William & Mary
CHARTERED 1693

W&M ScholarWorks

Reports

4-1993

Data base development for characterizing contaminated sediments in the Chesapeake Bay region

Gary F. Anderson
Virginia Institute of Marine Science

Caroline Brouwer-Riel
Virginia Institute of Marine Science

Maynard M. Nichols
Virginia Institute of Marine Science

Follow this and additional works at: https://scholarworks.wm.edu/reports

 Part of the Oceanography Commons

Recommended Citation

Anderson, G. F., Brouwer-Riel, C., & Nichols, M. M. (1993) Data base development for characterizing contaminated sediments in the Chesapeake Bay region. Virginia Institute of Marine Science, William & Mary. https://doi.org/10.25773/7gdg-tn59

This Report is brought to you for free and open access by W&M ScholarWorks. It has been accepted for inclusion in Reports by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

VIMS
GC
97.8
C5 D38
1993
v.1

DATA BASE DEVELOPMENT FOR CHARACTERIZING CONTAMINATED SEDIMENTS IN THE CHESAPEAKE BAY REGION

Task 1 Data Base Organization

Task 4 Data Processing

Prepared for:

U.S. Geological Survey
Branch of Atlantic Marine Geology
Quissett Campus
Woods Hole, Massachusetts 02543

By:

Gary Anderson, Caroline Brouwer-Riel and Maynard Nichols

Virginia Institute of Marine Science
School of Marine Science
College of William and Mary
Gloucester Point, Virginia 23062

LIBRARY
of the
VIRGINIA INSTITUTE
of
MARINE SCIENCE

Work accomplished for Task 1 and Task 4 of USGS/VIMS
Cooperative Agreement 1434-92-A-0989

April, 1993

PROJECT DESCRIPTION

This project is one component of the U.S. Geological Survey's National Coastal Geology Program directed to polluted sediments. Its long-term aim is to develop a comprehensive database on estuarine contaminated sediments that provides a summary of information and a digital reference source of detailed and readily accessible data. It focuses on Chesapeake Bay because there is a wealth of data on bottom sediments and sedimentary contaminants. However, this data is fragmented, uncollated and dispersed in many papers, books, reports, files and documents, often local sources, outside the mainstream of national consideration and scientific knowledge. Without an organized body of data, resource managers and research scientists are handicapped in structuring decisions and preparing plans. They may not know what data exists, where to find it and how to obtain it. Potentially valuable data may go unused because it is overlooked, poorly documented or difficult to obtain.

To address problems of contaminated sediment the U.S. Geological Survey's Branch of Atlantic Marine Geology (Woods Hole) executed a cooperative agreement in May 1992 with the Virginia Institute of Marine Science. The project aims to structure a PC accessible database for incorporation into CD ROM media. It draws on existing historical data, mainly from published and unpublished "grey" literature spanning the last 55 years. This contrasts to databases of NOAA's Status and Trends Monitoring Program and EPA's Environmental Monitoring and Assessment Program (EMAP) that draw on new data from field surveys. The data sources come from diverse scientific, academic, commercial and government organizations, and from a range of fields including sedimentology, geochemistry, estuarine marine science, pollution and benthic biology. Historical data are of value for evaluating changes caused by dredging and disposal as well as storms and to assess baseline concentrations prior to contamination.

Database development of this project consists of four components or tasks:

1. To organize and structure a database with a set of procedures, data dictionary and codebook, formatted for transfer to a CD ROM file.

2. A search for data sources in the literature and in files on bottom sediments and their contaminants.

3. An inventory of relevant data sources according to location, station abundance, occurrence of variables, etc.

4. Compilation of prototype digital data files from selected data sources.

It is anticipated that results of this project will show what data sources exist, where they come from and where the gaps are. The database organization and data dictionary facilitate future data processing while the prototype data files provide an initial test of database organization and procedures. The new files help extend the U.S. Geological Survey's East Coast (offshore) sediment database into inshore areas. Once the data are incorporated into CD ROM files they should provide a widely-accessible, high volume comprehensive source of data that can be manipulated in a powerful personal computer.

CONTENTS

Note: Quattro Pro and dBASE are trademarks of Borland International, Inc.
PAPYRUS is a trademark of Research Software Design, Inc.

INTRODUCTION

This document describes the overall organization and structure of the contaminated sediment database for Chesapeake Bay developed during the first year of the cooperative agreement. Included also are a description of the procedures used, and a report on the results of preliminary processing of datasets. These elements comprise Task 1 and Task 4 of the first year workplan, as listed in the project description.

While the long-term goal of the project was to make data available in CD-ROM format, the immediate goal of the current year was to develop the methodology for the acquisition, documentation and storage of datasets relevant to the subject of bottom sediments and contaminated sediments in Chesapeake Bay. Thus, in addition to the implementation of a system to store field observations, a system to store and retrieve potential data sources (bibliography) as well as an inventory of known sources (data inventory) were also needed. Much of the effort was devoted to designing and implementing the bibliographic and data inventory databases, which contained the results from literature searches and materials acquisitions. The results of those efforts are described in two companion reports, subtitled:

Task 2 Data Sources and Bibliography

Task 3 Inventory of Data Sources

Organization of the Digital Data Base, Task 1

The following goals were developed early in the project to guide the overall organization

of data files and design the processing procedures:

1. Review all pertinent data sources, including refereed publications, grey literature, student theses and dissertations, and agency data banks.

2. Preserve as much detail of the original data sources as possible in the final products, including source references, processing notes and assumptions made about the data.

3. Conform the field observations and measurements to a Data Dictionary of common terms.

4. Store observation data in a format that is easily imported into commercially available packages.

A set of procedures were established, illustrated in Figure 1, to meet the objectives outlined above. Beginning with Task 2, the flow chart also represents the path that data sources follow as they pass through the system, from identification as a potential source, to transformation into a digital data file format. Each source was subject to the various checkpoints along the way, including entry into the bibliographic file, elimination of duplicates, acquisition of the hard copy, and an assessment of relevance to the project. The inventory step (Task 3) allowed for further review and detailed documentation of their contents. Finally, field observation data were captured into digital format (Task 4).

The products of the process described above consists of the following elements:

1. Data Sources and Bibliography - This is a datafile in which all literature items are first contained. From this file, duplicate entries that were encountered from several searches were removed. It also allowed for tracking of materials through the process, including acquisition, review, and characterization in the inventory. Each item was assigned a unique number, BIBNUMxxx, where xxx was an integer.

2. Data Inventory - This is a datafile in which information captured from the bibliography or other data sources are identified in further detail. It contains keywords identifying the type of information contained in the source, such as

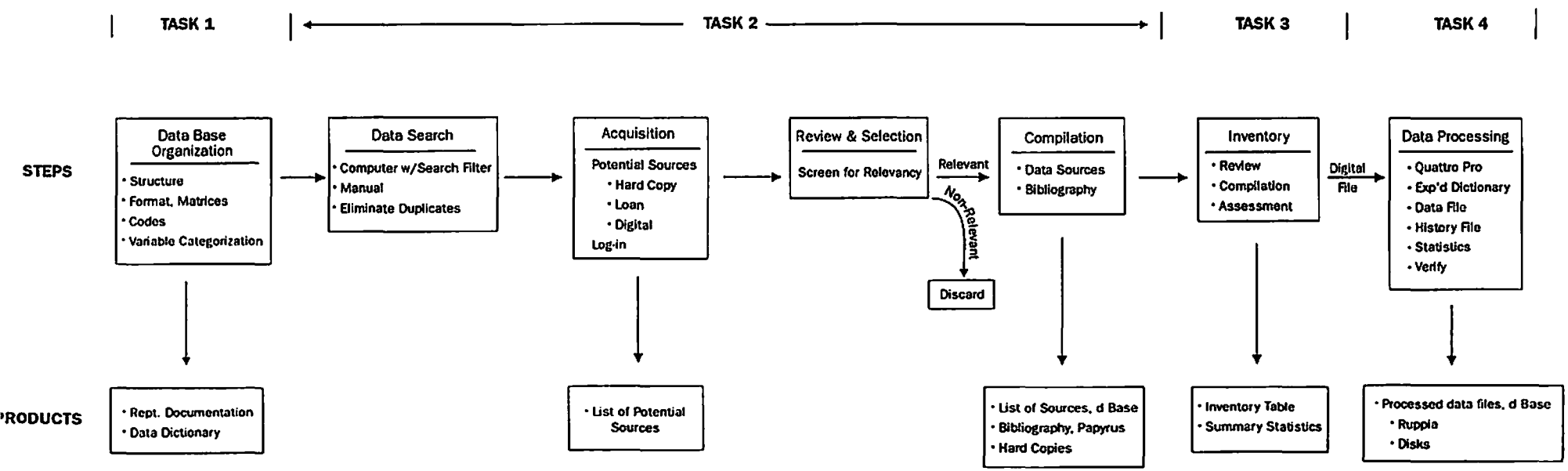

Figure 1. Flow chart of project activities showing tasks, work steps and resultant products.

parameters, dates, geographic coverage, charts and graphs, as well as an estimate of the number of data points and a summary of other information.

3. Data Files - These are the final product of processing a given source. Each consists of two files, one containing the observation data, and another containing processing notes and administrative information.

For further detail on the procedures used in Task 2 and Task 3, and the product data base that resulted from them, the reader is referred to the two companion reports. The remainder of this report concerns itself only with Item 3 above, the organization and processing of the resulting data files containing field observations and accompanying documentation.

Organization of the Data Files

Two digital data files were created to contain information from sources identified in Task 2 and screened in Task 3:

a. Data File - contains actual measurements reported by a study such as the geopositioned station data, including measured observations, station identifiers and locations, detection limits, and any descriptive field notes included in the source. Initially, all datafiles were processed using Quattro Pro spreadsheet software, however, this package could not handle large files (>2500 samples). For the larger databases, dBASE III+ was used instead.

b. History File - contains administrative information about the study such as reference data about the source, funding agency, analytical approach, study abstract, and processing notes. The history file is in every way as important as the data file itself because it contains notes about assumptions that were made during the processing of the source document when creating the data file. Thus, it includes information about the data set that will be needed by any individual who receives a copy of the data file itself.

Copies of the history files for all files processed during the first year are provided in Appendix 2 of this document, and a listing of the datafiles are provided (under separate cover) as Appendix 3.

Data Dictionary Development

A Data Dictionary was developed in cooperation with scientists at the Branch of Atlantic Marine Geology, U.S. Geological Survey (USGS/AMG) in order to document the content of the datafiles that were collected. The data dictionary contains terms that are used for assigning names to fields in the data files produced from a given source. The benefits of using a data dictionary are:

1. To provide definition of contents, in some cases to the level of the analytical methods that were used.

2. To provide a set of common terms to be used when combining different datasets for composite analysis.

3. To provide a reference to aid those creating the digital data files from the original source materials.

Since USGS/AMG already maintained an extensive dictionary for contaminated sediments from their work in Boston Harbor, the dictionary that they provided was used as a starting point for further development and refinement. As data sources were processed, terms that were missing from the data dictionary were added as needed. Thus the dictionary is a dynamic entity, in that it is constantly being revised, refined, and updated with new information as needed.

The USGS/AMG Dictionary was divided into two dictionaries, one pertaining to the datafiles and one for the history files described above. The datafile dictionary contained field names appropriate for the data observations from the project. On the other hand, the field names in the history file reflect information measured only once about each project, such as origin, processing labs, etc. The history file dictionary is provided in the following table (Table 1).

Table 1. Data Dictionary of Fields used in the History file.

Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
VDR	Cover-Id Unique Sample Identifier (US#)		2	Cover-Id Unique Sample Identifier (US#)
NAVMODE	Navigational mode		17	Navigational mode
AGENCY1	Agency1 (Sponsoring)		21	Agency1 (Sponsoring)
AGENCY2	Agency2 (Contracted)		22	Agency2 (Contracted)
AGENCY3	Agency3 (Subcontracted)		23	Agency3 (Subcontracted)
REGNUM	Regulatory File Number		26	Regulatory File Number
PROJECT	Project Name (I.E. Lex Atlantic)	[Entry of this field not restricted to regulatory action or larger study.]	27	Project Name (I.E. Lex Atlantic)
STATE	State Name		28	State Name
QUAD	Quad Name		29	Quad Name
LOC_GEN	General Name Of Location or Water Body		30	General Name Of Location or Water Body
LOC_SPEC	Specific Name Of Location or Water Body		31	Specific Name Of Location or Water Body
GEAR	Sampling Device		44	Sampling Device
SAM_TYPE	Sample type		45	Sample type
LOC_DISP	Proposed Disposal Area		55	Proposed Disposal Area
ANAL_MET	Metals OR other inorganics analyzed?		56	Metals and other inorganics analyzed?
ANAL_ORG	Organic contaminants analyzed ?		57	Organic contaminants analyzed ?
ANAL_GR	Grain sizes analyzed?		58	Grain sizes analyzed?
ANAL_BIO	Bioassay data available?		59	Bioassay data available?

Table 1. Data Dictionary of Fields used in the History file. (continued)

Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
BIO_COM	Comments-Bioassay		60	Comments-Bioassay
BIO_REF	Bio reference		61	Bio reference
ANAL_MSC	Other types of analysis in reference but not in this database?		62	Other types of analysis in reference but not in this database?
MSC_COM	Comments- other analysis		63	Comments- other analysis
MET_LAB	Metals Testing Lab		63	Metals Testing Lab
MET_METH	Analytical technique (metals)		66	Analytical technique (metals)
MET_COM	Analytical comments (metals)		67	Analytical comments (metals)
MET_TDTE	Testing Date (metals)		70	Testing Date (metals)
MET_TDAY	Test day (metals)		71	Test day (metals)
MET_TMO	Test month (metals)		72	Test month (metals)
MET_TYR	Test year (metals)		73	Test year (metals)
INO_LAB	"Other inorganics" testing lab		74	Other inorganic testing lab
INO_METH	Analytical technique (Other inorganics)		77	Analytical technique (Other inorganics)
INO_COM	Analytical comments (Other inorganics)		78	Analytical comments (Other inorganics)
INO_TDTE	Testing Date (Other inorganics)		81	Testing Date (Other inorganics)
INO_TDAY	Test day (Other inorganics)		82	Test day (Other inorganics)
INO_TMO	Test month (Other inorganics)		83	Test month (Other inorganics)
INO_TYR	Test year (Other inorganics)		84	Test year (Other inorganics)
GOR_LAB	Organics testing lab for general organic contaminants		269	Organics testing Lab #1

Table 1. Data Dictionary of Fields used in the History file. (continued)

Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
GOR_METH	Analytical technique, general organic contaminants		272	Analytical technique (organic contaminants)
GOR_COM	Analytical comments for general organic contaminants		273	Analytical comments (organic contaminants)
GOR_TDTE	Testing Date for general organic contaminants		276	Testing Date (Organic Contaminants)
GOR_TDAY	Test day, General Organic Contaminants)		277	Test day (Organic Contaminants)
GOR_TMO	Test month, General Organic Contaminants		278	Test month (Organic Contaminants)
GOR_TYR	Test year, General Organic Contaminants		279	Test year (Organic Contaminants)
SOR_LAB	Specific organics testing lab (name)		305	Organics testing Lab #2
SOR_METH	Analytical technique (specific organics)		308	Analytical technique (specific organics)
SOR_COM	Analytical comments regarding specific organics		309	Analytical comments (specific organics)
GR_LAB	Grain size testing laboratory		547	Grain size testing laboratory
GR_METH	Analytical technique (size)		550	Analytical technique (size)
GR_COM	Analytical comments (size)		551	Analytical comments (size)
GR_TDTE	Date Anal.		554	Date Anal.
GR_REQBY	Requestor		555	Requestor
GR_ANLBY	Analyst		556	Analyst

Since the dictionary of field names for the actual data files changes as more and more sources are processed, a copy and description is provided as part of the results of preliminary processing section of this report (Task 4).

Processing Procedures

In creating prototype data files during Task 4 of the project, we found that each source often poses its own unique set of questions and problems. Each of these must be resolved on a case by case basis. As problems are encountered and resolved during processing, the solution often feeds back to the Data Dictionary and to the overall processing procedures. As the work continued, the procedures were refined in concert with USGS/AMG suggestions.

Generally, the steps used in processing datafiles were as follows:

1. Identification of data fields.
2. Identification of reference location.
3. Keying-in of numeric data.
4. Conversion to preferred units.
5. Reproduction of original source document.

The details of these steps are:

1. Identification of data fields - This step involves locating the data within a source and identifying the parameters using the Data Dictionary. This is the most important and time consuming step because it provides detailed definition of the content of the resulting data file. In most cases, the text of the document must be read in order to determine the content of the reported data, and often the analytical methods section must be carefully scrutinized to ensure that data items are correctly identified. At this step the history file is first created and header information about the funding source, general approach to sampling, notes about detection limits, and analytical techniques used in the study are recorded. Also recorded in the history file is a log of modifications that were made, such as conversion of units, along with assumptions that were used in making them.

2. Identification of reference location - All data recorded in the digital file are to be associated with a geographic position. Sometimes these are reported in as coordinate pairs, but more often they are merely provided in the form of a study map or chartlet. In this case, charts are used as the source for geopositioning, and

the location of each station are extracted either manually or using a digitizer when necessary. The method used to establish geographical position is recorded in the history file.

3. Keying-in of digital data - Once the field names and geographic locations for the source data have been established, a spreadsheet file is created with appropriate columns to accept each parameter. Data will be keyed manually into the spreadsheet file on a 486 PC compatible with a spreadsheet package, Quattro Pro. To expedite this process for tabular station data we will attempt to employ an optical character scanner.

4. Conversion to preferred units - In the case where a parameter is reported in units other than those preferred as defined in the Data Dictionary, original units are recorded in a field within the data file, and converted to the preferred units and stored within the data file. Notes on assumptions made during the conversion of units, algorithms for conversion, and any unresolved issues are recorded in the history file. Values less than the detection limit were included, and indicated by placing a "less than" symbol ('<') in the qualifier field.

5. Reproduction of the source documents to support the data file - In the case of items which have been received on loan from lending libraries (interlibrary loan), source materials will be xeroxed in order to provide supporting materials for further refinement and scrutiny of the data. In particular, the following sections will always be reproduced for future reference:

    Title pages and abstract
    Methods and materials
    Locational maps
    Data tables

    In addition, charts and graphs will be xeroxed for possible scanning and interpretation in a future phase. Also, new data sources will be noted from the reference list.

As each source was processed, the Data Dictionary was expanded and updated with new terms, definitions, and rules for processing were amended as needed.

Task 4. Results of Preliminary Processing

Modified Data Dictionary

A copy of the dictionary as it existed after the preliminary processing of three data sources showing additions to the original USGS dictionary is provided in Appendix 1. It contains a combination of information from both VIMS and USGS, showing modifications to the original dictionary as made during the processing of data.

Since the Data Dictionary changes every time a new data source is processed, a set of rules were established for modifying the dictionary terms. This set of rules reflect a basic level of information that is desired for each of the measured parameters, including preferred and original units, analytical limits of detection, and appropriate qualifiers.

General Rules for Naming Data Fields

1. Field names are limited to eight characters.

2. Each measured parameter has a field for preferred units, the analytical detection limit, a textual qualifier, original units values, and original units identifier. An example for Cadmium follows:

Field Name	Description
CD	Cadmium (ug/g dry weight)
CD_Q	Qualifier text for Cadmium.
CD_D	Detection limit for Cadmium.
CD_O	Cadmium value in other units.
CD_U	Units if other than preferred.

General Rules (Cont'd)

3. All parameters will be recorded in original units, showing original detection limits when available. Values will be converted to the preferred units, when possible. If original units are the same as the preferred units, both fields will be used, with the values duplicated.

Field names were restricted to eight characters because this was the smallest limitation for some commercially available packages.

Sample Data and History Files

Three data sources were processed as a prototype of the database organization and procedures described above. These were chosen so as to contain a sample of sediment data of different types, including one that contained primarily metals, one for organics, and one containing texture and mass properties. The primary references for the sources that were processed are listed as follows:

1. Baseline Sediment Studies to Determine Distribution, Physical Properties, Sedimentation Budgets in the Virginia Portion of Chesapeake Bay
   Byrne, et al., 1982 (VDR135)

2. Toxic Organic Compounds in the Sediments of the Chesapeake Bay
   Huggett, et al., 1982 (VDR165).

3. Chesapeake Bay Sediment Trace Elements.
   Helz, et al., 1981 (VDR163).

These three files represent over 128,000 data points of field observations for contaminated sediments in Chesapeake Bay. For a summary of the content of these files, the reader is referred to the history files, provided in Appendix 2. The observational data for these sources are listed in Appendix 3.

Conclusion

The outcome of this project is a set of processing procedures and a compilation of data sources characterizing contaminated sediments for the Chesapeake Bay region. Many of these sources were scattered among local entities, in books, student theses, contract reports and agency data banks. The results of the inventory (Task 3) is a quantification of their content, categorized by a common set of keywords pertinent to Chesapeake Bay sediments. We have only taken the initial steps towards ensuring that these invaluable scientific data are not irretrievably lost. The procedures that were developed will help convert these to a readily available digital format that has been scrutinized and well-documented by experts on the subject of bottom sediments and contaminated sediments in the mid-Atlantic region.

APPENDIX 1: DATA DICTIONARY

Appendix 1. Data Dictionary of VIMS/USGS Chesapeake Bay Sediment Data Base

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
Source					
	OBS	Local Row or ID Number		1	Local Row or ID Number
	XCOORD	X-Coord (State Plane E)		3	X-Coord (State Plane E)
	YCOORD	Y-Coord (State Plane N)		4	Y-Coord (State Plane N)
Location					
	LATDD	Latitude, decimal degrees north		5	Latitude (decimal)
	LATD	Latitude, degrees north		6	Lat(deg)n
	LATM	Latitude, minutes north		7	Lat(min)n
	LATS	Latitude, seconds north		8	Lat(sec)n
		Lat Orig. position format and precision		9	Lat Orig. position format and precision
	LONDD	Longitude, decimal degrees. West lon is negative.		10	Longitude (decimal) (-) = west long.
	LOND	Longitude, degrees (west is negative)		11	Lon(deg)w
	LONM	Longitude, minutes (west is negative)		12	Lon(min)w
	LONS	Longitude, seconds (west is negative)		13	Lon(sec)w
		Lon Orig. position format and precision		14	Lon Orig. position format and precision
		Original location in orig. format, if unusual		15	Original location in orig. format, if unusual
	XYDATUM	Datum		16	Datum
		Time Delay 1			Time Delay 1
		Time Delay 2			Time Delay 2
		Sounding (m)		18	Sounding (m)

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Sounding (in original units, if not m)		19	Sounding (in original units, if not m)
		Sounding original units		20	Sounding original units
Paper-trail					
		Source of Information, Reference, or Reference ID No.		24	Source of Information, Reference, or Reference ID No.
		Original Database ID		25	Original Database ID
	STATION_Q	Location Comments		32	Location Comments
Sampling					
	DATE_SAM	Sampling Date	Sampling date in format: YRMODA (year, month, day without punctuation).	33	Sampling Date
	DAY	Da		34	Da
	MONTH	Mo		35	Mo
	YEAR	Year		36	Year
	HOUR	Hr		37	Hr
	MIN	Min		38	Min
	TIDE_CBP	Tide position, Ches. Bay Program code.	Tide position when sample was collected from the natural environment, coded according to Ches. Bay Program coding scheme.	39	Tide
	SAMPLEID	Sample ID or original Sample Field Number	Sample ID used when both sample and station have identifiers.	40	Sample ID or original Sample Field Number
	CRUISEID	Cruise ID		41	Cruise ID
	STATION	Orig. sta. #	Use this field in preference to SAMPLEID.	42	Orig. sta. #
	COREID	Core Or Grab #, use when both core and sample # exist		43	Core Or Grab #

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	GEAR	Sampling Device		44	Sampling Device
	SAM_TYPE	Sample type		45	Sample type
	CDEPTH	Depth In Core or sediment,when interval is not given (cm or text)		46	Depth In Core or sediment,when interval is not given (cm or text)
	DEPTHTOP	Depth interval, TOP of Core section or sample (cm)		47	Depth interval, TOP of Core or sample (cm)
	DEPTHBOT	Depth interval, BOTTOM of Core section or sample (cm)		48	Depth interval, BOTTOM of Core or sample (cm)
		Original Depth in sediment in original units if not centimeters		49	Original Depth in sediment in original units if not centimeters
		Original depth units		50	Original depth units
	CORECOMP	Compositing Scheme		51	Compositing Scheme
	COMMENTS	General Comments Pertaining To Sample		52	General Comments Pertaining To Sample
	COLOR	Description/Color		53	Description/Color
		Estimated Volume of material to be disposed		54	Estimated Volume of material to be disposed
Related info Analytical					
		Laboratory's internal ID number		64	Laborotory's internal ID number
		Laboratory's sample ID number (metals)		65	Laboratory's sample ID number (metals)
		Replicate no ___ of n (metals)		68	Replicate no ___ of n (metals)
		Total replicates n (metals)		69	Total replicates n (metals)
		Laboratory's internal ID number (Other inorganics)		75	Laboratory's internal ID number (Other inorganics)
		Laboratory's sample ID number (Other inorganics)		76	Laboratory's sample ID number (Other inorganics)

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Replicate no ___ of n (Other inorganics)		79	Replicate no ___ of n (Other inorganics)
		Total replicates n (Other inorganics)		80	Total replicates n (Other inorganics)
Majors and trace metals					
	AG	Ag (silver) ug/g		85	Ag (silver) µg/g
	AG_D	Ag det. lim.		86	Ag det. lim.
	AG_O	Ag value, in original units			Al original units
	AG_U	Ag original units			
	AG_Q	Ag q		87	Ag q
	AL	Al (aluminum) ug/g		88	Al (aluminum) µg/g
	AL_D	Al det. lim.		89	Al det. lim.
	AL_O	Al value, in original units		90	Al original units
	AL_U	Al original units (unit name)		90	
	AL_Q	Al qualifier		91	Al q
		Al value in original units, if not µg/g		92	Al value in original units, if not µg/g
	AS	As (arsenic) ug/g		93	As (arsenic) µg/g
	AS_D	As det. lim.		94	As det. lim.
	AS_Q	As qualifier		95	As q
		Au (gold) µg/g		96	Au (gold) µg/g
		Au det. lim.		97	Au det. lim.
		Au q		98	Au q
		Ba (barium) µg/g		99	Ba (barium) µg/g
		Ba det. lim.		100	Ba det. lim.
		Ba original units		101	Ba original units
		Ba q		102	Ba q
		Ba value in original units		103	Ba value in original units
		Be (beryllium) µg/g		104	Be (beryllium) µg/g
		Be det. lim.		105	Be det. lim.
		Be q		106	Be q
		Ca (calcium) µg/g		107	Ca (calcium) µg/g
		Ca det. lim.		108	Ca det. lim.
		Ca original units		109	Ca original units
		Ca q		110	Ca q
		Ca value in original units, if not µg/g		111	Ca value in original units, if not µg/g

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	CD	Cd (cadmium) µg/g, in dry sediment		112	Cd (cadmium) µg/g
	CD_D	Cd det. lim.		113	Cd det. lim.
	CD_Q	Cd qualifier		114	Cd q
	CL	Cl (chloride) µg/g		115	Cl (chloride) µg/g
	CL_D	Cl det. lim.		116	Cl det. lim.
	CL_U	Cl original units		117	Cl original units
	CL_Q	Cl q		118	Cl q
	CL_O	Cl value in original units, if not µg/g		119	Cl value in original units, if not µg/g
	CO	Co (cobalt) µg/g, in dry sediment		120	Co (cobalt) µg/g
	CO_D	Co detection limit		121	Co det. lim.
	CO_Q	Co (cobalt) qualifier text		122	Co q
	CR	Cr (chromium) µg/g, in dry sediment		123	Cr (chromium) µg/g
	CR_D	Cr detection limit		124	Cr det. lim.
	CR_Q	Cr q		125	Cr q
	CU	Cu (copper) µg/g		126	Cu (copper) µg/g
	CU_D	Cu det. lim.		127	Cu det. lim.
	CU_Q	Cu qualifier text		128	Cu q
	FE	Fe (iron) µg/g		129	Fe (iron) µg/g
	FE_D	Fe detection limit		130	Fe det. lim.
	FE_U	Fe original units (unit name)		131	Fe original units
	FE_Q	Fe qualifier text		132	Fe q
	FE_O	Fe value in original units, if not µg/g		133	Fe value in original units, if not µg/g
	HG	Hg (mercury) µg/g		134	Hg (mercury) µg/g
	HG_D	Hg det. lim.		135	Hg det. lim.
	HG_Q	Hg q		136	Hg q
		K (potassium) µg/g		137	K (potassium) µg/g
		K det. lim.		138	K det. lim.
		K original units		139	K original units
		K q		140	K q
		K value in original units, if not µg/g		141	K value in original units, if not µg/g
		Mg (magnesium) µg/g		142	Mg (magnesium) µg/g
		Mg det. lim.		143	Mg det. lim.

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Mg q		144	Mg q
	MN	Mn (manganese) µg/g, in dry sediment		145	Mn (manganese) µg/g
	MN_D	Mn det. lim.		146	Mn det. lim.
	MN_U	Mn original units		147	Mn original units
	MN_Q	Mn q		148	Mn q
	MN_O	Mn value in original units, if not µg/g		149	Mn value in original units, if not µg/g
		Na (sodium) µg/g		150	Na (sodium) µg/g
		Na det. lim.		151	Na det. lim.
		Na original units		152	Na original units
		Na q		153	Na q
		Na value in original units, if not µg/g		154	Na value in original units, if not µg/g
	NI	Ni (nickel) µg/g, in dry sediment		155	Ni (nickel) µg/g
	NI_D	Ni det. lim.		156	Ni det. lim.
	NI_Q	Ni qualifier		157	Ni q
		P (phosphorous) µg/g		158	P (phosphorous) µg/g
		P det. lim.		159	P det. lim.
		P q		160	P q
	PB	Pb (lead) µg/g		161	Pb (lead) µg/g
	PB_D	Pb det. lim.		162	Pb det. lim.
	PB_Q	Pb q		163	Pb q
		Ra (radium) µg/g		164	Ra (radium) µg/g
		Ra det. lim.		165	Ra det. lim.
		Ra q		166	Ra q
		Sb (antimony) µg/g		167	Sb (antimony) µg/g
		Sb det. lim.		168	Sb det. lim.
		Sb q		169	Sb q
		Se (selenium) µg/g		170	Se (selenium) µg/g
		Se det. lim.		171	Se det. lim.
		Se q		172	Se q
	SI	Si (silicon) µg/g		173	Si (silicon) µg/g
	SI_D	Si detection limit		174	Si det. lim.
	SI_U	Si original units		175	Si original units
	SI_Q	Si qualifier text		176	Si q
	SI_O	Si value in original units, if not µg/g		177	Si value in original units, if not µg/g

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	SN	Sn (tin) µg/g		178	Sn (tin) µg/g
	SN_D	Sn det. lim.		179	Sn det. lim.
	SN_Q	Sn qualifier		180	Sn q
	TI	Ti (titanium) µg/g, in dry sediment		184	Ti (titanium) µg/g
	TI_D	Ti detection limit		185	Ti det. lim.
	TI_U	Ti original units		186	Ti original units
	TI_Q	Ti qualifier text		187	Ti q
	TI_O	Ti value in original units, if not µg/g		188	Ti value in original units, if not µg/g
		Tl (Tellurium) µg/g			Tl (Tellurium) µg/g
		Tl det. lim.			Tl det. lim.
		Tl q			Tl q
		Th (thorium) µg/g		189	Th (thorium) µg/g
		Th det. lim.		190	Th det. lim.
		Th q		191	Th q
		U (uranium) µg/g		181	U (uranium) µg/g
		U det. lim.		182	U det. lim.
		U q		183	U q
	V	V (vanadium) µg/g, in dry sediment		192	V (vanadium) µg/g
	V_D	V det. lim.		193	V det. lim.
	V_Q	V qualifier		194	V q
	ZN	Zn (zinc) µg/g, in dry sediment		195	Zn (zinc) µg/g
	ZN_D	Zn det. lim.		196	Zn det. lim.
	ZN_Q	Zn qualifier		197	Zn q
Other inorganics					
		Carbonate CO3 %		198	Carbonate CO3 %
		Carbon (inorganic) % dry wt		198b	Carbon (inorganic) % dry wt
		Carbon (carbonate) % dry wt		199	Carbon (carbonate) % dry wt
	C_TOTORG	Carbon (total organic) % dry wt	Total organic carbon in percent dry weight	200	Carbon (organic) % dry wt
		Carbon (organic) dl		201	Carbon (organic) dl

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	C_TOTWP	Carbon (Total) % dry wt	Total carbon (both ORGANIC AND INORGANIC) in the sample expressed as percent dry weight.	202	Carbon (Total) % dry wt
		Carbon q		203	Carbon q
		Hydrogen %		204	Hydrogen %
	N_TOTWP	Nitrogen %, dry weight		205	Nitrogen %
		Ammonia (NH3) µmoles/kg		206	Ammonia (NH3) µmoles/kg
		NH3 qualifier		207	NH3 q
		Nitrate (NO3) µmoles/kg		208	Nitrate (NO3) µmoles/kg
		NO3 q		209	NO3 q
	NO2	Nitrite (NO2) µmoles/kg		210	Nitrite (NO2) µmoles/kg
	NO2_Q	NO2 qualifier		211	NO2 q
		Oxygen (O2) µmoles/kg		212	Oxygen (O2) µmoles/kg
		O2 q		213	O2 q
		Sulfide (SO2) µmoles/kg		214	Sulfide (SO2) µmoles/kg
		SO2 q		215	SO2 q
		Sulfite (SO3) µmoles/kg		216	Sulfite (SO3) µmoles/kg
		SO3 q		217	SO3 q
		Sulfate (SO4) µmoles/kg		218	Sulfate (SO4) µmoles/kg
		SO4 q		219	SO4 q
		Acid Volatile Sulfides (AVS) µmole-S/g		220	Acid Volatile Sulfides (AVS) µmole-S/g
		AVS q		221	AVS q
		Chem Oxygen Demand (COD) µg/g		222	Chem Oxygen Demand (COD) µg/g
		COD q		223	COD q
		Cation Exchange Capacity (CEC) moles/kg		224	Cation Exchange Capacity (CEC) moles/kg
		CEC q		225	CEC q

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Surface area m2/g		226	Surface area m2/g
		Surface area q		227	Surface area q
		Total sample weight g		228	Total sample weight g
		Total sample weight q		229	Total sample weight q
		Total Solids weight%		230	Total Solids weight%
		Total Solids q		231	Total Solids q
	H2O	Water weight% or porosity		232	Water weight% or porosity
		Water q		233	Water q
		Resistivity mohms		234	Resistivity mohms
		Specific Conductance mmhos		235	Specific Conductance mmhos
		Specific Conductance or Resistivity q		236	Specific Conductance or Resistivity q
	SALIN	Salinity ppt		237	Salinity ppt
		Salinity q		238	Salinity q
		Alkalinity meq/kg		239	Alkalinity meq/kg
		Alkalinity q		240	Alkalinity q
	PH	pH	The negative log of the hydrogen ion concentration for a wet sediment sample.	241	pH
		Temperature degrees C		242	Temperature degrees C
		Temperature q		243	Temperature q
Radioactives					
		Total Radioactivity mR/hr		244	Total Radioactivity mR/hr
		Gross alpha radioactivity pCi/g		245	Gross alpha radioactivity pCi/g
		Gross beta radioactivity pCi/g		246	Gross beta radioactivity pCi/g
		Pb210 dpm/g		247	Pb210 dpm/g
		Pb210 q		248	Pb210 q
		Th228 dpm/g		249	Th228 dpm/g
		Th228 q		250	Th228 q
		Th234 dpm/g		251	Th234 dpm/g
		Th234 q		252	Th234 q
		Ra226 dpm/g		253	Ra226 dpm/g

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Ra226 q		254	Ra226 q
		Th230 dpm/g		255	Th230 dpm/g
		Th230 q		256	Th230 q
		Cs137 dpm/g		257	Cs137 dpm/g
		Cs137 q		258	Cs137 q
		Pu239,240 dpm/g		259	Pu239,240 dpm/g
		Pu239,240 q		260	Pu239,240 q
		Sr90 dpm/g		261	Sr90 dpm/g
		Sr90 q		262	Sr90 q
		Carbon 14 %-Delta-14C		263	Carbon 14 %-Delta-14C
		Carbon 14 q		264	Carbon 14 q
		Carbon 13 %-delta-13C		265	Carbon 13 %-delta-13C
		Carbon 13 q		266	Carbon 13 q
		Other radioactivity dpm/g		267	Other radioactivity dpm/g
		Radioactivity q		268	Radioactivity q
Analytical					
		Laboratory's internal ID number		270	Laboratory's internal ID number
		Laboratory's sample ID number (organic contaminants)		271	Laboratory's sample ID number (organic contaminants)
		Replicate no ___ of n (organic contaminants)		274	Replicate no ___ of n (organic contaminants)
		Total replicates n (organic contaminants)		275	Total replicates n (organic contaminants)
General organics					
		Total Volatile Solids (TVS)-EPA %		280	Total Volatile Solids (TVS)-EPA %
		TVS-EPA q		281	TVS-EPA q
		Total Volatile Solids (TVS)-NED %			Total Volatile Solids (TVS)-NED %
		Volatile Solids (VS)-NED %		282	Volatile Solids (VS)-NED %
		VS-NED q		283	VS-NED q
		Oil And Grease (O and G) ppm		284	Oil And Grease (O and G) ppm

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		O and G q		285	O and G q
		O and G det. lim.		286	O and G det. lim.
		Petroleum Hydrocarbons-total (Total PHC) %DW		287	Petroleum Hydrocarbons-total (Total PHC) %DW
		PHC q		288	PHC q
		PHC det. lim.		289	PHC det.. lim.
		PCB's (Total Polychlorinated biphenyls) µg/g		290	PCB's (Total Polychlorinated biphenyls) µg/g
		PCB's q		291	PCB's q
		PCB's det. lim.		292	PCB's det. lim.
		DDT total µg/g		293	DDT total µg/g
		DDT total q		294	DDT total q
		DDT total det lim		295	DDT total det lim
		Pesticides Total µg/g		296	Pesticides Total µg/g
		Pesticides Total q		297	Pesticides Total q
		Pesticides Total dl		298	Pesticides Total dl
		Aromatic Hydrocarbons (Total Parent PAH) %DW		299	Aromatic Hydrocarbons (Total Parent PAH) %DW
		PAH q		300	PAH q
		Lipids ppb		301	Lipids ppb
		Others		302	Others
		Clostridium perfringens (spores/g)		303	Clostridium perfringens (spores/g)
		Clostridium perfringens q		304	Clostridium perfringens q
				::	
Table of Specific Organic Contaminants				GSCE-O R2	
		Local Row or ID Number		1	Local Row or ID Number
		Cover-Id Unique Sample Identifier (US#)		2	Cover-Id Unique Sample Identifier (US#)
		Source of Information, Reference, or Reference ID No.		24	Source of Information, Reference, or Reference ID No.

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
Analytical					
		Laboratory's internal ID number (specific organics)		306	Laboratory's internal ID number (specific organics)
		Laboratory's sample ID number (specific organics)		307	Laboratory's sample ID number (specific organics)
		Replicate no ___ of n (specific organics)		310	Replicate no ___ of n (specific organics)
		Total replicates n (specific organics)		311	Total replicates n (specific organics)
		Testing Date (specific organics)		312	Testing Date (specific organics)
		Test day (specific organics)		313	Test day (specific organics)
		Test month (specific organics)		314	Test month (specific organics)
		Test year (specific organics)		315	Test year (specific organics)
Specific organic compounds					
		PCB*8 ppb		316	PCB*8 ppb
		PCB*18 ppb		317	PCB*18 ppb
		PCB*28 ppb		318	PCB*28 ppb
		PCB*44 ppb		319	PCB*44 ppb
		PCB*52 ppb		320	PCB*52 ppb
		PCB*66 ppb		321	PCB*66 ppb
		PCB*77/110 ppb		322	PCB*77/110 ppb
		PCB*101 ppb		323	PCB*101 ppb
		PCB*105 ppb		324	PCB*105 ppb
		PCB*118 ppb		325	PCB*118 ppb
		PCB*126 ppb		326	PCB*126 ppb
		PCB*128 ppb		327	PCB*128 ppb
		PCB*138 ppb		328	PCB*138 ppb
		PCB*153 ppb		329	PCB*153 ppb
		PCB*179 ppb		330	PCB*179 ppb
		PCB*180 ppb		331	PCB*180 ppb

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		PCB*187 ppb		332	PCB*187 ppb
		PCB*195 ppb		333	PCB*195 ppb
		PCB*206 ppb		334	PCB*206 ppb
		PCB*209 ppb		335	PCB*209 ppb
		PCB q		336	PCB q
		PCB det lim		337	PCB det lim
		Arochlor* 1016/1242 ppb		338	Arochlor* 1016/1242 ppb
		Arochlor* 1221 ppb		339	Arochlor* 1221 ppb
		Arochlor* 1232 ppb		340	Arochlor* 1232 ppb
		Arochlor* 1248 ppb		341	Arochlor* 1248 ppb
		Arochlor* 1254 ppb		342	Arochlor* 1254 ppb
		Arochlor* 1260 ppb		343	Arochlor* 1260 ppb
		Arochlor q		344	Arochlor q
		Arochlor det. lim.		345	Arochlor det. lim.
		Toxaphene ppb		346	Toxaphene ppb
		Toxaphene q		347	Toxaphene q
		Toxaphene det. lim.		348	Toxaphene det. lim.
		DDT 4,4' ppb		349	DDT 4,4' ppb
		DDT 4,4' det lim		350	DDT 4,4' det lim
		DDT 4,4' q		351	DDT 4,4' q
		DDT 2,4' ppb		352	DDT 2,4' ppb
		DDT 2,4' det lim		353	DDT 2,4' det lim
		DDT 2,4' q		354	DDT 2,4' q
		DDE total ppb		355	DDE total ppb
		DDE total q		356	DDE total q
		DDE total det. lim.		357	DDE total det. lim.
		DDE 4,4' ppb		358	DDE 4,4' ppb
		DDE 4,4' det lim		359	DDE 4,4' det lim
		DDE 4,4' q		360	DDE 4,4' q
		DDE 2,4 ppb		361	DDE 2,4 ppb
		DDE 2,4' det lim		362	DDE 2,4' det lim
		DDE 2,4' q		363	DDE 2,4' q
		DDD total ppb		364	DDD total ppb
		DDD total q		365	DDD total q
		DDD total det. lim.		366	DDD total det. lim.
		DDD 4,4' ppb		367	DDD 4,4' ppb
		DDD 4,4' det lim		368	DDD 4,4' det lim

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		DDD 4,4' q		369	DDD 4,4' q
		DDD 2,4 ppb		370	DDD 2,4 ppb
		DDD 2,4' det lim		371	DDD 2,4' det lim
		DDD 2,4' q		372	DDD 2,4' q
	HEPCL	Heptachlor ppb		373	Heptachlor ppb
	HEPCL_Q	Heptachlor qualifier		374	Heptachlor q
	HEPCL_D	Heptachlor det. lim.		375	Heptachlor det. lim.
	HEPCLX	Heptachlor epoxide ppb		376	Heptachlor epoxide ppb
	HEPCLX_Q	Heptachlor epoxide qualifier		377	Heptachlor epoxide q
	HEPCLX_D	Heptachlor epoxide det. lim.		378	Heptachlor epoxide det. lim.
		Hexachlorobenzene (HCB) ppb		379	Hexachlorobenzene (HCB) ppb
		Hexachlorobenzene q		380	Hexachlorobenzene q
		Hexachlorobenzene det. lim.		381	Hexachlorobenzene det. lim.
	ENDRIN	Endrin ppb		382	Endrin ppb
	ENDRIN_Q	Endrin qualifier		383	Endrin q
	ENDRIN_D	Endrin det. lim.		384	Endrin det. lim.
		Endrin Aldehyde ppb		385	Endrin Aldehyde ppb
		Endrin Aldehyde q		386	Endrin Aldehyde q
		Endrin Aldehyde det. lim.		387	Endrin Aldehyde det. lim.
		Aldrin ppb		388	Aldrin ppb
		Aldrin q		389	Aldrin q
		Aldrin det. lim.		390	Aldrin det. lim.
	DIELDR	Dieldrin ppb		391	Dieldrin ppb
	DIELDR_Q	Dieldrin qualifier		392	Dieldrin q
	DIELDR_D	Dieldrin det. lim.		393	Dieldrin det. lim.
		Cyclohexane (total) ppb		394	Cyclohexane (total) ppb
		Cyclohexane (total) det. lim		395	Cyclohexane (total) det. lim
		Cyclohexane (total) q		396	Cyclohexane (total) q
		Cyclohexane (alpha) ppb		397	Cyclohexane (alpha) ppb
		Cyclohexane (alpha) det. lim		398	Cyclohexane (alpha) det. lim

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Cyclohexane (alpha) q		399	Cyclohexane (alpha) q
		Cyclohexane (beta) ppb		400	Cyclohexane (beta) ppb
		Cyclohexane (beta) det. lim		401	Cyclohexane (beta) det. lim
		Cyclohexane (beta) q		402	Cyclohexane (beta) q
		Cyclohexane (gamma) ppb		403	Cyclohexane (gamma) ppb
		Cyclohexane (gamma) det. lim		404	Cyclohexane (gamma) det. lim
		Cyclohexane (gamma) q		405	Cyclohexane (gamma) q
		Chlordane (total) ppb		406	Chlordane (total) ppb
		Chlordane (total) det. lim		407	Chlordane (total) det. lim
		Chlordane (total) q		408	Chlordane (total) q
		Chlordane (alpha) ppb		409	Chlordane (alpha) ppb
		Chlordane (alpha) det. lim		410	Chlordane (alpha) det. lim
		Chlordane (alpha) q		411	Chlordane (alpha) q
		Chlordane (gamma) ppb		412	Chlordane (gamma) ppb
		Chlordane (gamma) det. lim		413	Chlordane (gamma) det. lim
		Chlordane (gamma) q		414	Chlordane (gamma) q
		Trans-nonachlor ppb		415	Trans-nonachlor ppb
		Trans-nonachlor det. lim		416	Trans-nonachlor det. lim
		Trans-nonachlor q		417	Trans-nonachlor q
		Mirex ppb		418	Mirex ppb
		Mirex q		419	Mirex q
		Mirex det. lim.		420	Mirex det. lim.
		Parathion ppb		421	Parathion ppb
		Parathion q		422	Parathion q
		Parathion det. lim.		423	Parathion det. lim.
		Malathion ppb		424	Malathion ppb
		Malathion q		425	Malathion q
		Malathion det. lim.		426	Malathion det. lim.
		Methoxychlor ppb		427	Methoxychlor ppb
		Methoxychlor q		428	Methoxychlor q
		Methoxychlor det. lim.		429	Methoxychlor det. lim.

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		BHC (alpha) ppb		430	BHC (alpha) ppb
		BHC (alpha) q		431	BHC (alpha) q
		BHC (alpha) det. lim.		432	BHC (alpha) det. lim.
		BHC (beta) ppb		433	BHC (beta) ppb
		BHC (beta) q		434	BHC (beta) q
		BHC (beta) det. lim.		435	BHC (beta) det. lim.
	LIND	BHC-gamma (Lindane) ppb		436	BHC (gamma) = Lindane ppb
	LIND_Q	BHC-gamma (Lindane) qualifier		437	BHC (gamma) = Lindane q
		BHC (gamma) = Lindane det. lim.		438	BHC (gamma) = Lindane det. lim.
		BHC (delta) ppb		439	BHC (delta) ppb
		BHC (delta) q		440	BHC (delta) q
		BHC (delta) det. lim.		441	BHC (delta) det. lim.
		Benzene ppb		442	Benzene ppb
		Benzene q		443	Benzene q
		Benzene det. lim.		444	Benzene det. lim.
	DBTHIO	dibenzothiophene ppb		445	dibenzothiophene ppb
	DBTHIO_Q	dibenzothiophene qualifier field		446	dibenzothiophene q
	DBTHIO_D	dibenzothiophene det lim		447	dibenzothiophene det lim
		dibenzothiophene (total) ppb			dibenzothiophene (total) ppb
		dibenzothiophene (total)q			dibenzothiophene (total)q
		dibenzothiophene (total) dl			dibenzothiophene (total) dl
		dibenzothiophene (C1) ppb			dibenzothiophene (C1) ppb
		dibenzothiophene (C1) q			dibenzothiophene (C1) q
		dibenzothiophene (C1) dl			dibenzothiophene (C1) dl
		dibenzothiophene (C2) ppb			dibenzothiophene (C2) ppb
		dibenzothiophene (C2) q			dibenzothiophene (C2) q

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		dibenzothiophene (C2) dl			dibenzothiophene (C2) dl
		dibenzothiophene (C3) ppb			dibenzothiophene (C3) ppb
		dibenzothiophene (C3) q			dibenzothiophene (C3) q
		dibenzothiophene (C3) dl			dibenzothiophene (C3) dl
		dibenzofuran (total) ppb		448	dibenzofuran (total) ppb
		dibenzofuran q		449	dibenzofuran q
		dibenzofuran det lim		450	dibenzofuran det lim
		Naphthalene ppb			Naphthalene ppb
		Naphthalene q			Naphthalene q
		Naphthalene det. lim.			Naphthalene det. lim.
		Naphthalenes (total) ppb		451	Naphthalenes (total) ppb
		Naphthalenes (total) q		452	Naphthalenes (total) q
		Naphthalenes (total) det. lim.		453	Naphthalenes (total) det. lim.
		Naphthalenes (C1) ppb		454	Naphthalenes (C1) ppb
		Naphthalenes (C1) q		455	Naphthalenes (C1) q
		Naphthalenes (C1) det. lim.		456	Naphthalenes (C1) det. lim.
		1-Methyl-Napthalene ppb		457	1-Methyl-Napthalene ppb
		1-Methyl-Napthalene q		458	1-Methyl-Napthalene q
		1-Methyl-Napthalene det. lim.		459	1-Methyl-Napthalene det. lim.
		2-Methyl-Napthalene ppb		460	2-Methyl-Napthalene ppb
		2-Methyl-Napthalene q		461	2-Methyl-Napthalene q
		2-Methyl-Napthalene det. lim.		462	2-Methyl-Napthalene det. lim.
		Naphthalenes (C2) ppb		463	Naphthalenes (C2) ppb
		Naphthalenes (C2) q		464	Naphthalenes (C2) q
		Naphthalenes (C2) det. lim.		465	Naphthalenes (C2) det. lim.

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Naphthalenes (C3) ppb		466	Naphthalenes (C3) ppb
		Naphthalenes (C3) q		467	Naphthalenes (C3) q
		Naphthalenes (C3) det. lim.		468	Naphthalenes (C3) det. lim.
		Naphthalenes (C4) ppb			Naphthalenes (C4) ppb
		Naphthalenes (C4) q			Naphthalenes (C4) q
		Naphthalenes (C4) det. lim.			Naphthalenes (C4) det. lim.
	BIPHEN	Biphenyl ppb		469	Biphenyl ppb
	BIPHEN_Q	Biphenyl q		470	Biphenyl q
	BIPHEN_D	Biphenyl det. lim.		471	Biphenyl det. lim.
		Acenaphthene ppb		472	Acenaphthene ppb
		Acenaphthene q		473	Acenaphthene q
		Acenaphthene det. lim.		474	Acenaphthene det. lim.
		Acenaphthylene ppb		475	Acenaphthylene ppb
		Acenaphthylene q		476	Acenaphthylene q
		Acenaphthylene det. lim.		477	Acenaphthylene det. lim.
	FLUOR	Fluorene ppb		478	Fluorene ppb
	FLUOR_Q	Fluorene q		479	Fluorene q
	FLUOR_D	Fluorene det. lim.		480	Fluorene det. lim.
		Fluorene (C1) ppb			Fluorene (C1) ppb
		Fluorene (C1) q			Fluorene (C1) q
		Fluorene (C1) det. lim.			Fluorene (C1) det. lim.
		Fluorene (C2) ppb			Fluorene (C2) ppb
		Fluorene (C2) q			Fluorene (C2) q
		Fluorene (C2) det. lim.			Fluorene (C2) det. lim.
	PANTH	Phenanthrene ppb		481	Phenanthrene ppb
	PANTH_Q	Phenanthrene qualifier		482	Phenanthrene q
	PANTH_D	Phenanthrene det. lim.		483	Phenanthrene det. lim.
		1-Methyl-Phenanthrene ppb		484	1-Methyl-Phenanthrene ppb
		1-Methyl-Phenanthrene q		485	1-Methyl-Phenanthrene q
		1-Methyl-Phenanthrene det. lim.		486	1-Methyl-Phenanthrene det. lim.

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Phenanthrene* (C2)			Phenanthrene* (C2)
		Phenanthrene* (C2) q			Phenanthrene* (C2) q
		Phenanthrene* (C2) dl			Phenanthrene* (C2) dl
		Phenanthrene* (C3)			Phenanthrene* (C3)
		Phenanthrene* (C3) q			Phenanthrene* (C3) q
		Phenanthrene* (C3) dl			Phenanthrene* (C3) dl
		Phenanthrene* (C4)			Phenanthrene* (C4)
		Phenanthrene* (C4) q			Phenanthrene* (C4) q
		Phenanthrene* (C4) dl			Phenanthrene* (C4) dl
	ANTH	Anthracene ppb		487	Anthracene ppb
	ANTH_Q	Anthracene qualifier		488	Anthracene q
	ANTH_D	Anthracene det. lim.		489	Anthracene det. lim.
	BAANTH	Benz(a) anthracene ppb		490	Benz(a) anthracene ppb
	BAANTH_Q	Benz(a) anthracene qualifier		491	Benz(a) anthracene q
	BAANTH_D	Benz (a) anthracene det. lim.		492	Benz (a) anthracene det. lim.
		dibenz (a,h) anthracene ppb		493	dibenz (a,h) anthracene ppb
		dibenz (a,h) anthracene q		494	dibenz (a,h) anthracene q
		dibenz (a,h) anthracene det. lim.		495	dibenz (a,h) anthracene det. lim.
	PYREN	Pyrene ppb		496	Pyrene ppb
	PYREN_Q	Pyrene q		497	Pyrene q
	PYREN_D	Pyrene det. lim.		498	Pyrene det. lim.
		Pyrene (C1) ppb			Pyrene (C1) ppb
		Pyrene(C1) q			Pyrene(C1) q
		Pyrene (C1) det. lim.			Pyrene (C1) det. lim.
	BAPYRE	Benzo (a) pyrene ppb		499	Benzo (a) pyrene ppb
	BAPYRE_Q	Benzo (a) pyrene qualifier		500	Benzo (a) pyrene q
	BAPYRE_D	Benzo (a) pyrene det. lim.		501	Benzo (a) pyrene det. lim.
	BEPYRE	Benzo (e) pyrene ppb		502	Benzo (e) pyrene ppb
	BEPYRE_Q	Benzo (e) pyrene qualifier		503	Benzo (e) pyrene q
	BEPYRE_D	Benzo (e) pyrene det. lim.		504	Benzo (e) pyrene det. lim.
	INDPYR	Indeno(123)Pyrene ppb		505	Indeno(123)Pyrene ppb
	INDPYR_Q	Indeno(123)Pyrene qualifier		506	Indeno(123)Pyrene q

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	INDPYR_D	Indeno(123)Pyrene det. lim.		507	Indeno(123)Pyrene det. lim.
		3,4 Benzo pyrene ppb		508	3,4 Benzo pyrene ppb
		3,4 Benzo pyrene q		509	3,4 Benzo pyrene q
		3,4 Benzo pyrene dl		510	3,4 Benzo pyrene dl
	FANTH	Fluoranthene ppb		511	Fluoranthene ppb
	FANTH_Q	Fluoranthene qualifier		512	Fluoranthene q
	FANTH_D	Fluoranthene det. lim.		513	Fluoranthene det. lim.
		Fluoranthene (C1)			Fluoranthene (C1)
		Fluoranthene (C1) q			Fluoranthene (C1) q
		Fluoranthene (C1) det. lim.			Fluoranthene (C1) det. lim.
		Benzo (b) floranthene ppb		514	Benzo (b) floranthene ppb
		Benzo (b) floranthene q		515	Benzo (b) floranthene q
		Benzo (b) floranthene det. lim.		516	Benzo (b) floranthene det. lim.
	BKFLAN	Benzo (k) floranthene ppb		517	Benzo (k) floranthene ppb
	BKFLAN_Q	Benzo (k) floranthene qualifier		518	Benzo (k) floranthene q
	BKFLAN_D	Benzo (k) floranthene det. lim.		519	Benzo (k) floranthene det. lim.
	CHRYSE	Chrysene ppb		520	Chrysene ppb
	CHRYSE_Q	Chrysene qualifier		521	Chrysene q
	CHRYSE_D	Chrysene det. lim.		522	Chrysene det. lim.
	PERYLE	Perylene ppb		523	Perylene ppb
	PERYLE_Q	Perylene qualifier		524	Perylene q
	PERYLE_D	Perylene det. lim.		525	Perylene det. lim.
		Benzo (g) Perylene ppb		526	Benzo (g) Perylene ppb
		Benzo (g) Perylene q		527	Benzo (g) Perylene q
		Benzo (g) Perylene det. lim.		528	Benzo (g) Perylene det. lim.
	BGHIPE	Benzo (g,h,i) Perylene ppb		529	Benzo (g,h,i) Perylene ppb
	BGHIPE_Q	Benzo (g,h,i) Perylene qualifier		530	Benzo (g,h,i) Perylene q

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	BGHIPE_D	Benzo (g,h,i) Perylene det. lim.		531	Benzo (g,h,i) Perylene det. lim.
		monobutyl tin ppb			monobutyl tin ppb
		monobutyl tin q			monobutyl tin q
		monobutyl tin det. lim.			monobutyl tin det. lim.
		Dibutyl tin ppb		532	Dibutyl tin ppb
		Dibutyl tin q		533	Dibutyl tin q
		Dibutyl tin det. lim.		534	Dibutyl tin det. lim.
		Tributyl tin ppb		535	Tributyl tin ppb
		Tributyl tin q		536	Tributyl tin q
		Tributyl tin det. lim.		537	Tributyl tin det. lim.
		Tetrabutyl tin ppb			Tetrabutyl tin ppb
		Tetrabutyl tin q			Tetrabutyl tin q
		Tetrabutyl tin det. lim.			Tetrabutyl tin det. lim.
		Endosulfan II ppb		538	Endosulfan II ppb
		Endosulfan II q		539	Endosulfan II q
		Endosulfan II det. lim.		540	Endosulfan II det. lim.
		Endosulfan Sulfate ppb		541	Endosulfan Sulfate ppb
		Endosulfan Sulfate q		542	Endosulfan Sulfate q
		Endosulfan Sulfate det. lim.		543	Endosulfan Sulfate det. lim.
		Endosulfan I ppb		544	Endosulfan I ppb
		Endosulfan I q		545	Endosulfan I q
		Endosulfan I det. lim.		546	Endosulfan I det. lim.
				::	
Table of Sediment Grain Size and Other Physical Properties				GSCE-SIZ	
		Local Row or ID Number		1	Local Row or ID Number
		Cover-ID Unique Sample Identifier (US#)		2	Cover-ID Unique Sample Identifier (US#)

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Source of Information, Reference, or Reference ID No.		24	Source of Information, Reference, or Reference ID No.
Analytical		Laboratory ID number (size)		548	Laboratory ID number (size)
		Laboratory's sample ID number (size)		549	Laboratory's sample ID number (size)
		Replicate no ___ of n		552	Replicate no ___ of n
		Total replicates n		553	Total replicates n
		Sample weight		557	Sample weight
		Sample weight units		558	Sample weight units
		Physical description of sample		559	Physical description of sample
		Dominant soil or sediment class		560	Dominant soil or sediment class
		Classification system used		561	Classification system used
		Grain Size Curve-Med		562	Grain Size Curve-Med
		Grain Size Curve-Q1		563	Grain Size Curve-Q1
		Grain Size Curve-Q2		564	Grain Size Curve-Q2
		Grain Size Curve-Q3		565	Grain Size Curve-Q3
		Grain Size Curve-%Curve [?]		566	Grain Size Curve-%Curve [?]
		Specific Gravity g/cm3		47	Specific Gravity g/cm3
	567				
	GRAVEL	Gravel (%DW)		48	Gravel (%DW)
	568				
	SAND	Sand (%DW)		49	Sand (%DW)
	569				
	SILT	Silt (%Dw)		50	Silt (%Dw)
	570				

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	CLAY	Clay (%Dw)		51	Clay (%Dw)
571		Total Fines (%Dw)		572	Total Fines (%Dw)
	MEAN_FG	Mean	Mean grain size, Folk's graphic, phi units	573	Mean
	MEDIANF50	Median	Median grain size, Folk's, phi 50th percentile	574	Median
	SORT_FGI	Sorting	Folk inclusive graphic std-sorting coefficient	575	Sorting
	SKEW_FGI	Skewness	Folk inclusive graphic skewness	576	Skewness
	KURT_FGI	Kurtosis	Folk Inclusive graphic kurtosis	577	Kurtosis
		Mode 1 (phi units)		578	Mode 1 (phi units)
		Mode 1 strength		579	Mode 1 strength
		Mode 2 (phi units)		580	Mode 2 (phi units)
		Mode 2 strength		581	Mode 2 strength
		Mode 3 (phi units)		582	Mode 3 (phi units)
		Mode 3 strength		583	Mode 3 strength
		No. of modes		584	No. of modes
		From phi		585	From phi
		To phi		586	To phi
		Phi step		587	Phi step
		Phi -11		588	Phi -11
		Phi -10		589	Phi -10
		Phi -9		590	Phi -9
		Phi -8		591	Phi -8
		Phi -7		592	Phi -7
		Phi <-6		593	Phi <-6
		Phi -6		594	Phi -6
		Phi -5		595	Phi -5
		Phi -4		596	Phi -4
		Phi -3		597	Phi -3

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Phi -2		598	Phi -2
		Phi <-1		599	Phi <-1
		Phi -1		600	Phi -1
		Phi 0		601	Phi 0
		Phi 1		602	Phi 1
		Phi 2		603	Phi 2
		Phi 3		604	Phi 3
		Phi 4		605	Phi 4
		Phi 5		606	Phi 5
		Phi 6		607	Phi 6
		Phi 7		608	Phi 7
		Phi 8		609	Phi 8
		Phi 9		610	Phi 9
		Phi 10		611	Phi 10
		Phi 11		612	Phi 11
		Phi >10		613	Phi >10
		Phi 12		614	Phi 12
		Phi 13		615	Phi 13
		Phi 14		616	Phi 14
		Phi 15		617	Phi 15
		Phi 16		618	Phi 16
		Phi 17		619	Phi 17
		Phi 18		620	Phi 18
		Phi 19		621	Phi 19
		Phi 20		622	Phi 20
		Phi 21		623	Phi 21
		HPhi <=-3.0		624	HPhi <=-3.0
		Hphi -2.5		625	Hphi -2.5
		HPhi -2.0		626	HPhi -2.0
		HPhi -1.5		627	HPhi -1.5
		HPhi -1.0		628	HPhi -1.0
		HPhi -0.5		629	HPhi -0.5
		HPhi 0.0		630	HPhi 0.0
		HPhi 0.5		631	HPhi 0.5
		HPhi 1.0		632	HPhi 1.0
		HPhi 1.5		633	HPhi 1.5
		HPhi 2.0		634	HPhi 2.0
		HPhi 2.5		635	HPhi 2.5

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		HPhi 3.0		636	HPhi 3.0
		HPhi 3.5		637	HPhi 3.5
		HPhi 4.0		638	HPhi 4.0
		HPhi 4.5		639	HPhi 4.5
		HPhi 5.0		640	HPhi 5.0
		HPhi 6.0		641	HPhi 6.0
		HPhi 7.0		642	HPhi 7.0
		HPhi 8.0		643	HPhi 8.0
		HPhi 9.0		644	HPhi 9.0
		HPhi 10.0		645	HPhi 10.0
		HPhi 11.0		646	HPhi 11.0
		HPhi >10		647	HPhi >10
		QPhi <=-2.50		648	QPhi <=-2.50
		QPhi -2.25		649	QPhi -2.25
		QPhi -2.00		650	QPhi -2.00
		QPhi -1.75		651	QPhi -1.75
		QPhi -1.50		652	QPhi -1.50
		QPhi -1.25		653	QPhi -1.25
		QPhi -1.00		654	QPhi -1.00
		QPhi -0.75		655	QPhi -0.75
		QPhi -0.50		656	QPhi -0.50
		QPhi -0.25		657	QPhi -0.25
		QPhi 0.00		658	QPhi 0.00
		QPhi 0.25		659	QPhi 0.25
		QPhi 0.50		660	QPhi 0.50
		QPhi 0.75		661	QPhi 0.75
		QPhi 1.00		662	QPhi 1.00
		QPhi 1.25		663	QPhi 1.25
		QPhi 1.50		664	QPhi 1.50
		QPhi 1.75		665	QPhi 1.75
		QPhi 2.00		666	QPhi 2.00
		QPhi 2.25		667	QPhi 2.25
		QPhi 2.50		668	QPhi 2.50
		QPhi 2.75		669	QPhi 2.75
		QPhi 3.00		670	QPhi 3.00
		QPhi 3.25		671	QPhi 3.25
		QPhi 3.50		672	QPhi 3.50
		QPhi 3.75		673	QPhi 3.75

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		QPhi 4.00		674	QPhi 4.00
		QPhi 4.25		675	QPhi 4.25
		QPhi 4.50		676	QPhi 4.50
		QPhi 4.75		677	QPhi 4.75
		QPhi 5.00		678	QPhi 5.00
		QPhi 6.00		679	QPhi 6.00
		QPhi 7.00		680	QPhi 7.00
		QPhi 8.00		681	QPhi 8.00
		QPhi 9.00		682	QPhi 9.00
		QPhi 10.00		683	QPhi 10.00
		QPhi 11.00		684	QPhi 11.00
		QPhi >10		685	QPhi >10
		Class 1		686	Class 1
		Class 1 %		687	Class 1 %
		Class 2		688	Class 2
		Class 2 %		689	Class 2 %
		Class 3		690	Class 3
		Class 3 %		691	Class 3 %
		Class 4		692	Class 4
		Class 4 %		693	Class 4 %
		Class 5		694	Class 5
		Class 5 %		695	Class 5 %
		Class 6		696	Class 6
		Class 6 %		697	Class 6 %
		Class 7		698	Class 7
		Class 7 %		699	Class 7 %
		Class 8		700	Class 8
		Class 8 %		701	Class 8 %
		Class 9		702	Class 9
		Class 9 %		703	Class 9 %
		Class 10		704	Class 10
		Class 10 %		705	Class 10 %
		Class 11		706	Class 11
		Class 11 %		707	Class 11 %
		Class 12		708	Class 12
		Class 12 %		709	Class 12 %
		Class 13		710	Class 13
		Class 13 %		711	Class 13 %

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Class 14		712	Class 14
		Class 14 %		713	Class 14 %
		Class 15		714	Class 15
		Class 15 %		715	Class 15 %
		Class 16		716	Class 16
		Class 16 %		717	Class 16 %
		Class 17		718	Class 17
		Class 17 %		719	Class 17 %
		Class 18		720	Class 18
		Class 18 %		721	Class 18 %
		Class 19		722	Class 19
		Class 19 %		723	Class 19 %
		Class 20		724	Class 20
		Class 20 %		725	Class 20 %
		Class 21		726	Class 21
		Class 21 %		727	Class 21 %
		Class 22		728	Class 22
		Class 22 %		729	Class 22 %
		Class 23		730	Class 23
		Class 23 %		731	Class 23 %
		Class 24		732	Class 24
		Class 24 %		733	Class 24 %
		Class 25		734	Class 25
		Class 25 %		735	Class 25 %
				::	
Table of References				GSCE-REF	
		Local Row or ID Number		1	Local Row or ID Number
		Cover-Id Unique Sample Identifier (US#)		2	Cover-Id Unique Sample Identifier (US#)
		Source of Information, Reference, or Reference ID No.		24	Source of Information, Reference, or Reference ID No.
Reference		Author(s)		736	Author(s)
		year		737	year

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Title		738	Title
		Journal or document source		739	Journal or document source
Organizational					
		List of agencies		740	List of agencies
		acronym for agencies		741	acronym for agencies
		List of laboratories		742	List of laboratories
		acronym for laboratories		743	acronym for laboratories
		List of Location Names		744	List of Location Names
		Abreviation for location names		745	Abreviation for location names
		List of sampling devices		746	List of sampling devices
		Abreviation for sampling devices		747	Abreviation for sampling devices
		List of units		748	List of units
		Abreviation for units		749	Abreviation for units
		List of navigational modes		750	List of navigational modes
		Abreviation for naviagational modes		751	Abreviation for naviagational modes
		List of journal or reference names		752	List of journal or reference names
		Abreviation for journal or reference names		753	Abreviation for journal or reference names
		List of analytical methods		754	List of analytical methods
		Abreviation for analytical methods		755	Abreviation for analytical methods
		Additional frequently cited items		756	Additional frequently cited items
		Abreviation for additional frequently cited items		757	Abreviation for additional frequently cited items
		List of fields added by data entry person			List of fields added by data entry person

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
		Placement of added fields			Placement of added fields
	CBP_SEG	Ches. Bay Program code for section of Bay (same as CBP SEGMENT)	The code indicating the geographic segment of the Chesapeake Bay, as defined by the Chesapeake Bay Program. Identical to C.B.P. field named SEGMENT.		
	ZR	Zr (zirconium) ug/g, in dry sediment			
	YB	Yb (ytterbium) ug/g, in dry sediment			
	AGE_YR	Year of deposition of sediment by 210Pb dating			
	GA	Ga (gallium) ug/g, in dry sediment			
	LA	La (lanthanum) ug/g, in dry sediment			
	DY	Dy (dysprosium) ug/g, in dry sediment			
	CE	Ce (cerium) ug/g, in dry sediment			
	PYRO	pyrogenic organics in sediment, ug/kg			
	NON_PYRO	non-pyrogenic organics in sediment, ug/kg			
	DBTHIO_O	dibenzothiophene value in original units, if not ppb			
	DBTHIO_U	dibenzothiophene original units			
	ANTH_O	anthracene value in original units, if not ppb			
	ANTH_U	anthracene original units			
	BIPHEN_O	biphenyl value in original units, if not ppb			

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	BIPHEN_U	biphenyl original units			
	PANTH_O	phenanthrene value in original units, if not ppb			
	PANTH_U	phenanthrene original units			
	FLUOR_O	fluorene value in original units, if not ppb			
	FLUOR_U	fluorene original units			
	PERYLE_O	Perylene value in original units, if not ppb			
	PERYLE_U	Perylene original units			
	INDPYR_O	Indeno(123)Pyrene value in original units, if not ppb			
	FANTH_O	Fluoranthene value in original units, if not ppb			
	FANTH_U	Fluoranthene original units			
	PYREN_O	Pyrene value in original units, if not ppb			
	PYREN_U	Pyrene original units			
	BAPYRE_O	Benzo (a) pyrene value in original units, if not ppb			
	BAPYRE_U	Benzo (a) pyrene original units			
	BEPYRE_O	Benzo (e) pyrene value in original units, if not ppb			
	BEPYRE_U	Benzo (e) pyrene original units			
	BAANTH_O	Benz (a) anthracene value in original units, if not ppb			
	BAANTH_U	Benz (a) anthracene original units			
	CHRYSE_O	Chrysene value in original units, if not ppb			
	CHRYSE_U	Chrysene original units			
	BKFLAN_O	Benzo (k) fluoranthene value in original units, if not ppb			
	BKFLAN_U	Benzo (k) fluoranthene original units			
	INDPYR_U	Indeno(123)Pyrene original units			

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	BAFLUR	Benzo (a) fluorene, ppb			
	BAFLUR_O	Benzo (a) fluorene value in original units, if not ppb			
	BAFLUR_U	Benzo (a) fluorene original units			
	BAFLUR_Q	Benzo (a) fluorene qualifier			
	BAFLUR_D	Benzo (a) fluorene detection limit			
	BGHIPE_O	Benzo (g,h,i) perylene value in original units, if not ppb			
	BGHIPE_U	Benzo (g,h,i) perylene original units			
	TOT_ORG	Total resolvable organics (pyro & non-pyro)			
	NH4	Ammonium, umoles/kg			
	NH4_O	Ammonium, value in original units if not umoles/kg			
	NH4_U	Ammonium original units			
	NO2_O	Nitrite (NO2) value in original units, if not umoles/kg			
	NO2_U	Nitrite (NO2) original units, if not umoles/kg			
	NO3_O	Nitrate (NO3) value in original units, if not umoles/kg			
	NO3_U	Nitrate (NO3) original units, if not umoles/kg			
	PO4	Phosphate (PO4) in umoles/kg			
	PO4_O	Phosphate (PO4) original value, if not in umoles/kg			
	PO4_U	Phosphate (PO4) original units, if not umoles/kg			
	LORANTDX	Loran-C x lane coordinate			
	LORANTDY	Loran-C y lane coordinate			
	RAYD_GRN	Raydist green lane coordinate			
	RAYD_RED	Raydist red lane coordinate			

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	MEDIANUP	Median grain size, phi units, method of determination unknown.	Median grain size, in phi units, where method of determination is unknown (not specified by data source).		
	MEAN_UP	Mean grain size, phi units, method of determination unknown.	Mean grain size, in phi units, where method of determination is unknown (not specified by data source).		
	MUD	Mud, weight percent of dry sample.	Mud, weight percent of dry sample. Use this field also for data labelled "silt + clay".		
	AS_O	As (arsenic) value in original units, if not ug/g			
	AS_U	As (arsenic) original units, if not ug/g.			
	CD_O	Cd (cadmium) value in original units, if not ug/g.			
	CD_U	Cd (cadmium) original units, if not ug/g.			
	HG_O	Hg (mercury) value in original units, if not ug/g.			
	HG_U	Hg (mercury) original units, if not ug/g.			
	PB_O	Pb (lead) value in original units, if not ug/g.			
	PB_U	Pb (lead) original units, if not ug/g.			
	SN_O	Sn (tin) value in original units, if not ug/g.			
	SN_U	Sn (tin) original units, if not ug/g.			

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	DMPHOL_O	2,4-dimethylphenol, value in original units, if not ppb (dry wt.)			
	DMPHOL_U	2,4-dimethylphenol original units, if not ppb.			
	DMPHOL	2,4-dimethylphenol, ppb, dry weight.			
	HEPCL_O	Heptachlor, value in original units, if not ppb.			
	HEPCL_U	Heptachlor original units, if not ppb.			
	HEPCLX_O	Heptachlor epoxide, value in original units, if not ppb.			
	HEPCLX_U	Heptachlor epoxide, original units, if not ppb.			
	DIELDR_O	Dieldrin value in original units, if not ppb.			
	DIELDR_U	Dieldrin original units, if not ppb.			
	ENDRIN_O	Endrin value in original units, if not ppb.			
	ENDRIN_U	Endrin original units, if not ppb.			
	STA_ID	Station ID code, provided in addition to station or sample number.	This field encountered in data file VDR135. Significance unknown.		
	DATE_SAS	Date in SAS format.	Date is stored as an integer in SAS format. Integer represents number of days since the "baseline" or reference date for SAS (Jan. 1, 1960).		
	SAM_FRAC	Sample of fraction analyzed.	A code representing the fraction of the sample that was analyzed: 0=bulk, 1=fine fraction.		

Category	Field Name	VIMS Brief Description	VIMS Expanded Description (as needed)	USGS Number	USGS Brief Description
	CWP0000	Cumulative wt.% at 0.00 phi			
	CWP0025	Cumulative wt.% at 0.25 phi			
	CWP0050	Cumulative wt.% at 0.50 phi			
	CWP0075	Cumulative wt.% at 0.75 phi			
	CWP0100	Cumulative wt.% at 1.00 phi			
	CWP0125	Cumulative wt.% at 1.25 phi			
	CWP0150	Cumulative wt.% at 1.50 phi			
	CWP0175	Cumulative wt.% at 1.75 phi			
	CWP0200	Cumulative wt.% at 2.00 phi			
	CWP0225	Cumulative wt.% at 2.25 phi			
	CWP0250	Cumulative wt.% at 2.50 phi			
	CWP0275	Cumulative wt.% at 2.75 phi			
	CWP0300	Cumulative wt.% at 3.00 phi			
	CWP0325	Cumulative wt.% at 3.25 phi			
	CWP0350	Cumulative wt.% at 3.50 phi			
	CWP0375	Cumulative wt.% at 3.75 phi			
	CWP0400	Cumulative wt.% at 4.00 phi			
	CWP0425	Cumulative wt.% at 4.25 phi			
	CWP0450	Cumulative wt.% at 4.50 phi			
	CWP0475	Cumulative wt.% at 4.75 phi			
	CWP0500	Cumulative wt.% at 5.00 phi			
	CWP0600	Cumulative wt.% at 6.00 phi			
	CWP0700	Cumulative wt.% at 7.00 phi			
	CWP0800	Cumulative wt.% at 8.00 phi			
	CWP0900	Cumulative wt.% at 9.00 phi			
	CWP1000	Cumulative wt.% at 10.00 phi			
	CWP1100	Cumulative wt.% at 11.00 phi			
	CWP_0025	Cumulative wt.% at -0.25 phi			
	CWP_0050	Cumulative wt.% at -0.50 phi			
	CWP_0075	Cumulative wt.% at -0.75 phi			
	CWP_0100	Cumulative wt.% at -1.00 phi			
	CWP_0125	Cumulative wt.% at -1.25 phi			
	CWP_0150	Cumulative wt.% at -1.50 phi			
	CWP_0175	Cumulative wt.% at -1.75 phi			
	CWP_0200	Cumulative wt.% at -2.00 phi			

APPENDIX 2: HISTORY FILES

\\VIMS DATA HISTORY FILE:
From the Virginia Institute of Marine Science, Gloucester, Virginia.
This file contains information which supplements the data file listed below.
\\
\\CONTACT: For more information, please contact Gary Anderson.
\\
\\FILE NAME: VDR135.DBF
\\
\\FILE DATE: 04/16/93
\\
\\FILE SIZE: 2,102,784
\\
\\BIBLIOGRAPHY: Reference # VDR 135 (BIBNUM 299)
\\
\\ABSTRACT

\\
\\SAMPLING SUMMARY:

Data collection type:	Surface sediment grabs
Number of stations or sites:	2168 (each record is believed to represent a separate station)
Number of measured variables:	57
Number of observations:	119,773

\\

\\NOTES:

4/87 > Received data in ASCII format from C.H. Hobbs, III.
04/07/93 > Converted to dBase format using SAS procedure PROC DBF.
04/08/93 > Reassigned field names.
> Converted west longitude to negative values.
04/15/93 > Reassigned null (missing) values.

> This file is in DBF format since its size prevents its import to Quattro Pro.
> Verification of data file against the published report is limited to one table, # 3A (p. 29) containing 8 samples. C.H. Hobbs, III (co-author) confirms that the text specified here matches the data file. (See BIBLIOGRAPHY.)

> We did not remove the null values in use, but merely replaced them, since dBase lacks the ability to create blank fields. We assume three null values to be in use--16 nines, 999 and 999.875. After comparing the dbf file with a partial printout obtained directly from the SAS file (ie, without converting to dbf format) and with a completely separate file in ASCII format, we feel the value 999.875 is equivalent to 999.0 and represents a missing value.

Since different nulls occur in the same field, it is possible that there is a reason for the use of two nulls, thus we have replaced them with separate values; 16 nines becomes -9999, and both 999.0 and 999.875 become -999. Note that the value 16 nines appears to be at dBase's numeric limit.

> The significance of STA_ID is unknown (contains null values).
> Phi units are assumed for MEDIAN and MODE.
> Percent dry weight is assumed for C_TOTWP and C_TOTORG.
> S_TOTRED is assumed to include elemental sulfur, hydrogen sulfide, and metal sulfides.
> Methods of determination for KURT and SKEW are unknown.

> Minimal data assessment was done and uncovered erroneous values for three fields: C_TOTWP, C_TOTORG, S_TOTRED. The mean values for these fields did not match those given in the text, and a spot check of two records against the original data sheets indicated the fields should be a factor of 10 lower. We adjusted these values accordingly, and the recalculated means now agree with the text. In addition, two samples needed further correction--they were originally off by 100 (verified against original data sheets):
>
> Station 127; field C_TOTORG
> Station 434; field C_TOTWP
>
> Values for several statistical variables appear unusual. The following fields contain values which may lie outside accepted ranges; SKEW, SKEW_MM, KURT, KURT_MM, KURT, FG. Since data quality assessment is not part of this project phase, no further consideration will be given to this problem at this time.

\\

\\HEADER FIELDS

Key: NAP=NOT APPLICABLE; NAV=NOT AVAILABLE

USGS #	FIELD NAME	FIELD CONTENTS
2	VDR	135
17	NAVMODE	LORAN C
21	AGENCY1	EPA Chesapeake Bay Program
22	AGENCY2	VIMS
23	AGENCY3	NAP
26	REGNUM	NAP
27	PROJECT	Baseline Sediment Studies to Determine Distribution, Physical Properties, Sedimentation Budgets and Rates in the Virginia Portion of the Chesapeake Bay
28	STATE	Virginia
29	QUAD	
30	LOC_GEN	Chesapeake Bay, Virginia Portion
31	LOC_SPEC	
44	GEAR	Smith-MacIntyre stainless steel grab sampler
45	SAM_TYPE	grab
55	LOC_DISP	NAP
56	ANAL_MET	N
57	ANAL_ORG	N
58	ANAL_GR	Y
59	ANAL_BIO	N
60	BIO_COM	NAP
61	BIO_REF	NAP
62	ANAL_MSC	Y
63	MSC_COM	Graphic: bathymetric change; sand accumulation. Tabular: sand, silt, clay accumulation; shoreline erosion/accretion (sediment mass)
63	MET_LAB	NAP
66	MET_METH	NAP
67	MET_COM	NAP
70	MET_TDTE	NAP
71	MET_TDAY	NAP
72	MET_TMO	NAP
73	MET_TYR	NAP
74	INO_LAB	NAP
77	INO_METH	NAP
78	INO_COM	NAP

81	INO_TDTE	NAP
82	INO_TDAY	NAP
83	INO_TMO	NAP
84	INO_TYR	NAP
269	GOR_LAB	NAP
272	GOR_METH	NAP
273	GOR_COM	NAP
276	GOR_TDTE	NAP
277	GOR_TDAY	NAP
278	GOR_TMO	NAP
279	GOR_TYR	NAP
305	SOR_LAB	NAP
308	SOR_METH	NAP
309	SOR_COM	NAP
547	GR_LAB	VIMS and MD Geological Survey
550	GR_METH	Rapid sediment analyzer, sieving, Coulter counter
551	GR_COM	All samples received the same pre-treatment but analytical methods varied according to sample fraction. See text, p. 21, for details.
554	GR_TDTE	NAV
555	GR_REQBY	NAV
556	GR_ANLBY	NAV

\\

\\STATISTICS

Unable to provide at this time.

\\

\\VIMS DATA HISTORY FILE:
From the Virginia Institute of Marine Science, Gloucester, Virginia.
This file contains information which supplements the data file listed below.
\\
\\CONTACT: For more information, please contact Gary Anderson.
\\
\\FILE NAME: VDR165.WQ1
\\
\\FILE DATE: 04/26/93
\\
\\FILE SIZE: 133,339
\\
\\BIBLIOGRAPHY: Reference # VDR 165 (BIBNUM 398, 275)
\\
\\ABSTRACT
The objective of this study was to establish a system to detect, identify, and quantify toxic organic compounds of significance in the water column, in sediments, and in oyster tissues from the Chesapeake Bay and selected tributaries.

This data set specifically contains organic toxics measured in sediments and whole water samples. The data were obtained on tape. Examination of the published reports failed to locate these data values that are included in this data set. Considerably more data are contained in the published reports than are contained in this file.
\\
\\SAMPLING SUMMARY:

Data collection type:	Surface sediment grabs, cores
Number of stations or sites:	123
Number of variables:	20
Number of observations:	2159

\\

\\NOTES:

6/90 > Received data in SAS format from CBP Computer Center, EPA Chesapeake Bay Program .
01/23/93 > Converted to dBase format using SAS procedure PROC DBF.
02/02/93 > Further converted to Quattro Pro file.
> Reassigned field names. Added columns to hold units.
> Converted west longitude to negative values.
> Deleted null (missing) values.
04/06/93 > Converted the field DATE_SAS to DATE_SAM by using date functions of Quattro Pro. Both fields included in the data set.

> Verification of the data file was attempted with BIBNUM 398 and was unsuccessful. Verification should be attempted with BIBNUM 275. Information presented here is based on BIBNUM 398.

> We assume that 1 x 10^16 is used as a null value (to represent missing values) and does not represent actual data.
> Unit of measure for total resolvable organics is assumed to be µg/kg.

\\

\\HEADER FIELDS

VDR	165
NAVMODE	Loran C and shore bearing (instrument not stated)
AGENCY1	EPA Chesapeake Bay Program
AGENCY2	VIMS
AGENCY3	NAP
REGNUM	NAP
PROJECT	Toxic Organic Compounds in the Sediments of the Chesapeake Bay
LOC_GEN	Chesapeake Bay mainstem
LOC_SPEC	
GEAR	0.1 m^2 stainless steel Smith-MacIntyre grab
SAM_TYPE	[YET TO BE RESOLVED--WHAT TO ENTER HERE? CODE TABLE NEEDED?]
LOC_DISP	NAP
ANAL_MET	N
ANAL_ORG	Y
ANAL_GR	N [BUT GRAVEL/SAND/SILT/CLAY % PROVIDED--NOTE THIS ELSEWHERE?]
ANAL_BIO	Y
BIO_COM	
BIO_REF	
ANAL_MSC	Y
ANAL_COM	METALS, SEE VDR163.
MET_LAB	NAP
MET_METH	NAP
MET_COM	NAP
INO_LAB	NAP
INO_METH	NAP
INO_COM	NAP
INO_TDTE	NAP
INO_TDAY	NAP
INO_TMO	NAP
INO_TYR	NAP
GOR_LAB	NAP
GOR_METH	NAP
GOR_COM	NAP
SOR_LAB	NAP
SOR_METH	gel permeation chromotography, HPLC, gas chromotography
SOR_COM	
GR_LAB	[not stated, VIMS assumed]
GR_METH	[not stated]
GR_COM	
GR_TDTE	
GR_REQBY	
GR_ANLBY	

\\

\\STATISTICS

VARIABLE	# SAMPLES	AVERAGE	MAXIMUM	MINIMUM	STD DEV
DBTHIO_O	111	204.50	10422.00	0.00	1030.58
DBTHIO_U					
BIPHEN_O	89	56.99	719.00	0.00	116.89
BIPHEN_U					
FLUOR_O	102	350.22	21854.00	0.00	2206.53
FLUOR_U					
PANTH_O	118	774.22	19370.00	2.00	2213.15
PANTH_U					
ANTH_O	111	386.77	12158.00	0.00	1376.83

ANTH_U					
FANTH_O	119	1559.91	34616.00	1.00	4034.09
FANTH_U					
PYREN_O	119	1363.87	26377.00	1.00	3136.95
PYREN_U					
BAFLUR_O	117	465.18	9182.00	0.00	1165.71
BAFLUR_U					
BBFLAN_O	115	887.59	24756.00	0.00	2459.28
BBFLAN_U					
BAANTH_O	117	541.35	9999.00	0.00	1173.06
BAANTH_U					
CHRYSE_O	118	847.36	15099.00	2.00	1797.81
CHRYSE_U					
BKFLAN_O	94	1128.04	12032.00	0.00	1901.30
BKFLAN_U					
BEPYRE_O	118	567.37	11185.00	0.00	1247.48
BEPYRE_U					
BAPYRE_O	118	641.77	15581.00	1.00	1597.57
BAPYRE_U					
PERYLE_O	122	441.65	10152.00	0.00	1026.80
PERYLE_U					
INDPYR_O	116	324.15	10766.00	0.00	1090.26
INDPYR_U					
BGHIPE_O	118	273.73	9734.00	0.00	952.08
BGHIPE_U					
TOTR_ORG	79	34136.79	333888.00	613.00	56261.58
PYRO	79	11518.49	91992.00	435.00	14850.05
NON_PYRO	79	22618.45	299872.00	110.00	44743.42

\\

\\VIMS DATA HISTORY FILE:
From the Virginia Institute of Marine Science, Gloucester, Virginia.
This file contains information which supplements the data file listed below.
\\
\\CONTACT: For more information, please contact Gary Anderson.
\\
\\FILE NAME: VDR163.WQ1
\\
\\FILE DATE: 04/26/93
\\
\\FILE SIZE: 164,958
\\
\\BIBLIOGRAPHY: Reference # VDR 163 (BIBNUM 119)
\\
\\ABSTRACT

This study presents the results of analyses of surface samples and cores from the main stem of Chesapeake Bay. For the surface samples, both the fine fraction and the unfractioned sediment were analyzed for Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd, and Pb by atomic absorption spectrometry. For the cores, water content, Pb-210, C, N, Al, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, and Zr were determined at various depths. Alpha spectrometry was used for Pb-210, and DC plasma emission spectrometry was used for all elements except C and N, which were determined by a CHN analyzer. Roughly 10,000 individual analyses are reported, making this the first reasonably comprehensive survey of trace element chemistry in the Bay.

This study consisted of three components: 1) concentrations of nine elements were determined in 246 surface samples in order to establish the current geographic distribution of these elements; 2) vertical profiles were determined in 45 cores to investigate the possibility of historical changes; and 3) Pb-210 and Ra-226 activity in certain cores was measured in order to determine deposition rates and provide a time scale for historical dating.

Sediment cores were collected between November 1978, May to June 1979, and May to June 1981.

This file contains the data for the vertical core profiles for the main Bay, Table D1 of the published report [p. 167].

\\
\\SAMPLING SUMMARY:

Data collection type:	Cores, grabs, and deep cores
Number of stations or sites:	17 station cores
Number of measured variables:	20
Number of observations:	7152

\\
\\NOTES:

6/90 > Received data in SAS format from the CBP Computer Center, EPA Chesapeake Bay Program.
01/23/93 > Converted to dBase format using SAS procedure PROC DBF.
01/27/93 > Further converted to Quattro Pro file.
> Reassigned field names.
> Data verified against Table D1 of the published report. (See BIBLIOGRAPHY.)
> Converted west longitude to negative values.
> Removed null (missing) values.

> We assume that 1 x 10^16 is used as a null value (to represent missing values) and does not represent actual data.

```
            > We assume C_TOTWP (originally "C") represents total carbon.
            > We assume "percent" means weight percent for all variables.
\\

\\HEADER FIELDS

Key:  NAP=NOT APPLICABLE; NAV=NOT AVAILABLE

USGS #    FIELD NAME      FIELD CONTENTS

       2 VDR             163
      17 NAVMODE         NAV
      21 AGENCY1         EPA Chesapeake Bay Program
      22 AGENCY2         U. Maryland, Dept. Chemistry
      23 AGENCY3         NAP
      26 REGNUM          NAP
      27 PROJECT         Chesapeake Bay Sediment Trace Elements
      28 STATE           Maryland, Virginia
      29 QUAD
      30 LOC_GEN         Chesapeake Bay mainstem
      31 LOC_SPEC
      44 GEAR            gravity corer
      45 SAM_TYPE        [YET TO BE RESOLVED--WHAT TO ENTER HERE? CODE TABLE
                           NEEDED?]
      55 LOC_DISP        NAP
      56 ANAL_MET        Y
      57 ANAL_ORG        N
      58 ANAL_GR         N
      59 ANAL_BIO        N
      60 BIO_COM         NAP
      61 BIO_REF         NAP
      62 ANAL_MSC        N
      63 MSC_COM         NAP
      63 MET_LAB         U. Maryland Chemistry Dept.
      66 MET_METH        alpha spectrometry, DC plasma emission spectrometry
      67 MET_COM
      70 MET_TDTE        NAV
      71 MET_TDAY        NAV
      72 MET_TMO         NAV
      73 MET_TYR         NAV
      74 INO_LAB         U. Maryland Chemistry Dept.
      77 INO_METH        CHN analyzer
      78 INO_COM
      81 INO_TDTE        NAV
      82 INO_TDAY        NAV
      83 INO_TMO         NAV
      84 INO_TYR         NAV
     269 GOR_LAB         NAP
     272 GOR_METH        NAP
     273 GOR_COM         NAP
     276 GOR_TDTE        NAP
     277 GOR_TDAY        NAP
     278 GOR_TMO         NAP
     279 GOR_TYR         NAP
     305 SOR_LAB         NAP
     308 SOR_METH        NAP
     309 SOR_COM         NAP
     547 GR_LAB          NAP
     550 GR_METH         NAP
     551 GR_COM          NAP
     554 GR_TDTE         NAP
```

```
     555 GR_REQBY          NAP
     556 GR_ANLBY          NAP
\\

\\STATISTICS
```

VARIABLE	# SAMPLES	AVERAGE	MINIMUM	MAXIMUM	STD DEV
AGE_YR	378	1849.6243	622.0000	1979.0000	203.4209
AL_O	380	5.3770	2.0000	8.3999	1.2209
AL_U					
C_TOTWP	157	2.1694	0.4000	9.7695	1.2611
CE	380	76.3605	10.0000	150.0000	26.7607
CE_Q					
CO	380	22.4526	7.0000	76.0000	13.1067
CO_Q					
CR	380	71.7605	27.0000	140.0000	19.4656
CU	380	39.5447	2.0000	1700.0000	106.0840
CU_Q					
DY	380	3.5994	1.0000	7.5000	1.3363
DY_Q					
FE_O	380	3.0105	2.0000	5.0000	0.8078
FE_U					
GA	380	20.1132	6.0000	43.0000	4.6742
LA	380	34.1000	15.0000	73.0000	10.6435
MN	380	604.5789	155.0000	3000.0000	512.0814
N_TOTWP	157	0.2494	0.0100	0.8700	0.1380
NI	380	41.1342	13.0000	110.0000	16.1965
SI_O	380	27.4158	12.0000	39.0000	3.9948
SI_U					
TI_O	380	0.5617	0.3500	0.8300	0.0992
TI_U					
V	380	100.3816	48.0000	140.0000	20.7009
YB	380	2.1777	0.0100	3.6000	0.8000
ZN	380	136.0395	37.0000	710.0000	101.4895
ZR	380	223.6211	96.0000	720.0000	96.9060

```
\\
```

VIRGINIA INSTITUTE OF MARINE SCIENCE
1001004397

VIMS GC 97.8 C5 D38 1993 v.
Data base development for
characterizing contaminated
sediments in the Chesapeake
Bay region.

DEMCO