

ALAMEDA COUNTY
HEALTH CARE SERVICES



AGENCY
DAVID J. KEARS, Agency Director

RO#912

August 14, 1997
StID # 35

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

Mr. Albert Yuen
Yuen's Exxon Service
1901 Park Blvd.
Oakland CA 94606

Re: Yuen's Exxon Service, 1901 Park Blvd., Oakland CA 94606

Dear Mr. Yuen:

This letter is to notify you of the risk management requirements for the above site. Although the above site has been recommended for no further work in regards to the three former underground gasoline tanks and one waste oil tank, you are reminded that any subsurface work in the area of the former service island requires notification to this office and the implementation of an approved health and safety plan.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

c: B. Chan, files
Mr. L. Griffin, City of Oakland OES, 505 14th St., Suite
702, Oakland CA 94612

trlt1901

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



Ro# 912

RAFAT A. SHAHID, DIRECTOR

STID 35

February 5, 1996

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

DEPARTMENT OF ENVIRONMENTAL HEALTH
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6777

RE: 1901 PARK BLVD., OAKLAND, CA 94606

Dear Mr. and Mrs. Yuen,

This office recently completed a review of the case file for the above referenced Oakland site up to and including the Tank Protect Engineering (TPE) "Fourth Quarter Report" dated January 10, 1996. However, this letter is in reference to the TPE "Tank Closure Report" dated December 13, 1995.

The December 13, 1995 report documents the soil over-excavation activities for the removal of one 500-gallon waste oil tank. Laboratory analysis of the confirmatory soil samples collected from the waste oil pit, collected at a depth of five (5) feet below ground surface (bgs), detected elevated levels of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethyl benzene and xylenes (BTEX). In particular, concentrations of TPHg/benzene were detected in confirmatory soil samples S-2 and S-3 at concentrations of 9900/27000 ppb and 910000/4300. In addition, the semi-volatile organic compounds (SVOCs), 1,2-dichlorobenzene, naphthalene, 2-methylnaphthalene, phenanthrene, fluoranthene and pyrene were detected in stockpile soil sample SP-(1-2), at concentrations of 617 ppb, 522 ppb, 589 ppb, 921 ppb, 742 ppb and 583 ppb, respectively.

At this time please have the groundwater samples collected from monitoring wells MW-1, MW-2 and MW-3 analyzed for SVOC's using EPA Method 8270 parameters.

This site will be reevaluated after the review of the next quarterly sampling event's results to determine whether it qualifies as a "Low Risk Groundwater Case" as defined in the California Regional Water Quality Control Board "Interim Guidance on Required Cleanup at Low Risk Fuel Sites".

As documented in the "Interim Guidance on Required Cleanup at Low Risk Fuel Sites", the preferred management strategy for "Low Risk Groundwater Cases" is passive bioremediation with continued groundwater monitoring of the site to determine plume stability and the effectiveness of the remedial strategy.

Please be advised that future reports shall be submitted to this office no later than 45 days from the end of scheduled field activities.

Albert & Grace Yuen
RE: 1901 Park Blvd
February 5, 1996
Page 2 of 2

Please feel free to call me directly at 510/567-6880 should you have any questions.

Sincerely,



Dale Klettke, CHMM
Hazardous Materials Specialist

c: Thomas Peacock-LOP Manager--files
Lee Huckins, c/o Tank Protect Engineering, 2821 Whipple Road, Union City, CA 94587

Bx
0035svoc.dkt

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

DAVID J. KEARS, Agency Director



R0912

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs

March 7, 1995
STID 35

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

ALAMEDA COUNTY-ENV. HEALTH DEPT.
ENVIRONMENTAL PROTECTION DIV.
1131 HARBOR BAY PKWY., #250
ALAMEDA CA 94502-6577
(510)567-6700

RE: 1901 Park Blvd., Oakland, CA 94606

Dear Albert Yuen:

This office has received and reviewed a first quarter report dated February 10, 1995 by Tank Protect Engineering. The following are comments concerning this report:

1. It appears that contamination levels have dropped enormously from the 44,000ppb TPHd and 490ppb benzene that was found on 6/5/90. This is a good sign.
2. There still is benzene being found in MW-2, which is the down gradient well. The levels seem relatively low but are not stabilized. Continued monitoring must be done to verify the contamination on the site.

If you have any questions, please contact this office at 567-6782.

Sincerely,

Thomas Peacock, Supervising HMS
Hazardous Material Division

cc: Gordon Coleman, Acting Chief - files
John Mrakovich, Tank Protect Engineering, 2821 Whipple Rd.,
Union City, CA 94587-1233

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

DAVID J. KEARS, Agency Director



R0912

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program

December 23, 1994
STID 35

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

**Alameda County Environmental Health
Environmental Protection Division
1131 Harbor Bay Parkway, Rm. 250
Alameda, CA 94502-6577 CC:430-4510**

RE: 1901 Park Blvd., Oakland, CA 94606

Dear Albert Yuen:

This office has received and reviewed a fourth quarter report dated November 15, 1994 by Tank Protect Engineering. The following are comments concerning this report:

1. It appears that contamination levels have dropped enormously from the 44,000ppb TPHd and 490ppb benzene that was found on 6/5/90. This would be a good sign except for the great inconsistency of the apparent groundwater gradient. The gradient has varied by more than 180 degrees in the three monitoring events done so far.
2. It is extremely important to get the next quarters report to this office soon so that proper decisions can be made. It is very appropriate to fax results as soon as they are available so that we can discuss this matter. Our fax number is 337-9335.

This office concurs with the recommendations for continued ground water sampling on page 6 of the report.

If you have any questions, please contact this office at 567-6782. Note that our phone and location have changed.

Sincerely,

Thomas Peacock, Supervising HMS
Hazardous Material Division

cc: Edgar Howell, Chief - files
John Mrakovich, Tank Protect Engineering, 2821 Whipple Rd.,
Union City, CA 94587-1233

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

DAVID J. KEARS, Agency Director



R0912

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board

November 2, 1994
STID 35

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

Alameda County CC 4580
Health Care Services Agency
Dept. Of Environmental Health
1131 Harbor Bay Pkwy 2nd Flr.
Alameda, CA 94502-6577

RE: 1901 Park Blvd., Oakland, CA 94606

Dear Albert Yuen:

This office has received and reviewed a second quarter report dated 5/24/94 and a third quarter report dated August 11, 1994, both by tank protect engineering. The third quarter report resumes groundwater monitoring that was suspended in 1991. The following are comments concerning these reports:

1. It appears that contamination levels have dropped enormously from the 44,000ppb TPHd and 490ppb benzene that was found on 6/5/90. This would be a good sign except for the great inconsistency of the apparent groundwater gradient.
2. The gradient has varied by more than 180 degrees in the three monitoring events done so far. The last gradient is disturbing as it would leave the sight without a well downgradient from the former tank pit. An additional well would have to be installed to the south or southeast, in or across Park Blvd.
3. It is extremely important to get the next quarters report to this office soon so that proper decisions can be made. It is very appropriate to fax results as soon as they are available so that we can discuss this matter. Our fax number is 337-9335.

This office concurs with the recommendations on page 5 of the most recent report. If you have any questions, please contact this office at 567-6700. Note that our phone and location have changed.

Sincerely,

Thomas Peacock, Supervising HMS
Hazardous Material Division

cc: Edgar Howell, Chief - files
John Mrakovich, Tank Protect Engineering, 2821 Whipple Rd.,
Union City, CA 94587-1233

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

DAVID J. KEARS, Agency Director



R0912

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

March 21, 1994
STID 35

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

RE: 1901 Park Blvd., Oakland, CA 94606

SECOND NOTICE

Dear Albert Yuen:

This office has received and reviewed your letter dated December 12, 1992 where you say how your house and records were destroyed in the October 20, 1991 firestorm. You were asked to update this office as to your site's current status in a letter dated September 24, 1993. To date you have not responded. Please update this office with your current situation within 30 days. You said you could obtain records of soil disposal, but this office has not received any correspondence from you. Please submit these records.

This office acknowledges your request to have until April of 1994 to proceed with monitoring and cleanup of your site. We can not, however, ignore the fact that you are not continuing with investigation of the site at this time. That time is coming very soon.

If you have any questions, please contact this office.

Sincerely,

Thomas Peacock, Supervising HMS
Hazardous Material Division

cc: Edgar Howell, Chief - files
Gil Jensen, Alameda County District Attorney's Office

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

DAVID J. KEARS, Agency Director



R0912

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

September 24, 1993
STID 35

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

RE: 1901 Park Blvd., Oakland, CA 94606

Dear Albert Yuen:

This office has received and reviewed your letter dated December 12, 1992 where you say how your house and records were destroyed in the October 20, 1991 firestorm. Please update this office with your current situation within 30 days. You said you could obtain records of soil disposal, but this office has not received any correspondence from you. Please submit these records.

This office acknowledges your request to have until April of 1994 to proceed with monitoring and cleanup of your site. We can not, however, ignore the fact that you are not continuing with investigation of the site at this time.

If you have any questions, please contact this office.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Thomas Peacock'.

Thomas Peacock, Supervising HMS
Hazardous Material Division

cc: Edgar Howell, Chief - files

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

DAVID J. KEARS, Agency Director



R0912

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

November 18, 1992
STID 35

Albert & Grace Yuen
1901 Park Blvd.
Oakland, CA 94606

RE: 1901 Park Blvd., Oakland, CA 94606

Dear Albert Yuen:

This office has received and reviewed the Site Assessment Report by Tank Protect Engineering dated July 3, 1990 and their workplan dated April 26, 1990 concerning the above site. The following comments are to be considered:

1. There is no documentation since then of what has happened to 20 tons of contaminated soil with levels of TPH greater than 1,000 ppm. Please submit manifests of disposal for this material or a report of its proper removal.
2. Although high levels of TPHg and Benzene were found in the 3 groundwater monitoring wells during initial sampling in 1990, no additional reports have been received by this office. You are directed to begin a quarterly groundwater monitoring program within 30 days. Also, please submit a report with some recommendations for further work you propose.

Enclosed is a format the Regional Board would like followed for site closure. If you have any questions, please contact this office at (510) 271-4530.

Sincerely,

Thomas Peacock, Supervising HMS
Hazardous Material Division

cc: Richard Hiatt, RWQCB
Edgar Howell, Chief - files
Enclosure

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director



R0912

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

September 5, 1991

Albert Yuen
1901 Park Blvd.
Oakland, CA 94606

RE: Five Year Permit to Operate One Underground Storage Tank at
1901 Park Blvd. Oakland, 94606

Dear Mr. Yuen:

Please find enclosed a five year permit to operate one underground storage tank at the above facility. For this permit to be valid, you are required to comply with conditions as described in the California Code of Regulations, Title 23, Subchapter 16, Section 2712. These conditions are summarized below:

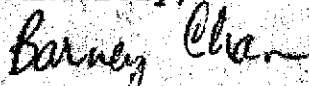
1. The permittee shall report to this office within 30 days any changes in the uses of any underground storage tank. These changes include:
 - A. Storage of any new hazardous substances.
 - B. Changes in monitoring procedures.
 - C. Replacement or repair of any part of underground storage tanks or pipes.
2. The permittee shall report to this office any unauthorized releases as described in Sections 2652 (b) and (c).
3. Written records of all monitoring performed shall be maintained on-site for a period of at least three years from the date the monitoring was performed. These records shall be made available for inspection during any site inspection by a representative of this office.

Mr. Albert Yuen
September 5, 1991
Page 2 of 2

4. Permits may be transferred to new underground storage tank owners if the new tank owner does not change any conditions of the permit, the transfer is registered with this office within 30 days of the change in ownership, and any necessary modifications are made to the permit application information. This office may review, modify, or terminate the permit to operate the underground storage tank upon receiving the ownership transfer request.
5. Waste Oil tank gauging must be performed at least once per seven days, but must occur after periods of non-use of at least 48 hours. Records of gauging must be maintained. The form you provided to this office is an acceptable reporting format.

Feel free to contact either Cathy Gates or myself with any questions about your underground tanks at 271-4320.

Sincerely,



Barney Chan
Hazardous Materials Specialist

cc: Files

BC:CG:cg mem38
enclosure

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY

DAVID J. KEARS, Agency Director



R0912

Certified Mailer #: P 062 127 839

March 20, 1990

Mr. Albert Yuen
c/o Yuen's Automotive
1901 Park Boulevard
Oakland, California 94606

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

Subject: Subsurface Investigation of the Underground Storage Tank
Leak at 1901 Park Boulevard in Oakland, California

Dear Mr. Yuen:

We have reviewed the following documents pertaining to the removal
of three underground storage tanks from 1901 Park Boulevard on
December 8 and 13, 1989.

Report on Underground Tank Removal Activities, Yuen's Exxon,
1901 Park Boulevard, Oakland, California, January 1990, Tank
Protect Engineering

Letter to Katherine Chesick, Alameda County Hazardous Materials
Division (documenting the proposed method of contaminated soil
remediation at 1901 Park Boulevard), February 26, 1990, Tank
Protect Engineering

Letter to Katherine Chesick, Alameda County Hazardous Materials
Division (explains the separation of soil contaminated with
less than 1,000 ppm TPH from soil contaminated with greater
than 1,000 ppm TPH for purposes of soil handling), March 7,
1990, Tank Protect Engineering

The on-site stockpiled soil remediation method proposed in the
February 26, and the March 7, 1990, letters (adding a hydrogen
peroxide mixture to contaminated soil) is acceptable to us and may
be carried out. We understand the proposed on-site soil
remediation will be performed only on soils contaminated with less
than 1,000 ppm TPH; soil containing 1,000 ppm or greater TPH will
be hauled to an appropriate dump site. Sampling, treatment, and
disposal documentation must be submitted for all soil excavated
at the site - regardless of soil contaminant levels. Confirmation
sampling of the stockpiled soils remediated on site must be
adequate to characterize contamination.

Your soil treatment/aeration proposal must meet the requirements of
the Bay Area Air Quality Management District.

Page 2 of 6
Mr. Albert Yuen
Yuen's Automotive
March 20, 1990

Please note that any on-site treatment of soil contaminated with greater than 1,000 ppm TPH must be permitted through the State Department of Health Services (DHS).

Because the soil samples collected at the time of tank removal contain up to 1.6 % TPH as gasoline, and because a sheen and brown foamy material were noted on the ground water in the tank pit, a subsurface investigation must be performed to assess soil and ground water contamination.

To assess site contamination, we require that you submit a work plan which, at a minimum, addresses the items listed below and presents a timetable for their completion. Please submit this work plan within 45 days of the date of this letter.

Our office will be the lead agency overseeing the investigation of this site. The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) is currently unable to oversee the large number of underground tank cases within Alameda County and has delegated the handling of this case to our Division. We will be in contact with the SFRWQCB in order to provide you with guidance concerning the SFRWQCB's investigation requirements. However, please be aware that you are responsible for diligent actions to protect the waters of the State.

All work must be performed according to the following SFRWQCB documents:

- * Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, 2 June 1988, revised 9 November, 1989 (2 June 1988 SFRWQCB document); and
- * Appendix A for above, 1 July 1988, revised 3 April 1989.

Copies of these documents can be obtained by calling the SFRWQCB data management group at 464-1269. Please note the LUFT manual as a whole has not been adopted by the SFRWQCB.

Items to Address:

1. Site Description.

This shall incorporate the following information:

- A. A map which shows streets, site buildings, underground tank locations, tank islands and pipings, subsurface

Page 3 of 6
Mr. Albert Yuen
Yuen's Automotive
March 20, 1990

conduits and utilities, on-site and nearby wells, and nearby streams or water bodies.

- B. A description of the hydrogeologic setting of the site and surrounding area. Include a description of any subsurface work previously done at the site or on adjacent sites.

2. Determination of the vertical and lateral extent of soil contamination.

This shall describe the method(s) by which the contaminated soil extent has been and will be determined.

- A. If soil samples are to be collected for contamination delineation, consult the SFRWQCB guidelines and the LUFT manual for soil sampling protocols. During drilling of all boreholes and monitoring wells, undisturbed soil samples are to be collected at a minimum of every five feet in the unsaturated zone and at any changes in lithology for logging and analytical purposes. Borings and wells are to be permitted through Alameda County Flood Control and Water Conservation District, Zone 7. Borings and wells shall be logged from undisturbed soil samples. Logs shall include observed soil odors; blow counts shall be expressed in blows per 6 inches of drive.
- B. Soil samples must be analyzed by a California State Certified Laboratory for the appropriate constituents (see Attachment 1, Table 2, 2 June 1988 SFRWQCB document).

3. Determination of Ground Water Quality.

Because evidence of free product was noted on the ground water within the excavation and because soil contamination exceeded 100 ppm TPH, water quality must be characterized.

- A. A minimum of three monitoring wells must be installed to determine the ground water gradient. One monitoring well must be installed within 10 feet of the tank in the down-gradient direction. If the verified down-gradient location has been established, then complete gradient data must be submitted and only one monitoring well must be installed; this well must be within 10 feet of the tank in the down-gradient direction.
- B. Monitoring wells shall be designed and constructed to be consistent with the SFRWQCB guidelines and to permit entrance of any free product into the wells. Filter pack

Page 4 of 6
Mr. Albert Yuen
Yuen's Automotive
March 20, 1990

and slot sizes for all wells should be based on particle analysis (ASTM D-422) from each stratigraphic unit in at least one boring on the site and on the types of ground water contaminants present. The well screen must be situated to intercept any floating product from both the highest and lowest ground water levels. All wells shall be surveyed to mean sea level to an established benchmark to 0.01 foot.

- C. Monitoring wells must be sampled. Water level and free product thickness measurements shall be made in all wells before sampling is begun. Measurement of free product must be done by an optical probe or other method having equal accuracy.
- D. Ground water samples are to be analyzed by a California State Certified Laboratory for the appropriate constituents (see Attachment 1).

4. Site Safety Plan.

5. Interpretation of hydrogeologic data.

Water level contour maps showing ground water gradient direction, and free and dissolved product plume definition maps of each contaminant constituent should be prepared and submitted with other sampling results in a technical report.

6. Reporting.

- A. A technical report must be submitted by June 20, 1990 which presents and interprets the information generated during the initial subsurface site investigation. At a minimum, the report must include the following items:
- * boring and well construction logs;
 - * records of field observations and data;
 - * chain-of-custody forms;
 - * tabulations of soil and ground water contaminant concentrations;
 - * status of soil contamination characterization;
 - * water level data;
 - * water level contour map showing ground water gradient direction;
 - * contaminant plume maps;
 - * description of any remedial work/soil treatment performed;

Page 5 of 6
Mr. Albert Yuen
Yuen's Automotive
March 20, 1990

- * laboratory-originated analytical results for all soil (including stockpiled soil) and ground water samples collected;
 - * laboratory-originated analytical results for soil samples collected beneath tank piping runs (one sample was to be collected for every 20 feet of piping at the time of tank removal);
 - * copies of TSDF to Generator manifests for any hazardous waste hauled off site;
 - * documentation of disposal of non-hazardous/treated soil; and
 - * any recommendations for additional investigative or remedial work.
- B. All reports and proposals must be signed by a California-Certified Engineering Geologist, California-Registered Geologist or a California-Registered Civil Engineer (see page 2, 2 June 1988 SFRWQCB document). A statement of qualifications for each lead professional should be included in all workplans and reports.
- C. The technical report should be submitted with a cover letter from Yuen's Automotive and received in this office by the established due date. The letter must be signed by a principal executive officer or by an authorized representative of that person.

All proposals, reports and analytical results pertaining to this investigation and remediation must be sent to our office and to:

Lester Feldman
Regional Water Quality Control Board, San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, California 94612
(415) 464-1255

You should be aware that this Division is working in conjunction with the SFRWQCB and that this is a formal request for technical reports pursuant to California Water Code Section 13267 (b). Any extensions of agreed-upon time deadlines must be confirmed in writing by either this Division or the SFRWQCB.

To cover our costs for remediation review, please submit a check, payable to Alameda County, for \$500.

Should you have any questions concerning this letter, please

Page 6 of 6
Mr. Albert Yuen
Yuen's Automotive
March 20, 1990

contact me at (415) 271-4320.

Sincerely,



Katherine A. Chesick,
Senior Hazardous Materials Specialist

attachment

cc: Marc Zomorodi, Tank Protect Engineering
Lester Feldman, Regional Water Quality Control Board,
San Francisco Bay Region
Howard Hatayama, State Department of Health Services
Bay Area Air Quality Management District
Gil Jensen, Alameda County District Attorney, Consumer and
Environmental Protection Division
Rafat A. Shahid, Director, Alameda County Environmental Health
Department
Files

TABLE #2
REVISED 6 OCTOBER 1988

RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR
UNDERGROUND TANK LEAKS

<u>HYDROCARBON LEAK</u>	<u>SOIL ANALYSIS</u>		<u>WATER ANALYSIS</u>	
<u>Unknown Fuel</u>	TPH G TPH D BTX&E	GCFID(5030) GCFID(3550) 8020 or 8240	TPH G TPH D BTX&E	GCFID(5030) GCFID(3510) 602 or 624
<u>Leaded Gas</u>	TPH G BTX&E ---Optional--- TEL EDB	GCFID(5030) 8020 or 8240 DHS-LUFT DHS-AB1803	TPH G BTX&E TEL EDB	GCFID(5030) 602 or 624 DHS-LUFT DHS-AB1803
<u>Unleaded Gas</u>	TPH G BTX&E	GCFID(5030) 8020 or 8240	TPH G BTX&E	GCFID(5030) 602 or 624
<u>Diesel</u>	TPH D BTX&E	GCFID(3550) 8020 or 8240	TPH D BTX&E	GCFID(3510) 602 or 624
<u>Jet Fuel</u>	TPH D BTX&E	GCFID(3550) 8020 or 8240	TPH D BTX&E	GCFID(3510) 602 or 624
<u>Kerosene</u>	TPH D BTX&E	GCFID(3550) 8020 or 8240	TPH D BTX&E	GCFID(3510) 602 or 624
<u>Fuel Oil</u>	TPH D BTX&E	GCFID (3550) 8020 or 8240	TPH D BTX&E	GCFID(3510) 602 or 624
<u>Chlorinated Solvents</u>	CL HC BTX&E	8010 or 8240 8020 or 8240	CL HC BTX&E	601 or 624 602 or 624
<u>Non Chlorinated Solvents</u>	TPH D BTX&E	GCFID(3550) 8020 or 8240	TPH D BTX&E	GCFID(3510) 602 or 624
<u>Waste Oil or Unknown</u>	TPH G TPH D O & G BTX&E CL HC	GCFID(5030) GCFID(3550) 503D&E 8020 or 8240 8010 or 8240	TPH G TPH D O & G BTX&E CL HC	GCFID(5030) GCFID(3510) 503A&E 602 or 624 601 or 624

---If any of the above detected, include:---

ICAP or AA TO DETECT METALS: Cd, Cr, Pb, Zn
METHOD 8270 FOR SOIL OR WATER TO DETECT:
PCB
PCP
PNA
CREOSOTE
PCB
PCP
PNA
CREOSOTE

EXPLANATION FOR TABLE #2: MINIMUM VERIFICATION ANALYSIS

1. OTHER METHODOLOGIES are continually being developed (such as cryogenic focusing), and as they are accepted by EPA or DHS, they also can be used. GCMS using Focused Cryogenic procedures may be substituted for BTX&E,TPH or chlorinated hydrocarbon analyses.
2. For DRINKING WATER SOURCES, EPA recommends that the 500 series for volatile organics be used in preference to the 600 series because the detection limits are lower and the QA/QC is better.
3. APPROPRIATE STANDARDS for the material stored in the tank are to be used for all analyses on Table #2. For instance, seasonally, there may be five different jet fuel mixtures to be considered.
4. TO AVOID FALSE POSITIVE detection of benzene, benzene-free solvents are to be used.
5. PRACTICAL QUANTITATION/REPORTING LIMITS are matrix dependent. Those listed are provided for guidance and should be achievable in most instances. Practical quantitation reporting limits for the above soil and water analyses should be as follows:

	<u>SOIL.PPM</u>	<u>WATER.PPB</u>
TPH G	1.0	50.0
TPH D	1.0	50.0
BTX&E	0.005	0.5
O & G	50.0	5,000.0

When not achievable, sufficient justification should be submitted.

6. TOTAL PETROLEUM HYDROCARBONS (TPH) as gasoline (G) and diesel (D) ranges (volatile and extractible, respectively) are to be analyzed and characterized by GCFID with a fused capillary column and prepared by EPA method 5030 (purge and trap) for volatile hydrocarbons, or extracted by sonication using 3550 methodology for extractible hydrocarbons. Fused capillary columns are preferred to packed columns; a packed column may be used as a "first cut" with "dirty" samples or once the hydrocarbons have been characterized and proper QA/QC is followed.
7. TETRAETHYLLEAD (TEL) may be analyzed as total lead. However, a confirming analysis must be completed using a soil sample at the same soil depth in another borehole, or for water, from an upgradient well that is not contaminated with hydrocarbons.
8. CHLORINATED HYDROCARBONS (CL HC) and BENZENE, TOLUENE, XYLENE AND ETHYLBENZENE (BTX&E) are analyzed in soil by EPA methods 8010 and 8020, respectively, (or 8240) and for water 601 and 602, respectively, (or 624).
9. OIL AND GREASE (O & G) may be used when heavy, straight chain hydrocarbons may be present. Infrared analysis by method 418.1 may also be acceptable for O & G if proper standards are used.