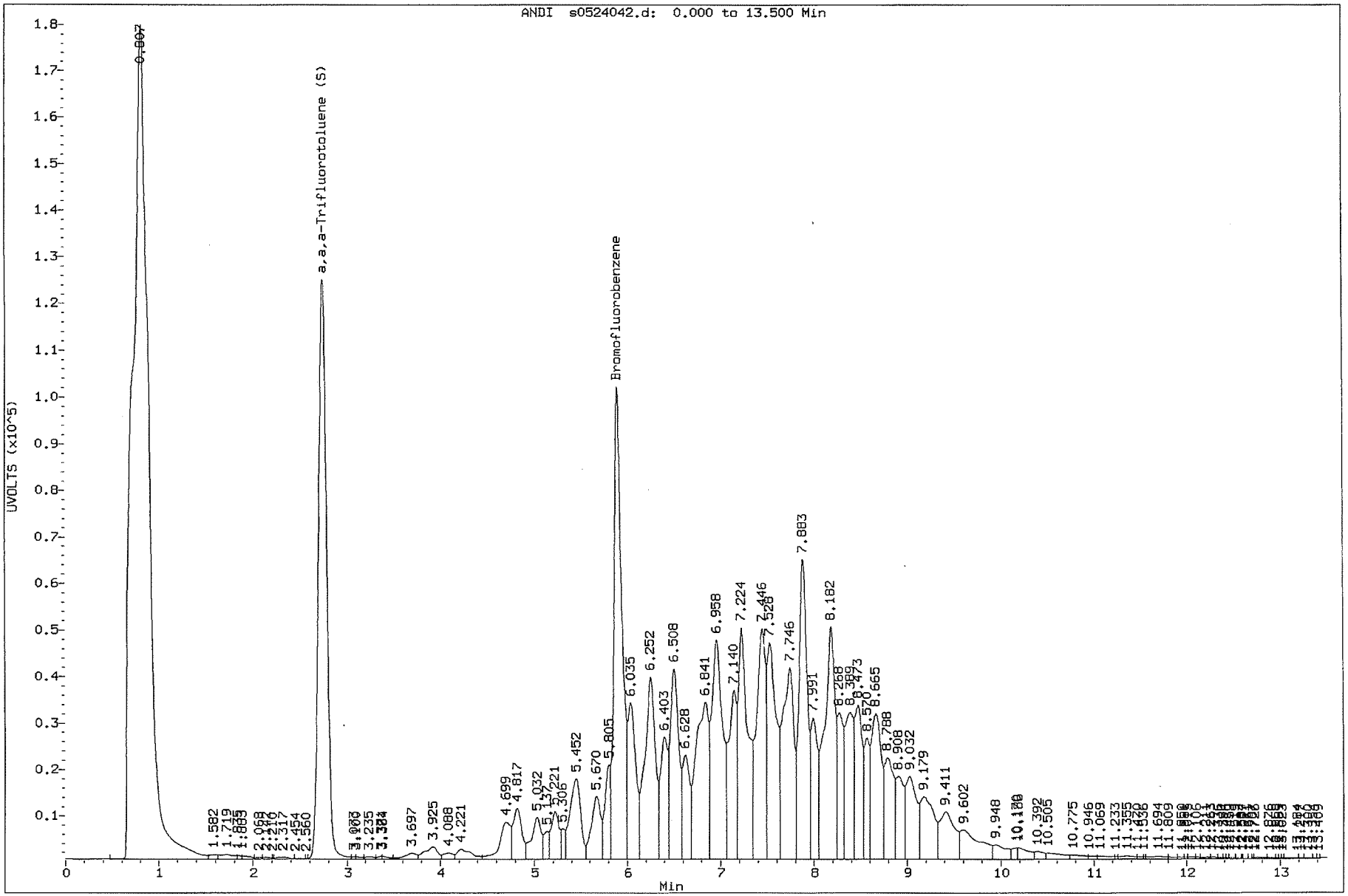

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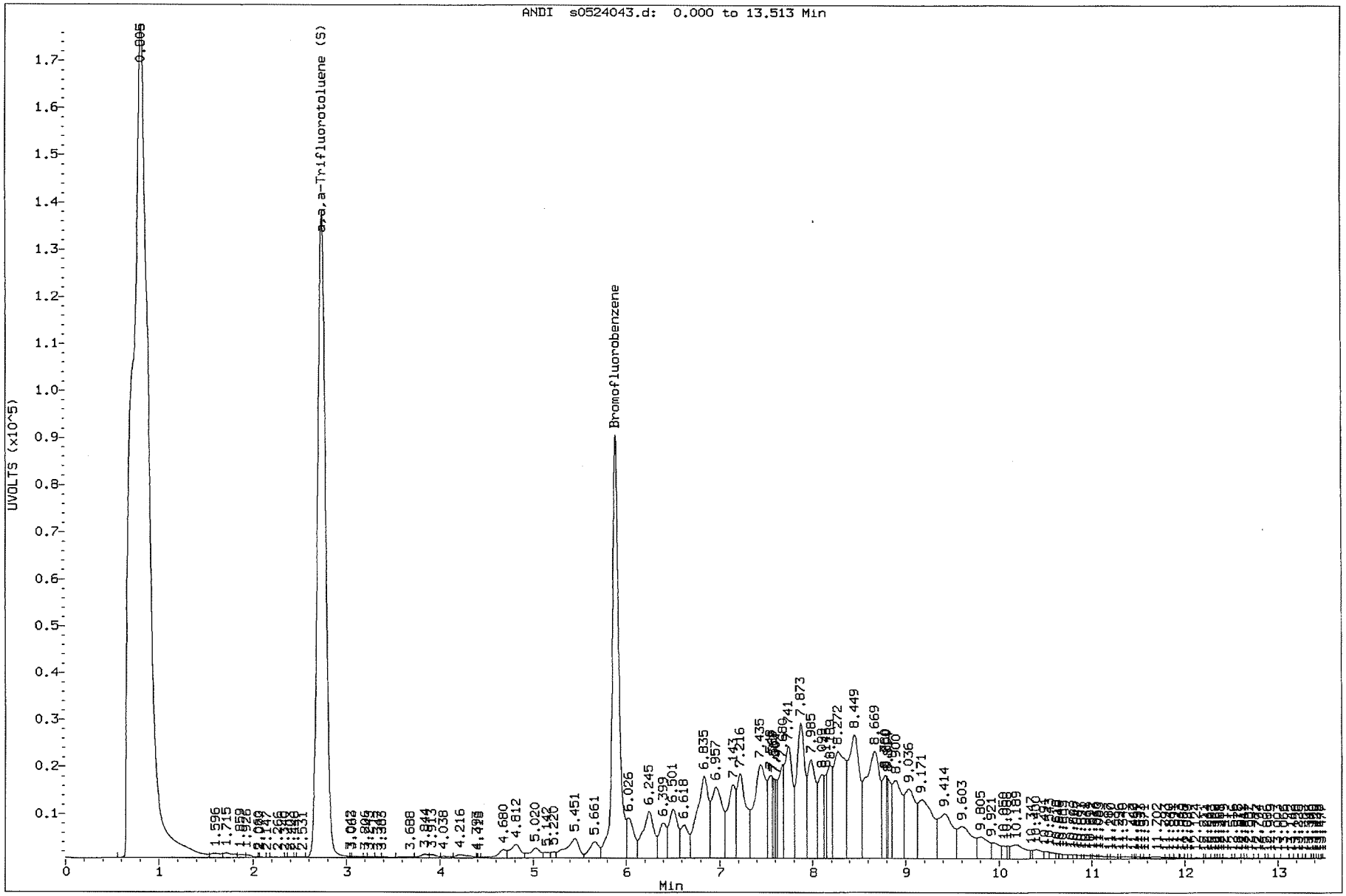

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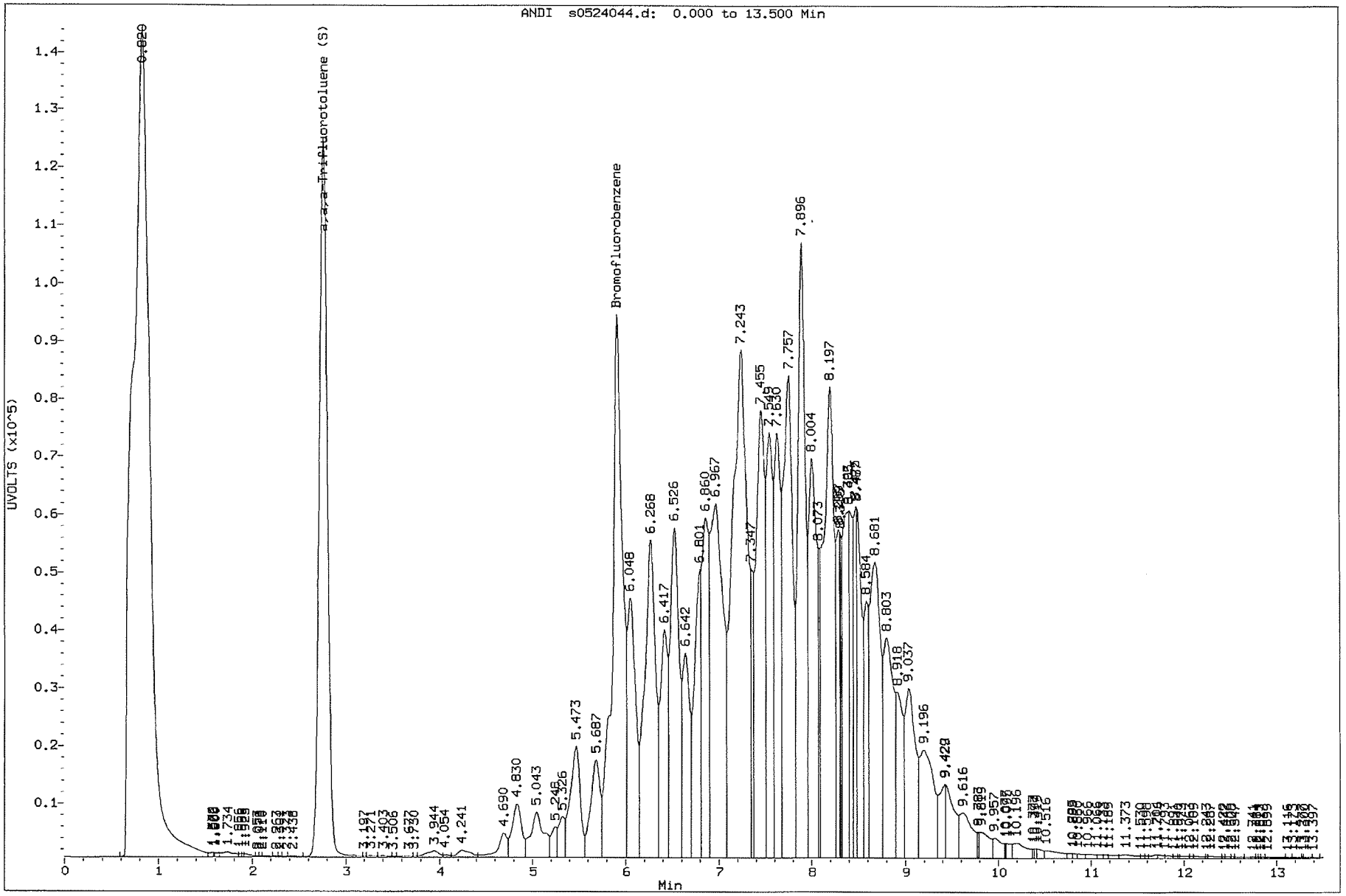

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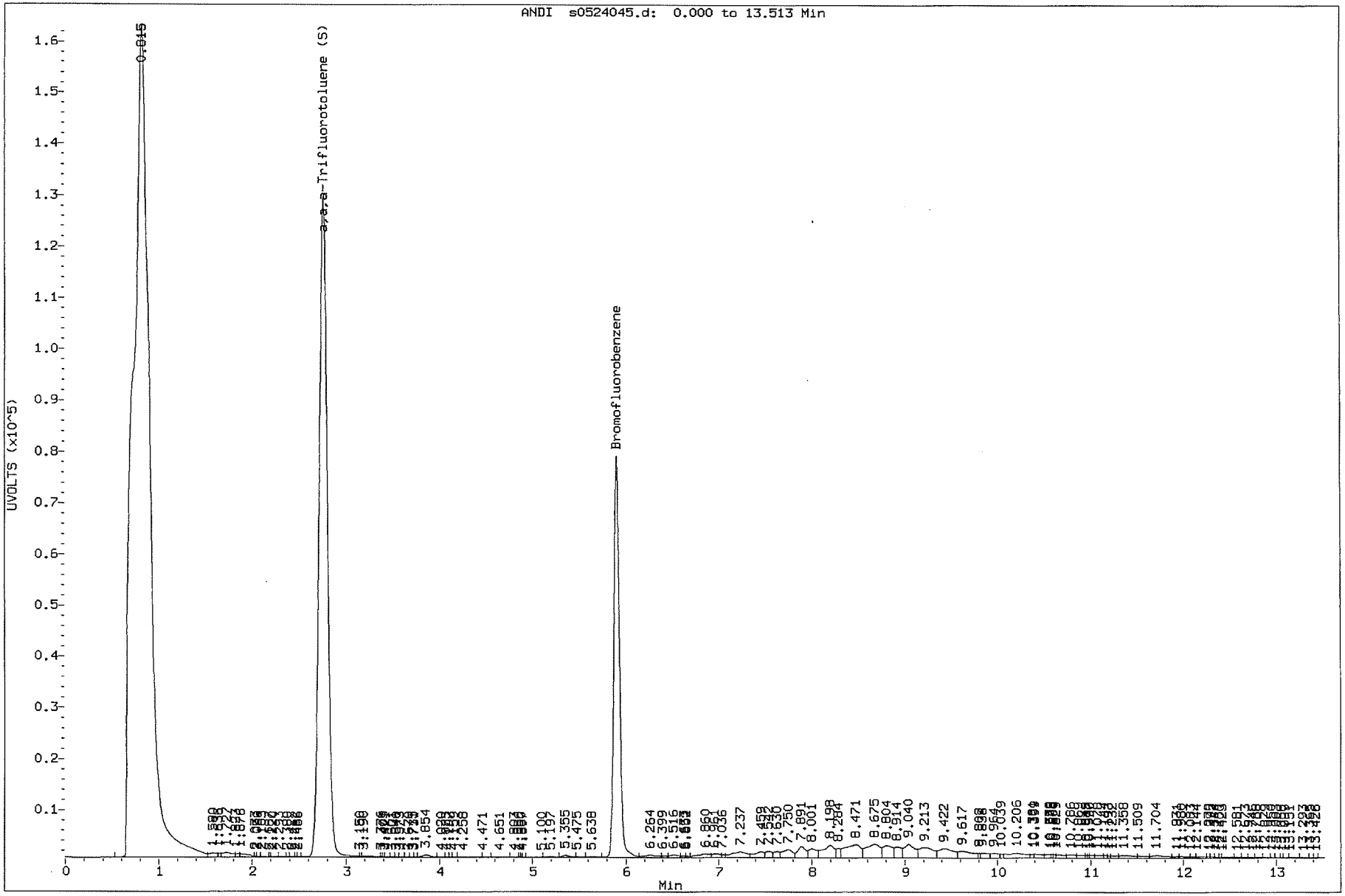

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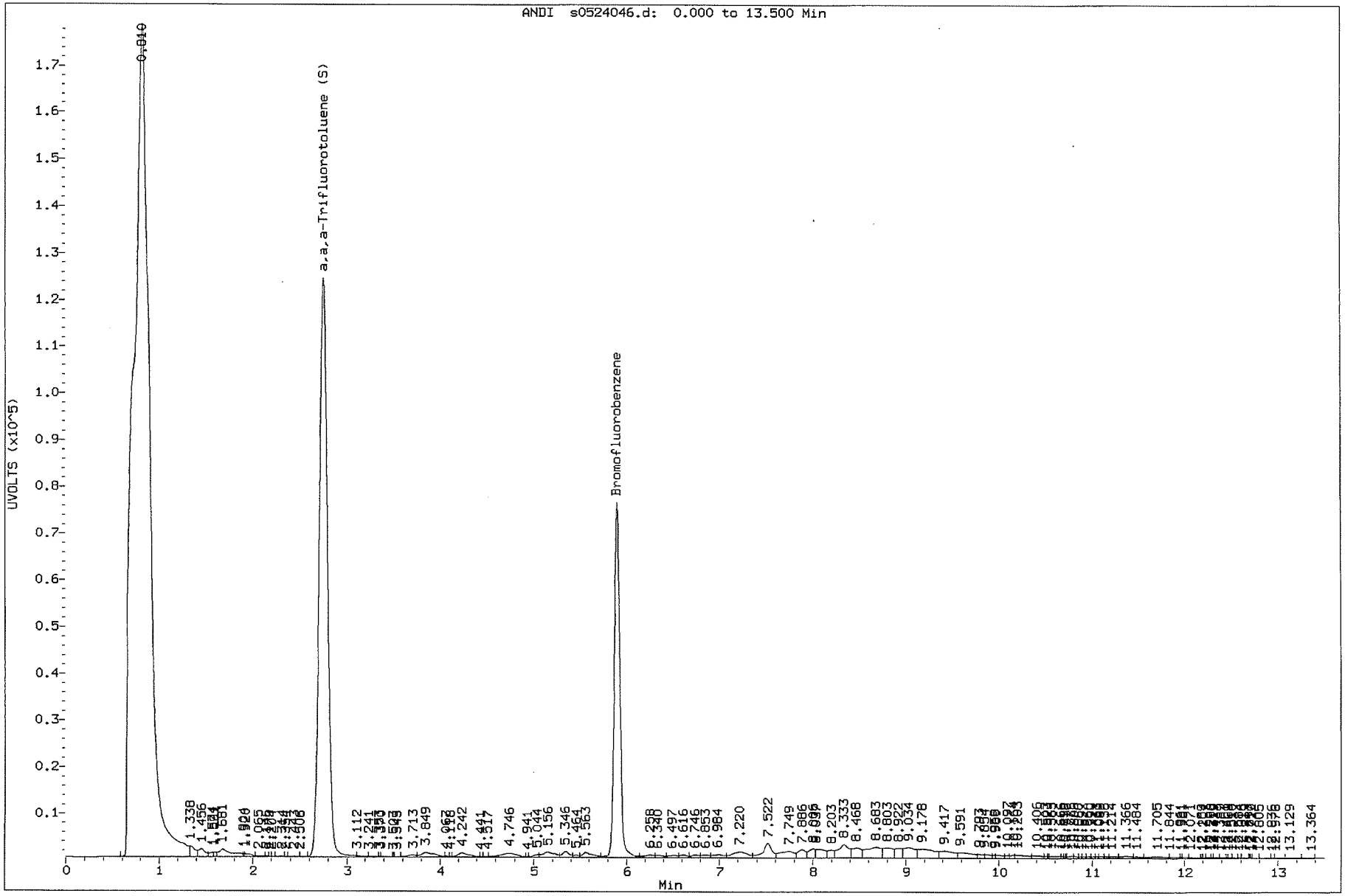

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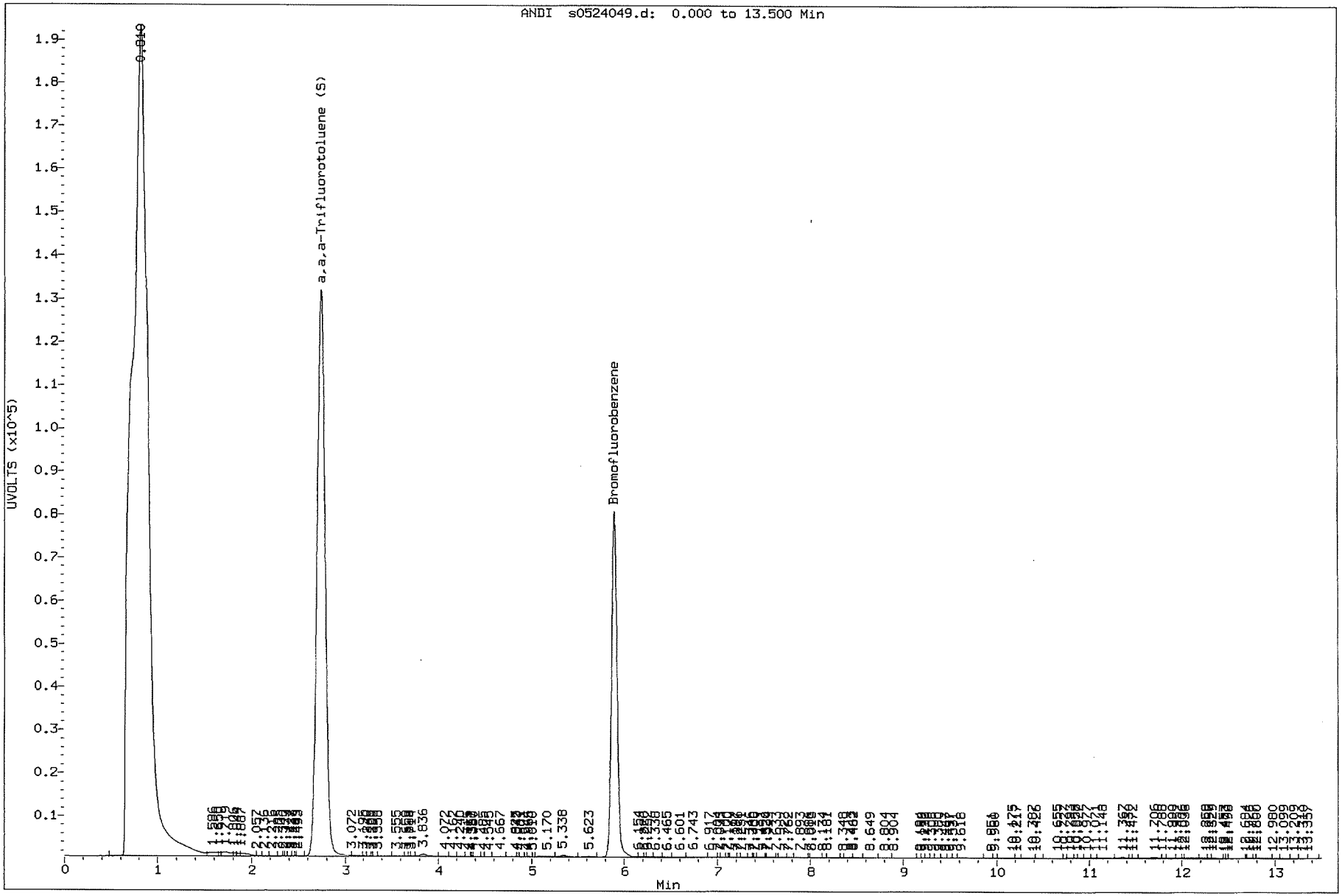

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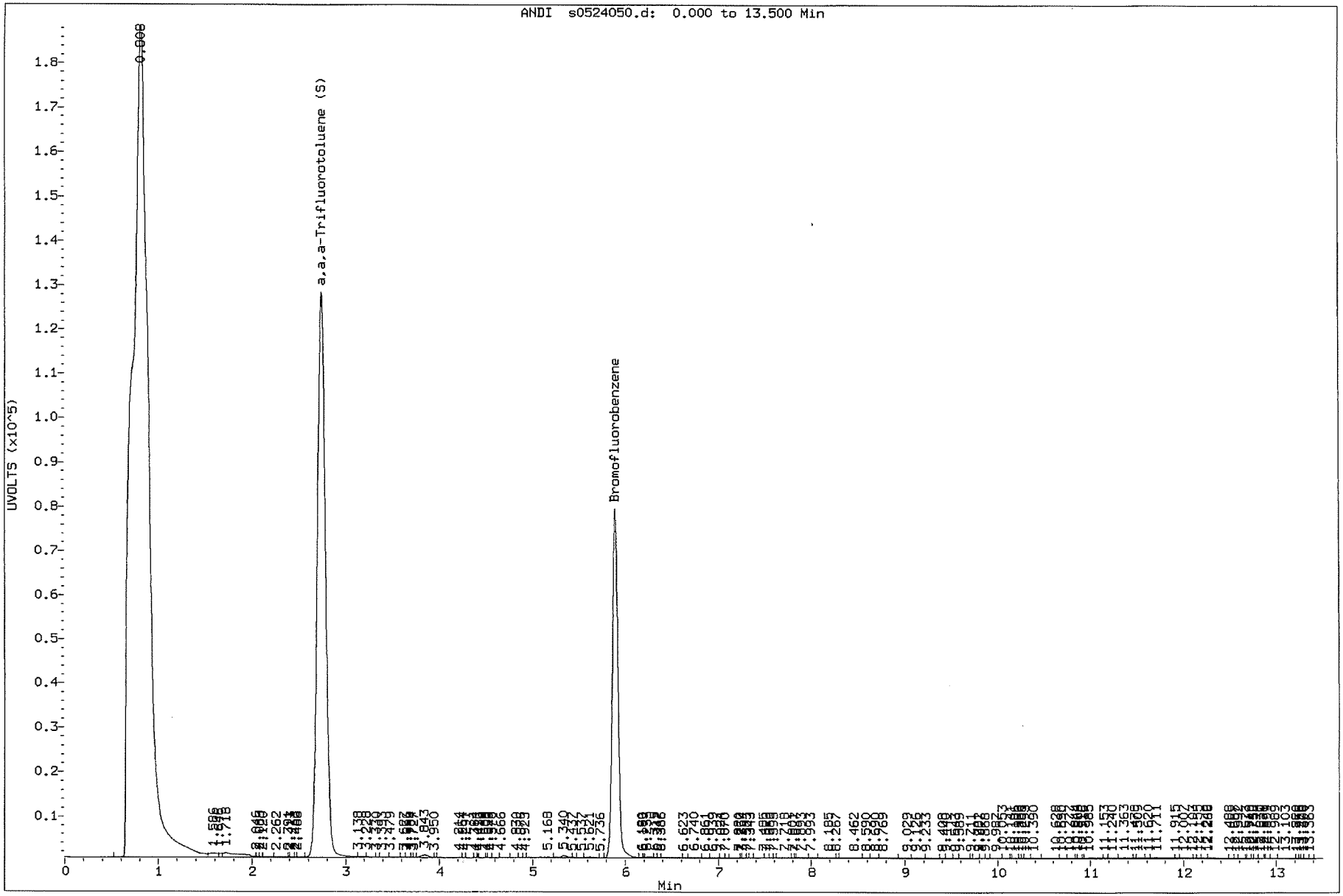

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