ATSDR Agency for Toxic Substances & Disease Registry

Public Health Assessments & Health Consultations

PUBLIC HEALTH ASSESSMENT

MALLARD BAY LANDING BULK PLANT
GRAND CHENIERE, CAMERON PARISH, LOUISIANA

I. SUMMARY

The Mallard Bay Landing Building Plant (MBLBP)(formerly known as Talen's Landing) site islocated 23 miles northeast of Grand Cheniere in Cameron Parish, Louisiana. The site is situated onapproximately 10 acres of land. It consists of two 5-acre tracts of land separated by an inlet from theIntracoastal Waterway (ICW) and Talen's Marina and Fuel, an active refueling Marina facility anddock. Wooded wetlands border the site to the north. On the west the site is bordered by an unnamedroad, and the site is bordered on the south by Talen's Marina and Fuel. The National Priorities List(NPL) inclusion of the site was July 27, 2000, based on the evidence that hazardous substances thathave migrated and/or could migrate to nearby water bodies, and associated wetlands. Thehazardous substances include: styrene, polycyclic aromatic hydrocarbons, other organic aromaticcompounds, and metals, including aluminum, barium and manganese. These water bodies are usedfor recreational and commercial fishing and provide a habitat to numerous waterbird nestingcolonies and other wildlife.

Currently, access to the site is partially restricted. Exposures to trespassers (from wetlands) could beoccurring at present. Past exposures to soil contamination to on-site workers at MBLBP site didoccur. No drinking water intakes are located within the surface water pathways; however, fisheriesand sensitive wetland environments are present nearby. The groundwater sampling from the Talen'sMarina and Fuel well was denied. It is not known if airborne off-site migration of contaminantsattributable to MBLBP site has occurred. However, this pathway is unlikely because the closestresident to the site is approximately one mile away. Exposure to on-site soil and sediments are acompleted pathway. On-site contamination was detected in the MBLBP East and West properties. The contaminants include aluminum, barium, manganese and polycyclic aromatic hydrocarbons. Aluminum, barium and manganese pose no public health hazard based on data available. PAHspose an indeterminate public health hazard. Additional data will be reviewed in a separate document.

II. PURPOSE AND HEALTH ISSUES

The 1986 Superfund Amendments and Reauthorization Act to the Comprehensive EnvironmentalResponse, Compensation and Liability Act of 1980 directs the Agency for Toxic Substances andDisease Registry (ATSDR) to perform specific public health activities associated with actual orpotential exposures to hazardous substances released into the

environment. Among those activities ATSDR was mandated to perform a public health assessment for each facility or site listed orproposed to be listed on the National Priorities List (NPL).

The Section of Environmental Epidemiology and Toxicology of the Louisiana Department of Healthand Hospitals, Office of Public Health (OPH) is conducting this public health assessment for theMallard Bay Landing Bulk Plant NPL site to determine the public health significance of the site. This public health assessment contains recommendations to reduce or prevent site-related exposure that might result in adverse health effects.

III. BACKGROUND

A. Site Description and History

The Mallard Bay Landing Bulk Plant (MBLBP) site is located 23 miles northeast of GrandCheniere in Cameron Parish, Louisiana. MBLBP is an inactive crude oil refining facility. Therefinery operated under the names Mallard Resources, Inc (MRI) and Cameron Resources, Inc(CRI). The site is situated on approximately 10 acres of land. It consists of two 5-acre tracts of landseparated by an inlet from the Intracoastal Waterway (ICW) and Talen's Marina and Fuel, an activerefueling facility and dock. Those two 5-acre tracts of land are referred as MBLBP East and Westfacilities (Appendix A: Figure 1). The site latitude is 29 54"59" N; longitude: 92 37"30" W. TheMallard Bay Landing facility is bordered by a ditch, an unnamed road, and wooded wetland areas tothe north and west by Talen's Marina and Fuel to the south, and by an open field/parking lot to the east [1].

East Facility
The MBLBP East facility is bordered to the north and west by the ICW and by wooded wetland areas to the south and east. A dirt road runs along the east boundary of the facility. (Appendix A: Figure 2). The east facility has a locked gate which is bound to an 8-foot-high, chain-link fence. The areas included are:

a) East Tank Battery - This consists of nine aboveground storage tanks all of which are containedwithin an earthen containment berm. Standing water was present in the southeastern portion of thebermed area. West of the Tank Battery is a barge loading dock and associated pump house.

b) Process Area - This consists of a crude oil processing unit, an office and control room building, alaboratory, a mobile trailer, and five small sheds used for storage and/or office spaces. Thelaboratory contained numerous chemicals, and one of the five sheds was full of soil samples.

c) Heater Area - This consists of a sheet metal building, referred to as the boiler building, two heaterunits and processing area via insulated pipes.

West Facility
The MBLBP West facility is bordered by a ditch, an unnamed road, and wooded wetland areas to the north and west, by Talen's Marina and Fuel to the south, and by an open field/parking lot to the east (Appendix A: Figure 3). The area surrounding the site is mainly undeveloped and utilized for hunting and cattle grazing. It has a fence which was locked during the site visit. The nearest residences are located approximately one mile north of the facility [3].

The areas included are:

a) Waste Tank Battery.- There is evidence that standing water within the bermed area flows freely tothe surrounding wooded area. Approximately 142 fifty five-gallon metal drums were present. Thevast majority were rusted, visibly empty, and stacked along the southern portion of the berm.

b) Water Treatment System.- It consists of an above ground oil-water separator and two watertreatment ponds. These two ponds are interconnected by a 4" polyvinyl chloride (PVC) pipe. Thispipe is in the berm separating the ponds. Each of the two ponds was full of water.

In January 1983, a Resource Conservation and Recovery Act (RCRA) inspection was conducted atMallard Resources, Inc. (MRI), by the Environmental Protection Agency (EPA) and the LouisianaDepartment of Natural Resources (LDNR). The result of this inspection was a Notice of Violation. In July 1983, a violation letter was sent to MRI. During November 1983, another inspection visitwas done. The facility was not in operation, and there were no indications that the violations werecorrected. Therefore, LDNR issued a Letter of Warning to MRI [1].

In early 1984, MRI filed for Chapter XI Bankruptcy Proceedings and the facility was sold toCameron Resources, Inc. (CRI). In January 1985, Louisiana Department of Environmental Quality(LDEQ) conducted a general inspection of the facility, and this revealed that a complete renovationwas being conducted in order to bring facility up to full operating status.

CRI began operations at the facility in August 1985. In October 1985, January 1986, and March1986, the EPA and LDEQ-Hazardous Waste Division (HWD) conducted inspections and follow-upvisits to verify compliance. The facility has been complying with the order [1].

In April 1987, LDEQ-HWD performed a general inspection based on information that CRI hadundergone bankruptcy, and that the facility was closed. This revealed that the facility was notoperating and was in negotiations for sale. CRI accepted hazardous waste fuels that were notpermitted. LDEQ reported that CRI had received styrene which it tried to process, resulting inserious problems within the refinery that ultimately led to its closure.

In April 1993, the LDEQ Inactive and Abandoned Sites Division (IASD) conducted a preliminaryinspection of the facility. The inspection revealed that material and/or sludge was present in severaltanks, and that the southwest tank in the East facility was nearly full. LDEQ also noted three pondsfull of liquid, several drums, numerous process samples located in a small shed, and various areas ofstained soil. In June 1993, LDEQ-IASD referred MBLBP to EPA for consideration of assessmentunder Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as apotential hazardous waste site [1].

On July 30, 1996, EPA tasked the Superfund Technical Assessment and Response Team (START)to conduct a removal assessment. START conducted the removal assessment from August 5 toAugust 11, 1997. During this removal START numbered, inventoried and sampled 17 aboveground storage tanks and eight 55-gallon drums for hazard categorization. Many of the tanks weredeteriorating. The presence of a chemical odor around some of the tanks further substantiated thefact that the tanks were not sealed and/or spillage of tank contents had occurred [1]. From Januaryto March 1999, approximately 866,304 gallons of tank waste material was transported off site fordisposal. Some material remains in the tanks because it could not be pumped out due to its thickconsistency.

On July 27, 2000, MBLBP was included on the National Priorities List (NPL). This was based onthe evidence that hazardous substances were in tanks and drums at elevated concentrations. Amongthose substances are: benzene, ethylbenzene, styrene, toluene, xylenes, 2-methylnaphthalene, andnaphthalene, as well as other organic aromatic compounds, and metals, including arsenic,chromium, lead, mercury, cobalt, copper, manganese, nickel, vanadium and zinc. Those hazardouschemicals could migrate to nearby water bodies, including the Intracoastal Waterway (ICW), GrandLake, Mermentau River, White Lake, Gueydan Canal, bayous, other small water bodies, andassociated wetlands. These water bodies are used for recreational and commercial fishing andprovide habitats to numerous waterbird nesting colonies and other wildlife. A total of one mile ofcontaminated wetlands was identified by chemicals during the 1999 START Site Investigation [3].

B. Site Visit

On Friday, April 6, 2001, persons from OPH, EPA, Tetra Tech and LDEQ visited the MBLBP site(east and west facilities). No residences are close to the site. The access road and Talen's Marinaand Fuel are in-between the two parcels of MBLBP property. Talen's Marina and Fuel operates aboat launch for recreational fishers and has a large parking lot for the cars of people who work onthe barges on the ICW. They also own an area that, according to DEQ, had been used in the past forinformal camping. The camping area could only comfortably accommodate about two campers or tents.

The MBLBP east parcel contains the process unit, an office and some tanks. The site was fenced onthe side by the road. A trespasser could access the site by boat or through the wetland side of thesite. We could smell a styrene odor because styrene has coated the inside of the process unit. Theprocess unit is surrounded by a levee. Several cuts on the levee were seen, which had been made inorder to allow rainwater to flow out from around the process unit. Contamination is already in the wetland, and an oily sheen on water was visible.

In its current condition, the east site contains physical hazards, including asbestos, debris on theground, and a catwalk between two storage tanks. LDEQ related that they found radish plants whichwere planted by trespassers to attract deer. A deer stand was observed on the exterior of the processarea in the marshy portion of the site. Shotgun shells also have been found in the past on the site.

The west side was locked. The west side had only a 3-foot high fence with no barbed wire. Thisarea served as a waste water treatment area. Two ponds which were full of rainwater were observed. A ditch surrounds the west side of the site which contains a discharge pipe.

C. Demographics, Land Use, and Natural Resource Use

The MBLBP site is located in Cameron Parish, Louisiana, which had a total population of 9,260 in1990. Cameron Parish, the largest parish (area-wise) in Louisiana, is located in the southwesterncorner of the state on the Gulf of Mexico, bordering the Texas line. The area has no day carefacilities, schools, or permanent residents within 200 feet of observed contamination. The nearestindividual is the resident manager of the Spirit 76 Energy Plant (a.k.a. the Jupiter Plant) locatedapproximately 1/4 mile northeast of the MBLBP West facility site. The next closest residence islocated approximately 1 mile north of the site. The residential population within a 1-mile radius ofthe site is estimated to be approximately 4 individuals (Appendix A: Figure 4) and the residentialpopulations within a 4-mile radius of the site is estimated to be approximately 20 individuals [2].

The 1,441 square-mile parish is home to four wildlife refuges comprising about 284,000 acres ofboth fresh and saltwater marshes and bird sanctuaries. According to the National Wetlandsinventory Maps, there are more than 20 linear miles of wetland frontage area. Recreational andcommercial fishing is conducted within 15 miles of the site for both freshwater and marine speciesincluding: catfish, buffalo (fish), blue crabs, paddlefish, and white shrimp. Grand Lake is theprimary commercial fishing ground for those species in Cameron Parish. Hunting and crabbing,shelling and birdwatching on 36 miles of accessible beaches are other activities close to the site[1,3]. The area surrounding the site is mainly undeveloped and utilized for hunting. Nocommercial, agriculture, livestock production or grazing occurs near or at the site.

D. Health Outcome Data

There have not been any data collected from area residents to evaluate.

IV. DISCUSSION

A. Environmental Contamination and Other Hazards

In this section, we review the environmental data collected at the site, evaluate sampling adequacy, select contaminants of concern, and list the maximum and mean contaminant concentrations.

We select contaminants of concern based on the following factors:

1. Concentrations of contaminants on and off-site. Although background concentrations are useful in determining if contaminants are site-related, contaminants are only eliminated from further consideration if both the background and on-site concentrations are below standard health comparison values. This is necessary to assess the public health risk of all contaminants detected, whether site-related or not.

2. Field data quality, laboratory data quality, and sample design.

3. Community health concerns.

4. Comparison of maximum and mean on- and off-site concentrations with published Agencyfor Toxic Substances and Disease Registry (ATSDR) standard comparison values. ATSDR'spublished standard comparison values are media-specific concentrations used to selectcontaminants for further evaluation. They are not used to predict health effects or to set cleanup levels. Contaminants with media concentrations above an ATSDR standard comparisonvalue do not necessarily represent a health threat, but are selected for further evaluation. Contaminants with media concentrations below an ATSDR standard comparison value are unlikely to be associated with health effects and are not evaluated further.

5. Other health-based guidelines are used for comparison of maximum and mean on- andoff-site concentrations when there are no ATSDR standard comparison values. Thisincludes the Environmental Protection Agency (EPA's) references doses (RfDs).

We used the following five ATSDR standard comparison values, in order of priority, to select contaminants of concern:

- Environmental Media Evaluation Guide (EMEG) - derived from ATSDR'sMinimal Risk Level (MRL) using standard exposure assumptions, such as ingestionof 50 - 200 milligrams of soil per day (mg/day), and body weight of 70 kilograms(kg) for adults and 10 kg for children. MRLs are an estimate of daily humanexposure to a chemical likely to be without an appreciable risk of noncanceroushealth effects.

- Reference Dose Media Evaluation Guide (RMEG) - derived from EPA's ReferenceDose (RfD) using standard exposure assumptions. RfDs are an estimate of dailyhuman exposure to a chemical likely to be without an appreciable risk ofnoncancerous health effects.

- Maximum Contaminant Level (MCL)- The maximum permissible level of acontaminant in a public water system.

ATSDR standard health-based comparison values are used only to select contaminants of concernfor further consideration. Identification of a contaminant of concern in this section does notnecessarily mean that exposure will be associated with illnesses. Identification serves to narrow thefocus of the public health assessment to those contaminants most important to public health. Weevaluate the contaminants of concern in subsequent sections and determine whether exposure to them has public health significance.

1. On-Site Contamination

Waste

The Target Compound List (TCL) Volatile Organic Compounds (VOC) analytical results for the 16 above ground tank samples collected at East and West Mallard Bay Landing Bulk Plant (MBLBP) showed that benzene, toluene, ethylbenzene, and xylene (BTEX) were present in all tank samples. The results of the sample analysis in 1997 were: benzene was detected in concentrations of up to 510 milligrams per kilogram (mg/kg); toluene up to 1,000 mg/kg; ethylbenzene up to 810 mg/kg; and xylene up to 4,000 mg/kg. Eleven samples analyzed showed polycyclic aromatic hydrocarbons (PAHs): acenaphthene up to 740 mg/kg; anthracene up to 490 mg/kg; fluorene up to 780 mg/kg; fluoranthene up to 700 mg/kg; 2-methyl naphthalene up to 8,900 mg/kg; naphthalene up to 12,000 mg/kg; phenanthrene up to 2,100 mg/kg; and pyrene up to 1,100 mg/kg. Dibenzofuran was found at concentrations of 390 mg/kg, and phenol at concentrations up to 2,800 mg/kg [3]. Data on the waste is included here to provide information on what is likely to be found in soils and sediments.

TCL Pesticides and Polychlorinated biphenyls (PCBs) results from 11 tank samples and herbicideresults for two composite tank samples showed: endrin aldehyde at 2.8 mg/kg; one herbicide, 2-4dichlorophenoxybutyric acid (2,4-DB), detected at 0.674 mg/kg in one of the composite samples.

Soil

Soil Sampling MBLBP East Facility

In March 1999, four grab soil samples from 0-6 feet depth were collected from the MBLBP East Facility and the analyses showed the presence of phenol, bis-(2-ethylhexyl)phthalate, acetone, 2-butanone, benzene, ethylbenzene, styrene, toluene, and total xylene. Chemical analysis of the inorganic fraction revealed the presence of 13 metals (aluminum, arsenic, barium, chromium, copper, lead, magnesium, manganese, mercury, nickel, selenium,

vanadium, and zinc). Table 2 in Appendix B shows only the chemicals which exceed the health Comparison Value (CV).

Soil Sampling MBLBP West Facility

In March 1999, five grab soil samples from 0-6 feet depth were collected from the MBLBP West Facility containment area. Chemical analysis of the organic fraction revealed the presence of four compounds (acetone, 2-butanone, xylenes, and pyrene). Chemical analysis of the inorganic fraction revealed the presence of 13 metals (aluminum, arsenic, barium, chromium, copper, lead, magnesium, manganese, mercury, nickel, selenium, vanadium, and zinc). Table 2 in Appendix B shows only the chemicals which exceed the health CV [3].

Water Treatment Pond Sampling

START identified two water treatment ponds, located in the MBLBP West facility in August 1997. Two composite samples were collected, one from each pond and analyzed for BTEX, PAHs,pesticides and metals. Toluene was detected in trace quantities of 0.015 mg/kg. Two PAHs weredetected with a combined concentration of 0.121 mg/kg. The pesticides beta and deltahexachlorocyclohexene(BHC) were detected at 0.097 mg/kg and 0.050 mg/kg respectively. TheSTART report states that twenty metals were detected in one or both samples. Concentrations arenot reported in this document because the table which contained actual data was not available.

Groundwater

The region in the vicinity of the site obtains its water from the Chicot aquifer system. A water welldatabase provided by the Louisiana Department of Transportation and Development (LDOTD)indicates groundwater is used for rig supply, industrial (commercial and public), and privatedomestic wells. There are 13 wells (12 industrial non-drinking water wells and one domesticdrinking water well) within a 3 to 4 mile area of the site. These wells range in depth from 150 to233 feet below groundwater surface (bgs). The closest wells to the site are located approximately500 feet south of the West facility and 500 feet west of the East facility.

The nearest documented drinking water well is located approximately 0.19 miles south of the site atTalen's Marina and Fuel. This well is listed as a rig supply; however, the Superfund TechnicalAssessment and Response Team (START) documented that the well was used only to providepotable water for boats and the Talen's Marina (approximately 30 employees). A sample wasobtained from Talen's Marina and Fuel well, but it was not analyzed.

Talen's Marina and Fuel is reported to use well water for human consumption. They allowed EPAto sample their tap water but then rescinded permission to have this sample analyzed on the adviceof their consultant. DEQ suspects they draw from a deeper aquifer than the wells on MBLBPbecause the shallower groundwater contains too high a level of total dissolved solids for humanconsumption.

Employees of the Jupiter Plant stated that a rig supply well located at their facility was not used forpublic consumption. All employees drank only bottled water. The well water sample was analyzedfor VOCs, semi-volatile organic compounds (SVOCs) and metals. No contaminants were foundwhich exceeded the EPA MCL. Assessment of the migration pathway indicates documentedobserved releases to the groundwater pathway; however, the groundwater pathway has limitedtargets.

Surface Water

The topography of the site, and the entire region, is flat and low lying. Surface waterrunoff fromthe East facility flows west and north of the Intercoastal Waterway (ICW) and south and east intowetlands. A ditch runs along the west side of the West facility. This ditch runs between Talen'sMarina and Fuel and the Jupiter Plant. When the water level in the ditch is high enough, itoverflows west to an unnamed tributary to the ICW. The ICW, south of the site to the Gulf ofMexico, comprises interconnected lakes, bayous, canals, and wetlands. No on site surface watersamples have been collected at this time.

Air

No air sampling and analysis has been performed at the site.

2. Off-Site Contamination

Sixteen surface water pathway sediment samples, including six background samples were collectedto evaluate the surface water pathways. Three were collected in the ditch west of the West facility,and two in the barge slips to the west of the east facility, one in the ICW approximately 500 feet eastof the site, one in the ICW approximately 500 feet west of the site. All sediment samples will beanalyzed for TAL metals, TCL VOCs, and TCL SVOCs. No results of those analyses wereprovided to OPH [3].

3. Physical and Other Hazards

The MBLBP site has a partial fence around both facilities with a gate which is locked. STARTidentified ten types of insulating material present in the Process Area and Heater Area in the EastFacility. A total of 32 grab samples was collected for asbestos analysis. The results showed thatasbestos was not detected above the practical quantitation limit. One sample showed a trace of theasbestos. START and Louisiana Department of Environmental Quality (LDEQ) posted signs on thelaboratory and the five buildings, stating "KEEP OUT DANGEROUS CHEMICALS." Contaminated sampling equipment was labeled and secured in the lavatory of the control room with the door locked. The gates at the entrance of the West and East facilities were locked [3].

B. Pathways Analyses

To determine whether people are exposed to contaminants migrating from the site, ATSDR andOPH, Section of Environmental Epidemiology and Toxicology evaluated the environmental andhuman components that lead to human exposure. This pathways analysis consists of studying fiveelements: a source of contamination, transport through an environmental medium, a point ofexposure, a route of human exposure, and an exposed population.

ATSDR categorizes an exposure pathway as a completed or potential exposure pathway. Completedpathways require that the five elements exist and indicate that exposure to a contaminant hasoccurred in the past, is currently occurring, or will occur in the future. Potential pathways, however,require that at least one of the five elements is missing but could exist. Potential pathways indicatethat exposure to a contaminant could have occurred in the past, could be occurring now, or couldoccur in the future. An exposure pathway can be eliminated if at least one of the five elements ismissing and will never be present.

In Appendix B, Table 3 identifies the completed exposure pathways, and Table 4 identifies thepotential exposure pathways. The discussion that follows incorporates only those pathways that are important and relevant to the site.

1. Completed Exposure Pathways

On-site soil

A completed exposure pathway existed in the past for industrial workers who worked at the MBLBPwhen it was operational. Contaminants found in the on-site soil that workers could have beenexposed to include chromium, copper, arsenic, lead and polycyclic aromatic hydrocarbons (PAHs).Table 2 in Appendix B shows only the chemicals which exceed the health comparison value (CV). Exposure could have occurred through ingestion, inhalation and dermal contact.

The East and West sites of MBLBP are partially fenced; therefore, trespassers can currently get intothe site and be exposed to the contaminants on-site. This exposure can occur presently and in thefuture so the site could be a future health hazard, as well. Because the area is actively used forhunting and fishing, the most likely trespasser would be an adult or older youth. A younger childwould gain access to the site only if brought there by an adult or older youth.

On-site Sediment

From the East and West properties, past exposure to contaminated sediments is likely from the on-site sediments. Current and future exposures to sediments are possible. Past exposure throughdermal contact and ingestion may have occurred to on-site workers and youth who may havetrespassed onto the site. Present and future exposure may occur to those who trespass onto the site.

On-site air

In the past, a completed exposure pathway to on-site workers existed via inhalation. Currently, thepossibility exists for particulate inhalation if dust forms from remaining sludge, solids, and non-pumpable liquids remaining in two tanks and uncovered contaminated soil at the site. VOCs werefound in soil samples; therefore, volatilization might have occurred and resulted in exposure ofMBLBP workers in the past. During the Removal Assessment, no air samples were taken due to the lack of residents in proximity to the site.

2. Potential Exposure Pathways

Off-site Sediment

Off-site sediment includes the sediment in the surrounding wetlands which are not within the fencewhich partially surrounds the site. This pathway is considered potential because the amount ofhunting and fishing close to the site is unknown and the ditch and ditch sediments are inaccessible.

Off-site air

Air samples for contaminants attributable to the site have not been collected, thus, it is not known ifairborne migration of contaminants has occurred. The possibility exists for generation of particulatedusts from remaining sludge, soils and non-pumpable liquids remaining in two tanks as well asuncovered contaminated soil at the site. VOCs were found in soil samples; therefore, volatilizationmight have occurred. The nearest individual is the resident manager of the Jupiter Plant locatedapproximately 1,200 feet north of the MBLBP West facility. The nearest regularly occupiedbuilding is the Talen's Marina and Fuel facility, located at 1/4 mile of the MBLBP site. Approximately 30 people work at Talen's. The next

closest residence is located approximately 1mile north of the site. The total number of individuals living or working within the 4-mile radius is90. Due to the lack of residents in proximity to the site, no air samples were collected and exposurevia this pathway is unlikely [1].

Residential Water Wells

Talen's Marina and Fuel had the closest drinking water well (1/4 mile) for their 30 employees. However, permission to sample the water was denied, so there is no knowledge if the water iscontaminated. Residential water wells are considered as potential exposure pathways.

Biota

The MBLBP is close to nearby water bodies, including the ICW, Grand Lake, Mermentau River,White Lake, Gueydan Canal, bayous, other small water bodies, and associated wetlands. Thesewater bodies are used for recreational and commercial fishing. During the sample collectionperformed in 1999, no biota samples were collected. Tetra Tech sampled biota in April 2001 to perform the Ecological Risk Assessment.

C. Public Health Implications

1. Toxicological Evaluation

In this section, health effects that could result from exposures to contaminants at the MBLBP site arediscussed. Information on the toxicity of constituents found in completed exposure pathways ispresented below. People can only be exposed to a site contaminant if they come in contact with it. In order to understand health effects that may be caused by a specific chemical, three factorsaffecting how the human body responds to exposure need to be considered. These factors includethe exposure concentration, the duration of exposure, and the route of exposure. Individualcharacteristics of each human such as age, sex, nutritional status, and overall health can affect how acontaminant is absorbed, distributed, metabolized or eliminated from the body. Together thesefactors determine the individual's response to chemical contaminants and what health effects mayoccur for that individual.

To evaluate health effects, ATSDR has developed minimal risk levels (MRLs) for contaminantscommonly found at hazardous wastes sites. The MRL is an estimate of daily human exposure to acontaminant below which non-cancerous, adverse health effects are unlikely to occur. MRLs aredeveloped for each route of exposure, such as ingestion and inhalation, and for the length ofexposure, such as acute (less than 14 days), intermediate (15 to 364 days), and chronic (greater that365 days). For determining possible exposures to contaminants in soil, contaminant levels in thesoil are used. Cancer risk is calculated using EPA's cancer slope factors and other exposureassumptions. These are theoretical risks, based on conservative (i.e., protective) assumptions.

Factors such as duration of exposure, age, and body weight are used to help estimate the amount ofcontaminant that might have entered a person's body. For example, some young children betweenthe ages of 1 to 6 years old are known to put everything in their mouth (pica behavior). Thisbehavior increases their chances of exposure to soil contaminants. The assumptions for exposurecalculations for a young child are a body weight of 10 kilograms (approximately 22 pounds), withan ingestion rate of 5,000 milligrams of soil per day. The assumptions for an older child (7 years orolder) are a body weight of 16 kilograms

(approximately 35 pounds) and a soil ingestion rate of 200 milligrams per day. The adult assumptions are a body weight of 70 kilograms (approximately 150 pounds), and a soil ingestion rate of 100 milligrams per day. In addition, the maximumconcentration found in a particular media was used for calculating risks and doses, so a worse casescenario was evaluated.

Aluminum

Aluminum occurs naturally and makes up about 8% of the surface of the earth. Aluminum metal issilver-white and flexible. It is often used in cooking utensils, containers, appliances, and buildingmaterials. It is used also in paints and fireworks; to produce glass, rubber, and ceramics; and inconsumer products such as antacids, astringents, buffered aspirin, food additives and antiperspirants[4].

This metal binds to particles in the air, it can be taken up into some plants from soils, and it is notknown to bioconcentrate in the food chain. Persons are exposed through eating small amounts ofaluminum in food and drinking water with high levels of aluminum near waste sites. Very littlealuminum enters our body from aluminum cooking utensils.

The aluminum concentration in on-site soil exceeded the CV for a child but not an adult. (AppendixB, Table 2). Because the nearest residence is 1 mile away, frequent child exposure is not expected[2]. A child could accompany an adult to the site and be exposed to the contaminants identified atthe site, but the frequency of this exposure is expected to be low. Aluminum in soil is not a publichealth hazard.

Barium

Barium is a silvery-white metal found in nature. It occurs combined with other chemicals such assulfur or carbon and oxygen. Barium compounds are used by the oil and gas industries to makedrilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. Barium is also used to make paint, bricks, tiles, glass, and rubber. Barium sulfate is sometimesused by doctors to perform medical tests and to take x-rays of the stomach [5].

Barium gets into the air during mining, refining, and production of barium compounds, and from theburning of coal and oil. Fish and aquatic organisms accumulate barium. People get exposed tobarium while working in industries that make or use barium and by drinking water containing highlevels of barium. EPA allows 2 parts barium per million (ppm) in drinking water [5].

The health effects caused by barium will depend upon if the compounds ingested dissolve or not inour bodies. Ingesting high amounts of barium that dissolves will cause difficulties in breathing,increase blood pressure, changes in hearth rhythm, stomach irritation, brain swelling, muscleweakness, damage to the liver, kidney, heart and spleen [5].

The barium concentration level in on- site soil exceeded the CV for a child but not an adult (Appendix B, Table 2). Because the nearest residence is 1 mile away, frequent child exposure is notexpected. A child could accompany an adult to the site and be exposed to this chemical, but thefrequency of this exposure is expected to be low. Barium in soil is not a public health hazard.

Manganese

Manganese is a natural occurring substance found in many types of rock. It does not have anyspecial taste or smell. Pure manganese is a silver-colored metal; however, it does not occur in theenvironment as a pure metal. Rather, it occurs combined with other substances such as oxygen,sulfur, and chlorine. Some manganese compounds can dissolve in water, and low levels of thesecompounds are normally present in lakes, streams, and the ocean. Some manganese compounds areused in the production of batteries, in dietary supplements, and as ingredients in some ceramics,pesticides, and fertilizers [6].

Manganese can be released to the air from industry and by burning of fossil fuels. Manganese is anessential nutrient, and eating a small amount of it each day is important to stay healthy. Manganeseis present in many foods, including grains and cereals, and is found in many foods, such as tea [6].

Manganese miners or steel workers exposed to high levels of manganese dust in air may have mentaland emotional disturbances, and their body movements may become slow and clumsy. Thiscombination of symptoms is a disease called "manganism" [6].

Manganese was found in on- site soil. Exposure to manganese through soil ingestion may haveoccurred in the past to adults who may have trespassed on the site. Exposure may occur in the futureto children who trespass on the site. Manganese concentration in on-site soil was found at 292mg/kg, which exceeded the CV (100 mg/kg) for a child but not an adult. Because the nearestresidence is 1 mile away, frequent child exposure is not expected. A child could accompany anadult to the site and be exposed to this metal, but the frequency of this exposure is expected to below. Manganese in soil is not a public health hazard.

Polycyclic Aromatic Hydrocarbons (PAH's)

A family of compounds known as polycyclic aromatic hydrocarbons (PAHs) are a component ofcrude oil. They are also formed by combustion and are often found in the environment in creosote,smoke, tobacco, soot, coal and charbroiled meat. PAHs usually occur as complex combinations ofchemicals, not as single compounds. More than 100 different PAHs exist. Generally, PAHs are lesssoluble in water and strongly absorbed to soil, so migration is limited. They bioaccumulate in thefood chain and may have additive toxic effects. PAHs can be divided into noncarcinogenic andprobable carcinogenic compounds [7].

PAHs were found in on-site soils and sediments. Exposure to PAHs through soil ingestion or dermalexposure may have occurred in the past to adults who worked at the site and to children who mayhave trespassed on the site. Exposure may also occur in the future to children who trespass on thesite. There is a potential for trespassers or remedial on-site workers to experience health effects fromdirect contact with the on-site soils. Dermal exposure to the PAH contaminated soil may lead toirritation and other skin sensitivities [7].

The site was not in compliance at times when it was operational. The site description mentionsvarious sources of oily waste - ponds, drums, tanks, and stained surface soils, so OPH assumesPAHs are a contaminant of concern at MBLBP. Because the data is not yet complete, PAHs in soils and sediments are an indeterminate public health hazard.

2. ATSDR'S Child Health Initiative

ATSDR recognizes that infants and children may be more vulnerable to environmental exposurethan adults in communities faced with contamination of their water, soil, air, or food. Thisvulnerability is a result of the following factors: (1) children are more likely to be exposed to certainmedia (e.g., soil or surface water) because they play outdoors; (2) children

are shorter than adults,which means that they can breathe dust, soil, and vapors close to the ground; and (3) children aresmaller, therefore childhood exposures result in higher doses of chemicals per body weight. Childrencan sustain permanent damage if these factors lead to toxic exposure during critical growth stages.

Because children depend completely on adults for risk identification and management decisions,ATSDR is committed to evaluating their special interests at MBLBP site, as part of the ATSDRChild Health Initiative.

Children who are the most likely to be exposed to contamination at MBLBP site are the childrenliving in nearby homes. The closest residence is 1 mile North of MBLBP. Exposures to media may include:

> On and off-site soil: Children may have been, and may continue to be, exposed tocontaminated soils that were impacted by the site. A child accompanying an adult fishing orhunting would be exposed to site contaminants for no more than several hours. A childstaying at the informal campsite could have also been exposed if they ventured onto or nearto the site. OPH does not know how often that the campsite was actually used.
>
> Off-site sediment: Children may have been, and may continue to be, accessing the ditch andsediment located off the site. This exposure would likely be in the company of an adult and would last for no more than several hours.

V. COMMUNITY HEALTH CONCERNS

No health problems related to the site have been identified to date. No day care facilities, schools orpermanent residents have been identified within 200 feet of observed contamination at Mallard BayLanding Bulk Plant. The residential population within a 4-mile radius of the site is estimated to be approximately 20 individuals. In the near future, OPH will be able to contact community leaders in order to learn if there are concerns regarding the site and their health.

VI. SITE UPDATE AND DATA GAPS

The Environmental Protection Agency's (EPA) Remedial Investigation/Feasibility Study began inMay 2001. Additional samples to characterize on and off-site contamination are being analyzed. This additional data will be presented as a separate document.

Several data gaps were identified during the preparation of the public health assessment. Some of thesoil samples taken composited soils from 0 to 6 feet deep into one sample. Because they are closestto the surface, contaminant levels in the 0 to 6 inch soils would likely have a higher contaminantconcentration so this data may have under-reported the level of contamination which a trespasserwould be exposed to. Secondly, some pages were missing from the Appendix of the Site InspectionWork Plan, March 16, 1999 so actual numbers could not be presented. Lastly, the absence of data on the drinking water at Talen's Marina and Fuel, the nearest user of groundwater is a data gap.

VII. CONCLUSIONS

1. Access to the Mallard Bay Landing Bulk Plant (MBLBP) East and West Property ispartially restricted. Current exposures to trespassers (from wetlands) could be occurring at present. Past exposures to soil contamination to on-site workers at MBLBP site did occur.

2. No drinking water intakes are located within the surface water pathways; however, fisheriesand sensitive wetland environments are present nearby. The wetlands frontage area subjectto actual contamination was calculated to be approximately one mile.

3. The groundwater sampling from the Talen's Marina and Fuel well was denied. Noinformation about this water, which is used for drinking purposes by 30 employees, wasobtained.

4. No on-site or off-site air samples have been collected. It is not known if airborne off-sitemigration of contaminants attributable to MBLBP site has occurred. However, this pathwayis unlikely because the closest resident to the site is approximately one mile away.

5. Exposure to on-site soil and sediments are a completed pathway. On-site contamination was detected in the MBLBP East and West properties. The contaminants include aluminum,barium, manganese and polycyclic aromatic hydrocarbons. Aluminum, barium andmanganese pose no public health hazard based on data available. PAHs pose anindeterminate public health hazard. Additional data will be reviewed in a separatedocument.

VIII. RECOMMENDATIONS

1. EPA should post warning signs to keep trespassers out of the portions of the site where no fencing is located.

2. Since samplingwas not allowed at Talen's Marina and Fuel, EPA should consider installing a groundwater monitoring well down gradient of the site to determine if off-site migration has occurred or is occurring.

3. EPA should prevent off-site migration of site related contaminants.

4. During remedial activities at the site, EPA should use dust suppression techniques to prevent off-site migration of contaminants.

5. During EPA remedial activity, air monitoring should occur to determine if dust suppression techniques are effective.

IX. PUBLIC HEALTH ACTION PLAN

The following is a description of actions already taken and those to be taken by the Louisiana Officeof Public Health (OPH), Section of Environmental Epidemiology and Toxicology and the Agencyfor Toxic Substances and Disease Registry (ATSDR) at the Mallard Bay Landing Bulk Plant(MBLBP) site and surrounding areas. The purpose of the public health action plan is to ensure thatthis public health assessment not only identifies public health hazards, but provides a plan of actionto mitigate and prevent adverse human health effects resulting from

exposure to hazardous substances in the environment. Included is a commitment on the part of OPH/ATSDR to follow upon these actions to ensure that they are implemented. The public health actions which have either been implemented or are planned for the future by OPH/ATSDR are as follows:

Past Actions

1. OPH staff obtained from representatives of EPA, Region 6, on February 2001information about Hazardous Ranking and Site Inspection.

2. OPH staff visited the site on April 6, 2001.

Actions Planned

1. OPH will complete the initial public health assessment in 2002.

2. OPH will review more data as it becomes available.

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REFERENCES

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2. Ecology and Environment, Inc.(E&E), September 1999, *Site Inspection Report for Talen's Landing Bulk Plant. Grand Cheniere, Cameron, Louisiana*. Prepared for the U.S. EPA, Region 6, Contract No. 68-W6-0013.

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4. Agency for Toxic Substance and Disease Registry. Toxicological profile for aluminum,Atlanta: US Department of Health and Human Services, June 1999.

5. Agency for Toxic Substance and Disease Registry. Toxicological profile for barium,Atlanta: US Department of Health and Human Services, September 1995.

6. Agency for Toxic Substance and Disease Registry. Toxicological profile for manganese,Atlanta: US Department of Health and Human Services, September 2000.

7. Agency for Toxic Substance and Disease Registry. Toxicological profile for polycyclicaromatic hydrocarbon (PAHs), Atlanta: US Department of Health and Human Services, August 1995.

APPENDICES

APPENDIX A: FIGURES

Figure 1. Site Sketch

Figure 2. East Facility

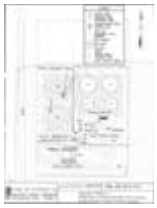

Figure 3. West Facility

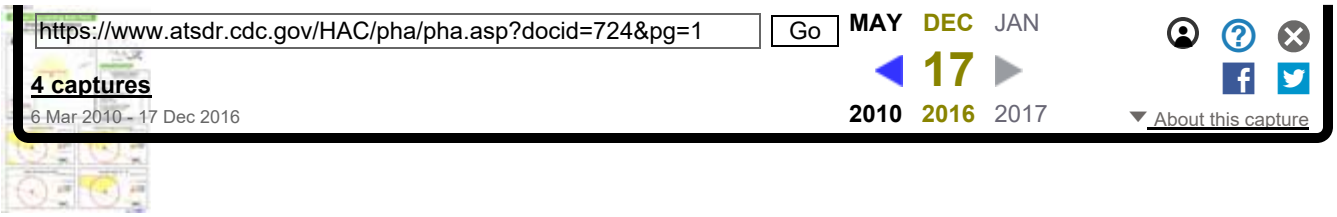

Figure 4. Demographic Statistics

APPENDIX B: TABLES

Table 1.

Maximum Concentrations of oil/waste in Tank sample. Presented in Site Inspection Report, Ecology and Environment, Inc., 1999. Mallard Bay Landing Bulk Plant, Grand Cheniere Parish, Louisiana

	Concentration (mg/kg)[1]
Volatile Organic Compounds	
Benzene	1,420
Ethylbenzene	2,040
Styrene	3,010
Toluene	4,600
Xylene (total)	12,400
Semivolatile Organic Compounds	
2-Methylnaphthalene	724
Naphthalene	954
Metals	
Aluminum	1,230
Arsenic	14.4
Barium	225
Cadmium	0.964
Chromium	185
Cobalt	7.52
Copper	59.2
Lead	327
Manganese	146
Mercury	4.47
Nickel	16.2
Selenium	0.602

Zinc		647

1 - micrograms per kilogram

Table 2.

Maximum Concentrations in On-Site Soil of the East and West Facilities at the Mallard Bay Landing Bulk Plant. Presented in Site Inspection Report, 1999. Mallard Bay Landing Bulk Plant, Grand Cheniere Parish, Louisiana

Contaminant of Concern	East Facility	West Facility	Comparison Values	
	Max. conc. detected (mg/kg)[1]	Max. conc. detected (mg/kg)	(mg/kg)	Source
Inorganics				
Aluminum	6,370	8,390	4,000	EMEG[2] pica child
Barium	180	211	100	RMEG[3] pica child
Manganese	292	79.9	100	RMEG pica child

1 - micrograms per kilogram
2 - Environmental Media Evaluation Guide
3 - Reference Dose Media Evaluation Guide

Table 3.

Completed Exposure Pathways. Mallard Bay Landing Bulk Plant, Grand Cheniere City. Cameron Parish, Louisiana

Pathway Names	Exposure Pathway Elements					Time
	Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Population	
Soil	Site	Soil	On-site*	Ingestion Dermal contact	Mallard workers	Past
					Trespassers	Present Future
Sediment	Site	Sediment	On-site	Ingestion Dermal contact	Mallard Workers	Past
					Trespassers	Present Future
Air	Site	Volatilization of site contaminant	On-site Air	Inhalation	Mallard Workers	Past

*On-site – Mallard Bay Landing Plant site and adjacent property (all within the fence).

Table 4.

Potential Exposure Pathways. Mallard Bay Landing Bulk Plant, Grand Cheniere City. Cameron Parish, Louisiana

Pathway Names	Exposure Pathway Elements					Time
	Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Population	
Air	Mallard Site	Airborne soil particulate	Off-site	Inhalation	Fishers Trespassers	Present Future
Water	Mallard site	Drinking Water	Off-site wells	Drinking	Talen's Marina and Fuel employees and clients	Past Present Future
Sediment	Mallard Site	Sediment	Off-site unnamed creek bottom and banks	Ingestion Dermal contact	Fishers Trespassers	Past Present Future
Biota	Mallard Site	Fish	Fish Consumption	Fish Consumption	Off-site Fishers	Past Present Future
Water	Mallard Site	Groundwater	Off-site	Non-residents water use	Talen's Marina and Fuel employees and clients	Past Present Future

CERTIFICATION

This Mallard Bay Landing Bulk Plant Public Health Assessment was prepared by the LouisianaDepartment of Health and Hospitals/Office of Health under a cooperative agreement with theAgency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was begun.

Alan W. Yarbrough
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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

Lisa C. Hayes
for Chief, State Program Section, SSAB, DHAC, ATSDR

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