

Phase III GIS-based Sediment Quality Database for the St. Louis River Area of Concern (AOC)— Minnesota Focus

Addendum to the Phase II Help Section for Database Users

Final Report

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TABLE OF CONTENTS

	<u>Page</u>
Disclaimer	ii
Table of Contents	iii
List of Tables	iv
List of Figures	iv
List of Acronyms and Abbreviations	v
Acknowledgments	vi
1.0 Introduction	1
2.0 Summary of Phase III Database Updates	4
2.1 New Data Sets	4
2.2 Inclusion of Benthic Invertebrate Community Data	5
2.3 Addition of Query Options in MST TM Access Database	5
2.4 Updated Phase II Table and Figure	6
3.0 Phase III Database Issues	25
3.1 Interpretation of Mean PEC-Q Data	25
3.2 Display of Sediment Quality Data on GIS Applications	26
4.0 Instructions for Obtaining Phase III Database Files	29
5.0 Project Contact	32
References	33

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1	Summary of Information Contained Within the Phase III MS™ Access 2000 Sediment Quality Database.....4
2	Detailed Description of Database Components10

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1	Map of the St. Louis River AOC 2
2	Water body and reach boundaries of sites within the St. Louis River AOC where sediment quality samples have been collected 3
3	Diagram showing the relationships between components of the MS™ Access 2000 sediment quality database..... 8
4	Sample locations (by StudyID) plotted on the water boundaries basemap for the St. Louis River Interlake/Duluth Tar Superfund site. Note the mislocation of sites on land, particularly by Slip 7..... 27
5	Location of sample sites for the St. Louis River Interlake/Duluth Tar Superfund site plotted on the accompanying orthographic aerial photograph. The data appear to be plotted in the correct locations 28

LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
CD	Compact Disk
FK	Foreign Key
F/P	Fluoranthene to Pyrene Ratio
FTP	File Transfer Protocol
GIS	Geographic Information System
GT	Greater Than
ID	Identification
IJC	International Joint Commission
LDepth	Lower Depth Interval of a Sediment Core
LKP	Look-up
LT	Less Than
MLSCP	Minnesota's Lake Superior Coastal Program
MN	Minnesota
MPCA	Minnesota Pollution Control Agency
MS™	Microsoft™
NOAA	National Oceanic and Atmospheric Administration
P/A	Phenanthrene to Anthracene Ratio
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PEC	Probable Effect Concentration
PEC-Q	Probable Effect Concentration Quotient
PK	Primary Key
PTBL	Table
QM	Query Manager
SQT	Sediment Quality Target
TEC	Threshold Effect Concentration
UDepth	Upper Depth Interval of a Sediment Core
UTM	Universal Transverse Mercator
WA	Washington

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Searay Environmental: Raymond Valente

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CHAPTER 1

INTRODUCTION

The lower St. Louis River, including the Duluth-Superior Harbor, provides an important coastal resource to western Lake Superior. In particular, this transboundary waterway provides critical habitat to invertebrate, fish, and waterfowl species and also provides an economic venue for Great Lakes shipping and business (Figure 1). Contaminated sediments have contributed to several use impairments in the lower St. Louis River and were a factor in the International Joint Commission's (IJC) decision to designate the lower St. Louis River as one of 43 Areas of Concern (AOCs) in the Great Lakes basin (IJC 1989). Consequently, a number of entities have conducted contaminated sediment and fish tissue studies in the lower St. Louis River AOC since 1990 to delineate the extent and magnitude of contaminants of potential concern and to assess the potential for ecological effects (Figure 2). Sediment quality issues in the Lower St. Louis River AOC are of interest to Minnesota and Wisconsin state and local agencies, as well as the federal government, tribal groups, responsible parties, and other concerned stakeholders.

The Minnesota Pollution Control Agency (MPCA), with the contractual assistance of Exa Data & Mapping Services, Inc. and their subcontractors, have completed Phase III of a Geographic Information System (GIS)-based sediment quality database for the St. Louis River AOC (Crane 2005). This phase of the database focused on the Minnesota side of the AOC. A history of the development of earlier phases of this sediment quality database is provided in the Phase II Help Section for Database Users (Smorong and Crane 2004). The purpose of this addendum document is to provide a summary of the updates that were completed as part of the Phase III database effort. Database users should refer to the Phase II documentation (Smorong and Crane 2004, Smorong *et al.* 2004a,b), in addition to this report, when using either the Phase III Microsoft™ (MS™) Access 2000 sediment quality database or the Query Manager-compatible database files. The MS™ Access 2000 sediment quality database is also available in MS™ Access '97 format for those users lacking MS™ Access 2000 software. For detailed information regarding changes to the content and organization of the Phase III sediment quality database, refer to the accompanying Addendum to the Phase II Technical Documentation (Crane and Myre 2005).

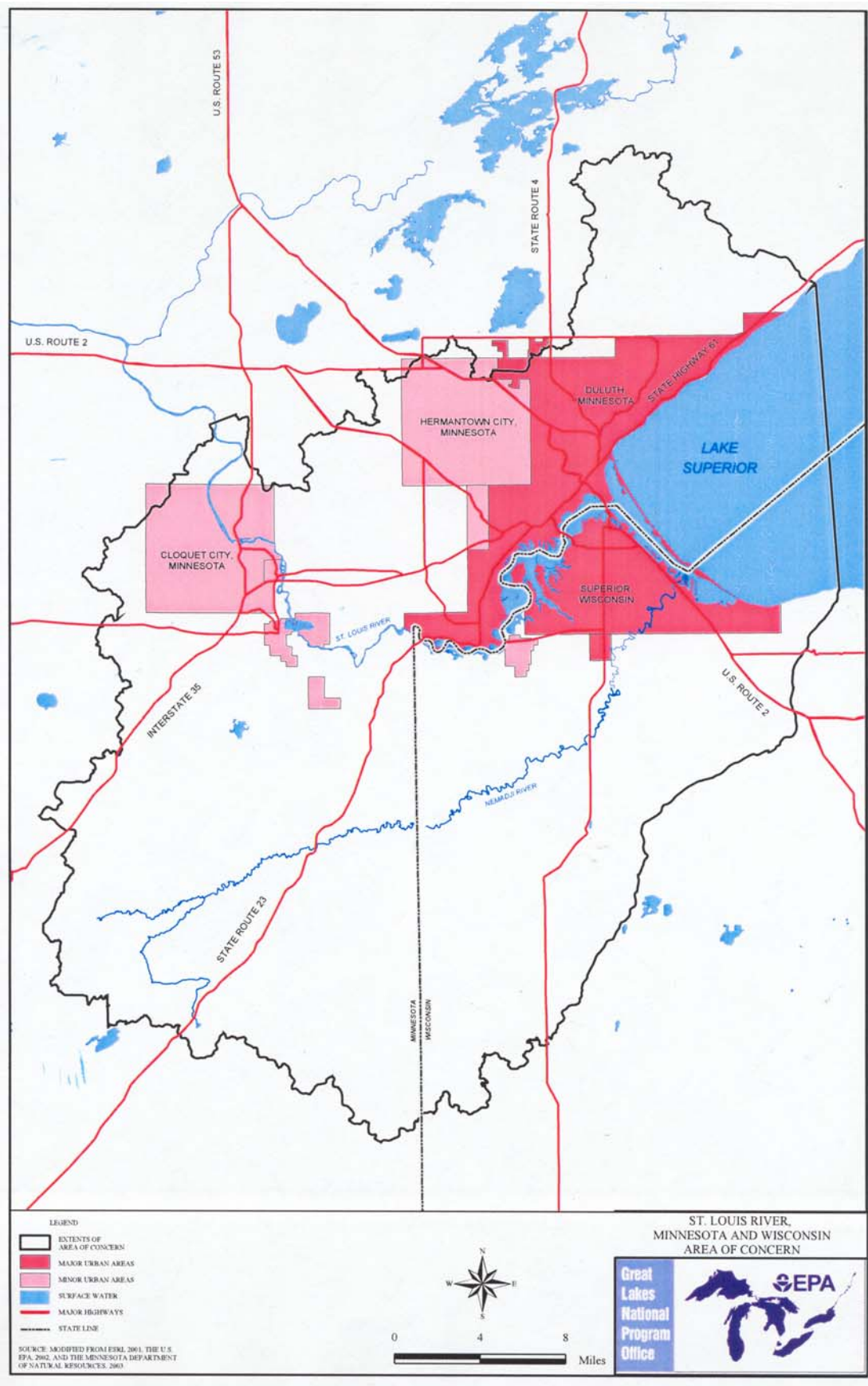


Figure 1. Map of the St. Louis River AOC.

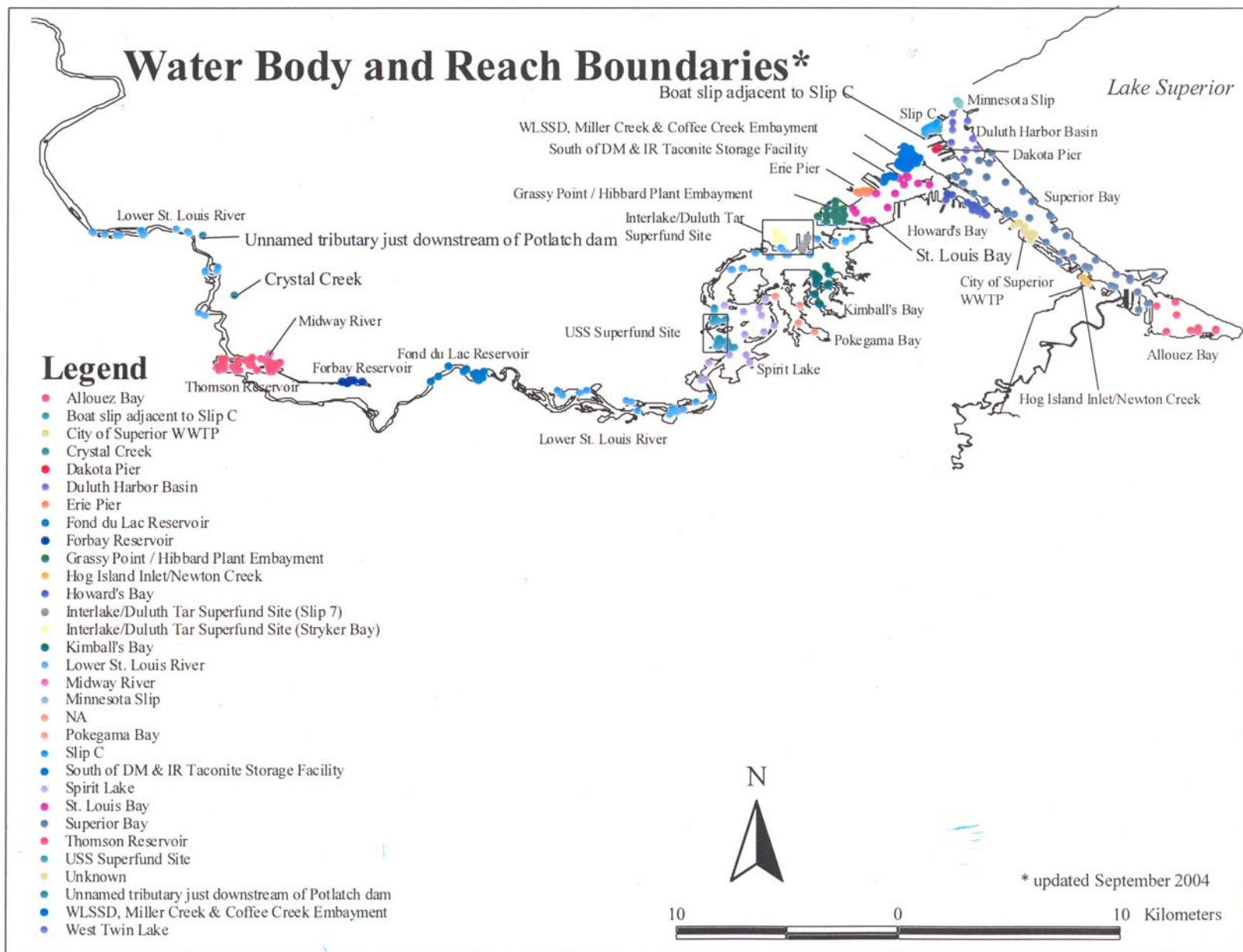


Figure 2. Water body and reach boundaries of sites within the St. Louis River AOC where sediment quality samples have been collected

CHAPTER 2

SUMMARY OF PHASE III DATABASE UPDATES

2.1 NEW DATA SETS

The Phase III MSTM Access 2000 database includes the sediment quality and fish tissue data contained within the Phase I and II databases, as well as 25 new data sets from the Minnesota side of the St. Louis River AOC. Thirteen of these new data sets were obtained directly from the National Oceanic and Atmospheric Administration's (NOAA's) Query Manager Watershed database for the St. Louis River. NOAA compiled this Watershed database as part of their Natural Resource Trustee activities for the St. Louis River Interlake/Duluth Tar Superfund site. New data were also added to the Phase III sediment quality database from the USS Superfund site, Minnesota Slip, Kingsbury Bay, and several lakes near the St. Louis River bordering the Fond du Lac Reservation. A description of these data sets is provided in the Addendum to the Phase II Technical Documentation (Crane and Myre 2005). A summary of the number of records contained within the Phase III MSTM Access 2000 database for various sediment quality parameters is given in Table 1.

Table 1. Summary of Information Contained Within the Phase III MSTM Access 2000 Sediment Quality Database.

Parameter	Number of Records
Sediment Chemistry	95,155
Sediment Toxicity	1,494
Benthic Invertebrate Community (mean values)	13,980
Benthic Invertebrate Community (replicate values)	40,958
Sample Tissue (i.e., plants, fish, invertebrates)	446
Tissue Chemistry	12,506
Mean PEC-Qs*	2,064
Sample Information	3,349
Station Information	1,586
Studies	55

*PEC-Q = probable effect concentration quotient

2.2 INCLUSION OF BENTHIC INVERTEBRATE COMMUNITY DATA

Based on input from MPCA staff and stakeholders, benthic invertebrate community data have been added to the Phase III MS™ Access 2000 database as a new parameter. In particular, benthic data from two large studies (Crane *et al.* 1997; Breneman *et al.* 2000, Crane *et al.* 2005) were added to the database. These data sets provide good spatial coverage of benthic populations along the Minnesota side of the St. Louis River AOC. Benthic data for the Wisconsin side of the AOC will be added to the Phase IV GIS-based sediment quality database for the St. Louis River AOC—Wisconsin focus. The Phase IV database will be completed by the spring of 2006 through the collaborative efforts of Judy Crane (MPCA), Lynelle Hanson (St. Louis River Citizens Action Committee), Nancy Larson and Jim Killian (of the Wisconsin Department of Natural Resources), and Peggy Myre (Exa Data & Mapping Services, Inc.) and her team of subconsultants. Please note that NOAA's Query Manager database format does not currently house benthic invertebrate community data. Thus, these benthic data will not be accessible in the Query Manager compatible files produced for this project.

2.3 ADDITION OF QUERY OPTIONS IN MS™ ACCESS DATABASE

Another new feature of the Phase III MS™ Access 2000 and '97 sediment quality databases is the addition of several queries, of which the query output is recorded in the "Queries" section of each database. These queries were developed by Peggy Myre (Exa Data & Mapping Services, Inc.) as an extra feature for the benefit of a few MPCA staff. As such, the queries are not very user friendly, although users with knowledge about MS™ Access will be able to adapt them for their own use. A user friendly query interface will be completed as part of the Phase IV MS™ Access 2000 sediment quality database. The query options include:

- Calculate polycyclic aromatic hydrocarbon (PAH) source ratios of phenanthrene/anthracene (P/A) and fluoranthene/pyrene (F/P) to 3 significant digits for the following depth intervals:
 - ≥ 0 to ≤ 5 cm,
 - ≥ 0 to ≤ 15 cm,
 - ≥ 0 to ≤ 30 cm,
 - ≥ 15 to ≤ 30 cm,
 - ≥ 30 to ≤ 45 cm, and
 - ≥ 30 cm.

Treat data below the detection limit as one-half the reported detection limit. Exclude data that do not fall within these depth ranges (e.g., 25-40 cm).

- Sort sediment chemistry data by the Area field (e.g., Allouez Bay, Duluth Harbor, Lower St. Louis River, Lower St. Louis River Watershed, Nemadji River, St. Louis Bay, and Superior Bay). Treat data below the detection limit as one-half the reported detection limit. Users will then be able to run other queries on this subset of data that they can either design themselves or else use one of the other queries available in the MS™ Access database.

- Search benthic invertebrate community data for a specific metric of the category “Taxonomic Group.” The query is currently set-up to query the metric “Total Abundance” with the units of organisms/m². Refer to the Addendum to the Phase II Technical Documentation (Crane and Myre 2005) for directions on how to edit this query to select other benthic metrics.
- Query mean PEC-Qs (3 significant figures) for the following surficial depth intervals:
 - ≥ 0 to ≤ 5 cm,
 - ≥ 0 to ≤ 15 cm, and
 - ≥ 0 to ≤ 30 cm.
 The results are grouped as <0.1 (low risk to benthic invertebrates), ≥ 0.1 to ≤ 0.6 (moderate risk), and >0.6 (high risk).
- Compare surficial (i.e., ≥ 0 to ≤ 5 cm, ≥ 0 to ≤ 15 cm, and ≥ 0 to ≤ 30 cm) contaminant concentrations to the corresponding Level I and Level II sediment quality targets (SQTs) listed in Table 14 of Crane *et al.* (2000). Treat data below the detection limit as one-half the reported detection limit. Exclude data that do not fall within these depth ranges. Results are grouped as less than (LT) or greater than (GT) the corresponding Level I and Level II SQT values.
- Sort sediment toxicity data by toxic, not toxic, and not determined results (using the MESL_TOXIC field). This single query simply extracts all of the sediment toxicity data and sorts the data by Species, Endpoint, and MESL_Toxicity code. Other fields selected include the Effect value (Effectval), the control-adjusted effects value (Ctrladj), the originally reported significance (Sigeffect), the TestID, and the medium of the test (sediment, elutriate, etc.). Negative control data are excluded from the query.

Each query includes the following fields: StudyID, MESL_StationID, SampleID, StationID, UDepth (upper depth), LDepth (lower depth), as well as coordinates (latitude/longitude and UTM coordinates).

2.4 UPDATED PHASE II TABLE AND FIGURE

Some documentation in the Phase II Help Section for Database Users (Smorong and Crane 2004) was updated to account for the addition of benthic invertebrate community data in the Phase III database. Table 1 (Detailed Description of Database Components) and Figure 1 (Diagram showing the relationships between database components) from the aforementioned Phase II document have been updated with similar caption titles in this Addendum document as Table 2 and Figure 3, respectively. For Figure 3, Peggy Myre (Exa Data & Mapping Services, Inc.) added primary key (PK) and foreign key (FK) designations to several fields. Since the MSTM Access sediment quality database is a relational database, the database consists of several tables that can be linked together to facilitate retrieval of the data. Every record in a table must have a primary key that differentiates it from every other record in the table. Primary keys may consist of a single attribute or multiple attributes in combination. For chemistry data, the primary key fields are SiteID, StudyID, StationID, SampleID, Labrep, and Chemcode (Figure 3). The foreign key numbering system allows one to group the keys together into unique foreign keys. Thus, the

primary key of one table is used in another table to establish a relationship. For example, for the chemistry table (ptbl – CHEM):

- FK1 describes the foreign key ‘Chemcode’ that relates the look-up (lkp) table CHEMDICT;
- FK2 describes the foreign key ‘Qualcode’ that relates to lkp – QUALIFY;
- FK3 describes the foreign key ‘Chemcode’ that relates to lkp – SQC; and,
- FK4 describes the foreign key group (SiteID+StudyID+StationID+SampleID+Labrep) that relates to parent table ptbl – SAMPLE.

These fields were designed to be consistent with fields used in NOAA’s Query Manager 2.56 software.

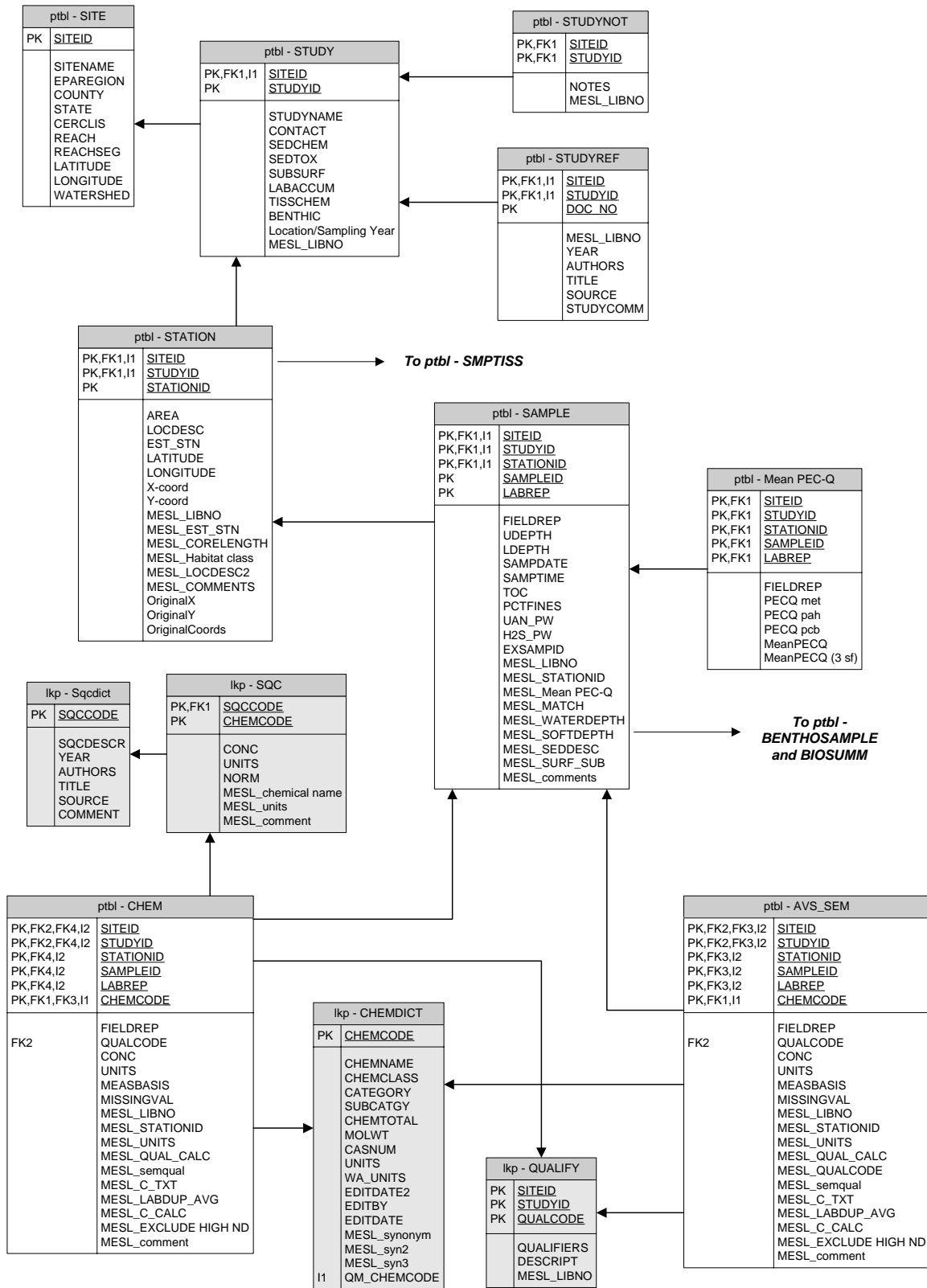


Figure 3. Diagram showing the relationships between components of the MS™ Access 2000 sediment quality database.

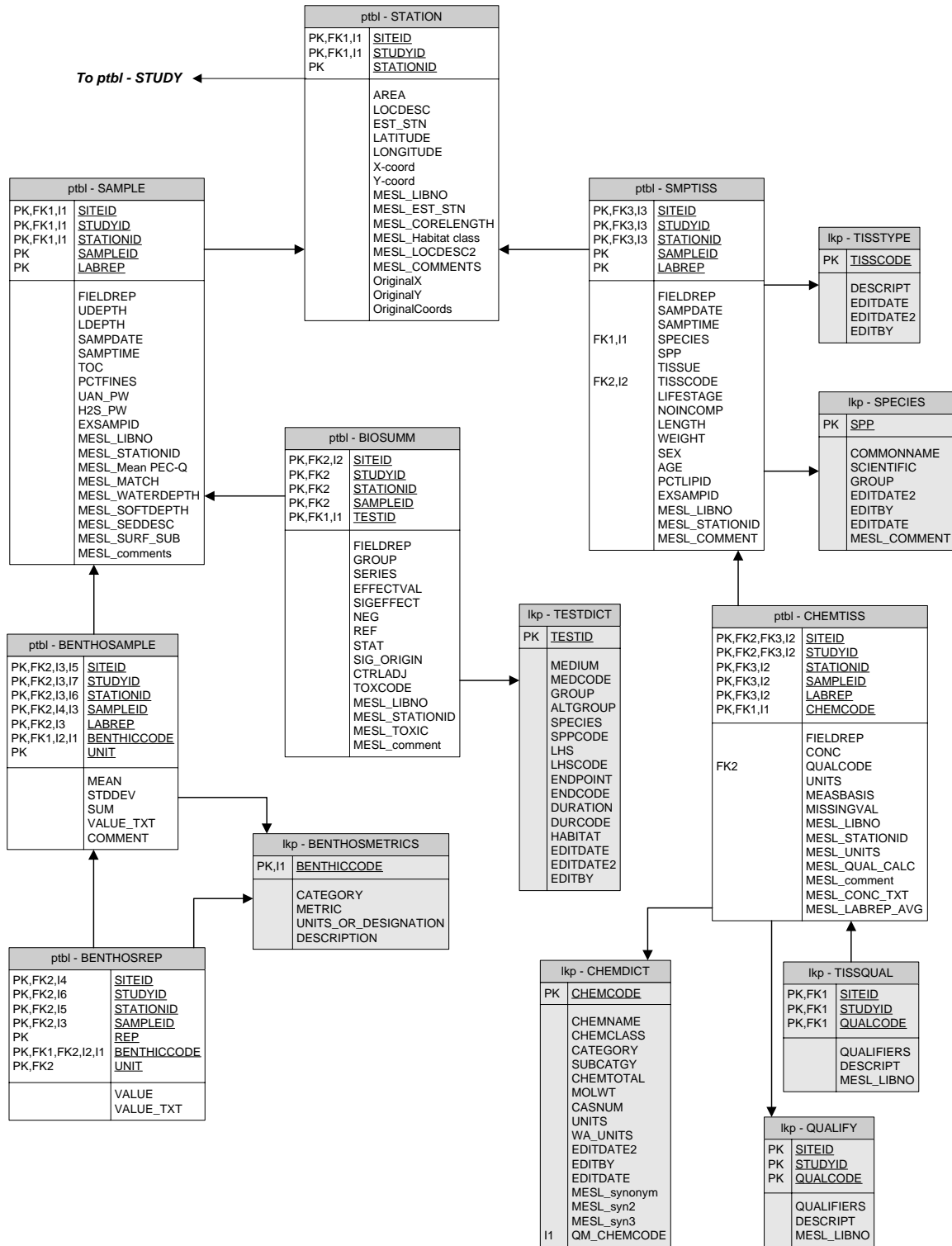


Figure 3. Continued.

Table 2. Detailed Description of Database Components

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
lkp - BENTHOSMETRICS				
	BENTHICCODE	Text	4	Code for benthic parameter.
	CATEGORY	Text	25	General category or grouping for the benthic parameter.
	METRIC	Text	50	Measurement of the benthic parameter.
	UNITS_OR_DESIGNATION	Text	50	Possible units or designation for the parameter.
	DESCRIPTION	Text	200	Description of the benthic parameter.
lkp - CHEMDICT				
	CHEMCODE	Text	10	Chemical code.
	CHEMNAME	Text	45	Chemical name.
	CHEMCLASS	Text	8	Chemical class.
	CATEGORY	Text	8	Query Manager field.
	SUBCATGY	Text	10	Query Manager field.
	CHEMTOTAL	Text	10	Query Manager field.
	MOLWT	Number, Double	8	Molecular weight of chemical.
	CASNUM	Text	24	Chemical abstract services number.
	UNITS	Text	6	Units of chemical concentration.
	WA_UNITS	Text	6	Query Manager field.
	EDITDATE2	Text	8	Query Manager field.
	EDITBY	Text	15	Query Manager field.
	EDITDATE	Date/Time	8	Query Manager field.
	MESL_synonym	Text	150	Synonym for chemical name.
	MESL_syn2	Text	150	Synonym for chemical name.
	MESL_syn3	Text	150	Synonym for chemical name.
	QM_CHEMCODE	Text	50	Equivalent chemcode for Query Manager.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
lkp - QryDepthBin				Lookup table used to classify data into sediment depth bins.
	UDEPTH	Number, Single	4	Upper sampling depth (cm).
	LDEPTH	Number, Single	4	Lower sampling depth (cm).
	SORTORDER	Number, Long Integer	4	Used in queries to sort results by depth bin.
	DEPTHBIN	Text	15	Sediment depth bin category used in queries.
lkp - QryPEC_Class				Lookup table used to classify data into risk categories.
	MESL_Mean PEC-Q	Number, Single	4	A unique list of PEC quotients from sediment quality database, rounded to 3 significant digits.
	CLASSIFICATION	Text	20	Classification of risk.
lkp - QUALIFY				Lookup table for sediment chemistry qualifiers (QUALCODE).
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	QUALCODE	Text	5	Qualifier code for concentration value, modified to be compatible with Query Manager (all ND data has a "U" in this field).
	QUALIFIERS	Text	30	Qualifier code for concentration value, as designated in report.
	DESCRIPT	Text	80	Description of the meaning of the qualifier, as indicated in the original report or data file.
	MESL_LIBNO	Text	50	MESL - library number.
lkp - SPECIES				Lookup table for tissue samples species type (SPP).
	SPP	Text	5	Species code.
	COMMONNAME	Text	25	Common name.
	SCIENTIFIC	Text	40	Scientific name.
	GROUP	Text	25	Query Manager field.
	EDITDATE2	Text	8	Query Manager field.
	EDITBY	Text	15	Query Manager field.
	EDITDATE	Date/Time	8	Query Manager field.
	MESL_COMMENT	Text	50	MESL - comments.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
lkp - SQC				
				Sediment Quality Criteria: Level I and Level II SQTs (Crane et al. 2000) and SQGs (WDNR 2003).
	SQCCODE	Text	10	Code for Sediment Quality Criteria (see lkp - Sqcdict for a description of the codes).
	CHEMCODE	Text	10	Chemical code (defined in lkp - chemdict).
	CONC	Number, Double	8	Chemical concentration.
	UNITS	Text	6	Units of SQC is reported in.
	NORM	Text	2	Indicates measurement basis SQC are reported in.
	MESL_chemical name	Text	50	MESL - chemical name.
	MESL_units	Text	50	MESL - units.
	MESL_comment	Text	100	MESL - comments.
lkp - Sqcdict				
				Lookup table for Sediment Quality Criteria references (SQCCODE).
	SQCCODE	Text	10	Code for Sediment Quality Criteria.
	SQCDESCR	Text	90	Description of the SQCCODE.
	YEAR	Text	4	Year of publishing for study reporting the sediment quality criteria.
	AUTHORS	Text	160	Authors for study reporting the sediment quality criteria.
	TITLE	Text	160	Title of the study reporting the sediment quality criteria.
	SOURCE	Text	160	Source (location) for study reporting the sediment quality criteria.
	COMMENT	Text	160	Comments.
lkp - SQCPAIRS				
				Lookup table for identifying Sediment Quality Criteria pairs.
	PAIRNAME	Text	50	High and low Sediment Quality Criteria (how Query Manager will reference the pair).
	SQCLOW	Text	10	SQCCODE of low Sediment Quality Criteria.
	SQCHIGH	Text	10	SQCCODE of high Sediment Quality Criteria.
	LOW_NAME	Text	8	Low Sediment Quality Criteria (how Query Manager will reference the SQC).
	HIGH_NAME	Text	8	High Sediment Quality Criteria (how Query Manager will reference the SQC).
	SORT_ORDER	Number, Integer	2	Query Manager field.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
lkp - TESTDICT				Lookup table for toxicity test dictionary (TESTID).
	TESTID	Text	12	Code describing the bioassay.
	MEDIUM	Text	15	Medium used in toxicity test (e.g., bulk sediment or pore water).
	MEDCODE	Text	2	Code used to indicate medium used in toxicity test.
	GROUP	Text	20	Group of organism used in toxicity test (e.g., bacteria or amphipod).
	ALTGROUP	Text	20	Group of organism used in toxicity test - alternate.
	SPECIES	Text	40	Species used in toxicity test.
	SPPCODE	Text	3	Code used to indicate species used in toxicity test.
	LHS	Text	10	Life stage of organism used in toxicity test.
	LHSCODE	Text	1	Code used to indicate life stage of organism used in toxicity test.
	ENDPOINT	Text	30	Endpoint of toxicity test (e.g., growth or survival).
	ENDCODE	Text	2	Code used to indicate endpoint of toxicity test.
	DURATION	Text	10	Duration of toxicity test.
	DURCODE	Text	4	Code used to indicate duration of toxicity test.
	HABITAT	Text	2	Query Manager field.
	EDITDATE	Date/Time	8	Query Manager field.
	EDITDATE2	Text	8	Query Manager field.
	EDITBY	Text	15	Query Manager field.
lkp - TISSQUAL				Lookup table for tissue chemistry qualifiers (QUALCODE).
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	QUALCODE	Text	5	Qualifier code for concentration value, modified to be compatible with Query Manager (all ND data has a "U" in this field).
	QUALIFIERS	Text	30	Qualifier code for concentration value, as designated in report.
	DESCRIPT	Text	80	Description of the meaning of the qualifier, as indicated in the original report or data file.
	MESL_LIBNO	Text	50	MESL - library number.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
lkp - TISSTYPE				Lookup table for tissue sample tissue types (TISSCODE).
	TISSCODE	Text	6	Tissue type code.
	DESCRIPT	Text	50	Description of tissue type.
	EDITDATE	Date/Time	8	Query Manager field.
	EDITDATE2	Text	8	Query Manager field.
	EDITBY	Text	15	Query Manager field.
ptbl - AVS_SEM				Sediment chemistry results for Acid Volatile Sulfides and Simultaneously Extracted Metals (units of $\mu\text{mol/g}$).
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	LABREP	Text	2	This field will not be populated (lab dups will be averaged and the MESL_LABREP_AVG field identifies these averaged results).
	CHEMCODE	Text	10	Chemical code (defined in lkp - CHEMDICT).
	QUALCODE	Text	5	Qualifier code for concentration value, modified to be compatible with Query Manager (all ND data has a "U" in this field).
	CONC	Number, Double	8	Chemical concentration (dry weight basis).
	UNITS	Text	6	Units of chemical concentration.
	MEASBASIS	Text	2	Measurement basis - dry weight (DW).
	MISSINGVAL	Yes/No	1	'Yes' indicates a missing value (i.e., not reported, not sampled, lost, etc; -9 entered in CONC field).
	MESL_LIBNO	Text	20	MESL - library number.
	MESL_STATIONID	Text	50	MESL - station ID (retains the Station ID code as it appears in the original datafiles and/or reports).
	MESL_UNITS	Text	7	MESL - units of concentration value.
	MESL_QUAL_CALC	Text	10	MESL - qualifier code for concentration value - used for calculation purposes (NUM - value, U - less than detect value; X - do not include in calculations).

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - AVS_SEM (cont.)				Sediment chemistry results for Acid Volatile Sulfides and Simultaneously Extracted Metals (units of $\mu\text{mol/g}$).
	MESL_QUALCODE	Text	5	MESL - qualifier code for concentration value, as designated in report, with modifications.
	MESL_semqual	Text	50	MESL - qualifier code to indicate whether to use SEM metal conc. or total metal conc. (B entered in this field indicates that both are measured, therefore do not use the SEM result.)
	MESL_C_TXT	Text	50	MESL - concentration value represented in a text field (nondetected results include a "<").
	MESL_LABDUP_AVG	Yes/No	1	MESL - indicates if results for laboratory duplicate samples were averaged.
	MESL_C_CALC	Number, Double	8	MESL - concentration value represented in a number field (nondetected results included as 1/2 the detection limit).
	MESL_EXCLUDE HIGH ND	Text	50	MESL - X entered in this field indicates a nondetected result with a detection limit greater than the Level II SQT.
	MESL_comment	Text	250	MESL - comments.
ptbl - BENTHOSAMPLE				Benthic infaunal data including mean, standard deviation, and summary data.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	LABREP	Text	2	This field will not be populated, necessary to link to sample table.
	BENTHICCODE	Text	4	Benthic code, linked to lkp - BenthosMetrics.
	UNIT	Text	10	Unit for the benthic metric.
	MEAN	Number, Single	4	Mean value.
	STDDEV	Number, Single	4	Standard deviation of the mean value.
	SUM	Number, Single	4	Abundance sum for the sample.
	VALUE_TXT	Text	35	Text result value (if applicable).
	COMMENT	Text	35	Comment

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - BENTHOSREP				Benthic infaunal replicate data.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	REP	Text	2	Replicate designator.
	BENTHICCODE	Text	4	Benthic code, linked to lkp - BenthosMetrics.
	UNIT	Text	10	Unit for the benthic metric.
	VALUE	Number, Single	4	Numeric result.
VALUE_TXT	Text	35	Text result value (if applicable).	
ptbl - BIOSUMM				Sediment toxicity test and bioaccumulation test results.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	TESTID	Text	12	Code describing the bioassay (see lkp - TESTDICT table for a description of the codes).
	GROUP	Text	2	Query Manager field.
	SERIES	Text	2	Associates control sample results with test results.
	EFFECTVAL	Number, Double	8	Toxicity test result (e.g., percent survival).
	SIGEFFECT	Yes/No	1	Toxic (-1) or Not toxic (0).
	NEG	Yes/No	1	Negative control sample? Yes (-1) or No (0).
	REF	Yes/No	1	Reference sample? Yes (-1) or No (0).
	STAT	Yes/No	1	Identifies sample used to determine significance (T/NT) - ND results (i.e., growth endpoint not measured because of low survival) from SQT database added as NOT TOXIC.
	SIG_ORIGIN	Text	50	Original significance designations - from Query Manager.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - BIOSUMM (cont.)				Sediment toxicity test and bioaccumulation test results.
	CTRLADJ	Number, Double	8	Control adjusted result (test result/control result*100).
	TOXCODE	Text	1	Query Manager field.
	MESL_LIBNO	Text	50	MESL - library number.
	MESL_STATIONID	Text	50	MESL - Station ID (retains the Station ID code as it appears in the original datafiles and/or reports).
	MESL_TOXIC	Text	2	Toxic (T), Not toxic (NT), or ND (growth endpoint not measured because of low survival).
	MESL_comment	Text	250	MESL - comments.
ptbl - CHEM				Chemistry results for sediment samples.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	LABREP	Text	2	This field will not be populated (lab dups will be averaged and the MESL_LABREP_AVG field identifies these averaged results).
	CHEMCODE	Text	10	Chemical code (defined in lkp - CHEMDICT).
	QUALCODE	Text	5	Qualifier code for concentration value, modified to be compatible with Query Manager (all ND data has a "U" in this field).
	CONC	Number, Double	8	Chemical concentration (dry weight basis).
	UNITS	Text	6	Units of chemical concentration.
	MEASBASIS	Text	2	Measurement basis - dry weight (DW).
	MISSINGVAL	Yes/No	1	'Yes' indicates a missing value (i.e., not reported, not sampled, lost, etc; -9 entered in CONC field).
	MESL_LIBNO	Text	20	MESL - library number.
	MESL_STATIONID	Text	50	MESL - station ID (retains the Station ID code as it appears in the original datafiles and/or reports).
	MESL_UNITS	Text	7	MESL - units of concentration value.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - CHEM (cont.)				Chemistry results for sediment samples.
	MESL_QUAL_CALC	Text	10	MESL - qualifier code for concentration value - used for calculation purposes (NUM - value, U - less than detect value; X - do not include in calculations).
	MESL_semqual	Text	50	MESL - qualifier code to indicate whether to use SEM metal conc. or total metal conc. (B entered in this field indicates that both are measured, therefore do not use the SEM result.)
	MESL_C_TXT	Text	50	MESL - concentration value represented in a text field (nondetected results include a "<").
	MESL_LABDUP_AVG	Yes/No	1	MESL - indicates if results for laboratory duplicate samples were averaged.
	MESL_C_CALC	Number, Double	8	MESL - concentration value represented in a number field (nondetected results included as 1/2 the detection limit).
	MESL_EXCLUDE HIGH ND	Text	50	MESL - X entered in this field indicates a nondetected result with a detection limit greater than the Level II SQT.
	MESL_comment	Text	250	MESL - comments.
ptbl - CHEMTISS				Chemistry results for tissue samples.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	LABREP	Text	2	Not populated (lab dups will be averaged and the MESL_LABREP_AVG field identifies these averaged results).
	CHEMCODE	Text	10	Chemical code (defined in lkp - chemdict).
	CONC	Number, Double	8	Chemical concentration (wet weight basis).
	QUALCODE	Text	5	Qualifier code for concentration value, as designated in report (see lkp_TISSQUAL table for a description of the codes).
	UNITS	Text	6	Units of chemical concentration.
	MEASBASIS	Text	2	Measurement basis - wet weight (WW).

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - CHEMTISS (cont.)				Chemistry results for tissue samples.
	MISSINGVAL	Yes/No	1	'Yes' indicates a missing value (i.e., not reported, not sampled, lost, etc; -9 entered in CONC field).
	MESL_LIBNO	Text	20	MESL- library number.
	MESL_STATIONID	Text	50	MESL- Station ID (retains the Station ID code as it appears in the original datafiles and/or reports).
	MESL_UNITS	Text	7	MESL - units of concentration value.
	MESL_QUAL_CALC	Text	10	MESL - qualifier code for concentration value - used for calculation purposes (NUM - value, U - less than detect value; X - do not include in calculations; UX - less than MDL, DL unknown).
	MESL_comment	Text	250	MESL - comments.
	MESL_CONC_TXT	Text	50	MESL - concentration value represented in a text field (nondetected results include a "<").
	MESL_LABREP_AVG	Yes/No	1	MESL - indicates if results for laboratory duplicate samples were averaged.
ptbl - Mean PEC-Q				Mean Probable Effect Concentration-Quotients (Mean PEC-Q).
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	LABREP	Text	2	This field will not be populated (lab dups will be averaged and the MESL_LABREP_AVG field identifies these averaged results).
	PECQ met	Number, Double	8	PEC quotient for metals.
	PECQ pah	Number, Double	8	PEC quotient for PAHs.
	PECQ pcb	Number, Double	8	PEC quotient for PCBs.
	MeanPECQ	Number, Double	8	Mean PEC quotient (as calculated).
	MeanPECQ (3 sf)	Number, Double	8	Mean PEC quotient (3 significant figures).

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - SAMPLE				Sediment sample information.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	LABREP	Text	2	This field will not be populated (lab dups will be averaged and the MESL_LABREP_AVG field identifies these averaged results).
	UDEPTH	Number, Single	4	Upper sampling depth (cm).
	LDEPTH	Number, Single	4	Lower sampling depth (cm).
	SAMPDATE	Text	8	Sample date (YYYYMMDD).
	SAMPTIME	Text	5	Sample time.
	TOC	Number, Single	4	Total organic carbon (%).
	PCTFINES	Number, Single	4	Percent fines (sand + clay), the micron diameter used to define PCTFINES is <53 µm, unless otherwise noted in the MESL_comments field.
	UAN_PW	Number, Single	4	Unionized ammonia in pore water.
	H2S_PW	Number, Single	4	Hydrogen sulfide in pore water.
	EXSAMPID	Text	30	Original station ID reported in study or data file.
	MESL_LIBNO	Text	50	MESL - library number.
	MESL_STATIONID	Text	50	MESL - station ID (retains the Station ID code as it appears in the original datafiles and/or reports).
	MESL_Mean PEC-Q	Number, Single	4	MESL - Mean PEC-Q (3 significant figures).
	MESL_MATCH	Text	50	MESL - indicates if the sample has matching sediment chemistry and toxicity data.
	MESL_WATERDEPTH	Text	50	MESL - water depth at the point of sediment sampling (m). NR = not reported.
	MESL_SOFTDEPTH	Text	50	MESL - soft sediment depth (m). NR = not reported.
	MESL_SEDESC	Text	255	MESL - sediment description (have included the sediment description if this data was available electronically). NA = not available.
	MESL_SURF_SUB	Text	50	MESL - indicates if the sample is designated as surficial or sub-surface, according to NOAA's Query Manager rules. NA indicates that the sampling depth was not specified.
	MESL_comments	Text	255	MESL - comments.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - SITE				
				Site Identification (Query Manager table).
	SITEID	Text	4	Site ID code (from Query Manager).
	SITENAME	Text	40	Descriptive name for site (from Query Manager).
	EPAREGION	Number, Integer	2	Region for site location; 11 for Canada (from Query Manager).
	COUNTY	Text	25	County where site is located (from Query Manager).
	STATE	Text	2	State where site is located (from Query Manager).
	CERCLIS	Text	12	CERCLIS number for site (from Query Manager).
	REACH	Text	8	Reach number for site (from Query Manager).
	REACHSEG	Text	11	Reach segment number for site (from Query Manager).
	LATITUDE	Number, Double	8	General latitude for site location (from Query Manager).
	LONGITUDE	Number, Double	8	General longitude for site location (from Query Manager).
	WATERSHED	Text	20	Watershed name for site location (from Query Manager).
ptbl - SMPTISS				
				Tissue sample information.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	SAMPLEID	Text	6	Sample ID code.
	FIELDREP	Text	2	Identifies field replicate samples (samples collected in close proximity).
	LABREP	Text	2	Not populated (lab dups will be averaged and the MESL_LABREP_AVG field identifies these averaged results).
	SAMPDATE	Text	8	Date sample collected (YYYYMMDD).
	SAMPTIME	Text	5	Time sample collected.
	SPECIES	Text	5	Species from which the tissue sample was collected (see the lkp_SPECIES table for a description of the codes).
	SPP	Text	5	Species code (see the lkp_SPECIES table for a description of the codes).
	TISSUE	Text	30	Tissue type analyzed (see the lkp_TISSTYPE table for a description of the codes).
	TISSCODE	Text	6	Tissue type code (see the lkp_TISSTYPE table for a description of the codes).

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - SMPTISS (cont.)				Tissue sample information.
	LIFESTAGE	Text	1	Lifestage of the organism at the time of sampling.
	NOINCOMP	Number, Integer	2	Number of individuals in a composite sample.
	LENGTH	Number, Single	4	Length (cm) of individual organisms collected for tissue analysis.
	WEIGHT	Number, Single	4	Weight of individual organisms collected for tissue analysis.
	SEX	Text	1	Sex of individual organisms collected for tissue analysis.
	AGE	Number, Integer	2	Age of individual organisms collected for tissue analysis.
	PCTLIPID	Number, Single	4	Percent lipids (%).
	EXSAMPID	Text	15	Query Manager field.
	MESL_LIBNO	Text	50	MESL- library number.
	MESL_STATIONID	Text	50	MESL- Station ID (retains the Station ID code as it appears in the original datafiles and/or reports).
	MESL_COMMENT	Text	255	MESL - comments.
ptbl - STATION				Station information (sediment and tissue samples).
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STATIONID	Text	10	Station ID code (this is the MESL_STATIONID, unless it exceeded 6 characters, then the QM_STATIONID was substituted).
	AREA	Text	50	Waterbody (corresponds with 'DB_AREA' theme in GIS projects).
	LOCDESC	Text	50	Reach (corresponds with 'Location Description' theme in GIS projects).
	EST_STN	Text	50	Code indicating how the geographic coordinates were obtained (R = reported; P = plotted in GIS based on a map from the report; E = estimated using site descriptions from report; U = unknown).
	LATITUDE	Number, Double	8	Geographical coordinates (decimal degrees).
	LONGITUDE	Number, Double	8	Geographical coordinates (decimal degrees).
	X-coord	Number, Double	8	Geographical coordinates (UTM Zone 15 NAD83 datum).
	Y-coord	Number, Double	8	Geographical coordinates (UTM Zone 15 NAD83 datum).
	MESL_LIBNO	Text	50	MESL - library number.
	MESL_EST_STN	Text	50	MESL - description of how the geographic coordinates were obtained.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - STATION (cont.)				Station information (sediment and tissue samples).
	MESL_CORELENGTH	Text	50	MESL - core length (units are in meters). Note that this field has only been populated when the information has been readily available (electronic format).
	MESL_Habitat class	Text	50	MESL - relevant to REMAP studies only (STUDYID 04 & 06). Codes: 1 = Shallow area; 2 = Channel; 3 = Reservoir.
	MESL_LOCDISC2	Text	50	MESL - additional station location descriptions.
	MESL_COMMENTS	Text	150	MESL - comments.
	ORIGINALX	Number, Single	4	Draft: Originally reported X coordinate.
	ORIGINALY	Number, Single	4	Draft: Originally reported Y coordinate.
	ORIGINALCOORDS	Text	50	Draft: Original coordinate system.
ptbl - STUDY				Study names and the types of data associated with each study.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	STUDYNAME	Text	40	Study name.
	CONTACT	Text	40	Contact person/agency.
	SEDICHEM	Yes/No	1	Indicates if the study has surficial sediment chemistry data incorporated in the database.
	SEDTOX	Yes/No	1	Indicates if the study has sediment toxicity data incorporated in the database.
	SUBSURF	Yes/No	1	Indicates if the study has sub-surface sediment chemistry data incorporated in the database.
	LABACCUM	Yes/No	1	Indicates if the study has bioaccumulation test data incorporated in the database.
	TISSCHEM	Yes/No	1	Indicates if the study has tissue chemistry data incorporated in the database.
	BENTHIC	Yes/No	1	Indicates if the study has benthic infaunal data incorporated in the database.
	Location/Sampling Year	Text	40	Location and sampling year.
	MESL_LIBNO	Text	50	MESL- library number.

Table 2. Continued

Table Name	Field Name	Data Type	Field Size	Table Description / Field Description
ptbl - STUDYNOT				Study notes.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	NOTES	Memo	0	Notes.
	MESL_LIBNO	Text	50	MESL - library number.
ptbl - STUDYREF				Bibliographic references for each study.
	SITEID	Text	4	Site ID code (from Query Manager).
	STUDYID	Text	2	Study ID code.
	DOC_NO	Text	50	Unique document number.
	MESL_LIBNO	Text	50	MESL - library number.
	YEAR	Text	4	Publish year for report.
	AUTHORS	Text	160	Authors of the report.
	TITLE	Text	180	Title of the report.
	SOURCE	Text	160	Source (locations).
	STUDYCOMM	Text	160	Comments.

CHAPTER 3

PHASE III DATABASE ISSUES

3.1 INTERPRETATION OF MEAN PEC-Q DATA

Two types of narrative SQTs have been adopted by the MPCA for the Minnesota side of the St. Louis River AOC (Crane *et al.* 2000, 2002). The Level I SQTs are intended to identify contaminant concentrations below which harmful effects on sediment-dwelling organisms are unlikely to be observed. In contrast, the Level II SQTs are intended to identify contaminant concentrations above which harmful effects on sediment-dwelling organisms are likely to be observed. The narrative objectives for both levels of SQTs do not address the potential for bioaccumulation nor the associated effects on those species that consume aquatic organisms (i.e., wildlife and humans, for which the MPCA has adopted separate SQT values; see Table 15 in Crane *et al.* 2000).

Most of the Level I and Level II SQTs were adopted from the consensus-based threshold effect concentrations (TECs) and probable effect concentrations (PECs), respectively, of MacDonald *et al.* (2000; Crane *et al.* 2000). Because sediments in the St. Louis River AOC are known to contain complex mixtures of contaminants (Schubauer-Berigan and Crane 1996, 1997; Crane *et al.* 1997; Breneman *et al.* 2000; Crane *et al.* 2005), the predictive ability of the SQTs to predict sediment toxicity is likely to increase when the SQTs are used together to classify these sediments. The procedure for calculating Level II SQT quotients (i.e., mean PEC-Qs) is provided on page 36 of Crane *et al.* (2000). In short, the mean PEC-Q is calculated for the three main classes of chemicals (i.e., metals, total PAHs, and total polychlorinated biphenyls; PCBs) with reliable PECs. In this context, the term reliable is defined as the ability of the sediment quality guidelines (PECs in this case) to correctly classify sediments as toxic or nontoxic based on the data used to derive the guidelines (Long and MacDonald 1998). Based on a matching sediment chemistry and toxicity database for the St. Louis River AOC, the incidence of sediment toxicity to amphipods (*Hyalella azteca*) and midges (*Chironomus tentans*) within five ranges of mean PEC-Qs was found to increase as the mean PEC-Q ranges increased (Crane *et al.* 2002). Thus, the mean PEC-Qs provide a reliable basis for classifying sediments as toxic or not toxic in the St. Louis River AOC (Crane *et al.* 2002).

The numerical SQTs provide useful tools for making sediment management decisions in the Minnesota side of the St. Louis River AOC, especially when considered as part of a weight-of-evidence approach that includes other sediment quality indicators, such as sediment contaminant chemistry and geochemical characteristics, sediment toxicity, and benthic invertebrate community structure (Crane and MacDonald 2003). The recommended applications of using the numerical SQTs in the St. Louis River AOC include: designing monitoring programs, interpreting sediment chemistry data, conducting ecological risk assessments, and developing site-specific sediment quality remediation targets for small, simple sites where adverse biological effects are likely (Crane and MacDonald 2003).

Limitations on the use of Level I and Level II SQTs and mean PEC-Qs in the St Louis River AOC have been discussed previously (Crane *et al.* 2002; Crane and MacDonald 2003). Of particular note with regards to the Phase III MS Access and Query Manager-compatible database files is that a mixture of sediment chemistry data was not available for the calculation of mean PEC-Qs for all samples. Thus, some mean PEC-Q values may only represent one chemical class (i.e., metals, total PAHs, or total PCBs). Furthermore, some mean PEC-Q values in the database may only represent one reliable metal [e.g., lead was the only component of the mean PEC-Q values for some of the recently entered samples from StudyID's 47 and 48, for which the corresponding total PCB data were excluded because the sum of the undetected Aroclor PCBs exceeded the Level II SQT (i.e., PEC) value for total PCBs]. Thus, users should be careful of interpretations they make about sediment chemistry data from StudyID's 47 and 48 based on only the mean PEC-Q values. Users may want to analyze the mean PEC-Q data further to flag values that are composed of only one chemical, and in particular, only one metal. As a reminder, mercury is not included in the calculation of mean PEC-Qs, because this metal does not have a reliable PEC value (Crane *et al.* 2000).

3.2 DISPLAY OF SEDIMENT QUALITY DATA ON GIS APPLICATIONS

Sediment quality data from either the Phase III MS™ Access '97/2000 or Query Manager-compatible databases can be plotted on the Phase II GIS applications if the data have associated geographical coordinates. Chapter 6 of the Phase II Help Section for Database Users (Smorong and Crane 2004) explains how to plot queried data in either the Phase II ArcView 3.2 projects or ArcMap 8.3 map documents.

These GIS applications have a line and polygon basemap (i.e., water boundary shapefile) for the St. Louis River AOC that is inaccurate when viewed at larger scales. This discrepancy is evident when comparing the water boundary shapefile to the orthographic aerial photographs and/or topographic maps that users can also choose to plot data on (Smorong *et al.* 2004a). During previous phases of the database, when station locations appeared to be falling outside the water boundaries (i.e., on land), the water boundary shapefile was compared to the orthographic aerial photograph to determine whether the geographic coordinates of the station location were inaccurate, or if the water boundary shapefile was inaccurate. If the later situation existed, the water boundary shapefile was edited to match the aerial photograph for the section of the shoreline adjacent to the station location. However, for the Phase III sediment quality database, a large number of samples for the St. Louis River Interlake/Duluth Tar Superfund site appeared to be offset from the water boundary shapefile (especially for StudyID's 41 and 42, as well as some sites from StudyID's 37-40 along Slip 7; Figure 4). These samples appeared to plot correctly on the orthographic aerial photograph for this site (Figure 5). Due to the limited resources of this project, the water boundary shapefile was not adjusted for the Phase III project. Users should consider plotting data from this site on the accompanying aerial photograph.

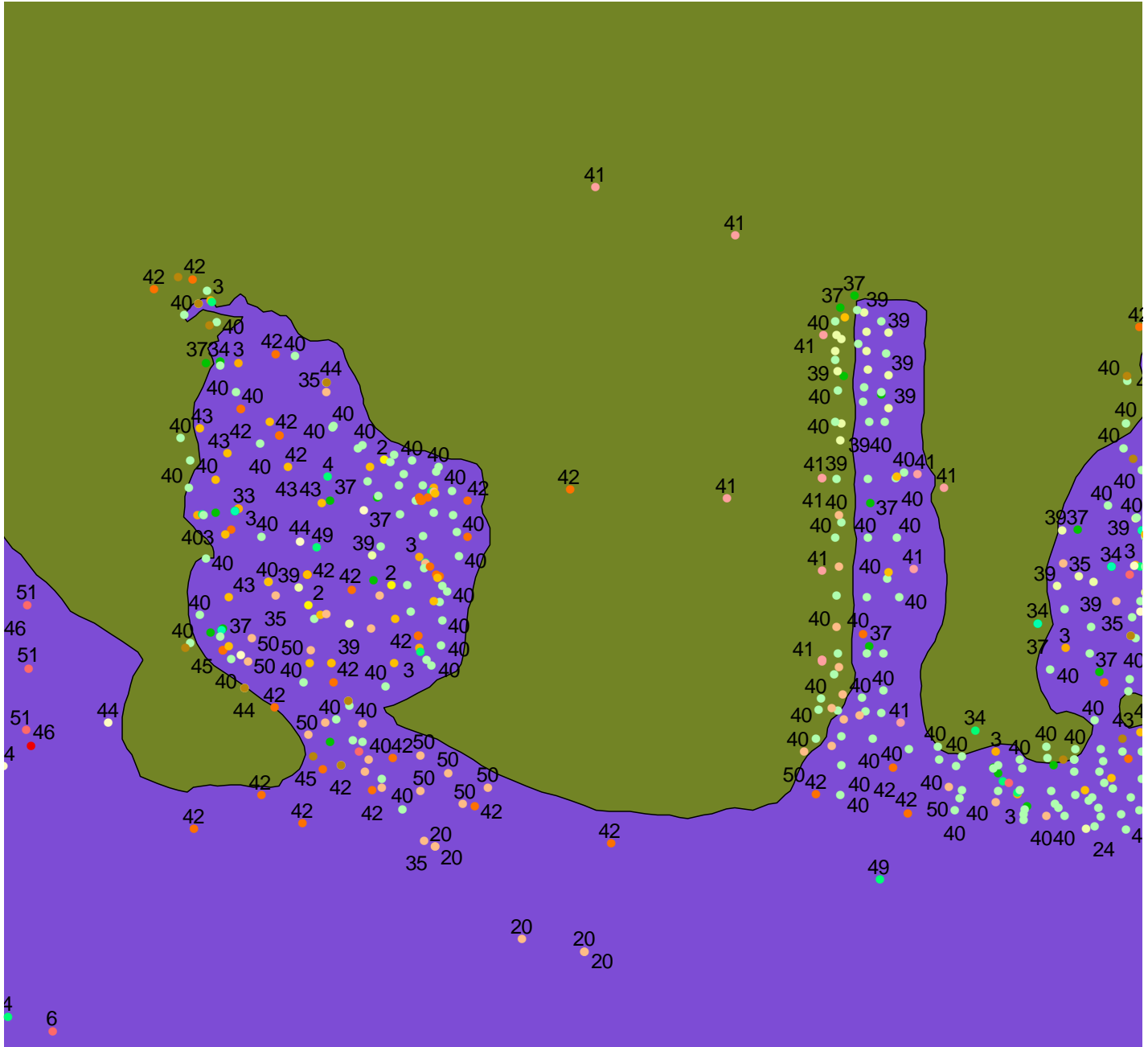


Figure 4. Sample locations (by StudyID) plotted on the water boundaries basemap for the St. Louis River Interlake/Duluth Tar Superfund site. Note the mislocation of sites on land, particularly by Slip 7 (middle slip).

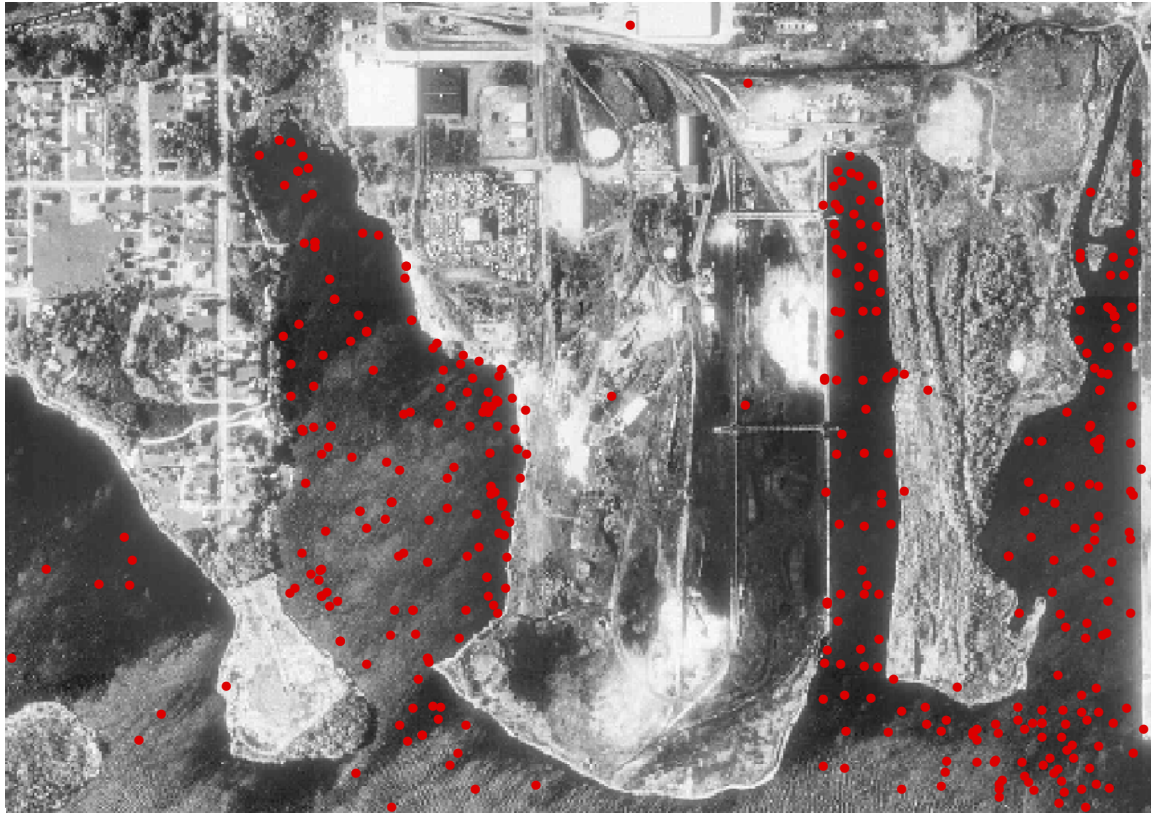


Figure 5. Location of sample sites for the St. Louis River Interlake/Duluth Tar Superfund site plotted on the accompanying orthographic aerial photograph. The data appear to be plotted in the correct locations.

CHAPTER 4

INSTRUCTIONS FOR OBTAINING PHASE III DATABASE FILES

The Phase III database products will be available on the MPCA's File Transfer Protocol (FTP) server until the Phase IV database products are completed during Spring 2006. The MPCA's FTP server provides a convenient way to make electronic files available to collaborators, stakeholders, and other interested parties. User's lacking internet access should contact Judy Crane at 651-297-4068 (voice) or by email at judy.crane@pca.state.mn.us to request a CD of the database files. Otherwise, the database files can be obtained by separately copying and pasting the below FTP addresses into the user's web browser (such as Internet Explorer). Users with MSTM Access 2000 software should not download the MSTM Access '97 file.

- ***Phase III MSTM Access 2000 sediment quality database:***
ftp://files.pca.state.mn.us/pub/tmp/STLR_SED_DB_PH3_FinEdited.zip
- ***Phase III MSTM Access '97 sediment quality database*** (for those users lacking MSTM Access 2000): ftp://files.pca.state.mn.us/pub/tmp/STLR_SED_DB_PH3_97.zip
- ***Query Manager-compatible database files*** (i.e., 23 files):
ftp://files.pca.state.mn.us/pub/tmp/STLR_SEDB_QM_Final.zip. This version of the database contains a number of user-friendly queries developed by NOAA which allow users to quickly obtain information from the database.

After linking to the FTP server, a "File Download" box will appear with the option of either opening or saving the file. Choose "Save". Next, users need to save the file to a directory of their choosing on their computer. Please put the MSTM Access database and Query Manager-compatible files in separate folders. Do not change the file name or type of file (it is a WinZip file). Press "Save".

Next, navigate to the directory where the file(s) were just saved. The files have been zipped to reduce their size. They will need to be unzipped in order to use the databases. For users with WinZip software, double-click on the file to open WinZip. Users lacking WinZip software should consider purchasing this inexpensive software from the internet. Click the "Extract" button, and view the "Extract" box. Select the directory to store the extracted file(s) to, and press the "Extract" button. The files are now available to use as "working" files. Retain the zipped file(s) as the "master" file(s) that can be utilized in case portions of the "working" file(s) are accidentally deleted or mistakenly modified.

A few extra steps need to be followed before the Query Manager-compatible database files can be used within NOAA's Query Manager software. Users who downloaded previous versions of NOAA's Query Manager software should delete it from their C: drive as NOAA recently updated Query Manager to version 2.56 (as described at: <http://response.restoration.noaa.gov/cpr/watershed/watershedtools.html>). NOAA will release a slightly updated version of Query Manager 2.56 during the fall of 2005. Follow the directions on

NOAA's Watershed Database and Mapping Projects Web page to download the current version of Query Manager to the users C:drive (see <http://response.restoration.noaa.gov/cpr/qm/qmmpinstall.html>). NOAA's Query Manager files will be automatically downloaded to the "C:\qm25win\" folder created on the users computer. Next, create a subfolder called "C:\qm25win\stlouis\sl_data". Note: the following directions supersede those given in Section 7.3 of the Phase II Help Section for Database Users (Smorong and Crane 2004). Copy the following Query Manager-compatible files from the Phase III project to the "C:\qm25win\stlouis\sl_data" folder:

- bmaster.DBF
- bmaster.FPT
- biosum.DBF
- chem.DBF
- chemsb.DBF
- chemtiss.DBF
- qualify.DBF
- sample.DBF
- site.DBF
- smpsedsb.DBF
- smptiss.DBF
- station.DBF
- study.DBF
- studynot.DBF
- studynot.FPT
- studyref.DBF

Copy the remainder of the Phase III Query Manager-compatible files to the "C:\qm25win" folder. Note: this action will result in the replacement of existing NOAA files with the files listed below that are applicable to the Phase III database project.

- chemdict.DBF
- species.DBF
- sqc.DBF
- sqcdict.DBF
- sqcpairs.DBF
- testdict.DBF
- tisstype.DBF

When the Query Manager files were downloaded from NOAA's web site, a Query Manager icon (QM) was automatically placed on the users desktop. Click on the QM icon to start it up. The first time Query Manager is started, it will provide a list of Phase III files it "prepared". Users can then conduct a number of queries from the drop down menu in Query Manager for the following categories:

- All Data Types;

- Sediment Chemistry (surface);
- Sediment Chemistry (subsurface);
- Tissue Chemistry; and
- Sediment Bioassay.

Refer to Chapter 5 of the Phase II Help Section for ArcView Users (Smorong *et al.* 2004a) for instructions on linking query output from the MS™ Access 2000 database and Query Manager database to the Phase II ArcMap 8.3 map documents. Since ArcMap 8.3 has been replaced by ArcMap 9 at the MPCA, all MPCA users will need to save the files as ArcMap 9 map documents. The Phase II GIS files will be updated with new GIS watershed data as part of the Phase IV database project; these ArcMap 9 updates should be completed by February 2006.

Please contact Judy Crane at 651-297-4068 (voice) or by email at judy.crane@pca.state.mn.us if any problems are encountered with downloading the Phase III database files from the MPCA's FTP server. In addition, new users of the database should provide their contact information to Dr. Crane so she can inform them when the Phase IV database files, ArcMap 9 map documents, and associated reports are ready for distribution.

CHAPTER 5

PROJECT CONTACT

For further information about the Phase III MST™ Access '97/2000 or Query Manager-compatible sediment quality databases for the St. Louis River AOC—Minnesota focus, contact Judy Crane at:

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Documents from the Phase III project will be posted on the MPCA's Contaminated Sediments Web page at: <http://www.pca.state.mn.us/water/sediments/studies-stlouis.html#assessment> . Users will be notified when the Phase IV MST™ Access '97/2000 and Query Manager-compatible sediment quality databases for the St. Louis River AOC—Wisconsin focus have been completed by the spring of 2006.

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