TNRCC

Protecting Texas
by Reducing and
Preventing Pollution

Expanded Site Inspection Work Plan

for

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341
Port Neches, Jefferson County, Texas

Prepared in cooperation with the
U.S. Environmental Protection Agency

February 1998

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EXPANDED SITE INSPECTION WORK PLAN

Star Lake Canal, a.k.a. Jefferson Canal

Port Neches, Texas

TX0001414341

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Expanded Site Inspection Work Plan

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Port Neches, Texas
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Prepared in cooperation with the

Texas Natural Resource Conservation Commission
and
U.S. Environmental Protection Agency

Prepared by

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February 1998

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NOTE

The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), and Texas Air Control Board (TACB), referred to throughout this report are now known as the Texas Natural Resource Conservation Commission (TNRCC). The new agency, TNRCC, became effective September 1, 1993, as mandated under State Senate Bill 2 of the 73rd Regular Legislative Session.

SECTION 1

INTRODUCTION

The Texas Natural Resource Conservation Commission (TNRCC) has been requested by the U.S. Environmental Protection Agency (EPA) Region VI to conduct an Expanded Site Inspection (ESI) at the Star Lake Canal (SLC), a.k.a Jefferson Canal, site (EPA Identification Number TX0001414341).

The Star Lake Canal (SLC) confluences with Molasses Bayou as it empties into the Neches River. The canal is approximately 2 miles long. Land surrounding the canal is undeveloped, residential and industrial. The canal begins at 29° 58' 28" N Latitude and 93° 56' 32" W Longitude and empties into the Neches River at 29° 58' 57" N Latitude and 93° 53' 38" W Longitude. The Jefferson Canal confluences with the SLC between State Highway 366 and Sara Jane Road. SLC then drains directly to TNRCC Water Quality Segment Number 0601 of the Neches River in the Neches River Basin (Reference 3, page 3).

The purpose of this work plan is to describe the site reconnaissance and sampling activities which are planned at the site to determine if further action is required as described below.

WORK PLAN OVERVIEW

The purpose of the ESI is to further investigate and document the release(s) or potential release(s) of hazardous substances from the Jefferson Canal which may have migrated off-site. This work plan was developed using information obtained during a PA conducted on July 23, 1997 for the EPA, the Screening Site Inspection Report for Star Lake Canal (Reference 3) and available information obtained through a review of TNRCC central files located in Austin, Texas. Information presented in the SSI report was evaluated for data gaps and additional information needs were incorporated into this work plan. This plan will be modified as necessary based on actual site conditions encountered.

Section 1 is the introduction. Section 2 is the site background and description, and Section 3 describes the site field work to be conducted. The TNRCC file information used in preparing this workplan, ESI site specific Health & Safety Plan, TNRCC FY98 Quality Assurance/Quality Control (QA/QC) Requirements document, and the Site Reconnaissance Checklist are presented as Appendices A through D, respectively.

SITE OBJECTIVE WITH RESPECT TO THE PREREMEDIAL PROCESS

The preremedial stage of the Superfund process involves a PA and a site inspection (SI) stage consisting of an SSI and, if necessary, a listing site inspection (LSI). This SSI is being conducted to determine if the above-referenced site is eligible for proposal to the National Priorities List (NPL) under the Federal Superfund Program. The SSI will

focus on assessing the threat along the surface water pathway associated with the site.

A PA and SSI have already been completed for the site. This ESI will build upon existing data by obtaining additional background information relevant to the site through a file review and collecting environmental samples to further characterize conditions at the site. Sampling conducted during the field work will attempt to document hazardous substance migration from the site from potential sources (contaminated canal sediments), and look for evidence of actual human and environmental exposure to those hazardous substances.

PROJECT CONTACTS PHONE

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SECTION 2

SITE BACKGROUND AND DESCRIPTION

SITE INFORMATION

A PA was performed on July 23, 1996 for the Star Lake Canal (SLC) in which the surface water pathway was identified as the primary pathway of concern. An SSI was performed in October, 1996 and an SSI report was prepared in September, 1997. The ESI site project was assigned to the TNRCC on January 6, 1998 (Reference 5).

The SLC confluences with Molasses Bayou as it empties into the Neches River. The canal is approximately 2 miles long. Land surrounding the canal is undeveloped, residential and industrial. The canal begins at 29° 58' 28" N Latitude and 93° 56' 32" W Longitude and empties into the Neches River at 29° 58' 57" N Latitude and 93° 53' 38" W Longitude. The Jefferson Canal confluences with the SLC between State Highway 366 and Sara Jane Road. SLC then drains directly to Stream Segment Number 0601 of the Neches River in the Neches River Basin (Reference 6, page 3). See Figure 1 for the geographic location of the site.

A sampling inspection by the Texas Department of Water Resources (TDWR) in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal (Reference 7). This canal was used by Chemall, Inc. (now Calabrian Chemicals) and Texaco Chemical Company (now Huntsman Corporation) as an outfall for storm water and wastewater for an unknown period of time. The Jefferson Canal confluences with SLC between State Highway 366 and Sara Jane Road, a.k.a. East Port Neches Avenue (see Figure 1).

The pathway of concern for this site is the surface water pathway. The ground water migration, air migration and soil exposure pathways will not be evaluated during this ESI.

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FIGURE 1: Site Location Map

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341

Port Neches, Jefferson County, Texas

WASTE CONTAINMENT/HAZARDOUS SUBSTANCE IDENTIFICATION

Characteristics

The information used to identify the waste characteristics which may be present in the SLC was obtained from a review of state records. The Jefferson Canal was documented to have sediments in which hazardous substances had been deposited, stored, disposed, or placed. Results from the TDWR March, 1983 sampling event show the following hazardous substances in material dredged from the Jefferson Canal: Naphthalene (9280 mg/kg), acenaphthene (330 mg/kg), acenaphthylene (2140 mg/kg), fluorene (1140 mg/kg), phenanthrene (2050 mg/kg), anthracene (300 mg/kg), pyrene (535 mg/kg), benzo-a-anthracene (160 mg/kg), benzo-b-fluoranthene (15 mg/kg), benzo-a-pyrene (60 mg/kg), benzo-a-fluoranthene (15 mg/kg), chrysene (150 mg/kg), and other aromatic hydrocarbons that could not be identified by GC/MS. Property owned by Chemall, Inc. was also documented to be contaminated by toxaphene and pentachlorophenol in the vicinity of the Jefferson Canal (Reference 7).

Hazardous substances were documented in sediments of the Jefferson Canal during the October, 1996 SSI. The following tables provide values for highest background and observed contamination samples in the Jefferson Canal (Reference 6, pages 5-6):

Table 1: Inorganic Hazardous Substances in Jefferson Canal (mg/kg)

Highest Background and Observed Contamination for Jefferson Canal Sediment Samples							
CLP Traffic Report No./ Sample Location No.	% Solid	Hazardous Substance (mg/Kg)					
		Arsenic	Barium	Manganese	Mercury	Thallium	Cyanide
Background MFGP55/SE-01	42.2	3.9	61.8	98.6	0.17	0.81J↓	0.59U
Background MFGP56/SE-02	73.5	0.75	9.8	18.0	0.07U	0.27U	0.34U
Background MFGP57/SE-03	65.3	3.8	60.0	136	0.07U	0.65UJ	0.38U
Jefferson Canal MFGP40/SE-16	43.9	3.1	163	308	0.23	3.3	1.5
Jefferson Canal MFGP61/SE-19	45.0	1.9	179	181	0.76	2.1	0.55
CRDL mg/Kg		2	40	3	0.1	2	5

Notes:
J = The value is an estimated concentration because one or more quality control criteria have not been met.
U = Analyte concentration is undetected at the sample quantitation limit.
J↓ = The value is estimated and biased low.
Shaded values for background represent the highest and were used to calculate releases.
Shaded values for source samples represent hazardous substances attributable to the site.

Table 2: Organic Hazardous Substances in Jefferson Canal (μg/kg)

Highest Background and Observed Contamination for Jefferson Canal Sediment Samples						
Organics μg/Kg	FEY92 Background [SQL] SE-01	FEY93 Background SE-02	FEY94 Background SE-03	FEY77 Source [SQL] SE-16	FEZ01 Source [SQL] SE-19	CRQL μg/Kg
Naphthalene	780 U	580U	480U	4600J [9000]	6700 [2900]	330
2-Methylnaphthalene	780 U	580U	480U	7200J [9000]	8000 [2900]	330
Acenaphthylene	780 U	580U	480U	12000 [9000]	7300 [2900]	330
Acenaphthene	780 U	580U	480U	14000 [9000]	8800 [2900]	330
Fluorene	780 U	580U	480U	18000 [9000]	9200 [2900]	330
Phenanthrene	780 U	580U	480U	55000 [9000]	21000 [2900]	330
Anthracene	780 U	580U	480U	11000 [9000]	5000 [2900]	330
Fluoranthene	37 J [780]	61	480U	12000 [9000]	8500 [2900]	330
Pyrene	60 J [780]	170	480U	22000 [9000]	11000 [2900]	330
Benzo(b)fluoranthene	780 U	130	480U	2700J [9000]	4200 J↑ [2900]	330
Benzo(k)fluoranthene	780 U	140	480U	3000J [9000]	4700 J↑ [2900]	330
Aroclor - 1254	78 U		480U	130 J [92]	73U	33
% Moisture	58			64	55	

Notes:

1) CRQL listed in the table are for low concentration soils.
U = Analyte concentration undetected at the reported sample quantitation limit.
[SQL] = Sample quantitation limit provided within the brackets.
J = The value is an estimated concentration because one or more quality control criteria have not been met.
J↑ = The value is estimated and biased high.

Required Information (Data Gaps)

- Lateral extent of the contaminated sediments in the Jefferson Canal.
- Obtain background sediment samples to determine the naturally occurring levels of contaminants from unaffected areas adjacent to the site.

SURFACE WATER PATHWAY AND TARGETS

Characteristics

The Jefferson Canal drains directly to the SLC, Both canals are located within the Neches River Basin, draining directly to TNRCC Water Quality Segment Number 0601. One 15 mile target distance limit (TDL) exists for this site and will be defined in the Targets section.

The Neches River Basin drains approximately 1,145 miles^2 with an average total discharge of 1,200 cubic feet per second. It is designated for contact recreation and intermediate quality aquatic habitat. Currently, this segment has 5 on-segment monitoring stations and 1 off-segment monitoring station (Reference 8).

Natural drainage in the study area is shown in Figure 1. SLC begins near the intersection of State Highways 366 and 136 and flows in a southeasterly direction for approximately 1 mile before turning in a northeasterly direction as it flows approximately 1 mile to the Neches River. The Jefferson Canal flows in a northerly direction and confluences with SLC where it turns to the northeast.

The Probable Point of Entry (PPE) for source sediments to surface water lie within the Jefferson Canal at its upper reach, where the flow becomes perennial (see Figure 1). Wetlands exist adjacent to the source area and downstream of the PPE, along both forks of the hazardous substance migration route. The Neches River downstream of SLC is a documented fishery. No drinking water intakes are located along the 15 mile target distance limit (TDL).

Annual average precipitation for this region is 51 inches per year (Reference 9).

The Jefferson Canal is in the 100-year floodplain.

TNRCC files note that wastewater has been discharged to the Jefferson Canal in violation of the Texas Water Code (Reference 7).

Targets

There is no overland migration route associated with this site. The PPE begins at the uppermost reach of the Jefferson Canal (see Figure 1) where the flow becomes perennial. The Jefferson Canal flows in a northern direction to its confluence with the SLC (see Figure 1).

Five (5) HRS In-Water Segments exist for this site and are discussed below.

HRS In-Water Segment 1(approximately 0.15 miles) is defined as the in-water distance from the PPE to the confluence of the Jefferson Canal to the SLC. No surface water

use permits exist within this in-water segment. No drinking water intakes exist within the Jefferson Canal. This segment is not used as a fishery. No flow rate data is available for the Jefferson Canal. A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the Jefferson Canal (Reference 10). It is unknown if this in-water segment is used as a resource. See Figure 2 for the location of this in-water segment.

HRS In-Water Segment 2 (approximately 0.45 miles) is defined as the in-water distance from the confluence of the Jefferson Canal with the SLC to the farthest downstream sample of observed contamination (previously determined during the October, 1996 SSI. See Figure 2 for the location of this sample). No surface water use permits exist within this in-water segment. No drinking water intakes exist within the SLC. It is unknown if this segment is used as a fishery. No flow rate data is available for the Star Lake Canal. HRS qualifying wetland areas exist along both sides of both branches of this in-water segment (Reference 11). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 10). See Figure 2 for the location of this in-water segment.

HRS In-Water Segment 3 (approximately 1.02 miles) is defined as the in-water distance from the farthest downstream sample of observed contamination along Star Lake Canal to its confluence with the Neches River. No surface water use permits exist within this in-water segment. No drinking water intakes exist within the SLC. It is unknown if this segment is used as a fishery. No flow rate data is available for the Star Lake Canal. HRS qualifying wetland areas exist along both sides of both branches of this in-water segment (Reference 11). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 10). See Figure 2 for the location of this in-water segment.

HRS In-Water Segment 4 (approximately 3.04 miles) is defined as the in-water distance along the Neches River (from its point of confluence with Star Lake Canal) to Sabine Lake (see Figure 4). One surface water use permit exists along this in-water segment for industrial purposes. No drinking water intakes exist along this in-water segment. Average discharge in this in-water segment is 1,200 cubic feet per second (Reference 5). This in-water segment is documented as a fishery. HRS qualifying wetland areas exist along this in-water segment (Reference 11). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 10). This in-water segment is used as a resource by sport fishermen (Reference 12) and is designated for contact recreation (Reference 8). See Figure 3 for the location of this in-water segment.

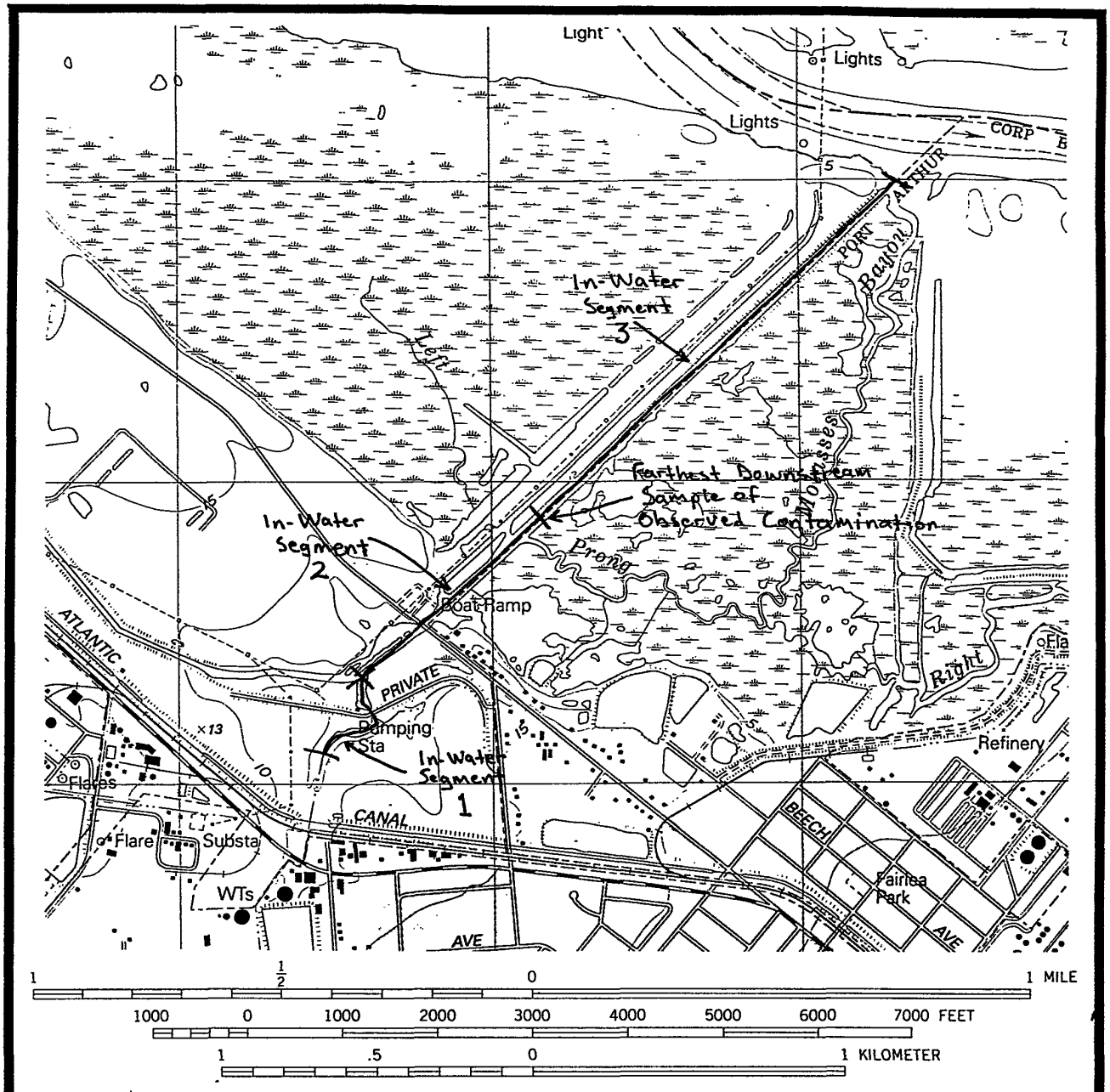

FIGURE 2: HRS In-Water Segments 1 , 2 and 3

Star Lake Canal, a.k.a. Jefferson Canal
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Port Neches, Jefferson County, Texas

HRS In-Water Segment 5 (10.34 miles) is defined as the in-water segment in Sabine Lake to the 15 mile TDL. No surface water use permits exist along this in-water segment. No public drinking water intakes exist along this in-water segment. No flow rate data is available for this in-water segment as it is a coastal tidal water. This in-water segment is designated as a fishery (Reference 12). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 10). This in-water segment has resource uses for contact recreation, high quality aquatic habitat and shellfish waters (Reference 8). See Figure 3 for the location of this in-water segment.

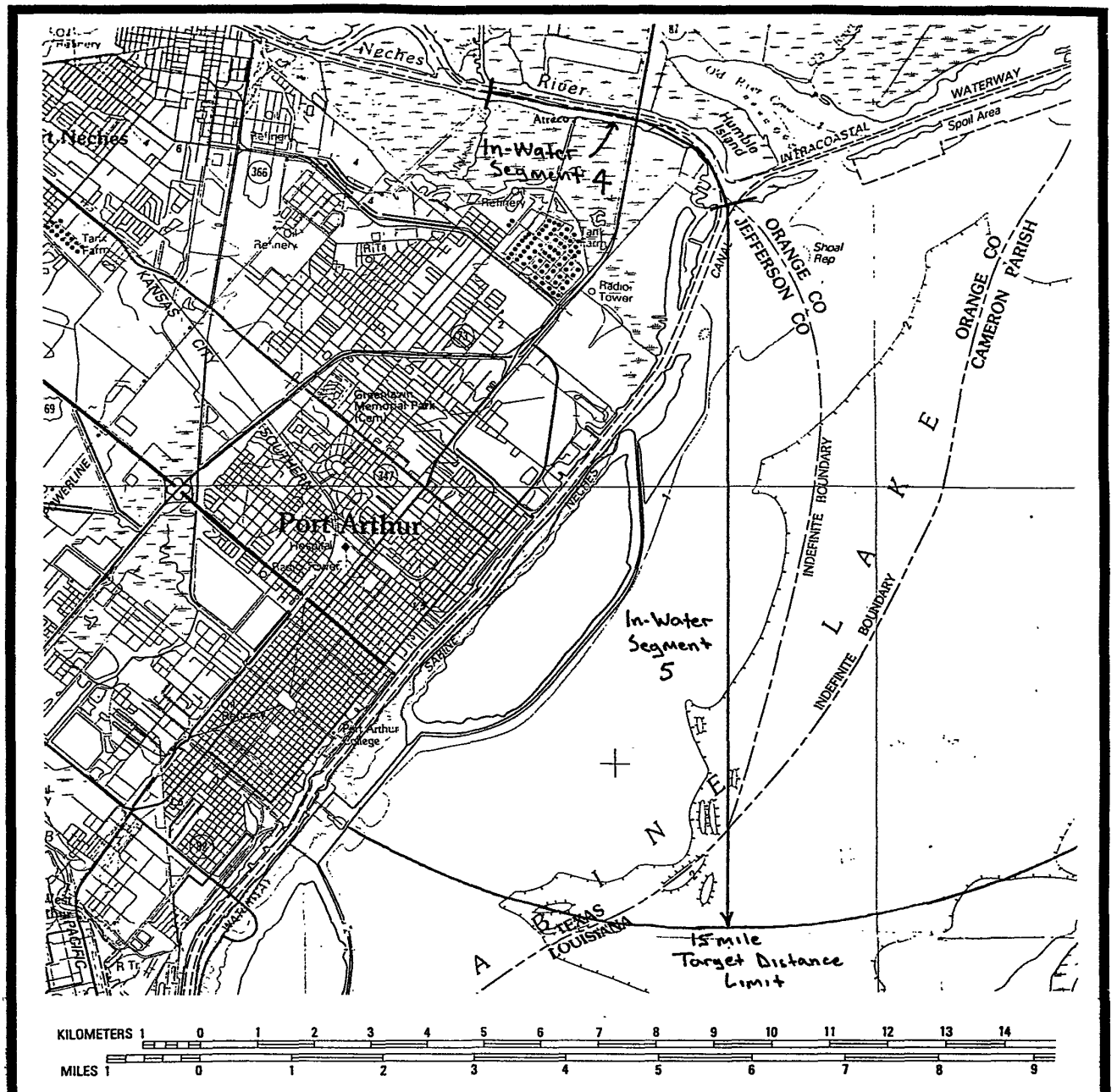


FIGURE 3: HRS In-Water Segments 4 and 5

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341

Port Neches, Jefferson County, Texas

Required Information (Data Gaps)

- Verify the direction and rate of surface water flow in the canals.
- Field verification to determine the location of drainage channels and drainage patterns in relation to the possible contaminant sources.
- Field verification of surrounding perennial water bodies and their uses.
- Field verification that HRS In-Water segments 2 and 3 are used as fisheries.
- Establish the presence of wetlands, sensitive environments and endangered species within a 4 mile radius of the site by correspondence with Texas Department of Parks and Wildlife.

SECTION 3

SITE NONSAMPLING DATA COLLECTION AND FIELD WORK

The Texas Natural Resource Conservation Commission (TNRCC) will perform the activities described in this section to provide site background information and analytical data that can be used by the EPA to evaluate the site using the Hazard Ranking System (HRS). This information will be presented in a documentation report that includes sediment sampling as discussed below.

All field work will be conducted in accordance with the health and safety plan (HSP) and the TNRCC-approved quality assurance project plan (QAPP). The HSP and QAPP are in Appendixes B and C, respectively. These plans will be reviewed by all personnel upon arrival at the site.

PERSONNEL REQUIREMENTS AND RESPONSIBILITIES

The TNRCC Central Office Technical Director for this screening site inspection (SSI) is Mr. Wesley Newberry and the TNRCC Program Manager is Mr. Allan Seils. The TNRCC Site Investigation Manager is Mr. Marshall A. Cedilote. Other team members will be identified prior to the sampling event. The TNRCC's Central Office mailing address is Pollution Cleanup Division, Emergency Response and Assessment Section, P.O Box 13087, Austin, Texas 78711-3087, (telephone no. (512) 239-2514, FAX no. (512) 239-2469). The Technical Director and Program Manager are responsible for identifying, assigning, and organizing the staff to execute the activities required to complete the SSI. The Site Investigation Manager is responsible for completing the activities described in this plan and adhering to the sampling activities and report schedule. The planned field schedule for activities at the SLC is presented in Table 2.

The TNRCC Technical Director and Program Manager will review all major reports and provide technical and administrative support to the Site Investigation Manager. The TNRCC Technical Director will review the work plan and final report and will approve the final versions. In addition, the TNRCC Technical Director and Program Manager will provide oversight for the field activities during the investigation. The EPA Region VI site assessment manager (SAM) is responsible for approving the sampling activities work plan and reviewing the final report.

COMMUNITY RELATIONS

Prior to the start of any work at the site, TNRCC will inform the appropriate City of Port Neches authorities of the intended site visit. Individual residents and businesses in the immediate area will be contacted by letter from the TNRCC or during the off-site reconnaissance visit. Requests for site-specific information will be made during the interview process or identified in the letter from the TNRCC. TNRCC will make no

other formal notifications of the ESI sampling event. Sample results will be sent to each property owner, for their property only, upon completion of the data quality assurance process. Any requests for information before or after the planned site inspection which the TNRCC receives from the above will be referred through the PA/SI Program Manager for an appropriate response. Any requests for information by the news media or parties not associated with the site will be directed through the TNRCC Technical Director or his designee to the TNRCC Central Office Media Relations Office, P.O. Box 13087, Austin, TX 78711, telephone (512) 239-5000.

The TNRCC Program Manager will provide each member of the TNRCC inspection team and the Site Investigation Manager with letters of introduction stating the purpose of the investigation and authorization to conduct appropriate field activities. The TNRCC will send notification letters to the appropriate site representatives informing them of the impending sampling activities and requesting access authorization for TNRCC inspectors to the site. TNRCC will set up the site visit only after receiving written or verbal access authorization from the property owner or their representatives.

Table 3. Star Lake Canal Field Schedule

Time	Activity
	Day 1
1030	Members of field team drive from Austin to Port Neches.
1530	Arrive in Port Neches. Drive to SLC site.
1300	Arrive at site. Review health and safety plan. Conduct initial safety meeting. Establish off site staging area.
1330	Begin on site and off site reconnaissance. Review and modify on site sampling plan. Prepare shipping and sampling labels. Prepare field logbook.
1600	End of day.
	Day 2
0700	Arrive at the site. Review health and safety plan. Conduct daily safety meeting. Review sampling strategy and prepare equipment.
0800	Begin collecting rinsate samples, background and target sediment samples. Record applicable data in logbook, document sampling locations with photographs.
1200	Lunch break.
1300	Resume collection of target sediment samples. Record applicable data in logbook, document sampling locations with photographs.
1630	Complete sediment sampling through in the Neches River, packaging and CLP lab documentation. Pack samples for overnight shipment.
1745	Deliver samples for shipping.
1800	End of day.
	Day 3
0700	Arrive at the site. Review health and safety plan. Conduct daily safety meeting. Review sampling strategy and prepare equipment.
0800	Begin collection of rinsate samples and sediment samples within Molasses Bayou. Record applicable sampling data in logbook, document sampling locations with photographs.
1200	Lunch break.
1300	Resume collection of source sediment samples in Molasses Bayou. Record applicable sampling data in logbook, document sampling locations with photographs.
1630	Complete rinsate and sediment sampling, packaging and CLP lab documentation. Pack samples for overnight shipment.
1745	Deliver samples for shipping.
1800	End of day.

Day 4

0700	Arrive at the site. Review health and safety plan. Conduct daily safety meeting. Review sampling strategy and prepare equipment.
0800	Begin collection of rinsate samples and sediment samples within Jefferson Canal. Record applicable sampling data in logbook, document sampling locations with photographs.
1200	Lunch break.
1300	Resume collection of source sediment samples in Jefferson Canal. Record applicable sampling data in logbook, document sampling locations with photographs.
1630	Complete rinsate and sediment sampling, packaging and CLP lab documentation. Pack samples for overnight shipment.
1745	Deliver samples for shipping.
1800	End of day.

Day 5

0900	Check out of lodging and return to Austin.

WORK PLAN ACTIVITIES

Task 1: Nonsampling and Sampling Activities and Rationale

The field team will first meet with property owner representatives (if specifically requested). The purpose of the meeting will be to conduct an initial safety briefing and review the intended sampling work schedule. Information concerning past and current site conditions outlined in the PA and ESI work plan will be discussed and verified. The Site Investigation Manager will record significant comments in the field logbook pertaining to site history and current/past operations.

After the initial meeting, an off-site reconnaissance inspection will be completed by designated team members. Information will be logged in the field logbook to include names of individuals interviewed, physical/mailing addresses, date and time of interviews, and observations noted. Information outlined in the Site Reconnaissance Checklist (Appendix D) applicable to off-site requirements will be obtained during the inspection. The off-site reconnaissance will be conducted at level D protection.

The initial on-site reconnaissance inspection will be accompanied by the owner or his designated representative, if available, to assist in identifying potential site hazards. Appropriate safety equipment will be required by each team member, which will include field respiratory protection with a combination organic/pesticide vapor cartridge and a dust/mist filter suitable for organic wastes. Personal protective equipment will initially be level C for sediment sampling. If it can be established that volatile and semivolatile vapors are safely below background and action levels, the on-site reconnaissance will continue at modified level D.

A determiniation will be made in the field whether any air monitoring equipment will be used. Any visual evidence of a release of hazardous substances will be noted to ascertain whether additional protective equipment will be required for the sampling events. In general, site safety requirements will be assessed in the initial site reconnaissance inspection, and safe entry and exit points will be identified for each proposed sampling event.

Upon completion of the site reconnaissance activities, the field team will again review the sampling plan. Sample locations will be adjusted as necessary to ensure that the samples provide sufficient data to properly evaluate the site. Photographs will be taken as required to document site conditions and support observations recorded in the field logbook. Photographs will require at a minimum, the following information for each photograph:

- Site name
- Location
- Name of photographer

- Date and time of photograph
- Description of situation/scene photographed.
- Type of camera, film, and lens setting (Must be 50mm).

The following section describes the proposed sampling plan for the SLC. This plan may be modified as a result of the on-site reconnaissance and/or noted site access constraints. The proposed samples to be collected and sample rationale are listed in Table 4. Proposed sample analyses, containers, and preservation requirements for the groundwater and soil samples are shown in Tables 5 and 6, respectively. Sample locations will be confirmed during the site reconnaissance inspection and noted in the field logbook. A field copy of this workplan will be annotated by the Site Investigation Manager to reflect actual sample locations.

Table 4. Proposed Samples to be Collected

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-1	Sediment sample in or adjacent to Neches River, upstream of confluence with SLC (Figure 4).	Background sample.
	SE-2	Sediment sample in or adjacent to Neches River, upstream of confluence with SLC (Figure 4).	Background sample.
	SE-3	Sediment sample in or adjacent to Neches River, upstream of confluence with SLC (Figure 4).	Background sample.
	SE-4	Sediment sample in or adjacent to Neches River, upstream of confluence with SLC (Figure 4).	Background sample.
	SE-5	Sediment sample in or adjacent to Neches River, upstream of confluence with SLC (Figure 4).	Background sample.
	SE-6	Sediment sample in Neches River, downstream of confluence with SLC (Figure 4).	Target sample within HRS In-Water Segment 4 to assess and characterize any contamination of the Neches River fishery.
	SE-7	Sediment sample in Neches River, downstream of confluence with SLC (Figure 4).	Target sample within HRS In-Water Segment 4 to assess and characterize any contamination of the Neches River fishery.
	SE-8	Sediment sample in Neches River, downstream of confluence with SLC (Figure 4).	Target sample within HRS In-Water Segment 4 to assess and characterize any contamination of the Neches River fishery.
	SE-9	Sediment sample in Neches River, downstream of confluence with SLC (Figure 4).	Target sample within HRS In-Water Segment 4 to assess and characterize any contamination of the Neches River fishery.
	SE-10	Duplicate sediment sample taken in the same location as SE-9 (Figure 4).	QA/QC.
	SE-11	Sediment sample in Neches River, downstream of confluence with SLC (Figure 4).	Target sample within HRS In-Water Segment 4 to assess and characterize any contamination of the Neches River fishery.

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-12	Sediment sample in Neches River, downstream of confluence with SLC (Figure 4).	Target sample within HRS In-Water Segment 4 to assess and characterize any contamination of the Neches River fishery.
	SE-13	Duplicate sediment sample in same location as SE-12 (Figure 5).	QA/QC.
	SE-14	Sediment sample from Molasses Bayou, near its confluence with SLC and the Neches River (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-15	Duplicate sediment sample taking in same location as SE-14 (Figure 5).	QA/QC.
	SE-16	Sediment sample from Molasses Bayou, near its confluence with SLC and the Neches River (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-17	Duplicate sediment sample taken in same location as SE-16 (Figure 5).	QA/QC.
	SE-19	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-20	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-21	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-22	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-23	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-24	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-25	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-26	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-27	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-28	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-29	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-30	Sediment sample in Molasses Bayou (Figure 5).	Target sample along hazardous substance migration route bordered by HRS qualifying wetlands.
	SE-31	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-32	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-33	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-34	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-35	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-36	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-37	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-38	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-39	Sediment sample within Jefferson Canal (Figure 6).	Source sample to further delineate lateral extent of contaminated source sediments.
	SE-40	Sediment sample taken in the same location as SE-39 (Figure 6).	QA/QC.
Rinsate	R-1	Rinsate sample from Eckman dredge and core sampler after to Day 1 of sediment sampling.	QA/QC.
	R-2	Rinsate sample from Eckman dredge and core sampler after Day 2 of sediment sampling.	QA/QC.
	FB-1	Field blank collected at same time as R-1.	QA/QC.
	FB 2	Field blank collected at same time as R-2.	QA/QC.

Table 5. Sample Containers, Methods, Preservatives, and Holding Times for Soil/Sediment

Parameters	Sample Container	Preservative	Holding Time
Volatile organics	Two 4-ounce widemouth glass jars with Teflon-lined septa	Cool to 4°C	14 days
Semivolatile organics	Two 4-ounce widemouth glass jars with Teflon-lined lids	Cool to 4°C	Extract within 14 days of collection and analyze within 40 days of extraction.
Pesticides/ PCBs	Two 4-ounce widemouth glass jars with Teflon-lined lids	Cool to 4°C	Extract within 14 days of collection and analyze within 40 days of extraction.
Metals/Cyanide	Two 4-ounce widemouth glass jars with Teflon-lined lids	Cool to 4°C	180 days after collection for metals and 14 days for cyanide

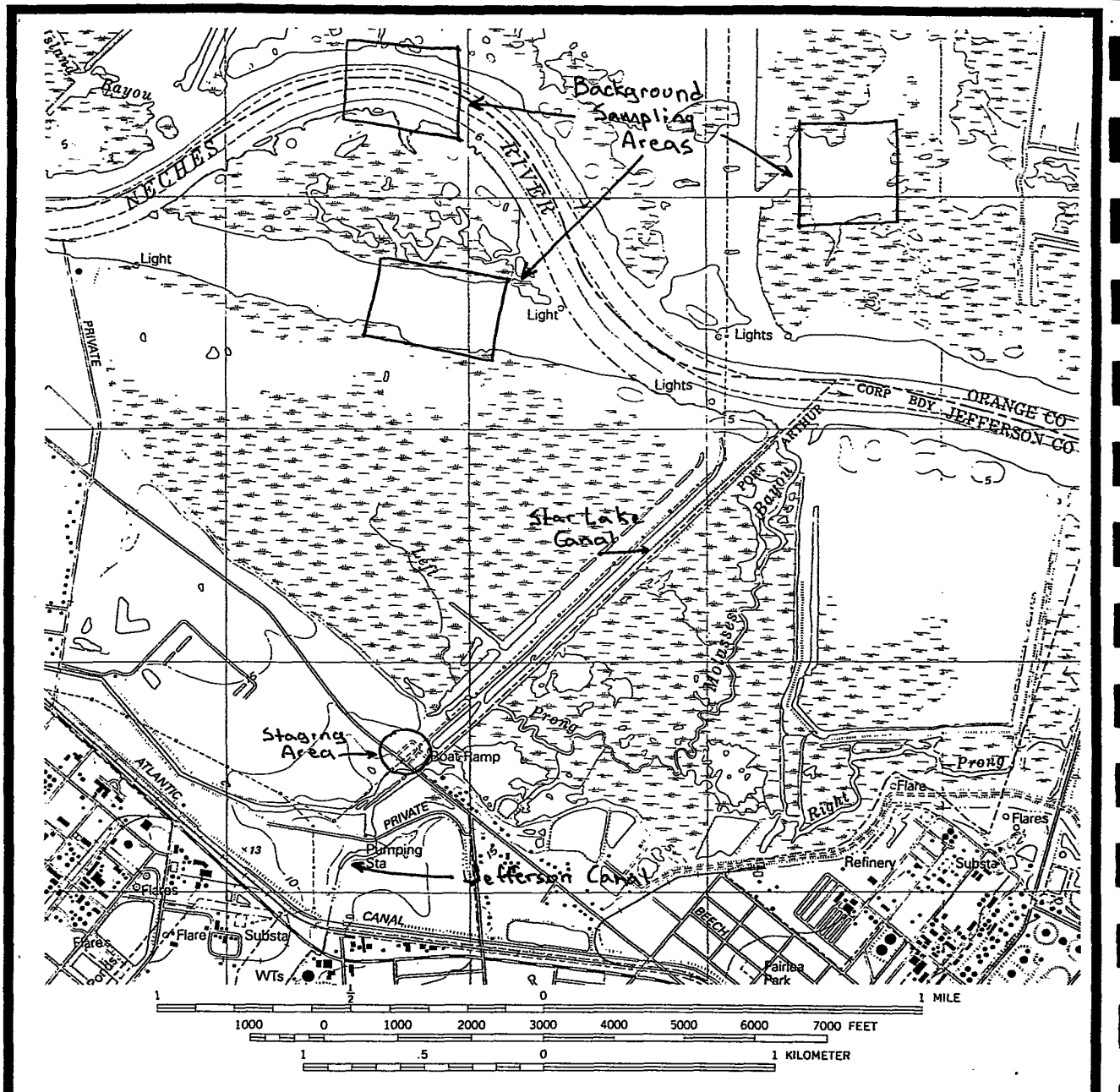
Table 6. Sample Containers, Methods, Preservatives, and Holding Times for Aqueous Samples

Parameters	Sample Container	Preservative	Holding Time
Volatile organics	Two 40-ml widemouth glass vials with Teflon-lined septa	Cool to 4°C	7 days
Semivolatile organics	Two 1-liter amber glass bottles with Teflon-lined lids	Cool to 4°C	Extract within 7 days of collection and analyze within 40 days of extraction.
Pesticides/PCBs	Two 1-liter amber glass bottles with Teflon-lined lids	Cool to 4°C	Extract within 7 days of collection and analyze within 40 days of extraction.
Metals/Cyanide	One 1-liter polyethylene bottle with a Teflon-lined cap	HNO_3 to Ph<2	6 months (except mercury*) and 14 days for cyanide

* Reference: EPA Contract Laboratory Program Statement of Work for Organics Analysis (March 1990) and Statement of Work for Inorganic Analysis (March 1990).

Waste Containment/Hazardous Substance Identification

The primary contaminants of concern for this site are toxaphene, pentachlorophenol and numerous aromatic hydrocarbons. To obtain legally defensible characterization data, a laboratory will be designated to perform EPA-stipulated Contract Laboratory Program (CLP) analytical methods on all samples collected from the site. The specific analytical methods for this sampling event are those listed under the CLP routine analytical services (RAS) contract.



TNRCC

FIGURE 4: Proposed Background Sampling Areas

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341

Port Neches, Jefferson County, Texas

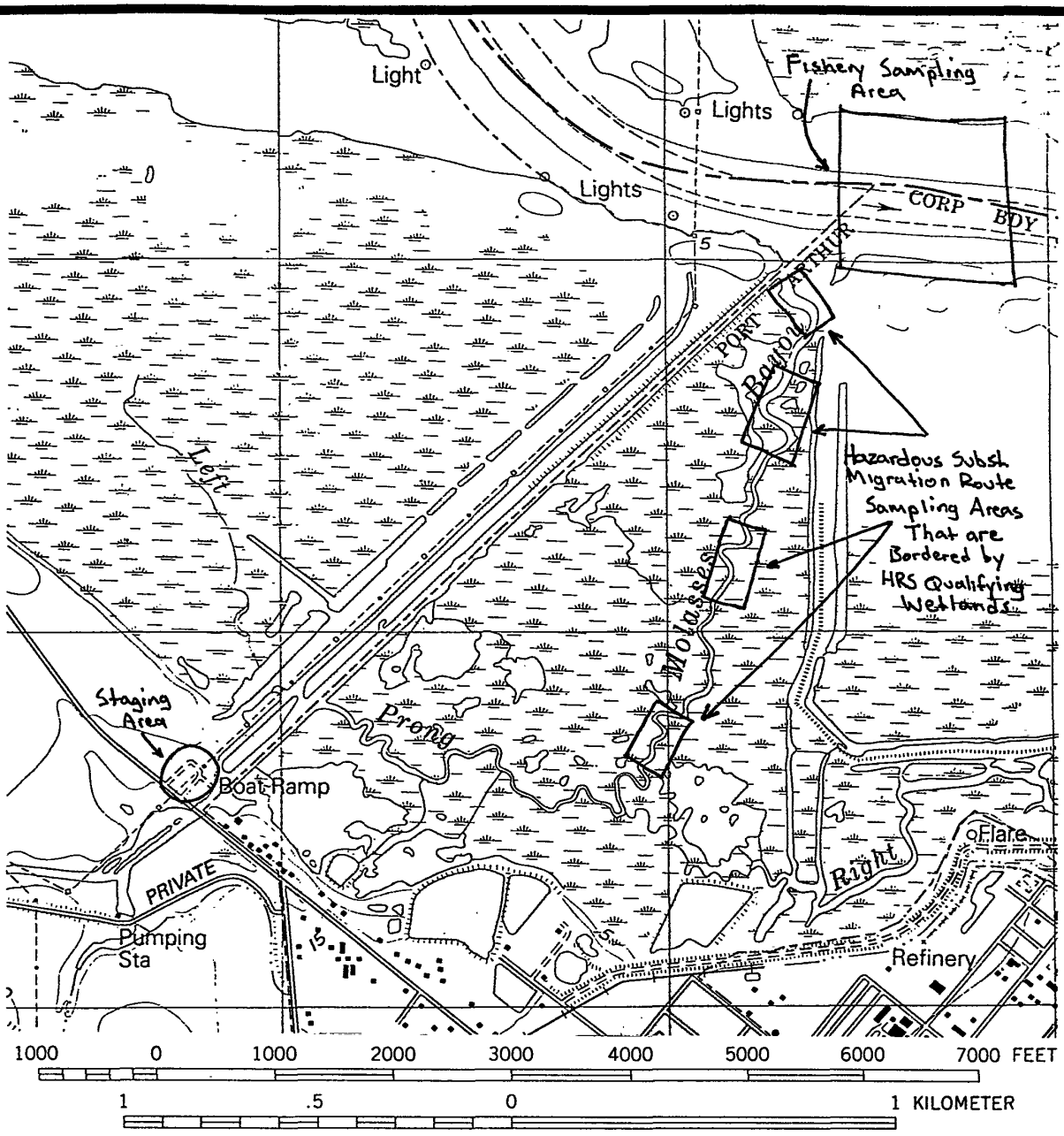


FIGURE 5: Proposed Target Sampling Areas

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341

Port Neches, Jefferson County, Texas

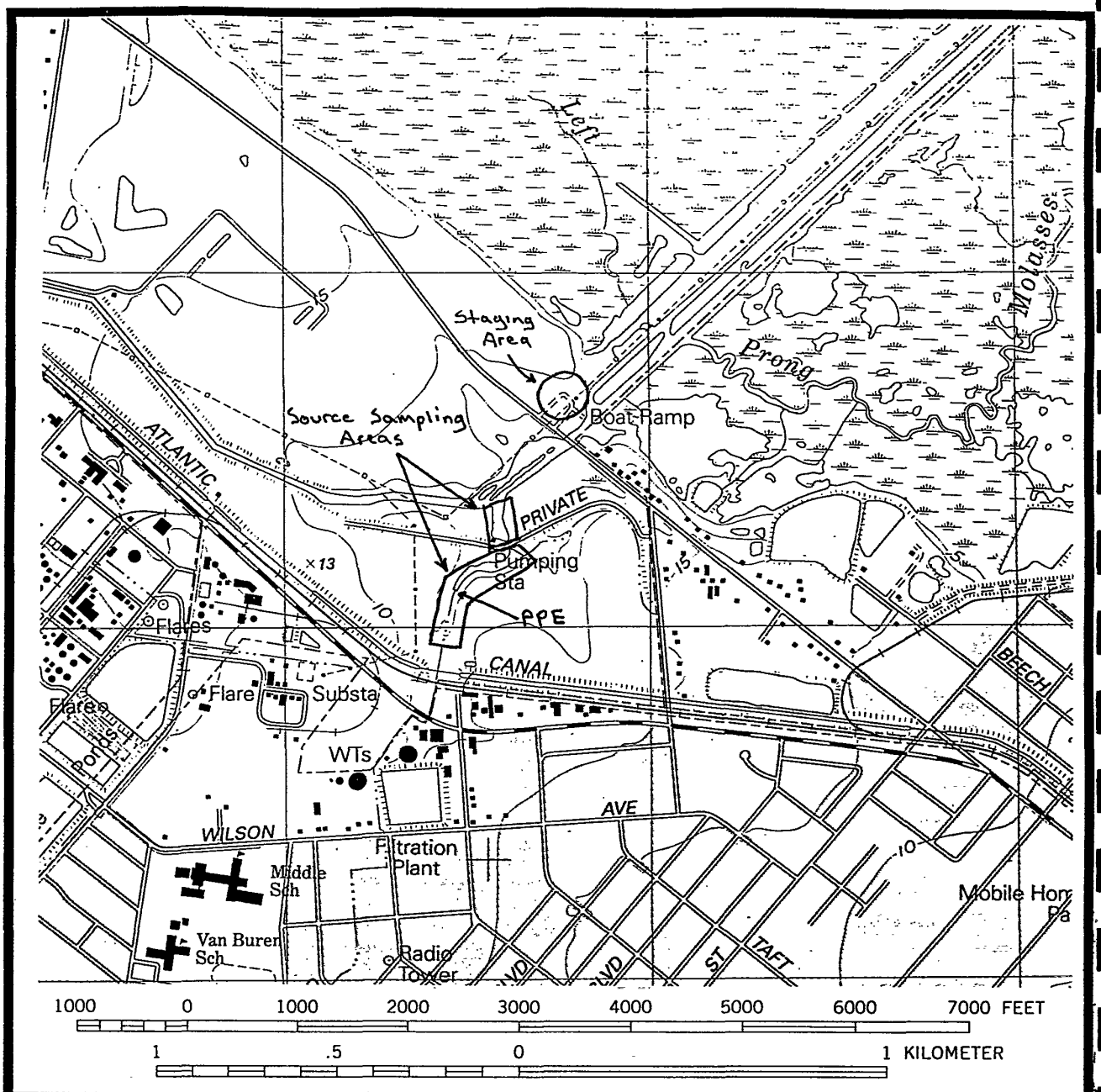


FIGURE 6: Source Sampling Area

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341

Port Neches, Jefferson County, Texas

Nonsampling data to be collected include:

- Field verify the site features and locations as depicted in Figure 1.
- Field verify the location and lateral extent of the areas of interest. Note any areas void of vegetation and obtain samples to confirm the release of contaminants.
- Field verify previous operations at the site and any hazardous substances related to these activities through observation and interviews with PRP personnel.

For this ESI, sediments in the Jefferson Canal are considered to be the source. A total of forty (40) sediment samples are planned for this project (see Figures 4,5 and 6 for the sampling areas); ten of these (SE-31 through SE-40) are source samples. These samples will be collected with a core sampler into which dedicated polyethylene zero-contamination tubes have been inserted.

Prior to using the Eckman dredge and core sampler, rinsate samples will be collected. Rinsate samples will also be collected at the end of sediment sampling for that day. This procedure will be repeated at the end of the second day of sediment sampling. Rinsate samples are designated as R-1 through R-2.

Surface Water Pathway

Nonsampling data to be collected include:

- Verify the direction of surface water in the canals.
- Field verification to determine the location of drainage channels and drainage patterns in relation to the contaminant sources.
- Establish the presence of wetlands, sensitive environments or endangered species within a 4 mile radius of the site by correspondence with Texas Department of Parks and Wildlife.

An Eckman dredge will be used to collect background and target samples within the Neches River. The Eckman dredge will be decontaminated per the QAPP between sample locations. Samples SE-1 through SE-5 are background samples. Samples SE-6 through SE-13 will be used to determine if there are releases to the Neches River fishery. Target samples SE-14 through SE-30 will be collected within Molasses Bayou, along the hazardous substance migration route with a sediment core sampler into which dedicated polyethylene zero-contamination tubes have been inserted.

Quality Assurance/Quality Control Samples

Three types of A/QC samples will be used in this sampling inspection. Duplicate samples will be taken at the rate of one (1) duplicate per matrix (groundwater and soil) and one (1) duplicate for every ten (10) samples collected. Field blanks will be collected and accompany each ice chest containing groundwater samples shipped for volatile organic analysis. In addition, temperature blanks will accompany each ice chest to the respective laboratories.

A fourth A/QC sample may be used, as required, in this sampling inspection. Equipment rinsate samples may be collected to establish that proper field decontamination procedures have been employed for sampling equipment which is used more than once in the field.

Volatile organics samples are susceptible to contamination by diffusion of organic contaminants through the Teflon-lined septum of the sample vial; therefore, a VOA field blank will be analyzed to monitor for possible sample contamination. The field blank also serves to detect contaminants in the sample bottles. Each field blank will be prepared by filling two VOA vials with CLP-specified grade water and shipping the blanks with the sample bottles. Field blanks accompany the sample bottles through collection and shipment to the laboratory and are stored with the samples. The field blanks will be analyzed for VOAs. Results of field blank analyses will be maintained with the corresponding sample analytical data in the project file.

An equipment rinsate sample(s) will be analyzed to detect possible sample contamination of non-dedicated sample equipment through field decontamination procedures. Each equipment blank will be prepared by filling two VOA vials; one 1-gallon amber glass bottle; and two 1-liter polyethylene bottles with CLP-specified grade water collected from the final rinse of the decontaminated equipment and shipped with the other samples. The equipment rinsate sample(s) will be analyzed for volatiles, semi-volatiles, pesticides/PCB's, metals, and cyanides. Results of equipment rinsate sample(s) analyses will be maintained with the corresponding sample analytical data in the project file.

Organic contaminates and some inorganic contaminants may volatilize during collection and subsequent shipment to the laboratory due to warming temperatures in the shipping container; therefore, a temperature blank will be monitored to insure that samples are properly cooled during shipment. One temperature blank per ice cooler will accompany the sample bottles to the laboratory. Each temperature blank will be prepared by filling one VOA vial with deionized water; enclosing it in a bubble bag; taping the package to the interior of the ice cooler and clearly marking it as the "temperature blank". Temperature blanks accompany the sample bottles through collection and shipment to the laboratory and are stored with the samples. Results of shipment temperatures will be maintained with the corresponding sample analytical

data in the project file.

Task 2: Decontamination Procedures

Equipment Decontamination

Proper decontamination procedures will aid in preserving the representativeness of the samples collected. Dedicated sampling spoons or trowels will be used to collect each soil sample at the site. These spoons or trowels will have been decontaminated prior to arrival at the site and sealed in plastic sealable bags in accordance with the QAPP. After sampling, gross contamination (visible) will be removed from the surface of the scoops or trowels and they will be placed back in their original plastic bag. Further decontamination will be accomplished by a detergent scrub and distilled water rinse at a location away from the investigation site in accordance with the QAPP. To minimize cross contamination, the outside of each sample container will be wiped clean with clean paper towels prior to placing the container into a plastic bag and bubble-wrapping it for shipment. An effort will be made to initially keep the outside of the containers free of gross contamination.

If sample equipment (non-dedicated) must be used more than once in the field, then the decontamination procedures for sample equipment will be followed by an equipment rinsate sample collected in the field at the end of each day and/or between each sample matrix type sampled, whichever is greater.

Decontamination fluids used to clean equipment will be disposed of on-site in the approximate area of the sampling location in accordance with investigation derived waste (IDW) guidelines. Equipment decontamination will not be necessary for domestic wells since the water sample is collected directly from the tap.

Personal Decontamination

All disposable clothing (i.e., Tyvek, gloves, etc.) will be rendered unusable prior to disposal to prevent inadvertent reuse. Boots will be scrubbed with detergent and rinsed with distilled water that will be disposed of on-site. Decontamination fluids from the rinse (if used) will also be disposed of on-site. Locations for IDW disposal will be noted in the field log book.

Task 3: Sample Shipping

During sampling activities, samples will be packed and preserved according to procedures described in the QAPP. Excess soil or liquid will be removed from the outside of each sample prior to placing it in a sealable plastic bag and placing it into an ice cooler packed with sealed ice bags. The Site Investigation Manager will assure that all appropriate paperwork necessary to ship samples to CLP laboratories for analysis is completed. Normally, a 35-day turnaround time for RAS will be requested.

Details of the sample handling and chain-of-custody (COC) requirements are discussed in greater detail in the attached QAPP (Appendix C).

Samples collected each day will be shipped and delivered daily to the designated CLP laboratory for analysis using an overnight courier. The overnight freight courier pickup point and office schedule in the area of the site is:

Airborne Express (1-800-247-2676)
Beaumont, Texas 77703
Office hours - 8:00 am to 6:30 pm Monday through Friday; no service Saturday.
Samples must be dropped off by 5:45 PM.

The chain-of-custody forms will be checked, signed, and placed in a sealable plastic bag and taped to the inside lid of the cooler. The outside of the cooler will be sealed with tamper-resistant tape which cannot be removed without tearing it. The sample custodian will sign across the seal prior to shipping the samples. In the event the shipper has to remove the cooler seal, the receiving laboratory will verify and record that the individual container, bottle, or vial sample seals are still intact.

During sampling and sample shipment, the site Investigation Manager (or his designee) will contact the CLP sample management office (SMO) representative, as designated on the CLP RAS Lab Assignment, each day that a shipment is sent. If there are any significant changes to the CLP analytical requirements, contact the TNRCC Central Office, Allan Seils, PA/SI Program Manager at (512) 239-2514, FAX (512) 239-2527 or his designee to coordinate and obtain approval for additional analytical requirements.

REFERENCE LISTING

1. US Environmental Protection Agency. Federal Register - 40 CFR Part 300; Hazard Ranking System; Final Rule; Volume 55, Number 241, December 14, 1990. 135 pages.

2. US Environmental Protection Agency. Hazard Ranking System Guidance Manual, EPA540-R-92-026, OSWER Directive 9345.1-07, November, 1992. 431 pages plus Appendix.

3. US Environmental Protection Agency. Guidance for Performing Site inspections Under CERCLA, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Publication 9345.1-05, September, 1992. 125 pages.

4. US Environmental Protection Agency. 1993 Superfund Chemical Data Matrix (SCDM). March, 1993.

5. US Environmental Protection Agency. Superfund Site Strategy Recommendation - Region 06. Star Lake Canal - Port Neches, a.k.a. Jefferson Canal. January, 1998.

6. Screening Site Inspection Report for Star Lake Canal, a.k.a. Jefferson Canal, TX0001414341. September, 1997.

7. TNRCC file information, 98 pages. Included as Appendix A.

8. Texas Natural Resource Conservation Commission. The State of Texas Water Quality Inventory, Volume 2. 1994.

9. Texas Department of Water Resources. Climatic Atlas of Texas. December, 1983.

10. Texas Parks and Wildlife Department correspondence. October 10, 1996. Included as Appendix E.

11. National Wetland Inventory Map, Port Arthur North Quadrangle. 1995. Included as Appendix I.

12. Texas Parks and Wildlife Department, Fisheries and Wildlife Division. Trends in Finfish Landings and Social and Economic Characteristics of Sport-Boat Fishermen in Texas Marine Waters, May 1974-May 1989. Management Data Series, No. 56, 1991.

APPENDIX A

TNRCC File Information

NO. D116345

STATE OF TEXAS	§	IN THE DISTRICT COURT
PLAINTIFF	§	
VS.	§	OF JEFFERSON COUNTY, TEXAS
CHEMALL, INC.,	§	
DEFENDANT	§	136 JUDICIAL DISTRICT

AGREED FINAL JUDGMENT

BE IT REMEMBERED THAT ON THIS 13th day of December, 1982, came on to be heard the above entitled and numbered cause, said cause being an action prosecuted by Plaintiff, State of Texas, against Defendant, Chemall, Inc., for alleged violations by Defendant in Jefferson County, Texas of Chapter 26 of the Texas Water Code and The Rules and Regulations of the Texas Department of Water Resources, and came Defendant by and through its attorney of record, and came Plaintiff by and through its attorney of record, and the parties announced to the Court that all matters alleged by Plaintiff in this case had been settled, agreed and compromised, subject to the approval of this Court, based on entry of this Judgment agreed upon by the parties and recommended to the Court; and the parties jointly moved the Court for entry of such agreed upon and recommended Judgment; and

The Defendant having waived all formalities of Rules 680-693, Texas Rules of Civil Procedure, and acknowledging an understanding of the terms contained in the Judgment, following participation in settlement negotiations and waiving writ of execution, and acknowledging receipt of a copy of this Judgment, and waiving all right of appeal; and it appearing to the Court that the agreed upon and recommended Judgment is in all respects proper and necessary at this time, it is, therefore, ORDERED, ADJUDGED AND DECREED as follows:

I.

Defendant Chemall, Inc., shall complete closure of their existing inactive waste pond in accordance with the rules, regulations and technical guidelines of the Texas Department of Water Resources no later than 22 weeks from the date of this

May 1, '83
Extended - Sept. 30, 83 DEPT. OF WATER RESOURCES

Judgment. Such closure shall be subject to Department review and approval and may be accomplished by disposal of existing contaminated wastewater at an approved disposal facility; removing remaining sludges to an approved disposal facility or solidifying sludges in place; filling of the emptied pit area with earthen fill material; capping the pit area with a three foot deep layer of compacted clay material; vegetating the capped fill material; and recording this Judgement, a plat of this property including the location of the prior pit and the proposed treatment facility and a statement that there may be residual toxaphene contamination on the plant property, in the deed records of Jefferson County, Texas.

II.

Defendant, Chemall, Inc. shall design, construct and implement a wastewater treatment system within 70 weeks from the date of this Judgment in accordance with the general design schedule contemplated by the documents titled "Chemall Wastewater Compliance Schedule," copies of which are attached hereto and made a part of this Judgment. The wastewater treatment system will be subject to standard Texas Department of Water Resources review and approval for such facilities, and will be designed and operated to assure compliance with toxaphene discharge limitations imposed by Permit No. 08157, as amended.

III.

Defendant Chemall, Inc. shall remove all toxaphene contaminated sediments from all ditches adjacent to and contiguous with Defendant's plant-site property, with the exception of the Jefferson Canal, to a point where concentration of toxaphene leachate does not exceed .04 mg/l. This toxaphene removal shall be completed no later than 4 weeks from the date of completion of the wastewater treatment system required by this judgment. Such toxaphene removal shall be subject to review and approval by the Texas Department of Water Resources in accordance with the standard TDWR Leachate Test as described in TDWR Technical Guide Number 1.

IV.

Defendant Chemall, Inc., its agents, representatives and employees are hereby permanently restrained, prohibited and enjoined from violating any of the terms of Texas Department of Water Resources Permit No. 01857, as amended, a copy of which is attached hereto and made a part of this Judgment.

IT IS FURTHER ORDERED, ADJUDGED and DECREED that Plaintiff, State of Texas, have and recover from Defendant Chemall, Inc. the sum of FOURTEEN THOUSAND DOLLARS ($14,000.00) civil penalites in satisfaction of all violations of the Texas Water Code alleged in Plaintiff's Original Petition and Application for Permanent Injunction.

IT IS FURTHER ORDERED, ADJUDGED and DECREED that Defendant pay all costs of court.

SIGNED and ENTERED this 8th day of December, 1982.

/s/ Robert King
JUDGE PRESIDING

APPROVED AS TO FORM AND SUBSTANCE
AND ENTRY REQUESTED:

MARK WHITE
ATTORNEY GENERAL OF TEXAS

/s/
MICHAEL LEBURKIEN
SBN 12100650
Assistant Attorney General
Environmental Protection Division

1220 Dallas, Suite 202
Houston, Texas 77002

ATTORNEYS FOR PLAINTIFF
STATE OF TEXAS

Paul G. Gosselink
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SBN 08222800

BOOTH, LLOYD AND SIMMONS, P.C.
302 San Jacinto Building
Austin, Texas 78701

ATTORNEYS FOR DEFENDANT
CHEMALL, INC.

CHEMALL, INC. BY ITS AUTHORIZED
AGENT, JERRY P. MOHN, PRESIDENT
CHEMALL, INC.

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder, Chief, Solid Waste and Spill Response, Enforcement and Field Operations

DATE: August 25, 1983

THRU :

FROM : Michael A. Moore, Engineering Technician, District 6

SUBJECT: Texaco Chemical Company, Registration No. 30029 and Drainage District No. 7, No Registration or Permit--Enforcement Action Request Addendum Report

Attached is a copy of the laboratory analysis results for a sample of soil which was collected during a solid waste investigation which was conducted on March 21, 1983. The sample was collected from a pile of dredge spoils which had recently been deposited on the north bank of a drainage ditch between Farm Road 366 and the Kansas City Southern Railroad, behind the city of Groves dog pound. The laboratory results indicate that significant amounts of toxaphene and other organic pollutants were present in the dredged material.

It is requested that these data be added to the enforcement action request submitted by this office, dated April 5, 1983.

Approved: Harry D. Boudreaux

Signed: Michael A. Moore

MAM/bk

Attachment

TEXAS DEPARTMENT OF WATER RESOURCES

NO. SW 02091

District 6 Org. No. 536 Work No. 7E? Lab TDH

Site Name: Jefferson Outfall canal

Site Location: Drainage ditch below FM 366 behind Port Neches dog pound

County: Jefferson Basin: Neches (Seg no 0601)

Method of Collection: Used shovel and plastic scoop to collect several subsamples, which were composited in clean plastic pail, then placed in acetone-rinsed jar with Teflon liner.

Point of Collection: Dredge spoils on south bank of ditch below FM 366

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill; ☐ Waste pile; ☐ Landfarm; ☒ Other drainage ditch

Time Collected 4:30 (am, pm) Date Shipped 3/22/83

And COC #: None

ODOR: ☒ Yes; ☐ No; Describe sweet, phenolic odor, very strong

(Collector's Signature)

S.W. Registration	Permit Number	Page No.		Date Mo.	Day	Yr.	
1–9	10–18	19–21	22	23 24	25 26	27 28	29
NONE	NONE		A	03	21	83	E

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR 0849

(106)

NO. SW 02091 MAY 24 1983

District 6 Org. No. 536 Work No. 7082 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☒ Soil (E); ☐ Well (M); ☐ Stream (S); ☐ Other (O)

Lab Only — Date rec'd MAR 23 1983; Date cmp MAY 23 1983; Analyst sign.: [illegible]

Comments: Dredging from ditch which was once used for disposal of wastes from various chemical plants in area (continued on back)

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3 Other

Auxiliary Tags: NONE

☐ LEACHATE ☐ EP Toxicity Series ☐ TDWR

1st

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH 00403		Priority Pollutants			
COD 00340					
TOC 00680		Toxaphene	ug/Kg 21000		
GC/MS					

001012

Texas Department of Health

Bureau of Laboratories
Austin, Texas

Product: Laboratory No.: EH3426 Sample No.: SW02

Date Received: 23 MAR 83 **Delivered By:** TDWR **Condition of Seals:** INTF

Description of Sample: SOIL SAMPLE

From:

LABORATORY FINDINGS

GC/MS ANALYSIS.

① EPA PRIORITY POLLUTANTS.

Naphthalene - 9280 mg/Kg.
Acenaphthylene - 2140 mg/Kg.
Fluorene - 1140 mg/Kg.
Acenaphthene - 330 mg/Kg.
Phenanthrene - 2050 mg/Kg.
Anthracene - 300 mg/Kg.
Fluoranthene - 275 mg/Kg.
Pyrene - 535 mg/Kg.
Benz (a) anthracene - 160 mg/Kg
Chrysene - 150 mg/Kg
Benz (b) fluoranthene - 15 mg/Kg.
Benz (k) fluoranthene - 15 mg/Kg
Benz (a) pyrene - 60 mg/Kg

② Other organic compounds present at up to 2000 mg/Kg.
Substituted naphthalenes (C_1 & C_2)
Biphenyls
Other aromatic hydrocarbons, unable to positively identify.

MAY 23 1983
Date Reported

③ TCDD - 2,3,7,8 isomer by capillary GC/MS technique <2 ng/Kg

MID
FORM NO. G-59

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: L. D. Bryant, DD #7 Call From: M. Moore, Dist. 6

Date of Call: March 22, 1983 File No:

Subject of Call: Contaminated soil dredged from drainage ditch below FM Road 366 in Port Neches, Jefferson County.

Information for File: I told Mr. Bryant that TDWR had sampled soil dredged from the drainage ditch below FM Road 366, and that we suspected that the soil contained hazardous wastes (eg: toxaphene and pentachlorophenol). I requested that DD #7 remove the soil from the banks of the ditch and have it disposed of in an approved facility.

Mr. Bryant furnished me with the following information:

1) The ditch was dredged by drag-line beginning about six weeks ago, with the project being completed approximately two weeks ago;

2) The ditch has never been dredged before, since it was a natural drainage area, and DD #7 did not previously have an easement on the property, which is owned by Texaco Chemicals;

3) Approximately one year ago, DD #7 acquired an easement on the ditch in order to improve area drainage, but the property is still owned by Texaco Chemicals;

4) Mr Bryant also pointed out that the area is very marshy, and pallets had to be used to support the equipment during the dredging operation;

5) Mr. Bryant recalled that for many years Texaco (then Jefferson

Signed: Mike O. Moore

TDWR-0225 h

Chemical Co.), Riverside, and Sonford Chemical companies discharged chemical wastes into the ditch, and he speculated that a variety of chemical residues still exist in the sediments.

6) Mr. Bryant also said that DD #7 is planning to concrete the ditch from FM 366 upstream to the point at which it is already lined and downstream to the railroad crossing.

I recommended that the drainage district contact TDWR prior to beginning any further work on the ditch. I also agreed to let him know what the laboratory analysis results show on the samples we collected on March 21, 1983.

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: A.W. Catanach, Texaco Chemical Co. Call From: M. Moore, Dist. 6

Date of Call: March 23, 1983 File No: 30029

Subject of Call: Jefferson Canal - Texaco Chemical Co. Reg. No. 30029

Information for File: I informed Mr. Catanach that we are investigating possible chemical contamination in the Jefferson Canal downstream from Hogaboom Road in Port Neches. I told him that we had been informed that the canal is located on property owned by Texaco Chemical Co. I also told him that we had noted strong phenolic odors in sediments which had recently been dredged from the canal below FM 366 and disposed along the canal bank, as well as in the sediments in the canal between Hogaboom Road and FM 366.

I recommended that Texaco Chemical Co. immediately remove and properly dispose of the dredge spoils which were removed in order to prevent contaminated run-off from re-entering the canal. I also recommended that the company determine the extent of contamination remaining in the canal between Hogaboom Rd. and Star Lake and begin remedial action to remove such contaminated material that is determined to exist in the canal.

I informed Mr. Catanach that the results of our investigation would soon be forwarded to the Central Office for appropriate enforceme action. I also mentioned that if hazardous wastes or hazardous waste constituents exist in the canal, this would constitute violations of

the Texas Solid Waste Disposal Act and the Texas Water Code.

Mr. Catanach thanked me for informing him of the investigation and said that he would relay the information to appropriate corporate officials for review. He said that the company had no objections to TDWR representatives entering Texaco Chemical property in the vicinity of the canal to continue our investigation.

Signed

C-4/5/83

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder, Chief, Solid Waste and Spill Response, Enforcement and Field Operations

DATE: April 5, 1983

THRU :

FROM : Harry D. Boudreaux, District 6 Supervisor

SUBJECT: Enforcement Action--Texaco Chemical Company, Registration No. 30029

Attached is an Enforcement Report concerning Texaco Chemical Co., Registration No. 30029. In reviewing this report, prepared by Michael Moore, I find that it is accurate and that the proposed recommendations will bring about the correction of those problems which are causing the violations. Please review this matter for appropriate enforcement action.

Harry D. Boudreaux

Attachment

INVESTIGATION REPORT

Texaco Chemical Company
Registration No. 30029
P.O. Box 847
Port Neches, Texas 77651

I. Introduction

A. Identification

1. Name of facility: Texaco Chemical Company

2. Location: Farm Road 366, Port Neches, Texas

B. Permits and Registrations

1. Permits: WCO No. 00585; TX0005606

2. Registration: 30029

C. Permit provisions: Texaco Chemical Company is a petrochemical plant which manufactures the following organic chemicals: ethylene/propylene, ethylene oxide, ethylene glycols, propylene glycols, glycol ethers, morpholine, diglycoamine, oil additive TC-9781, nonylphenols, ethanolamines, and ethylene oxide/propylene oxide adducts. Wastewater permits control discharge of uncontaminated storm water only. Outfall is into Jefferson Canal at Hogaboom Road (NPDES Outfall 002 is the same as Texas Department of Water Resources (TDWR) Outfall 001). Process wastewater is treated at the Neches Butane Products Company regional treatment facility (Permit No. 00511).

D. Background information: The Jefferson Canal, from Hogaboom Road to Star Lake, is located on property owned by Texaco Chemical Company (formerly Jefferson Chemical Company). Other background information, including previous owners of the facility which is a suspected contributor to the contamination of the Jefferson Canal, is contained in the attached report dated August 13, 1979, August 17, 1979, and November 27, 1979 (enforcement action against one of these companies, Chemall, Inc., was resolved in the Agreed Final Judgement, Cause No. D116345, 136th Judicial District Court, Jefferson County, Texas, signed on December 13, 1982).

II. Waste Handling Facility

A. Type of facility: Drainage ditch

B. Description of facility: The drainage ditch runs from Hogaboom Road to Farm Road 366, between Chemall, Inc. and Union Carbide; thence below Farm Road 366 to Star Lake (see attached map). The ditch is approximately 15 feet deep and 50 feet wide at the top. The distance between Hogaboom Road and Star Lake is approximately one mile. In past years, various wastes were discharged to the ditch, including untreated toxaphene and pentachlorophenol process wastes. During the past two months, the ditch between Farm Road 366 and Star Lake was dredged, and the contaminated

dredgings were placed along the north bank of the ditch.

III. Water Quality Impact

A. Surface water: Samples were collected at the railroad crossing below Farm Road 366 on March 23, 1983 after a 2.5-inch rain (Chain of Custody (COC) Tag Numbers SW 02094 and SW 02096). Laboratory analysis results for these samples will be forwarded in an addendum report when received by this office.

B. Ground water: Unknown; no shallow wells have thus far been identified in the area.

IV. Previous enforcement: See attached reports dated August 13, 1979, November 27, 1979, and Agreed Final Judgement dated December 13, 1982.

V. Violation

Violation	Data Source	Permit or Other Requirement
Disposal of hazardous wastes in such a manner so as to cause the discharge or imminent threat of discharge of wastes into or adjacent to the waters in the State.	Reports dated 08/13/79, 08/17/79, and 11/27/79; COC Tag Nos. SW 02090, SW 02091, SW 02094, and SW 02096 (pending).	Texas Solid Waste Disposal Act; Texas Water Code

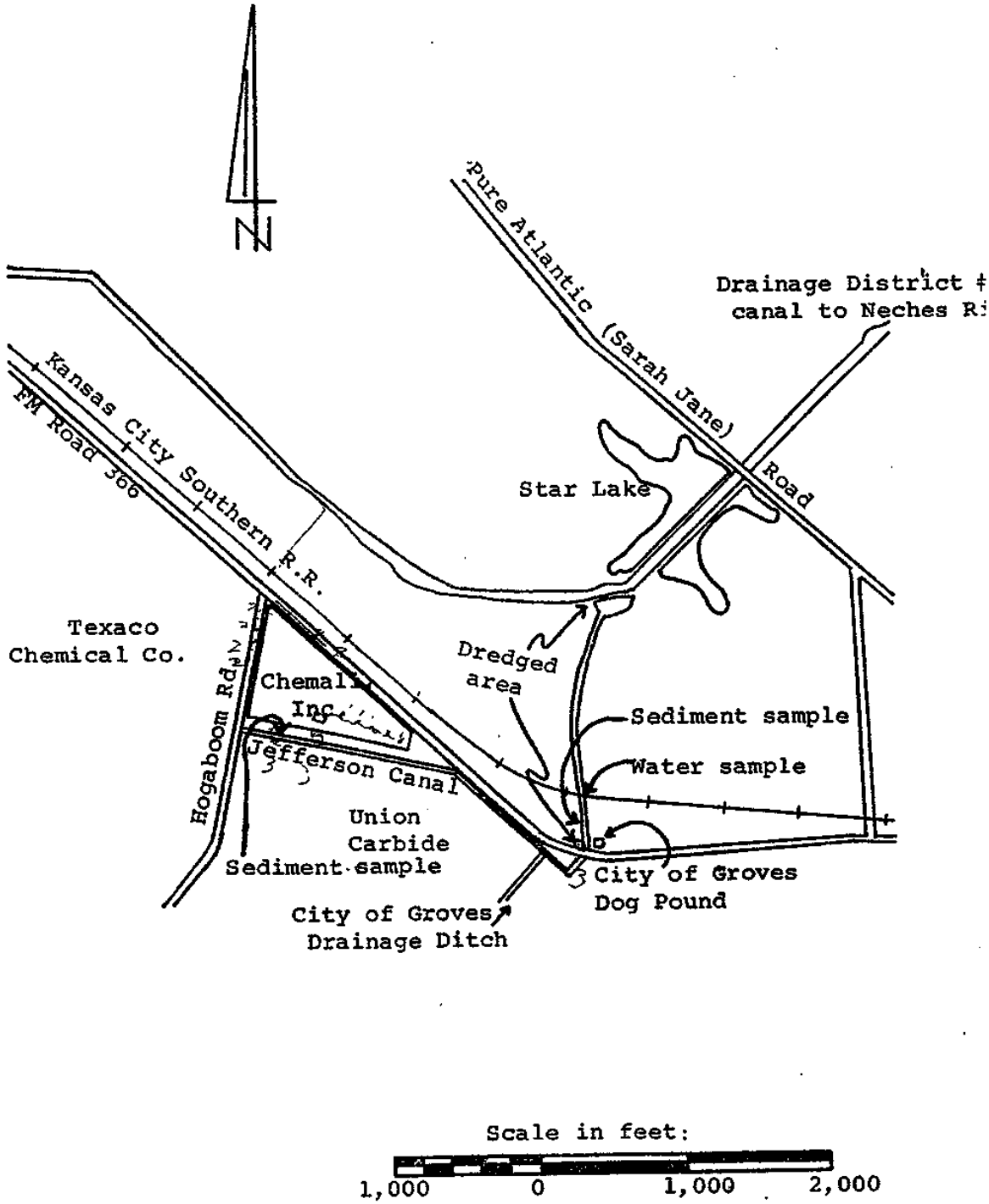
VI. Causes of violation: For an undetermined period of time, Jefferson Chemical Co. (presently owned by Texaco Chemical Co.) and/or the various owners and operators of the facility now owned by Chemall, Inc. disposed of wastes and contaminated wastewater into the Jefferson Canal, which is located on property owned by Texaco Chemical Company. On August 3, 1979 Texaco Chemical Company was requested by TDWR to remove the contaminated materials from the ditch, but the request was refused by the company (see interoffice memorandum dated 11/27/79, S. Cook to B. Bigelow). On March 21, 1983 TDWR District 6 representatives Michael Moore and Wesley Newberry inspected the ditch and collected sediment samples. The samples were observed to have a strong aromatic odor characteristic of phenolic compounds (COC Tag No. SW 02090). A sample was also collected from soil which had recently been dredged from the ditch below Farm Road 366 and it was observed that this material had a similar odor (COC Tag No. SW 02091). During a follow-up inspection conducted on March 23, 1983 it was observed that rainfall runoff from the dredge disposal area was enterin the canal. A sample of the runoff was collected and it also had a strong phenolic odor (COC Tag No. SW 02094). It appears probable that hazardous wast including toxaphene and pentachlorophenol, are being discharged to the waters of the State from the sediments in the canal and from the dredgings which were recently disposed along the bank of the canal.

VII. Technical Recommendations

A. It is recommended that, within 20 days, Texaco Chemical Company remove all contaminated dredgings from the bank of the Jefferson Canal and dispose of such wastes in an approved facility.

B. It is recommended that, within 30 days, Texaco Chemical Company determine the extent of contamination present in the sediments of the Jefferson Canal and Star Lake; and within 60 days, remove all contaminated sediments and dispose of such wastes in an approved facility.

C. It is recommended that, during the course of the cleanup activities, adequate measures be taken to prevent further discharges of hazardous wastes, via rainfall runoff and mixing of sediments with canal water, to the waters of the State.


N
Pure Atlantic (Sarah Jane)
Drainage District
canal to Neches R
Kansas City Southern R.R.
FM Road 366
Road
Star Lake
Texaco
Chemical Co.
Hogaboom Rd.
Chemali
Inc
Dredged
area
Sediment sample
Water sample
Jefferson Canal
Union
Carbide
Sediment sample
City of Groves
Dog Pound
City of Groves
Drainage Ditch
Scale in feet:
1,000
0
1,000
2,000

8/9/79

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Steve Cook, Investigation Unit, Enforcement Support Section

DATE: August 13, 1979

THRU :

FROM : Clarence W. Moritz, District 6 Supervisor

SUBJECT: Enforcement Action: Sonford Chemical Company, Permit Application Control No. 342; H & R Chemical, No Permit; Bison Chemical Company, Permit Application Control No. 2564; Riverside Chemical Company, Permit No. 01857 and Solid Waste Registration No. 30446; and/or Chemall, Inc., Permit No. 01857

Attached is an Enforcement Report concerning Sonford Chemical Company, H & R Chemical, Bison Chemical Company, Riverside Chemical Company, and/or Chemall, Inc. with the subject permit status. In preparing and/or reviewing this report, I find that it is accurate and that the proposed recommendations will bring about the correction of those problems which are causing or have caused the violations. Please review this matter for appropriate enforcement action.

C. Clarence W. Moritz

Clarence W. Moritz

See Attachment

INVESTIGATION REPORT

Sonford Chemical Company; H & R Chemical;
Bison Chemical Company; Riverside
Chemical Company and Chemall, Inc.

Sonford Chemical Company, Permit Application Control No. 342; H & R Chemical, no permit, operating for Sonford Chemical Co.; Bison Chemical Company, Permit Application Control No. 2564; Riverside Chemical Company, Permit No. 01857 and Solid Waste Registration No. 30446 and Chemall, Inc., Permit No. 01857.

Chemical Plant of the subject companies is located at the intersection of FM 366 (Pure Atlantic Highway) and Hogaboom Road in Port Neches, Jefferson County, Texas. Area of concern in this investigation is the Jefferson Chemical Outfall Canal and land owned by Jefferson Chemical - leased to Union Carbide, both of which have been found to be contaminated with high concentrations of toxaphene discharged or improperly disposed of in the area. The adjacent Union Carbide land is in Groves, Jefferson County, Texas with the outfall ditch apparently forming the boundary line between Groves and Port Neches.

I. Introduction (by sequential ownership)

A. Identification

1. Sonford Chemical (in operation prior to October 31, 1967 to October 3, 1972):

No treatment system - drains, ditch, sump, and tile pipe to Jefferson Chemical Outfall Ditch

Permit applications pending, Control No. 342 submitted on October 23, 1968, June 30, 1969 and November 20, 1970. Permit application was extended to amend and meet "excellent treatment" requirements by September 30, 1973. Owner filed bankruptcy petition on June 2, 1972. Permit was never issued.

2. H & R Chemical (packaged inventory, only with no discharge, for Sonford Chemical Company from July 5, 1972 to last week in August 1972):

   No treatment system

   No permit (apparently operated under provisions of Chapter 11 of Bankruptcy Act or under orders of the court)

3. Bison Chemical Company (owned plant from October 3, 1972 to February 5, 1974):

   No treatment system

   Permit Application Control No. 2564, submitted application on November 18, 1973

4. Riverside Chemical Company (owned plant from February 5, 1974 to February 17, 1978):

   No treatment system initially. Neutralization of discharge by caustic scrubbers apparently took place after April 26, 1974. On November 8, 1975 all wastewater except boiler blowdown and cooling water were routed to a 600,000 gallon holding pond. On March 2, 1976 the boiler blowdown was routed to the pond. Discharges from the pond were routed to a pit where they joined the cooling water prior to discharge through a clay tile pipe to the outfall ditch. On March 19, 1976 a pit system used for monitoring was sealed, the cooling water recycled and the pond used for holding and evaporation.

The pond was formerly used as a waste slop pit for toxaphene, pentachlorophenol, chlorinated hydrocarbons and calcium chloride wastes.

Permit pending February 5, 1974 to May 22, 1974. Permit No. 01857, May 22, 1974. Permit No. 01857 amended August 31, 1977 and transferred to Chemall, Inc., pending transfer of title, which was finally closed on February 17, 1978. Solid Waste Registration No. 30466, April 12, 1976.

5. Chemall, Inc. (owned plant from February 17, 1978 to date):

No treatment - same as Riverside (recent inspection report to follow).

Permit No. 1857, amended August 31, 1977 and transferred from Riverside Chemical Company to Chemall, Inc., pending transfer of title, which was finally closed February 17, 1978. Note: Letter DW/HCY, Jr./Robert C. Harnden, Riverside Chemical Company on August 2, 1977 relative to holding and evaporation pond (still contaminated) holding both Riverside Chemical and Chemall, Inc. jointly liable for any discharge from pond (pit). Chemall has had no apparent discharge.

B. Current Discharge Parameters (average):

1. Sonford Chemical Company proposed monthly average. Excellent treatment requirements of October 8, 1970 (equivalent to Permit Application Control No. 342):

pH	5.5 - 8.5
Total Residue, mg/l	10,000
Chloride, mg/l	5,000
Sulphate, mg/l	1,000
Total Suspended Solids, mg/l	30
Volatile Suspended Solids, mg/l	10
Settleable Matter, mg/l	5
Immediate Oxygen Demand, mg/l	0.5
Biochemical Oxygen Demand	25
Chemical Oxygen Demand	250
Oil and Grease, mg/l	2
Free and Floating Oil	None
Color APHA Units	20
Temperature °F	90
Debris	None
Phenol, mg/l	5
Flow, mgd	0.580

Toxic Compounds - None in such amounts that will cause the receiving waters to be toxic to human, animal, or aquatic life.

Foaming or Frothing Material - None in such amounts that will cause foaming or frothing of a persistent nature in the receiving waters.

2. H & R Chemical - packaging of inventory only

3. Bison Chemical Company - submitted application November 18, 1973. Processed under Riverside Chemical Company ownership on May 22, 1974.

4. Riverside Chemical Company, Permit No. 01857 dated May 22, 1974

Flow, mgd, not to exceed	.045
Biochemical Oxygen Demand (5 day), lbs/day	10.0
Chemical Oxygen Demand, lbs/day	60.0
Total Suspended Solids, lbs/day	10.0
Oil & Grease, lbs/day	5.0
Toxaphene, lbs/day	0.04
Chlorinated Hydrocarbons as $C Cl_4$, mg/l	3.0 max/day
pH	6 - 9

Solid Waste Registration No. 30406 dated April 12, 1976 - General plant trash & rubble (Class II) off-site - Camphene and waxes (Class I) off-site - Toxaphene (Class I) off-site

Riverside Chemical Company, Permit No. 01857 dated August 31, 1977, as amended (to transfer of title, effective February 17, 1978):

Flow (see Special Provisions below)	
Biochemical Oxygen Demand (5 day), lbs/day	10.0
Chemical Oxygen Demand, lbs/day	60.0
Total Suspended Solids, lbs/day	10.0
Oil & Grease, lbs/day	5.0
Toxaphene, lbs/day	0.0007
Chlorinated Hydrocarbons (as C Cl4) max/day	3.0 mg/l
pH	6.0 - 9.0

5. Chemall, Inc., Permit No. 01857 dated August 31, 1977, as amended (transferred title effective February 17, 1978). Parameters same as Riverside as of August 31, 1977.

C. Special Provisions of Permit:

1. Sonford Chemical Company - No permit

2. H & R Chemical - No permit (operating under Bankruptcy Act)

3. Riverside Chemical Company, Permit No. 01857 dated May 22, 1974 (permit pending February 5, 1974 to May 22, 1974):

Standard provisions for effluent limitations and monitoring requirements including point of discharge; monitoring and reporting pursuant to Board Order No. 69-1219-1; management requirements including change in discharge, non-compliance notification, facilities operation, adverse impact, bypassing, power failures and removed substances.

Removed substances specified that solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State of Texas.

Standard provisions also included responsibilities including right of entry, transfer of ownership or control, availability of reports, permit modifications, toxic pollutants, civil and criminal liability, oil and hazardous substance liability, state and federal laws, property rights, and severability of conditions.

No special provisions were included in Part III, Other Requirements of the May 22, 1974 permit.

Solid Waste Registration No. 30446 dated April 12, 1976 included standard provisions for shipping-control tickets and monthly reporting for off-site disposal of Class I wastes.

Riverside Chemical Co., Permit No. 01857, amended August 31, 1977. Part III, Other Requirements.

All storm water which falls within the boundaries of the plant site shall be considered to be contaminated and will be given full treatment in the treatment plant prior to discharge should samples indicate that the quality of water exceeds these limits:

Parameter (mg/l)	Grab Sample (not to exce
Total Organic Carbon	70
Oil & Grease	15
Toxaphene	0.01
Total Chlorinated Hydrocarbons	0.5

The treatment technology considered to be the minimum necessary to properly treat the wastewaters which are authorized to be discharged by this permit during any period of plant production is considered to be neutralization, API separation, equalization, filtration, carbon adsorption, or ion exchange, or reductive degradation, and only additional treatment or pre-treatment necessary to stabilize biodegradable organic material to within the limits specified by this permit.

An alternative treatment system may be used with prior approval from the Executive Director. No discharge of pollutants to the waters in the State is authorized by this permit unless the pollutant has received treatment in a facility which includes the processes specified above or an approved alternate. This provision applies only to process water and contaminated storm water.

The permittee shall,within 180 days following the approval of this permit, install a permanent flow measuring device equipped to totalize and record measured volume for all discharges from the outfall.

All samples which are taken to characterize the chemical quality of the effluent to be discharged shall be analyzed according to the Environmental Protection Agency method specified in 40 CFR, Part 136. An alternate method of analyses may be used with prior approval of the Executive Director.

II. Waste Load

A. Source:

1. Sonford Chemical Company: Chemical plant producing pentachlorophenol, toxaphene, chlorinated waxes, and calcium chloride, with once through (well) cooling water, steam condensate, caustic scrubbing (sodium hydroxide), boiler blowdown, brine, glycol solvent and with muratic (hydrochloric) acid as a by-product. Discharge was subject to spills, wash down, pipe and valve leaks, and rainfall runoff. Pilot plant operations at plant was unknown; however, as outlined in a later SPCCP (Riverside Chemical Company) warehouse storage included 2, 4, 5-T; 2, 4D, malathion, dinitrophenol, captan, carbaryl, chlorodane, dalapon, diazinon, dimethylamine, diquat, diuron, ethion, guthion, methylparathion, and parathion in addition to toxaphene.

2. H & R Chemical - Packaging inventory for Sonford Chemical Company

3. Bison Chemical Company - Same as Sonford Chemical Company except pentachlorophenol was not being produced, but was in inventory.

4. Riverside Chemical Company: Produced toxaphene, chlorinated waxes, and hydrochloric acid until February 25, 1976 when toxaphene production was discontinued. Inventory of pentachlorophenol was removed following purchase of plant on February 5, 1974. Removal date of toxaphene inventory is unknown; although, in an engineering report (TCB, August 1977) a small inventory was still on hand along with drums containing acetone, epon resin, and diesel oil. Warehouse storage of insecticides status was the same as listed in the SPCCP of June 1976 and in

August 1977 methylparathion, 2, 4D, and 2, 4, 5T were on hand. Status of others was unknown. Have had no process discharges since March 1973; however, storm water runoff contaminated with high concentrations of toxaphene was observed on July 21, 1977 and August 5, 1977.

Samples taken in the facultative holding pond on September 30, 1976 and November 2, 1976, recorded on Chain of Custody Tags IN3753 and IN3789, indicated brown sludge concentrations of 7,400 and 20,000 mg/kg of toxaphene, respectively and in the water of 17.5 and 2.0 mg/l of toxaphene, respectively. Samples of sediment from wet well on January 29, 1976 (IN2620) revealed a toxaphene concentration of 3,916 mg/kg and a pentachlorophenol concentration of 87.7 mg/kg. On July 21, 1977 the pond waters contained 78 mg/l toxaphene and 69.0 mg/l pentachlorophenol.

5. Chemall, Inc.: Produced parafins and chlorinated waxes and oils for the linoleum industry with muratic (hydrochloric) acid as a by-product. Holding and evaporation pond still contained toxaphene sludges on August 5, 1977; however, the company has made no discharges of wastewaters and have no toxaphene in inventory. A recent inspection report is in progress.

B. Quantity and Quality of Waste from each Source:

1. Sonford Chemical Co.: Boiler blowdown (1%), domestic sewage (septic tank to inadequate drain field), cooling water (94%), process water (0.0%), intermittant wash up water (5.0%) - unit clean-up, small product spills, ruptured pipeline and flanges, and rainfall runoff.

Flow	0.06 - 0.55 mgd
pH	0.9 - 11.0 (neutralizing with brine)
Phenols	0.4 - 68 mg/l
Cond.	1808 - 81,144 umhos/cm
TSS	<10 - 652 mg/l
VSS	6 - 90 mg/l
BOD	24 - 230 mg/l
DO	0.8 - 7.5 mg/l
COD	113 - 4330 mg/l (interference)
Chlorides	13,300
Oil & Grease	7.8 mg/l

Production rates: Pentachlorophenol - 10,000 pounds/yr (2/18/70)
Planned expansion to 18,000,000 pounds/yr (5/70)
Leading producer of toxaphene

2. H & R Chemical: Packaging inventory for Sonford Chemical while under bankruptcy investigation.

3. Bison Chemical Co.: Same as Sonford Chemical Co. except pentachlorophenol was discontinued.

Flow	0.37 mgd
pH	2.0
Cond.	34,944 umhos/cm
TSS	2,800 mg/l
BOD	25 mg/l
COD	<0.2 mg/l
Phenols	<0.05 mg/l
Oil & Grease	1.6 mg/l

On January 23, 1973 a contractor from Denver, Colorado was in process of removing approximately 100,000 pounds of off-grade toxaphene and pentachlorophenol left by Sonford and shipping it to Colorado. Planned to tear down pentachlorophenol unit, old toxaphene unit, and build a new toxaphene unit.

On October 2, 1973 attempting tear down and to rebuild old corroding plants with considerable progress. Still had 158 drums and some partially filled tanks on hand, utilizing Class I sites.

On October 24, 1973 indicated they had gotten rid of 40 drums of PCP but still had 400 more belonging to Dr. Hatcher of Sonford.

4. Riverside Chemical Company: Producing 5-6,000,000 pounds per year of toxaphene, 2,000,000 pounds per year of chlorinated paraffins, and 12,000,000 pounds per year of muratic (hydrochloric) acid. Estimated 1 ppm or less of toxaphene, 1 ppm or less chlorinated paraffins and 5-10 ppm or less hydrochloric acid in waste. Survey of August 6, 1974 (BM, 11/6/74) gives breakdown of boiler blowdown, storm water runoff, cooling water, acid tank wash, caustic scrubber and final plant effluent. Chlorides 5100 mg/1, TSS 256 mg/1, and pH 10.0 were in violation of Permit No. 01857. Toxaphene was 5.25 mg/1 in storm water runoff.

From April 26, 1974 to December 5, 1975 pollutants in excess of Column II effluent limitations specified on page 11 of Permit No. 01857 were allowed on 85 separate occassions to discharge. Eighteen (18) violations of toxaphene (0.52 - 16.2 mg/1) occurred between the period of October 29, 1975 to December 11, 1974. Seven TDS violations ranged from 4,163 to 26,310 mg/1. Eleven oil and grease violations ranged from 21 to 260 mg/1. Seven BOD violations ranged from 83 mg/1 to 2,052 mg/1. Twenty pH violations ranged from a pH of 1.4 to 13.3. Two COD violations of 414 and 1,120 mg/1 also occurred. District 6 inspection of September 29, 1975 revealed non-compliance discharge violations of pH (9.4), oil and grease (188 mg/1), TSS (92 mg/1) and Toxaphene (2.08 mg/1).

III. Treatment System

A. Description of System:

1. Sonford Chemical Company: No treatment system - gravity flow to drains to sump to ditch to pit to 10" clay tile pipe to Jefferson Chemical Outfall Canal. No control of storm water runoff. Slop pit (600,000 gal.) utilized for waste disposal of toxaphene, pentachlorophenol, chlorinated hydrocarbons and calcium chloride.

2. H & R Chemical: No treatment system - same as Sonford Chemical Company - said to be packaging inventory only.

3. Bison Chemical Company: No treatment - same as Sonford Chemical Company.

4. Riverside Chemical Company: No treatment system - initially same as Sonford Chemical Company. Neutralization of discharge by caustic occurred after April 26, 1974. On November 8, 1975 all wastewaters except boiler blowdown and cooling water were routed to 600,000 gallon waste pond, thence to a monitoring pit where the discharge was joined by cooling water and boiler blowdown prior to discharge through 10" clay tile pipe through a levee to the Jefferson Chemical Outfall Ditch. On March 2, 1976 the boiler blowdown was routed to the holding and evaporation pond. On March 19, 1976 the pit system used for monitoring was sealed and the cooling water recycled. Outfall 001 was filled and no apparent discharges other than in storm water runoff occurred after March 1977. Only the contaminated holding and evaporation pond was utilized for wastewaters were routed to a caustic scrubber thence to a common pump utilized also for wash down wastewaters and runoff from the railroad tank car loading area prior to discharging to holding and evaporation pond and/or a back-up surge tank.

5. Chemall, Inc.: Inspection report in progress - apparently no change from Riverside Chemical Co.

V. Construction Grants - Not Applicable

VI. Previous Citations and Other Enforcement Orders

1. Sonford Chemical Co.: Shut down for two months in the summer of 1971 in the face of a Texas Air Control Board order for immediate compliance with the Clean Air Act. Suit filed in February 1972 by Jefferson County for alledged air pollution problems.

2. H & R Chemical - No action

3. Bison Chemical Co.: Referred to Attorney General on October 15, 1973 by the Texas Water Quality Board for illegal discharges without a Waste Control Order - under litigation October 19, 1973. Cause D99641, 136th Judicial Court, Jefferson County - judgment 12/13/73 resulted in a civil penalty of $2,500 and that the defendant be permanently enjoined from violating the Texas Water Quality Act.

4. Riverside Chemical Co.: District 6, CWM/GS, October 24, 1975 requested enforcement action for continued non-compliance of Permit No. 01857 and violation of the Texas Water Quality Act. Enforcement Order 75-26 effective May 26, 1976 required in general:

   a. Immediate compliance with the reporting, monitoring and sampling requirements of Permit No. 01857 and Board Order No. 69-1219-1;

b. By July 1, 1976 a flow measuring device installed on Outfall 001;

c. By July 1, 1976 an SPCCP prepared by a professional engineer experienced in industrial wastewater control technology;

d. By July 1, 1976 a plan to eliminate any contaminated storm water discharge, prepared by a registered professional engineer, and submitted to the Executive Director of the Texas Water Quality Board for approval; and

(1) Within 90 days of approval of the plan - eliminate such storm water discharges;

(2) By no later than July 1, 1977 reduce oil and grease to not more than 15 mg/l and TOC to not more than 35 mg/l in contaminated storm water.

e. By July 1, 1976 eliminate septic tank discharge of domestic sewage;

f. By December 1, 1976 submit plans and specifications to limit discharges of toxaphene to 0.01 mg/l for any single grab sample, prepared by a registered professional engineer, to the Executive Director of the Texas Water Quality Board for approval; and

(1) Submit an application to amend Permit No. 01857 to reflect the modifications that are necessary to limit the discharge of toxaphene;

g. By July 1, 1977 complete all construction necessary to meet the conditions of the permit and/or an appropriately amended permit.

On June 6, 1977 all items of Enforcement Order 76-26 were said to be completed (R.C. Harnden/HCY, Jr.); however, follow-up inspections on July 21, 1977 and August 5, 1977 revealed toxaphene in storm water runoff in violation of Items 4, 6 and 7 of the order.

5. Chemall, Inc.: No action taken - inspection report in progress. Note: Letter DW/HCY, Jr./ Robert C. Harnden, Riverside Chemical Co. held Riverside Chemical Co. and the purchaser (Chemall, Inc.) jointly liable for any discharge from the pit (holding and evaporation pond).

VII. Violations (sequential table)

Violation	Data Source	Permit or Other Requirement
Sonford Chemical Co.: Discharging wastewaters to the waters of the State without a Waste Control Order	District 6 inspection of 1967(1), 1968(2), 1969(4) and 1971(2)	Section 21.251 of the Texas Water Code
Bison Chemical Co.: Discharging highly acidic wastewaters to the waters of the State without a Waste Control Order on 01/23/73	Dist. 6 inspection (LH) report of 03/29/73	Section 21.25[illegible] of the Texas Water Code

Violation	Data Source	Permit or Other Requirement
Eastman Kodak B-11 solvent spill (1400 gal.) and diesel fuel (100 gal.) spills on 06/12/73	Dist. 6 report AG/ JBL (KJ) 07/11/73	Section 21.251 of the Texas Water Code
Hydrochloric acid spill (4500 gal.) on 10/02/73	Dist. report AT/JBL (KJ) 10/09/73	Section 21.251 of the Texas Water Code
Hydrochloric acid spill (8,000 gal.) on 10/08/73	Dist. report AT/JBL (KJ) 10/09/73	Section 21.251 of the Texas Water Code
Riverside Chemical Co.: 08/06/74 - non-compliant with chlorides, TSS, and pH with 5.25 mg/l of toxaphene in storm water runoff	District 6 survey BM, 11/06/74	Permit No. 01857; Sec. 21.251 of Texas Water Code or Part II, Sec. 5 of Permit No. 01857
04/26/74 to 12/05/75 85 separate violations of non-compliance - toxaphene (18), TDS (7), oil & grease (11), BOD (7), pH (20), COD (2), TSS (20)	Dist. 6 enforcement presentation, 02/12/76	Permit No. 01857, Col. II, p. 11
09/29/75 - non-compliance with pH, oil and grease, TSS, toxaphene and possible contaminated storm water outfalls	Dist. 6 inspection of 09/29/75	Permit No. 01857, Col. II, p. 11

Violation	Data Source	Permit or Other Requirement
No flow device	Dist. 6 enforcement presentation 02/12/76	Permit No. 01857, Board Order 69-1218-1
Failure to collect samples of final effluent monitoring point	Dist. 6 inspection of 09/29/75	Permit No. 01857
Failure to collect composite samples representative of volume and nature of monitored discharge	Dist. 6 inspection of 09/29/75	Permit No. 01857 Monitoring Requirements
Failure to collect any composite samples for the purpose of self-reporting for August 1975	Dist. 6 inspection of 09/29/75	Permit No. 01857 and Board Order No. 69-1219-1
Failed to collect required number of weekly composite samples for toxaphene and chlorinated hydrocarbons	Dist. 6 inspection of 09/29/75	Permit No. 01857 Monitoring Requirements
Unpermitted discharge from inadequate domestic tank system	Dist. 6 inspection of 09/29/75	Permit No. 01857, Part II, Sec. 5 or Sec. 21.251 of Texas Water Code
01/22/76, pH non-compliant	Dist. 6 inspection of 01/22/76	Permit No. 01857

Violation	Data Source	Permit or Other Requirement
Jan. 1976 - non-compliant in pH max. and toxaphene	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
Feb. 1976 - non-compliant in pH max., 13 pH violations, COD (mg/1), not reporting toxaphene and chlorides	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
Discharging storm water containing high concentrations of toxaphene on 08/05/77 and 07/21/77	Dist. inspection report of 11/28/77	Enforcement Order 76-26, Items 4, 6, and 7 and Permit No. 01857
Mar. 1976 - non-compliant in pH max., 4 pH violations, TSS avg. (#s), BOD avg. (#s), oil & grease (mg/1) and avg. (#s), chlorides mg/1 (3), TDS mg/1 (3)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
April 1976 - non-compliant with toxaphene mg/1 (3), TDS mg/1 (4), and chlorides mg/1 (4)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1

Violation	Data Source	Permit or Other Requirement
May 1976 - non-compliant in TSS, avg. (kg/day), toxaphene (kg/day) and (mg/1) TDS mg/1 (4), chlorides mg/1 (4)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
June 1976 - non-compliant in TSS, avg. (kg/day), toxaphene, avg. (kg/day) and max. (kg/day)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
Oct. 1975 - July 1976 not reporting chlorinated hydrocarbons analyses	Self-Reporting	Permit No. 01857 and Board Order 69-1219-1
Sept. 30, 1976 - bypassing treatment system with domestic wastewater	Dist. 6 inspection of 09/30/76	Permit No. 01857, Part II, Sec. 5 and/or Sec. 21.251 of the Texas Water Code and Enforcement Order 76-25, Item 5

VIII. Causes of Violations

1. Sonford Chemical Co.: Discharging wastewaters on District 6 inspections of 10/31/67, 02/14/68, 04/09/68, 03/04/69, 04/01/69, 04/17/69, 09/23/69, 04/26/71, and 11/03/71 without a permit. Operations were production oriented with poorly designed and corroded units resulting in pipe and valve leaks and spills with apparent conscious disregard to the Texas Water Code and the Clean Air Act

in addition to poor housekeeping and disregard for the environment. In general, operations were "damn" sloppy.

2. Bison Chemical Co.: Discharging wastewaters on District 6 inspection of January 23, 1973 without a permit. Tank truck ran over and broke solvent line to solvent tank, then backed-up and ruptured fuel tank on June 12, 1973. Hydrochloric acid spill resulted on October 2, 1973 when valve or tank broke. Hydrochloric acid spill resulted on October 8, 1973 when Durakne resin tank ruptured and gave way. Bison Chemical Co. inherited the problems of housekeeping and corroded units from Sonford Chemical Company in addition to a large inventory which was still owned by Sonford Chemical Co. Bison tore down the old toxaphene and pentachlorophenol units and built a new toxaphene unit. In the process they contracted for disposal of 100,000 pounds of off-grade to a Denver, Colorado contractor about March 29, 1973. On September 13, 1973 Bison Chemical Co. needed 630 yards hauled off with that much to go. Operating personnel were essentially the same except for management. Bison Chemical felt that no treatment was needed.

3. Riverside Chemical Co.: Inherited Sonford Chemical Co.'s mess in addition to essentially some operating personnel, except for management. Neither the corporate structure nor the management had regard for the Texas Water Code and/or their permit which did result in the numerous violations of their permit until the enforcement hearing on February 22, 1976. The company did make an attempt to stop the discharges of wastewaters and contaminated

storm water under the enforcement order; however, like its predecessors did not believe treatment was necessary. Toxaphene production was stopped on February 25, 1976; however, inventories were on hand and the contaminated holding and evaporation pond remained without clean-out when sold to Chemall, Inc.

4. Chemall, Inc.: Retained essentially the same operating personnel. Delayed purchase of the plant from August 31, 1977 (date of amended permit and transfer to Chemall, Inc.) to February 17, 1978 due to apparent financial status. Provisions of amended permit require treatment and apparently no treatment has been implemented as there has been no discharge reported from the plant since March 1977. A District inspection was planned prior to learning of a toxaphene disposal problem from past operations on May 15, 1979 through an indirect complaint. The toxaphene determination due to this problem and as a result of a recent inspection, should determine Chemall's present status.

Recommendations

This investigation was made in an attempt to assess the party and/or parties responsible for past disposal of toxaphene in high concentrations in Jefferson Chemical Company Outfall Ditch (Permit No. 00585-02 used formerly for process wastewaters and now used for uncontaminated storm water runoff) and onto adjacent property leased by Jefferson Chemical Co. to Union Carbide Corporation, Linde Division, Groves. Soil from construction of the latter plant was delivered to Block Sand Pit, Port Arthur and to Keown Supply Co., Port Neches for use as topsoil, which has in part ended up on several yards and in gardens ultimately leading to a complaint

resulting in back tracking to the source. It has not at this point been determined as to whether or not the toxaphene was dredged from the ditch and/or dumped indiscriminately onto the adjacent property. It has, however, been determined that discharges containing high concentrations of toxaphene did occur through the period prior to October 31, 1967 through February 25, 1976 when toxaphene production was stopped or when pumping from the pond stopped on March 5, 1976, and/or when the pit system used for monitoring was sealed on March 19, 1976. This places the former owners - Sonford Chemical Company, H & R Chemical, Bison Chemical Co., and Riverside Chemical Co. and the operators, some serving in supervisor capacity for several of the companies as the potential responsible parties. Riverside Chemical Company continued to violate Enforcement Order 76-26 and Permit No. 01857 for the period of May 27, 1976 to September 30, 1976. It is therefore recommended that:

1. Sonford Chemical Company, H & R Chemical, Bison Chemical Co. and Riverside Chemical Co. be held responsible for the toxaphene disposal and violations of the Texas Water Code and/or the Solid Waste Act for which Union Carbide has and Jefferson Chemical may (unknown at this writing) assume the responsibility for clean-up.

2. The responsible companies listed in No. 1 above should also assume responsibility for any future violations of the Texas Water Code and/or the Solid Waste Act.

3. That Riverside Chemical Co. be held responsible for further violations of Permit No. 01857 and Enforcement Order 76-26 and be subject to appropriate enforcement action.

4. That Chemall, Inc. implement the conditions and special provisions of Permit No. 01857, as amended on August 31, 1977 and effectively transferred to them on February 17, 1978, not withstanding any further violations found in the recent inspection for which the report is incomplete at this writing.

5. That should further violations of storm water runoff in and/or adjacent to the plant be found, Chemall, Inc. shall assume the responsibility of clean-up and appropriate correction.

6. That should the holding pond and/or evaporation pond contain high concentrations of toxaphene in the water or sediment samples of the sludge, Chemall, Inc. shall take immediate steps to clean and dispose of the ponds contents in an approved Class I site suitable for that disposal.

ATTACHMENT 1

TEXAS WATER QUALITY BOARD
P.O. Box 13246, Capitol Station
Austin, Texas 78711

ENFORCEMENT ORDER NO. 76-26

AN ENFORCEMENT ORDER of the Texas Water Quality Board setting out findings of fact and conclusions of law with regard to violations of Permit No. 01857 by Riverside Chemical Company and specifying corrective measures to be taken by the company.

WHEREAS, a public Enforcement Hearing was held before a Hearing Commission of the Texas Water Quality Board on February 11, 1976 at Beaumont, Texas for the purpose of exploring the status of compliance by Riverside Chemical Company with the terms and provisions of Permit No. 01857; and

WHEREAS, Riverside Chemical Company was duly represented at the Enforcement Hearing of which notice had been given through letter and publication;

THE TEXAS WATER QUALITY BOARD MAKES THE FOLLOWING FINDINGS OF FACT BASED ON INFORMATION AND TESTIMONY PRESENTED AT THE ENFORCEMENT HEARING:

1. Riverside Chemical Company owns and operates a toxaphene and chlorinated paraffin manufacturing plant located at the intersection of FM Road 366 and Hogaboom Road in Port Neches, Jefferson County, Texas. The company is authorized by Permit No. 01857 to discharge industrial wastes into the Jefferson County Canal and thence into the Neches River.

2. The company has not provided a flow measuring device at Outfall 001. The self reporting instructions adopted pursuant to Board Order No. 69-1219-1 require that measurements of flow be taken at certain intervals. Accurate reporting of flow is not possible without a flow measuring device.

3. The company has failed to collect samples of the final effluent at the monitoring point specified in the permit. Permit No. 01857, Part A. states that samples taken in compliance with specified monitoring requirements shall be taken at Outfall 001, the point of discharge of plant effluent into the Jefferson County Canal.

4. The company has failed to collect the required number of

ATTACHMENT 1

weekly composite samples for toxaphene and chlorinated hydrocarbon concentrations in its final effluent. Permit No. 01857, Part A. requires that two (2) 24-hour composite samples of toxaphene and chlorinated hydrocarbons be taken each week.

5. On many occasions since May 22, 1974, the company has discharged effluent in excess of 0.5 milligrams per liter (mg/l) toxaphene, 70 mg/l suspended solids, 3500 mg/l total dissolved solids, 20 mg/l oil and grease, 70 mg/l biochemical oxygen demand (BOD), and 6.0-9.0 standard units pH. The Other Requirements section of Permit No. 01857 specifies grab sample limits for the following quality parameters: 0.5 mg/l toxaphene, 70 mg/l suspended solids, 3500 mg/l total dissolved solids, 20 mg/l oil and grease, and 70 mg/l BOD. Part A of Permit No. 01857 specifies a pH of 6.0-9.0 standard units.

6. The company has not provided the treatment facilities necessary to meet the effluent requirements of Permit No. 01857.

7. Partially treated domestic sewage is periodically discharged from a septic tank system on the company's property into a public drainage ditch. This discharge is not authorized by a permit or other order of the Texas Water Quality Board.

8. The company has not taken adequate measures to prevent the occurrence of spills of hazardous materials on the plant property. The spill areas, if not segregated from the uncontaminated areas and controlled, pose a threat of pollution to the waters of the state.

9. Notice of the Enforcement Hearing at which alleged violations of Permit No. 01857 by Riverside Chemical Company were considered was mailed on January 13, 1976 and published in a newspaper of local circulation on January 22, 1976. The Enforcement Hearing was held on February 11, 1976.

THE TEXAS WATER QUALITY BOARD MAKES THE FOLLOWING CONCLUSIONS OF LAW BASED ON THE FOREGOING FINDINGS OF FACT AND IN ACCORDANCE WITH THE REQUIREMENTS AND POLICIES OF CHAPTER 21 OF THE TEXAS WATER CODE:

ENFORCEMENT ORDER

NO. 76-26

1. Failure by the company to provide a flow measuring device at Outfall 001 is a violation of Board Order No. 69-1219-1 and the instructions adopted thereto. Violation of a Board order contravenes Section 21.251(c) of the Texas Water Code which prohibits the discharge of any waste or the performance of any activity in violation of any permit or order of the Texas Water Quality Board.

2. Failure by the company to collect samples of the final effluent at the monitoring point specified in Part A. of Permit No. 01857 violates that permit provision and also violates Section 21.251(c) of the Texas Water Code.

3. Failure by the compnay to collect the required number of composite samples for toxaphene and chlorinated hydrocarbons as specified in Part A. of Permit No. 01857 contravenes that permit provision and also contravenes Section 21.251(c) of the Texas Water Code.

4. The discharge by the company of effluent containing concentrations of toxaphene, suspended solids, total dissolved solids, oil and grease and BOD in excess of grab sample limits specified by Permit No. 01857 violates those permit specifications and also violates Section 21.251(c) of the Texas Water Code.

5. The unauthorized discharge of partially treated sewage from a septic tank system on the company's premises contravenes Section 21.251(a) of the Texas Water Code which states that except as authorized by a permit or other order of the Texas Water Quality Board, no person may discharge sewage into or adjacent to any water in the state.

6. Violations of Permit No. 01857 by Riverside Chemical Company and related matters were considered at an Enforcement Hearing held in accordance with the Texas Water Quality Board's Rules of Practice and ocedure and the Texas Water Code. Now, therefore,

BE IT ORDERED BY THE TEXAS WATER QUALITY BOARD THAT:

ENFORCEMENT ORDER

NO. 76-26

1. Effective immediately, Riverside Chemical Company shall comply with the reporting, monitoring and sampling requirements of Permit No. 01857 and Board Order No. 69-1219-1.

2. By not later than July 1, 1976, Riverside Chemical Company shall install on Outfall 001 a permanent flow measureing device.

3. By not later than July 1, 1976, Riverside Chemical Company shall submit to the Executive Director of the Texas Water Quality Board a spill prevention control and countermeasure plan prepared by a registered professional engineer experienced in industrial wastewater control technology.

4. By not later than July 1, 1976, Riverside Chemical Company shall submit to the Executive Director of the Texas Water Quality Board for approval a plan prepared by a registered professional engineer to eliminate any storm water discharges from its property contaminated with detectable amounts of toxaphene, pentachlorophenol or any chlorinated hydrocarbon. All such storm water discharges shall be eliminated within 90 days of approval of the plan. In addition, the company shall by not later than July 1, 1977, reduce concentrations of oil and grease and total organic carbon in contaminated storm water to not more than 15 mg/l and 35 mg/l, respectively.

5. By not later than July 1, 1976, Riverside Chemical Company shall eliminate the discharge of inadequately treated domestic sewage from a septic tank system located on the company's property.

6. By not later than December 1, 1976, Riverside Chemical Company shall submit to the Executive Director of the Texas Water Quality Board for approval plans and specifications prepared by a registered professional engineer to limit discharges of toxaphene to 0.01 mg/l for any single grab sample; upon submission of the plans and specifications, Riverside Chemical Company shall also submit an application to amend Permit No. 01857 to reflect the modifications that are necessary to limit the discharge of toxaphene.

ENFORCEMENT ORDER

NO. 76-26

7. By not later than July 1, 1977, Riverside Chemical Company shall complete all construction necessary to meet the conditions of the permit and/or an appropriately amended permit.

APPROVED AND ISSUED THIS, THE 27TH DAY OF MAY, 1976.

TEXAS WATER QUALITY BOARD

J. Douglass Toole, Chairman

(Seal)

ATTEST:

Hugh C. Yantis, Jr., Executive Director

RIVERSIDE CHEMICAL COMPANY
TOXAPHENE SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
10/29/75	.76 mg/l	.5 mg/l
5/07/75	.54 mg/l	.5 mg/l
4/17/75	1.4 mg/l	.5 mg/l
4/11/75	1.7 mg/l	.5 mg/l
4/03/75	2.8 mg/l	.5 mg/l
3/27/75	1.4 mg/l	.5 mg/l
3/20/75	1.9 mg/l	.5 mg/l
3/14/75	1.1 mg/l	.5 mg/l
2/19/75	.86 mg/l	.5 mg/l
2/12/75	.95 mg/l	.5 mg/l
2/07/75	2.05 mg/l	.5 mg/l
1/30/75	2.14 mg/l	.5 mg/l
1/22/75	5.9 mg/l	.5 mg/l
1/10/75	1.25 mg/l	.5 mg/l
1/17/75	1.27 mg/l	.5 mg/l
12/31/74	1.6 mg/l	.5 mg/l
12/26/74	16.2 mg/l	.5 mg/l
12/11/74	9.2 mg/l	.5 mg/l

TABLE II
RIVERSIDE CHEMICAL COMPANY
SUSPENDED SOLIDS SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
4/23/75	186 mg/l	70 mg/l
3/27/75	75 mg/l	70 mg/l
3/17/75	156 mg/l	70 mg/l
2/28/75	259 mg/l	70 mg/l
2/12/75	234 mg/l	70 mg/l
1/22/75	314 mg/l	70 mg/l
1/14/75	262 mg/l	70 mg/l
12/26/74	900 mg/l	70 mg/l
11/27/74	108 mg/l	70 mg/l
10/23/74	268 mg/l	70 mg/l
9/25/74	206 mg/l	70 mg/l
9/11/74	529 mg/l	70 mg/l
3/27/75	75 mg/l	70 mg/l
2/12/75	234 mg/l	70 mg/l
1/22/75	260 mg/l	70 mg/l
9/25/74	206 mg/l	70 mg/l
8/08/74	81 mg/l	70 mg/l
7/26/74	82 mg/l	70 mg/l
5/01/74	152 mg/l	70 mg/l
4/26/74	119 mg/l	70 mg/l

TOTAL DISSOLVED SOLIDS SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
7/25/75	15,927 mg/l	3500 mg/l
7/23/75	4,163 mg/l	3500 mg/l
7/21/75	26,310 mg/l	3500 mg/l
9/12/74	6,720 mg/l	3500 mg/l
9/11/74	16,800 mg/l	3500 mg/l
9/06/74	18,400 mg/l	3500 mg/l
9/05/74	25,800 mg/l	3500 mg/l

TABLE IV
RIVERSIDE CHEMICAL COMPANY
OIL AND GREASE SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENTS
12/03/75	21 mg/l	20 mg/l
11/07/75	108 mg/l	20 mg/l
11/06/75	25 mg/l	20 mg/l
10/01/75	86 mg/l	20 mg/l
9/24/75	260 mg/l	20 mg/l
9/12/75	114 mg/l	20 mg/l
8/20/75	27 mg/l	20 mg/l
2/12/75	106 mg/l	20 mg/l
1/22/75	230 mg/l	20 mg/l
1/14/75	40 mg/l	20 mg/l
12/26/74	75 mg/l	20 mg/l

TABLE V
RIVERSIDE CHEMICAL COMPANY
BIOCHEMICAL OXYGEN DEMAND SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
10/29/75	2,052 mg/l	70 mg/l
10/22/75	2,000 mg/l	70 mg/l
10/03/75	1,150 mg/l	70 mg/l
10/01/75	83 mg/l	70 mg/l
7/15/75	185 mg/l	70 mg/l
1/22/75	260 mg/l	70 mg/l
7/26/74	240 mg/l	70 mg/l

TABLE VI
RIVERSIDE CHEMICAL COMPANY
pH SAMPLES

DATE	SAMPLE CONCENTRATION	EFFLUENT LIMITATION
12/05/75	10.0	6.0-9.0
12/03/75	10.96	6.0-9.0
11/14/75	10.8	6.0-9.0
11/12/75	11.6	6.0-9.0
11/11/75	10.9	6.0-9.0
10/31/75	11.5	6.0-9.0
10/29/75	12.73	6.0-9.0
9/24/75	9.99	6.0-9.0
9/12/75	10.43	6.0-9.0
8/27/75	4.94	6.0-9.0
8/20/75	9.55	6.0-9.0
5/7/75	10.64	6.0-9.0
4/23/75	13.2	6.0-9.0
3/27/75	10.0	6.0-9.0
11/27/74	10.5	6.0-9.0
11/13/74	13.3	6.0-9.0
10/23/74	10.5	6.0-9.0
9/25/74	9.8	6.0-9.0
9/11/74	13.6	6.0-9.0
4/26/74	1.4	6.0-9.0

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Harry D. Boudreaux, District 6 Supervisor, DATE: April 14, 1983
District 6 Office

THRU :

FROM : Gary D. Schroeder, Chief, Solid Waste and Spill Response Section,
Enforcement and Field Operations Division

SUBJECT: Enforcement Action - Texaco Chemical Company
Registration No. 30029

A memorandum regarding the above subject has been received by this office. The matter has been assigned to Mr. Mike Dick of the Solid Waste Compliance Unit for necessary action. I understand that Mr. Michael Moore is the field representative dealing with this matter, and Mike will contact Michael in due course. Meanwhile, if you or Michael have any questions or additional information, please feel free to contact Mike directly.

Gary D. Schroeder

BWD:tm

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APR 18 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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George W. McCleskey, Vice Chairman
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Lonnie A. "Bo" Pilgrim
Louie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Lee B. M. Biggart, Chairman
Felix McDonald
John D. Stover

May 26, 1983

Mr. M. J. Adair
Commissioner
Drainage District No. 7
4401 9th Street
Port Arthur, Texas 77640

Dear Commissioner Adair:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal;
Solid Waste Registration No. 30029

The purpose of this letter is to summarize the meeting held May 19, 1983. This meeting was held to discuss the disposal of dredge spoil from Jefferson Canal. It is the Department's understanding that the parties present would review the analytical data submitted at the meeting and contact the Department by June 9, 1983 with their respective entities' intentions regarding this matter. Therefore, the Department fully expects a response by this date. If you have any questions in the interim, please contact Mr. Michael Dick at 512/475-5516.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD:rn

ccs: Ms. Mary Reagan, Office of the General Counsel
Texas Department of Water Resources District 6 Office

RECEIVED
MAY 31 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

June 30, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P. O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil From Jefferson Canal

This letter is written in response to your letter of June 7, 1983, indicating that your company needed additional time to evaluate the issues discussed in our May 19, 1983 meeting. The Department expects the response requested in that meeting to be submitted no later then July 5, 1983.

The Department appreciates your attention to this matter and if you have any questions, please contact Mr. Michael Dick at 512/475-5516.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

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JUL 05 1983
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WATER RESOURCES
DISTRICT 6

MGD:rn

ccs: Office of the General Counsel
Texas Department of Water Resources District 6 Office

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Enforcement Coordinators DATE: August 3, 1983

THRU: Gary D. Schroeder, Chief
Solid Waste and Spill Response Section
Enforcement and Field Operations Division

FROM : Mike Dick, Solid Waste Compliance Unit,
Solid Waste and Spill Response Section

SUBJECT: Enforcement Notice - Texaco Chemical Company, Registration No. 30029 and Drainage District No. 7

The Solid Waste Compliance Unit is reviewing Texaco Chemical Company and Drainage District No. 7 for enforcement action. Please review the attached investigation report and provide your comments in writing within 10 days to me.

Mike Dick

Mike Dick

MGD:rn

Attachment

ccs: Office of the General Counsel
Texas Department of Water Resources District 6 Office

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AUG 05 1983
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WATER RESOURCES
DISTRICT 6

INVESTIGATION REPORT

Texaco Chemical Company
Registration No. 30029
P.O. Box 847
Port Neches, Texas 77651

I. Introduction

A. Identification

1. Name of facility: Texaco Chemical Company

2. Location: Farm Road 366, Port Neches, Texas

B. Permits and Registrations

1. Permits: WCO No. 00585; TX0005606

2. Registration: 30029

C. Permit provisions: Texaco Chemical Company is a petrochemical plant which manufactures the following organic chemicals: ethylene/propylene, ethylene oxide, ethylene glycols, propylene glycols, glycol ethers, morpholine, diglycoamine, oil additive TC-9781, nonylphenols, ethanolamines, and ethylene oxide/propylene oxide adducts. Wastewater permits control discharge of uncontaminated storm water only. Outfall is into Jefferson Canal at Hogaboom Road (NPDES Outfall 002 is the same as Texas Department of Water Resources (TDWR) Outfall 001). Process wastewater is treated at the Neches Butane Products Company regional treatment facility (Permit No. 00511).

D. Background information: The Jefferson Canal, from Hogaboom Road to Star Lake, is located on property owned by Texaco Chemical Company (formerly Jefferson Chemical Company). Other background information, including previous owners of the facility which is a suspected contributor to the contamination of the Jefferson Canal, is contained in the attached reports dated August 13, 1979, August 17, 1979, and November 27, 1979 (enforcement action against one of these companies, Chemall, Inc., was resolved in the Agreed Final Judgement, Cause No. D116345, 136th Judicial District Court, Jefferson County, Texas, signed on December 13, 1982).

II. Waste Handling Facility

A. Type of facility: Drainage ditch

B. Description of facility: The drainage ditch runs from Hogaboom Road to Farm Road 366, between Chemall, Inc. and Union Carbide; thence below Farm Road 366 to Star Lake (see attached map). The ditch is approximately 15 feet deep and 50 feet wide at the top. The distance between Hogaboom Road and Star Lake is approximately one mile. In past years, various wastes were discharged to the ditch, including untreated toxaphene and pentachlorophenol process wastes. During the past two months, the ditch between Farm Road 366 and Star Lake was dredged, and the contaminated

dredgings were placed along the north bank of the ditch.

III. Water Quality Impact

A. Surface water: Samples were collected at the railroad crossing below Farm Road 365 on March 23, 1983 after a 2.5-inch rain (Chain of Custody (COC) Tag Numbers SW 02094 and SW 02096). Laboratory analysis results for these samples will be forwarded in an addendum report when received by this office.

B. Ground water: Unknown; no shallow wells have thus far been identified in the area.

IV. Previous enforcement: See attached reports dated August 13, 1979, November 27, 1979, and Agreed Final Judgement dated December 13, 1982.

V. Violation

Violation	Data Source	Permit or Other Requirement
Disposal of hazardous wastes in such a manner so as to cause the discharge or imminent threat of discharge of wastes into or adjacent to the waters in the State.	Reports dated 08/13/79, 08/17/79, and 11/27/79; COC Tag Nos. SW 02090, SW 02091, SW 02094, and SW 02096 (pending).	Texas Solid Waste Disposal Act; Texas Water Code

VI. Causes of violation: For an undetermined period of time, Jefferson Chemical Co. (presently owned by Texaco Chemical Co.) and/or the various owners and operators of the facility now owned by Chemall, Inc. disposed of wastes and contaminated wastewater into the Jefferson Canal, which is located on property owned by Texaco Chemical Company. On August 3, 1979 Texaco Chemical Company was requested by TDWR to remove the contaminated materials from the ditch, but the request was refused by the company (see interoffice memorandum dated 11/27/79, S. Cook to B. Bigelow). On March 21, 1983 TDWR District 6 representatives Michael Moore and Wesley Newberry inspected the ditch and collected sediment samples. The samples were observed to have a strong aromatic odor characteristic of phenolic compounds (COC Tag No. SW 02090). A sample was also collected from soil which had recently been dredged from the ditch below Farm Road 366 and it was observed that this material had a similar odor (COC Tag No. SW 02091). During a follow-up inspection conducted on March 23, 1983 it was observed that rainfall runoff from the dredge disposal area was entering the canal. A sample of the runoff was collected and it also had a strong phenolic odor (COC Tag No. SW 02094). It appears probable that hazardous waste including toxaphene and pentachlorophenol, are being discharged to the waters of the State from the sediments in the canal and from the dredgings which were recently disposed along the bank of the canal.

VII. Technical Recommendations

A. It is recommended that, within 20 days, Texaco Chemical Company remove all contaminated dredgings from the bank of the Jefferson Canal and dispose of such wastes in an approved facility.

B. It is recommended that, within 30 days, Texaco Chemical Company determine the extent of contamination present in the sediments of the Jefferson Canal and Star Lake; and within 60 days, remove all contaminated sediment and dispose of such wastes in an approved facility.

C. It is recommended that, during the course of the cleanup activities, adequate measures be taken to prevent further discharges of hazardous wastes, via rainfall runoff and mixing of sediments with canal water, to the waters of the State.

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Susan Plettman, General Counsel DATE: August 4, 1983

THRU :

FROM : Robert G. Fleming, Director,
Enforcement and Field Operations ~~Division~~

SUBJECT: Request for Enforcement Action - Texaco Chemical Company,
Registration No. 30029 and Drainage ~~District No. 7~~,
No Registration or Permit

Enforcement and Field Operations Division hereby requests that the Office of the General Counsel schedule immediate enforcement action concerning Texaco Chemical Company and Drainage District No. 7. Attached is the original Investigation Report regarding this matter.

Robert G. Fleming

MGD:rn

Attachments

cc: Texas Department of Water Resources District 6 Office

RECEIVED
AUG 08 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Felix McDonald, Chairman
Lee B. M. Biggart
John D. Stover

August 8, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P.O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

The Department is in receipt of your letter dated July 22, 1983 which states Texaco's analytical data of the dredge spoil shows concentrations of contaminants approximately one thousand times lower than those documented by the Department. In light of this matter, the Department would like to offer the following comments:

1. The types of compounds which have been found in the dredge spoil are relatively resistant to degradation, therefore, this would not support a theory of degradation between sampling events.

2. Texaco's samples may have come from different areas of the dredge spoil than those collected by the Department.

3. The samples collected by the Department were analyzed by the Texas Department of Health and were reported in mg/kg (ppm) and not in parts per billion as suggested by Texaco.

In any case, the Department stands by its results. However, it may well be that the degree of contamination varies throughout the dredge spoil. Therefore, we request that Texaco and Drainage District Number 7 initiate a comprehensive sampling effort to determine what type of disposal will be required.

In regard to your question concerning the responsibility of Drainage District No. 7, the Department reiterates that this matter is the responsibility of both parties. The Department hopes this situation will be resolved voluntarily between Texaco and the Drainage District.

P. O. Box 13087 Capitol Station • Austin, Texas 78711 • Area Code 512/475-3187

Please submit a response detailing Texaco's intentions within 10 days upon receipt of this letter, otherwise we will pursue alternative measures to ensure this problem is resolved. If you have any questions in the interim, please contact Mr. Michael Dick at 512/475-5516 or Ms. Mary Reagan at 512/475-7845.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD/jp

cc: Office of the General Counsel
Texas Department of Water Resources District 6 Office

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
[illegible] A. Beckett, Jr., Chairman
[illegible] W. McCleskey, Vice Chairman
[illegible] T. Rogers
[illegible] O. Bankston
Louie A. "Bo" Pilgrim
[illegible] Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Felix McDonald, Chairman
Lee B. M. Biggart
John D. Stover

August 9, 1983

Mr. M. J. Adair
Commissioner
Drainage District No. 7
4401 9th Street
Port Arthur, Texas 77640

Dear Commissioner Adair:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

The Department is in receipt of the letter dated June 8, 1983 from your attorney, Mr. David A. Provost, which states that the District neither created nor added to any environmental pollution that already existed in Jefferson Canal by disposing of dredge spoil adjacent to the canal. The Department does not agree with this contention. While the contaminants remained in the sediment of the canal covered by a silt layer, they were less likely to commingle with the overlying water. Once the sediments were removed and stockpiled adjacent to the canal, increased contamination is occurring from runoff from the spoil directly to the waters of the canal. This phenomenon has been documented by Department samples.

Additionally, we have received a letter from Texaco, Inc. indicating that sample results collected from the dredge spoil by Texaco showed contaminant concentrations one thousand times lower than ones analyzed by the Department. The Department stands by its results; however, these results may evidence that the degree of contamination varies throughout the dredge spoil. Therefore, we request that Texaco and the Drainage District conduct a comprehensive sampling effort to determine what type of disposal from each area will be required.

Please submit a response detailing the District's intentions in regard to this matter within 10 days upon receipt of this letter. Otherwise, we will pursue alternative measures to ensure that this problem is resolved. If you have any questions in the interim, please contact Mr. Michael Dick at 512/475-5516 or Ms. Mary Reagan at 512/475-7845.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD/jp

ccs: Office of the General Counsel
Texas Department of Water Resources District 6 Office

RECEIVED
AUG 11 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

Site # 50037

AUG 19 '83

ENFORCEMENT AND FIELD OPERATIONS

TEXACO INC.

P. O. BOX 52332
HOUSTON, TEXAS 77052
(713) 650-4221

J. SAMUEL LISTIAK
ATTORNEY

August 17, 1983

RE: DREDGED MATERIAL -
STAR LAKE OUTFALL CANAL

David A. Provost, Esq.
Provost, Umphrey, McPherson
& Swearingen
P. O. Box 3837
Port Arthur, Texas 77640

Dear Mr. Provost:

Enclosed is a copy of a letter from the Texas Department of Water Resources concerning the material dredged from the Star Lake Outfall Canal by Jefferson County Drainage District No. 7 and piled on its easement along the Canal by the District.

As can be determined from the August 8, 1983 letter of TDWR, the Department continues to believe that Drainage District No. 7 bears at least some responsibility in connection with this matter. Whether or not the District shares this belief, Texaco would be interested in knowing the intentions of the District concerning any further activities with regard to this matter. In particular, does the District have any present intention or willingness to share in sampling, testing, or other investigation or to share the costs of such sampling, testing, or investigation?

Inasmuch as certain sampling and testing has already been performed, an early response would be appreciated.

Sincerely,

J. SAMUEL LISTIAK

JSL
sly:1/d

cc: Robert G. Fleming, P.E.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Mr. Michael Dick
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Mary Reagan, Esq.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

SWL# - 029

AUG 19 '83

ENFORCEMENT AND FIELD OPERATIONS

TEXACO
INC.

P. O. BOX 52332
HOUSTON, TEXAS 77052
(713) 650-4221

J. SAMUEL LISTIAK
ATTORNEY

RECEIVED
AUG 25 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

August 17, 1983

(BLIND) RE: ENVIRONMENTAL - POLLUTION INCIDENTS - STATE WATER - TEXACO CHEMICAL COMPANY - PORT NECHES

RE: DREDGED MATERIAL - STAR LAKE OUTFALL CANAL

Mr. Robert G. Fleming, P.E.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Dear Mr. Fleming:

Texaco has received your letter of August 8, 1983 which, in all likelihood, crossed in the mail with my letter of August 4, 1983.

The contract laboratory which analyzed the dredged soil samples is confident of its results, just as the Texas Department of Health is confident of its results. Nevertheless, if the discrepancy is due to variations in the dredged soil, it would be helpful to compare the Texaco sampling locations with the Department sampling locations. I will make an attempt to uncover information concerning where the samples were taken which led to the results detailed in my letter of August 4, 1983, if the Department feels it can provide similar information concerning its sampling location for purposes of comparison. Secondly, it may also be useful to split samples with the Department in an attempt to resolve the discrepancies in the results. Beyond anyother information which such additional sampling might provide, the results may well have an influence on the cost of any disposal.

With regard to Drainage District No. 7, Texaco knows of no investigation or any other efforts which may have been made by the District in connection with this matter, nor has Texaco been in communication with the District. Since recent communications from the TDWR to Texaco have not been copied to Jefferson County Drainage District No. 7, Texaco has assumed that any communications between the Department and the District were independent of the correspondence between Texaco

and the Department, or, that the TDWR was no longer corresponding with the District. Texaco does wish to reiterate that it does not purport to speak for Drainage District No. 7, nor has Texaco's investigation involved the participation of Drainage District No. 7. By letter Texaco has sought a clarification of the District's present position on any future involvement.

Sincerely,

J. SAMUEL LISTIAK

JSL
sly:1/c

cc: Mr. Michael Dick
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Mary Reagan, Esq.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

DISTRICT NO. 6
WORK NO. 9085

TEXAS DEPARTMENT OF WATER RESOURCES

INSPECTION SYSTEM
INSPECTION SUMMARY REPORT
DW2600

Texaco Chemical Company, Port Neches — ENTITY NAME (For Reference Only)

SW - 00300 29 — PERMIT NUMBER (12)

1A (13) : 1 (14) — ACTION / CARD NO.
A—Add
C—Change

08-25-83 (15–20) — DATE OF REPORT (MMDDYY)

C (21) — TYPE EFFLUENT SAMPLE
C—Composite
G—Grab

(22–23) — NO. OF HOURS (Comp. Only)

N (24) — CITATION ISSUED?
Y—Yes
N—No

2 (25) — TYPE
1—Major
2—Minor

5 (26) — TYPE WASTE
1—Publicly Owned Domestic
2—Privately Owned Domestic
3—Industrial
4—Agricultural
* 5—Solid Waste Hazardous
6—Solid Waste Non-Hazardous
7—Other

	Non-Commercial		Commercial		Transporters
	Gen	TSD	Gen	TSD	**
* 5—Solid Waste Hazardous →	☒	☒	☐	☐	☐

NOTE: * Check all appropriate boxes, e.g. if a facility is both a generator and TSD facility, check both boxes.
** In addition to checking the appropriate boxes concerning their status as generator and/or TSD facility, check this box for all hazardous waste transporters.

5 (27) — INSPECTION
1—Annual Compliance
2—Compliance Survey
3—Pre-Hearing
4—Pre-Grant
5—Other
6—Waste Disposal Wells
7—In-Situ Mining Wells

01 (28–29) — NUMBER OF SAMPLES FOR LAB

002 (30–32) — NUMBER OF ANALYSES

1 (33) — LABORATORY USED
1—State Department of Health Resources
2—Trinity River Authority
3—Sabine River Authority
4—TDWR—EPA
5—Corpus Christi City County Health Department
6—Other
7—San Antonio River Authority

SIGNATURE [signature] 8/19/

____ Permit Not Required
____ Permit Required
____ Permit Applied For

TDWR-0228 (Rev. 8-18-82)

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder, Chief, Solid Waste and Spill Response, Enforcement and Field Operations

DATE: August 25, 1983

THRU :

FROM : Michael A. Moore, Engineering Technician, District 6

SUBJECT: Texaco Chemical Company, Registration No. 30029 and Drainage District No. 7, No Registration or Permit--Enforcement Action Request Addendum Report

Attached is a copy of the laboratory analysis results for a sample of soil which was collected during a solid waste investigation which was conducted on March 21, 1983. The sample was collected from a pile of dredge spoils which had recently been deposited on the north bank of a drainage ditch between Farm Road 366 and the Kansas City Southern Railroad, behind the city of Groves dog pound. The laboratory results indicate that significant amounts of toxaphene and other organic pollutants were present in the dredged material.

It is requested that these data be added to the enforcement action request submitted by this office, dated April 5, 1983.

Approved: Harry D. Boudreaux

Signed: Michael A. Moore

MAM/bk

Attachment

TEXAS DEPARTMENT OF WATER RESOURCES TDWR 0849

District 6 Org. No. 536 Work No. 9082 Lab TDH

NO. SW 02091

Site Name Jefferson Outfall canal

Site Location Drainage ditch w/o FM 366 behind Port Neches dog pound

County Jefferson Basin Neches (Seg. no 0601)

Method of Collection Used shovel and plastic scoop to collect several subsamples, which were composited in clean plastic pail. Then filled in acetone-rinsed jar with Teflon liner

Point of Collection Dredge spoil on south bank of ditch below FM 366

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill; ☐ Waste pile; ☐ Landfarm; ☒ Other drainage ditch

Time Collected 4:30 (am, pm) Date Shipped 3/22/83

Add. COC #s None

ODOR; ☒ Yes; ☐ No; Describe sweet, phenolic odor, very strong

David P. Sisson
(Collector's Signature)

S.W. Registration	Permit Number	Page No.	Mo.	Day	Yr.
1 9	10 18	19 21	22 23 24	25 26	27 28 29
None	None	A	03	21	83

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR 0849

NO. SW 02091 MAR 24 1983

(106)

District 6 Org. No. 536 Work No. 9082 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☒ Soil (E); ☐ Well (M); ☐ Stream (S); ☐ Other (O)

Comments Dredge spoil from ditch which was once used for disposal of wastes from various chemical plants, mills (continued on back)

Lab Only: Date rec'd MAR 23 1983 cn MAR 23 1983

Analyst sign.: [redacted]

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3

Other

Auxiliary Tags None

☐ LEACHATE: EP Toxicity Series: TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH 00403		Priority Pollutants			
COD 00340					
TOC 00680		Toxaphene ug/kg	21000		
GC/MS					

001072

Texas Department of Health

Bureau of Laboratories
Austin, Texas

Product: Laboratory No.: EH3426 Sample No.: SW020

Date Received: 23 MAR 83 Delivered By: TDWR Condition of Seals: INTA

Description of Sample: SOIL SAMPLE

From:

LABORATORY FINDINGS

GC/MS ANALYSIS.

① EPA PRIORITY POLLUTANTS.

Naphthalene - 9280 mg/Kg.
Acenaphthylene - 2140 mg/Kg.
Fluorene - 1140 mg/Kg.
Acenaphthene - 330 mg/Kg.
Phenanthrene - 2050 mg/Kg.
Anthracene - 300 mg/Kg.
Fluoranthene - 275 mg/Kg.
Pyrene - 535 mg/Kg.
Benz (a) anthracene - 160 mg/Kg
Chrysene - 150 mg/Kg.
Benz (b) fluoranthene - 15 mg/Kg.
Benz (k) fluoranthene - 15 mg/Kg
Benz (a) pyrene - 60 mg/Kg.

② Other organic compounds present at up to 2000 mg/Kg.
Substituted naphthalenes (C_1 & C_2)
Biphenyls
Other aromatic hydrocarbons, unable to positively identify.

MAY 23 1983
Date Reported

③ TCDD - 2,3,7,8 isomer by capillary GC/MS technique <2 ug/Kg

MID
FORM NO. G-59

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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Louie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Paul Hopkins, Chairman
Lee B. M. Biggart
Ralph Roming

December 8, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P. O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

The Department has received your letter dated October 5, 1983 in which Texaco requested our opinion in regard to creating a landfill in the vicinity of the above-referenced dredge spoil. Because this proposal does not conform with the definition of on site storage or disposal as defined in 31 Texas Administrative Code Section 335.1, the Department cannot agree to this type of environmental solution without permit authorization under the Solid Waste Disposal Act. Therefore, the Department must reiterate our original requests in this matter:

1) Texaco and Drainage District Number 7 should dispose of the dredge spoil at a proper site which will be determined by a representative sampling program to be initiated by the company and the district; and

2) Texaco and Drainage District Number 7 should initiate a sampling program to determine the degree of contamination in the sediments of the Jefferson Canal so that decisions can be made in regard to future disposal of the dredge spoil.

The Department requests that we be notified of Texaco's intentions within 15 days upon receipt of this letter.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD:py

RECEIVED
DEC 14 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

ccs: Drainage District Number 7
Office of the General Counsel, Texas Department of Water Resources
Texas Department of Water Resources District 6 Office

1836-1986

001074

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: Mike Dick Call From: Wesley Newberry

Date of Call: 12-14-83 File No:

Subject of Call: Texaco Chemical Co. Reg. 30029

Information for File: I asked Mike if he had any reason for the District not to send an enforcement letter to Texaco Chemical Co. (Port Neches) concerning the recent Compliance Inspection. Mike stated that the enforcement action request only was concern with Jefferson County and that this was separate from their Solid Waste registration. He had no objection to the District sending an enforcement letter.

Signed: Wesley Newberry

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

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Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
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Ralph Roming

January 16, 1984

RECEIVED
JAN 19
DEPT. OF WATER RESOURCES DISTRICT 6

RECEIVED
JAN 16 '84
ENFORCEMENT AND FIELD OPERATIONS

The Honorable Jim Mattox
The Attorney General of Texas
Supreme Court Building
Austin, Texas 78711

Attention: Mr. Jim Mathews, Chief
Environmental Protection Division

Dear General Mattox:

Re: Texaco Chemical Company, Permit No. 00588
Solid Waste Registration No. 30029
Jefferson County, Texas Drainage District No. 7

The enclosures to this letter summarize evidence which indicate that Texaco Chemical Company and Jefferson County, Texas Drainage District No. 7, are in violation of the Texas Solid Waste Disposal Act, Article 4477-7, V.A.C.S., Chapter 26 of the Texas Water Code, and the rules and regulations promulgated pursuant to these statutes. Texaco Chemical Company is a petrochemical plant manufacturing a number of organic chemicals and is located at Farm Road 366, Port Neches, Jefferson County, Texas. For an undetermined period of time, Jefferson Chemical Company, now owned by Texaco Chemical Company, disposed of wastes and contaminated wastewaters into the Jefferson Canal, which from Hogaboom Road to Star Lake is located on property owned by Texaco Chemical Company. Wastewater permits issued to the Company and its predecessor authorize discharge of uncontaminated stormwater only. As a result of this activity, and other disposal activities in the area, the sediments in the canal have become contaminated. In February, 1983, Drainage District No. 7 excavated portions of the canal and stockpiled these sediments along its banks. These disposal activities on the part of Texaco Chemical Company and Drainage District No. 7 have been conducted without authorization and in a manner so as to cause the discharge or imminent threat of discharge of wastes into or adjacent to the waters of the State.

Please accept this letter as a request for the Attorney General to represent the Texas Department of Water Resources and the Executive Director in instituting appropriate legal action for these violations. In requesting that you represent the Department in this matter, we would appreciate having the opportunity for the Department's representative Mary Reagan, Special Counsel for Hazardous Waste, to discuss this matter with your representative and assist in determining more specifically the nature of the action

necessary for representing the Department in this lawsuit. Should there be any other material, information or assistance needed, please let us know.

Sincerely yours,

Charles E. Nemir
Executive Director

Enclosure
cc: U. S. Environmental Protection Agency, Region VI

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco Inc.
P. O. Box 52332
Houston, Texas 77052

Mr. M. J. Adair, Commissioner
Drainage District No. 7
4401 9th Street
Port Arthur, Texas 77640

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
Louis A. Beecherl, Jr., Chairman
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Connie A. "Bo" Pilgrim
Lonnie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Felix McDonald, Chairman
Lee B. M. Biggart
G. Ralph Roming

September 20, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P. O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

Pursuant to your telephone request on August 23, 1983 the analyses of dredge spoil were reviewed by our Permits Division for the purposes of classification.

These results indicated the material could be classified as a Class II waste and may be disposed of accordingly. The discrepancy in the quantity of materials found by Texaco and the Department may be attributed to sample locations. The Department sampled areas where visual contamination was obvious, while Texaco sampled a more representative area.

We are forwarding a copy of this letter to Drainage District #7 and request that both entities respond with their respective intentions within 10 days upon receipt.

In the interim, if you have any questions, please contact Mr. Michael Dick at 512/475-5516 or Ms. Mary Reagan at 512/475-7845.

Sincerely,

Gary D. Schroeder, P.E., Chief
Solid Waste and Spill Response Section
Enforcement and Field Operations Division

MGD:py

ccs: General Counsel's Office
Texas Department of Water Resources District 6 Office
Mr. M. J. Adair, Commissioner
Drainage District #7

RECEIVED
SEP 22 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES

C O N F E R E N C E R E C O R D

Project: Jefferson Canal - Solid Waste Registration 30029

Conference date: March 8, 1984 Place: SFA Building - Rm. 1028

Type of conference: Informal
(telephone, staff, formal or informal hearing, other)

Attendance:

Name	Agency
See Attachment	

Summary:

The outcome of this meeting was that Texaco would immediately start sampling the dredge spoil for classification and disposal alternatives. Texaco would respond by March 12, 1984 as to whether they would be willing to make an assessment of the upper reaches of Jefferson Canal. We informed Texaco that a decision would be made on March 12, 1984 as to whether the Attorney General's Office would file suit.

MGD:py

ccs: TDWR District 6 Office
Office of the General Counsel

Prepared by: _____

TEXAS DEPARTMENT OF WATER RESOURCES

CONFERENCE ATTENDANCE

Project: Jefferson Canal

Conference: 3-6-84 Place: 1028 SFA

Name	Representing	Title Function, or Position	Phone No.
Mike Dicke	TDWR	Staff	512/475-5514
Mary Reagan	TDWR	attorney	475-7845
Ken Cross	AG	Attorney	475-1101
Pete Steele	~~dbf for~~ DD7	Attorney	409/963-0101
W.C. Vetters	Drainage Dist "7	Engineer	409/985-43 985
[illegible] DeBois	" "	Comm.	[illegible]
J. Samuel Listiak	Texaco	Atty	713-652
H.W. Miller	Texaco	manager services	713-432-

TEXACO
INC.

RECEIVED
MAR 21 '84

P. O. BOX 52332
HOUSTON, TEXAS 77052
(713) 960-4221

J. SAMUEL USTIAK
ATTORNEY

March 15, 1984

DREDGED MATERIAL-STAR LAKE
OUTFALL CANAL

Kenneth Cross, Esquire
Office of the Attorney General
Supreme Court Building
Austin, Texas 78711

Dear Mr. Cross:

Due to difficulties encountered in making telephone contact, the following is being utilized as a means of apprising you of Texaco's current position on several matters relating to the material dredged from Star Lake Outfall Canal by Drainage District No. 7 and piled on its easement along the Canal by the District.

As has been communicated to Mr. Michael Dick of the Texas Department of Water Resources, Texaco is willing to undertake a program for sampling sediment in the drainage ditch between the Port Neches Chemical Plant and Highway 366, which is upstream of the area where Drainage District No. 7 has performed its dredging. Preliminary plans for a sampling program have been developed, and should be initiated shortly.

Texaco has also developed a preliminary plan for representative sampling of the dredged spoil, in order to confirm its waste classification. When this is complete, the results will be communicated to the Texas Department of Water Resources for its review in connection with the classification.

With further regard to the dredged spoil, Texaco is willing to participate in its disposal in a manner acceptable to the State. It is Texaco's intent to seek Drainage District No. 7's participation in the disposal.

MAR 26 1984
TEX. DEPT. OF
WATER RESOURCES
DISTRICT 6

001081

Lastly, it has already been determined that there is no locally available municipal landfill in the Port Neches area which would dispose of this material so this does not appear to be a viable disposal option.

Sincerely,

Signed: J. SAMUEL LISTIAK

J. SAMUEL LISTIAK

JSL
cz:2/ee

cc: Mary Reagan, Esq.
Texas Department of
Water Resources
P.O. Box 13087
Capitol Station
Austin, Texas 78711

Mr. Michael Dick
Texas Department of
Water Resources
P.O. Box 13087
Capitol Station
Austin, Texas 78711

Peter Steele, Esq.
Provost, Umphrey, McPherson
& Swearingen
4800 Twin City Highway
P.O. Box 3837
Port Arthur, Texas 77640

bc: HWMiller

TEXACO

File

RECEIVED

H.W. MILLER
MANAGER - SERVICES

TEXACO
CHEMICAL COMPANY
A DIVISION OF TEXACO INC.
P. O. BOX 430
BELLAIRE, TEXAS 77401
(713) 432-2029

APR 84
ENVIRONMENT AND
FIELD OPERATIONS

April 16, 1984

Mr. Michael Dick
Texas Department of
Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Dear Mr. Dick:

DREDGED MATERIAL-STAR
LAKE OUTFALL CANAL

In reference to my subject memorandum of March 26, the sampling of the dredge spoil and the sediment in the Jefferson Canal was completed last week.

The sampling of the dredge spoil was accomplished as previously outlined. The Jefferson Canal samples were obtained as planned; however, the sample taken between the railroad and Highway 366 will not be composited with the four upstream samples since the appearance of this material differs substantially from the others. A separate top, middle and bottom analysis will be run on this sample with the other four samples being composited as originally outlined.

The sampling was delayed beyond the projection time due to the arrangements with the contractor taking longer than anticipated coupled with having to modify the specialty sampling equipment to perform this specific work.

Work will commence this week on making up the samples for analysis. The outside laboratories are being contacted in order to arrange for early attention to these samples. Pending firm commitments

APR 23 1984

TEXAS DEPT. OF
WATER RESOURCES
DISTRICT 6

from the laboratories, it is estimated it will be 4-6 weeks before the results are available. If this schedule changes substantially you will be so advised.

Very truly yours,

H. W. Miller

HWM:bjb/50

attachment

cc: Mary Reagan, Esq.
Texas Department of
Water Resources
P. O. Box 13087
Capitol Station
Austin, TX 78711

Mr. Kenneth Cross, Esquire
Office of the Attorney General
P. O. Box 12548, Capitol Station
Austin, Texas 78711

TEXACO

H.W. MILLER
MANAGER - SERVICES

TEXACO
CHEMICAL COMPANY
A DIVISION OF TEXACO INC.
P. O. BOX 430
BELLAIRE, TEXAS 77401
(713) 432-3029

June 28, 1984

#30029

Mr. Michael Dick
Texas Department of Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Dear Mr. Dick:

We want to apologize for the length of time it took the contract laboratories to analyze samples from the Star Lake dredge material and core samples taken from the Texaco Chemical Company stormwater canal. The stormwater canal is upstream of Star Lake and in the past has also been used with effluent and stormwater from Chemall and its predecessors.

The dredge material was sampled at eight locations with samples taken at four depths for a total of 32 samples. The 32 samples were composited and mixed in a mechanical blender. Samples of the blended composite were sent to Spectrix Corporation, Houston and Southwestern Laboratories, Houston for analysis for priority pollutants by EPA approved methods. Southwestern Laboratories subcontracted the GC-MS analysis to Chromospec Corporation, Houston. Results of the analysis of the dredged material is given in attached Table 1. Also included in Table 1 are: (1) results on a grab sample of dredge material taken by Texaco Chemical Company and analyzed by Spectrix Corporation and (2) results on a grab sample by the local TDWR representative which was sent to the Austin office of the TDWR for analysis. We are concerned with the lack of agreement of the results obtained for priority pollutants between the two contract laboratories on the same composite sample of dredged material. However, a comparison of all of the data indicates the earlier TDWR sample was not representative of the total dredged material.

The differences in results obtained on the composite samples by the two laboratories will be analyzed by a Texaco expert in this analytical technique to determine if this kind of variation is typical. If not, a visit to the laboratories will be made to try and establish reasons for these variations. It is expected this

will be completed and that we will be in a position to meet and discuss these results with you in about two to three weeks.

Also, we have included GC-MS results on core samples from the Texaco Chemical Company stormwater canal upstream of the Star Lake dredged material. As with the results obtained on the dredged material, we plan to have the data reviewed by a Texaco GC-MS expert and will discuss the results of the investigation at the meeting on the dredged material.

Very truly yours,

H. W. Miller

GDE-AWC
mc:D/dd

cc: Mr. Harry Boudreaux
TDWR District 6 Office
P. O. Box 337
Orange, Texas 77630

TABLE 1

DREDGED MATERIAL RESULTS

Priority Pollutants

wt. ppm

	Grab Sample by TDWR - Results from TDWR	Grab Sample by Texaco - Analyzed by Spectrix	Composite of 32 Samples by Southwestern La Analyzed by Chromospec	Analy by Spectr
Methyl Napthalene				35
Diethylphthalate		1.2	112	
Phenanthrene			3500	
Di-n-Octylphthalate			156	
Di-N-Butylphthalate		2.1		
Ethyl Benzene				11
Pyrene		0.7	1100	26
Napthalene	2080			
Acenapthylenes	2140	110	76	30
Fluorene	1140			29
Anthracene	300			62
Chrysene	150		325	
Perylene			76	
Toluene				7
Total Xylenes				4
Acetone				19
Styrene				24
Fluoranthene	275	0.3		13
Phenantherene	2050			
Benzopyrenes	60	0.6		
Total Benzo fluoranthenes	30	0.3		
Toxaphene	210			
Acenapthane	330			
Benzoanthracene	160			
Other PNA's	2000			

D/dd1
6/28/84

TABLE 2

wt. ppm

Composite from Cores #2&3 Approx. 1500' & 2000' from Hogaboom Rd.				Core #4 Approx. 2200' from Hogaboom Rd.				Core #5 Aprox. 150' North of Hwy. 366		
0-4"	4"-24"		24-31"	0-4"		4"-155"	15.5"-28"	0-23"		23"-31"
S.W. Labs	S.W. Labs	Spectrix	S.W. Labs	S.W. Labs	Spectrix	S.W. Labs	S.W. Labs	S.W. Labs	Spectrix	S.W. Labs
									1,900	
	23		4	34			34	114	310	
	6	6	1	51		19	24	10,600		35
800	205		21	94		63	150			91
117	39		6			67	65			70
43	10		2						330	
					5			2,600		
								3,300		
								700	320	
					4			441	600	
					10			1,300	1,300	
								2,400		
									7	
									170	
									140	
									3	
									5	
					2				180	
									190	
									1,200	

Analytical tests to Chromospec Labs - Houston, TX

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

SMM Rec
→ HB
Mike Letter discussed

TELEPHONE MEMO TO THE FILE

(Please complete with typewriter or black pen)

Call To: LARRY HAGEN Call From: MIKE DICK

Date of Call: 7/25/84 File No.:

Phone No.: ( ) Subject: TEXACO, CHEMICAL (STAR LAKE OUTFALL DITCH) PI Neches.

Information for File:

MIKE SAID A MEETING ~~WITH~~ WITH TEXACO & CHEMICAL ~~HAS~~ BEEN SET FOR 1:30 PM AUG 9, 1984, IN ROOM 1028 SFA BLDG. MIKE MOORE MAY WISH TO ATTEND. CALL BACK FOR DETAILS

Signed: Larry Hagen RS

TDWR-0225h (Rev. 9-8-83)

001089

TEXAS DEPARTMENT OF WATER RESOURCES

C O N F E R E N C E R E C O R D

Project: Texaco # 30029

Conference date: August 9, 1984 Place: SFA Bldg. Rm. 1028A

Type of conference: Formal
(telephone, staff, formal or informal hearing, other)

Attendance:

Name	Agency
See attachment	

Summary:
Texaco agreed to the following.

1. Remove and dispose properly of all dredge spoil from Hwy 366 to the Railroad Trussel (DD7 to dredge and concrete this area).

2. Sample remaining sediments for PNA's and Toxaphene.

3. Sample all dredge spoil to be left on site for Toxaphene for purposes of deed recordation.

4. Perform Toxaphene analyses on previously collected samples from Hogaboom Rd. to Intersection at Hwy. 366 (from 0-12").

5. All Toxaphene analyses will be for total and E. P. Tox.

We informed Texaco that we would forward this information to the Ken Cross at the A. G.'s office. Additionally, Texaco agreed that all laboratory results reported by S. W. Labs (Chromospec) were invalid. Texaco was able to reproduce the spectric laboratory results from split samples run in house.

RECEIVED
AUG 13 1984

Prepared by: Michael Hall

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

NO. SW 04178 AUG 30 1984

(233)

District 06 Org. No. 536 Work No. 9093 Lab TDH

Site Name Jefferson Outfall Canal

Site Location From Hopkinson Rd. between Chemall, Inc and Union Carbide - Linde Division plants

County Jefferson Basin Neches Coy. no. 06C1

Method of Collection Pushed plastic tube into ditch bottom to 2' depth then extruded sample into bucket; composited and mixed various samples in till glass quart jars.

Point of Collection East side of ditch just below clay pipe, at end of concrete lining

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill ☐ Waste pile; ☐ Landfarm; ☒ Other Drainage ditch

Time Collected 0830 (am, pm) Date Shipped 8/14/84

Add. COC # n/a

ODOR; ☒ Yes; ☐ No; Describe Chlorinated Hydrocarbons (Naphthene)

(Collector's Signature)

S.W. Registration	Permit Number	Page No.	Sup	Date Mo.	Day	Yr.	Sup
1 9	10 18	19 21	22	23 24	25 26	27 28	29
3 0 0 2 9			B	0 8	1 4	8 4	0

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

NO. SW 04178 AUG 30 1984

(233)

District 06 Org. No. 536 Work No. 9093 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☐ Soil (E); ☐ Well (M); ☐ Stream (S); ☒ Other (O) Ditch sediment and water

Comments Sample collected from ditch previously used to discharge raw process wastes from various petrochemical manufacturing plants (continued on back)

Lab Daily Date rec'd: AUG 15 1984 cmplt: AUG 28 1984

Analyst sign.: [redacted]

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3

Other

Auxiliary Tags None

☐ LEACHATE: EP Toxicity Series; TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH 0 0 4 8 3		Priority pollutants scan			
COD 0 0 3 4 0		Toxaphene	mg/kg 1 7 7		
TOC 0 0 6 8 0					
GC/MS					

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

(233)

NO. SW 04173

District 12 Org. No. 536 Work No. 9083 Lab TDH

Site Name Jefferson (AUG 20 1984) Fall Canal

Site Location Exxon Refinery Rd. between Chemwall Inc. and Union Carbide - Linde Division plants

County Jefferson Basin Neches (Seg. no. 0601)

Method of Collection Pushed plastic tube into ditch bottom to 2' depth. Then extruded sample into bucket; composited and mixed enough samples to fill glass quart jars.

Point of Collection Center of ditch adjacent to closed spray evaporation pond at Chemwall plant.

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill ☐ Waste pile; ☐ Landfarm; ☒ Other Drainage ditch

Time Collected 0930 (am, pm) Date Shipped 8/14/84

Add. COC #s N/A

ODOR: ☒ Yes; ☐ No; Describe chlorinated hydrocarbons (weak)

[signature] (Collector's Signature)

S.W. Registration (1–9)	Permit Number (10–18)	Page No. (19–21)	(22)	Date Mo. (23–24)	Day (25–26)	Yr. (27–28)	(29)
30029			B	08	14	84	0

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

(233)

NO. SW 04173 (AUG 30 1984)

District 12 Org. No. 536 Work No. 9083 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☐ Soil (E); ☐ Well (M); ☐ Stream (S); ☒ Other (O) Ditch sediment and water

Comments Sample collected from ditch previously used to discharge raw process wastes from various petrochemical manufacturing plants. (continued on back)

Lab Only — Date rec'd: [illegible] [redacted] cmplt: AUG 28 1984

Analyst sign.: RAA

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3

Other NA

Auxiliary Tags none

☐ LEACHATE: __ EP Toxicity Series: __ TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH		Priority pollutants scan			
00403					
COD		Toxaphene mg/Kg			
00340			340		
TOC					
00680					
GC/MS					

001092

J Samuel Listiak
Attorney

Texaco Inc

PO Box 52332
Houston TX 77052
713 650 4221

November 15, 1984

RE: STAR LAKE OUTFALL CANAL

Mary Reagan, Esquire
Texas Department of Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Dear Ms. Reagan:

Texaco Chemical contracted with Spectrix Corporation Laboratories to analyze various Star Lake Outfall Canal samples for toxaphene. The results it reported are tabulated below:

Sample*	Toxaphene mg/kg	EP Toxicity Toxaphene mg/l
TDWR composite close to Hogaboom	Not tested	0.010
TDWR composite close to B-1	" "	0.014
B-1 0-5"	15	Not tested
B-1 12-30"	46	" "
B 2-3 composite 0-4"	23	" "
B 2-3 composite 4"-24"	2.7	" "
B-4 0-4"	26	" "
B-4 4-15-1/2"	46	" "
Special between concrete ditch & Hwy. 366 0-12"	1.2	" "
Special between concrete ditch & Hwy. 366 12-18"	N.D. (0.3)[1]	" "
B-5 0-24" composite	N.D. (10)[1]	N.D. (0.0065)[1]
B-5 26-31"	N.D. (0.3)[1]	Not tested
Dredge material composite	N.D. (8)[1]	" "

[1] ( ) = Detection Limit.
* Sample locations are identified on the attached map.

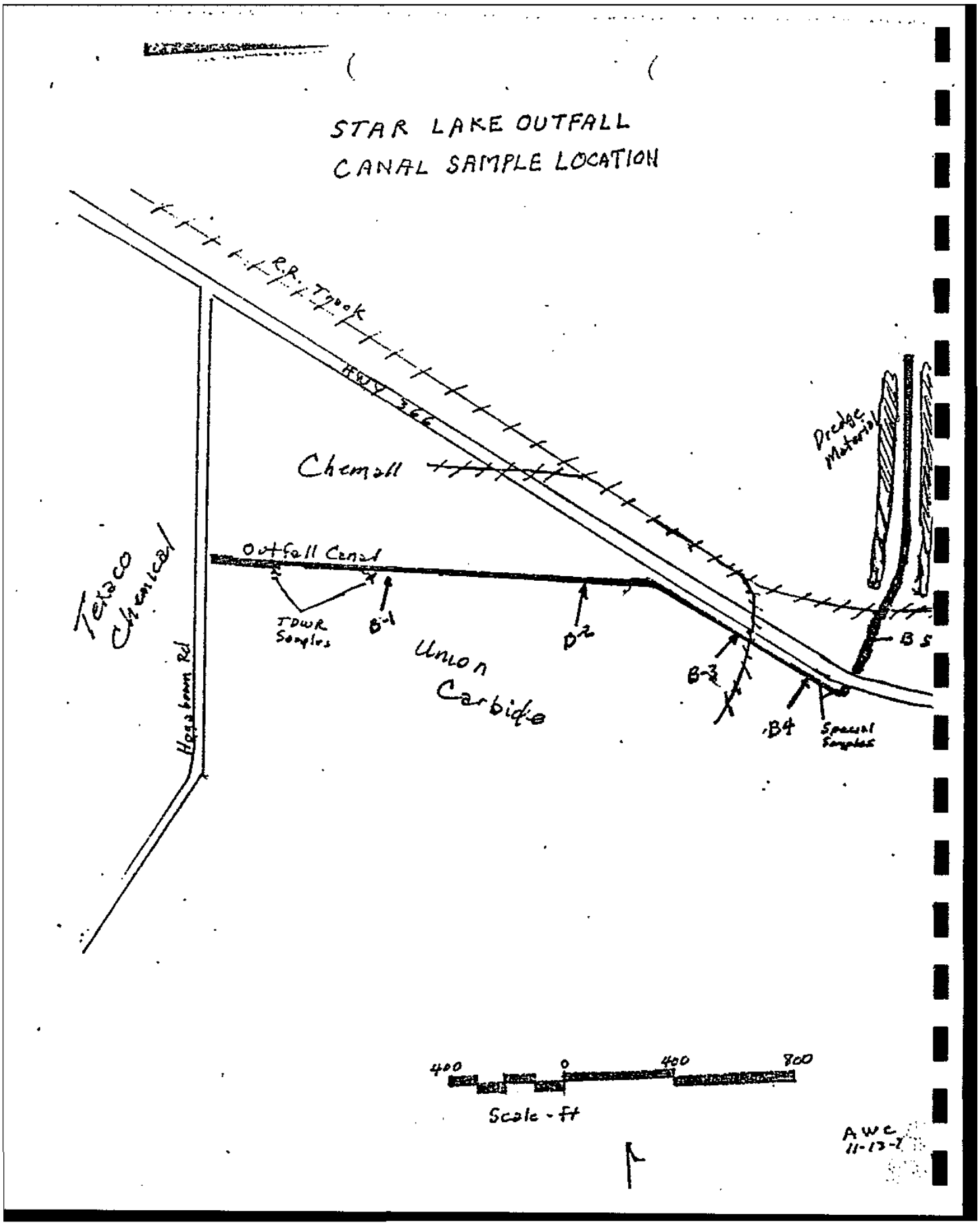
The earliest we will be able to meet to discuss this matter will be the week of November 26.

Sincerely,

J. SAMUEL LISTIAK

JSL
cz:1/dl
Attachment

cc: Mr. Michael Dick
TDWR District Office
Orange, Texas


STAR LAKE OUTFALL
CANAL SAMPLE LOCATION
R.R. Track
HWY 366
Chemall
Dredge Material
Outfall Canal
Texaco Chemical
TDWR Samples
B-1
B-2
B-3
B-4
B-5
Special Samples
Union Carbide
Hogsboom Rd
400
0
400
800
Scale - ft
AWC 11-12-1

APPENDIX B

Health & Safety Plan

HEALTH AND SAFETY PLAN
FOR
EXPANDED SITE INSPECTION FIELD WORK
STAR LAKE CANAL, a.k.a. JEFFERSON CANAL

Prepared by

Texas Natural Resource Conservation Commission
Superfund Site Discovery and Assessment Team
Austin, Texas

Reviewed and approved by

Site Safety Officer:	_____ Name	_____ Date
Site Investigation: Manager	Marshall Critchton Name	2/17/98 Date
PA/SI Program Manager Representative:	_____ Name	_____ Date
TNRCC Central Office Health & Safety Representative:	Tell Cantu Name	2/17/98 Date

February 1998

Contents

APPENDICES

FIGURES

TABLES

EMERGENCY CONTACTS

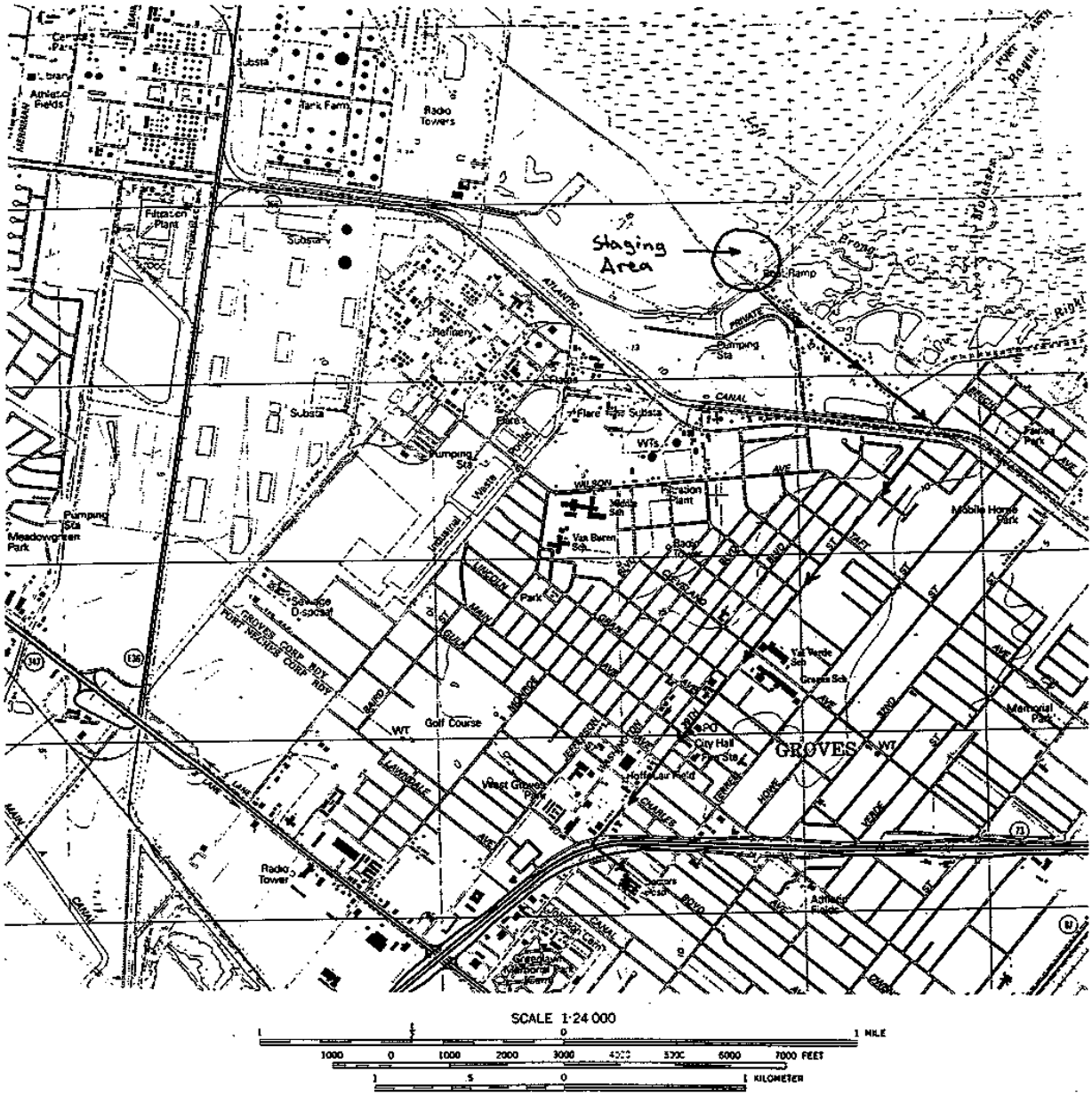
In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations contact the appropriate response teams:

Site Location: 29° 58' 28" N Latitude and 93° 56' 32" W Longitude and empties into the Neches River at 29° 58' 57" N Latitude and 93° 53' 38" W Longitude. The Jefferson Canal confluences with the SLC between State Highway 366 and Sara Jane Road.

Contingency Contacts	Phone Number
Fire Department	911
Police	911
Sheriff's Department	911

Medical Emergency	
Hospital Name	Doctor's Hospital Phone No. (409) 962-5733
Hospital Address	5500 39th Street Groves, Texas
Map to Hospital (see next page)	

TNRCC Contacts	
TNRCC PA/SI Program Manager:	Allan M. Seils- Austin, Texas Phone: Work (512) 239-2514
TNRCC Central Office Health & Safety Representative:	C. Todd Counter - Austin, Texas Phone: Work (512) 239-2591
TNRCC Field Health & Safety Representative:	To be Determined Phone: Work (512) 239-????



TNRCC

N
W E
S

FIGURE 1: Map to Hospital

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341

Port Neches, Jefferson County, Texas

SECTION 1

INTRODUCTION

PURPOSE AND POLICY

The purpose of this health and safety plan is to establish personnel protection standards and mandatory safety practices and procedures for work conducted for screening site inspections (SSI) under the Texas Natural Resource Conservation Commission (TNRCC) Preliminary Assessment/Site Investigation (PA/SI) program. The plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while field work is being conducted at the Star Lake Canal (SLC) site in Jefferson County, Texas.

All personnel who engage in field project activities at the site must be familiar with this plan and comply with its requirements. The provisions of the plan are mandatory for all TNRCC field personnel on this project.

PROGRAM DESCRIPTION

This screening site inspection will be conducted in conformance with the requirements of the revised Hazard Ranking System (HRS) 40 CFR Part 300; Final Rule, dated December 14, 1990. TNRCC Central Office staff recently completed collecting information needed to prepare a work plan and this health and safety plan. TNRCC Central Office staff personnel may visit the site to assist in executing the work plan and/or conduct inspection activities. Activities that will be conducted during the site visit include: site reconnaissance, interviews with any site personnel, and collection of surface water and sediment samples. The anticipated time frame for the execution of all the field work is October, 1996. This health and safety plan pertains to activities performed while executing the work plan.

SECTION 2

SITE INFORMATION

GENERAL INFORMATION

Site: Star Lake Canal site, a.k.a Jefferson Canal TX0001414341

Location: Empties into the Neches River between Port Neches and Groves, Texas. The Jefferson Canal confluences with Star Lake Canal (SLC) between State Highway 366 and Sara Jane Road.

Mailing Address: None

Proposed date of field work: October, 1996

Hazard Assessment: ___ High ___✓___ Medium ___ Low

___ None ___ Unknown

Site description:
The SLC confluences with Molasses Bayou as it empties into the Neches River. The canal is approximately 2 miles long. Land surrounding the canal is undeveloped, residential and industrial. The canal begins at 29° 58' 28" N Latitude and 93° 56' 32" W Longitude and empties into the Neches River at 29° 58' 57" N Latitude and 93° 53' 38" W Longitude.

A sampling inspection by the Texas Department of Water Resources (TDWR) in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal. This canal was used by Chemall, Inc (now Calabrian Chemicals) and Texaco Chemical Company (now Huntsman Corporation) as an outfall for stormwater and wastewater for an unknown period of time. The Jefferson Canal confluences with SLC in an area between State Highway 366 and Sara Jane Road, a.k.a. East Port Neches Avenue.

SCOPE OF WORK SUMMARY

The field team will collect source, background and target sediment samples. Sampling data to be collected includes a total of forty (40) sediment samples. These include five (5) background samples from the north side of the Neches River; seven (7) source samples from the Jefferson Canal; seven (7) sediment samples in the Neches River fishery; and eleven (11) sediment samples from Molasses Bayou.

All samples will be collected according to the procedures outlined in the QAPP (Appendix E).

No air samples are planned to assess releases to the air pathway and no soil samples are anticipated since canal sediments are considered the source for this ESI.

SITE/CHEMICAL CHARACTERISTICS

Chemical type(s):	_✓_ Liquid	_✓_ Solid	___ Sludge	___ Gas
Characteristic(s):	___ Corrosive	___ Ignitable	___ Radioactive	
	_✓_ Volatile	_✓_ Toxic	___ Reactive	
	___ Unknown	___ Other		

Summary of known wastes: See below.

List of chemicals used on site:
The Jefferson Canal was documented to have sediments in which hazardous substances had been deposited, stored, disposed, or placed. The hazardous substances include acenaphthene, acenaphthylene, anthracene, benzo-b-fluoranthene, benzo-k-fluoranthene, fluoranthene, fluorene, naphthalene, 2-methylnaphthalene, PCBs (aroclor-1254), phenanthrene and pyrene.

Description of all known waste disposal areas on site:
An SSI performed in October, 1996 identified the sediments of the Jefferson Canal as a source of hazardous substances. See above for hazardous substances detected in these sediments.

Site waste management history:
Specific wastes disposed of in the Jefferson Canal is unknown. The Jefferson Canal received industrial wastewater discharges for an unknown period of time.

Unusual features (surface impoundment/tank integrity, power lines, terrain, etc.):
The Jefferson Canal may have steep and unvegetated banks that could present a falling hazard.

Current status of site:
The Jefferson Canal may be freely accessed by way of the SLC. It is unknown if the Jefferson Canal currently receives any wastewater discharges.

Summary of the regulatory history of the site:
The Texas Water Quality Board issued an enforcement order to the Riverside Chemical Company, (site is now occupied by Calabrian Chemical Company), on May 27, 1976 for wastewater discharges to the Jefferson Canal in exceedance of their wastewater discharge permits. The unpermitted discharges exceeded, among other water quality parameters, toxaphene and pentachlorophenol.

A sampling inspection by the Texas Department of Water Resources in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal. The hazardous substances include toxaphene, pentachlorophenol, naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, pyrene, benzo-a-anthracene, benzo-b-fluoranthene, benzo-a-pyrene, benzo-a-fluoranthene, chrysene, and other aromatic hydrocarbons that could not be identified by GC/MS.

SECTION 3

PROJECT TEAM ORGANIZATION

Table 3.1 describes the responsibilities of all staff and on-site personnel associated with this project. The names of individuals associated with this project are listed below:

TNRCC PA/SI Program Manager:	Allan M. Seils, Austin, Texas
Staff Safety Officer:	C. Todd Counter, Austin, Texas
Site Investigation Manager:	Marshall A. Cedilote, Austin, Texas
Assistant:	To Be Determined.
Site Safety Officer:	To Be Determined.

Personnel - The Site Investigation Manager designates the Site Health and Safety Officer who will be responsible to see that the site work is performed in a manner consistent with the Health and Safety Plan (HASP). The Site Health and Safety Officer will be responsible for Health and Safety briefings before each daily on-site inspection. **The Site Investigation Manager or the Site Health and Safety Officer may temporarily suspend field activities if health and safety of personnel are endangered. The Site Investigation Manager or the Site Health and Safety Offer may temporarily suspend an individual from the field activities for infractions of the HASP.**

Table 3.1
Staff and On-site Personnel

Title	General Description	Responsibilities
PA/SI Program Manager/ Deputy	Reports to upper-level management. Has authority to direct site investigation activities. Assumes responsibility of meeting all PA/SI program goals/objectives.	Prepares, organizes, and provides program support material. Reviews/approves the project Work Plan, Health and Safety Plan, and the Quality Assurance Project Plan. Appoints field team members for the field work. Briefs the Site Investigation Manager on his specific duties. Ensures, through the Staff Safety Officer, that safety and health requirements are met. Serves as the liaison with the Region VI EPA Representative.
Staff Safety Officer	Advises the PA/SI Program Manager on all aspects of health and safety. Reviews Health and Safety Plans submitted to Central Office.	Advises the PA/SI Program Manager on all health and safety issues. Reviews all project Health and Safety Plans to assure proper clothing and protective equipment are identified. Ensures that the proper protective clothing and safety equipment are available for the field investigation efforts.
Site Safety Officer	Advises the Site Investigation Manager on all aspects of health and safety. Assures proper field safety is implemented according to the project Health and Safety Plan.	Ensures that entry and exit controls at the site access control points are in place and maintained. Periodically inspects protective clothing and equipment. Confirms each team member's suitability for work based on a physician's recommendation. Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue. Implements the health and safety plan. Conducts periodic inspections to determine if the project Health and Safety Plan is being followed. Enforces the buddy system.

Table 3.1
Staff and On-site Personnel
(Continued)

Title	General Description	Responsibilities
Site Safety Officer (Continued)		Notifies, when necessary, local public emergency officials in coordination with on-site representatives. Coordinates emergency medical care. Ensures setup of decontamination lines and solutions appropriate for the type of chemical contamination on the site. Controls decontamination of all equipment, personnel, and samples from the contaminated areas. Ensures proper disposal of contaminated clothing and materials. Advises medical personnel of potential exposures and consequences. Notifies emergency response personnel by telephone or radio in the event of an emergency. Ensures that all personnel can appropriately use the equipment.
Site Investigation Manager	Prepares Work Plan, and Health and Safety Plan for review/approval. Responsible for field investigation phase of the project.	Obtains permission for site access from the property owners or their representatives. Coordinates all field activities with the appropriate local community officials. Prepares the Work Plan and Health and Safety Plan for Central Office review/approval. Ensures that the work plan is complete and submitted to meet schedule requirements. Executes the Work Plan, Health and Safety Plan, and assures QAPP requirements are met according to the project schedule. Enforces safety procedures through the Site Safety Officer. Documents field activities and sample collection efforts. Serves as a liaison with the on-site client representative.

Table 3.1
Staff and On-site Personnel
(Continued)

Title	General Description	Responsibilities
Site Investigation Manager (Continued)		Prepares and submits the final report and required support documentation for Central Office approval.
Field Team Members	Perform field activities as instructed by Site Investigation Manager.	Safely complete the on-site tasks required to fulfill the work plan. Notify Site Safety Officer or supervisor immediately of suspected or noted unsafe conditions observed in the field. Take precautions necessary to prevent injury to themselves and other employees. Read, sign-off, and comply with the project Health and Safety Plan before entering the site for field activities. Maintain visual contact between partners (buddy system). Perform only those tasks they believe they can do safely. Immediately report to the field team leader any accidents and/or unsafe conditions, or any deviations from the Health and Safety Plan.

SECTION 4

SAFETY AND HEALTH RISK ANALYSIS

RESPIRATORY HAZARDS

Respiratory hazards may exist on site from volatile compounds in contaminated sediments which could be inhaled during sediment sampling activities.

CHEMICAL HAZARDS

Chemical hazards can exist when liquid, vapors, or soil samples contact human tissue. Every effort will be made to avoid inadvertent contact with the chemical media at the site. Since groundwater and soil samples will be collected, protective equipment will be used to avoid physical contact. The chemical hazards at the site include Surface water and sediments which may contain hazardous substances detected during previous investigations.

Information on the contaminants that may be encountered at the site is presented in Section 2 and Appendix B. The site may contain other hazardous chemicals that may release hazardous or toxic vapors. The site will be approached with caution, and any moving or handling of drums, containers, or equipment will be avoided.

ROUTES OF EXPOSURE

The field team may be exposed to contaminated materials through inhalation, ingestion, and/or skin and eye contact.

- Respiratory system contact with hazardous airborne materials can occur. If these conditions exist, field work will be conducted upwind, proper protective equipment will be used, or the site will be evacuated.

- Eye contact with solid samples that are contaminated can occur when a worker does not wear safety glasses while samples are being taken or handled.

- Skin contact with contaminated solid or liquid samples can occur when a worker does not wear gloves and protective clothing during sampling activities.

- Gastrointestinal system contact with samples can occur when workers do not observe personal hygiene rules designed to reduce the chance of ingesting site contaminants (i.e., wash hands before smoking, eating, or drinking).

PHYSICAL HAZARDS

Active Sites

The site is a canal with unrestricted public access. There may be unknown physical hazards encountered during site sampling events that could cause physical injury. Physical hazards include, but are not limited to snakes, alligators, mosquitoes, fire ants, and poison ivy. Field work should be performed using all normal safety precautions. The Health and Safety Plan guidelines concerning avoiding physical hazards will be followed, as a minimum. In addition,

- Unnecessary moving or opening any heavy or bulky containers, drums, bags, etc., will be avoided;
- The "buddy" system will be used at all times;
- Field team members will follow safe boating procedures as outlined in the materials included in this Health & Safety Plan as Appendix C.

Heat Stress

If elevated temperatures are encountered, heat stress may occur. Field work may be performed when daytime temperatures are often high. Water will be available on site, and the Site Safety Officer will encourage workers to drink frequently to prevent dehydration and stay in shaded areas whenever possible. In addition, workers should adhere to the recommended work/rest schedule determined by the Site Safety Officer. Depending on work levels and outside temperatures, each individual should monitor his body temperature and note indications of heat stress as they onset. The "buddy" system will be used at all times to check each other for the first symptoms of heat stress.

Heat stress/stroke control. The TNRCC Site Safety Officer will set work and break schedules depending on the outside temperature. General guidelines for heat stress control while sampling include rest breaks in the shade for at least 10 minutes out of every hour during elevated temperatures. Rest time shall also include fluid replacement with water or electrolytes fluids.

Heat stress/stroke monitoring. The TNRCC Site Safety Officer will monitor workers who are performing strenuous activities in elevated temperatures for heat stress/ stroke. Monitoring will be conducted at the Site Safety Officers discretion, worker's request, or at the beginning of a rest period. The monitoring shall also be conducted when workers performance or mental status significantly changes. The heat stress monitoring plan may include:

- Measurement of worker heart rate, OR
- Measurement of body temperature, and
- Observation of the field team members for signs and symptoms of heat injury.

Heart rate (HR) will be measured by the radial pulse for 30 seconds as early as possible during the resting period. The HR at the beginning of the rest period should **not exceed 100 beats per minute.** If the HR exceeds 100 beats per minute, the next work period will be shortened by one third while the length of the rest period remains the same.

Body temperature will be measured using an oral thermometer. Worker **body temperature should not exceed 99.6°F.** If the worker's body temperature exceeds this, the work period will be shortened by one third while the length of the rest period remains the same. No person will be permitted to wear a semipermeable or impermeable garment **when body temperature exceeds 100.6°F.**

Table 4.1 presents suggested frequencies for heat monitoring. Heat stress monitoring will be performed by a person with a current first-aid certification. Workers that exhibit signs of heat injury will be allowed to rest until the signs are no longer observable. The signs of heat stress/stroke are depicted in Figures 4.1 and 4.2. Suggested emergency medical procedures for treating heat exhaustion and heat stroke are also provided.

Cold Injury

Although the field sampling activities will occur during the spring months, all field personnel should be especially alert to the possibility of cold injuries, which are most likely to occur when an unprotected individual is exposed to cold temperatures. Temperature, humidity, precipitation, and wind all play roles in the development of cold injuries. The most serious cold injuries are hypothermia and frostbite. Dehydration can also occur if insufficient fluids are not taken as in hot weather. In cold weather, the individual may not be as aware of the problem since perspiration evaporates rapidly or is absorbed by layers of heavy clothing.

Individuals with a history of cold injuries (i.e., frostbite) have a higher-than-normal risk of recurrence, not necessarily involving the part previously injured. Individuals with prior cold injuries should notify the Health and Safety Officer and use the "buddy" system to monitor early detection of cold injury symptoms.

53 Heat Exhaustion/ Heat Cramps

Signs & Symptoms: cool, pale, clammy skin / fatigue and faintness / headache / heavy sweating / weak pulse / near-normal body temperature / nausea. Onset is gradual.

If person is unconscious, see *Heatstroke*, p. 84.

Calm the person by talking while attending to the problem. Explain what you are doing. Try not to show anxiety; act with confidence. Your calm behavior can help to reassure the sick person.

If possible, bring person indoors to a cool room. (Use air conditioner or electric fan or open windows and fan vigorously.) Outdoors, move person to a shaded area.

Have the person lie down. Elevate legs and feet with pillows or rolled blankets.

Loosen or remove clothing. Cool the skin with cool, wet sponges or cloths applied to forehead, arms, and legs.

If the person has no heart problems or high blood pressure and is fully conscious, give sips of a salt solution (1 teaspoon salt to 16 oz. — 2 cups — water) every 15 minutes for about one hour. Check body temperature every 5 minutes and continue to cool with wet cloths.

If the person complains of muscle cramps, do not massage cramped muscles. This may increase pain.

Does temperature suddenly rise? Are there convulsions, stupor, or unconsciousness?

Yes → If any of these occur, see *Heatstroke*, p. 84.

No

Does the person begin to feel better after one hour?

Yes → Keep person out of the sun and in cool and comfortable as possible. Person should be checked by a doctor as a precaution. Discourage unnecessary exercise; this person may now be more susceptible to heat. If symptoms reappear, repeat process and call a physician.

No → Seek medical care immediately. While awaiting assistance, continue cooling with wet cloths and checking body temperature frequently.

Smelling salts, held briefly under the nose, may help to stimulate the person.

If the temperature suddenly rises or convulsions, stupor, or unconsciousness develop, see *Heatstroke*, p. 84.

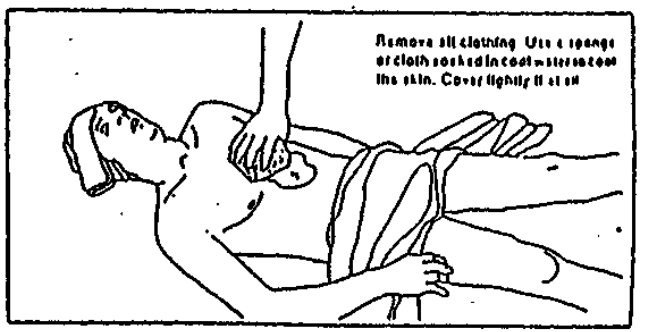


Figure 4.1

Reproduced from *Emergency Medical Procedures for the Home, Auto & Workplace*, revised edition, by The Deltakron Institute. New York: Prentice-Hall Press, 1987.

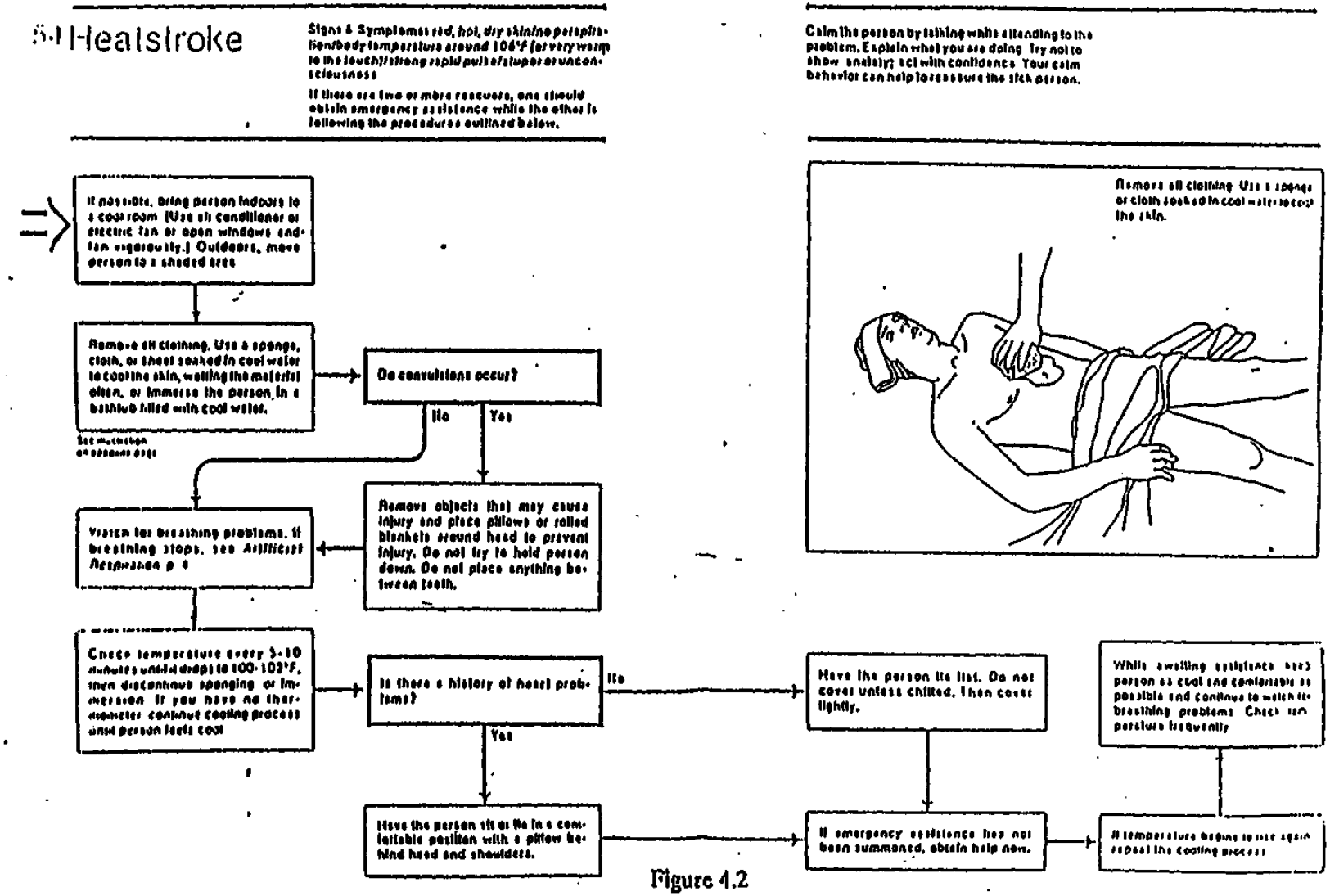


Figure 4.2

Reproduced from *Emergency Medical Procedures for the Home, Auto & Workplace*, revised edition, by The Deltakron Institute. New York: Prentice-Hall Press, 1987.

Table 4.1 - Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers[1]

Temperature	Normal Work Ensemble[2]	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minute work period	After each 15 minutes work period
87.5-90°F (30.8-32.2°C)	After each 60 minutes work period	After each 30 minutes work period
82.5-87.5°F (28.1-30.8°C)	After each 90 minutes work period	After each 60 minutes work period
77.5-82.5°F (25.3-28.1°C)	After each 90 minutes work period	After each 90 minutes work period
72.5-77.5°F (22.5-25.3°C)	After each 150 minutes work period	After each 120 minutes work period

[1] For moderate work, e.g. walking about with moderate lifting and pushing.
[2] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Noise

The field team may be exposed to excessive noise levels when vehicles or other boats are operating near the site. Therefore, hearing protection will be available for use as appropriate.

Snake Hazards

It is likely that snakes may be encountered at the site. Long pants and high boots or snake guards will be worn during site activities to avoid a snake hazard. Never reach into a bushy area before checking for snakes by probing the area with a stick and listening for movement in the brush. Workers will use caution when working in areas where snakes may be present.

If a worker is bitten by a poisonous snake, the following steps should be taken:

- Attempt to identify the type of snake and its location,

- Keep the victim calm and minimize movement,
- Apply ice to the area bitten, and
- Transport victim to the nearest medical facility.

SAFE WORK PRACTICES

To ensure a strong safety awareness program during the sampling inspection, personnel must have adequate training. The Health and Safety Plan must be read by each member of the field team before conducting field activities and briefed to the field team at the beginning of each sampling day. A safety awareness must be developed and communicated to all members of the field team. All members of the field team will adhere to the following safety requirements while conducting field work for this sampling effort:

- No smoking, eating, or drinking carbonated beverages while at the site.
- Do not carry matches, lighters, or other ignition sources on the site.
- Facial hair will not be allowed where respirators contact the face.
- Contact lenses will not be worn during field work.
- Alcoholic beverages will not be permitted in state vehicles.
- Always use the "buddy" system while performing field work.
- Avoid walking through puddles or stained soil.
- Discovery of unusual or unexpected conditions will result in immediate evaluation and reassessment of site conditions and health and safety practices.
- A safety briefing will be performed each day prior to on-site work beginning.
- Other safety meetings may be conducted, as necessary.
- Take precautions to reduce injuries from field equipment and other tools.

All personnel will check their equipment at least two weeks before going into the field in case replacements are necessary. For respirator users, the correct corresponding cartridge or canister for the user's respirator will be verified before entering the site.

Tyvek coveralls, neoprene or nitrile gloves and rubber steel-toed boots or steel-toed shoes or boots will be worn by all personnel performing sampling activities. Safety glasses will be worn during sediment sampling to prevent eye injury from contaminated sediment.

SECTION 5

PERSONNEL PROTECTION EQUIPMENT AND MONITORING

RESPIRATORY PROTECTION

The chemicals that may be present at the site are listed in Section 2, List of Chemicals Used On Site. As a precaution to avoid respiratory exposure to on-site airborne chemical vapors, daily air monitoring will be performed during the inspection events as specified in Section 7, if determined to be necessary by the Site Investigation Manager. In addition, visual inspection will be used to detect the presence of any remaining chemicals by noting stained or vegetation stressed areas during the initial walk through. As a final precaution, during the sample collection efforts, warning symptoms such as headaches and nausea and observations of unusual vapors, mists, or clouds, will require using readily available respiratory protective equipment or immediate evacuation of the area.

PERSONAL PROTECTION

The required personal protection clothing will be worn during on-site inspections, especially during all sampling events, except where down-grades are acceptable:

Level C (Modified)

- Coveralls (i.e., Tyvek), neoprene, PVC, or rubber boots (steel toe), inner vinyl or latex surgical gloves, outer neoprene work gloves, full-face respirator with organic and particulate filters.

- Coveralls will be taped at wrists and ankles. Respirator cartridges to be used will bear NIOSH/MSHA approvals. Respirator cartridges will be changed once daily or when recommended exposure is reached to minimize the potential for break-through. If break-through occurs, cartridges must be changed.

If a down-grade is deemed acceptable:

Level D

- Tyvek (non-chemical resistant) coveralls, neoprene, PVC, rubber, or leather work boots (steel toe), optional inner vinyl or latex surgical gloves, outer neoprene work glove, optional goggles or face masks, and a hard hat.

MEDICAL SURVEILLANCE

Each field member must be a current participant in the TNRCC Health Monitoring Program, and must have already had their initial physical examination prior to entering this or any site where a potential exists for exposure to hazardous chemicals.

Each team member will acknowledge that they have had a current annual physical by signature on the Plan Acceptance Form and that they are medically fit to perform team tasks as assigned. If there are any medical restrictions on a team member's utilization, these restrictions must be provided in writing to the Site Safety Officer as noted by a physician as soon as possible before the field work begins. These restrictions will be complied with at all times while performing team tasks. If the team member cannot perform the task as required, another team member will be selected to perform the task.

SITE SPECIFIC TRAINING

The Site Safety Officer will be responsible for developing a hazard awareness briefing for all TNRCC personnel that are to perform team member tasks on the site, and other visiting personnel, as necessary. If other personnel visit the site during the sampling inspection and wish to participate, they will be required to review the Health and Safety Plan and/or receive a hazard awareness briefing from the Site Safety Officer before entering the site. This training will be acknowledged by signature of the visiting personnel on the Plan Acceptance Form (Appendix A). A daily safety meeting will be held prior to entering the site each day and a Site Safety Briefing Form completed (See Appendix B). The safety meeting will consist of the following topics:

SITE SAFETY BRIEFING (Held Each Day)

- Roll call - identify the team member responsible for site safety and health. Assure the Plan Acceptance Form has been signed by each team member.
- Assign 2-way radio Home Base (Staging Area) Monitor.
- Discuss safety, health, and other issues that may effect the tasks assigned.
- Discuss/review proper use of personal protective equipment.
- Review work practices by which the employee can minimize risk from hazards.
- Discuss safe operation of engineering controls and equipment used on the site.
- Review potential chemicals and acute effects of the chemicals at the site.
- Review evacuation routes, signals, and emergency evacuation procedures.

- Review decontamination procedures, assign decontamination tasks.
- Assign designated area to meet in case work area must be evacuated.
- Review "buddy" system procedures.

The Site Safety Officer shall be familiar with the operation, calibration, and limitations of all field monitoring equipment. In addition, the field team should have the following health and safety items readily available:

- Copy of the Health and Safety Plan,
- Cellular phone and emergency phone numbers,
- 2-way communication radio set,
- First aid and snake bite kits, including ice,
- Emergency eyewash bottle,
- Air sampling/monitoring equipment (photoionization detector, etc,),
- Oxygen/combustible gas indicator (as required),
- Fire extinguisher, and
- Distilled water (for eyewash bottle refill and decontamination procedures).

SECTION 6

FREQUENCY AND TYPES OF AIR MONITORING

If the Site Investigation Manager determines that air monitoring is necessary two types will be performed at this site: monitoring for combustible hydrocarbon emissions and for volatile organic vapors. The first instrument to be used on site is the O_2/combustible gas indicator (CGI), or explosimeter. The lower explosive limit (LEL) for combustible gases will be monitored initially before any other instruments are employed, since volatile ignitable gases may be present. Dangers from these gases include asphyxiation to entering a potentially explosive atmosphere. The **action level** for LEL is established as **>20% LEL**. Therefore, LELs of 20% or greater are cause to stop work and evacuate the area upwind until levels are determined below this action level.

If the LEL is established as < 20%, monitoring for organic vapors/gases will be conducted as the second type of air monitoring using a photoionization detector (PID) instrument. Field instruments must be calibrated prior to use at the site according to the manufacturer's specifications and as outlined in the QAPP. Monitoring of the potential breathing zone around the sampling areas will be performed during the sampling activities as well as periodically during other on-site activities. An **action level** of **10 ppm above background** will be used for **volatile organics** at all sampling areas because of the potential for encountering unknown chemicals. If 10 ppm above background is encountered on the air monitoring equipment at a sampling location, the Site Safety Officer will be immediately contacted to reevaluate safety equipment requirements or whether the site will be evacuated until the vapors are identified or dissipate.

The need for air monitoring equipment and frequency will be determined on a site-specific basis by anticipated respiratory concerns at the area (i.e., background samples taken off-site may not need air monitoring equipment).Table 6.1 lists the chemicals that **may be present** in the Jefferson and Star Lake canals and the TLV, PEL, and other pertinent information for each chemical. Table 6.2 lists the same information for the decontamination and preservation chemicals which may be used at this site.

AIR MONITORING EQUIPMENT CALIBRATION AND MAINTENANCE

All monitoring instruments will be calibrated daily in accordance with the QAPP. Calibration data/time/equipment comments will be noted in the project field notebook.

HNU Photoionization Analyzer Model PI-101

The HNU Systems, Inc. Model PI-101 Photoionization Detector (PID) must be kept hooked up to the battery charger overnight before use. A spare battery is kept in the carrying case and should be kept charged so a backup battery is available.

The HNU may be calibrated with a calibration gas of known contents by connecting the probe to a sampling source using flexible tubing. The HNU requires a "zero" adjustment to background levels. Start-up procedures are provided with the instrument and may be referred to for correct equipment operation. A review of the operating considerations are provided below:

Check the function switch on the control panel to make sure it is in the OFF position. Attach the probe to the readout unit. Match the alignment key, and twist the connector clockwise until it locks. Turn the function switch to the BATTERY CHECK position and check that the indicator is in the "green." Turn the function switch to STANDBY to zero the instrument. Rotate the ZERO POTENTIOMETER until the meter reads "zero." Wait 15 to 20 seconds to confirm that the zero adjustment is stable. If not, then readjust. Check to see that the SPAN POTENTIOMETER is set to the appropriate setting for the probe being used (5.0 or 10.2). Set the function switch to the desired ppm range. Listen for the fan operation to verify the fan function. Check operation of the sensor using an organic source, such as a "magic marker" to verify instrument function.

MONITORING REQUIREMENTS AND INSTRUMENT LIMITATIONS

The TNRCC Site Safety Officer will periodically perform and maintain calibration and on-site maintenance records for the direct-reading instruments.

Table 6.1 Chemicals known to be present in Jefferson Canal sediments (From NIOSH & ACGIH Pocket Guides)

Possible Chemical Contaminants	**NIOSH REL** (Recommended exposure level for 10 hr wk day/40 hr week) ST (short term exposure level/15 minutes)	**PEL** (Permissible exposure limit for 8 hr days in a 40 hr week) ST (short term exposure level/15 minutes)	**TLV** (Threshold Limit Values for 8 hours) **only listed if more stringent than PEL	**IDLH** (Immediate Dangerous to life or health concentrations	**Symptoms of Exposure** (inhalation; skin absorption)
Naphthalene	10 ppm ST=15 ppm	10 ppm	**	250 ppm	Eye irritation, headache, nausea
Acenaphthylene	NOT LISTED IN NIOSH OR ACGIH GUIDES				
Flourene	NOT LISTED IN NIOSH OR ACGIH GUIDES				
Phenanthrene	NOT LISTED IN NIOSH OR ACGIH GUIDES				
Pyrene	NOT LISTED IN NIOSH OR ACGIH GUIDES				
Anthracene	NOT LISTED IN NIOSH OR ACGIH GUIDES				
Flouranthene	NOT LISTED IN NIOSH OR ACGIH GUIDES				

ppm = Parts per million
ca = Carcinogen
a/TLV-TWA = Threshold limit value, time weighted average. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm.
b/PEL = Permissible exposure limit. Average air concentration (same definition as TLV, above) as recommended by the American Conference of Governmental and Industrial Hygienists (ACGIH).
c/IDLH = Immediately dangerous to life or health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
° = denotes Ceiling limit
Toxicity information, if available, is presented for compounds not listed in the NIOSH or ACGIH guides.

Table 6.2 Chemicals of Record Used for Field Investigations

Chemical	TLV a/	(OSHA) PEL b/	Odor Threshold (ppm)	IDLH c/ (ppm)	Comments
Hexane	50	500		500	Calibration for HNU PI-101 photoionization detector. No anticipated problems since hexane in cylinder is only 0.14 percent by volume with air.
Nitric Acid	2	2		100	Very corrosive sample preservative agent. Avoid contact with skin, eyes, and clothing. Store bottle in an upright secure position. Do not preserve water samples suspected of containing cyanide compounds.
Hydrochloric Acid	(C),5	(C),5	1-5	100	Very corrosive sample preservative agent. Avoid contact with skin, eyes, and clothing. Store bottle in an upright secure position. Do not preserve water samples suspected of containing cyanide compounds.
Isopropanol	400			12,000	Decontamination fluid. Wear gloves when cleaning equipment.

ppm = Parts per million
ca = Carcinogen
a/TLV-TWA = Threshold limit value, time weighted average. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm.
b/PEL = Permissible exposure limit. Average air concentration (same definition as TLV, above) as recommended by the American Conference of Governmental and Industrial Hygienists (ACGIH).
c/IDLH = Immediately dangerous to life or health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
° = denotes Ceiling limit

SECTION 7

ACCIDENT PREVENTION AND CONTINGENCY PLAN

ACCIDENT PREVENTION

All field personnel will receive health and safety training prior to the initiation of any site activities. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before beginning the site investigation, a meeting will be held to discuss accident prevention (see Section 5, Site Safety Briefing). The discussion should cover but not be limited to:

- Tasks to be performed; time constraints (e.g., rest breaks);
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals; and emergency medical procedures.
- Emergency evacuation procedures.

Buddy System

The "buddy" system will be used at all times by all TNRCC field personnel while performing work related tasks on site. All activities must be conducted with a partner (buddy) who can:

- Provide his or her partner with assistance;
- Observe his or her partner for signs of chemical or weather exposure; and
- Notify the Site Safety Officer or others if emergency help is needed.

CONTINGENCY PLAN

Emergency Procedures

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site, or

- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should then notify the Site Safety Officer of the chemical exposure. The Site Investigation Manager should contact the appropriate emergency response agency.

- If the chemical is on the individual's clothing, the chemical should be neutralized or removed (if it is safe to do so).

- If the chemical has contacted the skin, the skin should be washed immediately with copious amounts of water.

- In case of eye contact, the emergency eye-wash solution should be used. Eyes should be washed for at least 15 minutes using available distilled water.

- All chemical exposure incidents must be reported to the Region/Central Office Staff Safety Offices. The Site Investigation Manager is responsible for reporting the chemical exposure incident and assist the individual's supervisor in submitting a written report (see Appendix A).

Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- A team member should signal the other team member that an injury has occurred.

- A field team member trained in first aid can administer immediate treatment to the injury.

- The victim should then be stabilized and transported (if applicable) to the nearest hospital or medical center.

- The Site Investigation Manager is responsible for making certain that an accident report form is completed and submitted to the Region and Central Office Staff Safety Offices. Follow-up action should be taken to correct the situation that caused the accident.

Evacuation Procedures

- The Site Safety Officer will determine whether an evacuation is necessary.
- All personnel in the work area should evacuate the area and meet in the predesignated area.
- Account for all personnel. Wait for further instructions from the Site Safety Officer.

SECTION 8

SITE-SPECIFIC DECONTAMINATION PROCEDURES

Prior to leaving the site, personnel protective and sampling equipment will be decontaminated. Decontamination procedures will be conducted as follows:

- Remove and wash goggles or safety glasses (if used),
- Remove and wash chemical protective boots, gloves,
- Wash sampling equipment to remove gross contamination, and
- Wash hands and face.

Protective gloves will be placed in garbage bags and disposed of appropriately at the conclusion of site activities. Sampling equipment will be placed in plastic bags for final decontamination at the conclusion of site activities.

PERSONNEL DECONTAMINATION PROCEDURES

The TNRCC field team will establish an on-site decontamination station. An area will be set up during initial field activities prior to any sampling event. The decontamination station will have provisions for collecting disposable protective equipment; for washing boots, gloves, field instruments, sampling tools (if required); and for washing hands, face, and other exposed body parts. Investigation derived waste (IDW) from decontamination will be properly disposed in accordance with EPA guidelines outlined in the EPA/540/G-91/009, May 1991 handbook.

Decontamination equipment will include, as necessary:

- Plastic buckets, pails, and scrub brushes
- Non-phosphate detergent
- Isopropyl alcohol
- Paper towels
- Plastic garbage bags, sheets of plastic
- Deionized and potable water.

SECTION 9

DOCUMENTATION AND NOTIFICATION

LOGBOOK DOCUMENTATION REQUIREMENTS

Implementation of the provisions of the Health and Safety Plan will be recorded in the field log book. Information to be recorded shall include:

- Weather conditions at the time of the inspection (daily entry),
- Names of the personnel on-site (daily entry),
- Levels of personal protective equipment worn by the field personnel (specifically note conditions or rational for down- or up-grading PPE),
- Monitoring instrument readings,
- Subjects discussed during site health and safety briefings, and
- All safety violations.

A Health and Safety Checklist has been included in Appendix C to assist the Site Safety Officer in assuring that appropriate safety consideration have been covered in the daily safety briefing.

EPA NOTIFICATION OF IMMINENT DANGER TO THE GENERAL PUBLIC

If there is an imminent danger that the general public may come into direct contact with hazardous substances or wastes, which are readily accessible on-site, the Site Investigation Manager will notify the Project Manager who will notify the EPA no later than one (1) day after the inspection team returns from the site. Written notification will follow any verbal communication in regard.

SECTION 10

CONFINED SPACE ENTRY

A "Confined Space" means that a space:

1) is large enough and so configured that an employee can bodily enter and perform assigned work;
2) has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
3) is not designed for continuous employee occupancy.

Should confined spaces be required to be inspected for a SSI, the Site Project Manager will be responsible for evaluating the site to determine if any confined spaces meet the definition of a permit-required confined space. "Permit-required confined space" means a confined space that has one or more of the following characteristics:

1) contains or has a potential to contain a hazardous atmosphere;
2) contains material that has the potential for engulfing an entrant;
3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4) contains any other recognized serious safety or health hazard.

If permit-required confined spaces are observed on site and are required to be investigated, the Site Project Manager, or any other team member, will not enter these spaces and will notify the Staff Health and Safety Officer, who will arrange for certified personnel who can work in permit-required confined spaces.

APPENDIX A

PLAN ACCEPTANCE FORM

SUMMARY OF ACTIVITIES

- Collection of source, background and target sediment samples in the Jefferson Canal, Neches River and Molasses Bayou, respectively.
- Decontamination and collection of rinsate samples from sediment sampling equipment.

ACCEPTANCE

I have read the Health and Safety plan (or been briefed on the hazards) for Expanded Site Inspection (ESI) field work to be conducted at the Star Lake Canal Site located in Port Neches, Jefferson County, Texas, and agree to abide by the rules and guidelines contained therein. I acknowledge that I have had a current annual physical within the last 12-month period from the date signed below, and am medically cleared to perform my tasks as outlined.

Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date

VI. SUPERVISOR'S PACKET

Forms to be completed by the supervisor are:

Form #	Form Title
TWCC-1S	Employer's First Report of Injury
TWCC-6	Supplemental Report of Injury
TWCC-121	Supervisor's Investigation of Employee's Accident/Incident

Supervisor's Responsibilities

1. Complete all attached forms in accordance with the instructions outlined in the TNRCC Workers' Compensation Claims Handbook. Submit forms to the TNRCC Claims Coordinator in accordance with the time frames identified.

2. Report job related injury/illness, accident/incident to TNRCC Claims Coordinator, TNRCC Safety Manager or ADSO immediately, or as soon as possible after medical attention is provided to the employee.

3. Sign all forms in accordance with the instructions when required.

4. Keep the TNRCC Claims Coordinator updated on the status of medical services received, lost time from work, and workers compensation benefits received as a result of the injury or illness.

5. Ensure the injured employee completes all necessary paperwork as required by the Workers' Compensation Claims Handbook.

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

To: Date:

From: Cora Gratten
Claims Coordinator
Support Services Division

Subject: Employee's Packet, Workers' Compensation Claims
(wcpro#1)

It has been brought to my attention that you may have been injured on the job or experienced a job related illness. I hope the injury is not serious and that you fully recover soon. Our goal as an agency is to ensure you receive proper medical care for your injury/illness and that you fully recover so that you can return to work as quickly as possible.

My responsibilities as the TNRCC Claims Coordinator is to work with you and your supervisor to ensure your claim is processed in accordance with the law. As a TNRCC employee part of your responsibilities are to fill out certain forms that are necessary to process the claim. These forms are required as part of the Workers' Compensation Claims process which is administered by the Office of the Attorney General.

Attached is a packet of material that provides some basic information regarding the Workers' Compensation and more detail about your responsibilities regarding this matter. The forms that you must fill out are included in this packet. There are also instructions provided that should be followed in completing the forms. I am also available should you need assistance in completing the forms. It is critical that these forms be completed and submitted to me in accordance with the instructions and time frames that are identified.

Your supervisor also has responsibilities regarding this claim, and will be sent information about your injury/illness and about their responsibilities. They will work with you to ensure you receive medical attention (if necessary) and that you return to work as quickly as possible if you miss time from work.

Again, if you need assistance at anytime regarding this incident, you may contact me at (512) 239-0245.

Attachments

cc: Employee's Supervisor

V. EMPLOYEE'S PACKET

Forms to be completed by the injured employee are:

Form #	Form Title
Pub. No. PI96-007A (03-96)	Employee Rights & Responsibilities
WCD-16	Authorization for Release of Information
WCD-29	Employee's Report of Injury
WCD-74	Witness Statement
WCD-80	Employee's Election Regarding Utilization of Sick Leave

Employee Responsibilities

1. Report job related injury/illness, accident/incident to their supervisor or the TNRCC Claims Coordinator immediately, or as soon as possible after medical attention is received.

2. Complete all forms in accordance with the instructions outlined in the Workers' Compensation Claims Handbook.

3. Sign all forms in accordance with the instructions when required.

4. Keep their supervisor updated on the status of medical services received, lost time from work, and workers compensation benefits received as a result of the injury or illness.

5. Return to work as soon as possible after a lost time injury/illness. Provide original of physicians release to return to work.

6. Provide original of any and all documentation related to medical expenses and physicians statements relating to the injury/illness.

TNRCC INSTRUCTIONS FOR TWCC-1S

EMPLOYER'S FIRST REPORT OF INJURY OR ILLNESS

Required:

Form TWCC-1S must be completed and submitted to the TNRCC Claims Coordinator for any on-the-job injury that:
* has more than one day of lost time;
* is an occupational disease, with or without lost time or medical expenditures;
* resulted in the death of the employee; or
* results in expenditures for medical treatment or service.

Filing Deadline:

The form must be initially received by the TNRCC Claims Coordinator no later than the first calendar day after the first notice of injury is reported to the employee's supervisor or manager.

The TNRCC Claims Coordinator sends the form to Human Resources & Staff Development for completing information for box #s 30-35. (4-hour turn around)

Human Resources & Staff Development sends the form to Payroll/Time & Attendance for completing information for box #s 36-38. (4-hour turn around)

Financial Administration sends the form to the TNRCC Claims Coordinator for completion of box #s 39-53, then submission to the OAG-WCD.

The completed form shall be submitted to the OAG-WCD within three calendar days after the first notice of injury is reported to the employee's supervisor or manager. DO NOT send a paper copy of the TWCC-1S form to the TWCC.

NOTE: The form shall date & time stamped (on the back of the form) into each division and be hand delivered by the Division who has completed their portion of the form to the next Division who must provide information.

Completed By:

Programs listed above are responsible for completion as noted, with assistance from the TNRCC Claims Coordinator as necessary.

In cases of an extreme emergency when immediate medical attention is necessary, the TNRCC Claims Coordinator may be required to confirm a job related injury before the

TWCC-1S Form is completed by Payroll/Time & Attendance. In these situations the TNRCC Claims Coordinator may have to confirm information from Payroll/Time and Attendance by phone so the TWCC-1S Form can be faxed to the Attorney General's Office immediately. In these situations, the TNRCC Claims Coordinator will advise Payroll/Time & Attendance by e-mail that the information was for an emergency. A copy of the TWCC-1S Form should then be sent to Payroll/Time & Attendance.

Instructions:

PLEASE COMPLETE ALL APPLICABLE FIELDS. Most fields are self-explanatory, however, the following items may require more attention:

Item 4:	If no home phone, please give a phone number where the employee can be reached.
Items 7,8:	This information is no longer required.
Item 17:	This should be the first full day of lost time from work. (Please note that the Date of Injury is not considered the first day of Lost Time.)
Item 18:	List the nature of the injury. Examples include: burn, cut, or sprain.
Item 19:	List specific body part, e.g., chin, right leg, upper arm, etc. If more than one body part is affected, list each part.
Item 20:	Describe in detail. Use additional sheet of paper if necessary.
Item 24:	This should state the specific substance or exposure that directly inflicted the injury such as a tool, chemical or machine.
Item 28:	This is the employee's immediate supervisor.
Item 29:	This is the date the employee reported the injury to the employer.
Item 34:	This 4-digit code corresponds to the primary occupation in which the employee was engaged at the time of the injury or exposure. This code is from the state payroll classification table and is available from Human Resources & Staff Development, or Payroll/Time & Attendance.
Item 43:	This 9-digit code, assigned to each agency by TWCC, represents the location of the agency unit that employed the injured worker at the time of their injury or exposure.

Item 44: This 9-digit code is assigned to each agency by the Internal Revenue Service for employment, tax and reporting purposes.

Item 45: This 4-digit code is assigned to each agency and represents the nature of the employer's business. For specific questions about Primary Standard Industrial Classification (SIC) codes, call the Texas Workforce Commission (TWC) at 1-800-227-7816.

Item 46: This may be the same as the last item if the agency has one primary SIC code. If there is more than one, this should be the SIC code specific to the job being performed. If in doubt, call the TWC at the number listed above.

Item 47: TNRCC's state agency code number is 582 and is assigned by the State Comptroller of Public Accounts.

Item 51: This must be the signature and title of the TNRCC Claims Coordinator in the Support Services Division.

Item 52: Enter the number of sick leave hours credited to the employee as of the date of injury.

Distribution:

It is the TNRCC Claims Coordinator's responsibility to make distribution as indicated below.

Mail original to: Office of the Attorney General
Workers Compensation Division

Mail a copy to the claimant.

Send a copy to: TNRCC Claim File
Human Resources & Staff Development
Payroll/Time & Attendance
TNRCC Safety Manager

:ail this form to:
FFICE OF THE ATTORNEY GENERAL
/orkers' Compensation Division
. O. Box 13777
ustin, Texas 78711

:ease read instruction sheet CAREFULLY,
'ving special attention to items marked
:ith an asterisk (*).

TWCC CLAIM # _____

DIRECTOR'S # _____

EMPLOYER'S FIRST REPORT OF INJURY OR ILLNESS

1. Name (Last, First, M.I.)		2. Sex F ☐ M ☐
3. Social Security Number	4. Home Phone ( )	5. Date of Birth (m-d-y)
6. Does the Employee Speak English? YES ☐ NO ☐ If No, Specify Language		
7. *Block no longer used*	8. *Block no longer used*	
9. Mailing Address Street or P.O.Box		
City	State Zip Code County	
10. Marital Status *Married* ☐ *Widowed* ☐ *Separated* ☐ *Single* ☐ *Divorced* ☐		
11. Number of Dependent Children	12. Spouse's Name	
13. Doctor's Name		
14. Doctor's Mailing Address (Street or P.O.Box)		
City	State Zip Code	

15. Date of Injury (m-d-y)	16. Time of Injury : am ☐ pm ☐	17. Date Lost Time Began (m-d-y)
18. Nature of Injury*	19. Part of Body Injured or Exposed*	
20. How and Why Accident/Injury Occurred*		
21. Was employee doing his regular job? YES ☐ NO ☐	22. Worksite Location of Injury (stairs, dock, etc.)*	
23. Address Where Injury or Exposure Occurred. Name of business if incident occurred on a business site. Street or P.O. Box County		
City State Zip Code		
24. Cause of Injury (fall, tool, machine, etc.)*		
25. List Witnesses		
26. Return to work date/or expected (m-d-y)	27. Did employee die? YES ☐ NO ☐	28. Supervisor's Name / 29. Date Reported (m-d-y)

30. Date of Hire (m-d-y)	31. Was employee hired or recruited in Texas? YES ☐ NO ☐	32. Length of Service in Current Position Months _____ Years _____	33. Length of Service in Occupation Months _____ Years _____
34. State Payroll Classification Code	35. Occupation of Injured Worker		
36. Rate of Pay at this Job $_____Hourly $_____Weekly $_____Monthly	37. Full Work Week is: _____ Hours _____ Days	38. Last Paycheck was: $_____	39. Is employee an Owner, Partner, or Corporate Officer? YES ☐ NO ☒

40. Name and Title of Person Completing Form Claim Coordinator	41. Name of Agency
42. Agency Mailing Address and Telephone Number Street or P.O. Box Telephone ( )	43. Agency Location Code ___ ___ ___ / ___ ___ ___ / ___ ___ ___
City State Zip Code	Name of Location: _____

44. Federal Tax Identification Number	45. Primary Standard Industrial Classification Code (SIC)* (4 digit)	46. Specific SIC Code* (4 digit)	47. Comptroller Agency Code ___ ___ ___
48. *Workers' Compensation Insurance Company* State Employee's Division, Attorney General's Office		49. Policy Number TXSTATEPOL001	
50. Did you request accident prevention services in past 12 months? YES ☐ NO ☐ If yes, did you receive them? YES ☐ NO ☐		52. Number of Hours of Sick Leave Credited to Employee on Date of Injury	

51. Signature and Title (READ INSTRUCTIONS ON INSTRUCTION SHEET BEFORE SIGNING)

X _____ Claim Coordinator Date _____

Rule 120.2

TNRCC INSTRUCTIONS FOR TWCC-6

Supplemental Report of Injury

Required:

The TWCC-6 should be completed by the supervisor immediately when the employee:

a. * Has returned to work;
b. * Has additional day(s) of disability;
c. Has a change in weekly earnings after the injury (increase or decrease);
d. Is terminated or resigns; or
e. * Has been absent from work for more than 60 days (the employing agency will complete a TWCC-6 at the end of each 60 day period as long as the employee remains unable to work).

NOTE: * A physician's statement is required for these situations.

Filing Deadline:

For each of the five required situations listed above that the TWCC-6 must be filed, the following are the corresponding filing deadlines:

a. No later than one calendar day after the employee returns to work;
b. No later than one calendar day after the additional day of disability occurs;
c. No later than five calendar days after the change in earnings has taken place;
d. No later than five calendar days after the employee resigns or is terminated; and
e. No later than five calendar days after each 60-day period that the employee is unable to return to work.

Completed By:

The employee's supervisor shall complete item #s 1-12.
The TNRCC Claims Coordinator shall complete item#s 13-17.

Instructions:

1. Check the appropriate boxes which show the reason for filing a Supplemental Report of Injury and complete only the blocks indicated.
2. In block 7 give actual wages. Please do not estimate wages. Contact Payroll/Time & Attendance for assistance in completing this block.

Distribution:

It is the TNRCC Claims Coordinator's responsibility to make distribution as indicated below.

Mail original to: Office of the Attorney General
Workers Compensation Division

Mail a copy to the claimant.

Send a copy to: TNRCC Claim File
Human Resources & Staff Development
Payroll/Time & Attendance
TNRCC Safety Manager

• original with employer's carrier.
• copy with injured employee.

CARRIER'S CLAIM #_____
TWCC #_____

SUPPLEMENTAL REPORT OF INJURY

DO NOT SEND THIS FORM TO TEXAS WORKERS' COMPENSATION COMMISSION UNLESS REQUESTED.

WHEN AND WHERE TO FILE: *For all injuries occuring January 1, 1991 or after* that require a TWCC-1, Employer's First Report of Injury, to be filed, the employer must file by first class mail or personal delivery a Supplemental Report of Injury (TWCC-6) with the employer's workers' compensation carrier and the injured employee: 1) within 3 days after the injured employee returns to work; 2) within 3 days when the employee, after returning to work, has an additional day or days of disability because of the injury; 3) within 10 days after the end of each pay period in which the employee has an increase or decrease of earnings during the time the employee is entitled to temporary income benefits; 4) within 10 days after the employee resigns or is terminated. If the injured employee is no longer employed by the employer, the employee is responsible for providing information to the carrier about amounts of earnings or offers of employment. The employee may use a TWCC-6, Employer's Supplemental Report of Injury for this purpose. **An employee has disability if he/she is unable to work as a result of the injury or has returned to work earning less than pre-injury wages because of the injury.**

EMPLOYEE INFORMATION

1. Employee's Name (Last, First M.I.) and Telephone No. ( )
2. Social Security No.
3. Date of Injury (m-d-y)

4. Employee's Mailing Address (Street or P.O. Box)

City | State | Zip Code

TO EMPLOYER: Based on above rule requirements, check boxes which show reasons for filing Supplemental Report of Injury this date:

- ☐ *employee returned to work* — Complete Block 5a or 5b; Complete Blocks 6 and 7
- ☐ *additional day(s) of disability* — Complete Block 5b; Complete Block 7
- ☐ *change in weekly earnings after injury* — Complete Blocks 5a or 5b; Complete Blocks 7 and 8
- ☐ *employee terminated/resigned* — Complete Block 5a or 5b; Complete Block 7; Complete Block 9

5. a) If initial filing of TWCC-6, first day of disability due to injury (m-d-y)

5. b) If second or subsequent filing of TWCC-6, give first day of disability due to injury for this period only (m-d-y)

6. Date of Return to Work _____
(Check box) ☐ Full Duty, Full Pay ☐ Limited Duty; Full Pay ☐ Reduced Pay

7. Weekly and Hourly Earnings at Time of This Report
(Check box) ☐ Same as Preinjury Wages ☐ Increase from Preinjury Wages ☐ Decrease from Preinjury Wages
$_____ weekly
$_____ hourly

8. No. of Hours Working Weekly at Time of This Report _____
(Check box) ☐ Same as Preinjury ☐ Increase from Preinjury Hours Worked Weekly ☐ Decrease from Preinjury Hours Worked Weekly

9. If the employee resigns or is terminated, fill in the appropriate section.
☐ Date of Resignation (m-d-y) _____
☐ Date of Termination (m-d-y) _____

9a. Reason for Resignation or Termination

10. If applicable, eight days of disability began on (m-d-y) [see above definition of disability]

11. Has injured employee died? If so, give date of death (m-d-y)

12. Was employee on limited duty at time of termination? ☐ Yes ☐ No

EMPLOYER INFORMATION

13. Employer's Business Name

14. Telephone No. ( )

15. Employer's Business Mailing Address (Street or P.O. Box)

City | State | Zip Code

16. Name of Workers' Compensation Carrier for Above Injury

17. The information provided in this report is accurate to the best of my knowledge. It may be relied upon for evaluation of the named employee's eligibility for benefits.

Signature and Title of Person Completing Form ☐ Employer ☐ Employee | Date

TNRCC INSTRUCTIONS FOR TWCC-121

Supervisor's Investigation of Employee's Accident/Incident

Required:

Immediately after receiving notice of an injury/illness, accident/incident the supervisor should investigate the accident/incident and complete this form. The ADSO and the Division Director who serves the area where the injured employee works should review and comment on the supervisors comments.

Filing Deadline:

The form must be received by the TNRCC Claims Coordinator no later than one week after the First Report of Injury or Illness (TWCC-1S), or notice of an accident/incident is reported to the supervisor.

Completed By:

The injured employee's immediate supervisor, or next in charge in the event of absence of the immediate supervisor, is responsible for completion of the form.

Instructions:

1. The form must be typed or clearly printed.
2. The supervisor should complete the form, comment and sign in block N.
3. The appropriate ADSO should comment and sign in block P.1.
4. The appropriate of the supervisor should comment and sign in block P.2.
5. The TNRCC Safety Manager should complete and sign in block P.3.

Distribution:

It is the TNRCC Claims Coordinator's responsibility to make distribution as indicated below.

Send a copy to: Claimant
Near Miss Incident File

APPENDIX B

HEALTH AND SAFETY CHECKLIST

_ 1. Conduct safety briefing (each day).

_ 2. Conduct initial site survey (first day).

_ 3. Personal Protective Equipment: Tyvek (or chemical resistant suit) coveralls, boots, inner and outer gloves, respirator and matching organic and particulate filter canisters, hard hat, and goggles.

_ 4. Copy of HASP.

_ 5. First aid and snakebite kits, including ice.

_ 6. Calibrated air monitoring devices.

_ 7. Water.

_ 8. Emergency contact list and map to hospital (or mark in HASP).

_ 9. Appropriate weather gear (i.e., rain gear, cold weather clothing, etc.)

_ 10. Copy of SSI Workplan.

SITE SAFETY BRIEFING

Job Number (Site) Star Lake Canal, a.k.a Jefferson Canal Number TX0001414341
Date _____ Start Time _____ Completed _____
Site Location Port Neches, Jefferson County, Texas
Type of Work (General) _____

****

SAFETY ISSUES

Tasks (this shift) _____

Protective Clothing/Equipment _____

Physical Hazards _____

Control Methods _____

Chemical Hazards _____

Decontamination Procedures/Tasks _____

Evacuation Procedures/Route/Signals _____

Evacuation Meeting Area _____
Nearest Phone _____
Hospital Name/Address Doctor's Hospital, 5500 39th Street, Groves, Texas (409) 962-5733
Special Topics (incidents, actions taken, etc.) _____

****

ATTENDESS

Print Name	Sign Name

Meeting conducted by: _____

SITE SAFETY BRIEFING

Job Number (Site) Star Lake Canal, a.k.a Jefferson Canal Number TX0001414341
Date _____ Start Time _____ Completed _____
Site Location Port Neches, Jefferson County, Texas
Type of Work (General) _____

****

SAFETY ISSUES

Tasks (this shift) _____

Protective Clothing/Equipment _____

Physical Hazards _____

Control Methods _____

Chemical Hazards _____

Decontamination Procedures/Tasks _____

Evacuation Procedures/Route/Signals _____

Evacuation Meeting Area _____
Nearest Phone _____
Hospital Name/Address Doctor's Hospital, 5500 39th Street, Groves, Texas (409) 962-5733
Special Topics (incidents, actions taken, etc.) _____

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by: _____

SITE SAFETY BRIEFING

Job Number (Site) Star Lake Canal, a.k.a Jefferson Canal Number TX0001414341
Date _____ Start Time _____ Completed _____
Site Location Port Neches, Jefferson County, Texas
Type of Work (General) _____

****

SAFETY ISSUES

Tasks (this shift) _____

Protective Clothing/Equipment _____

Physical Hazards _____

Control Methods _____

Chemical Hazards _____

Decontamination Procedures/Tasks _____

Evacuation Procedures/Route/Signals _____

Evacuation Meeting Area _____
Nearest Phone _____
Hospital Name/Address Doctor's Hospital, 5500 39th Street, Groves, Texas (409) 962-5733
Special Topics (incidents, actions taken, etc.) _____

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by: _____

SITE SAFETY BRIEFING

Job Number (Site) Star Lake Canal, a.k.a Jefferson Canal Number TX0001414341
Date _____ Start Time _____ Completed _____
Site Location Port Neches, Jefferson County, Texas
Type of Work (General) _____

****

SAFETY ISSUES

Tasks (this shift) _____

Protective Clothing/Equipment _____

Physical Hazards _____

Control Methods _____

Chemical Hazards _____

Decontamination Procedures/Tasks _____

Evacuation Procedures/Route/Signals _____

Evacuation Meeting Area _____
Nearest Phone _____
Hospital Name/Address Doctor's Hospital, 5500 39th Street, Groves, Texas (409) 962-5733
Special Topics (incidents, actions taken, etc.) _____

****

ATTENDEES

Print Name	Sign Name

Meeting conducted by: _____

SYNS:
3-ACETOXYQUINUCLIDINE GLAUCOSTAT
3-QUINUCLIDINOL ACETATE

TOXICITY DATA: 3 CODEN:
scu-rat LD50:225 mg/kg ARZNAD 18,320,68
ivn-rat LD50:45 mg/kg ARZNAD 18,320,68
orl-mus LD50:165 mg/kg ARZNAD 18,320,68
scu-mus LD50:102 mg/kg ARZNAD 18,320,68
ivn-mus LD50:36 mg/kg RPTOAN 35(2),55,72

THR: HIGH scu, ivn, orl.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

ACEFEN

CAS RN: 3685845 NIOSH #: AG 0440000
mf: $C_{12}H_{16}ClNO_3 \cdot ClH$; mw: 294.20

SYNS:
CENTROPHENOXINE HYDROCHLORIDE
DIMETHYLAMINOETHYL ESTER OF P-CHLOROPHENOXYACETIC ACID HYDROCHLORIDE
LUCIDRYL HYDROCHLORIDE
MECLOFENOXATE HYDROCHLORIDE

TOXICITY DATA: 3-2 CODEN:
orl-mus LD50:1750 mg/kg CRSBAW 153,1914,59
ipr-mus LD50:845 mg/kg CRSBAW 153,1914,59
ivn-mus LD50:350 mg/kg CRSBAW 153,1914,59
ivn-rbt LDLo:150 mg/kg CRSBAW 153,1914,59

THR: HIGH ivn. MOD orl, ipr.
Disaster Hazard: When heated to decomp it emits very toxic fumes of Cl^-, NO_x and HCl.

ACENAPHTHALENE

NIOSH #: AB 1255500
mf: $C_{10}H_6(CH_2)_2$; mw: 154.2

White, elongated crystals. mp: 95°, bp: 277.5°; d: 1.024 @ 99°/4°; vap. press.: 10 mm @ 131.2°; vap. d: 5.32. Insol in water, sl sol in hot alc, ether and chloroform.

SYN: 1,8-ETHYLENE NAPHTHALENE.

TOXICITY DATA: CODEN:
mma-sat 490 umol/L/2H CNREA8 39,4152,79

THR: MUT data. A skn and mu mem irr. May cause acute vomiting if swallowed in large quantities.
Fire Hazard: Slight.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

ACENAPHTHANTHRACENE

CAS RN: 5779793 NIOSH #: CU 1575000
mf: $C_{20}H_{14}$; mw: 254.34

SYNS:
BENZ(K)ACEPHENANTHRENE
4,5-DIHYDROBENZ(K)ACEPHENANTHRYLENE
3:4-DIMETHYLENE-1:2-BENZANTHRACENE

TOXICITY DATA: 3 CODEN:
skn-mus TDLo:960 mg/kg/40W-1:ETA PRLBA4 129,439,40

THR: An exp ETA.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

5-ACENAPHTHENAMINE

CAS RN: 4657936 NIOSH #: AB 0900000
mf: $C_{12}H_{11}N$; mw: 169.24

Sol. in ethanol; colorless needles, mp: 108°.

SYNS:
5-AMINOACENAPHTHENE
1,2-DIHYDRO-5-ACENAPHTHYLENAMINE

TOXICITY DATA: 3 CODEN:
ivn-mus LD50:56 mg/kg CSLNX* NX#01911

Carcinogenic Determination: Indefinite IARC** 16, 243,78
THR: HIGH ivn. An exper ± CARC.
Disaster Hazard: When heated to decomp it emits toxic fumes of NO_x.

ACENAPHTHYLENE

CAS RN: 208968 NIOSH #: AB 1254000
mf: $C_{12}H_8$; mw: 152.20

SYN: CYCLOPENTA(DE)NAPHTHALENE

TOXICITY DATA: CODEN:
mma-sat 1 mmol/L/2H CNREA8 39,4152,79

Reported in EPA TSCA Inventory, 1980.
THR: MUT data.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

ACEPROMAZINE MALEATE

CAS RN: 3598376 NIOSH #: OB 2450000
mf: $C_{19}H_{22}N_2OS \cdot C_4H_4O_4$; mw: 442.57

SYNS:
ACETYLPROMAZINE MALEATE (1:1)
MALEATE ACIDE DE L'ACETYL-3-DIMETHYLAMINO-3-PROPYL-10-PHENOTHIAZINE (FRENCH)

TOXICITY DATA: 3 CODEN:
orl-mus LDLo:270 mg/kg AIPTAK 113,53,57
scu-mus LD50:175 mg/kg AIPTAK 113,53,57
ivn-mus LD50:65 mg/kg APTOA6 19,87,62

THR: HIGH tox in mice via oral, scu and ivn routes.
Disaster Hazard: When heated to decomp it emits highly tox fumes of NO_x and SO_x.

ACETAL

CAS RN: 105577 NIOSH #: AB 2800000
mf: $C_6H_{14}O_2$; mw: 118.20

Colorless, volatile liquid, agreeable odor, nutty after-taste. bp: 102.7°, flash p: −5°F (CC), lel = 1.65%, uel = 10.4%, d: 0.831; autoign. temp.: 446°F, vap. press: 10 mm @ 8.0°, vap. d: 4.08, mp: −100°. Sl sol in water, misc in alc and ether.

Yellow needles from alc. mp: 130°. Insol HCl, sol in alc.

SYNS:

ALPHA-AMINOANTHRACENE	1-ANTHRACYLAMINE
1-AMINOANTHRACENE	1-ANTHRAMINE

TOXICITY DATA: 3	CODEN:
mma-sat 20 ug/plate	PNASA6 72,5135,75
dnr-esc 100 mg/L	JNCIAM 62,873,79
mrc-smc 5 pph	JNCIAM 62,901,79
orl-rat TDLo:7200 mg/kg/27D-I:ETA	CNREA8 28,924,68

THR: MUT data. An exper ETA.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

ANTHRACENE

CAS RN: 120127 NIOSH #: CA 9350000
mf: $C_{14}H_{10}$; mw: 178.24

Colorless crystals, violet fluorescence. mp: 217°, lel = 0.6%, flash p: 250°F (CC), d: 1.24 @ 27°/4°, autoign. temp.: 1004°F, vap. press: 1 mm @ 145.0°, (sublimes), vap. d: 6.15, bp: 339.9°. Insol in water. Sol in alc @ 1.9/100 @ 20°; in ether = 12.2/100 @ 20°.

SYNS:

ANTHRACEN (GERMAN)	PARANAPHTHALENE
ANTHRACIN	TETRA OLIVE N2G
GREEN OIL	

TOXICITY DATA: 3	CODEN:
mma-sat 100 ug/plate	ABCHA6 43,1433,79
skn-mus 118 ug MLD	CALEDQ 4,333,78
dns-hmn:fbr 10 mg/L	CNREA8 38,2091,78
hma-mus/sat 125 mg/kg	JNCIAM 62,911,79
dnd-mam:lym 100 umol	BIPMAA 9,689,70
orl-rat TDLo:20 gm/kg/79W-I:ETA	ZEKBAI 60,697,55
scu-rat TDLo:3300 mg/kg/33W-I:NEO	NATWAY 42,159,55
scu-rat TD:660 mg/kg/33W-I:ETA	ZEKBAI 60,697,55

"NIOSH Manual of Analytical Methods" VOL 1 206. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: MUT data. A skn irr. An allergen. An exper ETA, NEO.
Fire Hazard: Low, when exposed to heat or flame; reacts with oxidizing materials.
Spontaneous Heating: No.
Explosion Hazard: MOD, when exposed to flame, $Ca(OCl)_2$, chromic acid.
To Fight Fire: Water, foam, CO_2, water spray or mist, dry chemical.
Incomp: Fluorine.

1,9-ANTHRACENEDIOL

CAS RN: 30086954 NIOSH #: CA 9698000
mf: $C_{14}H_{10}O_2$; mw: 210.24

SYN: 1,9-DIHYDROXYANTHRACENE

TOXICITY DATA:	CODEN:
mmo-smc 1000 ppm/16H	ADVEA4 51,45,71

THR: MUT data.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

1,2,10-ANTHRACENETRIOL

CAS RN: 577333 NIOSH #: CB 1220000
mf: $C_{14}H_{10}O_3$; mw: 226.24

Yellow, brown powder; mp: 208°.

SYN: ANTHRAROBIN

TOXICITY DATA:	CODEN:
mmo-sat 100 ug/plate	BCSTB5 5,1489,77
mma-sat 100 ug/plate	BCSTB5 5,1489,77

THR: MUT data. MLD allergen. Local contact may cause contact dermatitis.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

1,8,9-ANTHRACENETRIOL

CAS RN: 480228 NIOSH #: CB 1225000
mf: $C_{14}H_{10}O_3$; mw: 226.24

Yellow powder. mp: 178°-180°. Insol in water, sol in fat, hot alc, benzene and dilute alkalies.

SYNS:

ANTHRALIN	1,8-DIHYDROXY-9-ANTHRANOL
1,8,9-ANTHRATRIOL	1,8-DIHYDROXY-9-ANTHRONE
DIHYDROXY-ANTHRANOL	DIOXYANTHRANOL
1,8-DIHYDROXYANTHRANOL	1,8,9-TRIHYDROXYANTHRACENE

TOXICITY DATA: 3	CODEN:
mmo-sat 100 ug/plate	BCSTB5 5,1489,77
mma-sat 100 ug/plate	BCSTB5 5,1489,77
dnr-esc 250 ug/plate	JNCIAM 62,873,79
mmo-smc 165 nmol/L	ADVEA4 51,45,71
skn-mus TDLo:509 mg/kg/53W-I:NEO	JMCMAR 21,26,78
skn-mus TD:73 mg/kg/11W-I:ETA	GANNA2 59,187,68

Carcinogenic Determination: Animal Suspected IARC** 13,75,77.
Toxicology Review: ZKKOBW 78,99,72.
THR: MUT data. An exper NEO, ETA, susp CARC. Locally it can cause folliculitis of skin. Absorption may result in kidney injury and intestinal disturbances.
Fire Hazard: Slight, when heated.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

1,8,9-ANTHRACENETRIOL TRIACETATE

CAS RN: 16203977 NIOSH #: CB 1410000
mf: $C_{20}H_{16}O_6$; mw: 352.36

SYNS:

EXOLAN	1,8,9-TRIACETOXYANTHRACENE

TOXICITY DATA: 2	CODEN:
eye-rbt 330 ug SEV	BJOPAL 53,819,69

THR: An eye irr.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

FLUORACIZINE

CAS RN: 30223484 NIOSH #: SO 4700000
mf: $C_{20}H_{21}F_3N_2OS$; mw: 394.49

SYN: 10-DIETHYLAMINOPROPIONYL-3-TRIFLUOROMETHYL PHENOTHIAZINE HYDROCHLORIDE

TOXICITY DATA: 3	CODEN:
unk-rat TDLo:300 mg/kg/(16-21D preg):TER	RPTOAN 36(4),178,73
unk-mus TDLo:10 mg/kg (4D preg)	RPTOAN 36 ,178,73
unk-rbt TDLo:140 mg/kg (16-29D preg)	RPTOAN 36 ,178,73

THR: An exper TER.
Disaster Hazard: When heated to decomp it emits very tox fumes of SO_x, NO_x and F^-.

FLUORANTHENE

CAS RN: 206440 NIOSH #: LL 4025000
mf: $C_{16}H_{10}$; mw: 202.26

A polycyclic hydrocarbon. Colorless solid. mp: 120°, bp: 367°, vap. press: 0.01 mm @ 20°.

SYNS:
BENZO(JK)FLUORENE 1,2-(1,8-NAPHTHYLENE)BENZENE
IDRYL

TOXICITY DATA: 3	CODEN:
mma-sat 100 mg/L/72H	FCTXAV 17,141,79
skn-mus TDLo:280 mg/kg/58W-I TFX:ETA	JNCIAM 56,1237,76
orl-rat LD50:2000 mg/kg	AIHAAP 23,95,62
ivn-mus LD50:100 mg/kg	CSLNX* NX#00205
skn-rbt LD50:3180 mg/kg	AIHAAP 23,95,62

"NIOSH Manual of Analytical Methods" VOL 1 183, 184. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: An exper ETA. HIGH ivn. MOD oral and skin. MUT data.
Fire Hazard: Slight, when exposed to heat or flame.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

1,1'-(3,9-FLUORANTHENEDIYL)BIS(2-(DIMETHYLAMINO)ETHANONE) DIHYDROCHLORIDE HYDRATE

CAS RN: 64296500 NIOSH #: KM 5776000
mf: $C_{24}H_{24}N_2O_2 \cdot 2ClH \cdot xH_2O$; mw: 571.56

SYN: RMI 11645 DA

TOXICITY DATA: 2	CODEN:
orl-mus LD50:2590 mg/kg	ALACBI 12,77,79
scu-mus LD50:930 mg/kg	ALACBI 12,77,79

THR: MOD orl, scu.
Disaster Hazard: When heated to decomp it emits very tox fumes of HCl and NO_x.

FLUORAPATITE

CAS RN: 1306054 NIOSH #: LL 4850000
mf: $Ca_{10}F_2O_4P$; mw: 533.77

SYN: PHOSPHATE ROCK

TOXICITY DATA:
Occupational Exposure to Inorganic Fluorides-recm std: Air: TWA 2.5 mg(F)/m3 NTIS**.
THR: See also fluorides and phosphates.
Disaster Hazard: When heated to decomp it emits very tox fumes of F^- and PO_x.

FLUOREN-2-AMINE

CAS RN: 153786 NIOSH #: LL 5075000
mf: $C_{13}H_{11}N$; mw: 181.25

SYNS:
AMINOFLUOREN (GERMAN) 2-FLUORENAMINE
2-AMINOFLUORENE 2-FLUORENEAMINE

TOXICITY DATA: 3	CODEN:
dnd-rat:lvr 4200 nmol/L	CNREA8 40,3579,80
dns-rat:lvr 500 nmol/L	ENMUDM 3,11,81
bfa-rat/sat 10 mg/kg	ENMUDM 1,155,79
msc-rat:lvr 100 umol/L	ENMUDM 2,278,80
dnr-sat 50 ug/plate	MUREAV 89,1,81
mma-omi 20 ug/plate	CBINA8 22,297,78
orl-rat TDLo:3600 mg/kg/32W-C:CAR	CNREA8 15,188,55
skn-rat TDLo:240 mg/kg/73W-I:CAR	JNCIAM 10,1201,50
scu-rat TDLo:400 mg/kg/26W-I:ETA	CNREA8 7,453,47
orl-mus TDLo:100 mg/kg/47W-C:ETA	CNREA8 7,453,47
skn-mus TDLo:11 mg/kg/34W-C:NEO	BJCAAI 14,195,60
imp-mus TDLo:50 mg/kg:CAR	BJCAAI 12,222,58
orl-rat TD:4000 mg/kg/23W-C:ETA	CNREA8 7,730,47
orl-rat TD:3200 mg/kg/58W-C:ETA	CNREA8 7,453,47
orl-rat TD:2420 mg/kg/23W-C:NEO	JNCIAM 10,1201,50
imp-mus TD:100 mg/kg:ETA	BMBUAQ 14,147,58

Toxicology Review: 85CVA2 5,63,70.
THR: An exper CARC, ETA, NEO. MUT data.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

FLUORENE-9,9-(BIS)PROPYLAMINE

CAS RN: 2409190 NIOSH #: LL 5860000
mf: $C_{19}H_{24}N_2$; mw: 280.45

SYN: 9,9'-FLUORENEDIPROPYLAMINE

TOXICITY DATA: 2	CODEN:
eye-rbt 500 mg SEV	IHFCAY 6,1,67
orl-rat LD50:620 mg/kg	IHFCAY 6,1,67

THR: MOD oral. A severe irr to rbts' eyes.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

9-FLUORENECARBOXYLATE-3-QUINUCLIDINOL, HYDROCHLORIDE

CAS RN: 548652 NIOSH #: VD 7180000
mf: $C_{21}H_{22}NO_2 \cdot ClH$; mw: 356.90

SYN: FLUORENE-9-CARBOXYLIC ACID, 3-QUINUCLIDINYL ESTER

SYNS:
ISOAMYL PHENYLAMINOACETATE HYDROCHLORIDE
ISOPENTYL-2-PHENYLGLYCINATE HYDROCHLORIDE
3-METHYLBUTYL ALPHA-AMINOBENZENEACETATE HYDROCHLORIDE (±)-
PHENYLAMINOACETIC ACID ISOAMYL ESTER HYDROCHLORIDE
d,l-2-PHENYLGLYCINISOAMYLESTERHYDROCHLORID (GERMAN)

TOXICITY DATA: 3-2 CODEN:
orl-mus LD50:2600 mg/kg PHARAT 33,749,78
ipr-mus LD50:415 mg/kg PHARAT 30,765,75
ivn-mus LD50:77 mg/kg PHARAT 33,749,78

THR: HIGH ipr, ivn; MOD orl.
Disaster Hazard: When heated to decomp it emits very tox fumes of Cl^- and NO_x.

PHENANTHRA-ACENAPHTHENE

CAS RN: 7258915 NIOSH #: QI 9400000
mf: $C_{24}H_{16}$; mw: 304.40

SYN: 4,5-DIHYDRO-NAPHTHA(1,2-K)ACEPHENANTHRYLENE

TOXICITY DATA: 3 CODEN:
skn-mus TDLo:1250 mg/kg/52W-I:ETA PRLBA4 117,318,35

THR: An exper ETA via skn in mus.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PHENANTHRENE ←

CAS RN: 85018 NIOSH #: SF 7175000
mf: $C_{14}H_{10}$; mw: 178.24

Solid or monoclinic crystals. mp: 100°, bp: 339°, d: 1.179 @ 25°, vap. press: 1 mm @ 118.3°, vap. d: 6.14. Insol in water; sol in CS_2 benzene, hot alcohol; very sol in ether.

SYN: PHENANTHREN (GERMAN)

TOXICITY DATA: 3 CODEN:
dnd-sal:spr 3 gm/L BIPMAA 5,477,67
dnd-sal:tes 5 ug/1H-C BIJOAK 110,159,68
dnd-ham:kdy 5 mg/L BCPCA6 20,1297,71
mma-sat 100 ug/plate APSXAS 17,189,80
dnd-ham:fbr 5 mg/L/24H BCPCA6 20,1297,71
cyt-ham:lng 40 mg/L/27H MUREAV 66,277,79
sce-ham-ipr 900 mg/kg/24H MUREAV 66,65,79
sce-ham:fbr 10 umol/L JNCIAM 58,1635,77
skn-mus TDLo:71 mg/kg:NEO JNCIAM 50,1717,73
skn-mus TD:22 gm/kg/10W-I:ETA BJCAAI 10,363,56
orl-mus LD50:700 mg/kg HYSAAV 29,19,64
ivn-mus LD50:56 mg/kg CSLNX* NX#00190

"NIOSH Manual of Analytical Methods" VOL 1 206. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: MUT data. An exper NEO, ETA. HIGH ivn. MOD orl. A hmn skn photosensitizer. A slight fire hazard.
To Fight Fire: water, foam, CO_2, dry chemical.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PHENANTHRENE-3,4-DIHYDRODIOL

NIOSH #: SF 7353100
mf: $C_{14}H_{12}O_2$; mw: 212.26

SYNS:
3,4-DIHYDROMORPHOL
3,4-DIHYDRO-3,4-PHENANTHRENEDIOL

TOXICITY DATA: 3 CODEN:
skn-mus TDLo:85 mg/kg:ETA CNREA8 39,4069,79

THR: An exper ETA.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PHENANTHRENE EPOXIDE

NIOSH #: SF 7704500
mf: $C_{14}H_8O$; mw: 192.22

TOXICITY DATA: CODEN:
otr-ham:emb 5 mg/L CNREA8 32,1391,72

THR: MUT data.

9,10-PHENANTHRENE OXIDE

CAS RN: 585080 NIOSH #: SF 7352000
mf: $C_{14}H_{10}O$; mw: 194.24

Colorless needles; mp: 152°-153°; very slightly sol in water; very sol in alc, ether.

SYNS:
9,10-EPOXY-9,10-DIHYDROPHENANTHRENE
1A,9B-DIHYDROPHENANTHRO-(9,10-B)OXIRENE,(9CI)
PHENANTHRENE-9,10-EPOXIDE

TOXICITY DATA: 3 CODEN:
mma-sat 100 ug/plate MUREAV 66,337,79
skn-mus TDLo:40 mg/kg:ETA JNCIAM 39,1217,67

THR: MUT data. An exper ETA.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PHENANTHRENEQUINONE

CAS RN: 84117 NIOSH #: SF 7875000
mf: $C_{14}H_8O_2$; mw: 208.22

Orange needles; d: 1.405 @ 4°; mp: 206.5°-207.5°; bp: > 300° subl; very slightly sol in water; sol in hot alc, benzene; slightly sol in ether.

SYNS:
9,10-PHENANTHRAQUINONE
9,10-PHENANTHRENEQUINONE
9,10-PHENANTHRENEDIONE

TOXICITY DATA: 3 CODEN:
skn-mus TDLo:800 mg/kg/29W-C:ETA PIATA8 16,309,40
ipr-mus LDLo:165 mg/kg HBTXAC 5,110,59

Reported in EPA TSCA Inventory, 1980.
THR: An exper ETA. HIGH acute ipr.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PYRENE

CAS RN: 129000 NIOSH #: UR 2450000
mf: $C_{16}H_{10}$; mw: 202.26

Colorless solid, solutions have a slight blue color, insol in water, fairly sol in organic solvents. (a condensed ring hydrocarbon), mp: 156°, d: 1.271 @ 23°, bp: 404°.

SYNS:
BENZO(DEF)PHENANTHRENE
PYREN (GERMAN)

TOXICITY DATA: 3	CODEN:
dnd-esc 10 umol/L	PNCCA2 -,39,65
dnd-sal:spr 3 gm/L	BIPMAA 5,477,67
dnd-sal:tes 5 ug/1H-C	BIJOAK 110,159,68
skn-rbt 500 mg/24H MOD	28ZPAK -,26,72
mma-sat 140 umol/L/2H	CNREA8 39,4152,79
msc-rat:emb 10 mg/L	JTEHD6 4,79,78
otr-ham:emb 10 mg/L	CNREA8 31,1118,71
cyt-ham:emb 10 mg/L	CNREA8 31,1118,71
dnd-mam:lym 100 umol	BIPMAA 9,689,70
skn-mus TDLo:10 gm/kg/3W-I:ETA	BJCAAI 10,363,56

"NIOSH Manual of Analytical Methods" VOL 1 183,184. Reported in EPA TSCA Inventory, 1980.
THR: MUT data. A skn irr. An exper ETA.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

N-PYREN-2-YLACETAMIDE

CAS RN: 1732145 NIOSH #: AC 7840000
mf: $C_{18}H_{13}NO$; mw: 259.32

SYN: 2-ACETYLAMINOPYRENE

TOXICITY DATA: 3	CODEN:
orl-rat TDLo:5508 mg/kg/32W-C:NEO	CNREA8 15,188,55

THR: An exper NEO.
Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

4-PYRENYLOXIRANE

NIOSH #: RR 0878000
mf: $C_{18}H_{12}O$; mw: 244.2

TOXICITY DATA:	CODEN:
mmo-sat 100 pmol/plate	CNREA8 40,642,80
msc-ham:lng 1 umol/L	CNREA8 40,642,80

THR: MUT data.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PYRETHRIN

CAS RN: 97110 NIOSH #: GZ 1575000
mf: $C_{21}H_{28}O_3$; mw: 328.49

SYNS:
2-CYCLOPENTENYL-4-HYDROXY-3-METHYL-2-CYCLOPENTEN-1-ONE CHRYSANTHEMATE
3-(2-CYCLOPENTEN-1-YL)-2-METHYL-4-OXO-2-CYCLOPENTEN-1-YL CHRYSANTHEMUMATE
3-(2-CYCLOPENTENYL)-2-METHYL-4-OXO-2-CYCLOPENTENYL CHRYSANTHEMUMMONOCARBOXYLATE
CYCLOPENTENYLRETHONYL CHRYSANTHEMATE
ENT 22,952

TOXICITY DATA: 2	CODEN:
orl-rat LD50:1410 mg/kg	ARSIM* 20,7,66
unk-rat LD50:900 mg/kg	30ZDA9 -,131,71

Toxicology Review: 27ZTAP 3,43,69.
THR: MOD orl, unk. See also esters. An insecticide.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PYRETHRIN I

CAS RN: 8003347 NIOSH #: UR 4200000
mf: $C_{21}H_{28}O_3$; mw: 328.4

Viscous liquid; bp: 170° @ 0.1 mm (decomp).

SYNS:
CINERIN I OR II
JASMOLIN I OR II
PYRETHRIN I OR II
CHRYSANTHEMUM CINERAREAE-FOLIUM
DALMATION INSECT FLOWERS
INSECT POWDER
PYRETHRUM (INSECTICIDE)
TRIESTE FLOWERS

TOXICITY DATA: 3	CODEN:
orl-rat LD50:200 mg/kg	GUCHAZ 6,442,73
orl-mus LD50:370 mg/kg	EVHPAZ 14,15,76
orl-mam LD50:250 mg/kg	AMIHAB 14,178,56

TLV: Air: 5 mg/m3 DTLVS* 4,352,80. OSHA Standard: Air: TWA 5 mg/m3 (SCP-U) FEREAC 39,23540,74.
THR: MOD orl, unk. See also esters. An allergen. Has produced diarrhea, convulsions, collapse and respiratory failure, nausea, tinnitus, headache and CNS upset. A highly insecticidal extract of weak mammalian tox. Rapid detoxified in GI tract. For the long term, slight but definite liver damage occurs at 1000 ppm and 5000 ppm diet levels. Usual early symptoms are a contact dermatitis, asthma, sneezing. A dose of 15g was fatal to a child.
Fire Hazard: Slight.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

PYRETHRIN II

CAS RN: 121299 NIOSH #: GZ 0700000
mf: $C_{22}H_{28}O_5$; mw: 372.50

Viscous liquid; bp: 200° @ 0.1 mm (decomp).

SYNS:
ENT 7,543
PYRETHROLONE CHRYSANTHEMUM DICARBOXLIC ACID METHYL ESTER ESTER
PYRETHROLONE ESTER OF CHRYSANTHEMUMDICARBOXYLIC ACID MONOMETHYL ESTER
PYRETRIN II

TOXICITY DATA: 2	CODEN:
unk-man LDLo:1029 mg/kg	85DCAI 2,73,70
orl-rat LD50:1200 mg/kg	12VXA5 8,889,68

Toxicology Review: 27ZTAP 3,121,69. Reported in EPA TSCA Inventory, 1980.
THR: MOD orl, unk. See also pyrethrin I; An allergen, insecticide.
Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

APPENDIX C

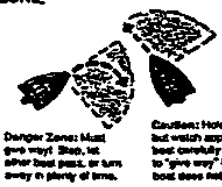
Federal Law Says You MUST Have This Aboard

Equipment	Less than 16 feet	Less than 26 feet
Life Jackets (PFDs)	One Type I, II, III, IV, or Hybrid Type V for each person. Hybrid Type V must be worn at all times to meet Coast Guard regulations	One Type I, II, III, or Hybrid Type V for each person on board or being towed on water skis, etc., plus 1 Type IV available to be thrown. Hybrid Type V must be worn at all times to meet Coast Guard regulations
Fire Extinguishers	At least one B-1 Coast Guard approved type hand portable fire extinguisher. Not required on outboard motorboats less than 26 feet in length if the construction of such motorboats will not permit the entrapment of flammable gases or vapors. NOTE: When Coast Guard approved fixed fire extinguishing system is installed in machinery space(s), no hand portable extinguisher is required.	
Ventilation	At least 2 ventilator ducts fitted with cowls for the purpose of properly and efficiently ventilating the bilges of every inboard engine and fuel tank compartment of boats constructed or decked over after 25 April 1940, using gasoline or other fuel having a flashpoint less than 110°F. Boats built after 31 July 1980 must have operable power blowers.	
Whistle, Bell, or Horn	Any device capable of making an "efficient sound signal" audible for 1/2 mile.	
Backfire Flame Arrester	One Coast Guard approved device on each carburetor of all gasoline engines installed after 25 April 1940, except outboard motors.	
Visual Distress Signals - for coastal waters, Great Lakes or high seas.	Required only when operating at night (N). Same night equipment choices as for larger boats as shown at right.	Orange flag with black square-and-disc (D); and an S-O-S electric light (N); or 3 orange smoke signals, hand held or floating (D); or 3 red flares of handheld, meteor, or parachute type (D/N).

Operating Rules

You are legally responsible for the safety of those on your boat, any damage your boat causes to other boats and property, and all others injured by any damage you cause. Just like driving a car, if you don't know and obey the rules, the fact that you didn't know them is NOT a valid defense. Important: The law also says you're GUILTY if you cause an accident because you're "right" and therefore elect not to prevent the accident. These drawings show some (but not all) "right of way" rules. (Horn signals and navigation lights are not covered here.)

CROSSING: Every boat has a DANGER ZONE from straight in front (the bow) to past the middle of its right side. Like when meeting another car at a street intersection, the one on the RIGHT has the RIGHT OF WAY. You must YIELD to boats in your DANGER ZONE.



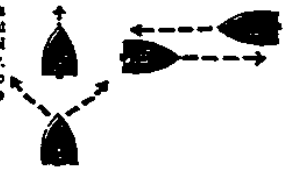
Danger Zone: Must give way! Stop, let other boat pass, or turn away in plenty of time.

Caution: Hold course but watch approaching boat carefully. Prepare to "give way" if other boat does not.

POWERBOATS MUST YIELD TO SAILBOATS and boats being rowed or paddled, except in a narrow channel. Stay well clear of all big vessels.

OVERTAKING: Be ready for trouble when a power boat passes you in a narrow waterway. As the lead boat (which always has the right of way) stay on your side of the channel and maintain a steady speed so that the overtaking vessel can pass you safely. Use your radio to discuss this with the passing boat.

MEETING: As in a car, both stay to your right & as far apart as practical, so its easier & safer to cross each other's wake. (Okay to pass left, if both know the plan.) Give notice by steering to right or left while still far apart. Then stay with that plan unless the other boat indicates otherwise. If you have a CB or VHF, use it. Be careful.



Take A Boating Course

This pamphlet funded through a grant from the United States Coast Guard with additional support from the USPS Educational Fund.

UNITED SAFE BOATING INSTITUTE
1504 Blue Ridge Road, Raleigh, NC 27622, (919) 821-0281
For info on boating classes call: 1-800-336-BOAT.

UNITED STATES POWER SQUADRONS

Take the public Boating Course to learn the basics of safer and more enjoyable boating, whether you own a boat, are thinking of buying one, or enjoy boating with friends. All instruction is free; there is a nominal charge to cover costs including a 150 page student workbook & chart. The course is offered as a public service to adults and teenagers in over 500 local areas throughout the U.S.A. Instructors are volunteer USPS members with advanced training, who have taught 2-1/2 million students.

UNITED STATES COAST GUARD AUXILIARY

Coast Guard Auxiliary, created by Act of Congress in 1939, is the Volunteer Civilian Arm of the United States Coast Guard. In promoting safe boating in the U.S.A., it performs these non-profit services: ■ Teaches several public boating courses. ■ Examines recreational boats for proper safety equipment. ■ Assists regular Coast Guard in search & rescue, and patrols navigable and state waterways.

For more free info on boating safety (including safety recalls) call: 1-800-368-5647.

AMERICAN RED CROSS

By congressional charter, the ARC is responsible for relieving and preventing accidents and suffering. The aim of the organization is to improve the quality of human life and to enhance individual self reliance and concern for others. It provides standards, courses, and materials in first aid, CPR, swimming, lifesaving, lifeguarding, and boating safety (canoeing, kayaking, sailing.)

UNITED STATES YACHT RACING UNION

National governing body for sailing. USYRU is also a membership organization of 25,000 active sailor and sailing groups. Programs include instructor training, sailing safety, and services to sailing groups. Membership benefits include discounts on sailing publications, videos, and travel; monthly "American Sailor" magazine. For information call (401) 849-5200 or write USYRU, Box 209, Newport, RI 02840

For information on Boating Classes in Canada call 1-800-268-3579

Tips for Safe Boating

No matter how many years you've been around boats, please take just five minutes to scan this quick reading booklet. People who hunt or fish from boats have one of the highest boat fatality rates. More die from falling off boats 16 feet and smaller than larger boats, and most boats are anchored at the time.

❑ Be weather wise. Sudden wind shifts, lightning flashes and choppy water all can mean a storm is brewing. Bring a portable radio to regularly check weather reports.

❑ Bring extra gear you may need. A flashlight, extra batteries, matches, a map of where you are, flares, sun tan lotion, first aid kit, extra sunglasses. Put those that need to be protected in a watertight pouch or a container that floats.

❑ Tell someone where you're going, who is with you, and how long you'll be away. Then check your boat, equipment, boat balance, engine and fuel supply before leaving.

❑ Ventilate after fueling. Open hatches, run blower, and most important, carefully sniff for gasoline fumes in the fuel and engine areas before starting your engine.

❑ Stay dry and warm. Wear several layers of light clothing; bring rainproof covering. Never wear hip waders in a small boat.

❑ Keep fishing & hunting gear clean and well packed. A loose fish hook can cause a lot of pain and ruin a great outing. Bring an extra length of line to secure boat or equipment.

❑ When changing seats, stay low and near center line of a small boat.

❑ Be ready for trouble when a powerboat passes you in a narrow channel. As the lead boat (which always has the right of way) stay on your side of the channel and maintain a steady speed so that the overtaking vessel can pass you safely. Use your radio to discuss this with the passing boat.

❑ Anchor from bow, not stern. Use anchor line length at least five times longer than water depth.

❑ Take a safe boating course. As an extra benefit, you may earn lower boat insurance costs. (See back cover.)

Distress Signals.

This illustrates the variety and combinations of distress signals which can be carried in order to meet Coast Guard requirements (the arm signals are shown for information only – they are an internationally recognized sign of distress, but are not "required distress signals"). All signals, except for the distress flag and light must show the words "Coast Guard Approved" and be marked with the service life of the signal. The distress flag and light must carry the manufacturer's certification that they meet Coast Guard requirements.

Visual Distress Signals

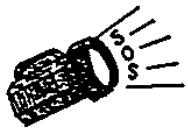
Orange Flag
use day only

Arm Signals (Use Bright Cloth)

Red Distress Flare (Hand)
use day and night
(minimum of 3 required)

Orange Smoke Signal (Hand)
use day only
(minimum of 3 required)

Red Meteor
use day, night
(minimum of 3 required)



use night only

Orange Smoke Signal (Floating)
use day only
(minimum of 3 required)

How you Board and Load Your Boat is Important.

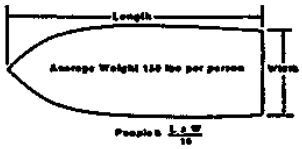
Be sure you know your boat's capacity. Look at the Capacity Plate. Don't overload it or put an oversize motor on it. On boats with no capacity plate, use the formula in the sketch at right to determine the maximum number of persons you can carry.

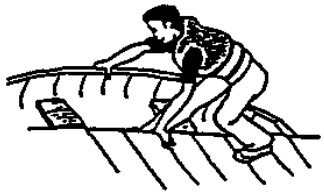
Be sure the dock lines are tied securely before you put gear aboard or go aboard yourself. Don't wind up straddling from dock to boat. If the boat is small, step as near the centerline as possible, and stay low in the boat. As you load, look at how much distance there is between the water and the top edge of your boat (freeboard). Waves, or wakes from passing boats, can easily swamp a small boat with low freeboard. Don't overload. Don't load heavy gear to one side.

Remember: When you overload, you are asking for trouble. Even with flotation a swamped boat is dangerous. Capsizing and falls overboard account for 70% of boating fatalities.

LOADING YOUR BOAT

Passenger Capacity Calculation





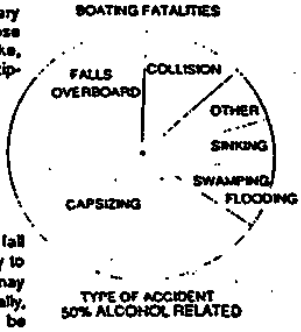
Some Sobering Facts about Alcohol

Over 1,000 people die in boating accidents every year. Nine out of ten of them drown. About half those deaths involve alcohol. It's a tragic fact and not a joke, but 50% of drunk men who drown have their fly unzipped. Enough said?

Four hours of exposure to powerboat noise, vibration, sun, glare, wind and motion produces a kind of "boater's hypnosis". This slows reactions almost as much as being legally drunk. Adding alcohol to this sun exposure intensifies the effects. As the chart shows, sometimes just a couple of beers are too many.

When you're "tipsy", you're much more likely to fall overboard. Alcohol also reduces your body's ability to protect against cold water. So within minutes you may not be able to call for help, or swim to safety. Actually, a drunk person whose head is immersed can be confused and swim down to death instead of up to safety.

BOATING FATALITIES



TYPE OF ACCIDENT
50% ALCOHOL RELATED

Blood Alcohol Content Chart*

Body Weight in Pounds	Number of Drinks in a Two Hour Period. 12 oz. beer = 5 oz. wine = 1 oz. 80 proof liquor.						
100	1	2	3				
120	1	2	3	4			
140	1	2	3	4	5		
160	1	2	3	4	5	6	
180	1	2	3	4	5	6	
200	1	2	3	4	5	6	
220	1	2	3	4	5	6	
240	1	2	3	4	5	6	

BAC to .05%	BE CAREFUL - Loss of judgment and coordination
BAC .05% to .10%	ABILITIES IMPAIRED - Chance of accident increased
BAC .10% and Over	DO NOT OPERATE A BOAT - High risk of accident

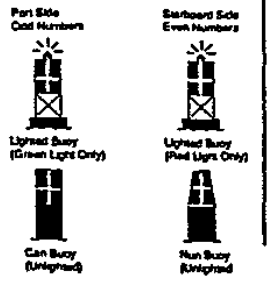
Federal Aids to Navigation.

(State waterway aids not shown)

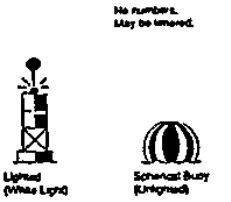
Federal Waterway Marking System

- Keep RED aids on your RIGHT coming upstream (& in from seaward).
- Keep marked channels clear. Don't anchor in a channel or to a navigational aid.

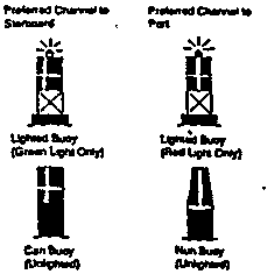
Lateral Aids Marking the sides of channels as seen when entering from seaward



Safe Water Aids marking mid-channels and fairways



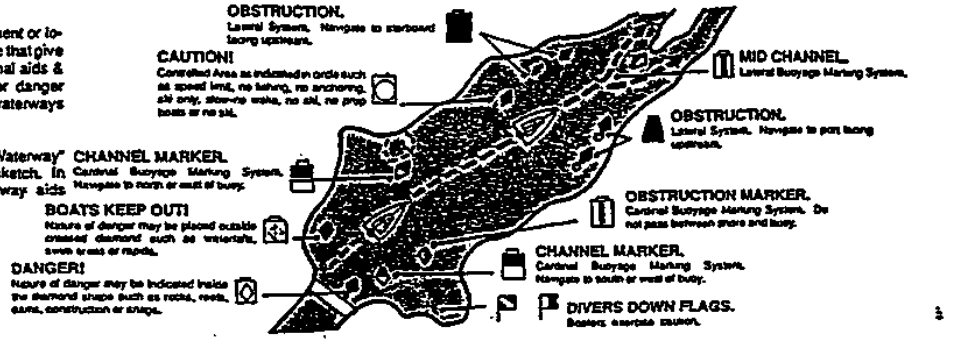
Preferred Channel Aids (Mark bifurcations. No numbers. May be lettered.)



Charts — Your "Road Maps"

Most areas have government or locally prepared charts available that give water depth, show navigational aids & major landmarks, underwater danger areas, as well as shorelines, waterways and harbor areas.

Some "Uniform State Waterway" aids are shown in the chart sketch. In most areas, Federal waterway aids also would be shown.



Life Jackets (PFDs) - The Choice Is Yours

- Get and wear a Coast Guard approved Personal Flotation Device (PFD) that fits well; make sure it is the proper type and approved for your specific usage. Actually put it on, adjust it and test it in the water, so you'll know how it will feel when needed. Do the same for all family members - especially children. Knowing what to expect in the water can prevent panic. Non-swimmers should wear a PFD on any small boat.
- Never leave PFDs sealed in plastic wrapping. They must be ready to put on fast.
- Whenever water conditions or weather cause concern, have everybody aboard immediately put on a PFD.
- And if you fall in the water, stay with the boat.

Offshore Life Jackets (Type I): Bulky; but floats you the best; best for open, rough, or remote water. Turns most unconscious persons face-up in the water. Not pictured here.

Near shore buoyant vests (Type II): Yoke-type, less bulky than Type I and more comfortable to wear. Will hold head of many unconscious persons out of water.

Flotation Aids (Type III): Vest style; popular among recreational boaters. Only designed for calm water with good chance of fast rescue. Wearer may have to hold head back to keep face out of water, which can contribute to exhaustion and hypothermia. *May not hold face of unconscious wearer out of water.*

Throwable Devices (Type IV): Life rings and floating cushions.

Special Use Devices (Type V): Approved only for the activities listed on the label. Some are approved specifically for white water rafting, board sailing, etc. Also includes new Hybrid PFDs with foam flotation and an inflatable chamber. Type V Hybrid PFDs are as comfortable to wear as a Type III, but when fully inflated have the flotation performance of a Type II or better.

First Aid Emergency Measures

Be boatwise. Take a first aid and CPR course.

FIRST AID EMERGENCY MEASURES		
INJURY	**SIGNS**	**TREATMENT**
Broken Bones	Pain, swelling, deformity, discoloration and possible bleeding.	Keep broken bone ends and adjacent joints from moving, control bleeding, treat for shock.
Burns	DEGREE: 1st - Skin is pink or reddish (sunburn). 2nd - Skin is blistered. 3rd - Skin may be red and raw; possibly black charred areas.	Pain of 1st degree and small 2nd degree burns can be relieved by excluding air. Three ways to exclude air from 1st or 2nd degree burns are: 1.) Submerge in cold water; 2.) Apply a cold pack, 3.) Cover with a thick dressing or unused plastic. For a 3rd degree burn, cover with dry clean cloth and call for medical help. If the victim's face is burned, he may stop breathing. Be ready to give artificial respiration.
Sunburn	Red, painful skin and chills. Fever and shock occasionally accompany severe sunburns.	Apply cold water. Do not re-expose burned area to sun until completely healed. Get medical attention.
Heart Failure - Epilepsy	Victim is ill with no apparent external injury. Clutching chest, extreme shortness of breath, convulsions.	Place the victim in a comfortable position, usually sitting up. Call for medical help and give prescribed heart medicine if available. If not breathing, give artificial respiration. Victims with convulsions should be laid down in a cleared, open area. Never place anything in the person's mouth.
Shock	Pale, clammy skin, irregular breathing, fast, weak pulse.	Keep person lying down and prevent loss of body heat. Do not give fluids if victim is unconscious. Get medical help as soon as possible.

Hypothermia - Here's How To Fight This Killer

Exposure causes loss of body heat. This is called hypothermia. Hypothermia can kill. Defense against hypothermia is to avoid exposure to cold. Do this by staying dry and avoiding the wind. Put on rain gear before you get wet. If you fall into cold water, do NOT discard clothing; it will help trap heat. Avoid moving as much as possible. A life jacket helps in two ways: it reduces the need to move, and it helps insulate against heat loss. When you wear a life jacket, draw knees up into a H.E.L.P. (Heat Escape Lessening Position).

If several persons are in the water, huddle together so you can conserve heat and stay alive.

Treatment involves getting the victim out of cold producing environment. Strip off all wet clothing and get person into a warm sleeping bag. Try to keep person awake. Do NOT give alcohol or massage vigorously. Giving the person warm drinks or food is not a good idea. They don't help re-warm the person and they can pose a choking hazard. Transport the victim to a hospital as soon as possible.

If the Water Temp. (F) is...	Exhaustion or Unconsciousness	Expected Time of Survival is...
32.5	Under 15 Min.	Under 15-45 Min.
32.5-40.0	15-30 Min.	30-90 Min.
40-50	30-60 Min.	1-3 Hr.
50-60	1-2 Hr.	1-6 Hr.
60-70	2-7 Hr.	2-40 Hr.
70-80	3-12 Hr.	3-Indefinitely
over 80	Indefinitely	

Canoeing

You can quickly and easily master getting into and out of a canoe without getting wet if you remember the following important points:

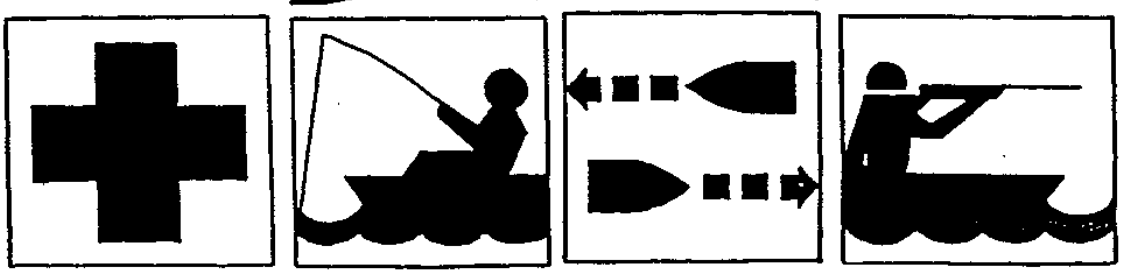
- Keep your center of gravity low, and move slowly and deliberately.
- Transfer your weight slowly from shore to the bottom center of the canoe.
- Board your canoe directly into your paddling position whenever possible.
- For maximum control and stability always kneel in canoes, even though some canoes have seats.

To get out of a canoe, simply reverse the steps described above.

Canoe capsizing: Once you have capsized, relax and make contact with the canoe with your hands, if you have not already done so. Stay upside down long enough to extract feet and legs from the canoe. Then surface, maintaining contact with the canoe. Keep your eyes open.

FISHERMEN, HUNTERS & CAMPERS

Tips for safe boating



Before Casting Off

et in the habit of performing these brief steps:

"Sniff" your bilges. Usually your nose is the best el/vapor detector. It'll mean getting down on your ands and knees, but it's the best way to do it.

Operate the bilge blower for at least FOUR INUTES before starting an inboard engine. If you ll smell fumes, try to find what is causing them and ake repairs before starting the engine.

Make sure the location of your fire extinguishers known to all passengers.

When refueling, close all hatches, ports and other penings; shut off all engines and motors; and refrain om smoking. Fill all portable tanks on the dock.

After refueling, wipe up or wash off any excess spilled fuel; open all hatches and ports; and let e boat air out. "Sniff" your bilges. Operate the ilge blower for at least four minutes before arting an inboard engine.

U.S. Department of Transportation
United States Coast Guard

Call the Boating Safety Hotline:

800-368-5647

(Toll Free!)

- For Boating-Safety-Recall Information.
- To Report Possible Safety Defects in Boats.
- For Answers to Boating Safety Questions.

Shipshape

is Firesafe

Shipshape is Firesafe

A shipshape boat is a safe boat. Firesafety is something that everyone who owns or operates a boat should practice.

Each year, boating fires and explosions injure hundreds of Americans and cause millions of dollars in property damage. While there is a greater chance for a fire or explosion on a boat than on land, many of these accidents can be prevented.

Fuel and fuel vapors are two of the leading ingredients in all boating accidents involving fires and explosions. Keep fuel and vapors in their proper places and make all of your boating trips firesafe.

The United States Coast Guard and the National Fire Protection Association offer the following helpful reminders:

In General or Seasonal

1. Be alert for damage to your boat's fuel system. Over a period of time, fuel fittings and fuel hoses wear out. Inspect these fittings and hoses regularly, especially near the engine where engine heat can accelerate deterioration.

2. Inspect fuel tanks annually. Pay particular attention to bottom surfaces which may have been in contact with bilge water and any part of the tank which touches the boat structure. The tank could have rusted or been damaged due to rubbing and abrasion. Permanently installed fuel tanks should be vented to the outside of the hull as well as closed compartments.

3. Be sure the fuel pipe is tightly fitted to fill the plate and located outside closed compartments. The fill pipe should also be located where any spilled fuel will be directed overboard. Look for fuel fill hoses that are dry and cracked or soft and mushy. Such hoses should be replaced with marine fuel hoses immediately.

4. If a hose or fuel tank is leaking, replace it before using your boat.

5. On a boat with portable fuel tanks, make sure the vents can be closed and that the tanks have a vapor-tight, leak-proof cap. The vent on a protable tank should be open when the motor is running, but when the tank is not in use, the vent and the cap should be tightly closed.

6. If the boat has powered ventilation (a bilge blower), make sure the blower operates.

7. Be sure heating and cooking appliances on board are secured and operate properly. Refer to the owner's manual for the appliance for guidance on inspecting for leaks in valves and connections; never use a match.

8. Make sure that flammable items are stowed safely and cannot come into contact with cooking or heating appliances or hot engine parts.

9. Make sure Coast Guard Approved fire extinguishers on board are in working order - that gauges register and that nozzels are clear. Take a boating safety course that teaches the correct use of a fire extinguisher aboard a boat. The time to learn is before a fire occurs.

10. Look for bare wires or loose electrical connections. They might cause a short in your boat's electrical system, which could start a fire.

11. Do not store small disposable propane cylinders or charcoal lighting fluid on board.

12. Conduct a bow to stern inspection checking for loose fuel, gas fumes and any malfunctioning instruments.

APPENDIX C

Quality Assurance Project Plan

TNRCC

Protecting Texas by Reducing and Preventing Pollution

Quality Assurance Project Plan

for

Texas Natural Resource Conservation Commission Preliminary Assessment/Site Inspection Program (FY 1998)

November 1997

Quality Assurance Project Plan

Texas Natural Resource Conservation Commission
Preliminary Assessment/Site Inspection
Program (FY 1998)

Prepared in cooperation with the

U.S. Environmental Protection Agency

November 1997

The preparation of this report was
financed through a grant from the U.S.
Environmental Protection Agency.

TNRCC QMP Revision 02: EPA QTRACK # Q-97-056

QUALITY ASSURANCE PROJECT PLAN
FOR
TNRCC PRELIMINARY ASSESSMENTS AND SITE INSPECTIONS

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Quality Assurance Specialist

Stephanie Pogue — 11/20/97 Date
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Superfund Site Discovery and Assessment Program
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Allan M. Seils — 11/20/97 Date
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Wesley G. Newberry — 11/20/97 Date
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REFERENCES

Interim Draft EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, October 1996

EPA Data Quality Objectives Process for Superfund, EPA QA/G-4, September 1994.

USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Document No. ILM04.0, February 1994

USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Revision No. OLM03.1, August, 1994

USEPA National Functional Guidelines for Inorganic Data Review, EPA 540/R-94/013, February 1994.

USEPA National Functional Guidelines for Organic Data Review, EPA 540/R-94/012, February 1994.

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SECTION A

PROJECT MANAGEMENT

(A4) PROJECT ORGANIZATION and (A6) PROJECT DESCRIPTION

This document is a Category I Quality Assurance Project Plan (QAPP) for the planning and implementation by the Texas Natural Resource Conservation Commission (TNRCC) of the Preliminary Assessments (PA) and Site Inspections (SI) in Texas for the U.S. Environmental Protection Agency (EPA) Superfund program. This QAPP has been prepared in accordance with the "Interim Draft EPA Requirements for Quality Assurance Project Plans ", EPA QA/R-5, October 1996, and EPA Data Quality Objectives Process for Superfund, EPA QA/G-4, September 1994. The site assessment process begins with site discovery, or notification to EPA or the TNRCC of possible releases of hazardous substances. The sites are evaluated using a phased investigation consisting of the PA and, if necessary, the SI. The PA is a limited scope investigation based primarily on available information. Samples are not collected during a PA. The PA distinguishes sites that pose no threat to human health and the environment from sites that may pose a significant threat. Sites that may pose a threat receive a further action recommendation after the PA and undergo an SI, where investigators collect sufficient waste and environmental media samples to identify sites that have a high probability of qualifying for the National Priorities List (NPL). This QAPP serves as a controlling mechanism to ensure that all data collected are of satisfactory quality.

A Regional EPA site assessment representative will accompany TNRCC personnel on the PA site visit and based solely on the field findings an immediate decision will be made on whether to proceed with preparation of an Screening Site Inspections (SSI) Work Plan. On those occasions when no EPA site assessment representative is present, the TNRCC PA/SI Program Manager, Technical Director and designated Site Investigation Manager (with EPA follow up concurrence) will decide if the site should proceed to the SSI stage. The TNRCC Site Investigation Managers will be responsible for collecting the samples defined in the SSI or Expanded Site Investigation (ESI) Work Plan (WP), initiating the proper chain-of-custody, health and safety, and quality assurance procedures. The TNRCC Site Investigation Managers will also be responsible for making any field sampling determinations as dictated by site conditions. Samples from the sites will be analyzed for semi-volatiles, volatiles, metals, pesticides and Polychlorinated Biphenyls (PCBs) and, if required, dioxins/furans.

If, considering site conditions, there is an imminent danger that the general public may come into direct contact with hazardous substances or wastes which are readily accessible on-site, the EPA will be notified no later than one (1) day after the inspection team returns from the site visit. Written notification will follow any verbal communication in this regard. The EPA will determine the course of action.

The Preliminary Assessments and Site Investigation (PA/SI) program organization chart, Figure 1.1, identifies the key individuals who will be primarily responsible for performance of the project. This organizational structure forms a management team of professionals to oversee the technical aspects of the project, supported by an administrative team who will ensure that personnel and equipment are available to the project when required.

Allan M. Seils, will function as TNRCC Program Manager. Mr. Seils will be responsible for overall coordination of project activities. He also will serve as primary TNRCC contact for the EPA. The Technical Director, Wesley G. Newberry, will review the SSI work plans, Preliminary Assessment (PA) and SSI reports, and progress reports. One of the Quality Assurance Specialists will be responsible for reviewing data in accordance with the procedures outlined in this QAPP, and will complete associated data assessment reports. The Quality Assurance Specialists will function independently of the Program Manager and will assure that project quality control is maintained. The Quality Assurance Specialists will audit the field work at 20% of the SSI/ESI sites. The Compliance Support Division Quality Assurance Specialist and the Compliance Support Division Director will serve as TNRCC final approval authorities for this PA/SI QAPP. C. Todd Counter will serve as the Health and Safety Officer, independent of the Program Manager. As such, he, or his designee will be responsible for ensuring that all on-site activities comply with the approved site specific Health and Safety Plan.

A generic Health and Safety Plan (H&SP) will be followed during performance of each PA site visit. Individual site H&SPs will be prepared for all SSI sites as part of the work plan development. All H&SPs will be based on TNRCC's health and safety program and TNRCC's understanding of current health and safety regulations.

There will be no more than twenty-five (25) PAs and twelve (12) to thirteen (13) SSIs conducted during this fiscal year with the possibility that both a PA and SSI may be conducted at any one location. A minimum of two (2) persons per PA and four (4) persons per SSI/ESI will be used to conduct field activities. At these sites, one TNRCC staff person will be designated as the lead Site Investigation Manager and will have the on-site responsibility for ensuring that the HS&P and QAPP are followed, and that appropriate data are collected to allow for preparation of site-specific SSI/ESI WP. The Site Investigation Manager also will be responsible for planning and conducting the site visit and preparing the final PA, SSI report and/or Documentation Record (for ESI sites, only) for the site.

Table 1.2. Schedule of Preliminary Assessments

Activity	Hours After Site Assignment
Site Assignment	0
Draft Preliminary Assessment Scoresheets and Background Research	60
Conduct PA Site Visit	12
Draft PA Report Complete	38
Final PA Report Submitted to EPA	10

Table 1.3. Schedule of Site Inspections

Activity	Hours After Site Assignment
Site Assignment to TNRCC	0
SSI Background Research Completed	68
Work Plan Completed and Approved	60
Health and Safety Plan Completed and Approved	18
Work Plan Executed (includes travel)	123
Laboratory Analyses Complete	40
Draft SSI Report/Prescore Complete	83
Final SSI Report/Prescore Submitted to EPA	16

It is anticipated the TNRCC Program Manager will issue site assignments such that the majority of PAs are completed within the first six (6) months of the fiscal year. See Appendix A - Preliminary Assessment/Site Inspection Program Fiscal Year 1998 Schedule. This will allow those sites which progress directly to an SSI Work Plan to be completed within the final six months of the fiscal year. The total anticipated time to complete each PA is 120 hours and each SSI is 400 hours. A detailed schedule for the completion of PAs and SSIs is presented in Tables 1.2 and 1.3, respectively. In the event an expanded SSI (ESI) is warranted, the total anticipated time to complete the ESI is 620 hours from site assignment. If the site is to be proposed for the NPL, a Hazard Ranking System (HRS) package may be warranted, and the total anticipated time to complete the HRS is 400 hours from completion of the ESI. These schedules may be adjusted to meet specific requirements of the EPA guidance. This guidance currently includes the following references: (1) *Federal Register,* 40 CFR Part 300, December 14, 1990; (2) "Guidance for Performing Preliminary Assessments Under Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA)" September, 1991; 3) "Guidance for Performing Site Inspections Under CERCLA", September, 1992; 4) "Regional Quality Control Guidance for NPL Candidate Sites", December, 1991; 5) "Region 6 CLP Training Manual", October, 1993; and 6) Management of Investigation-Derived Wastes During Site Inspections", May, 1991.

The TNRCC Site Investigation Manager designated to lead investigations at the SSI/ESI site will develop a WP and sampling strategy for the site. The information gained from the PA, tentative disposition, and other timely information will be used in determining tentative numbers, nature, and location of samples collected. The WP consists (1) a list of project contacts; (2) data quality objectives, and a site background review including site history, descriptions of the site including geology, hydrology, soil conditions, site map(s), and waste handling practices including types and quantities of wastes generated (if known); (3) a WP summary including field personnel, site reconnaissance plan, sampling strategy, sampling locations and map(s), and QA/QC sample protocols and decontamination procedures. The WP will also identify potential targets for the groundwater, surface water, soil exposure, and air pathways; (4) a health and safety plan to describe potential hazards and necessary site specific precautions and preparations for completing the field work described in the sampling plan; and (5) general project requirements such as a schedule, equipment needed, and mobilization/demobilization procedures.

The TNRCC Site Investigation Managers will prepare the WP according to the format agreed to by the EPA for use on the FY1998 and 1998 Multi-Site PA/SI Scope of Work. Revisions to this format will be determined by the EPA and TNRCC project managers prior to preparing the first documents. The EPA will be responsible for approving each work plan; however, the decision to proceed with WP implementation may be delegated by the EPA Site Assessment Manager (SAM) to the TNRCC Program Manager, as appropriate.

EPA shall choose a laboratory to be used for this project under its Contract Laboratories Program (CLP) and shall incur all costs for sample analyses. The EPA Houston's Laboratory shall provide analytical support for drinking water samples. The sample analyses shall include analysis for all constituents listed on the CLP Routine Analytical Services (RAS) Organic Target Compound List (TCL) and Inorganic Target Analyte List (TAL).

(A5) PROJECT DEFINITION/BACKGROUND

The major objective of this project is to perform and complete Preliminary Assessments and Screening Site Inspections at sites judged to be potentially hazardous because of current and past operational and waste disposal activities. The PA and SSI reports will provide technical information and data that can be used to determine the score of each respective site according to the Hazard Ranking System (HRS). The HRS is the primary means by which EPA evaluates sites for Superfund's National Priorities List (NPL).

Preliminary Assessments (PA) and Screening Site Inspections (SSI) will be conducted in conformance with the requirements of the revised Hazard Ranking System (HRS), Final Rule, dated December 14, 1990. The EPA furnished guidance for performance of these tasks and it will be used as reference material in collecting data, planning, and conducting on-site activities, and in preparation of the reports for each site. This guidance currently includes the following references: (1) *Federal Register,* 40 CFR Part 300, December 14, 1990; (2) "Guidance for Performing Preliminary Assessments Under CERCLA" September, 1991; 3) "Guidance for Performing Site Inspections Under CERCLA", September, 1992; 4) "Regional Quality Control Guidance for NPL Candidate Sites", December, 1991; 5) "Region 6 CLP Training Manual", October, 1993; and 6) Management of Investigation-Derived Wastes During Site Inspections", May, 1991.

In most cases, it will be necessary to obtain advance permission to inspect the sites. The TNRCC will obtain access agreements for each site. The designated TNRCC Site Investigation Manager for each site will prepare a written notification to the site owner/operator of the impending site visit, followed by telephone confirmation by the TNRCC Site Investigation Manager. The TNRCC Site Investigation Manager will also be responsible for notifying the local TNRCC Regional Office of the impending site visit. The TNRCC Program Manager will provide each member of the TNRCC project staff with written credentials describing the nature of the project and the authority under which it is conducted.

Upon arrival at a site, the inspection team will conduct an initial survey of the site to ensure adequate safety precautions are in place during site activities. The Site Investigation Manager

will, when possible, conduct a detailed interview with site representatives. Interviews with other individuals familiar with the site will be conducted as appropriate before, during, or after on-site reconnaissance activities.

A thorough site reconnaissance, if possible, will be conducted at each site. The inspection team will visually survey and document the location of the site relative to any roads or other access, drainage systems, surface waters, nearby structures, drums, tanks, monitoring wells, facility boundaries, unique geological features, and other factors which may affect pollutant migration pathways. These factors will be recorded, to the extent practical, on a field site sketch which will be prepared during the site visit. The facility sketch also will document the location of sensitive environmental receptors such as on-site and off-site homes and public building, natural areas, and drinking water supplies. Residences within 400 yards of the site will be included in the site sketch. Indicators of existing problems, such as areas of diseased, dying, or distressed vegetation or discolored soil, also will be noted on the site sketch. Photographs will be taken as necessary to document observations and on-site activities. Generalized population information, including collection of environmental equality data, will be based on the number and types of surrounding homes and businesses.

Where operator records are present, these will be reviewed for an indication of the type and quantity of materials disposed of at a given site. Where possible, the party responsible for waste disposal will be determined.

For SSI/ESI visits, environmental samples will be collected in accordance with the approved WP to provide site-specific data on the hazardous substances present as well as pollutant dispersal pathways. The samples collected during the SSIs and ESIs typically will be from the following sources:

- o On-site and off-site soils;
- o Groundwater from existing potable or agricultural water or monitoring wells;
- o Water or waste from open drums, surface impoundments, or evaporation pits;
- o Point of entry into receiving waters in the runoff pathway(s) from the site;
- o Environmentally sensitive areas near the site.

For each PA, initial activities will involve the collection of site background information and completion of a site visit. A Regional EPA site assessment representative will accompany TNRCC personal on the PA site visit and based solely on the field findings an immediate decision

will be made on whether to proceed with preparation of an SSI Work Plan. On those occasions when no EPA site assessment representative is present, the TNRCC PA/SI Program Manager, Technical Director and designated Site Investigation Manager (with EPA follow up concurrence) will decide if the site should proceed to the SSI stage.

If a site is designated to proceed to the SSI phase, then an SSI Work Plan and final SSI Report will be prepared for submission to the EPA. A complete PA will not be prepared for these sites. An abbreviated PA Report will be prepared for those PA candidate sites which are determined ineligible for CERCLA response by the EPA site assessment representative.

For each SSI, field activities will be conducted in two steps. TNRCC will collect information needed to prepare a work plan before the site visit. Following approval of the work plan, TNRCC will visit the site to execute the work plan, including sampling activities. The collected information, including sample results, will be compiled into a final SSI Report for the site.

Initial preparations for each PA, SSI and ESI site visit will involve obtaining information for preparation of the Health and Safety Plan and SSI/ESI WP. This task also includes obtaining access to the sites and the site inspection visit. Prior to any on-site inspections, the project staff and the TNRCC Program Manager will review the results of the preliminary assessment and/or available EPA and/or TNRCC files to address any health and safety risk concerns, and to assess the level of effort necessary to perform the site visit.

The TNRCC project staff will conduct a detailed background study for each PA/SSI/ESI site prior to any field activities. The purpose of this study is to collect available file information concerning activities at the site, hydrogeologic, photographic and topographic in formation pertinent to the site (to be used in pathway evaluation), and population and ecological information available for the area surrounding the site (to be used in a target evaluation).

Site activities information to be collected during this background study will be primarily the EPA, TNRCC, and other State and Federal agency records on the site. Hydrogeologic and topographic information will be collected at this time primarily from USGS topographic maps, city and county maps, county and regional water reports, county and regional geologic cross sections, state well construction records, soil maps, etc. Population and ecological information will be collected primarily from census figures, USGS topographic maps, public school records, the Texas Manufacturers Index, U.S. Fish and Wildlife and Texas Parks and Wildlife endangered species publications, and additional information if available. Aerial photography, as available from the

Texas Natural Resources Information System, Texas Department of Transportation, and other sources, will also be examined for additional information about the site.

The data collected will, whenever possible, be selected to meet the requirements of the HRS model. It is understood that, at the level of effort appropriate for a PA, it may not be possible at some sites to collect "HRS quality" data to fulfill every requirement of the model. The TNRCC will make every reasonable effort to collect "HRS quality" data for every site, within the limits of the project schedule, budget, and the available information. Every effort will be made to collect the best available information during the performance of each PA. In addition, all SSI/ESI information will be collected in accordance with applicable SI guidance.

The level of effort required for the SSI background research may be greater than that normally required. This increased effort is necessary because the PAs for some of the sites may not have been prepared prior to publication of the current HRS guidance and do not contain complete HRS information. Therefore, this additional PA information may need to be collected during the background study task of the SSI/ESI.

(A7) DQO for MEASUREMENT DATA

A quality assurance (QA) program is essential to assure the quality, controllability, accountability, and traceability of the work being performed for the TNRCC PA/SI Program. Quality assurance encompasses all actions taken by TNRCC and its subcontractors to achieve results which are accurate, reliable, and legally defensible for all aspects of the project. TNRCC and its subcontractors will adhere to the quality assurance procedures outlined herein and will rigorously implement the QA program throughout the duration of the project.

The primary goal of this QA program is to ensure the accuracy and completeness of the data which ultimately will be used to score and to determine the status of the sites that are investigated. In order to achieve this accuracy and completeness, it is necessary that all sampling, analysis, and data management activities be conducted in accordance with preset standards, and that these activities be reviewed regularly to maintain full compliance with the standards. This program has been designed so that corrective action can be implemented quickly if necessary without causing undue expense or delay to the project. The standards and review procedures which TNRCC will use to attain optimum accuracy and completeness of data are outlined in this plan. All subcontractors to TNRCC will be required to follow these standards and procedures, at a minimum.

Table 1.4. Matrix Spike/Matrix Spike Duplicate Control Limits for CLP GC/MS Organic Analyses**

	Water		Soil	
Matrix Spike Compound	% Recovery	RPD %	% Recovery	RPD %
Volatile organics:				
1,1-Dichloroethene	61-145	14	59-172	22
Trichloroethene	71-120	14	62-137	24
Benzene	76-127	11	66-142	21
Toluene	76-125	13	59-139	21
Chlorobenzene	75-130	13	60-133	21
Semivolatile organics				
Phenol	12-110	42	26-90	35
2-Chlorophenol	27-123	40	25-102	50
1,4-Dichlorobenzene	36-97	28	28-104	27
N-Nitroso-di-n-propylamine	41-116	38	41-126	38
1,2,4-Trichlorobenzene	39-98	28	38-107	23
4-Chloro-3-methylphenol	23-97	42	26-103	33
Acenaphthene	46-118	31	31-137	19
4-Nitrophenol	10-80	50	11-114	50
2,4-Dinitrotoluene	24-96	38	28-89	47
Pentachlorophenol	9-103	50	17-109	47
Pyrene	26-127	31	35-142	36
Pesticides:				
gamma-BHC	56-123	15	46-127	50
Heptachlor	40-131	20	35-130	31
Aldrin	40-120	22	34-132	43
Dieldrin	52-126	18	31-134	38
Endrin	56-121	21	42-139	45
4,4'-DDT	38-127	27	23-134	50

**USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Revision No. OLM03.1, August, 1994

Table 1.5 Surrogate Spike Control Limits
for CLP GC/MS Organic Analyses**

Surrogate Compound	Soil/Sediment % Recovery	Water % Recovery
Volatile organics:		
1,2-Dichloroethane-d4	70-121	76-114
4-Bromofluorobenzene	59-113	86-115
Toluene-d8	84-138	88-110
Semivolatile organics:		
Nitrobenzene-d5	23-120	35-114
Terphenyl-d14	18-137	33-141
2-Fluorobiphenyl	30-115	43-116
2-Fluorophenol	25-121	21-110
2,4,6-Tribromophenol	19-122	10-123
Phenol-d5	24-113	10-110
2-Chlorophenol-d4	20-130*	33-110*
1,2-Dichlorobenzene-d4	20-130*	16-110*

* These limits are for advisory purposes only.
**USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Revision No. OLM03.1, August, 1994

Table 1.6 Contract Required Detection Limit for Inorganic Target Analyte List (TAL)**

Analyte	Contract Required Detection Limit (1,2) (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

(1) Subject to the restrictions specified in Exhibit D and E, any analytical method specified in ILM04.0, Exhibit D may be utilized as long as the documented instrument or method detection limits meet the Contract Required Detection Limit (CRDL) requirements. Higher detection limits may only be used in the following circumstance:

If the sample concentration exceeds five times the detection limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Detection Limit. This is illustrated in the example below:

For lead: Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample concentration = 220
Contract Required Detection Limit (CRDL) = 3

The value of 220 may be reported even though the instrument detection limit is greater than CRDL.

(2) The CRDLs are the minimum levels of detection acceptable under the contract Statement of Work.

**USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Document No. ILM04.0, February 1994

The quality assurance objectives for all measurement data include considerations of precision, accuracy, completeness, representativeness, and comparability. Compliance with the QA objectives will be judged individually for each site. QC objectives stated in the EPA CLP Statement Of Work (SOW) are presented in Tables 1.4 and 1.5.

PRECISION

The precision of a measurement is an expression of mutual agreement of multiple measurement values of the same property conducted under prescribed similar conditions. Precision is evaluated most directly by recording and comparing multiple measurements of the same parameter on the same exact sample under the same conditions or a matrix spike and matrix spike duplicate. It is usually expressed in terms of the relative percent difference (RPD). The RPD can be evaluated both internally (laboratory duplicates) and externally (field duplicates) to the laboratory. Laboratory duplicate control limits for organics are method and laboratory specific, and will be evaluated as part of the EPA-CLP data validation. For metals analysis, a control limit of 20 percent RPD will be used for matrix spike and matrix spike duplicate sample values greater than or equal to 5 times the contract required detection limit. For field duplicates, a RPD of $\pm 35\%$ percent will be used as the objective of precision.

Field measurements will be taken of pH, conductivity, temperature, water level, and organic vapor concentration based on HNU[2] or OVA[3] readings. The objective for precision of field data collection methods is to achieve and maintain the factory specifications for the field equipment. For the pH meter, precision will be tested by multiple readings in the medium concerned. The readings will be within 0.1 pH standard units after the instrument has been field calibrated with standard (NIST-traceable) buffers.

The water level indicator readings will be precise within 0.01 foot for duplicate measurements. The HNU or OVA will be calibrated each day prior to field use. If calibration readings deviate 15 percent or more from the concentration of the calibration gas, the instrument will be recalibrated.

[2]HNU = systems photo ionization detector
[3]0VA = organic vapor analyzer
[4]VOA = volatile organics analysis

ACCURACY

The degree of accuracy of a measurement is based on a comparison of the measured value with the actual true value. Accuracy of an analytical procedure is best determined based on the recoveries of matrix spike, matrix spike duplicate, and surrogate compounds.

The degree of accuracy and the recovery of analyte to be expected for the analyses of QC samples and spiked samples is dependent on the matrix, method of analysis, and the compound or element being determined. The concentration of the analyte relative to the method detection limit is also a major factor in determining the accuracy of the measurement. For metals analysis, spike recovery limits of 75-125 percent will be used. The QC acceptance ranges and limits for GC/MS organic analyses used to assess the accuracy of the data according to CLP protocol are presented in Tables 1.4 and 1.5. These QC acceptance ranges and limits will be used as part of the EPA-CLP data validation.

The objective for accuracy of field measurements is to achieve and maintain factory specifications for the field equipment. The pH meter is calibrated with buffer solutions traceable to National Institute of Standards and Technology (NIST) standards. The HNU or OVA will be calibrated daily with calibration gas.

REPRESENTATIVENESS

Samples taken must be representative of the population. Because uncontrolled hazardous waste sites vary greatly in size and complexity, specific SI sampling guidelines that apply to all sites are not possible. Site-specific sampling plans are located in the workplan developed for each site.

COMPARABILITY

Consistency in the acquisition, handling, and analysis of samples is necessary so the results may be compared with previous and future studies. Concentrations will be reported in a manner consistent with general practices. Standard EPA analytical methods and quality control will be used to support the comparability of analytical results with those obtained in other testing. Calibrations will be performed in accordance with EPA or manufacturer's specifications and will be checked with the frequency specified in the methods.

COMPLETENESS

The completeness of the data is measured as the amount of valid data obtained from the measurement system (field and laboratory) versus the amount of data expected from the system. The EPA-CLP data validation will determine the amount of valid data obtained from each site inspection. At the end of each SSI, completeness of data will be assessed and, if any data omissions are apparent, an attempt will be made to re-sample the parameters in question. The specific objective for the completeness of this project will be greater than or equal to 90 percent for field and laboratory data for each site.

ANALYTICAL PARAMETERS AND QUANTITATION LIMITS

The analytical parameters and their quantitation limits for use on this project are determined under the EPA's Contract Laboratories Program (CLP). All samples will be analyzed by CLP methods. Quantitation limits are determined by the Contract Required Detection Limit (CRDL) which is the minimum level of detection acceptable. The CRDL for the Target Analyte List (TAL) is presented in Table 1.6

HOLDING TIMES

Holding times specified by EPA protocols will be set for samples collected under this program. Tables 1.7 and 1.8 list the types of analyses and their holding times.

Table 1.7 Holding Times* and Preservation for Aqueous Samples

Analysis	Extraction Times	Analysis Time	Preservation Method***
Volatile organics (VOA)	NA	7 days 14 days	cool, 4°C HCl to pH < 2 cool to 4°C
Semivolatile organics (BNA)	7 days	40 days after extraction	cool, 4°C
Pesticides/PCBs	7 days	40 days after extraction	cool, 4°C
Metals**	NA	6 months	HNO_3 to pH<2 cool, 4°C
Cyanide	NA	14 days	NaOH to pH>12 cool, 4°C

* Holding times begin at the time of collection.
** Except mercury, analysis time is 28 days.
***Preservation temperature may fluctuate by 2°C.

Table 1.8 Holding Times* and Preservation for Soil and Sediment Samples

Analysis	Extraction Times	Analysis Time	Preservation Method***
Volatile organics (VOA)	NA	14 days	cool, 4°C
Semivolatile organics (BNA)	14 days	40 days after extraction	cool, 4°C
Pesticides/PCBs	14 days	40 days after extraction	cool, 4°C
Metals**	NA	6 months	cool, 4°C
Cyanide	NA	14 days	cool, 4°C

* Holding times begin at the time of collection.
** Except mercury, analysis time is 28 days.
***Preservation temperature may fluctuate by 2°C.

(A9) TRAINING

A large percentage of TNRCC Site Investigation Managers have prior experience in conducting site investigations; however, all inspectors will undergo a formal training program. Major areas covered during the formal training project will be the objectives of the PA and SSI, preparation for inspection, legal ramifications, health and safety considerations, use of monitoring and sampling equipment in the field, sample shipment and chain-of-custody procedures, the appropriate procedures to be followed relative to any denial-of-entry problems encountered, and other aspects of the work to be performed under this project.

Each TNRCC employee involved in sample collection will be trained on how to collect representative samples from every medium which might be encountered. Project personnel will receive additional training in proper field documentation and in health and safety procedures. All training will be documented, and records will be maintained by the Program Manager.

(A10) DOCUMENTATION and RECORDS

Documentation Records will include documentation for all HRS factors evaluated. All assertions of fact will be referenced in the record. All reports will be submitted to the EPA as they are completed. Any corrections or additions to the submitted material that the EPA deems necessary and appropriate will be made by the TNRCC within budget constraints. A PA, SSI/ESI WP, SSI Report, and Documentation Record will be deemed complete and final when the EPA approval is received, or within six (6) months of submittal, whichever comes first.

Following the site visits and completion of analytical work, the TNRCC will prepare a PA (Abbreviated) and/or SSI report or Documentation Record (for ESI sites only) highlighting significant findings for each site. The abbreviated PA Reports will be prepared in accordance with the requirements stated in the "Guidance for Performing Preliminary Assessments Under CERCLA", September 1991, Section 4.4 Abbreviated Reporting. The final SSI reports will be prepared in accordance with the report outlines approved by the EPA. Documentation Records will be prepared in accordance with current guidance and by using the companion WordPerfect® version of the Documentation Record. Should additional guidance become available prior to completion of this project, the TNRCC will evaluate the effect that conformance to this guidance will have on the schedule and budget, and will submit a revised schedule and budget to the EPA for approval.

The SSI reports will contain a description of the site, the operating history and nature of waste handling at the site, and a discussion of waste sources, pathway characteristics, and identification and description of potential human and environmental targets. In addition, the SSI report will

contain a description of the data collected, analytical results, and QA/QC data. Supporting documents will be included in the SSI report as appendices and will consist of stratigraphic, hydrogeologic, and topographic information; a site sketch other pertinent maps; laboratory and chain-of-custody report originals; photographs; field notes; and reports from previous investigations at the site. All data collected during each SSI/ESI visit will be validated using the most current EPA data validation guidelines and any EPA Regional instructions.

QUALITY ASSURANCE REPORT

A summary of all QA activities and findings during the course of this project will be reported to the EPA on a site specific basis with the final site inspection reports. Other project-related quality assurance items and corrective actions will be discussed in the monthly progress reports. These may include the following items:

1. Summary of QA management, including any changes;
2. Measures of data quality from the project;
3. Significant problems related to work quality, and the status of any corrective actions implemented;
4. Results of QA performance audits;
5. Results of QA systems audits;
6. Assessment of data quality in terms of precision, accuracy, completeness, representativeness, and comparability; and
7. Quality-assurance-related training.

RECORD KEEPING

All information pertinent to PA site visits and SSI sampling activities will be recorded in a logbook. This book will be bound and have consecutively numbered pages. Entries in the logbook will be made in ink and will include, at a minimum, a description of all activities, the names of all individuals involved (sampling and oversight), date and time of sampling, weather conditions, any problems, and all field measurements.

SECTION B

MEASUREMENT/DATA ACQUISITION

(B1) SAMPLING PROCESS DESIGN

After approval of the SSI work plan, the field activities will be executed. At each site, these activities may include shallow soil sampling, sediment sampling, surface water sampling, and groundwater sampling.

Detailed reports on all PA and SSI non-sampling data collection and SSI sampling activities will be kept in field logbooks. In this book will be noted the date, time, location, and identification of each sample, along with the collector's name, a description of all equipment used and any problems encountered, and general comments of the inspection team. Logbooks also are used to record pertinent information regarding the site itself, including date, time, location, and identification of all photographs taken during the site visit.

Proper identification and labeling of samples is crucial to an effective sampling program. Immediately upon collection, each sample must be sealed and tagged. The tag should be marked with a sample identification number, station location, type (composite or grab), concentration (low, medium, or high), the parameters requested, collector's name, and the date and time of sample collection.

For many of the SSIs, the determining factor of hazard evaluation will be the data provided by sampling and analytical activities. Thus, it is important that QA/QC be maintained for each sample. The purpose of this Section is to outline specific procedures for inspectors to use while acquiring and handling samples during an inspection to ensure that quality data are obtained.

EPA-certified clean sample bottles will be used for sample collection. Custody of these bottles will be maintained by documenting the batch number of the sealed box, documenting opening of the box, and keeping the bottles locked up at all times. If returned to the office, the bottles will be placed in a sealable container and secured with custody seals.

(B2) SAMPLE METHODS REQUIREMENTS

This Section discusses the standard sampling procedures. Other sampling procedures may be used as determined necessary by the lead Site Investigation Manager and with approval of the Technical Director or Program Manager.

Regardless of sample type, the following principles and procedures should be adhered to during the sample collection phase of a site inspection:

1. Obtain ice before visiting a site where sample collection is involved.

2. Add appropriate preservatives to the sample bottles at the time of sample collection. The bottles required for each analysis are shown in Tables 2.1 and 2.2.

3. If there is reason to suspect the presence of toxic vapors, precede sampling activities by an initial survey of suspect areas, using appropriate safety gear and a photo ionization detector (or equivalent). The potential use of air monitoring equipment should have been specified in the SSI Work Plan. If it was not, and if organic vapor presence is possible, contact the Program Manager and Project Safety Officer for possible changes in safety procedures.

4. If possible, collect background samples first, then proceed from the probable least contaminated to most contaminated sampling points.

5. Change disposable gloves between sampling points, placing used gloves in a plastic bag for disposal.

6. If it is necessary to reuse sampling devices, use the specified decontamination procedures between sampling points.

7. At each sampling location,
   a. Photograph the collection of samples.
   b. Record in the logbook:
   - Sample number;
   - Photo number;
   - Location (show on site sketch);
   - Type of sample;
   - Time; and
   - Relevant observations.

Table 2.1 Bottles Required for Aqueous Samples

Analysis	Required Volume	Container Type
Volatile Organics	80 mL	2 40-mL glass vials
Extractable Organics (BNA and pesticide/PCB)	1 gallon	2 80-ounce or 4 1-liter amber glass bottles
Metals	1 liter	1 1-liter polyethylene bottle
Cyanide	1 liter	1 1-liter polyethylene bottle

Table 2.2 Bottles Required for Soil and Sediment Samples

Analysis	Required Volume	Container Type
Volatile Organics	240 mL	2 120-mL widemouthed glass vials or 2 4-ounce widemouth glass jars
Extractable Organics (BNA and pesticide/PCB)	6 ounces	1 8-ounce or 2 4-ounce widemouthed glass jars
Metals and Cyanide	6 ounces	1 8-ounce or 2 4-ounce widemouthed glass jars

8. If a facility representative requests, they will be allowed the opportunity to collect split samples. If these are desired, place samples directly in different containers at the sampling point rather than splitting them at a later time. In the event there may not be enough soil, sediment, and/or groundwater volume to provide split samples, collect the SSI required sample first and than provide the remaining volume to the facility representative.

9. If samples can be collected in a short period of time (less than 20 minutes), leave the cooler with ice at the car for convenience. Before placing samples in the iced cooler:

   a. Complete the sample tags and labels, and place clear tape over the sample labels on the sample containers to protect the writing from moisture.

   b. Double check the pH of all preserved water samples (exclusive of VOA samples).

   c. Place a custody seal around the bottle cap.

   d. Wrap the sample containers with plastic foam, bubble pack, or equivalent to protect against breakage.

   e. The TNRCC will include in each ice chest with samples to be shipped for analysis, a temperature blank taped to the side of the chest prior to shipping.

   f. Place the sample containers in plastic Ziploc® bags or equivalent to prevent melted ice from contacting the container.

   g. Place wrapped sample containers into ice chests filled with 2 to 3 inches of vermiculite.

10. Remove water from melted ice frequently, and replace with fresh ice. Place ice in plastic Ziploc® or sealable bags to minimize water leakage during shipment.

The following standard operating guidelines are presented for specific sample types.

GROUNDWATER WELL SAMPLING PROCEDURES

General

The primary consideration is to obtain a representative sample of the groundwater zone of interest without mixing the sample with stagnant (standing) water in the well casing.

To safeguard against collecting nonrepresentative stagnant water in a sample, the following guidelines and techniques will be adhered to during sample withdrawal:

1. As a general rule, all monitoring wells shall be pumped or bailed a minimum of three volumes of water in the well casing with three (3) consecutive consistent readings within 10% RPD for conductivity, ± 1°C for temperature, and within ± 0.5 pH units before representative samples are withdrawn.

2. For wells that can be pumped or bailed to dryness with the sampling equipment, the well should be evacuated and allowed to recover to 85 percent of original water level before sample withdrawal. In the event the well has not recovered to 85 percent after 24 hours, a sample may be drawn from the well. Enter the well volume recovered into the field logbook.

3. The purge waters will be managed according to guidance provided in the "Management of Investigation-Derived Wastes During Site Inspections", May 1991. The preference is to leave both RCRA hazardous and non-hazardous investigation-derived wastes on-site whenever it complies with regulations and does not pose any immediate threat to human health and the environment.

Sampling, Monitoring, and Evacuation Equipment

Sample containers will conform to EPA regulations for the appropriate constituents.

The following equipment should be on hand when sampling wells:

1. Coolers for sample shipping and cooling, chemical preservatives, and appropriate packing cartons and filler.

2. Thermometer, pH paper and meter, camera and film, labels, appropriate keys (for locked wells), tape measure, water level indicators, and specific-conductivity meter.

3. Pumps. Pumps will normally be used to obtain samples, although samples may be obtained directly from the pump discharge line for high yielding monitoring wells and wells with dedicated pumps.

4. Bailers and monofilament line with tripod-pulley assembly (if necessary).

5. Decontamination solutions--tap water, distilled water, Alconox, isopropanol, CLP specified grade water.

Ideally, sample withdrawal equipment should be completely inert, economical to manufacture, easily cleaned, and reused, able to operate at remote sites in the absence of power resources, and capable of delivery variable rates for well flushing and sample collection.

Calculation of Well Volume

Calculations are to be made according to the following steps:

1. Obtain all available information on well construction (casing, screens, etc.).

2. Determine well or casing diameter.

3. Determine static water level (feet below top of casing).

4. Determine depth of well from top of casing.

5. Calculate number of linear feet of static water (total depth minus the static water level).

6. Calculate one well volume in gallons: $V = Tr^2 (0.163)$, where T is linear feet of static water, and r is the inside radius of the well of casing in inches.

7. Determine the well volumes in gallons to be evacuated before sampling.

If possible, a number of observations will be made when groundwater sampling is to take place. Some of the information can be gained from file review prior to a site inspection.

1. Note if monitoring wells are locked. Arrangements must be made to secure keys or to remove locks by other means and re-secure the wells.

2. Note the condition of the monitoring wells (i.e. casing, concrete pad, etc.).

3. Note well diameters to ensure that a pump and/or bailer of the proper size will be available. The diameter is also necessary for calculating the wells' static water volume.

4. Note the type of casing materials--PVC, steel, etc.

5. Note any observable physical characteristics of the groundwater as it is being sampled--color, odor, turbidity, etc.

6. Measure the static water level of each well before sampling, if possible. This is best accomplished with an electronic water level indicator. Similarly, determine the total depth of the well before sampling. Obtain these measurements whether or not well logs are available, since the measurements are required in calculating the static water volume of the well.

7. Measure the pH, temperature, and specific conductivity of the groundwater being sampled. To avoid possible contamination problems, measure temperature, pH, and specific conductivity on a portion of groundwater which is not in a sample container to be sent out for analysis.

SURFACE WATER SAMPLING PROCEDURES

Surface water sampling locations will be selected according to the probability that they will show contaminants migrating from a site. In general, samples will be taken from streams running through or adjacent to a site, including those bodies of water which may receive surface runoff or leachate from a site. Samples will only be collected where it can be shown that the site provides the only source of contaminants to the surface water body. Care will be taken in sampling leachate breakouts, which may have high concentrations of contaminants. Surface water will also be sampled from any adjacent standing bodies of water such as ponds, lakes, or swamps which might be receiving contaminants.

Grab samples will be collected using a pond sampler. The pond sampler, described in "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA 1980 (EPA-600/2-80-018), consists of a beaker attached with a clamp to a telescoping aluminum pole. This sampler allows a sample to be collected several feet from the bank or berm.

TAP WATER SAMPLING PROCEDURES

Well depth, casing size, and holding-tank volume will be obtained, if possible to calculate the volume of the system, and the system will be evacuated by removing three to five volumes by letting a tap run. If the well depth, casing size, or holding-tank volume is not readily available or is unknown, a tap will be opened and allowed to run at highest flow for at least 15 minutes. Well purging well be considered complete after three consistent readings of pH and conductivity. These readings can be obtained within the 15 minutes the tap is allowed to run. The well evacuation strategy will be documented in the field book.

Samples will be collected in containers in accordance with the sampling guidelines from a point as close to the well as possible and before the water is processed through any water treatment devices (e.g., softeners or filters). In many cases this may not be possible. When samples must be collected after the filtration or softener system, the situation will be documented in the logbook. The exact type of filtration system or softener in use will be recorded. To determine whether desorption of the filters is occurring, samples may be collected after water has passed through treatment devices. When possible, do not collect samples through a water hose. Samples should be collected directly from the spout.

If samples are taken from direct water main connections, the spigot will be flushed for 2 to 3 minutes (15 to 30 minutes is not necessary) to clear the service line. Water parameters (conductivity, temperature, and pH) will be measured. Well purging will be considered complete after three (3) consistent readings of pH, temperature and conductivity. Samples will *not* be collected from spigots after treatment (except as noted above) or from spigots that leak around their stems **or that** contain aeration devices or screens within the faucet.

For private wells equipped with hand or mechanical pumps, the water will be pumped for 5 minutes before the sample is collected directly from the spout.

SURFACE SOIL SAMPLING PROCEDURES

Areas selected for sampling will be located in order to collect a representative fraction of the soils with the minimum of samples. A surface inspection of the subject area will be made to locate pertinent features (e.g., rock outcrops, drainage patterns, surface runoff, erosion areas, etc.) and to evaluate the relationship among these features and potential sources of pollution. The locations of sediment deposition areas are good indicators of surface runoff direction.

A method of obtaining a shallow soil sample is to use stainless steel spoon or shovel. When deemed appropriate, a deeper soil sample may be obtained through the use of a soil corer. After collection, the soil sample will then be placed in the appropriate glass bottle. After the sample has been collected, the top of the bottle and lid will be wiped with a clean paper towel to ensure a tight seal. Samples for VOA analysis will be collected first, followed by samples for BNA's, metals and pesticides/PCBs. If metals are the primary concern at a site, the metals sample will be collected second. Care will be taken to fill the 120 mL VOA sample as full as possible to minimize headspace. A decontaminated shovel or spade can be used to uncover the top 6 inches of soil so the sample can be collected from beneath the surface.

Sampling equipment such as stainless steel scoops and spoons, and shovels or spades must be decontaminated according to the specified procedures between sampling locations to avoid cross contamination. Dedicated sampling equipment will normally be used. If dedicated equipment are not used, then an equipment rinsate sample shall be collected at the end of each sampling day to demonstrate decontamination efficiency by TNRCC field personnel.

SEDIMENT SAMPLING PROCEDURES

Areas selected for sampling will be located in order to collect a representative fraction of the sediments with the minimum of samples. The primary consideration in sample site selection will be to choose an area of quiescent settling with low hydrologic activity or energy, and to evaluate these areas and potential sources of pollution. For example, areas that are: 1) inside the bend of channels; 2) backwater areas or side channels; and 3) of heavy shoaling and deposition. Quiescent areas are conducive to the settling of finer materials.

Sediment samples will be collected by use of a stainless steel spoon; or for samples greater than six (6) inches beneath the water surface, samples will be collected using either an Ekman dredge or sediment corer. When using a dredge, it will be lowered to the bottom of the water body with a minimum of substrate disturbance. Once the dredge jaws have been triggered, the closed dredge will be retrieved at a moderate speed of less than two (2) feet/second. Water overlying the sediment in the dredge will be gently

decanted by slightly tipping the dredge until the water runs out the top. The decanting process will be completed in a manner to avoid the removal of surficial sediments. In order to avoid contamination from material on the dredge walls, a stainless steel spoon will be used to remove sediments to a depth of one inch and no closer than 0.75 inches to the wall of the dredge. The sediment sample will then be placed in the appropriate glass bottle. Pebbles and sticks will not be transferred to the sample bottle. Additional dredge samples will be collected as needed to fill the sample bottle. After the sample has been collected, the top of the bottle and lid will be wiped with a clean paper towel to ensure a tight seal. Samples for VOA analysis will be collected first, followed by samples for BNA's, metals and pesticides/PCBs.

If metals are the primary concern at a site, the metals sample will be collected second. Care will be taken to fill the 120 mL VOA sample as full as possible to minimize headspace. The Ekman dredge and stainless steel spoons must be decontaminated according to the specified procedures between sampling locations to avoid cross contamination. Dedicated sampling equipment will normally be used.

DECONTAMINATION PROCEDURES

To prevent contamination of samples by materials originating from the variety of on-site sampling tools and equipment, all sampling equipment (sample scoops, bailers, surface water dippers) will be decontaminated. Dedicated sampling equipment will be available for each sample planned. All equipment to be used at one site will be decontaminated in one batch prior to initiating any sampling. Each sampling tool will be placed in an individual sealable plastic bag or wrapped in a large plastic trash bag and closed with a custody seal. In the event that additional sampling is required or a sampling tool's integrity is questionable, then that tool will go through a decontamination process. The decontamination procedures are as follows:

1. Rinse equipment with tap (potable) water.

2. Clean the equipment with a brush in a solution of laboratory-grade detergent (Liquinox, Alconox, or equivalent) and potable water.

3. Rinse with tap water.

4. Rinse with 10 percent nitric acid solution, (trace metals grade) if analyzing for metals.

5. Rinse with distilled or deionized water.

6. If analyzing for organics, rinse with reagent-grade isopropanol.

7. Rinse with deionized water.

8. Air dry.

9. Place in plastic sealable bag if immediate use is not expected.

The sampling equipment will be cleaned as described above before its use for collecting each sample. After sampling is complete, each sample tool will be cleaned with a detergent wash and rinsed with distilled water to remove any potential contamination.

(B3) SAMPLE HANDLING/CUSTODY REQUIREMENTS

Sample custody is an integral part of any sample collection and analysis plan. Several steps for maintaining sample custody apply to field sample custody versus laboratory sample custody. First, in the field, the appropriate collection, identification, preservation, and shipment of the samples will ensure sample integrity. The second step is correct sample bottle identification and preparation. Lastly, when samples reach the laboratory, they are assigned a laboratory number and maintained at 4°C until sample preparation and analyses can be performed.

FIELD SAMPLE CUSTODY

Sample custody and documentation procedures described in this Section will be followed throughout all sample collection for all TNRCC SSIs. Components of sample custody are field logbooks, sample labels, sample tags, and chain-of-custody forms. CLP Organic and Inorganic Traffic Report (TR) forms will serve as chain-of-custody forms for this project. When Dioxin samples are to be collected the PCDD/PCDF Traffic Report (For Dioxin CLP Analysis) form will be used for this project.

FIELD LOGBOOKS

Bound field logbooks will be maintained by the Site Investigation Manager and other team members to provide a daily record of significant events, observations, and measurements during the field investigation. Each page in the logbook will be initialed by the author and signed after the last entry of each day. All entries by persons other than the author will be initialed or signed. All entries will be signed and dated.

All information pertinent to the field survey and sampling will be recorded in the logbooks. The logbooks will be bound books with consecutively numbered pages that are at least 4 ½ inches by 7 inches in size. Waterproof ink will be used in making all entries. Entries in the logbook will include, at the minimum, the following:

· General information:

- Names and titles of author and assistant, date and time of entry, and physical/environmental conditions during field activity
- Location of sampling activity
- Name and title of field crew.

· Sampling documentation:

- Sample medium (e.g., soil)
- Description of sampling point(s)
- Date and time of collection
- Sample identification number(s).
- Photographs

· Other information:

- Names and titles of any site visitors or interviewees
- Field observations and unusual field conditions
- Any field measurements made (such as pH, conductivity, temperature) including specific calibration data and documentation of field equipment (serial number, decontamination, etc.)
- Modifications to the work plan
- Sample handling (e.g., preservation with ice).

None of the field logbooks or chain-of-custody documents will be destroyed or discarded, even if they are illegible or contain inaccuracies that require a replacement document. If a previously recorded value is discovered to be incorrect, the wrong information will be crossed out in such manner that it is still legible, the correct value written in, and the change initialed and dated. If the change is made by someone other than the original author or if the change is made on a subsequent day, a reason for the change will be recorded at the then-current active location in the logbook, with cross-references.

SAMPLE TAGS

All samples collected at the site will be placed in an appropriate sample container for preservation and shipment to the designated laboratory. Each sample will be identified with a separate identification label and tag. The bottles and ice chests will be sealed with custody seals. Sample identification tags and custody seals will be provided by the CLP Sample Management Office. The tag will indicate if the sample is a split sample. The label will contain the sample number. The following information will be recorded on the tag:

- Analyses to be performed
- Sample identification number
- Source/location of sample
- Type of sample (composite or grab)
- Preservatives used (ice)
- Date
- Time (a four-digit number indicating the 24-hr clock time collection; for example, 1430 for 2:30 PM)
- Sampler's signature
- CLP case number.

Once the tag is complete, a custody seal will be placed over the lid of the bottle. The custody seal will show the date and sampler's signature.

TRAFFIC REPORT FORMS

Introduction - Samples and Sample Numbers

The CLP organic and inorganic multi-sample Traffic Reports/Chain-of-Custody forms (TRs) document samples shipped to CLP laboratories. They also enable the Sample Management Office (SMO) and the Region to track samples and ensure that the samples are shipped to the appropriate contract laboratory. TRs will be used each time Routine Analytical Services (RAS) samples are shipped to a CLP laboratory. The TRs may document up to ten samples shipped to one CLP laboratory under one case number and RAS analytical program.

The TR includes a chain-of-custody record which is located at the bottom of the form. The form is used as physical evidence of sample custody. According to EPA enforcement requirements, official custody of samples must be maintained and documented from the time of collection until the time the samples are introduced as evidence in the event of litigation. The lead Site Investigation Manager is responsible for the care and custody of the sample until sample shipment.

A sample is considered to be in custody if any of the following criteria are met:

1. The sample is in possession of the sampling team or is in view after being in possession.

2. The sample was in possession and then locked up or sealed to prevent tampering.

3. The sample is in a secured area, and security is documented.

CLP sample types are defined by the RAS analytical program. Under the RAS Protocol (SOW), a RAS sample consists of a low or medium concentration water matrix or a soil/sediment matrix that is single phase and homogeneous. No oily sample, nor a multi-phasic sample can be shipped to a CLP laboratory operating under the RAS contract. Such high concentration samples are handled only by Special Analytical Services (SAS) CLP laboratories. The collection and management of high concentration samples will be conducted in accordance with the requirements outlined in the "Region 6 CLP Training Manual", August 1996.

Low concentration samples are samples collected from off-site areas, where hazards are thought to be significantly reduced by normal environmental processes. Medium concentration samples are those where a compound or element may comprise as much as 15% of the total sample.

Low/medium concentration inorganic, low to medium concentration organic, and high concentration organic. Low/medium inorganic samples may be analyzed for total metals, cyanide, or both. Low/medium organic samples may be analyzed for VOAs, base/neutral/acid (BNAs), pesticide/PCBs, or any combination of these. High concentration organic samples may be analyzed for VOAs, BNA/pesticide/PCBs, and aroclors/toxaphenes. Inorganic samples are documented on Inorganic TRs. Organic and high concentration samples are documented on Organic TRs.

A CLP sample is one matrix - water or soil - never both. The CLP sample is further defined as consisting of all the sample aliquots from one station location, for each matrix and RAS analytical program.

The CLP generates unique sample numbers that must be assigned to each organic and inorganic sample. The unique CLP sample numbers are printed at SMO on adhesive labels and distributed to the region as requested. The field team leader will be responsible for assigning this critical sample number correctly and transcribing it accurately on the TR.

Organic sample numbers are in the format XX123, and have ten labels per strip four for extractables, two for VOAs, and four blank (extra). **UNUSED LABELS will be destroyed to prevent duplication of sample numbers.**

Inorganic sample numbers are in the format MXX123 and have seven labels per strip-- two for total metals, two for cyanide, and three extra (see Attachment 1). Remember that the unique sample number must only be used once. **EXTRA LABELS must be destroyed.**

Use only the labels provided by EPA Region 6. CLP sample numbers are alphabetically coded to correspond with each region as follows:

Table 2.3 EPA Region Sample Letter Codes

Letter Code			Letter Code		
Organic	Inorganic	Region	Organic	Inorganic	Region
A	MA	I	F	MF	VI
B	MB	II	G	MG	VII
C	MC	III	H	MH	VIII
D	MD	IV	Y	MY	IX
E	ME	V	J	MJ	X

Remember:

- TRs must be used for each case number with every shipment of samples to each CLP laboratory.
- Organic samples, high concentration samples, and inorganic samples are assigned separate, unique sample numbers. Each sample consists of all the sample aliquots from a sample station location for analysis in one of the three analytical programs.
- A CLP RAS sample will be analyzed as either a water or a soil sample.
- Prevent accidental duplication of sample numbers by destroying unused labels.
- Use the sample numbers specific to EPA Region 6.

· Contact the Program Manager or Technical Director at telephone number 512/239-2514 or 512/239-2512 if you need to collect more than the previously approved number of samples or a high concentration sample.

· Call Regional Sample Control Center (RSCC) at telephone number 713/983-2130 or 713/983-2137 if you have any questions about using TRs.

Forms Completion - Case Documentation

Instructions for filling out the Organic and Inorganic Traffic Report/Chain of Custody forms are as follows:

Top of Form
· SAS Number

· Enter this number only if explicitly told to do so by the RSCC.

· Case Number

· Enter this number.

Box No. 1

· Project code/site information:

· Leave the Project Code, Account Code, Regional Information and Non-Superfund Program fields blank.

· Enter the Site name, City/State and Site Spill ID in the designated spaces.

Box No. 2

· Regional information:

· Enter the EPA Region number (6), the name of your Sampling Company (TNRCC), and your name and signature in the designated spaces.

Box No. 3

· Type of activity:

· Check funding level for sampling. Next, check the code which describes the task of the sampling mission:

Funding Level

SF - Superfund
PRP - Potential responsible party
ST - State
FED - Federal

Pre-Remedial

PA - Preliminary Assessment
SSI - Screening Site Investigation
LSI - Listing Site Investigation

Remedial

RIFS - Remedial investigation feasibility study
RD - Remedial design
O&M - Operations and maintenance
NPLD - National priorities list delete

Removal

CLEM - Classic emergency
REMA - Removal assessment
REM - Removal
Oil - Oil response
UST - Underground storage tank response

Box No. 4

· Shipping Information:

· Enter the Date Shipped, the Carrier (i.e. Federal Express, Purolator, Airborne) and the Airbill Number in the appropriate spaces.

Box No. 5

· Ship to:

· Enter the name of the CLP laboratory contact (sample custodian) and its full address in the box.

Box No. 6

· Preservative:

· This box provides a list of commonly-used preservatives. Please enter the appropriate preservative used in Column D.

Box No. 7

· Sample description:

· This box provides a list of the description/matrices of samples that are collected. Please enter the appropriate description in Column A.

Completing the Form - Sample Documentation

· Carefully transcribe the CLP Sample Number(s) from the printed sample labels on the TR in the space provided.

Note: If you have made a mistake, do NOT attempt to erase or write over your mistake. Draw a single line through the mistake and initial and date it. Then, enter the correct information on the next line.

Complete columns A through G to describe the sample.

Column A, Sample Description

Enter the appropriate sample description code from Box No. 7.

When out in the field:

If sampling groundwater or surface water, describe both VOA TRIP BLANKS and EQUIPMENT RINSATE SAMPLES as No. 1 "Surface Water."

If sampling only soil/sediment, describe both the EQUIPMENT RINSATE SAMPLE and the ULTRA DI SAMPLE as No. 4 "Field QC".

When conducting a laboratory decontamination event:

Describe both the EQUIPMENT RINSATE SAMPLE and the ULTRA DI SAMPLE as No. 4 "Field QC".

Note: Item No. 6 "Oil" and item No. 7 "Waste" are for SAS projects only. DO NOT SHIP OILY SAMPLES OR WASTE SAMPLES WITHOUT MAKING PRIOR ARRANGEMENTS WITH THE PROJECT MANAGER AND RSCC.

Column B, Concentration

Organic--If sample is estimated to be low or medium concentration, enter "L." When shipping SAS high concentration samples (previously arranged with Program Manager and RSCC), enter"H."

Inorganic--Enter "L" for low concentration, "M" for medium concentration, and "H" for high concentration (under previous SAS arrangement).

Note: Ship medium and high concentration organic and inorganic samples in metal cans.

Column C, Sample Type

Please enter which type of sample (composite or grab) was collected.

Column D, Preservation

Please enter preservation used (i.e., HCL, NaOH, HNO_3, H_2SO_4) refer to Box No. 6 or the reference number of the preservation (1-7, N). Always include ice as a preservative in addition to any chemical preservative used.

Column E, RAS Analysis

Check the analytical fractions requested for each sample, for example, VOAs, SVs, and pesticides are for low/medium concentration organics. Request only total metals and cyanide for RAS low/medium concentration inorganics.

Note: Aroclors/Toxaphenes may be requested, when using the High Concentration SOW, in a SAS Request.

Note: Either total or dissolved metals can be requested for each individual inorganic sample assigned a unique sample number, but not both analyses. A unique number must be assigned for each, even though they are from the same station location.

Column F, Regional Specific Tracking Number or Tag Number

Enter the Region specific tracking number or tag number(s) in the space provided. Since space is limited try to use tag numbers in a sequential order.

Column G, Station Location Number

Enter the Station Location Number in the space provided.

Column H, Month/Day/Year/Time of Sample Collection

Record the month, day, year, and time in military time (e.g., 1600 hours = 4:00 P.M.) of sample collection.

Column I, Sampler Initials

Enter the samplers initials.

Column J, Corresponding CLP Organic/Inorganic- Sample No.

Enter the corresponding CLP sample number for organic or inorganic analysis.

Column K, Designated Field QC

Enter the appropriate qualifier for "Blind" Field QC samples in this column.

Note: All samples must have a qualifier.

Blind Field QC	Qualifier
Blank	B
Duplicate	D
Rinsate	R
Performance Evaluation Samples	PE
Not a QC sample	---------

Note: This information will be entered into EPA Headquarters database to track QC sample data. Please complete this Section carefully and accurately.

Box Titled, "Shipment for Case Complete (Y/N)"

This should reflect the status of the samples scheduled at a lab for a specific case. When ALL samples scheduled/collected for shipment to a lab for a specific case have been shipped, the case is complete.

Box Titled, "Page 1 of "

Please enter the number of TRs per shipment.

Box Titled, "Sample Used for Spike and/or Duplicate"

Please enter sample number to be used for matrix spike and/or duplicate sample (internal lab QC). One per twenty/matrix/concentration/lab. See back of TR form.

Box Titled, "Additional Sampler Signatures"

Please record any additional sampler signatures you are unable to record in box 2.

Box Titled, "Chain-of-Custody Seal Number"

Leave the Chain-of-Custody Seal Number blank (Not used in Region 6).

Box Titled, "Split Samples Accepted/Declined"

Sampler should ask sight owner, PRP, etc. whether they want split samples taken. The split samples are either accepted or declined. Sampler should record their signature if split samples are collected and check the appropriate box.

How and When to Separate and Send Traffic Report/Chain-of-Custody Form Copies

When all paperwork has been completed by the sampler and samples are ready to be shipped:

Bottom 2 copies (white and yellow) of the traffic report/chain-of-custody forms should be placed in a plastic bag and taped to the inside of the cooler.

Top Blue/Green copy - Send to Region within five (5) working days from date of sample shipment. On this copy indicate in Column K the duplicate sample number.

Myra Perez
USEPA Region 6
10625 Fallstone Road
Houston, Texas 77099

Pink copy - Send to Dyncorp on the same day as the samples are shipped.

Molly Boyter
Dyncorp
2000 Edmund Halley Drive
Reston, Virginia 20191-3436

Instructions on the Reverse

Instructions summarizing CLP sample volumes, packaging, and shipment reporting requirements are printed on the back of the TRs.

SHIPPING OF SAMPLES

Samples will be shipped and delivered to the designated laboratory for analysis daily. During sampling and sample shipment, the lead Site Investigation Manager (or designee) will contact the SMO (designated on the CLP RAS Lab Assignment information facsimile) to inform them of shipments. **TNRCC WILL NOT CONTACT THE RECEIVING LABORATORY!!**

The samples will be shipped in ice chests by an overnight carrier such as Airborne Express. The TR forms (white and yellow) will be placed within the ice chest, which will be sealed with custody seals and/or tamper-resistant tape. Custody seals will be signed by the sample custodian shipping the samples. The air bill number will be noted on the chain-of-custody form. In addition the Airbill and TR form(s), each ice chest will contain an additional Airbill to provide for return of the ice chest to Judie Mattocks MC-142, Pollution Cleanup Division, TNRCC, Technical Park Center, Building D, 12100 Park 35 Circle, Austin, Texas 78753.

(B4) ANALYTICAL PROCEDURES and (B10) DATA MANAGEMENT

All analytical procedures will conform to analytical methods specified in the Routine Analytical Services (RAS) contract with the EPA. All data is managed by EPA in accordance with the USEPA Contract Laboratory Program Statement of Works for Organic and Inorganic Analyses. Data received by TNRCC in accordance with the 1996 and 1997 Cooperative Agreement is returned to EPA after validation for use in the SSI reports. EPA maintains full control of record-keeping procedures, receipt of data from the laboratory, and for detecting/correcting laboratory errors.

As per the EPA-CLP Statement of Work for Organic Analysis (including February 1994 revision), laboratories are required to perform any method specified in Exhibit D for volatile organic compounds (CLP-VOA), semivolatile organic compounds (CLP-SV), and pesticide/PCB compounds (CLP-PEST). As per the EPA-CLP Statement of Work for inorganic analysis (including February 1994 revision), laboratories are required to perform methods specified in Exhibit D. Metals will be analyzed using the 200 series, CLP-modified, methods as specified in Exhibit D. Cyanide will be analyzed by method 335.2 CLP-modified. Table 2.3 list the methods to be performed during this project under the RAS contract.

Table 2.4 Analytical Procedures for USEPA-CLP

Parameters	Method
Organics	
Volatile organics (VOA)	CLP-VOA
Semivolatile organics (BNA)	CLP-SV
Pesticides/PCBs	CLP-PEST
Inorganics	
Cyanides	335.2 CLP-M*
Metals	
Aluminum	202.2 CLP-M or 202.1 CLP-M
Antimony	204.2 CLP-M
Arsenic	206.2 CLP-M
Barium	208.2 CLP-M or 202.1 CLP-M
Beryllium	210.2 CLP-M
Cadmium	213.2 CLP-M
Calcium	218.2 CLP-M
Chromium	215.1 CLP-M
Cobalt	219.2 CLP-M or 219.1 CLP-M
Copper	220.2 CLP-M or 220.1 CLP-M
Iron	236.2 CLP-M or 236.1 CLP-M
Lead	239.2 CLP-M
Magnesium	242.1 CLP-M
Manganese	243.2 CLP-M or 243.1 CLP-M
Mercury	245.1 CLP-M, 245.2 CLP-M, or 245.5 CLP-M
Nickel	249.2 CLP-M or 249.1 CLP-M
Potassium	258.1 CLP-M
Selenium	270.2 CLP-M
Silver	272.2 CLP-M
Sodium	273.1 CLP-M
Thallium	279.2 CLP-M
Vanadium	286.2 CLP-M or 286.1 CLP-M
Zinc	289.2 CLP-M or 289.1 CLP-M

* CLP-M modified for the Contract Laboratory Program

(B5) QUALITY CONTROL REQUIREMENTS

Quality assurance for analytical work on this project will involve analysis of blank samples, spiked samples, and duplicate samples. For each group of 20 samples (or less if fewer than 20 samples are collected) of similar matrix (i.e., groundwater/surface water, soil/sediment) collected at each site, CLP internal laboratory QA/QC analysis will be conducted on one blank, one spiked, and one duplicate spiked sample. Field duplicates will be collected at a rate of 10% for each matrix and/or one per day, whichever is greater. Also, the TNRCC will include in each ice chest with samples to be shipped for analysis a temperature blank taped to the side of the chest prior to shipping.

LABORATORY QUALITY CONTROL BLANKS, SPIKED BLANKS, AND MATRIX SPIKES

Analysis of blank samples verifies that the analytical method does not introduce contaminants. The spiked blank is generated by addition of standard solutions to the blank water. The matrix spike will be generated by the CLP laboratory through the addition of standard solutions to a randomly selected field sample. Extra volume (triple volume) for a matrix spike and matrix spike duplicate will be collected for one water sample (groundwater or surface water, but not both) by the field team and sent to the assigned CLP Laboratory for internal quality control. In addition, one soil sample (no extra volume) will be designated on the TR by the field team and sent to the designated CLP laboratory for internal quality control.

FIELD BLANKS

All samples will be collected with dedicated equipment. All sampling equipment will be decontaminated prior to initiating sampling activities. Three types of blanks will be taken in the field. The first type, field blanks, are blanks that are exposed to the same contamination as the field samples (e.g., airborne contaminants that are not from the waste being sampled). The second type, trip blanks, are collected for volatiles only. Volatile organics samples are susceptible to contamination by diffusion of organic contaminants through the Teflon-lined septum of the sample vial; therefore, a VOA trip blank will be analyzed to monitor for possible sample contamination. The trip blank also serves to detect contaminants in the sample bottles. These blanks are similar to field blanks with the exception that they are not exposed to field conditions. They allow evaluation of contamination generated from sample containers and changes occurring during the shipping and laboratory storage process. The third type, equipment rinsate blanks, will consist of CLP-specified grade water that has been poured over the equipment after completion of decontamination. The number of blanks collected in the field will be specified by the work plans for each site. The blanks collected in the field will not be counted for the laboratory's quality control protocol for matrix spikes or duplicate samples.

FIELD DUPLICATES

For samples collected for laboratory analysis, field duplicates will be collected at a rate of 10 percent of the total number of samples collected during each day of sampling for each sample matrix type at every site. The number of samples collected will be rounded up to the next increment of ten, such that twenty-one samples would require collection of three duplicates, if collected within three days. At least one field duplicate will be collected per day of sampling and will be packaged and sent to the laboratory for analysis with the other samples of the same sample matrix type.

EQUIPMENT RINSATE SAMPLES

Equipment rinsate samples will be collected to establish that proper sample bottle preparation, decontamination and handling techniques have been employed. Dedicated sample equipment will be used at each site for each sample station. All sample equipment will be decontaminated in the field and carefully packaged for return to the TNRCC Central Office. The decontaminated equipment will be taken to the TNRCC Region 11 Austin Office laboratory where one equipment blank will be collected and shipped to the assigned CLP laboratory for analysis. The equipment rinsate sample will be prepared by collecting CLP-specified grade water from the final rinse of the sampling equipment. Finally, the sample equipment will be placed in individual dated plastic bags, including chain-of-custody seals.

If sample equipment must be used more than once in the field, then the decontamination procedures for sample equipment will be followed and a rinsate sample collected in the field at the end of each sampling day and/or between each sample matrix type sampled, whichever is greater, and shipped to the assigned CLP laboratory with the associated sample matrix type. The number and type of QA samples at each site will be estimated in the SSI work plan. Modifications to the plan may be deemed necessary by the site investigation manager depending on field conditions, the on-site determination of additions or removals of sample locations, and the number of days required to complete the site sampling investigation.

(B7) CALIBRATION PROCEDURES AND FREQUENCY

Calibration of field instruments and equipment will be performed at approved intervals as specified by the manufacturer or more frequently as conditions dictate. Calibrations also may be performed at the start and completion of each test run. However, such calibrations will be re-initiated after any delay caused by meals, work shift change, or damage incurred. Calibration standards used as reference standards will be traceable to the NIST, when existent. Standards will be used and duplicate samples analyzed in the field to verify pH and specific conductance data.

Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the EPA-CLP specifications. Calibration of laboratory equipment will be based on approved written procedures. It is the responsibility of the EPA data validators to ensure that the proper calibration protocols specified in the CLP statement of work were used. These calibration procedures and frequencies are included in the EPA Contract Laboratory Program, "Statement of Work for Organic Analysis" including revisions through August, 1994 and in the EPA Contract Laboratory Program, "Statement of Work for Inorganic Analysis" including revisions through February, 1994.

Records of calibration, repair, or replacement will be filed and maintained by the designated laboratory personnel performing quality control activities in accordance with EPA-CLP requirements. Calibration records of assigned laboratories will be filed and maintained at the laboratory location where the work is performed and will be subject to QA audit.

(B6 and B8) INSTRUMENT/EQUIPMENT TESTING, INSPECTION, PREVENTIVE MAINTENANCE PROCEDURES

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the operators.

SCHEDULES

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime of the measurement system. It will be the responsibility of the operator to adhere to this maintenance schedule and to arrange any necessary and prompt service as required. Service to the equipment, instruments, tools and gauges shall be performed by qualified personnel.

In the absence of any manufacturer's recommended maintenance criteria, a maintenance procedure will be developed by the operator based on experience and previous use of the equipment.

RECORDS

Logs will be established to record maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced will be reviewed, maintained, and filed by the operator when equipment, instruments, tools, and gauges are used at the sites. The Program Quality Assurance Specialist will audit these records to verify complete adherence to these procedures. Any deviations from these procedures will be reported to the Program Technical Director.

SECTION C

ASSESSMENT/OVERSIGHT

(C1) ASSESSMENT AND RESPONSE

QA audits are performed by the Program Quality Assurance Specialist. Functioning as an independent agent, the Program Quality Assurance Specialist will plan, schedule, and approve system and process audits according to procedures determined by the Program Technical Director, customized to specific project requirements. These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, activities, and documentation of the measurement system(s), including subcontractor activities.

The Program Quality Assurance Specialist will report directly to the Technical Director. The Program Quality Assurance Specialist will coordinate and monitor the overall QA program, including all on-site activities and the quality control programs of the laboratories. Implementing prompt, effective, and accurate corrective action in response to noncompliance that may occur on projects is absolutely essential in assuring the quality of the end product.

QUALITY SYSTEM AUDIT

A quality system audit refers to a detailed evaluation of the Project's Quality Assurance Program to determine its conformance to the Multi-Site Cooperative Agreement commitments and standard TNRCC procedures. Such an audit includes preparation of formal plans and a checklist based on established requirements. A copy of a field audit checklist is at the end of this section. Audits will be performed on TNRCC work.

(C2) REPORTS TO MANAGEMENT

Audit reports will be written by the Program Quality Assurance Specialist after gathering and evaluating all available data. Items, activities, and documents determined by the Program Quality Assurance Specialist to be non-compliant will be identified at interviews conducted with the Technical Director and Program Manager. Non-compliant elements will be logged, documented, and controlled through audit findings, which are attached to the audit report. These audit findings are directed to the Program Manager to resolve the noncompliance satisfactorily in a specified and timely manner.

All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the Program QA/QC Officer prior to issue. QA verification of acceptable resolutions may be determined by re-audit for documented surveillance of the item or activity. Upon verification acceptance, the Program QA/QC Officer will close out the audit report and findings.

It is the Program Manager's overall responsibility to ensure that all corrective actions to resolve audit findings are acted upon promptly and satisfactorily by project personnel.

FIELD AUDIT CHECKLIST

Project No. _____

Project Name _____

Site Investigation Manager _____

Auditor _____

Dates of Field Audit _/__/__ - _/__/__

A: Health and Safety

1. The Site-Specific Health and Safety Plan has been prepared by the TNRCC Site Investigation Manager and subsequently approved by the TNRCC Program Manager and TNRCC Health and Safety Officer prior to arrival to the site.

Yes ___ No ___

Comments_____

_____

2. The Site-Specific Health and Safety Plan has been signed by all who intend to enter within the site boundaries prior to entry onto the site.

Yes ___ No ___

Comments_____

_____

B: Project Organization Adequate ___ Marginal ___ Failed ___

1. Did the Site Investigation Manager hold a briefing with each participant to go over any concerns or questions for project organization?

Yes ___ No ___

Comments_____

_____

2. Did the Site Investigation Manager provide appropriate number and types of material supplies necessary to collect samples (jars, bottles, gloves, pens, coolers, coolant, preservatives, protective gear, Work Plan, Health and Safety Plan, CLP, QAPP or other reference material)?

Yes ___ No ___

Comments_____

_____

3. Were additional instructions given to each participant not otherwise found in the preliminary written material, such as the Site-Specific Work Plan, Health and Safety Plan, CLP or QAPP?

Not Applicable ___

Additional Instructions_____

_____

C: Sample Collection Procedures

1a. Did the Site Investigation Manager ensured that the sampler collected adequate volumes of sample to allow for the planned sample analyses and field duplicates, plus any laboratory QC blanks and laboratory QC duplicates/spikes, as applicable?

Yes ___ No ___

Comments_____

_____

1b. Did the Site Investigation Manager provided a supply of the appropriate type of sample containers for the samples collected?

Yes ___ No ___ No Modifications ___ Modifications ___

Comments_____

_____

2. Were samples collected as stated in the Site-Specific Work Plan (number, frequency, and type)?

Yes ___ No ___ No Modifications ___ Modifications ___

Sample Modifications_____

_____

D: Chain of Custody

1a. Did the Site Investigation Manager ensured that the sample tags were properly completed and attached to each sample container?

Yes ___ No ___

Comments_____

_____

1b. Did the Site Investigation Manager ensured that the custody seals were properly completed and attached to each sample container in unbroken condition?

Yes ___ No ___

Comments_____

_____

1c. Did the Site Investigation Manager ensured that each sample container was labeled with the sample number and protected with clear tap?

Yes ___ No ___

Comments_____

_____

2. Was each traffic report has been completed, faxed to EPA, original copy mailed to EPA, and copies corrected as necessary?

Yes ___ No ___

Comments_____

_____

3. Did the traffic report accompanied each shipment to the correct EPA contract lab?

Yes ___ No ___

Comments_____

_____

E: Field Observations Adequate ___ Marginal ___ Failed ___

1. Were field observations written in ink and presented accurately in the field logbook, and was each page signed and dated?

Yes ___ No ___

Comments_____

_____

2. Were photographs are logged in the logbook with the date, time, location, name of person taking the picture, type of sample, sample number, and the photo number?

Yes ___ No ___

Comments_____

_____

3. Prior to use, did the Site Investigation Manager ensured that the measuring equipment was calibrated to standard procedures as presented in accompanied documents written specifically for the instrument?

Yes ___ No ___

Comments_____

_____

4. Have any accountable documents been lost?

Not Applicable ___

Documents Lost_____

_____

General Comments or Concerns Regarding the Sampling Procedures, Organization, and Site Investigation Management:

_____

_____

_____

Printed Name of Auditor_____

Signature of Auditor _____ Date_____

SECTION D

DATA VALIDATION AND USABILITY

(D1 and D2) DATA REVIEW, VALIDATION, VERIFICATION METHODS

FIELD MEASUREMENT DATA

Field measurements will be made by field geologists and engineers, environmental analysts, and technicians. The following standard reporting units will be used during all phases of the project:

- pH will be reported to 0.1 standard units.
- Specific conductance will be reported to two significant figures below 100 umhos per centimeter (umhos/cm) and three significant figures above 100 umhos/cm.
- Temperature will be reported to the nearest 0.5° Celsius (°C).
- Water levels measured in wells will be reported to the nearest 0.01 foot.
- Soil sampling depths will be reported to the nearest 0.5 foot.

Field data will be validated using different procedures.

- Checklists will be used during the processing of data that will identify errors - for example, identifying errors in identification codes.
- Checks may be made for consistency with parallel data sets (data sets obtained presumably from the same population) - for example, from the same region of the aquifer or volume of soil.

The purpose of these validation checks and tests is to identify outliers, i.e., observations that do not conform to the pattern established by other observations. Outliers may be the result of transcription error or instrumental breakdowns. Outliers may also be manifestations of a greater degree of spatial or temporal variability than expected.

If an outlier is identified, a decision concerning its fate will be rendered. Obvious mistakes in data will be corrected when possible, and the correct value will be inserted. If the correct value cannot be obtained, the data may be excluded. An attempt will be made to explain the existence of the outlier. If no plausible explanation can be found for the outlier, it may be excluded, but a note to that effect will be included in the report. Also, an attempt will be made to determine the effect of the outlier when both included and excluded in the data set.

LABORATORY DATA

The procedures used for calculations and data reduction are specified in each method referenced previously. It will be the responsibility of the laboratory to follow these procedures.

VALIDATION

The laboratory data will be validated by EPA according to the following EPA documents:

- National Functional Guidelines for Organic Data Review (August 1994)
- National Functional Guidelines for Evaluating Inorganics Analyses (February 1994).

REPORTING

The project analytical report from the CLP laboratory will contain data sheets and the results of analysis of QC samples. Analytical reports may also contain the following items:

- Project identification
- Field sample number
- Laboratory sample number
- Sample matrix description
- Date of sample collection
- Analytical method description and reference citation
- Individual parameter results
- Date of analysis (extraction, first run, and subsequent runs)
- Quantitation limits achieved
- Dilution or concentration factors
- Corresponding QC report (including duplicates and spikes).

Matrix interferences on some of the samples, particularly the waste samples, may result in increased detection limits. Matrix interference will be reported as the cause of increased detection limits.

(D3) RECONCILIATION WITH DQO

The following procedures have been established to assure that conditions adverse to quality--malfunctions, deficiencies, deviations, and errors--are promptly investigated, evaluated, and corrected.

INITIATION OF CORRECTIVE ACTION

When a condition adverse to quality is noted at the project site, laboratory, or subcontractor locations, the cause of the condition will be determined and corrective action taken to preclude repetition. All project personnel have the responsibility, as part of normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality.

Corrective actions may be initiated at a minimum:

- When predetermined acceptance standards--objectives for precision, accuracy, and completeness--are not attained.
- When procedures or data compiled are determined to be faulty.
- When equipment or instrumentation is found faulty.
- When samples and test results cannot be traced with certainty.
- When quality assurance requirements have been violated.
- When designated approvals have been circumvented
- As a result of an audit.

PROCEDURE DESCRIPTION

Project management and staff, including field investigation teams, sample control personnel, and laboratory groups, monitor ongoing work performance in the normal course of daily responsibilities.

Following identification of an adverse condition or quality assurance problem, notification of the deficiency will be made to the project manager and senior individual in charge of the activity found to be deficient, along with recommendations for correction. Following implementation of corrective action, the senior individual in charge will report actions taken and results to the Program Manager and Program QA/QC Officer.

EQUATIONS FOR PRECISION, ACCURACY, AND COMPLETENESS

Planned procedures used to assess data precision and accuracy are in accordance with 44 FR 69533, "Guidelines Establishing Test Procedures for the Analyses of Pollutants", and appendix III, "Example Quality Assurance and Quality Control Procedures for Organic Priority Pollutants", December 3, 1979. Completeness is recorded by comparing the number of parameters initially analyzed with the number of parameters successfully completed and validated.

PRECISION

Relative percent difference (RPD) is calculated as:

$$RPD = \frac{|x_1 - x_2|}{x} \times 100\%$$

where:
x_1 = analyte concentration of first duplicate
x_2 = analyte concentration of second duplicate
x = average analyte concentration of duplicates 1 and 2.

ACCURACY

Accuracy is expressed as a percent recovery (PR), calculated by:

$$PR = \frac{(A-B)}{C} \times 100\%$$

where:
A = spiked sample result (SSR)
B = sample result (SR)
C = spike added (SA).

COMPLETENESS

The completeness of the data will be determined by:

$$PC = \frac{N_a}{N_t} \times 100\%$$

where:
PC = percent complete
N_a = number of actual valid results
N_t = number of theoretical results obtainable.

APPENDIX D

Site Reconnaissance Checklists

SITE RECONNAISSANCE CHECKLIST

I. General
1. Name and title of site contact.
2. Telephone number.
3. Site address.
4. Mailing address (if different).
5. Name of owner and/or operator.
6. Mailing address.

II. Site History
1. How long has current owner/operator been at site?
2. What were previous uses of site? Who were previous owners?
3. Size of site (acres).
4. Is any other property used that is not contiguous with site?
5. Permits (RCRA, TDH, etc.)
6. Any past spills or other environmental or accident problems.
7. What were previous waste management practices?

III. Current Operations
1. What is currently being done at facility?
2. What are waste management practices?
3. What are hazardous chemical management practices?
4. List major hazardous chemicals/constituents present and past.
5. Discuss sources (e.g., tanks, impoundments, containers, etc.).
6. Number of employees - current, peak.

IV. Source Characteristics
1. Identify type of wastes and quantities disposed of at site.
   a. Identify source of information.
   b. Photograph.
   c. Dimension (quantity, volume, area) of waste locations.
   d. Containment controls (clay cap, clay liner, vegetative cover, etc.)
   e. Existing data.
   f. Condition/integrity of storage/disposal units.

V. Groundwater Pathway
1. Distance from source to nearest well. Identify name and address of well owner, if possible - and estimate well usage (number of people served, irrigation, supplemental, etc.).

2. Verify wells within range of site. Indicate depth to water for each well and number of people served. Identify as many owners and addresses as practically feasible.
   a. 0 - 0.25 mile
   b. 0.25 - 0.50 mile
   c. 0.50 - 1.00 mile
   d. 1.00 - 2.00 mile
   e. 2.00 - 3.00 mile
   f. 3.00 - 4.00 mile
3. Aquifer nearest wells are screened in, and water quality.

VI. Surface Water Pathway

1. Identify the TNRCC Basin and Stream Segment where the site is located.
2. Describe surface water quality including:
   a. average discharge,
   b. total basin drainage area,
   c. TNRCC surface water quality monitoring stations.
3. Are there surface water bodies within 2 miles of site?
4. Provide sketch of surface water runoff and flow patterns for 15 stream-miles downstream.
5. identify intakes along surface water route within 15 stream-miles downstream.
6. What is water use at each intake.
7. Identify fisheries along the 15 stream-mile downstream pathway.
8. Identify sensitive environments along the 15 stream-mile downstream pathway (see attached list).
9. Identify downstream recreational uses.
10. Estimate approximate flow rates for each water body within the 15 stream-mile target distance (i.e., <10 cfs, 10-100 cfs, 100-1,000 cfs, 1,000- 10,000 cfs, etc.). Estimate length of each stream segment.
11. Identify the annual rainfall and net rainfall at the site.
12. Is site in flood plain (10 year, 100 year, 500 year)?
13. Estimate upgradient drainage area limits (watershed).
14. Draw a sketch of drainage from site to nearest surface water including any other contributing tributaries.
15. Identify recreational uses downstream (15 miles).

VII. Soil Exposure Pathway

1. Describe status of site access, fencing, gates, locks, condition of security controls.
2. Describe adjacent land use.
3. Describe off-site runoff patterns.
4. Describe number of people with residence, school, or day care on-site or within 200 yds.
5. Locate nearest school or day care.

6. Number of workers on-site (include maximum number to cover work on-site).
7. Identify sensitive environments, (see list end of checklist).
8. Describe any off-site runoff pattern existing at the site.

VIII. Air Pathway

1. Estimate number of people within 4 miles (city or county records).
   a. 0 - 0.25 mile
   b. 0.25 - 0.50 mile
   c. 0.50 - 1.00 mile
   d. 1.00 - 2.00 mile
   e. 2.00 - 3.00 mile
   f. 3.00 - 4.00 mile
2. Shortest distance from source to occupied building.
3. Identify known releases to air.
4. Identify reports of adverse health effects.
5. Identify existence of sensitive environments within 4 miles (see end of checklist for list).

Miscellaneous Inquiries

1. Are any additional aerial photographs depicting site history available?
2. Meteorological data.
3. Nearest recreational area? Hospital?
4. Local water supply sources?

Site Sketches to Include

1. Date(s) of visit.
2. Well locations (including nearest to site).
3. Storage areas (past and present).
4. UST and above ground storage tanks.
5. Waste Areas.
6. Buildings
7. Access roads.
8. Areas of ponded water, or depressions in surface.
9. Drainage direction.
10. Photograph locations and directions.
11. Vegetation and significant landscaped features.
12. Any irregular appearance for soil, vegetation, tanks, etc. such as may result from spill, backfill operation, recent dirt moving work, etc.