HOUSTON SHIP CHANNEL TESTING

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Galveston District

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US Army Corps of Engineers

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Section 404(b)(1) Guidelines

- Physical & Chemical Characteristics
- Biological Characteristics
- Special Aquatic Sites
- Human Use Characteristics
- Evaluation and Testing
- Actions to Minimize Adverse Effects

Definitions

- Testing
  - Specific procedures which generate biological, chemical, and/or physical data to be used in evaluations. The data are usually quantitative but may be qualitative, such as taste, odor, color, organism behavior, etc.

Definitions

- Evaluation
  - The process of judging data. Objective or subjective factors (or both) are used in a consistent and logical fashion to reach a decision.

Contaminants of Concern

- From the 1970s to 2002 the list varied to include up to 45 analytes.
- Since 2002, the list has expanded to 90 analytes that includes metals, pesticides, PAHs (polycyclic aromatic hydrocarbons), PCBs (polychlorinated biphenyls), and other organic chemicals

Water and Elutriate Quality

- Water sample data indicate ambient conditions.
- Elutriate preparation simulates the hydraulic dredging process and predicts resulting water quality.
- Contaminant levels are compared with Texas Surface Water Quality Standards.

Sediment Quality

- Sediment Quality Criteria or Standards do not exist.
- Sediment contaminant levels are compared with Sediment Quality Guidelines (SQGs) to determine if there exists a “reason to believe.”
- SQGs are not Pass/Fail values.

Sediment Quality

- Various published SQGs.
- For fill or Beneficial Use (BU) – ERL, ERM, AET, PEL, etc.
- For upland CDF – Protective Concentration Levels (PCLs) for residential soils from the Texas Risk Reduction Program (TRRP) administered by TCEQ.

LONG-TERM EFFECTS OF DREDGING OPERATIONS PROGRAM

Dredging Research Technical Note EEDP-04-29
May 1998

Use of Sediment Quality Guidelines (SQGs) in Dredged Material Management

PURPOSE: This technical note describes some major features of the most common methods for calculating sediment quality guidelines (SQGs) (U.S. Environmental Protection Agency 1997). The note also describes features that limit the utility of SQGs in dredged material management. In light of these limitations, this technical note specifies circumstances in dredged material assessments where SQGs may be technically appropriate and helpful, and describes conditions in which SQGs are not technically appropriate, for dredged material management decisionmaking.

BACKGROUND: The environmental quality of sediments has been judged by comparison to chemical concentration values for 30 years or more. The early values were derived primarily on the basis of geochemical considerations, or used approaches derived for sewage discharges that bore little relevance to dredged material assessment. Approximately 25 years ago, efforts began to develop methods for deriving values associated with adverse biological effects as opposed to mere chemical presence (Engler 1980, 1990). All past efforts were applied with little success because the methods did not account for the biogeochemical complexity of the interaction of chemicals and sediments (Wright, Engler, and Miller 1992). Over the past two decades, a number of methods and variations on methods for deriving sediment quality values have been developed. All are attempts to determine sediment contaminant concentration values that differentiate sediments of little concern from those predicted to have adverse biological effects.

In this technical note, all values used to determine sediment contaminant concentrations that differentiate sediments of little concern from those predicted to have adverse biological effects are collectively called "sediment quality guidelines" even though they have different names. The term SQG was selected because it has broad and general meaning and has no regulatory connotation as a "pass/fail" criterion or standard. The term SQG is broad enough to encompass all the methods leading to sediment quality guidelines, criteria, etc., which are discussed below. The various methods for determining sediment contaminant concentration values, to differentiate sediments of little concern from those predicted to have adverse biological effects, are presented.

Some methods have been used to derive values that have been codified in State regulations and used to make regulatory decisions. A technical basis for developing sediment quality criteria has been proposed by the U.S. Environmental Protection Agency (EPA), but has never been carried beyond the proposal stage. These and other methods have received varying degrees of attention from the scientific and regulatory communities and citizen groups. Opinions of the utility of SQGs range from essentially worthless to stand-alone, pass-fail determinants of the environmental acceptability of sediments.

This technical note provides guidance to Corps of Engineers staff on the technical context in which SQGs are to be used in dredged material evaluations. It describes the technical limitations of SQGs, which limit their usefulness to Tier 1 or Tier 2 screening of sediments that pose little concern under

EPA/TCEQ Dioxin Guidance for dredge and fill permits

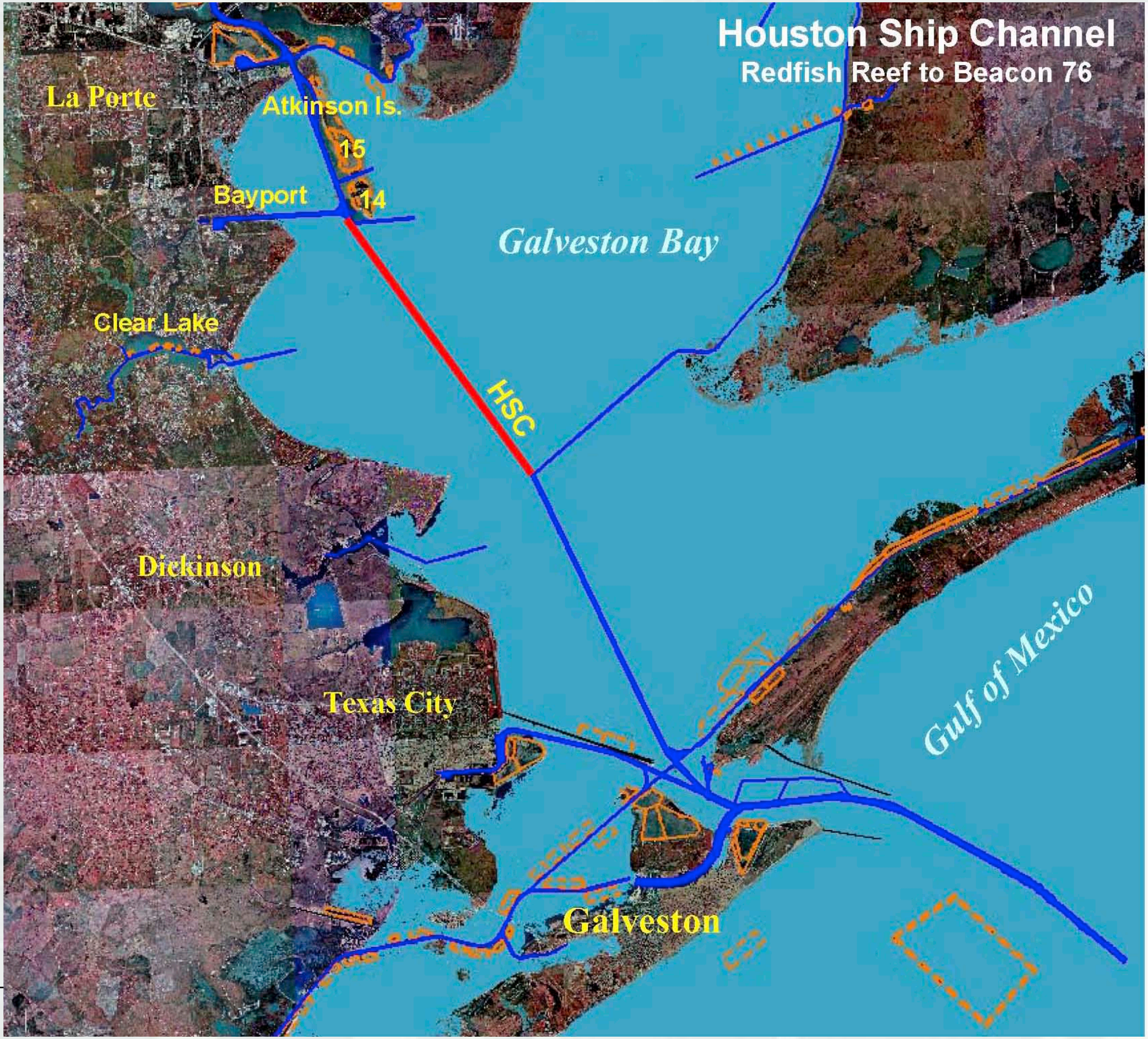
- If TEQ >1000 pg/g, disposal must be in a hazardous waste landfill.
- If TEQ <1000 pg/g, disposal into an upland CDF is acceptable.

COORDINATION OF WATER AND SEDIMENT QUALITY DATA

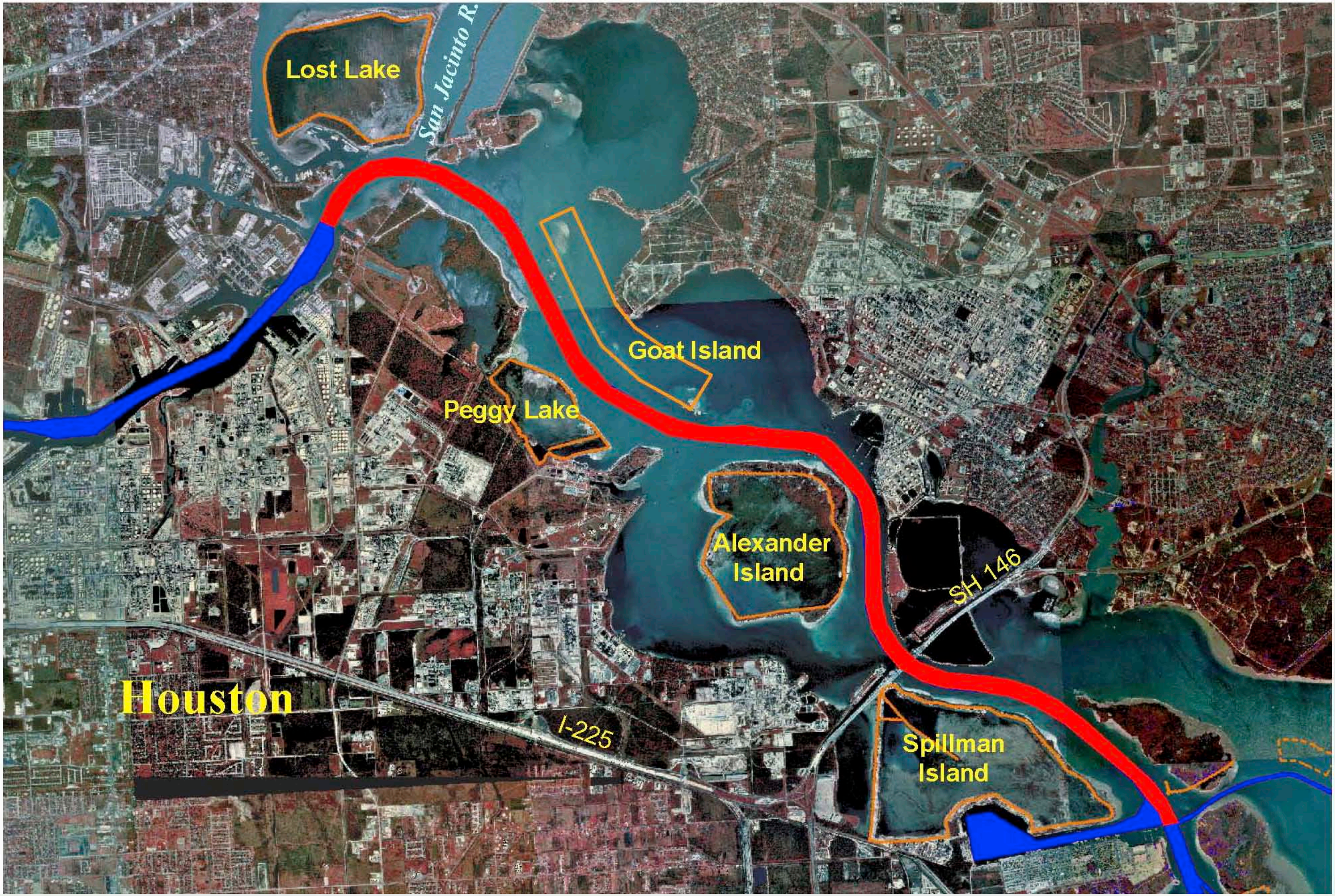
Years	No. of Coord.Letters	EPA Addressee	TCEQ Addressee
1971	5	Regional Administrator	Linda Wyatt, Texas Water Quality Board
1972	8	Regional Administrator	Linda Wyatt, Texas Water Quality Board
1973	0	Regional Administrator	Linda Wyatt, Texas Water Quality Board
1974	1	Regional Administrator	Linda Wyatt, Texas Water Quality Board
1975	8	Regional Administrator	Linda Wyatt, Texas Water Quality Board
1976	12	Regional Administrator	Linda Wyatt, Texas Water Quality Board
1977	10	John White	Linda Wyatt, Texas Water Quality Board
1978	9	Adelene Harrison	Linda Wyatt, Texas Water Quality Board
1979	18	Adelene Harrison	Texas Department of Water Resources
1980	11	Adelene Harrison	Texas Department of Water Resources
1981	16	Adelene Harrison	Texas Department of Water Resources
1982	12	Dick Whittington	Texas Department of Water Resources
1983	17	Dick Whittington	Texas Department of Water Resources
1984	12	Dick Whittington	Texas Department of Water Resources
1985	17	Dick Whittington	Texas Department of Water Resources
1986	21	Dick Whittington	Texas Department of Water Resources
1987	13	Robert Layton, Jr.	Texas Department of Water Resources
1988	19	Robert Layton, Jr.	Texas Department of Water Resources
1989	14	Robert Layton, Jr.	Texas Department of Water Resources
1990	11	Robert Layton, Jr.	Texas Department of Water Resources
1991	23	Russ Rhodes	Texas Department of Water Resources
1992	20	Russ Rhodes	Texas Department of Water Resources
1993	20	Russ Rhodes	Texas Department of Water Resources
1994	27	Russ Rhodes	Mark Fisher, TCEQ
1995	19	Russ Rhodes	Mark Fisher, TCEQ
1996	13	William Hathaway	Mark Fisher, TCEQ
1997	6	William Hathaway	Mark Fisher, TCEQ
1998	23	William Hathaway	Mark Fisher, TCEQ
1999	15	William Hathaway	Mark Fisher, TCEQ
2000	13	Richard Hoppers	Mark Fisher, TCEQ
2001	15	Richard Hoppers	Mark Fisher, TCEQ
2002	18	Oscar Ramirez	Mark Fisher, TCEQ
2003	20	Jane Watson	Mark Fisher, TCEQ
2004	17	Jane Watson	Mark Fisher, TCEQ
2005	11	Jane Watson	Mark Fisher, TCEQ
2006	21	Jane Watson	Mark Fisher, TCEQ
2007	14	Jane Watson	Mark Fisher, TCEQ
2008	17	Jane Watson	Mark Fisher, TCEQ
2009	16	Jane Watson	Mark Fisher, TCEQ
2010	11	Jane Watson	Mark Fisher, TCEQ
2011	13	Jane Watson	David Galindo, TCEQ

586 letters total
62 specifically for Houston Ship Channel

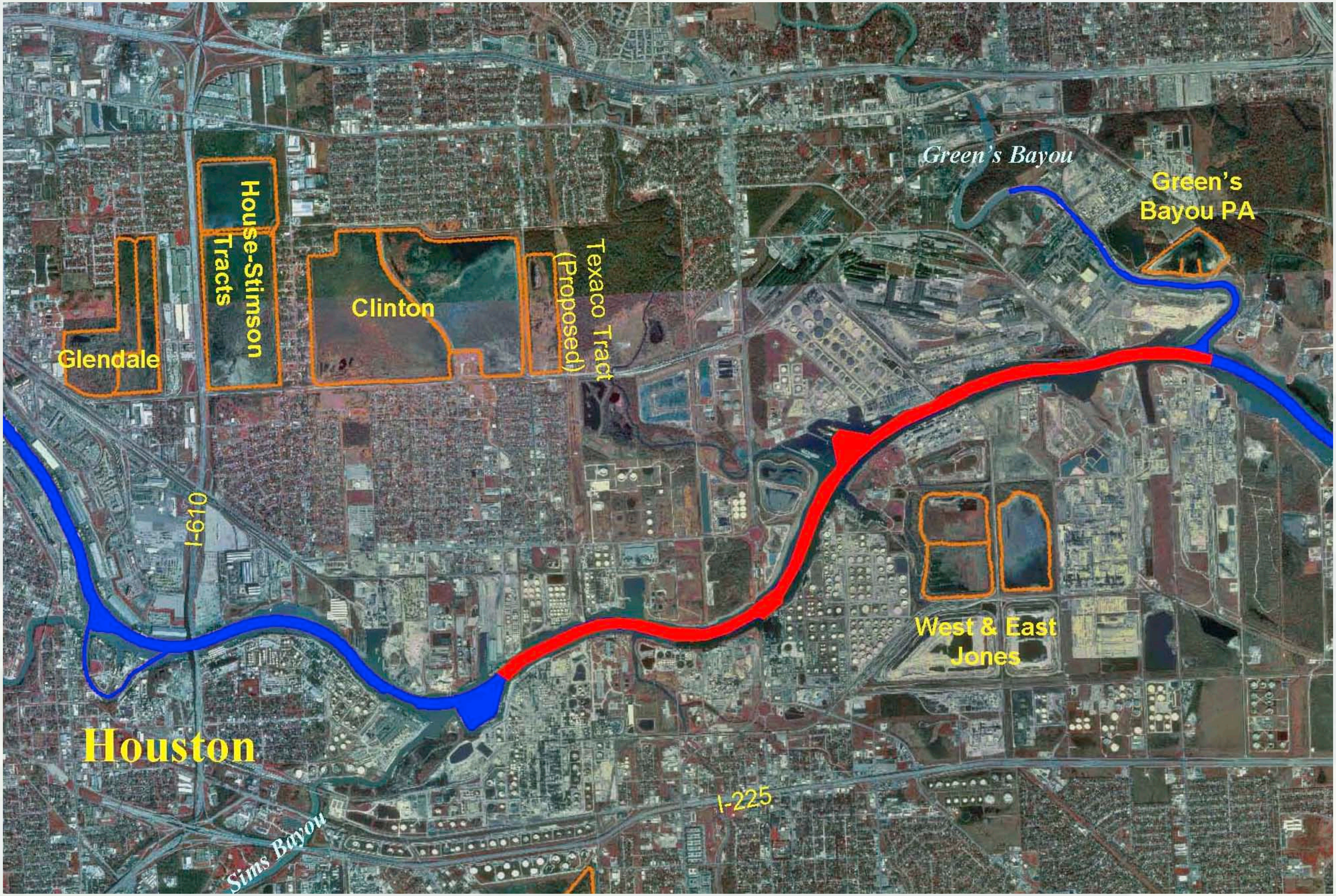
OVERVIEW OF THE HOUSTON SHIP CHANNEL

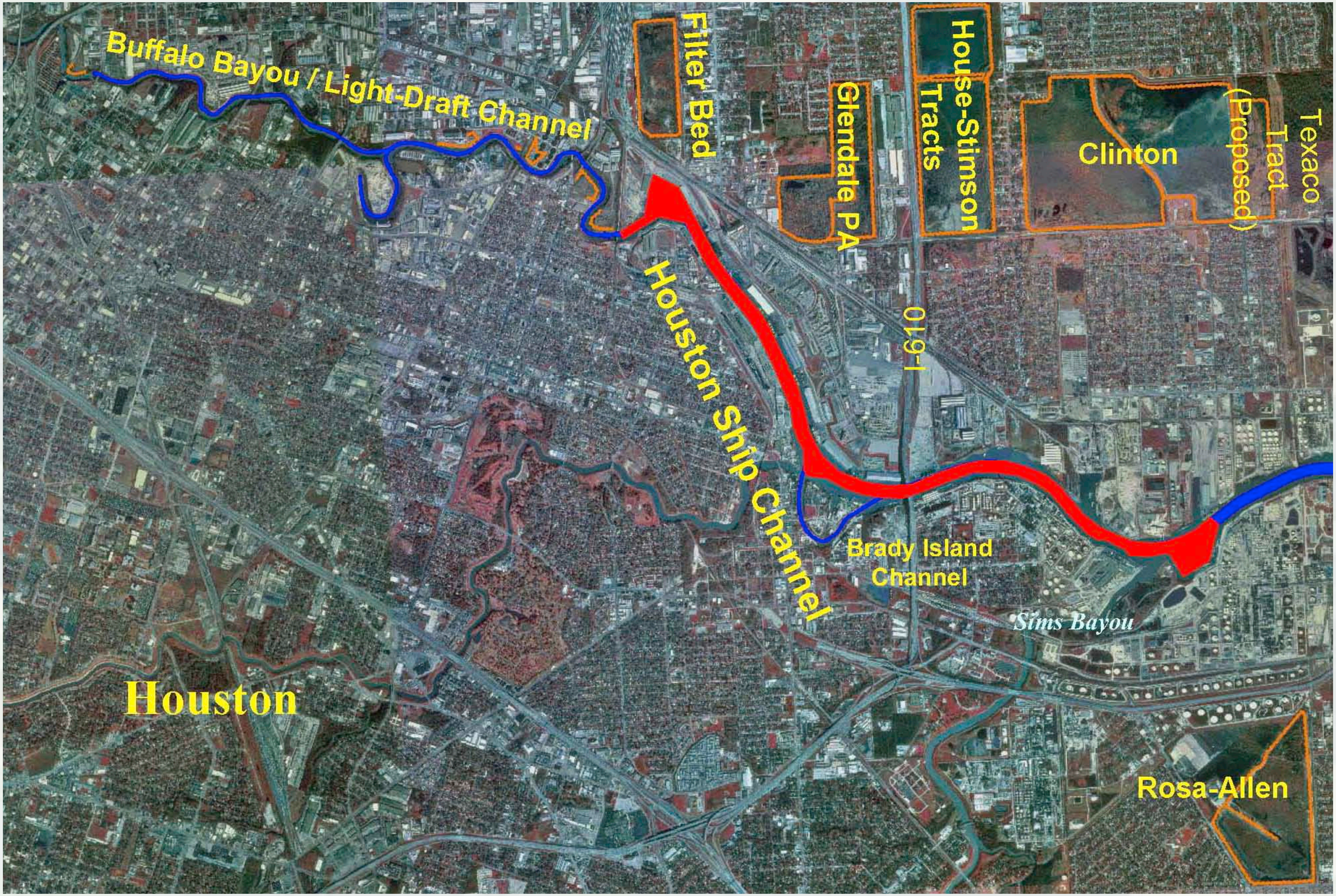

Houston Ship Channel
Redfish Reef to Beacon 76
La Porte
Atkinson Is.
15
14
Bayport
Galveston Bay
Clear Lake
HSC
Dickinson
Texas City
Galveston
Gulf of Mexico

TRONG®

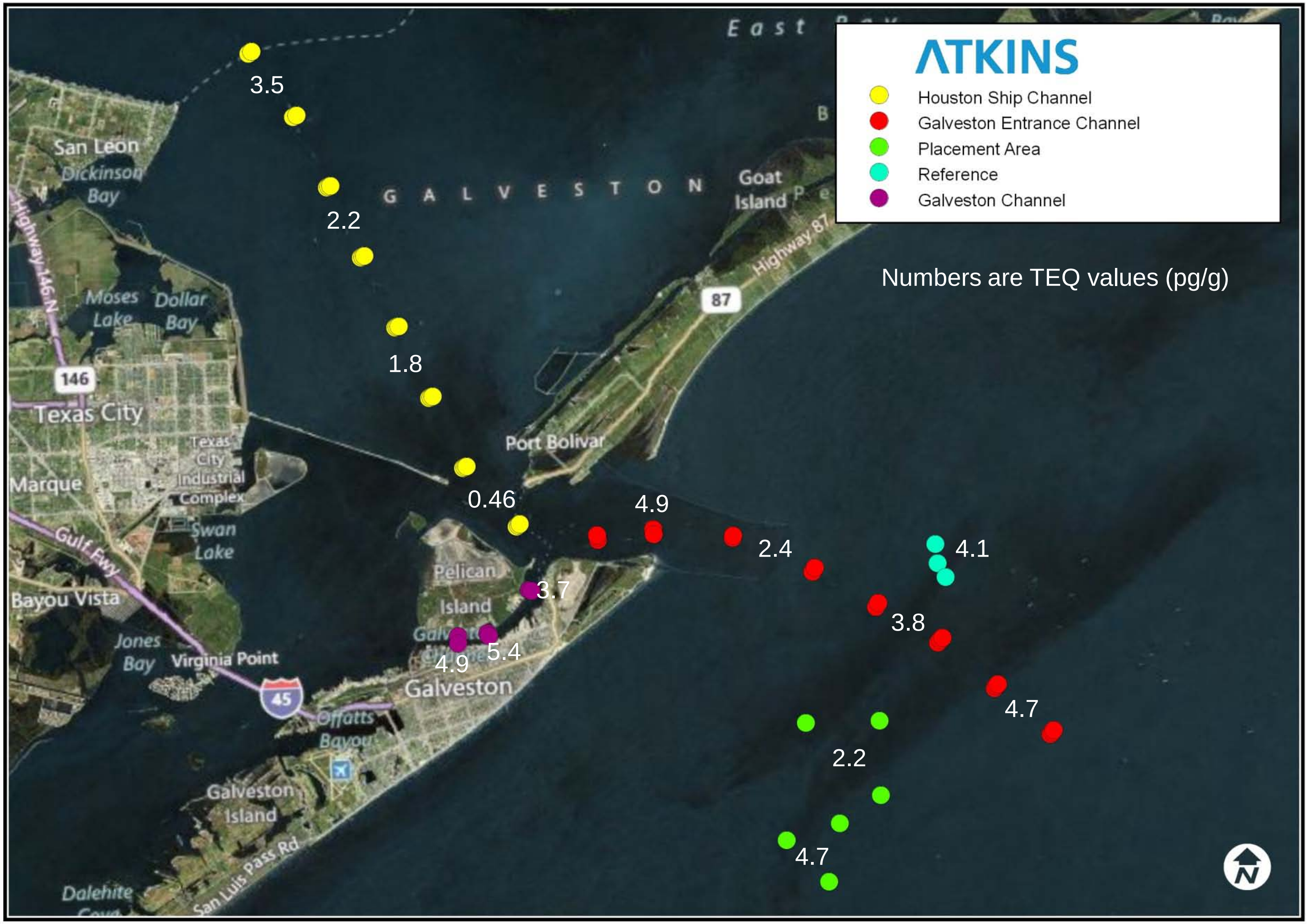

Lost Lake
San Jacinto R.
Goat Island
Peggy Lake
Alexander Island
SH 146
Houston
I-225
Spillman Island

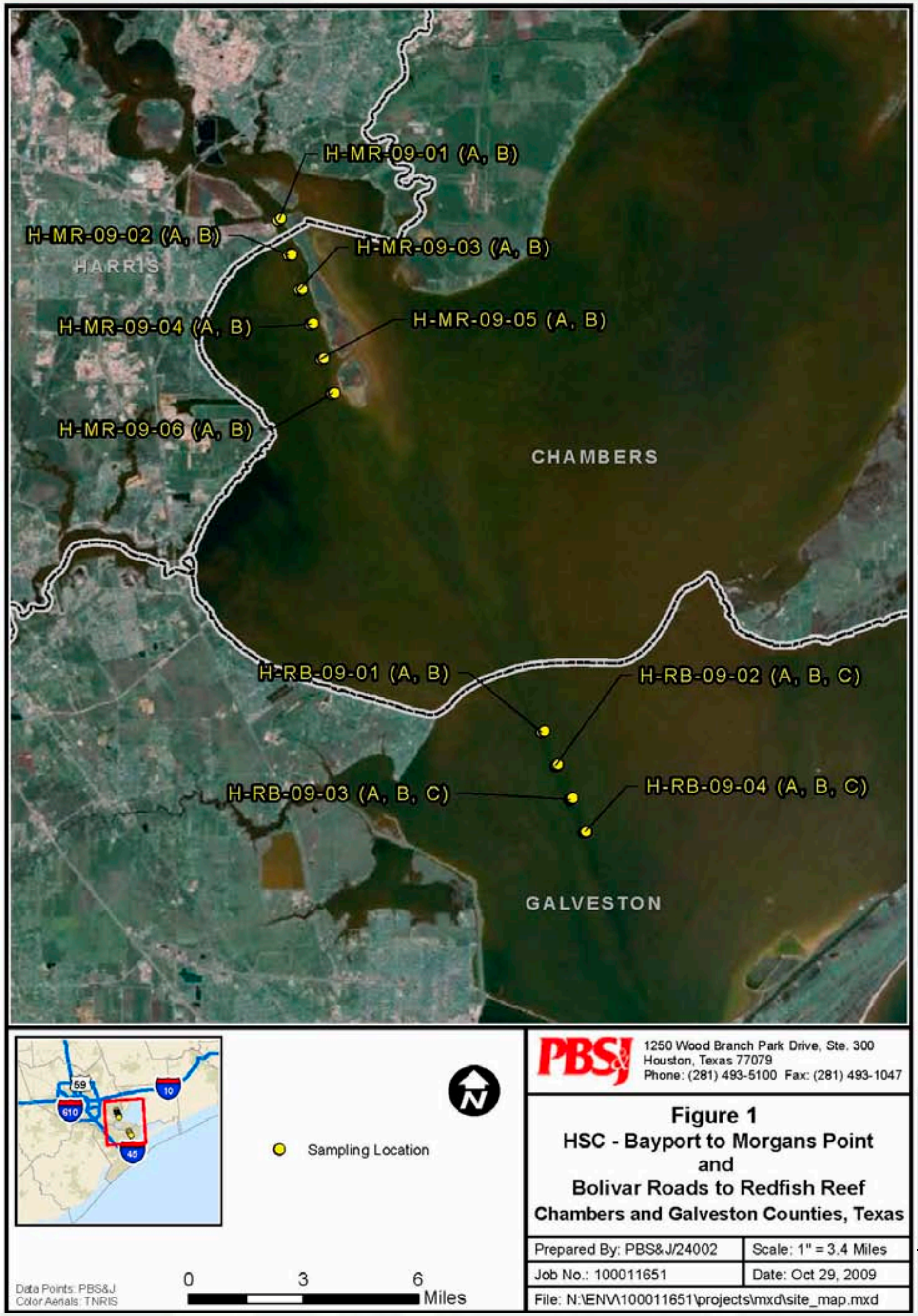

Lost Lake
San Jacinto R.
Green's
Bayou PA
Goat Island
Peggy Lake
West & East
Jones
Houston
I-225
Alexander
Island PA


Green's Bayou
Green's
Bayou PA
House-Stimson
Tracts
Clinton
Texaco Tract
(Proposed)
Glendale
I-610
West & East
Jones
Houston
I-225
Sims Bayou


Buffalo Bayou / Light-Draft Channel
Filter Bed
Glendale PA
House-Stimson Tracts
Clinton
Texaco Tract (Proposed)
Houston Ship Channel
I-610
Brady Island Channel
Sims Bayou
Houston
Rosa-Allen

SAMPLING SITES ALONG THE HOUSTON SHIP CHANNEL


ATKINS
Houston Ship Channel
Galveston Entrance Channel
Placement Area
Reference
Galveston Channel
Numbers are TEQ values (pg/g)
3.5
2.2
1.8
0.46
4.9
2.4
4.1
3.7
3.8
5.4
4.9
4.7
2.2
4.7
East Bay
GALVESTON
Goat Island
Highway 87
87
San Leon
Dickinson Bay
Moses Lake
Dollar Bay
146
Texas City
Texas City Industrial Complex
Port Bolivar
Marque
Swan Lake
Gulf Fwy
Pelican Island
Bayou Vista
Jones Bay
Virginia Point
45
Galveston
Offatts Bayou
Galveston Island
San Luis Pass Rd
Dalehite Cove


H-MR-09-01 (A, B)
H-MR-09-02 (A, B)
H-MR-09-03 (A, B)
HARRIS
H-MR-09-04 (A, B)
H-MR-09-05 (A, B)
H-MR-09-06 (A, B)
CHAMBERS
H-RB-09-01 (A, B)
H-RB-09-02 (A, B, C)
H-RB-09-03 (A, B, C)
H-RB-09-04 (A, B, C)
GALVESTON
Sampling Location
N
0 3 6 Miles
Data Points: PBS&J
Color Aerials: TNRIS
PBS&J
1250 Wood Branch Park Drive, Ste. 300
Houston, Texas 77079
Phone: (281) 493-5100 Fax: (281) 493-1047
Figure 1
HSC - Bayport to Morgans Point
and
Bolivar Roads to Redfish Reef
Chambers and Galveston Counties, Texas
Prepared By: PBS&J/24002
Scale: 1" = 3.4 Miles
Job No.: 100011651
Date: Oct 29, 2009
File: N:\ENV\100011651\projects\mxd\site_map.mxd

Sampling Location

0 2.5 Miles

Sources:
Sampling Locations: USACE
Background Image: Bing Maps

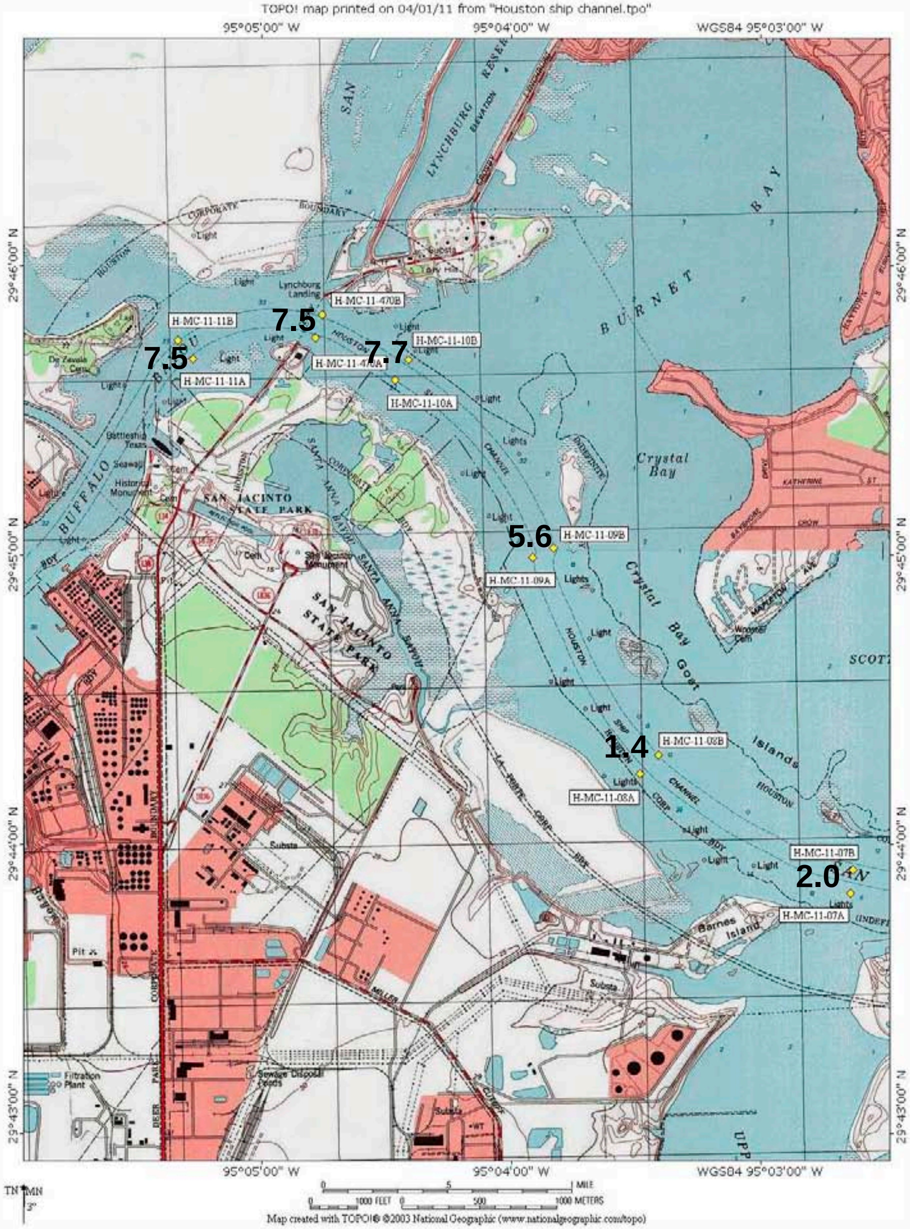
ATKINS

HOUSTON SHIP CHANNEL
REDFISH REEF TO BAYPORT
Galveston Bay
Bacliff and Smith Point Quadrangles
Chambers County, Texas

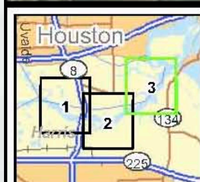
Prepared By: Atkins/13037	Scale: 1" = 2.5 Miles
Job No.: 100023322	Date: Aug, 2011
File: J:\HM\Progress\Jason\JOBS\USACE-Sabine_Pass	

FIGURE 2 - SAMPLE LOCATIONS

TOPO! map printed on 04/01/11 from "Houston ship channel.tpo"



Numbers are TEQ values (pg/g)



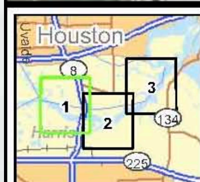
Sampling Location

0 1,500 3,000 4,500
Feet

PBS&J
1250 Wood Branch Park Drive, Ste. 300
Houston, Texas 77079
Phone (281) 493-5100 Fax: (281) 493-1047

Figure 1c
Houston Ship Channel -
Carpenter to Greens's Bayou
Harris County, Texas
Sheet 3 of 3

Prepared By: PBS&J/15490	Scale: 1" = 1500'
Job No.: 100002728	Date: June 5, 2008
File: ENV/100002728/prj/mxd/A_sample_loc.mxd	



N

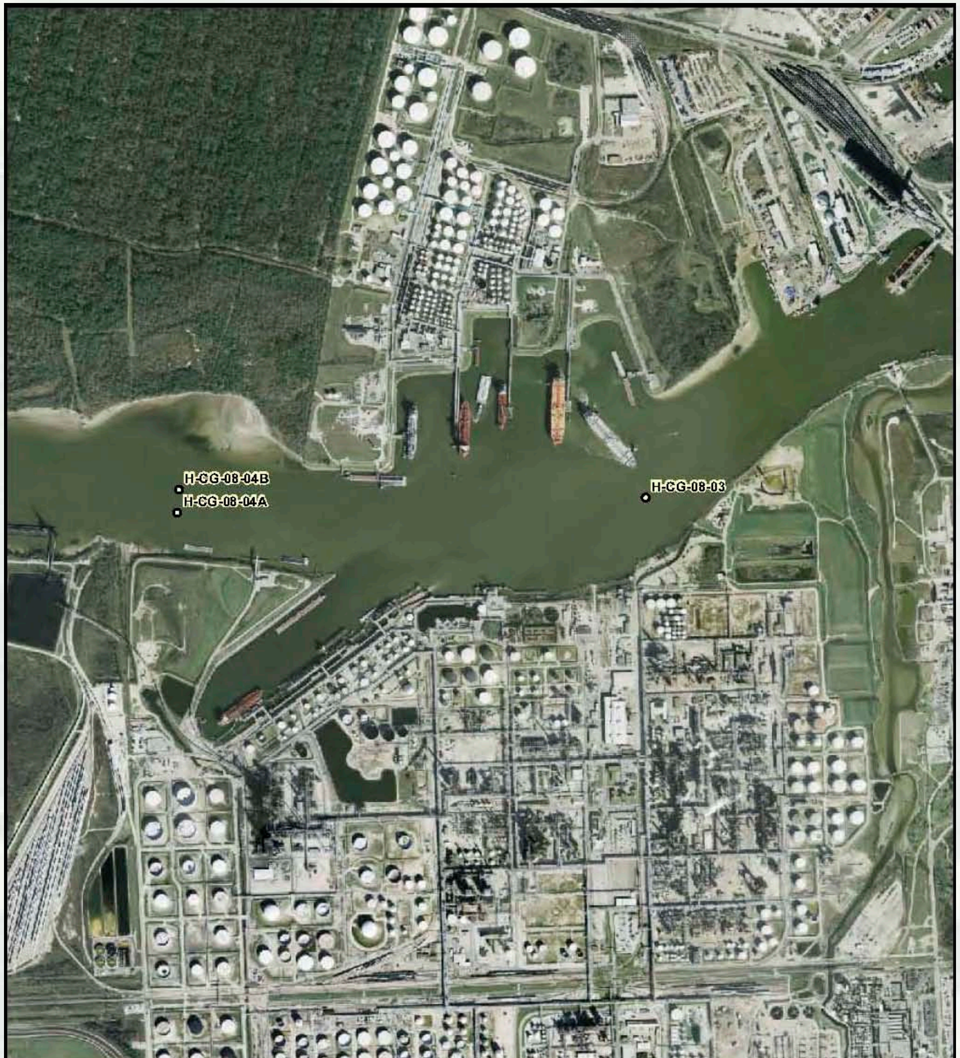
• Sampling Location

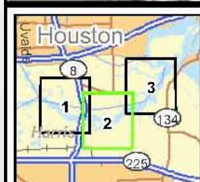
0 1,500 3,000 4,500
Feet

PBS&J
1250 Wood Branch Park Drive, Ste. 300
Houston, Texas 77079
Phone (281) 493-5100 Fax: (281) 493-1047

Figure 1a
Houston Ship Channel -
Carpenter to Greens's Bayou
Harris County, Texas
Sheet 1 of 3

Prepared By: PBS&J/15490	Scale: 1" = 1500'
Job No.: 100002728	Date: June 5, 2008
File: ENV/100002728/prj/mxd/A_sample_loc.mxd	





N

Sampling Location

0 1,500 3,000 4,500
Feet

PBSJ 1250 Wood Branch Park Drive, Ste. 300
Houston, Texas 77079
Phone (281) 493-5100 Fax: (281) 493-1047

Figure 1b
Houston Ship Channel -
Carpenter to Greens's Bayou
Harris County, Texas
Sheet 2 of 3

Prepared By: PBS&J/15490	Scale: 1" = 1500'
Job No.: 100002728	Date: June 5, 2008
File: ENV/100002728/prj/mxd/A_sample_loc.mxd	

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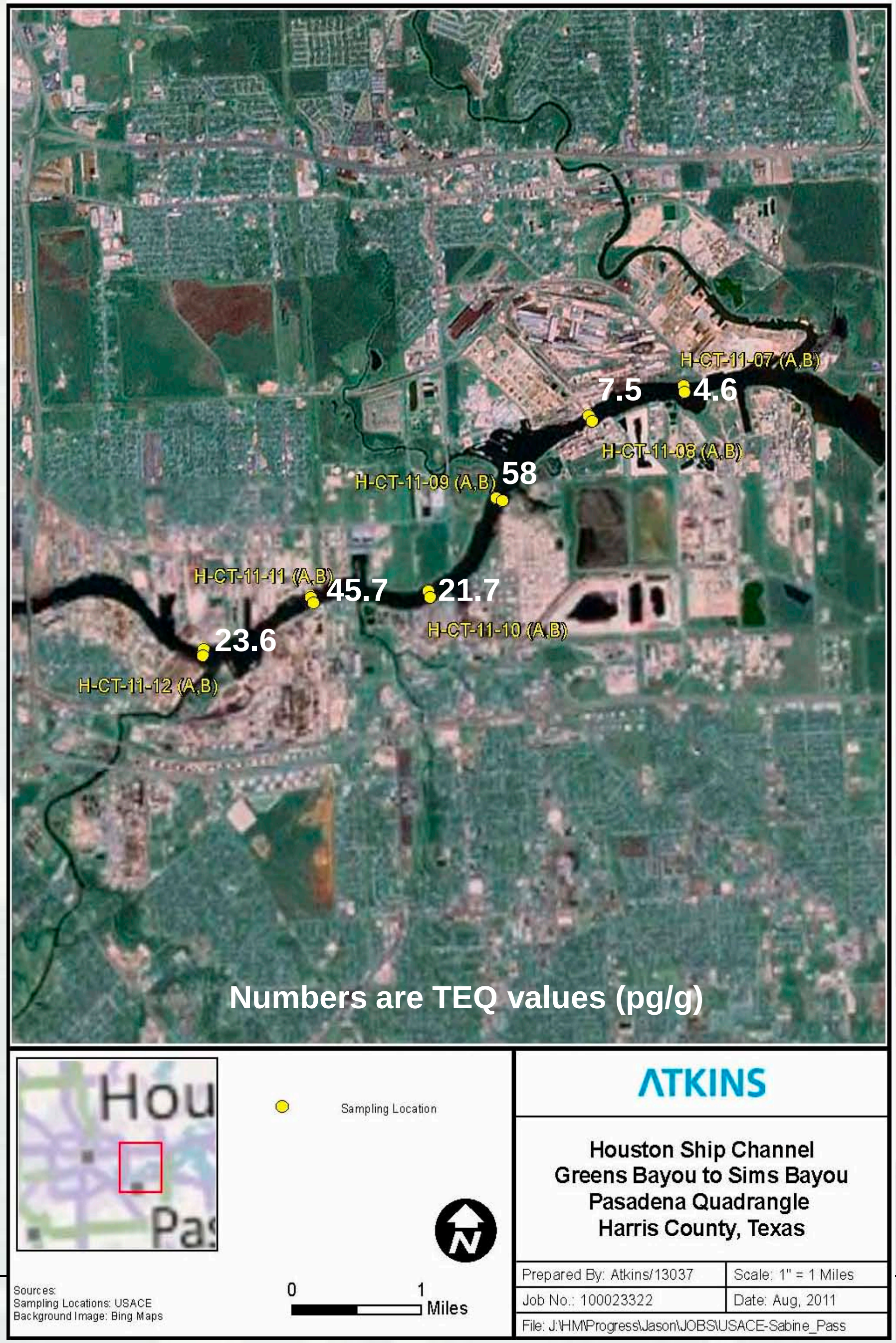

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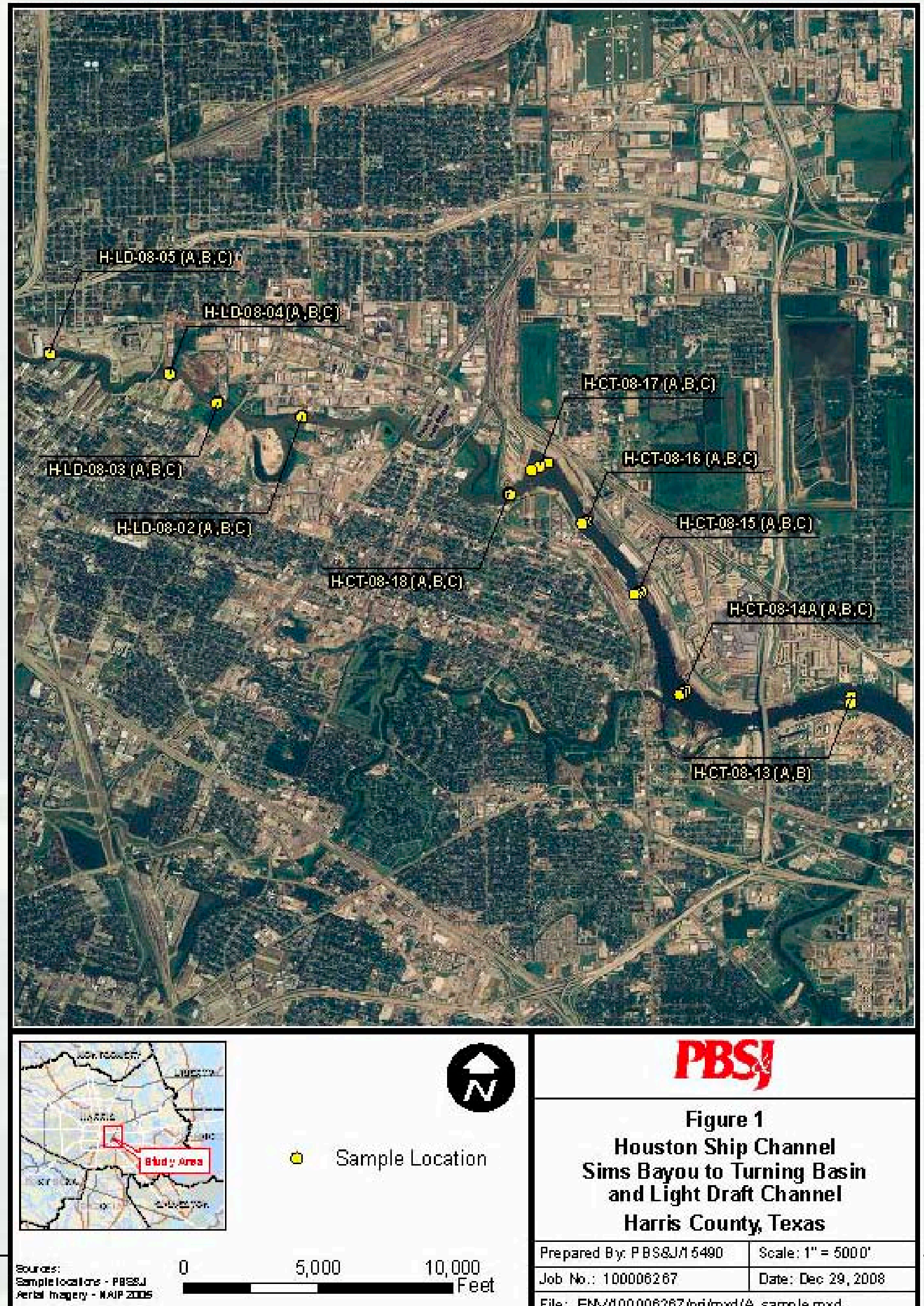
H-LD-08-05 (A,B,C)
H-LD-08-04 (A,B,C)
H-LD-08-03 (A,B,C)
H-LD-08-02 (A,B,C)
H-CT-08-18 (A,B,C)
H-CT-08-17 (A,B,C)
H-CT-08-16 (A,B,C)
H-CT-08-15 (A,B,C)
H-CT-08-14A (A,B,C)
H-CT-08-13 (A,B)
Study Area
Sample Location
Sources:
Sample locations - PBSJ
Aerial Imagery - NAIP 2005
0
5,000
10,000
Feet
PBSJ
Figure 1
Houston Ship Channel
Sims Bayou to Turning Basin
and Light Draft Channel
Harris County, Texas
Prepared By: PBS&J/15490
Scale: 1" = 5000'
Job No.: 100006267
Date: Dec 29, 2008
File: ENV/100006267/prj/mxd/A_sample.mxd

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