GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	***LAVACA BAY - PROJECT 2 (the Bay)***	***ProjectID:*** 06-05
Last Updated:	08/24/04	

City:	Point Comfort
County:	Calhoun
State:	TX
Country:	USA
Bodies of Water:	Lavaca Bay (including Cox Lake, Cox Marsh, and portions of Matagorda Bay)
US EPA Region:	VI
Status (Active, Complete, or Monitoring Only):	Active
Date On NPL:	1994
ROD/ESD Date:	2001
Operable Unit:	
Areas of Concern (length or acres):	80,000 acres of Lavaca Bay (includes 2,500 acres with fisheries closed); portions of Cox Bay, Cox Creek, Cox Cove, Cox Lake and western Matagorda Bay; 400-acre man-made dredge spoils island.
Other Characteristics of Water Body:	Lavaca Bay is about 13 miles in length, varies in width between 2 and 6.5 miles, and averages about 3 ft in depth. The bay includes a number of navigational channels that are maintained at up to 38 ft in depth. The bay is closed to fishing in an area adjacent to and west of the Alcoa Point Comfort facility due to elevated levels of mercury and PAHs in sediment. The Alcoa Industrial Channel provides access from Lavaca Bay for ships and barges into the Point Comfort dock facilities. The channel is approximately 3,800-ft long. The southern portion of the channel area is routinely dredged every 18 to 24 months using a hydraulic dredge with the dredged material pumped to upland Dredge Disposal Areas. The northern portion is dredged less frequently. While the maintenance dredging focuses on the Channel, other areas between the Channel and the plant shoreline and the Channel and Dredge Island have elevated mercury concentrations and are not routinely dredged. Dredge Island is man-made, 400 acres, and includes a 91-acre gypsum lagoon and a five-lagoon area for dredge spoils covering about 50 acres.
Contaminants of Concern:	mercury; PAHs
Source of Contamination:	Wastewater discharges containing mercury from a now defunct chlor-alkali production plant that used mercury electrodes in the electrolytic process beginning in 1966. From 1966 to 1969, wastewater discharges were directly to the bay; in 1969 and 1970 discharges were made through outfalls located in an off-shore gypsum lagoon on nearby Dredge Island. Additionally, groundwater from the Chlor-Alkali Process Area, surface water runoff from Dredge Island, and surface sediment with elevated mercury levels have all been identified as ongoing sources of mercury to Lavaca Bay. Elevated PAH levels in the Bay have been attributed to DNAPL migration from the former Witco Coal Tar Tank Farm area and from an area north of the former Witco Process Area. Surface sediments near these former areas were shown to contain PAH levels in excess of 45 ppm.
Contaminated Area Physical Characteristics:	A dredge treatability study (MCSS Database Project 06-03) targeted a northern and a southern subarea for dredging, both being located between the shoreline adjacent to the Alcoa facility and the navigational channel. Mercury levels in surface sediments in the northern subarea averaged 0.71 ppm with a maximum concentration of 0.98 ppm. Highest at depth concentration was 4.47 ppm mercury (20-30 cm depth). Surficial mercury concentrations in the southern subarea ranged from 0.46 to 119.9 ppm, with the non-geographic weighted average being 11.4

ppm. Subsurface samples varied considerably both aerially and with depth. The maximum mercury concentration at depth was 137.4 ppm (55-56 cm depth).

Type of Regulatory Action: Superfund. Final.

Overall Status Summary: In 1970, elevated levels of mercury found in oysters from the bay prompted the Texas Department of Health (TDH) to close the bay of oystering and the issuing of an order to Alcoa to discontinue the discharge of mercury-containing wastewater to the bay. The bay was reopened to oystering in 1971. In 1988, as a result of finding elevated mercury levels in fish, the TDH closed a section of the bay to commercial and recreational fishing. In 1990, an NRD preassessment was performed and in March 1994 the bay was place on the National Priorities List. Investigative and remedial activities also began in 1994. In 2000, the TDH reduced the size of the area of the bay closed to fishing.

A draft RI report and Baseline Risk Assessment were submitted by Alcoa to USEPA in August 1998 and an interim cleanup was performed in mid-1998. The interim cleanup was designated a dredging treatability study for selected areas of contaminated sediment in the industrial channel. As part of the treatability study, several contiguous areas adjacent to the Alcoa facility were selected for dredging that contained sediments with elevated levels of mercury. The treatability study was performed in two phases. Phase I was performed in August 1998 in a deeper area of the industrial channel adjacent to the former Chlor-Alkali Process Area and in conjunction with an ongoing maintenance dredging project. Phase II was performed during February 1999 in an area of shallower water depth adjacent to the channel and near the eastern tip of Dredge Island. The combined dredge study resulted in the removal of between 69,500 cy and 89,500 cy of mercury-contaminated sediment at a cost of $2,091,000 ($23 to $30 per cy). (See Project ID 06-03.) The relatively low cost for the treatability study is due in large part to no costs associated with either disposal or water treatment.

In addition to performing the dredge treatability study, two additional early actions have been performed: (1) the Dredge Island stabilization and Northern Marsh Removal which included relocation and stabilization of mercury-containing sediment and increasing the height of the island's dikes; and (2) hydraulic control and treatment of groundwater originating from the Chlor-Alkali Process Area.

In 2001, USEPA issued a ROD for the site that designates remedies for three specific areas: (1) the Bay System; (2) the Chlor-Alkali Process Area (CAPA) Soils, and (3) the Former Witco Soils. The remedies for the Bay System address both source control issues and existing areas of contamination, including the recommendation to dredge 200,000 cy of mercury-contaminated sediment from the Witco Channel. These are described in the ROD (Reference A-1132) as follows:

· "Installation of a DNAPL Collection or Containment System at the Witco Area –West of the former Witco Tank Farm Area, a collection trench or containment system will be installed for the purpose of intercepting DNAPL potentially migrating to Lavaca Bay. Recovered DNAPL will be collected and sent off site for treatment and disposal at a licensed disposal facility. The DNAPL will not be treated or stabilized on site prior to off site disposal. The specific areas of shoreline to be addressed by a remedy may be modified based on site conditions observed during remedy implementation. The use of either a DNAPL containment or collection technology will be refined during the remedial design. (estimated cost: $1,210,000)"

· "Dredging of the Witco Channel - approximately 200,000 cubic yards of mercury-contaminated sediment will be dredged and disposed of in an on site confined disposal facility located on Dredge Island. The dredged sediments will not be treated or stabilized before

disposal. A final cover for the disposal areas will consist of dredged material taken from an area of Lavaca Bay that has mercury concentrations below human health and ecological risk-based values. (estimated cost: $3,000,000)"

· "Remediation of the Witco Marsh by Dredging or Filling - the Witco Marsh would be actively remediated to address the concern of biological uptake of mercury. The decision to dredge or fill the marsh will be made in the remedial design. (estimated cost: $790,000)"

· "Enhanced Natural Recovery North of Dredge Island - the areas north of Dredge Island would receive a thin cap over the entire area to accelerate the natural recovery process currently observed occurring in Lavaca Bay. (estimated cost: $1,740,000)"

· "Natural Recovery of Sediments - sediments that are not actively remediated will recover to acceptable levels through natural sedimentation. It is estimated that surficial sediment mercury levels in all areas are expected to decline to levels in the current range of open areas of the Bay within a 5 to 10 year time frame."

· "Institutional Controls to Manage Exposure to Finfish/Shellfish - the fish closure originally established by the Texas Department of Health in 1988 and updated in January 2000 will remain in place to control the consumption of finfish and shellfish for the "Closed Area"."

· "Monitoring - long term monitoring of sediments and fish will be required to confirm the natural recovery of sediment and fish tissue to acceptable levels. In addition, monitoring of surface water will be conducted to evaluate the effectiveness of the CAPA hydraulic containment system. Full details of the monitoring program will be established during the design of the selected Bay System remedy."

The ROD estimates the scope of long-term monitoring in the bay will include fish tissue monitoring in years 1-10, 15, 20, and 30 and sediment monitoring in years 2, 4, 6, 8, 10, 15, 20, and 30 at an estimated cost of $1,660,000. The total estimated cost to implement the complete remedy as described in the ROD including design, mobilization/demobilization, construction monitoring/maintenance, and contingency is $16.129 million.

USEPA and Alcoa are currently negotiating a Consent Decree for implementation of the ROD remedy.

Remedial Action Planned:	☑
Risk Assessment:	☑
Remedial Action Implemented:	☐
Status of Dredging	☐
PRPs:	☑
Contacts:	☑
References:	☑
Modeling:	☐
Fishing Advisory:	☑

GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	***LAVACA BAY - PROJECT 2 (the Bay)***	***ProjectID:*** 06-05
Last Updated:	08/24/04	
Key Conditions:	dedicated landfill or CDF, dredging, natural recovery, post monitoring, tidal fluctuations, wetlands	

REMEDIAL ACTION PLANNED

Project Name	***LAVACA BAY - PROJECT 2 (the Bay)***	***ProjectID:*** 06-05
Last Updated:	08/25/04	

Target Sediment Cleanup Standards (TSCS):

For sediments in fringe marsh-type habitat, greater than 0.25 ppm mercury on average and for sediments in open-water habitat, greater than 0.5 ppm mercury on average.

For PAHs, sediment shown to contain greater than 44.8 ppm total PAH.

How TSCS Established:

Quantitatively developed to be protective of human health using the risk assessment process.

Target Bank and Floodplain Cleanup Levels (if applicable):

Other Target:

Environmental Sample Data References:

- ***Sediment:***
- ***Water:***
- ***Fish:***

Estimated Target Volume:

200,000 cy of sediment from the Witco Channel; also included is remediation of the Witco Marsh by either dredging or filling

Planned Disposal Method:

Dredged sediment will be discharged directly to a holding cell on Dredge Island.

Estimated Calendar Time to Implement Remedy:

Estimated Time to Implement Remedy:

Approximately 12 months

Estimated Cost to Implement Remedy:

Total cost of the remedy is estimated to be $16,129,000. This includes the following sediment-related components: dredging of the Witco Channel ($3,000,000); remediation of the Witco Marsh ($790,000); enhanced natural recovery, to include thin-film capping, in sediment north of Dredge Island ($1,740,000); long-term monitoring over 30 years ($1,660,000).

Stated Remedial Action Objectives (and Source):

(Source: ROD, Reference A-1132):

"The RAOs for mercury for Lavaca Bay are to (1) eliminate or reduce to the maximum extent practical mercury loading from on-going unpermitted sources to Lavaca Bay; (2) reduce to an appropriate level mercury in surface sediments in sensitive habitats; and (3) reduce to an appropriate level mercury in surface sediments in open-water that represent a pathway by which mercury may be introduced into the food chain. These objectives are designed to allow the reduction of mercury levels in fish tissue such that the overall risk throughout Lavaca Bay will approach that which would be present but for the historic Point Comfort Operations."

"The RAO for PAHs is to reduce sediment concentrations below the ERM."

Measures of Success to be Used:

Planned Monitoring and Restoration:

Thirty years of post-remedial monitoring for sediment and fish tissue is required as part of the selected remedy.

Project Name	***LAVACA BAY - PROJECT 2 (the Bay)***	***ProjectID:*** 06-05
Last Updated:	08/25/04	

Agency Position on Sediment Removal (and Source): (Source: ROD, Reference A-1132):

"The dredging treatability study concluded that dredging was effective for mass removal of contaminated sediments in areas with high mercury concentrations. Local contractors have completed hydraulic dredging and disposal of sediments regularly at the Point Comfort facility. Therefore, all of the alternatives that include dredging are rated high for implementability."

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Last Updated: 08/24/04

RA Type: Baseline Human Health & Ecological; Public Health

RA Status: Complete

RA Objectives:

Company Performing RA:

RA Reference Report:

RA Summary and Conclusions: Chemicals of concern evaluated for the HHRA were:

· Fish tissue from Lavaca Bay: methylmercury

· Sediment from Lavaca Bay: Inorganic mercury, methylmercury, acenapthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)pyrene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene

Chemicals of concern in water, sediment, and biota evaluated in the EcoRA were methylmercury, inorganic mercury, PAHs.

Conclusions of the RA are (Source: ROD, Reference A-1132):

"The risk assessment showed the following potential noncarcinogenic hazard indices greater than one, cumulative excess carcinogenic risks exceeding 1 x 10 -4 , and environmental impacts: 1) noncarcinogenic risk to a future industrial worker, future construction worker, and current maintenance worker exposed to mercury-contaminated soils within the footprint of the R-300 building; 2) noncarcinogenic risk to a woman of childbearing age consuming fish from within Lavaca Bay and the Closed Area of Lavaca Bay; 3) carcinogenic risk to a future industrial worker in the Witco Area; and 4) ecological impacts. It is the EPA's current judgment that the Selected Remedy identified in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment."

POTENTIALLY RESPONSIBLE PARTIES

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

PRP Name: **PRP INFORMATION NOT RELEASED** ***PRPID:***

Street Address:

City:

State:

KEY CONTACTS

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Last Name: **KEY CONTACT INFORMATION NOT RELEASED** ***Contact ID:***

First Name:

Title:

Company:

Address:

City:

State:

Postal Code:

Work Phone # : ***Other Phone #:***

Fax # :

Email Address:

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Reference Type: A ***ReferenceID:*** 1132

Title: ***Record of Decision***

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: US EPA Region VI

Preparer/Author Address:

Prepared For:

Date Published: December 2001

Key Words and Phrases:

Reference Type: A ***ReferenceID:*** 1139

Title: ***Proposed Plan of Action - EPA Proposes Final Remedy for Alcoa/Lavaca Bay***

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: US EPA Region VI

Preparer/Author Address:

Prepared For:

Date Published: 2001

Key Words and Phrases:

Reference Type: A ***ReferenceID:*** 1140

Title: ***Administrative Order on Consent in the Matter of: Alcoa (Point Comfort)/Lavaca Bay Superfund Site***

Location: AEM

Category: Legal

Prepared by/Author: US EPA Region VI

Preparer/Author Address:

Prepared For:

Date Published: March 31, 1994

Key Words and Phrases:

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Reference Type: B ***ReferenceID:*** 1130

Title: ***EPA: ALCOA/Lavaca Bay***

Location: AEM

Category: Site Update

Prepared by/Author: Texas Natural Resource Conservation Commission

Preparer/Author Address:

Prepared For: General Public

Date Published: March 2, 2004

Key Words and Phrases:

Reference Type: B ***ReferenceID:*** 1132

Title: ***Alcoa/Lavaca Bay, Texas***
EPA ID # TXD008123168

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region VI

Preparer/Author Address: Website

Prepared For: General Public

Date Published: July 28, 2004

Key Words and Phrases:

Reference Type: C ***ReferenceID:*** 723

Title: ***Alcoa's Texas Cleanup Includes Source Control and Capping***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Hazardous Waste/Superfund Week

Date Published: July 9, 2001

Key Words and Phrases:

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

ReferenceID: 1137

Reference Type:	C
Title:	***Lavaca Bay Hurricane Analysis***
Location:	AEM
Category:	Contractor and Vendor Information
Prepared by/Author:	QEA, LLC
Preparer/Author Address:	
Prepared For:	
Date Published:	2003 circa
Key Words and Phrases:	

ReferenceID: 1138

Reference Type:	C
Title:	***Alcoa removal mulled in Texas***
Location:	AEM
Category:	Site Update
Prepared by/Author:	
Preparer/Author Address:	
Prepared For:	Superfund Week
Date Published:	April 18, 1997
Key Words and Phrases:	

ReferenceID: 1139

Reference Type:	C
Title:	***EPA adds Alcoa site in Texas to NPL***
Location:	AEM
Category:	Site Update
Prepared by/Author:	
Preparer/Author Address:	
Prepared For:	Superfund Week
Date Published:	February 25, 1994
Key Words and Phrases:	

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

ReferenceID: 1140

Reference Type: C

Title: ***EPA eyeing Lavaca Bay removals***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: November 3, 1995

Key Words and Phrases:

ReferenceID: 1141

Reference Type: C

Title: ***Alcoa may do RI/FS in Texaas***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: January 28, 1994

Key Words and Phrases:

ReferenceID: 1142

Reference Type: C

Title: ***Alcoa/Lavaca Bay RI/FS ordered***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: September 23, 1994

Key Words and Phrases:

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Reference Type: C ***ReferenceID:*** 1143

Title: ***Huge Removal Continues, Long-Term Decision Delayed at ALCOA in Texas***

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: October 1, 1999

Key Words and Phrases:

Reference Type: E ***ReferenceID:*** 119

Title: ***Sediment Management Seminar 2000 Proceedings (Reference E-121)***

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: Blasland, Bouck & Lee, Inc.

Preparer/Author Address: 6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214

Prepared For: Attendees

Date Published: February 10-11, 2000

Key Words and Phrases:

Reference Type: E ***ReferenceID:*** 260

Title: ***Sediment Management Seminar February 9-10, 1998 Proceedings (Reference E-137)***

Location: AEM

Category: Dredging: Remedial (Contaminated Sediments)

Prepared by/Author: Blasland, Bouck & Lee, Inc.

Preparer/Author Address: 6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214

Prepared For: Attendees

Date Published: February 9-10, 1998

Key Words and Phrases:

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

ReferenceID: 64

Reference Type:	G
Title:	***Lavaca Bay Mercury Superfund Site***
Location:	AEM
Category:	Site Update
Prepared by/Author:	
Preparer/Author Address:	
Prepared For:	
Date Published:	2003 circa
Key Words and Phrases:	

ReferenceID: 65

Reference Type:	G
Title:	***RPM Panel Discussion: Sediments Remediation Alcoa/Lavaca Bay Superfund Site***
Location:	AEM
Category:	Site Update
Prepared by/Author:	
Preparer/Author Address:	
Prepared For:	Technical Support Project Meeting
Date Published:	May 8, 2001
Key Words and Phrases:	

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

ReferenceID: 197

Reference Type:	M
Title:	***Sediment-Water Fluxes of Mercury in Lavaca Bay, Texas***
Location:	AEM
Category:	Contaminated Sediments: Characteristics/Bioavailability
Prepared by/Author:	(1) Gary A. Gill; (2) Nicolas S. Bloom; (3) Steven Cappellino; (4) Charles T. Driscoll; (5) Charles Dobbs; (6) Larry McShea; (7) Robert Mason; and (8) John W. Rudd
Preparer/Author Address:	(1) Laboratory for Oceanographic and Environmental Research, Department of Oceanography, Texas A&M University at Galveston, 5007 Avenue U, Galveston, Texas 77551; (2) Frontier GeoSciences Inc., 414 Pontius Avenue N, Seattle, WA 98109; (3) Parametrix, Inc., 10450 Rockley Road, Suite 300, Houston, Texas 77099; (4) Department of Civil and Environmental Engineering, 220 Hinds Hall, Syracuse University Syracuse, New York 13244; (5 and 6) Aluminum Company of America, State Highway 35, Point Comfort, Texas 77978-0101; (7) Chesapeake Biological Laboratory, University of Maryland, P.O. Box 38, Solomons, Maryland 20688; and (8) Department of Fisheries and Oceans, Freshwater Institute, 501 University Crescent, Winnipeg, Manitoba, R3T 2N6 Canada
Prepared For:	Environmental Science & Technology, Vol. 33, No. 5
Date Published:	1999
Key Words and Phrases:	

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Reference Type: M ***ReferenceID:*** 198

Title: ***Sediment Transport and Hg Recovery in Lavaca Bay, as Evaluated from Radionuclide and Hg Distributions***

Location: AEM

Category: Contaminated Sediments: Characteristics/Bioavailability

Prepared by/Author: (1) Peter H. Santschi; (2) Mead A. Allison; (3) Shanna Asbill; (4) A. Britt Perlet; (5) Steven Cappellino; (6) Charles Dobbs; (7) Larry McShea

Preparer/Author Address: (1, 2, 3, 4) Laboratory for Oceanographic and Environmental Research
Department of Oceanography
Texas A&M University at Galveston
5007 Avenue U
Galveston, Texas 77551;
(5) Parametrix, Inc.,
Texas 77099; and
(6 and 7) Aluminum Company of America
State Highway 35
Point Comfort, Texas 77978-0101

Prepared For: Environmental Science & Technology, Vol. 33, No. 3

Date Published: 1999

Key Words and Phrases:

Reference Type: M ***ReferenceID:*** 453

Title: ***Verification and Enhancement of TSS Source Strength Models for Cutter Dredges***

Location: AEM

Category: Resuspension

Prepared by/Author: Pei-Yao Wu, Donald F. Hayes

Preparer/Author Address: Department of Civil and Environmental Engineering
University of Utah

Prepared For: World Dredging Mining & Construction

Date Published: August 2000

Key Words and Phrases:

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Reference Type: M ***ReferenceID:*** 454

Title: ***Evaluating Sediment Stability at Sites with Historic Contamination***

Location: AEM

Category: Modeling

Prepared by/Author: C. Kirk Ziegler

Preparer/Author Address: Quantitative Environmental Analysis, LLC
305 West Grand Avenue
Montvale, NJ 07645

Prepared For: Environmental Management

Date Published: May 2001

Key Words and Phrases:

Reference Type: R ***ReferenceID:*** 36

Title: ***Letter to PRP re: Case Histories: Contaminated Sediment Sites (with written response from ALCOA)***

Location: AEM

Category: Site Update

Prepared by/Author: AEM, Inc. with written response from ALCOA

Preparer/Author Address: Malvern, PA 19355

Prepared For: Alcoa, Inc., submitted to

Date Published: May 14, 1999

Key Words and Phrases:

MODELING

Project Name:	***LAVACA BAY - PROJECT 2 (the Bay)***	***ProjectID:*** 06-05
Last Updated:	08/24/04	

Modeling Performed: Hydrodynamic and Mercury Fate and Transport

Modeling Objectives: Provide a basis for interpreting data and predicting impacts of storm events on contaminated bay sediments, and examine the relative contributions of historical discharges and ongoing sources of mercury to surface sediments.

Modeling Description:

Company Performing Modeling: Quantitative Environmental Analysis, LLC.

Modeling Status: Complete

Modeling Summary:

As part of the Remedial Investigation/Feasibility Study (RI/FS) for the site, a number of studies were conducted directed at mercury fate within the bay. These studies focused on the impacts of storm-induced sediment transport on the erosion and transport of contaminated sediments, the contribution of ongoing sources to bay sediment contamination, the rate of recovery of bay sediments and the bioaccumulation of mercury by fish and shellfish. Detailed quantitative models of hydrodynamics, sediment transport, and mercury fate have been developed to provide a basis for interpreting data and predicting impacts of storm events. The models have been used to predict the degree to which a hurricane might uncover and transport contaminated sediments. Direct and indirect hits from hurricane storms similar to Hurricane Carla were simulated. The results indicate that conditions will not worsen as a result of hurricane conditions. In fact, the results of the study suggest that the concentrations of mercury in shallow sediments would be diminished by a large storm event.

In addition, a combination of data analysis and mathematical modeling were used to examine the relative contributions of historical discharges and ongoing sources to mercury contamination in surface sediments. This work involved mass balance analyses, modeling of mercury accumulation and burial in bay sediments, and modeling of mercury transport from source areas to the bay. The goal of this work was to determine the efficacy of various remedial options in accelerating the recovery of the bay. Extensive use of geographical information systems (GIS) enabled better understanding of the spatial aspects of the system. This GIS work included site characterization, data analysis, model input parameterization and final presentation.

Modeling and data analysis were also used to understand the pathways of mercury transport from water and sediment to fish and shellfish of concern, including red and black drum and blue crabs. This work focused on determining the probable response in the biota to reductions in mercury loading to the bay or to remedial actions directed to particular sediments within the bay.

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Advisory:	Cox Bay (modified Area of Upper Lavaca Bay Advisory	***AdvisoryID:***	1230
Extent:	The area of Cox Bay inshore of a line beginning at the southernmost point of land on the spoil island east of the Ship Channel northeast to Cox Point (Calhoun County)		
Pollutant:	mercury		
Species:	all fish		
Population:	NKZ		
Population Definition:	No-Kill Zones: Indicates it is illegal to take, kill or possess any fish from specified waters due to chemical contamination.		
Advisory Type:	Estuary	***Advisory Number:***	104233
Status (Active or Rescinded):	Rescinded	***Date Rescinded:***	
Contact Name:	Kirk Wiles	***Contact Number:***	512-719-0215

Advisory:	Cox Bay (modified Area of Upper Lavaca Bay Advisory	***AdvisoryID:***	1232
Extent:	The area of Cox Bay inshore of a line beginning at the southernmost point of land on the spoil island east of the Ship Channel northeast to Cox Point (Calhoun County)		
Pollutant:	mercury		
Species:	shellfish-crab		
Population:	NKZ		
Population Definition:	No-Kill Zones: Indicates it is illegal to take, kill or possess any fish from specified waters due to chemical contamination.		
Advisory Type:	Estuary	***Advisory Number:***	104233
Status (Active or Rescinded):	Rescinded	***Date Rescinded:***	
Contact Name:	Kirk Wiles	***Contact Number:***	512-719-0215

Project Name ***LAVACA BAY - PROJECT 2 (the Bay)*** ***ProjectID:*** 06-05

Advisory: Upper Lavaca Bay (Area Modified 01/13/2000, See Cox B ***AdvisoryID:*** 1229

Extent: That area of Lavaca Bay inshore of a line beginning at the last point of land at the northeastern approach of the Lavaca Bay Causeway, then in a southwest direction to Aquatic Life Marker A to Aquatic Life Marker B to Channel Marker #12,then in a southeastern direction to Aquatic Life Marker C to Aquatic Life Marker D to Aquatic Life Marker E to Channel Marker #74,then in a northeastern direction to Aquatic Life Marker F to the southernmost point of land on the spoil island east of the Ship Channel

Pollutant: mercury

Species: all fish

Population: NKZ

Population Definition: No-Kill Zones: Indicates it is illegal to take, kill or possess any fish from specified waters due to chemical contamination.

Advisory Type: Estuary ***Advisory Number:*** 851

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Kirk Wiles ***Contact Number:*** 512-719-0215

Advisory: Upper Lavaca Bay (Area Modified 01/13/2000, See Cox B ***AdvisoryID:*** 1231

Extent: That area of Lavaca Bay inshore of a line beginning at the last point of land at the northeastern approach of the Lavaca Bay Causeway, then in a southwest direction to Aquatic Life Marker A to Aquatic Life Marker B to Channel Marker #12,then in a southeastern direction to Aquatic Life Marker C to Aquatic Life Marker D to Aquatic Life Marker E to Channel Marker #74,then in a northeastern direction to Aquatic Life Marker F to the southernmost point of land on the spoil island east of the Ship Channel

Pollutant: mercury

Species: shellfish-crab

Population: NKZ

Population Definition: No-Kill Zones: Indicates it is illegal to take, kill or possess any fish from specified waters due to chemical contamination.

Advisory Type: Estuary ***Advisory Number:*** 851

Status (Active or Rescinded): Active ***Date Rescinded:***

Contact Name: Kirk Wiles ***Contact Number:*** 512-719-0215