TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Surface Water Quality Monitoring

Data Management Reference Guide

Water Quality Planning Division, Monitoring & Assessment Section, Data Management & Analysis Team

07/01/2019

Chapter 1 – Introduction to the SWQM Data Management Reference Guide

The purpose of this guide is to assist the Texas Commission on Environmental Quality (TCEQ) Clean Rivers Program (CRP) partner agencies, Total Maximum Daily Load (TMDL) Program contractors, Surface Water Quality Monitoring (SWQM) Program staff, Water Quality Standards (WQS) Group staff and contractors, Non-Point Source (NPS) Program contractors, and any other TCEQ programs or external entities submitting data to the TCEQ Surface Water Quality Monitoring Information System (SWQMIS) database. This guide outlines the processes for requesting parameter codes, station ID numbers, submitting and collecting entity codes, tag prefixes, corrections to data in SWQMIS, and data reports. It also explains data review and data reporting (including data reporting formats) and contains reference maps, tables, and descriptions for use when submitting data to the TCEQ. Guidance is also provided for using SWQMIS tools to extract and interact with data in the database.

Substantive changes were made to the guide this year. Appendix E – Qualifier Codes – contains new qualifier codes that have been added, existing qualifier codes that have been revised, and some codes that have been retired.

The original water monitoring program was established in 1967 with the purpose of collecting and analyzing the data necessary to describe the water quality of Texas streams, reservoirs and estuaries. Today, SWQMIS contains more than 50 years of physicochemical and biological data from up to 9,900 monitoring stations throughout Texas. This data is collected by the TCEQ, contributing river authorities, cities, and other local, state, and federal agencies.

The TCEQ maintains SWQMIS. This database serves as a repository for TCEQ surface water quality data. SWQMIS also provides data validation and reporting tools, a mapping interface, and modules for tracking information about projects and quality assurance documents. Forms related to the TCEQ's surface water quality programs data and SWQMIS are available in the Forms module of SWQMIS. These forms include the SWQMIS Change Request Template, the Data Correction Request, the Data Review Checklist, the Parameter/Constituent Request, and the Submitting Entity/Collecting Entity/Monitoring Type Request.

The Water Quality Planning Division, Monitoring and Assessment Section's Data Management and Analysis Team (DM&A) is responsible for the management of surface water quality data and metadata in cooperation with other TCEQ water programs and the Information Resources Division (IRD). This responsibility includes documentation and maintenance of records relating to the processes described in this document. Relationships between DM&A and other water program areas are documented in project-specific Quality Assurance Project Plans (QAPPs). Data not meeting quality objectives set forth in these QAPPs may be stored in SWQMIS with appropriate qualifiers (see Appendix E).

The TCEQ's statewide surface water quality database has received data since 1967, allowing for the assessment of short- and long-term trends. This data may be used by TCEQ to characterize existing conditions, evaluate spatial and temporal trends, develop water quality standards, determine water quality standards compliance, identify emerging problems, and evaluate the effectiveness of water quality control programs.

Access to SWQMIS is limited to active TCEQ surface water quality monitoring staff and a limited number of staff from active contractors. To request access to SWQMIS send an email to swqmis@tceq.texas.gov.

For additional information contact:

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Water Quality Planning Division

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Chapter 2 – Parameter and Constituent Code Requests

Parameter Code Request - Description

All parametric data entered into the SWQMIS database is identified using a unique 5-digit parameter code. Each parameter is also associated with a constituent. A parameter is a given constituent measured in a specific media by a specified method. A constituent is an element, compound, organism, or water characteristic in its most basic form.

The SWQMIS Parameter/Constituent Code Request Form, referred to as the Parameter Request Form, is to be used when adding a new parameter, a new constituent code, changing an existing parameter, or an existing constituent code in SWQMIS. This form is available from the hyperlink above, or SWQMIS users can access the Parameter Request Form in the SWQMIS module named 'Forms'.

For a current list of all existing parameter codes in the SWQMIS database, go to inventory of current parameter codes, or contact the DM&A Team directly.

SWQMIS users can use the SWQMIS Parameter Inventory Report to obtain a complete list of parameter codes stored in the database.

Request Process

1. Submit SWQMIS parameter code requests on the Parameter Request Form located under the Forms Module in the SWQMIS database or from TCEQ's external website. Submit the completed form by pressing the 'Submit Form' button located at the top right corner of the form. A pop-up window will appear asking for the email client in use. There are two options
    i. If you select the Desktop Email Application option, an email will auto-generate with the completed form attached. Press 'Send' to submit your form to the DM&A Team at wdma@tceq.texas.gov.
    ii. If you select the Internet Mail option, your computer's browser window will open prompting you to save the form. Generate an email to wdma@tceq.texas.gov and attach the completed Parameter Request Form.
2. When the DM&A Team receives your request, a data manager will either contact you for more information or complete the request in about 10 business days.
3. Once your request is completed, DM&A will notify you via email and attach the completed Parameter Request Form with the new or modified Parameter/Constituent Code information.

Parameter/Constituent Code Request Fields

Information Provided by the Requestor

To request a new or revised parameter/constituent code, complete the shaded portion of the

request form.

Check Action Required

Check the appropriate box —add a new code to the database or make changes to an existing code.

Person Submitting Request

Enter your name in the field.

Agency or Contractor Name

Enter the name of your agency or the contractor making the request.

Program Area

Enter the TCEQ program area with which the request is associated.

QAPP Title

Enter the title of the QAPP with which the request is associated.

Contact Phone

Enter a contact phone number in case any questions arise during the processing of the request.

Explanation of Request

Provide a brief explanation of why you are requesting the action.

Parameter

Provide a brief description of the parameter.

Parameter Code

If the request is for a change, enter the existing parameter code. Otherwise, leave this field blank.

Media

Enter the media in which the parameter is measured (water, sediment, tissue, etc.).

Unit of Measure

Enter the measurement units for the parameter. Enter NA if this field is not applicable.

Analytical Method

Enter the analytical method associated with the parameter. Indicate if this is an EPA approved method. Enter NA if this field is not applicable.

Analytical Method Number

Enter the number associated with the analytical method. Enter NA if this field is not applicable.

Information Provided by DM&A Staff

DM&A staff will complete the following form fields.

Parameter Code

DM&A assigns a unique 5-digit parameter code for new parameter requests, or they will use the code you provided.

Constituent ID

DM&A assigns the ID of the constituent for each parameter. For example, if the requested

parameter were suspended organic carbon, DM&A would assign the parameter to the constituent ID for carbon.

CAS Number

DM&A identifies the CAS (Chemical Abstracts Service) number associated with the constituent, if applicable.

Constituent Category

DM&A assigns each constituent to a category in SWQMIS. These categories include Physical/Chemical, Algae, Habitat, Benthos, Phytoplankton, Zooplankton, Nekton, Macrophytes, and NS (Not Specified).

Parameter Description

DM&A develops a parameter description.

Minimum Value

DM&A sets a minimum threshold value for the parameter. This value sets a data quality control check.

Maximum Value

DM&A sets a maximum threshold value for the parameter. This value sets a data quality control check. Results greater than this value require verification when data is manually entered or flat-file loaded into SWQMIS.

Entered in SWQMIS

The DM&A Data Manager signs the completed form verifying the change in SWQMIS.

Date Entered

The DM&A Data Manager provides the date the action was completed.

Parameter Inventory Report

SWQMIS contains over 5,800 parameter codes used to report data to the TCEQ and should not be confused with the list of STORET codes maintained by the EPA. The SWQMIS Parameter Inventory Report lists parameter codes and associated parameter metadata. Data providers should review this report when planning new or different sampling or analyses. If an existing code does not accurately represent the planned sampling or analyses, a new code is requested using the Parameter Request Form.

The following fields are included in a Parameter Inventory Report.

- Parameter Code
- Parameter Description
- Units of Measure
- Media
- Method
- CAS Number

Chapter 3 – SWQM Station Location (SLOC) Request

All parametric data entered into the sampling module of the SWQMIS database must be associated with a permanent monitoring station identified by a 5-digit Station Identification code (Station ID). A SWQM Station Location (SLOC) Request is submitted via the SWQMIS interface to:

- Create a new permanent Station ID, or
- Make a change to an existing permanent Station ID.

Process for Requesting New Stations or Correcting Existing Stations

1. Review the inventory of existing stations in SWQMIS prior to requesting a new station. A station may already exist at or very near the desired sampling location. This can be done either by running a Station Inventory Report or by using the Map Viewer in SWQMIS. A new Station ID is not required if the proposed sampling location is within 400 meters up or downstream of an existing stream station, or within a 400 meter radius in reservoirs and bays and if the existing station is representative of the same hydrologic, biologic, or water quality conditions. If the existing station does not accurately represent conditions at the new sampling location, a new station is necessary. For example, if there are conditions such as discharge points, a confluence with an adjoining stream, restrictions of flow, dams, any construction that might affect the stream, or differences in water depth that could influence circulation, a SLOC Request accurately describing the new location should be submitted. If the specific sampling design requires stations closer together than 400 meters, please specify this in the Monitoring Stations "General Comments" section on the Attachments and Status page within the request.
2. The monitoring entity may submit a SLOC directly if they are authorized to log into SWQMIS. Alternatively, the submitting entity (TCEQ Program project managers in particular) may choose to do this on behalf of the monitoring entity. TCEQ Regional staff who perform SWQM monitoring submit SLOC requests directly. Anyone filling out a SLOC may choose to save the SLOC prior to submitting it, to continue editing the request later.
3. For new stations, all required fields in the SLOC Create screens must be filled out by the requestor: SWQMIS will not allow an incomplete SLOC to be submitted. To request changes to an existing station, the SLOC screen will open populated with the data already existing for that station. Make changes to any fields as appropriate. All other fields (where no changes are desired) should be left as they are. Fields are defined later in this chapter.
4. A map image with scale 1:24,000 or greater, clearly depicting any proposed new station location must accompany the SLOC request form. The map must unambiguously define any nearby major highways, roads, streams, or physiographic features to facilitate verification of the station location. All base maps must be a 1:24,000 scale (7.5-minute series) United States Geological Survey (USGS) topographic map and/or a spatially correct digital orthophoto quarter quadrangle (DOQQ) with resolution of at least 1 meter. The map image must include any major long description landmarks, and all stations and features must be labeled. More information and resources are included in the SLOC Maps section of this chapter.
5. The SLOC Request is entered into SWQMIS and submitted with a map attached. DM&A verifies the entries made and the attached map follow the DMRG requirements for station locations before being elevated to the status of Pre-Production or Production.

6. The SLOC Request status will be Rejected and returned to the originator with comments if a map is not provided (for new stations or location changes to existing stations), if the request is incomplete, or if any other significant errors are identified.
7. When a SLOC Request is processed an electronic copy of the request is returned to the requestor and/or program project manager to be forwarded to the requestor. This acknowledgment includes the unique permanent Station ID to be used when submitting sample results collected at that station.
8. For expedited requests (less than 10 business days), please see the following section.

Expedited SLOC Requests

If for any reason it is necessary to create or correct a station faster than the usual turnaround of 10 business days, please refer to the following steps:

1. Submit a SLOC as described in the preceding section.
2. E-mail the SLOC Coordinator for your program area, requesting expedited processing and explaining the circumstances. Include the SLOC ID.

Batch Upload SLOC Requests

SLOC Request information may be uploaded to SWQMIS in ACSII pipe-delimited text file format instead of using the individual SLOC screens. All fields noted in the table below must be included in the text file whether the fields have values or are left blank. Required fields must contain a valid value. Optional fields may be left blank. Submit one or more request records per text file. Note that the "SWQMIS SLOC Batch Upload" screens also require that the user add a map attachment for each "Create SLOC"; there is a screen for this function.

SWQMIS SLOC Batch Upload required fields:

Field	Data Type	Length	Required/Optional
Station ID	Number	5	Must be blank for create request. Required for a change request.
Long Description	Alphanumeric	500	Required for create request. Optional for change request.
Temporary ID	Alphanumeric	10	Optional for create request. Optional for change request.
Requester	Alphanumeric	75	Required.
Latitude	Number	(+)9	Required for create request. Optional for change request. Latitude must be a positive value with 6 numbers to the right of the decimal. Positive symbol not required.
Longitude	Number	(-)9	Required for create request. Optional for change request. Longitude must be a negative value with 6 numbers to the right of the decimal and a negative symbol preceding the degree value.
Segment ID	Alphanumeric	4-6	Required for create request. Optional for change request.
Submitting Entity	Alpha	2	Required for create request. Optional for change request.
Collecting Entity	Alpha	2	Required for create request. Optional for change request.
Monitoring Type	Alpha	2	Required for create request. Optional for change request.
Permit Number	Alphanumeric	25	Required for create request only if Monitoring Type is RW (Receiving Water Assessment). Optional for change request.

Field	Data Type	Length	Required/Optional
USGS Gauge ID	Integer	8-15	Optional for create request. Optional for change request.
Stream Station Type Level	Integer	1	Required for create request. Optional for change request.
Stream Station Type Code	Alpha	6	Required for create request. Optional for change request.
Horizontal Organization	Alpha	2	Required for create request. Required for change request if Lat/Long entered.
Horizontal Reference	Alpha	10	Required for create request. Required for change request if Lat/Long entered.
Horizontal Description	Alpha	500	Optional for create request. Optional for change request.
Horizontal Date	Text	10	Required for create request. Required for change request if Lat/Long entered.
Horizontal Datum	Text	7	Required for create request. Required for change request if Lat/Long entered.
Horizontal Method	Text	5	Required for create request. Required for change request if Lat/Long entered.
Horizontal Accuracy	Number	4,2	Required for create request. Required for change request if Lat/Long entered.
Elevation Organization	Alpha	2	Optional for create request. Required if an Elevation is provided. Optional for change request. Required if an Elevation is provided.
Elevation	Number	6	Optional for create request. Required if an Elevation is provided. Optional for change request. Required if an Elevation is provided.
Elevation Date	Text	10	Optional for create request. Required if an Elevation is provided. Optional for change request. Required if an Elevation is provided.
Elevation Datum	Text	7	Optional for create request. Required if an Elevation is provided. Optional for change request. Required if an Elevation is provided.
Elevation Method	Text	5	Optional for create request. Required if an Elevation is provided. Optional for change request. Required if an Elevation is provided.
Elevation Accuracy	Number	4,2	Optional for create request. Required if an Elevation is provided. Optional for change request. Required if an Elevation is provided.

Example of create request:

|OKRY CREEK 80 METERS DOWNSTREAM OF US HWY 259 IN MORRIS COUNTY|08049565|tkirklan|32.86734948|-97.03917507|0841C|GS|GS|RT||08049565|1|STREAM|GS|OTHER||04/01/2009|NAD27|UNKNOWN|9999||||||

SLOC Maps

As long as the scale and readability are not negatively impacted, submission of a single map showing multiple sampling sites is encouraged. While in many cases it is not necessary to create individual maps for each SLOC, each “Create SLOC” request submitted via SWQMIS is required to include a map attachment. Requesters using GIS software who have ready-made maps may use

the SLOC interface to attach these files. Those without map-generation options outside SWQMIS can use the Map tool in the SLOC General Information screen to capture a map image to use as the attachment.

SLOC Request Field Descriptions

The following fields must be completed by the requestor:

Station ID

The station ID is a 5-digit code that is automatically generated when a new site is created in SWQMIS and is used when submitting sampling results from that site. A station ID is supplied by the requestor only when requesting changes to an existing station in SWQMIS.

Long Description

A detailed description limited to 500 characters is required. The description must be adequate to describe the exact location of the station. The description should not include directions to the station relative to landmarks, but should be concise and include enough specific information to allow someone to locate the station on a map with 25-meter accuracy. The name of the water body must be noted first, followed by relative location such as river meters/kilometers downstream or upstream of a named or numbered road or tributary preferably followed by the distance to a city or named feature on a map. The permit number of the target facility must be included in the long description for sites that are reporting data for a Receiving Water Assessment (RWA). See the “Helpful Hints on Completing SLOC Requests” section of this chapter for more information about station descriptions.

Temporary ID

Any identifier used by the submitter to track a station requested but not yet established should be noted here. If, for example, a SLOC map is marked with ATPWD 23" to illustrate the location of the proposed station, ATPWD 23" should be noted in the temporary ID field. This may also be the unique identifier used by the submitting entity in their own database.

Requester

The SWQMIS User ID of the person making the request. If the SWQMIS User ID is used both the Submitter and the Requester will have access to the SLOC Request. If the Requester is not a SWQMIS User, note instead the proper name and Organization (such as “Bruce Ridpath, H-GAC”).

Latitude/Longitude

Latitude and longitude in standard decimal degree format must be used. The accuracy of the latitude/longitude coordinates is governed by the TCEQ’s Operating Policy and Procedure 8.11.02, Geographic Information Systems Positional Data, which requires accuracy of 25 meters. Latitude and longitude values in decimal degrees must be specified to the nearest 1/10,000th of a degree (four decimal places) to meet this accuracy requirement. Latitude and longitude

coordinates are required and preferably determined by trained staff using a Global Positioning System (GPS) unit and appropriate post processing. Another accurate method is the interpolation of one meter resolution DOQQs or using the TCEQ Map Viewers. DOQQs for the entire state of Texas are available from the Texas Natural Resources Information System or via a TCEQ web viewer - see the SLOC Maps section of this chapter for more information on this viewer.

Note that this is a different GIS viewer than what is in SWQMIS.

Program

Select the TCEQ program area the data reported from this station will be submitted through. The options to select rom are CRP, CWQMN, NPS, SWQM, Standards, and TMDL.

Submitting Entity

This is a 2-character code for the organization that will be submitting monitoring data from this location to the TCEQ. See Chapter 4 for a list of valid codes.

Collecting Entity

This is a 2-character code for the organization that will be collecting monitoring data at this location. See Chapter 4 for a list of valid codes.

Monitoring Type

This is a 2- or 4-character code for the type of monitoring that will be performed at this location. See Chapter 13 for a list of valid codes.

Permit Number

If the station is near or will be used to monitor discharge from a permitted facility, report the permit number. Do not use the number symbol (#); simply list the alphanumeric value (such as "123-7558-A").

Segment ID

A Segment ID is a required 4, 5, or 6 character segment code determined from the Segment Descriptions list as found in the Texas Surface Water Quality Standards (TSWQS), Texas Administrative Code (TAC), Title 30, Part 1, Chapter 307, Appendix C.

Note, in addition to the Segments listed in the Standards, Stations can also be associated to an Unclassified Segment, which may not be defined in the Standards.

USGS Gauge ID

Submit the USGS gauge station ID for stations at the same location as a USGS gauge station.

This number is obtained by reviewing USGS topographic maps or from the USGS site inventory.

Note, the USGS gage can be within 0.25 mile of the station according to the SWQM Procedures manual.

Stream Station Level

Note the Level (1 through 5) of the Stream Station Type Code used. See Appendix B for information on Stream Stations Levels. Only Levels 1 through 2 are required unless samples are collected at the pipe, in which case all 5 levels become required.

Stream Station Code

Stations must be identified using the coding scheme listed in Appendix B. For example, a station that is considered to be within a mixing zone must be coded with the Level 2 value "NONAMB". The mixing zone is defined in the SWQM Procedures Manual, Volume 1 (1).

Horizontal Organization

The organization that generated the horizontal coordinates (latitude and longitude) for this station. Often, this is the same as either the Submitting Entity or Collecting Entity for the stations. Any Submitting or Collecting entity code listed in Chapter 4 may be used for this field.

Horizontal Reference

A code that specifically describes the precise location of the coordinate with reference to the facility, if applicable. For many ambient stations not associated with any facility, the code OTHER applies. Valid values are listed in Appendix D.

Horizontal Description

Additional information about the site location, such as driving directions or specific references for locating the site within a facility.

Horizontal Date

The date on which the horizontal coordinates (latitude and longitude) were generated.

Horizontal Datum

The horizontal reference datum used when collecting the horizontal coordinates. Valid values are listed in Appendix D. NAD83 is the most widely used since it is the datum used for DOQQ's and other popular mapping tools.

Horizontal Method

A code that defines the method used to generate the horizontal coordinates. Valid values are listed in Appendix D. The method code may also allow determination of the Horizontal Accuracy value as well.

Horizontal Accuracy

Assessment of the horizontal accuracy of the reported latitude/longitude coordinates expressed in meters. Accuracy will depend on the method of collection, procedures and equipment used, and/or the results of any statistically valid test of similar points. For example, coordinates obtained using a 1-meter DOQQ (including Google Maps) have an assumed accuracy of 5 meters, while those determined using a 1:24,000 scale topographic map will have an assumed accuracy of 12 meters. A value of 9999 should be entered if accuracy cannot be determined.

The following fields may optionally be completed by the requestor:

Note that if a value is reported for any of these fields, values for all six fields are then required.

Elevation Organization

The organization that generated the horizontal coordinates (latitude and longitude) for this station. Often, this is the same as either the Submitting Entity or Collecting Entity for the stations. Any Submitting or Collecting entity code listed in Chapter 4 may be used for this field.

Elevation

A value expressing the measured height above (or depression below) mean sea level, in meters.

Elevation Date

The date on which the elevation value was generated.

Elevation Datum

The vertical reference datum used when collecting the elevation value. Valid values are listed in Appendix D.

Elevation Method

A code that defines the method used to generate the elevation value. Valid values are listed in Appendix D.

Elevation Accuracy

Assessment of the accuracy of the reported elevation expressed in meters. Accuracy will depend

on the method of collection, procedures and equipment used, and/or the results of any statistically valid test of similar points. A value of 9999 should be entered if accuracy cannot be determined.

The following fields are maintained by DM&A or automatically stored by SWQMIS:

Ambient Indicator

This Y/N code is an indicator of whether the site is considered to be representative of ambient conditions in the water body.

Authorizer ID

SWQMIS captures the User ID of the data manager who promoted the station record to production status.

Submitter ID

SWQMIS captures the User ID of the individual submitting a SLOC.

Established Date

The date a station was originally given production status in SWQMIS.

TCEQ Region

The TCEQ administrative Region in which the station falls, automatically assigned based on the station coordinates.

Basin

The SWQM-defined river basin in which the station falls, automatically assigned based on the associated Segment ID.

On-Segment Indicator

This binary indicator (yes/no) denotes whether the station falls directly within the bounds of a TCEQ classified or unclassified segment. If no, the station falls on a water body flowing into the associated Segment ID.

NHD Reach Code

The 14-digit USGS National Hydrography Dataset code for the water body segment at the station location.

County

The name of the Texas county in which the station falls, automatically assigned based on the station coordinates. For out-of-state stations or stations out in the Gulf of Mexico, this is the closest Texas county.

Level III Ecoregion

The EPA Level III Ecoregion designation at the station location, automatically assigned based on the station coordinates. Ecoregions maps based on EPA data are included in Appendix A.

Level III Ecoregion Reference Site Indicator

This binary indicator (yes/no) denotes whether the station was established as a reference site for the Level III Ecoregion – a minimally impacted location most representative of the naturally occurring conditions within that Ecoregion.

Level IV Ecoregion

The EPA Level IV Ecoregion designation at the station location, automatically assigned based on the station coordinates. Ecoregions maps based on EPA data are included in Appendix A.

Level IV Ecoregion Reference Site Indicator

This binary indicator (yes/no) denotes whether the station was established as a reference site for the Level IV Ecoregion – a minimally impacted location most representative of the naturally occurring conditions within that Ecoregion.

STORET/WQX Station Type Primary

Analogous to the Stream Station Type Code (Level 1) also used to describe the station, this is a specific EPA code used in the national STORET/WQX database.

STORET/WQX Station Type Secondary

Analogous to the Stream Station Type Code (Levels 3-5) also used to describe the station, this is a specific EPA code used in the national STORET/WQX database.

General Comments

Any comments about the station, entered either by the Submitter or Authorizer.

Status

A station may exist in SWQMIS with one or more status designations at any given time. Stations available for data submission and reporting have a status of Production. When a SLOC is accepted for review by a data manager, it has a status of Pre-Production and is not yet available for use. SWQMIS station status options are Saved, Requested, Rejected, Pre-Production, and Production.

Inundated Stations

Stations inundated by reservoir filling are given a status of Retired. The phrase "now inundated use #####" is added to the original station description to show the new reservoir station ID. The station is listed as off-segment if it is located above the normal pool elevation as identified in the TSWQS Appendix C, Segment Descriptions. If monitoring is ongoing at the same location (now in a new reservoir segment), a new station is created for reporting the post-inundation data.

Duplicate Stations

Stations may have been created at locations where a station already existed, through errors in description or latitude/longitude. Where these co-located or "duplicate" stations are discovered, some simple analysis is performed to determine the appropriate action. If no data has been reported to SWQMIS at either station, the lowest numeric station ID is retained for reporting. The other station is given a status of Retired in SWQMIS and is no longer available for reporting data. If one station has data and the other does not, the station with no data is retired and annotated as above. If both stations have data, interested parties are consulted to choose an acceptable course of action. There are also cases where, for legitimate monitoring purposes, stations are created in close proximity. Documentation will be maintained regarding the necessity of the seemingly duplicate stations in these cases.

Helpful Hints on Completing SLOC Requests

The description must contain concise, specific information that allows the station to be located within a 25 meter radius on any map or in the field. The description must be adequate for locating the station on USGS topographic or other maps that meet requirements outlined in the SLOC Maps section of this chapter. Useful information may include a nearby town, for example, "TRINITY RIVER 37 METERS UPSTREAM OF US 57 **NEAR** COLUMBUS" or "… **IN** COLUMBUS". If a station is not located near a city or town, it must be referenced to some other named, mapped feature. For stations on unclassified tributaries, write the most characteristic identifier first, such as "CAGONA CREEK AT US 29" or "CLEAR CREEK 2.57 KILOMETERS DOWNSTREAM OF SH 439 NEAR SISTERDALE". Descriptions are limited to 500 characters.

Do:

- Use the metric system to convey measurements.
- Report any measurement over 1000 meters in kilometers.
- CAPITALIZE all station descriptions.
- Use "AT" rather than "@".
- Spell out "STREET", "AVENUE", "RAILROAD", "ROAD", and similar words whenever possible; use

common abbreviations such as “ST”, “AVE”, “RR”, and “RD” only when necessary to save space.

- Use the term “UNNAMED ROAD” if the name of a road crossing is not obtainable. Unnamed roads must be referenced to an upstream or downstream named road. If no road is available to reference, a named tributary may be used.
- Use “WWTP” for Wastewater Treatment Plant rather than “STP (for Sewage Treatment Plant).”
- Use “UPSTREAM” and “DOWNSTREAM” rather than “ABOVE” and “BELOW”.
- Use the abbreviated format indicated in the following examples for numbered roads:

HAYS CR 450	US 377
IH LOOP 610	SH SPUR 160
FM 2175	IH 45
SH LOOP 329	RR 620

- Use the format indicated in the following examples for roads with more than one name, separating the names with a slash:

TELEPHONE ROAD/SH 35	SH 95/SH LOOP 230
IH 45/US 75	PITTS STREET/NORTH MAIN STREET

- Use the format indicated in the following example for different road names on either side of a bridge, separating the names with a dash:

  WAUGH DRIVE-YALE STREET

- For County Roads (CR), include the full name of the county road in the description:

  WILLIAMSOM CR 258
  CALDWELL CR 100

- Use “IMMEDIATELY” rather than “JUST” when distances are unknown, but less than 25 meters:
  . . . IMMEDIATELY UPSTREAM OF MAPLE STREET.
- Provide exact distances upstream or downstream in meters rather than feet when the distance is less than 1.00 Kilometer (such as 28 meters). Indicate the unit of measurement (meters, kilometers).
- Provide exact distances upstream or downstream in kilometers rounded to up to the nearest hundredth when the distance is greater than or equal to 1000 meters (1.07 kilometers).
- On reservoirs, provide distance from the center of a dam, a road crossing, or other named, mapped feature.
- Whenever possible, use only the four cardinal directions in descriptions. For example, use “100 METERS NORTH AND 200 METERS WEST FROM THE INTERSECTION OF IH 35 AND US 290” rather than “225 METERS NORTHWEST OF THE IH 35 US 290 INTERSECTION”. This triangulated reference format is more precise.
- Use “UNNAMED TRIBUTARY OF” rather than “UNNAMED CREEK”. Follow this with the name of the water body, “UNNAMED TRIBUTARY OF CANEY CREEK AT US 27”. Since there may be more than one unnamed tributary of Caney Creek that crosses US 27, further description may be necessary. For example, “UNNAMED TRIBUTARY OF CANEY CREEK AT US 27 CONFLUENT WITH CANEY CREEK 2.57 KILOMETERS UPSTREAM OF IH 35", or “UNNAMED TRIBUTARY OF CANEY CREEK AT US 27 SOUTH OF ARAPAHO PARK”.
- Unnamed tributaries with a waste water treatment plant (WWTP) discharge may be named for the treatment plant as in “CITY OF COMMERCE WWTP DITCH 53 METERS UPSTREAM OF DISCHARGE TO APPLE CREEK”.
- WWTP effluent descriptions must identify the permit such as “CITY OF COLUMBUS

WWTP PERMIT WQ 1857-02". Do not include a "#" sign in the permit number.

- Sometimes there may be no road or other feature on the map that can be used to describe a stream station. When there are no roads, the distance upstream or downstream from a confluence can be used as the reference location. In describing tributary locations using the mainstream confluence as the reference location, use the format "BARTON CREEK 2.53 KILOMETERS UPSTREAM OF ITS CONFLUENCE WITH THE COLORADO RIVER".
- When describing mainstream locations using a tributary as the reference location, use the format "COLORADO RIVER 4.82 KILOMETERS UPSTREAM OF SANDY CREEK".

Remember to submit the SLOC request by using the 'Submit SLOC' button on the SLOC Attachments and Status screen.

Don't:

- Do not use station labels (letters and number, for example, "AA" or "D2") in long descriptions. If needed, alternate station names may be used in the Temporary ID field.
- Do not use the terms "CROSSING", "BRIDGE", or "HIGHWAY" unless it is an official, mappable part of the place or roadway name.
- Never use "AT" when the reference location used is a stream or WWTP outfall unless the station is specifically for sampling effluent (Stream Station Type Level 1 = PIPE). For monitoring the water body near the outfall, use "IMMEDIATELY UPSTREAM OF" or "IMMEDIATELY DOWNSTREAM OF"; for example, "ARROYO COLORADO IMMEDIATELY UPSTREAM OF THE DEWEYVILLE WWTP OUTFALL". Remember to report the permit number when monitoring adjacent to any permitted outflow.
- Do not use the pound sign (#), the ampersand symbol (&), parentheses, or any other special characters. Any punctuation used (commas, apostrophes, periods other than in numbers) may be removed from the verbal description by DM&A for consistency of format.

Monitoring Station Inventory Report

The Station Inventory Report generates a list of monitoring stations in the SWQMIS database. The Station Inventory Report can be used to verify that details about a monitoring station location are correct, as it includes all of the metadata elements listed in the SLOC Request Field Definitions section above. Users of SWQMIS should review the Station Inventory Report and/or use the Map feature prior to submitting a SLOC to determine whether a station that meets their needs already exists at or near their intended monitoring site.

Chapter 4 – Submitting Entity and Collecting Entity Codes

Submitting Entity and Collecting Entity Codes are assigned by DM&A at the request of TCEQ Programs—CRP, SWQM, TMDL, Standards, NPS. These codes are used to identify entities responsible for submitting the data, and for performing the monitoring. The Submitting Entity is a 2-character code that identifies the entity responsible for submitting the data to the TCEQ. The Collecting Entity is a 2-character code that identifies the entity responsible for performing the monitoring or collecting the data.

Request a new entity code by sending a Submitting Entity/Collecting Entity/Monitoring Type/Tag Prefix Request and Review Checklist to DM&A.

Existing codes are listed on the following pages.

Submitting Entity Codes

The entity responsible for submitting the data to the TCEQ.

AB	**City of Abilene**
AC	**Texas A&M College Station, Department of Wildlife & Fisheries Science**
AD	**Texas AgriLife Research and Extension - Dallas**
AE	**Texas A&M AgriLife Extension - Clear Lake**
AG	**Texas A&M University Galveston Seafood Safety Lab**
AK	**Texas A&M University - Kingsville**
AM	**Texas A&M University – Corpus Christi**
AN	**Angelina-Neches River Authority**
AP	**Alan Plummer Associates, Inc.**
AQ	**Edwards Aquifer Authority**
AR	**City of Arlington**
AT	**Texas A&M AgriLife Research - Stephenville**
AU	**City of Austin**
BA	**Bandera County River Authority and Groundwater District**
BC	**City of Boerne**
BE	**City of Beeville**
BR	**Brazos River Authority**
BS	**Barton Springs – Edwards Aquifer Conservation District**
BU	**Baylor University**
BY	**Bayou Preservation Association**
CB	**Conrad Blucher Institute for Surveying and Science**
CC	**City of Corpus Christi**
CE	**Corps of Engineers**
CL	**Caddo Lake Institute**
CP	**Coastal Bend Bays and Estuaries, Inc.**
CR	**Canadian River Municipal Water Authority**
CY	**Cypress Basin**
DF	**DFW Airport**
EA	**EA Engineering, Science, & Technology, Inc.**
EI	**Espey Consultants, Inc.**
GA	**City of Galveston**

GB	**Guadalupe-Blanco River Authority**
GS	**United States Geological Survey**
HD	**Texas Department of State Health Services**
HG	**Houston-Galveston Area Council**
HO	**City of Houston**
IB	**International Boundary & Water Commission**
IR	**City of Irving**
JC	**Jefferson County Environmental Control District**
JM	**J.M. Miertschin & Associates, Inc.**
KI	**City of Killeen**
LC	**Lower Colorado River Authority**
LD	**LEADS**
LK	**City of Lockhart**
LN	**Lavaca-Navidad River Authority**
LV	**Lower Neches Valley Authority**
MC	**Midland College**
NE	**Naismith Engineering, Inc.**
NR	**Nueces River Authority**
NT	**Northeast Texas Municipal Water District**
PA	**Patrick Bayou TMDL Lead Organization**
PB	**PBS&J**
PE	**Parsons Engineering Science**
PT	**University of Texas Pan-American**
PW	**Texas Parks and Wildlife Department**
RC	**Texas Railroad Commission**
RI	**City of Richardson**
RR	**Red River Authority**
RU	**Rice University**
SA	**San Antonio River Authority**
SB	**Senate Bill 835**
SJ	**San Jacinto River Authority**
SN	**San Antonio Metropolitan Health Department**
SR	**Sabine River Authority**
SU	**Sulphur River Basin Authority**
TA	

Texas Institute for Applied Environmental Research	
TF	**Texas Research Institute for Environmental Studies - SHSU**
TH	**Tetra Tech, Inc.**
TI	**The Meadows Center for Water and the Environment at Texas State University**
TP	**Texas Municipal Power Authority**
TR	**Trinity River Authority**
TS	**Texas Engineering Experimental Station - SERF**
TT	**Texas State Technological College**
TW	**Texas Watch**
TX	**Texas State Soil and Water Conservation Board**
UA	**University of Texas at Austin**
UB	**University of Texas Brownsville**
UC	**Upper Colorado River Authority**
UG	**Upper Guadalupe River Authority**
UH	**University of Houston**
UI	**University of Houston Clear Lake Environmental Institute of Houston**
UM	**University of Texas Marine Science Institute**
UN	**Upper Neches River Authority**
UR	**URS Corporation**
US	**University of Texas at San Antonio**
UY	**University of Texas at Tyler**
WA	**City of Waco**
WC	**Texas Commission on Environmental Quality**
WM	**Water Monitoring Solutions, Inc.**
WS	**Texas A&M University Corpus Christi Center for Water Supply Studies**
WR	**Texas Water Resources Institute**
XX	**Default Code for Unknown Sources**

Collecting Entity Codes

The entity responsible for sample collection.

AB	City of Abilene
AC	Texas A&M College Station, Department of Wildlife & Fisheries Science

AD	Texas AgriLife Research and Extension - Dallas
AE	Texas A&M Agrilife Extension – Clear Lake
AG	Texas A&M University Galveston Seafood Safety Lab
AK	Texas A&M University - Kingsville
AL	Al Amistad National Park Service
AM	Texas A&M University – Corpus Christi
AN	Angelina-Neches River Authority
AO	AECOM
AP	Alan Plummer Associates, Inc.
AQ	Edwards Aquifer Authority
AR	City of Arlington
AS	Water Quality Assessment Team
AU	City of Austin
BA	Bandera County River Authority and Groundwater District
BB	Big Bend National Park Service
BC	City of Boerne
BE	City of Beeville
BN	City of Brownsville
BO	Brownsville Public Utilities Board
BP	Big Thicket Preserve
BR	Brazos River Authority
BS	Barton Springs – Edwards Aquifer Conservation District
BT	Border Environmental Assessment
BU	Baylor University
CA	City of Corsicana
CB	Conrad Blucher Institute for Surveying and Science
CC	City of Corpus Christi
CE	Corps of Engineers
CL	Caddo Lake Institute
CO	TCEQ Central Office
CP	Coastal Bend Bays and Estuaries, Inc.
CR	Canadian River Municipal Water Authority
CW	Colorado River Municipal Water District
CY	Cypress Basin
DA	City of Dallas
DF	DM

DFW Airport	TCEQ SWQM Data Management
DR	City of Del Rio
DT	City of Dallas Trinity Watershed Management
EA	EA Engineering, Science, & Technology, Inc.
EC	Edwards Aquifer Research & Data Center
EI	Espey Consultants, Inc.
EK	Donald Macnair
EM	Ecological Communications Corporation - ECOMM
EP	El Paso Community College
FC	Franklin County Water District
FO	TCEQ Regional Office
FS	Town Lake Fish Study
FW	City of Fort Worth
GA	City of Galveston
GB	Guadalupe-Blanco River Authority
GC	Galveston County Health District
GF	Galveston Bay Foundation
GP	City of Grand Prairie
GS	United States Geological Survey
GW	Groundwater Protection Team
HC	Harris County Pollution Control
HD	Texas Department of State Health Services
HG	Houston-Galveston Area Council
HH	Houston Health & Human Services
HI	Hicks & Company, Inc.
HO	City of Houston
HP	City of Houston Department of Public Works & Engineering
HR	HDR Engineering Co.
HW	Houston Water Quality Control
HZ	Hays County
IB	International Boundary & Water Commission
IR	City of Irving
JM	J.M. Miertschin & Associates, Inc.
KG	City of Kilgore
KI	City of Killeen
LA	City of Laredo Health Department
LB	Texas Watch Little Bay Sentinels
LC	Lower Colorado River Authority
LD	LEADS
LE	City of Laredo Environmental Engineering Division

LK	City of Lockhart
LL	Trinity River Authority Lake Livingston Project
LN	Lavaca-Navidad River Authority
LR	Texas AgriLife Research - Vernon
LV	Lower Neches Valley Authority
LW	City of Longview
MB	Matagorda Bay Study
MC	Midland College
MF	Tetra Tech/MFG, Inc.
MG	Texas A&M University Galveston Lab of Oceanographic and Environmental Research
NE	Naismith Engineering, Inc.
NM	North Texas Municipal Water District
NR	Nueces River Authority
NT	Northeast Texas Municipal Water District
NW	North Water District Laboratory Services, Inc.
PB	PBS&J
PE	Parsons Engineering Science
PL	City of Pearland
PP	Paul Price Associates
PT	University of Texas Pan-American
PW	Texas Parks and Wildlife Department
RC	Texas Railroad Commission
RI	City of Richardson
RN	Rio Grande International Study Center
RR	Red River Authority
RU	Rice University
SA	San Antonio River Authority
SC	Friends of Sulphur Creek
SF	Stephen F. Austin State University
SG	City of San Angelo
SH	City of Sherman
SI	Standards Implementation Team
SJ	San Jacinto River Authority
SL	Sul Ross University
SM	San Marcos River Rangers
SN	San Antonio Metropolitan Health Department
SP	Sabal Palms Audubon Center and Sanctuary
SQ	SWQM Water Quality Monitoring Team
SR	Sabine River Authority

ST	Water Quality Standards Team
SU	Sulphur River Basin Authority
SV	Salado Creek Volunteer Monitors
SW	SWCA, Inc.
TA	Texas Institute for Applied Environmental Research
TC	Texarkana College
TD	Tarrant Regional Water District
TE	Texas Eastman
TF	Texas Research Institute for Environmental Studies - SHSU
TH	Tetra Tech, Inc.
TI	The Meadows Center for Water and the Environment at Texas State University
TK	Texarkana Water Utilities
TL	Texas A&M University Trace Element Research Laboratory
TM	Total Maximum Daily Load Team
TQ	TRC Environmental Consulting
TR	Trinity River Authority
TS	Texas Engineering Experimental Station -SERF
TT	Texas State Technological College
TU	Texas Tech University Llano River Field Station
TW	Texas Watch
TX	Texas State Soil and Water Conservation Board
TY	City of Tyler
UA	University of Texas at Austin
UB	University of Texas Brownsville
UC	Upper Colorado River Authority
UE	University of Texas at El Paso Department of Biological Sciences
UF	US Fish and Wildlife Service
UG	Upper Guadalupe River Authority
UH	University of Houston
UI	University of Houston Clear Lake Environmental Institute of Houston
UM	**University of Texas Marine Science Institute**
UP	Upper Pecos Soil and Water Conservation District
UR	**URS Corporation**
US	**University of Texas at San Antonio**
UT	University of North Texas
UY	University of Texas at Tyler

WA	**City of Waco**
WL	Wendy Lopez and Associates
WM	**Water Monitoring Solutions, Inc.**
WR	**Texas Water Resources Institute**
WS	**Texas A&M University Corpus Christi Center for Water Supply Studies**
WV	Wimberley Valley Watershed Association
WX	City of Waxahachie
XX	**Default Code for Unknown Sources**
ZP	Zapata County
01	Boy Scouts of America Sam Houston Chapter
43	Colorado River Watch

Chapter 5 – Tag Prefixes

The Tag Prefix is the first one or two digits of the Tag ID and is used to identify the entity reporting data to the TCEQ. SWQMIS is capable of identifying a sample with a unique Tag ID of up to 9 characters. If it is necessary for a dataset to use more than 7-digit Tag IDs, please contact DM&A to get approval. To request a Tag Prefix from DM&A, submit the Submitting Entity/Collecting Entity/Monitoring Type Code/Tag Prefix Request and Review Checklist. The existing Tag Prefixes for submitting data are listed Table 5.1.

Table 5.1. Tag prefixes.

Tag Prefix	Agency	Associated Submitting Entity Code
A	TEXAS A&M UNIVERSITY	AM
AC	TEXAS A&M COLLEGE STATION, DEPT. OF WILDLIFE AND FISHERIES SCIENCES	AC
AD	TEXAS AGRILIFE RESEARCH AND EXTENSION - DALLAS	AD
AE	TEXAS AGRILIFE EXTENSION – CLEAR LAKE	AE
AG	TAMUG SEAFOOD SAFETY LAB	AG
AK	TEXAS A&M UNIVERSITY KINGSVILLE	AK
AP	ALAN PLUMMER ASSOCIATES, INC.	AP
AQ	EDWARDS AQUIFER AUTHORITY	AQ

Tag Prefix	Agency	Associated Submitting Entity Code
AT	TEXAS A&M AGRILIFE RESEARCH - STEPHENVILLE	AT
AU	CITY OF AUSTIN	AU
B	IBWC	IB
BA	IBWC AMISTAD OFFICE	IB
BC	CITY OF BOERNE	BC
BD	IBWC AMERICAN DAM	IB
BH	IBWC EL PASO OFFICE	IB
BF	IBWC FALCON OFFICE	IB
BL	IBWC LAREDO OFFICE	IB
BM	IBWC MERCEDES OFFICE	IB
BP	IBWC PRESIDIO OFFICE	IB
BR	BRAZOS RIVER AUTHORITY	BR
BS	BARTON SPRINGS – EDWARDS AQUIFER CONSERVATION DISTRICT	BS
BU	BAYLOR UNIVERSITY	BU
BY	BAYOU PRESERVATION ASSOCIATION	BY
C	CRMWA CHEMICAL	CR
CB	CONRAD BLUCHER INSTITUTE FOR SURVEYING & SCIENCE	CB
CL	CADDO LAKE INSTITUTE	CL
CY	NORTHEAST TEXAS MUNICIPAL WATER DISTRICT	NT
D	CORPS OF ENGINEERS	CE
EA	EA ENGINEERING	EA
EC	ESPEY CONSULTANTS, INC.	EI
GB	GUADALUPE-BLANCO RIVER AUTHORITY	GB
H	TEXAS DEPARTMENT OF HEALTH	HD
HP	CITY OF HOUSTON	HO

Tag Prefix	Agency	Associated Submitting Entity Code
I	HOUSTON-GALVESTON AREA COUNCIL	HG
J	SABINE RIVER AUTHORITY	SR
JM	JAMES MIERTSCHIN AND ASSOCIATES	JM
K	ANGELINA-NECHES RIVER AUTHORITY	AN
KI	CITY OF KILLEEN	KI
L	LOWER COLORADO RIVER AUTHORITY	LC
LK	CITY OF LOCKHART	LK
LN	LAVACA NAVIDAD RIVER AUTHORITY	LN
M	LOWER NECHES VALLEY AUTHORITY	LV
N	UPPER NECHES RIVER MUNICIPAL WATER AUTHORITY	UN
NE	NAISMITH ENGINEERING, INC.	NE
O	NUECES RIVER AUTHORITY/NUECES COASTAL	NR
P	TEXAS PARKS & WILDLIFE	PW
PA	PATRICK BAYOU TMDL LEAD ORGANIZATION	PA
PB	PBS&J	PB
PE	PARSONS ENGINEERING SCIENCE	PE
PF	TCEQ PROFILE TAG IDs BEFORE TRACS	WC
PR	TCEQ PROFILE TAG IDs AFTER TRACS	WC
Q	TCEQ QUALITY ASSESSMENT (Central Office field)	WC
R	TCEQ REGIONAL FIELD DATA	WC
RC	TEXAS RAILROAD COMMISSION	RC
RR	RED RIVER AUTHORITY	RR
SA	SAN ANTONIO RIVER AUTHORITY	SA
T	THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT AT TEXAS STATE UNIVERSITY	TW
TA	TEXAS INSTITUTE FOR APPLIED ENVIRONMENTAL RESEARCH	TA

Tag Prefix	Agency	Associated Submitting Entity Code
TG	TRINITY RIVER AUTHORITY/GRAPEVINE (not active)	TR
TH	TETRA TECH, INC.	TH
TI	THE MEADOWS CENTER FORMERLY KNOWN AS THE TEXAS RIVER SYSTEMS INSTITUTE – TEXAS STATE UNIVERSITY	TI
TR	TRINITY RIVER AUTHORITY	TR
TS	TEXAS ENGINEERING EXPERIMENTAL STATION (SERF)	TS
TT	TEXAS STATE TECHNOLOGICAL COLLEGE	TT
TX	TEXAS STATE SOIL AND WATER CONSERVATION BOARD	TX
U	UNITED STATES GEOLOGICAL SURVEY (USGS)	GS
UA	UNIVERSITY OF TEXAS AT AUSTIN	UA
UC	UPPER COLORADO RIVER AUTHORITY	UC
UG	UPPER GUADALUPE RIVER AUTHORITY	UG
UH	UNIVERSITY OF HOUSTON	UH
UI	UNIVERSITY OF HOUSTON CLEAR LAKE – ENVIRONMENTAL INSTITUTE OF HOUSTON (EIH)	UI
UM	UNIVERSITY OF TEXAS MARINE SCIENCE INSTITUTE	UM
UR	URS CORPORATION	UR
US	UNIVERSITY OF TEXAS AT SAN ANTONIO	US
UY	UNIVERSITY OF TEXAS AT TYLER	UY
W	SULPHUR RIVER AUTHORITY	SU
WR	TEXAS WATER RESOURCES INSTITUTE	WR
WS	TEXAS A&M UNIVERSITY CORPUS CHRISTI CENTER FOR WATER SUPPLY STUDIES	WS
X	TCEQ WHITE DATA FORMS (HISTORICAL)	WC
Z	TCEQ OLD DATA	WC

Chapter 6 – Commonly Used Parameter Codes

The most common parameter codes reported for various types of sampling are provided in this chapter. Due to the evolving nature of SWQM, the parameter codes listed are subject to change. Any entity collecting or submitting data to the TCEQ must verify they are using the most current TCEQ parameter collecting codes.

Field Data

Refer to the SWQM Procedures Manual, Volume I: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (most current version), Chapter 3, for the procedures specific to collecting field and flow data.

Table 1: Field parameters and Parameter Codes

FIELD	Parameter Code
WATER TEMPERATURE (°C)	00010
PH (standard units)	00400
DISSOLVED OXYGEN (mg/L)	00300
SPECIFIC CONDUCTANCE (µmhos/cm @ 25 °C)	00094
TRANSPARENCY, SECCHI DISC (meters) **Important parameter for reservoir ranking	00078
DAYS SINCE PRECIPITATION EVENT (days)	72053
SALINITY - ppt (tidal waters only)	00480
CHLORINE, TOTAL RESIDUAL (mg/L) (downstream of WWTPs)	50060
FLOW SEVERITY:1=No Flow, 2=Low, 3=Normal, 4=Flood, 5=High, 6=Dry	01351
INSTANTANEOUS STREAM FLOW (cfs)	00061
FLOW METHOD 1=Flow Gage, 2=Electronic, 3=Mechanical, 4=Weir/Flume, 5=Doppler	89835
RESERVOIR STAGE (feet above mean sea level)	00052
RESERVOIR PERCENT FULL (%)	00053

Bacteria Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 4, for the procedures specific to bacteria data.

Table 2: Bacteria Parameters and Parameter Codes

BACTERIA	Parameter Code
FECAL COLIFORM (colonies/100 mL)	31613
FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, (#/100ML)	31616
E. COLI, mTec (#/100 mL) (freshwater only)	31648
E. COLI, IDEXX-Colilert (MPN/100 mL) Note: If reporting 31699, also report value for 31704	31699
E. COLI, COLILERT, IDEXX, HOLDING TIME (hours)	31704
E. COLI, NA + MUG OR EA + MUG, 24 HRS, 35 DEGREE (#/100 mL) (freshwater only)	31700
ENTEROCOCCI (#/100 mL) (marine only)	31649
ENTEROCOCCI, IDEXX-Enterolert (MPN/100 mL)	31701

24 Hour Field Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 3, for the procedures specific to 24-hour field data.

Table 3: 24 Hour Field Parameters and Parameter Codes

24HR	Parameter Code
DISSOLVED OXYGEN, 24-HOUR AVG (mg/L)	89857
DISSOLVED OXYGEN, # MEASUREMENTS DURING 24-HR	89858
DISSOLVED OXYGEN, 24-HOUR MAX.(mg/L)	89856
DISSOLVED OXYGEN, 24-HOUR MIN. (mg/L)	89855
WATER TEMPERATURE, 24-HR AVERAGE (°C)	00209
WATER TEMPERATURE, # OF MEASUREMENTS DURING 24-HRS	00221
WATER TEMPERATURE, MAXIMUM 24-HR (°C)	00210
WATER TEMPERATURE, MINIMUM 24-HR (°C)	00211
SPECIFIC CONDUCTANCE, 24-HR AVERAGE (µS/cm)	00212
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS DURING 24-HRS	00222
SPECIFIC CONDUCTANCE, MAXIMUM 24-HR (µS/cm)	00213
SPECIFIC CONDUCTANCE, MINIMUM 24-HR (µS/cm)	00214

Table 3: 24 Hour Field Parameters and Parameter Codes (continued)

24HR	Parameter Code
pH, # OF MEASUREMENTS DURING 24-HRS	00223
pH, MAXIMUM 24-HR (s.u.)	00215
pH, MINIMUM 24-HR (s.u.)	00216
SALINITY, 24-HR AVERAGE (ppt)	00218
SALINITY, # OF MEASUREMENTS DURING 24-HRS	00220
SALINITY, MAXIMUM 24-HR (ppt)	00217
SALINITY, MINIMUM 24-HR (ppt)	00219

Conventional Data (Inorganics and Nutrients)

Refer to the SWQM Procedures Manual, Volume I, Chapter 5, for the procedures specific to routine water chemistry data.

Table 4: Conventional Parameters and Parameter Codes

CONVENTIONAL PARAMETERS - INORGANIC	Parameter Code
ALKALINITY, TOTAL (mg/L as CaCO3)	00410
RESIDUE, TOTAL NONFILTRABLE (mg/L)	00530
RESIDUE, VOLATILE NONFILTRABLE (mg/L)	00535
RESIDUE, TOTAL FILTRABLE (DRIED AT 180° C) (mg/L)	70300
CHLORIDE (mg/L as Cl)	00940
SULFATE (mg/L as SO4)	00945
TOTAL ORGANIC CARBON(mg/L as C)	00680
CONVENTIONAL PARAMETERS - NUTRIENTS	Parameter Code
NITRATE NITROGEN, TOTAL (mg/L as N)	00620
NITRITE NITROGEN, TOTAL (mg/L as N)	00615
NITRITE + NITRATE, TOTAL ONE LAB DETERMINED VALUE (mg/L as N)	00630
AMMONIA-NITROGEN TOTAL (mg/L as N)	00610
ORTHOPHOSPHATE PHOSPHORUS FLDFLT <15MIN (mg/L as P)	00671
ORTHOPHOSPHATE PHOSPHORUS FILTER >15MIN (mg/L as P)	70507
TOTAL PHOSPHORUS (mg/L as P)	00665
TOTAL KJELDAHL NITROGEN (mg/L as N)	00625
CHLOROPHYLL-A, SPECTROPHOTOMETRIC (µg/L)	32211

Table 4: Conventional Parameters and Parameter Codes (continued)

CONVENTIONAL PARAMETERS – NUTRIENTS	Parameter Code
CHLOROPHYLL-A, FLUOROMETRIC (µg/L)	70953
PHEOPHYTIN-A, SPECTROPHOTOMETRIC (µg/L)	32218
PHEOPHYTIN-A, FLUOROMETRIC (µg/L)	32213

Routine Metals in Water Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 5, for the procedures specific to metals in water data.

Table 5: Routine Metals in Water Parameters and Parameter Codes

METALS IN WATER (**Dissolved)**	Parameter Code
ALUMINUM, DISSOLVED (µg/L as Al)	01106
ARSENIC, DISSOLVED (µg/L as As)	01000
CADMIUM , DISSOLVED (µg/L as Cd)	01025
CALCIUM, DISSOLVED (µg/L as Ca)	00915
CHROMIUM, DISSOLVED (µg/L as Cr)	01030
COPPER, DISSOLVED (µg/L as Cu)	01040
DISSOLVED HARDNESS, calc. (mg/L as CaCO3)	46570
IRON, DISSOLVED (µg/L as Fe)	01046
LEAD, DISSOLVED (µg/L as Pb)	01049
MAGNESIUM, DISSOLVED (µg/L as Mg)	00925
MANGANESE, DISSOLVED (µg/L as Mn)	01056
NICKEL, DISSOLVED (µg/L as Ni)	01065
POTASSIUM, DISSOLVED (µg/L as K)	00935
SILVER, DISSOLVED (µg/L as Ag)	01075
SODIUM, DISSOLVED (mg/L as Na)	00930
ZINC, DISSOLVED (µg/L as Zn)	01090
METALS IN WATER (**Total)**	Parameter Code
ALUMINUM, TOTAL (µg/L as Al)Total	01105
ARSENIC, TOTAL (µg/L as As)Total	01002
CADMIUM, TOTAL (µg/L as Cd)	01027
CALCIUM, TOTAL (mg/L as Ca)	00916

Table 5: Routine Metals in Water Parameters and Parameter Codes (continued)

METALS IN WATER (**Total)**	Parameter Code
CHROMIUM, TOTAL (µg/L as Cr)	01034

COPPER, TOTAL (µg/L as Cu)	01042
IRON, TOTAL (µg/L as Fe)	01045
LEAD, TOTAL (µg/L as Pb)	01051
MAGNESIUM, TOTAL (mg/L as Mg)	00927
MANGANESE, TOTAL (µg/L as Mn)	01055
MERCURY, TOTAL, EPA 1631 (µg/L as Hg)	71959
NICKEL, TOTAL (µg/L as Ni)	01067
POTASSIUM, TOTAL (µg/L as K)	00937
SELENIUM, TOTAL (µg/L as Se))	01147
SILVER, TOTAL (µg/L as Ag)	01077
SODIUM, TOTAL (mg/L as Na)	00929
TOTAL HARDNESS, calc. (mg/L as CaCO3)	82394
TOTAL HARDNESS, by titration (mg/L as CaCO3)	00900
ZINC, TOTAL (µg/L as Zn)	01092

Organics in Water Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 5, for the procedures specific to organics in water data.

Table 6: Organics in Water Parameters and Parameter Codes

ORGANICS IN WATER (µg/L) - **(Semivolatile)**	Parameter Code
PHENOL (C6H50H)-SINGLE COMPOUND	34694
2-CHLOROPHENOL	34586
2-NITROPHENOL	34591
2,4-DICHLOROPHENOL	34601
PARACHLOROMETA CRESOL	34452
2,4,5-TRICHLOROPHENOL	77687
2,4,6-TRICHLOROPHENOL	34621
2,4-DIMETHYLPHENOL	34606

Table 6: Organics in Water Parameters and Parameter Codes (continued)

ORGANICS IN WATER (µg/L) - **(Semivolatile cont.)**	Parameter Code
2,4-DINITROPHENOL	34616
4-NITROPHENOL	34646
DNOC (4,6-DINITRO-ORTHO-CRESOL)	34657
PCP (PENTACHLOROPHENOL)	39032
N-NITROSODIMETHYLAMINE	34438
BIS (2-CHLOROETHYL) ETHER	34273
1,3-DICHLOROBENZENE	34566
1,4-DICHLOROBENZENE	34571
1,2-DICHLOROBENZENE	34536
BIS (2-CHLOROISOPROPYL) ETHER	34283
HEXACHLOROETHANE	34396
N-NITROSO-DI-N-PROPYLAMINE	34428
NITROBENZENE	34447
ISOPHORONE	34408
BIS (2-CHLOROETHOXY) METHANE	34278
1,2,4-TRICHLOROBENZENE	34551
NAPHTHALENE	34696
HEXACHLOROBUTADIENE	34391
HEXACHLOROCYCLOPENTADIENE	34386
2-CHLORONAPHTHALENE	34581
ACENAPHTHYLENE	34200
DIMETHYL PHTHALATE	34341
2,6-DINITROTOLUENE	34626
ACENAPHTHENE	34205
2,4-DINITROTOLUENE	34611
FLUORENE	34381
4-CHLOROPHENYL PHENYL ETHER	34641
DIETHYL PHTHALATE	34336
N-NITROSODIPHENYLAMINE	34433

Table 6: Organics in Water Parameters and Parameter Codes (continued)

ORGANICS IN WATER (µg/L) – **(Semivolatile)**	Parameter Code
1,2-DIPHENYLHYDRAZINE	34346
4-BROMOPHENYL PHENYL ETHER	34636
PHENANTHRENE	34461
ANTHRACENE	34220
DI-N-BUTYL PHTHALATE	39110
FLUORANTHENE	34376
PYRENE	34469
BENZIDINE	39120
N-BUTYL BENZYL PHTHALATE	34292
CHRYSENE	34320
BENZO(A)ANTHRACENE (1,2-BENZANTHRACENE)	34526
3,3'-DICHLOROBENZIDINE	34631
BIS(2-ETHYLHEXYL) PHTHALATE	39100
DI-N-OCTYL PHTHALATE	34596
BENZO(B)FLUORANTHENE	34230
BENZO(K)FLUORANTHENE	34242
BENZO-A-PYRENE	34247
INDENO (1,2,3-CD) PYRENE	34403
1,2,5,6-DIBENZANTHRACENE	34556
BENZO(GHI)PERYLENE (1,12-BENZOPERYLENE)	34521
CRESOL	79778
HEXACHLOROPHENE	88813
ETHANAMINE (N-ETHYL-N-NITROSO)	73611
N-NITROSODI-N-BUTYL AMINE	73609
PYRIDINE	77045
1,2,4,5-TETRACHLOROBENZENE	77734
ORGANICS IN WATER (µg/L) – **(Volatile)**	Parameter Code
CHLOROMETHANE	30201
BROMOMETHANE	30202

Table 6: Organics in Water Parameters and Parameter Codes (continued)

ORGANICS IN WATER (µg/L) – **(Volatile)**	Parameter Code
VINYL CHLORIDE	39175
CHLOROETHANE	34311
ACRYLONITRILE	34215
CHLOROFORM	32106
METHYLENE CHLORIDE	34423
1,1-DICHLOROETHYLENE	34501
1,1-DICHLOROETHANE	34496
TRANS-1,2-DICHLOROETHENE	34546
1,2-DICHLOROETHANE	34531
CARBON TETRACHLORIDE	32102
BROMODICHLOROMETHANE	32101
BENZENE , HEXADECONE EXTR.	34030
DIBROMOCHLOROMETHANE	32105
1,1,1-TRICHLOROETHANE	34506
1,2-DICHLOROPROPANE	34541
TRANS-1,3-DICHLOROPROPENE	34699
CIS-1,3-DICHLOROPROPENE	34704
1,1,2-TRICHLOROETHANE	34511
2-CHLOROETHYL VINYL ETHER	34576
TRICHLOROETHYLENE	39180
BROMOFORM	32104
TOLUENE, HEXADECONE EXTR.	34010
ETHYLBENZENE	34371
1,1,2,2-TETRACHLOROETHANE	34516
TETRACHLOROETHYLENE	34475
CHLOROBENZENE	34301
XYLENE	81551
BIS (CHLOROMETHYL) ETHER	34268
1,2-DIBROMOETHANE	77651

Table 6: Organics in Water Parameters and Parameter Codes (continued)

ORGANICS IN WATER (µg/L) – **(Volatile)**	Parameter Code
METHYL-TERT-BUTYL ETHER (MTBE)	46491
ORGANICS IN WATER (µg/L) – **Pesticides (In whole water)**	Parameter Code
DDT	39370
DDD	39360
DDE	39365
ALDRIN	39330
DIELDRIN	39380
ENDRIN	39390
CHLORDANE, (TECH MIX & METABS)	39350
ALACHLOR	77825
HEPTACHLOR	39410
HEPTACHLOR EPOXIDE	39420
METHOXYCHLOR	39480
METOLACHLOR	82612
GAMMA-BHC (LINDANE)	39782
TOXAPHENE	39400
SIMAZINE	39055
ATRAZINE (AA TREX)	39630
CYANAZINE (dissolved)	04041
HEXACHLOROBENZENE	39700
ALPHA BENZENE HEXACHLORIDE (ALPHA-BHC)	39337
BETA BENZENE HEXACHLORIDE (BETA-BHC)	39338
DELTA BENZENE HEXACHLORIDE (DELTA-BHC)	34259
DICOFOL (KELTHANE)	39780
MIREX	39755
PENTACHLOROBENZENE	77793
MALATHION	39530
PARATHION	39540
DIAZINON	39570

Table 6: Organics in Water Parameters and Parameter Codes (continued)

ORGANICS IN WATER (µg/L) **- Pesticides (In whole water)**	Parameter Code
2,4-D	39730
2,4,5-T	39740
SILVEX	39760
DIURON (KARMEX)	39650
DURSBAN (CHLOROPYRIFOS)	81403
ENDOSULFAN (ALPHA)	34361
ENDOSULFAN (BETA)	34356
ENDOSULFAN SULFATE	34351
DEMETON	39560
GUTHION	39580
SEVIN	39750
PCB-1242	39496
PCB-1254	39504
PCB-1221	39488
PCB-1232	39492
PCB-1248	39500
PCB-1260	39508
PCB-1016	34671
TOTAL PCBS	39516
BENZENE HEXACHLORIDE (BHC)	20464

Metals in Sediment Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 6, for the procedures specific to metals in sediment data.

Table 7: Metals in Sediment Parameters and Parameter Codes

METALS IN SEDIMENT (mg/kg-dry weight)	Parameter Code
ALUMINUM (Al)	01108
ARSENIC (As)	01003
BARIUM (Ba)	01008
CADMIUM (Ca)	01028
CHROMIUM (Cr)	01029
COPPER (Cu)	01043
LEAD (Pb)	01052
MANGANESE (Mn)	01053
MERCURY (Hg)	71921
NICKEL (Ni)	01068
SELENIUM (Se)	01148
SILVER (Ag)	01078
ZINC (Zn)	01093
METALS IN SEDIMENT (mg/kg-dry weight) - **Sediment Conventionals**	Parameter Code
OIL & GREASE, FREON EXTR-GRAV METH (mg/kg)	00557
OIL & GREASE, FREON EXTR-IR METH (mg/kg)	00561
PERCENT SOLIDS IN SEDIMENT, DRY WEIGHT	81373
TOTAL ORGANIC CARBON, DRY WEIGHT (mg/kg)	81951
SEDIMENT PARTICLE SIZE <0.0039 CLAY % DRY WT	82009
SEDIMENT PARTICLE SIZE 0.0039-0.0625 SILT % DRY WT	82008
SEDIMENT PARTICLE SIZE 0.0625-2MM SAND % DRY WT	89991
SEDIMENT PARTICLE SIZE >2.0MM GRAVEL % DRY WT	80256

Organics in Sediment Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 6, for the procedures specific to organics-in-sediment data.

Table 8: Organics in Sediment Parameters and Parameter Codes

ORGANICS IN SEDIMENT (µg/kg-dry weight) – **(Semivolatile)**	Parameter Code
PHENOL(C6H5OH)-SINGLE COMPOUND	34695
2-CHLOROPHENOL	34589
2-NITROPHENOL	34594
2,4-DICHLOROPHENOL	34604
PARACHLOROMETA CRESOL	34455
2,4,5-TRICHLOROPHENOL	78401
2,4,6-TRICHLOROPHENOL	34624
2,4-DIMETHYLPHENOL	34609
2,4-DINITROPHENOL	34619
4-NITROPHENOL	34649
DNOC (4,6-DINITRO-ORTHO-CRESOL)	34660
PCP (PENTACHLOROPHENOL)	39061
N-NITROSODIMETHYLAMINE	34441
BIS (2-CHLOROETHYL) ETHER	34276
1,3-DICHLOROBENZENE	34569
1,4-DICHLOROBENZENE	34574
1,2-DICHLOROBENZENE	34539
BIS (2-CHLOROISOPROPYL) ETHER	34286
HEXACHLOROETHANE	34399
N-NITROSODI-N-PROPYLAMINE	34431
NITROBENZENE	34450
ISOPHORONE	34411
BIS (2-CHLOROETHOXY) METHANE	34281
1,2,4-TRICHLOROBENZENE	34554
NAPHTHALENE	34445
HEXACHLOROBUTADIENE	39705
HEXACHLOROCYCLOPENTADIENE	34389
2-CHLORONAPHTHALENE	34584
ACENAPHTYLENE	34203
DIMETHYL PHTHALATE	34344

Table 8: Organics in Sediment Parameters and Parameter Codes (continued)

ORGANICS IN SEDIMENT (µg/kg-dry weight) – (**Semivolatile)**	Parameter Code
2,6-DINITROTOLUENE	34629
ACENAPHTHENE	34208
2,4-DINITROTOLUENE	34614
FLUORENE	34384
4-CHLOROPHENYL PHENYL ETHER	34644
DIETHYL PHTHALATE	34339
N-NITROSODIPHENYLAMINE	34436
1,2-DIPHENYLHYDRAZINE	34349
4-BROMOPHENYL PHENYL ETHER	34639
PHENANTHRENE	34464
ANTHRACENE	34223
DI-N-BUTYL PHTHALATE	39112
FLUORANTHENE	34379
PYRENE	34472
BENZIDINE	39121
N-BUTYL BENZYL PHTHALATE	34295
CHRYSENE	34323
BENZO(A)ANTHRACENE (1,2-BENZANTHRACENE)	34529
3,3'-DICHLOROBENZIDINE	34634
BIS(2-ETHYLHEXYL) PHTHALATE	39102
DI-N-OCTYL PHTHALATE	34599
BENZO(B)FLUORANTHENE	34233
BENZO(K)FLUORANTHENE	34245
BENZO-A-PYRENE	34250
INDENO (1,2,3-CD) PYRENE	34406
1,2,5,6-DIBENZANTHRACENE	34559
BENZO(GHI)PERYLENE (1,12-BENZOPERYLENE)	34524
CRESOL	88811
HEXACHLOROPHENE	73120

Table 8: Organics in Sediment Parameters and Parameter Codes (continued)

ORGANICS IN SEDIMENT (µg/kg-dry weight) – **(Semivolatile)**	Parameter Code
N-NITROSODIETHYLAMINE	88817
N-NITROSO-DI-N-BUTYLAMINE	73159
PYRIDINE	88823
1,2,4,5-TETRACHLOROBENZENE	88826
ORGANICS IN SEDIMENT (µg/kg-dry weight) – **Pesticides (In bottom deposits)**	Parameter Code
DDT	39373
DDD	39363
DDE	39368
ALDRIN	39333
DIELDRIN	39383
ENDRIN	39393
CHLORDANE (TECH MIX & METABS)	39351
ALACHLOR	75050
HEPTACHLOR EPOXIDE	39413
METHOXYCHLOR	39481
GAMMA-BHC (LINDANE)	39783
TOXAPHENE	39403
HEXACHLOROBENZENE	39701
BHC, ALPHA ISOMER	39076
B-BHC-BETA	34257
DELTA BENZENE HEXACHLORIDE (DELTA-BHC)	34262
DICOFOL (KELTHANE)	79799
MIREX	79800
PENTACHLOROBENZENE	39118
MALATHION	39531
PARATHION	39541
DIAZINON	39571
2,4-D	39731
2,4,5-T	39741

Table 8: Organics in Sediment Parameters and Parameter Codes (continued)

ORGANICS IN SEDIMENT (µg/kg-dry weight) – **Pesticides (In bottom deposits)**	Parameter Code
SILVEX	39761
DIURON (KARMEX)	73030
DURSBAN	81404
ENDOSULFAN (ALPHA)	34364
ENDOSULFAN (BETA)	34359
ENDOSULFAN SULFATE	34354
DEMETON (SYSTOX)	82400
GUTHION	39581
SEVIN	81818
PCB-1242	39499
PCB-1254	39507
PCB-1221	39491
PCB-1232	39495
PCB-1248	39503
PCB-1260	39511
PCB-1016	39514
TOTAL PCBS	39519
BENZENE HEXACHLORIDE (BHC)	81323

Fish Tissue Analysis Data

Refer to the SWQM Procedures Manual, Volume I, Chapter 7, for the procedures specific to fish tissue analysis data.

Table 9: Fish Tissue Analysis Parameters and Parameter Codes

FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Tissue)**	Parameter Code
FISH SPECIES, USE EPA 3-DIGIT SPECIES CODE	74990
ANATOMICAL PART, EPA STORET NUMERIC CODE	74995
NUMBER OF INDIVIDUALS IN COMPOSITE TISSUE SAMPLE	81614
NUMBER OF SPECIES IN COMPOSITE TISSUE SAMPLE (ALWAYS REPORT A 1)	81615
MINIMUM SAMPLE LENGTH IN A COMPOSITE, MILLIMETERS	00280
MAXIMUM SAMPLE LENGTH IN A COMPOSITE, MILLIMETERS	00281
SAMPLE LENGTH IN MILLIMETERS (IF ONE FISH)	00039
SAMPLE WEIGHT IN GRAMS (IF ONE FISH)	00019
SEX (1-MALE, 2-FEMALE, 3-MIXED, 4-UNKNOWN)	84100
FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Metals in Tissue)**	Parameter Code
ARSENIC	01004
CADMIUM	71940
CHROMIUM	71939
COPPER	71937
LEAD	71936
MERCURY	71930
SELENIUM	01149
FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Semivolatile Organics in Tissue)**	Parameter Code
PERCENT FAT HEXANE EXTRACTION (LIPIDS)	39105
PHENOL	34468
2-CHLOROPHENOL	34590
2-NITROPHENOL	34595
2,4-DICHLOROPHENOL	34605
PARACHLOROMETA CRESOL	34456
2,4,5,-TRICHLOROPHENOL	88809
2,4,6-TRICHLOROPHENOL	34625
2,4-DIMETHYLPHENOL	34610
2,4-DINITROPHENOL	34620
4-NITROPHENOL	34650

Table 9: Fish Tissue Analysis Parameters and Parameter Codes (continued)

FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Semivolatile Organics in Tissue)**	Parameter Code
DNOC (4,6-DINITRO-ORTHO-CRESOL)	34661
PCP (PENTACHLOROPHENOL)	39060
N-NITROSODIMETHYLAMINE	34442
BIS (2-CHLOROETHYL) ETHER	34277
1,3-DICHLOROBENZENE	34570
1,4-DICHLOROBENZENE	34575
1,2-DICHLOROBENZENE	34540
BIS (2-CHLOROISOPROPYL) ETHER	34287
HEXACHLOROETHANE	34400
N-NITROSODI-N-PROPYLAMINE	34432
NITROBENZENE	34451
ISOPHORONE	34412
BIS (2-CHLOROETHOXY) METHANE	34282
1,2,4-TRICHLOROBENZENE	34555
NAPHTHALENE	34446
HEXACHLOROBUTADIENE	34395
HEXACHLOROCYCLOPENTADIENE	34390
2-CHLORONAPHTHALENE	34585
ACENAPHTHYLENE	34204
DIMETHYL PHTHALATE	34345
2,6-DINITROTOLUENE	34630
ACENAPHTHENE	34209
2,4-DINITROTOLUENE	34615
FLUORENE	34385
4-CHLOROPHENYL PHENYL ETHER	34645
DIETHYL PHTHALATE	34340
N-NITROSODIPHENYLAMINE	34437
1,2-DIPHENYLHYDRAZINE	34350
4-BROMOPHENYL PHENYL ETHER	34640

Table 9: Fish Tissue Analysis Parameters and Parameter Codes (continued)

FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Semivolatile Organics in Tissue)**	Parameter Code
PHENANTHRENE	34465
ANTHRACENE	34224
DI-N-BUTYL PHTHALATE	34683
FLUORANTHENE	34380
PYRENE	34473
BENZIDINE	34241
N-BUTYL BENZYL PHTHALATE	34296
CHRYSENE	34324
BENZO(A)ANTHRACENE (1,2-BENZANTHRACENE)	34530
3,3'-DICHLOROBENZIDINE	34635
BIS(2-ETHYLHEXYL)PHTHALATE	39099
DI-N-OCTYL PHTHALATE	34600
BENZO(B)FLUORANTHENE	34234
BENZO(K)FLUORANTHENE	34246
BENZO-A-PYRENE	34251
INDENO(1,2,3-CD) PYRENE	34407
1,2,5,6-DIBENZANTHRACENE	34560
BENZO(GHI)PERYLENE (1,12-BENZOPERYLENE)	34525
CRESOL	88812
HEXACHLOROPHENE	88815
N-NITROSODIETHYLAMINE	88818
N-NITROSO-DI-N-BUTYLAMINE	88821
PYRIDINE	88824
1,2,4,5-TETRACHLOROBENZENE	88827
DIOXINS/FURANS TOTAL TEC	20463
BROMOCHLOROMETHANE	20465
DIBROMOMETHANE	20466
FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Pesticides in Tissue)**	Parameter Code
DDT, SUM ANALOGS IN TISSUE	39376
DDD	81897

Table 9: Fish Tissue Analysis Parameters and Parameter Codes (continued)

FISH TISSUE ANALYSIS (mg/kg-wet weight) – **(Pesticides in Tissue)**	Parameter Code
DDE	81896
ALDRIN	34680
DIELDRIN	39406
ENDRIN	34685
CHLORDANE (TECH MIX & METABS)	34682
HEPTACHLOR	34687
HEPTACHLOR EPOXIDE	34686
METHOXYCHLOR (UG/G)	81644
GAMMA-BHC (LINDANE)	39785
TOXAPHENE	34691
HEXACHLOROBENZENE	34688
BHC-ALPHA ISOMER (UG/G)	39074
B-BHC-BETA	34258
DELTA BENZENE HEXACHLORIDE	34263
DICOFOL (KELTHANE)	85684
MIREX	81645
PENTACHLOROBENZENE	85679
MALATHION	39534
PARATHION	81810
DIAZINON	81806
2,4-D	88830
2,4,5-T	88833
SILVEX (2,4,5-TP)	39764
DIURON (KARMEX)	88844
DURSBAN	81807
ENDOSULFAN, ALPHA	34365
ENDOSULFAN SULFATE	34355
DEMETON (SYSTOX)	82401
GUTHION	81802

Table 9: Fish Tissue Analysis Parameters and Parameter Codes (continued)

FISH TISSUE ANALYSIS (mg/kg-wet weight) - **Pesticides in Tissue**	Parameter Code
SEVIN (CARBARYL)	81899
PCB-1242	34689
PCB-1254	34690
PCB-1221	34664
PCB-1232	34667
PCB-1248	34669
PCB-1260	34670
PCB-1016	34674
TOTAL PCBS	39515
PCB-1268	20467
BENZENE HEXACHLORIDE (BHC)	81826

EPA Species Numeric Code

For use with parameter code 74990, Fish Species: enter the EPA Species Code as the value.

Table 10: EPA Species Names, Code, and TCEQ Parameter Code

Common Name	Scientific Name	EPA Species Code	TCEQ Parameter Code
Alligator gar	Lepisosteus spatula	1	98344
American eel	Anguilla rostrata	76	98361
Arkansas River shiner	Notropis girardi	361	98472
Atlantic stingray	Dasyatis sabina	144	98318
Banded pygmy sunfish	Elassoma zonatum	418	99113
Bantam sunfish	Lepomis symmetricus	416	99102
Bay anchovy	Anchoa mitchilli	166	98412
Bayou killifish	Fundulus pulvereus	682	98699
Bigmouth buffalo	Ictiobus cyprinella	3	98508
Bigscale log perch	Percina macrolepida	580	99069
Black buffalo	Ictiobus niger	105	98509
Black bullhead	Ameirus melas	4	98563
Black crappie	Pomoxis nigromaculatus	5	99109
Black drum	Pogonias cromis	199	98970

Table 10: EPA Species Names, Code, and TCEQ Parameter Code (continued)

Common Name	Scientific Name	EPA Species Code	TCEQ Parameter Code
Blackside darter	Percina maculata	436	98540
Blackspot shiner	Notropis atrocaudalis	451	98462
Blackspotted topminnow	Fundulus olivaceus	406	98678
Blackstripe topminnow	Fundulus notatus	404	98677
Blacktail redhorse	Moxostoma poecilurum	391	98515
Blacktail shiner	Cyprinella venustus	377	98487
Blue catfish	Ictalurus furcatus	67	98562
Bluegill sunfish	Lepomis macrochirus	8	99097
Blue sucker	Cycleptus elongatus	386	98505
Bluntnose darter	Etheostoma chlorosomum	547	99075
Bowfin	Amia calva	68	98347
Brook silverside	Labidesthes sicculus	88	98734
Bullhead minnow	Pimephales vigilax	384	98498
Chain pickerel	Esox niger	14	98405
Channel catfish	Ictalurus punctatus	16	98561
Chesnut lamprey	Icthyomyzon castaneus	330	99297
Common carp	Cyprinus carpio	12	98437
Common shiner	Notropis cornutus	89	98470
Common stoneroller	Campostoma anomalum	335	98502
Creek chub	Semotilus atromaculatus	90	98443
Creek chubsucker	Erimyzon oblongus	387	98519
Cypress darter	Etheostoma proeliare	426	99083
Cypress minnow	Hybognathus hayi	339	98493
Dollar sunfish	Lepomis marginatus	414	99098
Dusky darter	Percina sciera	440	98541
Emerald shiner	Notropis atherinoides	77	98461
Fathead minnow	Pimephales promelas	382	98497
Flathead catfish	Pylodictus olivaris	489	98570
Flathead chub	Platygobio gracilis	345	98447
Flier	Centrarchus macropterus	412	99111

Table 10: EPA Species Names, Code, and TCEQ Parameter Code (continued)

Common Name	Scientific Name	EPA Species Code	TCEQ Parameter Code
Freckled madtom	Noturus nocturnus	400	98575
Freshwater drum	Aplodinotus grunniens	20	98958
Gafftopsail catfish	Bagre marinus	200	98557
Ghost shiner	Notropis buchanani	354	98467
Gizzard shad	Dorosoma cepedianum	21	98430
Golden redhorse	Moxostoma erythrurum	390	98514
Golden shiner	Notemigonus crysoleucas	22	98441
Golden topminnow	Fundulus chrysotus	403	98694
Goldfish	Carassius auratus	24	98439
Goldstripe darter	Etheostoma parvipinne	425	99082
Grass carp	Ctenopharyngodon idellus	337	98528
Green sunfish	Lepomis cyanellus	25	99094
Hardhead catfish	Ariopsis felis	136	98559
Harlequin darter	Etheostoma histrio	420	99080
Hogchoker	Trinectes maculatus	522	99218
Ironcolor shiner	Notropis chalybaeus	356	98468
Ladyfish	Elops saurus	486	98352
Lake chubsucker	Erimyzon sucetta	387	98520
Largemouth bass	Micropterus salmoides	31	99090
Log perch	Percina caprodes	433	99068
Longear sunfish	Lepomis megalotis	72	99099
Longnose dace	Rhinichthys cataractae	108	98455
Longnose gar	Lepisosteus osseus	32	98341
Mimic shiner	Notropis volucellus	378	98488
Mosquitofish	Gambusia affinis	407	98713
Mozambique tilapia	Tilapia mossambica	54	98565
Mud darter	Etheostoma asprigene	544	99074
Northern pike	Esox lucius	36	98406
Orangebelly darter	Etheostoma radiosum	428	99084
Orangespotted sunfish	Lepomis humilus	413	99096
Orangethroat darter	Etheostoma spectabile	429	99085

Table 10: EPA Species Names, Code, and TCEQ Parameter Code (continued)

Common Name	Scientific Name	EPA Species Code	TCEQ Parameter Code
Paddlefish	Polyodon spathula	106	98335
Pallid shiner	Notropis amnis	350	98460
Pinfish	Lagodon rhomboides	207	99153
Pirate perch	Aphredoderus sayanus	410	98773
Plains killifish	Fundulus zebrinus	455	98729
Plains minnow	Hybognathus placitus	341	98495
Pugnose minnow	Opsopoeodus emiliae	358	98452
Rainwater killifish	Lucania parva	539	98689
Redbreast sunfish	Lepomis auritus	70	99093
Red drum	Sciaenops ocellata	202	98962
Redear sunfish	Lepomis microlophus	40	99100
Redfin pickerel	Esox americanus	168	98404
Redfin shiner	Lythrurus umbratilis	376	98486
Red River shiner	Notropis bairdi	351	98463
Red shiner	Cyprinella lutrensis	363	98474
Redspotted sunfish	Lepomis miniatus		99101
Ribbon shiner	Lythrurus fumeus	359	98471
Rio Grande cichlid	Cichlasoma cyanoguttatum	686	98953
River carpsucker	Carpiodes carpio	42	98511
River darter	Percina shumardi	441	99168
River shiner	Notropis blennius	352	98464
Rock bass	Ambloplites rupestris	43	99106
Sabine shiner	Notropis sabinae	371	98481
Sand seatrout	Cynoscion arenarius	134	98973
Sand shiner	Notropis stramineus	452	98484
Sauger	Stizostedion canadense	559	99057
Scaly sand darter	Ammocrypta vivax	542	99072
Sheepshead	Archosargus probatocephalus	78	99155
Shortnose gar	Lepisosteus platostomus	107	98342
Shovelnose sturgeon	Scaphirynchus platorynchus	102	98337
Silverband shiner	Notropis shumardi	372	98482

Table 10: EPA Species Names, Code, and TCEQ Parameter Code (continued)

Common Name	Scientific Name	EPA Species Code	TCEQ Parameter Code
Silver chub	Macrhybopsis storeriana	346	98448
Silver perch	Bairdiella chrysoura	485	98960
Silvery minnow	Hybognathus nuchalis	340	98494
Skipjack herring	Alosa chrysochloris	26	98418
Slough darter	Etheostoma gracile	176	99078
Smallmouth bass	Micropterus dolomieui	47	99091
Smallmouth buffalo	Ictiobus bubalus	48	98507
Southern flounder	Paralichthys lethostigma	201	99246
Speckled chub	Macrhybopsis aestivalis	342	98449
Spot	Leiostomus xanthurus	181	98964
Spotted bass	Micropterus punctulatus	49	99089
Spotted gar	Lepisosteus oculatus	50	98340
Spotted seatrout	Cynoscion nebulosus	142	98974
Spotted sunfish	Lepomis miniatus	415	99101
Spotted sucker	Minytrema melanops	51	98517
Starhead topminnow	Fundulus dispar	405	98693
Striped anchovy	Anchoa hepsetus	532	98410
Striped bass	Morone saxatilis	52	99165
Striped killifish	Fundulus similis	526	98700
Striped mullet	Mugil cephalus	53	98793
Suckermouth minnow	Phenacobius mirabilis	380	98457
Swamp darter	Etheostoma fusiforme	176	99077
Tadpole madtom	Noturus gyrinus	397	98574
Threadfin shad	Dorosoma petenense	333	98429
Walleye	Stizostedion vitreum	55	99058
Warmouth	Lepomis gulosus	56	99095
Weed shiner	Notropis texanus	375	98485
Western sand darter	Ammocrypta clara	542	99071
White bass	Morone chrysops	57	99163
White crappie	Pomoxis annularis	59	99108

Table 10: EPA Species Names, Code, and TCEQ Parameter Code (continued)

Common Name	Scientific Name	EPA Species Code	TCEQ Parameter Code
Yellow bass	Morone mississippiensis	93	99164
Yellow bullhead	Ameirurus natalis	62	98564
Yellow perch	Perca flavescens	63	99062

EPA Anatomical Numeric Code

For use with parameter code 74995, Anatomical Part: enter the EPA Anatomical Part Code as the value.

Table 11: EPA Anatomical Parts, Codes, and Alpha Codes

Anatomy	Anatomical Part Code	EPA Alpha Code (84007)
Stomach	5	STOM
Liver	6	LIVER
Intestine	7	INTST
Gall Bladder	8	GLBDR
Heart	11	HEART
Kidney	32	KIDNY
Bladder	37	BLADR
Spleen	43	SLPN
Scales	57	SCALE
Skin	58	SKIN
Whole Organism	59	WHORG
Brain	61	BRAIN
Male	68	MALE
Female	69	FMALE
Ovary	70	OVARY
Gills	72	GILLS
Filet	86	FILET
Edible Portion	87	EAT
Headless Whole Fish	88	HDLS
Eviscerated Whole Fish	89	EVISC
Lipid Tissue	91	LIPID
Eggs	93	EGGS
Larvae	115	LARVA

Biological Data

Refer to the SWQM Procedures, Volume II, for the procedures specific to biological monitoring. Parenthetical information for each sampling category below dictates how to report the biological data as a composite record as well as the composite category, composite type, and parameter code that the composite should be based on when possible.

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values

BIOLOGICAL - **Nekton Texas Regional Index Summary & Metadata (Composite, Both, CN)**	Parameter Code
BIOLOGICAL DATA (report value of 1011 for Nekton Texas Regional Index Summary & Metadata)	89888
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	89961
NEKTON ORGANISMS-NONE PRESENT	98005
NUMBER OF SPECIES, FISH	98003
TOTAL NUMBER OF NATIVE CYPRINID SPECIES	98032
TOTAL NUMBER OF BENTHIC INVERTIVORE SPECIES	98052
TOTAL NUMBER OF BENTHIC FISH SPECIES	98053
TOTAL NUMBER OF SUNFISH SPECIES	98008
TOTAL NUMBER OF INTOLERANT SPECIES, FISH	98010
PERCENT INDIVIDUALS AS TOLERANT FISH SPECIES(EXCLUDING WESTERN MOSQUITOFISH)	98070
PERCENT OF INDIVIDUALS AS OMNIVORES, FISH	98017
PERCENT OF INDIVIDUALS AS INVERTIVORES, FISH	98021
PERCENT OF INDIVIDUALS AS PISCIVORES, FISH	98022
TOTAL NUMBER OF INDIVIDUALS SEINING	98039
TOTAL NUMBER OF INDIVIDUALS ELECTROFISHING	98040
NUMBER OF INDIVIDUALS PER SEINE HAUL	98062
NUMBER OF INDIVIDUALS PER MINUTE ELECTROFISHING	98069

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Nekton Electrofishing (Composite, Both, CN 89944)**	Parameter Code
BIOLOGICAL DATA (report value of 1012 for Nekton Electrofishing)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
ELECTROFISHING METHOD 1=BOAT 2=BACKPACK 3=TOTEBARGE	89943
ELECTROFISH EFFORT, DURATION OF SHOCKING (SEC)	89944
BIOLOGICAL **- Nekton Seining (Composite, Both, CN 89947)**	Parameter Code
BIOLOGICAL DATA (report value of 1013 for Nekton Seining)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
SEINING EFFORT (# OF SEINE HAULS)	89947
COMBINED LENGTH OF SEINE HAULS (METERS)	89948
SEINING EFFORT, DURATION (MINUTES)	89949
AREA SEINED (SQ METERS)	89976
SEINE, MINIMUM MESH SIZE, AVERAGE BAR, NEKTON,IN	89930
SEINE, MAXIMUM MESH SIZE, AVG BAR, NEKTON,INCH	89931
NET LENGTH (METERS)	89941
BIOLOGICAL **- Nekton Observation Not Captured (Composite, Both, CN)**	Parameter Code
BIOLOGICAL DATA (report value of 1014 for Nekton Observation Not Captured)	89888
NUMBER OF SPECIES, FISH	98003

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Nekton Hoop Net (Composite, Both, CN, 98077)**	Parameter Code
BIOLOGICAL DATA (report value of 1015 for Nekton Hoop Net)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
DURATION OF DEPLOYMENT (HRS)	98077
NUMBER OF SPECIES, FISH	98003
HOOP NET WIDTH (METERS)	98124
BIOLOGICAL **- Nekton Hook and Line (Composite, Both, CN, 89942)**	Parameter Code
BIOLOGICAL DATA (report value of 1016 for Nekton Hook and Line)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
NET OR HOOKLINE EFFORT,DURATION IN WATER (HRS)	89942
NUMBER OF SPECIES, FISH	98003
BIOLOGICAL **- Nekton Castnet (Composite, Both, CN, 89945)**	Parameter Code
BIOLOGICAL DATA (report value of 1017 for Nekton Castnet)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
CASTNETTING EFFORT (# OF CASTS)	89945
NUMBER OF SPECIES, FISH	98003
BIOLOGICAL **- Nekton Trawl (Composite, Both, CN, 89907)**	Parameter Code
BIOLOGICAL DATA (report value of 1018 for Nekton Trawl)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
TRAWL, OTTER, DURATION (MINUTES)	89907
TRAWL, OTTER, WIDTH (M)	89953
NUMBER OF SPECIES, FISH	98003
BIOLOGICAL **- Nekton Water Intake Screen (Composite, Both, CN, 89940)**	Parameter Code
BIOLOGICAL DATA (report value of 1019 for Nekton Water Intake Screen)	89888
NEKTON ORGANISMS-NONE PRESENT	98005

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Nekton Water Intake Screen (Composite, Both, CN, 89940)**	Parameter Code
INTAKE SCREEN COLLECTION, DURATION IN MINUTES	89940
COOLING WATER INTAKE SCREEN(1=REVOLVNG,2=STATIC)	89951
NUMBER OF SPECIES, FISH	98003
BIOLOGICAL **- Nekton Gill Net (Composite, Both, CN, 98077)**	Parameter Code
BIOLOGICAL DATA (report value of 10111 for Nekton Gill Net)	89888
NEKTON ORGANISMS-NONE PRESENT	98005
DURATION OF DEPLOYMENT (HRS)	98077
NUMBER OF SPECIES, FISH	98003
GILL NET MESH SIZE (INCHES)	98078
BIOLOGICAL **- Benthic Macroinvertebrates Rapid Bioassessment Qualitative (Composite, Both, CN, 89904)**	Parameter Code
BIOLOGICAL DATA (report value of 2011 for Benthic Macroinvertebrates Rapid Bioassessment Qualitative)	89888
BENTHIC DATA REPORTING UNITS (1=NUMBER OF INDIVIDUALS IN SUB-SAMPLE, 2=NUMBER OF INDIVIDUALS/FT2, 3=NUMBER OF INDIVIDUALS/M2, 4=TOTAL NUMBER OF INDIVIDUALS IN SAMPLE)	89899
BENTHIC SAMPLE COLLECTION METHOD (1=SURBER, 2=EKMAN, 3=KICKNET, 4=PETERSON, 5=HESTER DENDY, 6=SNAG, 7=HESS)	89950
MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM)	89946
KICKNET EFFORT,AREA KICKED (SQ.METER)	89903
KICKNET EFFORT,MINUTES KICKED (MIN.)	89904
DIP NET EFFORT,AREA SWEPT (SQ.METER)	89902
NUMBER OF INDIVIDUALS IN BENTHIC SAMPLE	89906
DEBRIS/SHORELINE SAMPLING EFFORT, MINUTES	89905
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	89961
BENTHOS ORGANISMS -NONE PRESENT	90005
TOTAL TAXA RICHNESS, BENTHOS	90055
NUMBER OF EPT INDEX	90008
HILSENHOFF BIOTIC INDEX (HBI)	90007

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Benthic Macroinvertebrates Rapid Bioassessment Qualitative (Composite, Both, CN, 89904)**	Parameter Code
CHIRONOMIDAE, PERCENT OF INDIVIDUALS	90062
DOMINANT TAXON, BENTHOS PERCENT OF INDIVIDUALS	90042
DOMINANT BENTHIC FUNCTIONAL FEEDING GRP, % OF INDIVIDUALS	90010
BENTHIC PREDATORS, PERCENT OF INDIVIDUALS	90036
RATIO OF INTOLERANT TO TOLERANT TAXA, BENTHOS	90050
PERCENT OF TOTAL TRICHOPTERA INDIVIDUALS AS HYDROPSYCHIDAE	90069
NUMBER OF NON-INSECT TAXA	90052
BENTHIC GATHERERS, PERCENT OF INDIVIDUALS	90025
ELMIDAE, PERCENT OF INDIVIDUALS	90054
RAPID BIOASSESSMENT PROTOCOLS BENTHIC MACROINVERTEBRATE IBI SCORE	90081
BENTHIC DATA REPORTING UNITS (1=NUMBER OF INDIVIDUALS IN SUB-SAMPLE, 2=NUMBER OF INDIVIDUALS/FT2, 3=NUMBER OF INDIVIDUALS/M2, 4=TOTAL NUMBER OF INDIVIDUALS IN SAMPLE)	89899
BIOLOGICAL **- Benthic Macroinvertebrates Quantitative Protocol (Composite, Both, CN, 89934, 89901, or 89935)**	Parameter Code
BIOLOGICAL DATA (report value of 2012 for Benthic Macroinvertebrates Quantitative Protocol)	89888
BENTHIC DATA REPORTING UNITS (1=NUMBER OF INDIVIDUALS IN SUB-SAMPLE, 2=NUMBER OF INDIVIDUALS/FT2, 3=NUMBER OF INDIVIDUALS/M2, 4=TOTAL NUMBER OF INDIVIDUALS IN SAMPLE)	89899
BENTHIC SAMPLE COLLECTION METHOD (1=SURBER, 2=EKMAN, 3=KICKNET, 4=PETERSON, 5=HESTER DENDY, 6=SNAG, 7=HESS)	89950
MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM)	89946
AREA OF SNAG SURFACE SAMPLED (SQ.MT)	89975
HESTER-DENDY DURATION (DAYS)	89933
PETERSEN SAMPLER EFFORT, AREA SAMPLED (SQ. MTR.)	89934
EKMAN SAMPLER EFFORT, AREA SAMPLED (SQ.METER)	89935

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Benthic Macroinvertebrates Quantitative Protocol (Composite, Both, CN, 89934, 89901, or 89935)**	Parameter Code
SURBER SAMPLER EFFORT,AREA SAMPLED (SQ. METER)	89901
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	89961
BENTHOS ORGANISMS -NONE PRESENT	90005
TOTAL TAXA RICHNESS, BENTHOS	90055
NUMBER OF DIPTERA TAXA	90056
NUMBER OF EPHEMEROPTERA TAXA	90057
TOTAL NUMBER OF INTOLERANT TAXA, BENTHOS	90058
EPT, PERCENT OF INDIVIDUALS	90060
CHIRONOMIDAE, PERCENT OF INDIVIDUALS	90062
TOLERANT BENTHOS, PERCENT OF INDIVIDUALS	90066
BENTHIC GRAZERS, PERCENT OF INDIVIDUALS	90020
BENTHIC GATHERERS, PERCENT OF INDIVIDUALS	90025
BENTHIC FILTERERS, PERCENT OF INDIVIDUALS	90030
DOMINANT 3 TAXA, PERCENT OF INDIVIDUALS	90067
QUANTITATIVE PROTOCOLS REGIONAL BENTHIC MACROINVERTEBRATE IBI SCORE	90085
BIOLOGICAL **- Benthic Macroinvertebrates Other Protocol (Composite, Both, CN, 89904)**	Parameter Code
BIOLOGICAL DATA (report value of 2013 for Benthic Macroinvertebrates Other Protocol)	89888
DEBRIS/SHORELINE SAMPLING EFFORT, MINUTES	89905
BENTHIC SAMPLE COLLECTION METHOD (1=SURBER, 2=EKMAN, 3=KICKNET, 4=PETERSON, 5=HESTER DENDY, 6=SNAG, 7=HESS)	89950
KICKNET EFFORT,MINUTES KICKED (MIN.)	89904
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	89961
BENTHOS ORGANISMS -NONE PRESENT	90005

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Habitat TCEQ Parts 1, 2, and 3 Protocol (Composite, Both, CN)**	Parameter Code
BIOLOGICAL DATA (report value of 3011 for Habitat TCEQ Parts 1, 2, and 3 Protocol)	89888
STREAM TYPE; 1=PERENNIAL 2=INTERMITTENT S/PERENNIAL POOLS 3=INTERMITTENT 4=UNKNOWN	89821
STREAMBED SLOPE (M/KM)	72051
DRAINAGE AREA ABOVE MOST DOWNSTREAM TRANSECT	89859
STREAM ORDER	84161
REACH LENGTH OF STREAM EVALUATED (M)	89884
NUMBER OF LATERAL TRANSECTS MADE	89832
AVERAGE STREAM WIDTH (METERS)	89861
AVERAGE STREAM DEPTH (METERS)	89862
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	00061
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	89835
HABITAT FLOW STATUS, 1=NO FLOW, 2=LOW,3=MOD,4=HIGH	89848
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)	89864
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)	89865
TOTAL NUMBER OF STREAM BENDS	89839
NUMBER OF WELL DEFINED STREAM BENDS	89840
NUMBER OF MODERATELY DEFINED STREAM BENDS	89841
NUMBER OF POORLY DEFINED STREAM BENDS	89842
TOTAL NUMBER OF RIFFLES	89843
DOMINANT SUBSTRATE TYPE(1=CLAY,2=SILT,3=SAND,4=GRAVEL,5=COBBLE,6=BOULDER,7=BEDROCK,8=OTHER)	89844
AVERAGE PERCENT OF SUBSTRATE GRAVEL SIZE OR LARGER	89845
AVERAGE PERCENTAGE INSTREAM COVER	84159
NUMBER OF STREAM COVER TYPES	89929
AVERAGE STREAM BANK EROSION (%)	89846
AVERAGE STREAM BANK SLOPE (DEGREES)	89847

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Habitat TCEQ Parts 1, 2, and 3 Protocol (Composite, Both, CN)**	Parameter Code
AVERAGE WIDTH OF NATURAL RIPARIAN VEGETATION (M)	89866
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON LEFT BANK (M)	89872
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON RIGHT BANK (M)	89873
AVERAGE PERCENT TREES AS RIPARIAN VEGETATION	89849
AVERAGE PERCENT SHRUBS AS RIPARIAN VEGETATION	89850
AVERAGE PERCENT GRASS AS RIPARIAN VEGETATION	89851
AVERAGE PERCENT CULTIVATED FIELDS AS RIPARIAN VEGETATION	89852
AVERAGE PERCENT OTHER AS RIPARIAN VEGETATION	89853
AVERAGE PERCENTAGE OF TREE CANOPY COVERAGE	89854
AESTHETICS OF REACH (1=WILD 2=NAT. 3=COMM. 4=OFF.)	89867
LAND DEVELOP IMPACT (1=UNIMP,2=LOW,3=MOD,4=HIGH)	89962
RIPARIAN VEGETATION %; LEFT BANK - TREES	89822
RIPARIAN VEGETATION %; RIGHT BANK - TREES	89823
RIPARIAN VEGETATION %; LEFT BANK SHRUBS	89824
RIPARIAN VEGETATION %; RIGHT BANK - SHRUBS	89825
RIPARIAN VEGETATION %: LEFT BANK - GRASSES OR FORBS	89826
RIPARIAN VEGETATION %; RIGHT BANK - GRASSES OR FORBS	89827
RIPARIAN VEGETATION %: LEFT BANK - CULTIVATED FIELDS	89828
RIPARIAN VEGETATION %: RIGHT BANK - CULTIVATED FIELDS	89829
RIPARIAN VEGETATION %: LEFT BANK - OTHER	89830
RIPARIAN VEGETATION %: RIGHT BANK - OTHER	89871
AVAILABLE INSTREAM COVER HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	89874
BOTTOM SUBSTRATE STABILITY HQI SCORE: 4=STABLE 3=MODERATELY STABLE 2=MODERATELY UNSTABLE 1=UNSTABLE	89875

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Habitat TCEQ Parts 1, 2, and 3 Protocol (Composite, Both, CN)**	Parameter Code
NUMBER OF RIFFLES HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	89876
DIMENSIONS OF LARGEST POOL HQI SCORE: 4=LARGE 3=MODERATE 2=SMALL 1=ABSENT	89877
CHANNEL FLOW STATUS HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NO FLOW	89878
BANK STABILITY HQI SCORE: 3=STABLE 2=MODERATELY STABLE 1=MODERATELY UNSTABLE 0=UNSTABLE	89879
CHANNEL SINUOSITY HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NONE	89880
RIPARIAN BUFFER VEGETATION HQI SCORE: 3=EXTENSIVE 2=WIDE 1=MODERATE 0=NARROW	89881
AESTHETICS OF REACH HQI SCORE: 3=WILDERNESS 2=NATURAL AREA 1=COMMON SETTING 0=OFFENSIVE	89882
HQI TOTAL SCORE	89883
NO FLOW ISOLATED POOL: LARGEST POOL MAX WIDTH (METERS)	89908
NO FLOW ISOLATED POOL: LARGEST POOL MAX LENGTH (METERS)	89909
NO FLOW ISOLATED POOL: LARGEST POOL MAX DEPTH (METERS)	89910
NO FLOW ISOLATED POOL: SMALLEST POOL MAX DEPTH (METERS)	89911
NO FLOW ISOLATED POOL: SMALLEST POOL MAX WIDTH (METERS)	89912
NO FLOW ISOLATED POOL: SMALLEST POOL MAX LENGTH (METERS)	89913
NO FLOW ISOLATED POOLS: NUMBER OF POOLS EVALUATE	89914
BIOLOGICAL **- Habitat EPA EMAP Protocol (Composite, Both, CN)**	Parameter Code
BIOLOGICAL DATA (report value of 3012 for Habitat EPA EMAP Protocol)	89888

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Algae Diatoms (Composite, Both, CN, 93308)**	Parameter Code
BIOLOGICAL DATA (report value of 4011 for Algae Diatoms)	89888
ALGAE SUBSTRATE TYPE (1=ROCKY 2=WOODY 3=SILT/SAND 4=COMPOSITE 5=ARTIFICIAL 6=NUTRIENT DIFFUSING)	93304
ALGAE SAMPLE TYPE (1=QUALITATIVE SINGLE SUBSTRATE 2=QUALITATIVE COMPOSITE 3=QUANTITATIVE 4=PERCENT SUBSTRATE COVERAGE)	93303
ALGAE HABITAT TYPE SAMPLED (1=RIFFLE 2=RUN 3=GLIDE 4=POOL 5=MULTIPLE HABITAT TYPES SAMPLED)	93307
ALGAE AREA SAMPLED, QUANTITATIVE (M2)	93308
ALGAL DATA REPORTING UNITS (1=CELLS/ML 2=CELLS/M2 3=CELLS/SAMPLE 4=OBSERVED)	93314
NUMBER OF DIATOM AND SOFT ALGAE GENERA IN SAMPLE	93301
NUMBER OF ALGAL DIVISIONS IN SAMPLE	93302
NUMBER DIATOM VALVES COUNTED	93316
NUMBER DIATOM TAXA	93318
DIATOM SHANNON DIVERSITY	93320
DIATOM POLLUTION TOLERANCE INDEX	93323
DIATOM SENSITIVE/INTOLERANT, %	93343
ALGAE, DOMINANT 3 TAXA, %	93333
ALGAE MOTILE TAXA, %	93335
ALGAE TOLERANT TAXA, %	93337
CYMBELLA GROUP RICHNESS	93340
FRAGILARIA GROUP RICHNESS	93344
BIOLOGICAL **- Algae Soft Benthic Not Diatoms (Composite, Both, CN, 93308)**	Parameter Code
BIOLOGICAL DATA (report value of 4012 for Algae Soft Benthic Not Diatoms)	89888
ALGAE SUBSTRATE TYPE (1=ROCKY 2=WOODY 3=SILT/SAND 4=COMPOSITE 5=ARTIFICIAL 6=NUTRIENT DIFFUSING)	93304
ALGAE SAMPLE TYPE (1=QUALITATIVE SINGLE SUBSTRATE 2=QUALITATIVE COMPOSITE 3=QUANTITATIVE 4=PERCENT SUBSTRATE COVERAGE)	93303

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Algae Soft Benthic Not Diatoms (Composite, Both, CN, 93308)**	Parameter Code
ALGAE HABITAT TYPE SAMPLED (1=RIFFLE 2=RUN 3=GLIDE 4=POOL 5=MULTIPLE HABITAT TYPES SAMPLED)	93307
ALGAE AREA SAMPLED, QUANTITATIVE (M2)	93308
ALGAL DATA REPORTING UNITS (1=CELLS/ML 2=CELLS/M2 3=CELLS/SAMPLE 4=OBSERVED)	93314
NUMBER OF DIATOM AND SOFT ALGAE GENERA IN SAMPLE	93301
NUMBER OF ALGAL DIVISIONS IN SAMPLE	93302
NUMBER OF CELLS/UNITS COUNTED, BENTHIC ALGAE	93346
CHLOROPHYLL A, BENTHIC	93347
ASH FREE DRY WEIGHT	93348
ALGAL CELL/UNIT DENSITY	93349
BIOLOGICAL **- Algae Phytoplankton (Composite, Both, CN, 93403, 93400)**	Parameter Code
BIOLOGICAL DATA (report value of 4013 for Algae Phytoplankton)	89888
ALGAL DATA REPORTING UNITS (1=CELLS/ML 2=CELLS/M2 3=CELLS/SAMPLE 4=OBSERVED)	93314
NUMBER OF DIATOM AND SOFT ALGAE GENERA IN SAMPLE	93301
NUMBER OF ALGAL DIVISIONS IN SAMPLE	93302
PLANKTON SAMPLE TYPE (1=TOW 2=GRAB 3=DEPTH INTEGRATED)	93390
PLANKTON SAMPLE VOLUME COLLECTED	93392
TOW TYPE (1=VERT., 2=HORIZ.)	89938
PLANKTON SAMPLE TOW LENGTH (METERS)	93400
PLANKTON SAMPLE TOW TIME (MINUTES)	93403
PHYTOPLANKTON DENSITY, TOTAL (CELLS/ML)	95999
DIVERSITY--MACROPHYTES	99300
PHYTOPLANKTON SAMPLED--NO ORGANISMS PRESENT	93305
PHYTOPLANKTON--UNKNOWN ORGANISM (#/SAMPLE)	93306

Table 12: Biological Parameters & Parameter Codes, Sampling Categories & Values (continued)

BIOLOGICAL **- Algae Visual Algal Assessment (Composite, Both, CN)**	Parameter Code
BIOLOGICAL DATA (report value of 4014 for Algae Visual Algal Assessment)	89888
ALGAE SUBSTRATE TYPE (1=ROCKY 2=WOODY 3=SILT/SAND 4=COMPOSITE 5=ARTIFICIAL 6=NUTRIENT DIFFUSING)	93304
ALGAE HABITAT TYPE SAMPLED (1=RIFFLE 2=RUN 3=GLIDE 4=POOL 5=MULTIPLE HABITAT TYPES SAMPLED)	93307
ALGAL DATA REPORTING UNITS (1=CELLS/ML 2=CELLS/M2 3=CELLS/SAMPLE 4=OBSERVED)	93314
ALGAL MAT (1=ABSENT 2=SLIME 3=VISIBLE 4=MEASUREABLE)	93405
ALGAL MAT THICKNESS	93407
BENTHIC ALGAE, PERCENT COVER	93409
GREEN FILAMENTOUS ALGAE, PERCENT COVER	93422
BLUEGREEN, PERCENT COVER	93424
DIATOM, PERCENT COVER	93426
RED ALGAE, PERCENT COVER	93429
FLOATING MAT/SCUM PERCENT COVER	93463
BIOLOGICAL **- Zooplankton (Composite, Both, CN, 93403, 93400)**	Parameter Code
BIOLOGICAL DATA (report value of 501 for Zooplankton)	89888
PLANKTON SAMPLE TYPE (1=TOW 2=GRAB 3=DEPTH INTEGRATED)	93390
PLANKTON SAMPLE VOLUME COLLECTED	93392
TOW TYPE (1=VERT., 2=HORIZ.)	89938
PLANKTON SAMPLE TOW LENGTH (METERS)	93400
PLANKTON SAMPLE TOW TIME (MINUTES)	93403

Chapter 7 – Data Reporting

Surface water quality monitoring data are reported to the Texas Commission on Environmental Quality by two methods: manual data entry and flat-file datasets. This chapter defines the method and formats used when submitting data to TCEQ for upload into the SWQMIS database.

TCEQ Region and Central Office Staff

The TCEQ staff authorized to enter sample data into the database use the data entry screens in the Sampling Module of the SWQMIS database. The creation of Sample Events and Sample Sets along with the entry of field parameter data are required to be reported electronically to the DM&A Data Manager via SWQMIS within 45 days of the sampling event. When data is entered and published by TCEQ staff, SWQMIS assigns the data the status of “pre-production data management” (PREDM).

Laboratory Information Management System (LIMS)

The TCEQ Houston Laboratory and other contracted laboratories perform laboratory analyses requested by TCEQ Regional and Central Office staff. Surface water quality monitoring samples are sent to the laboratories with SWQMIS-generated Request for Analysis (RFA) forms. The laboratory reports this data to DM&A using the LIMS file format provided in Appendix A, and

DM&A loads the data into the database. Upon loading, the data are assigned PREDM status in SWQMIS. DM&A staff review the lab report and the electronic data for completeness, appropriateness, and metadata accuracy (including codes, depth, date, time, tag number, and station ID), before publishing the data as Production (PROD) data in the SWQMIS database. Please see the "LIMS File Format" section of this chapter (p. 6) for information on how to structure the data files for LIMS Loader data.

TCEQ Partners and Contractors

Data Deliverables

Two ASCII (DOS) pipe-delimited text files must be provided to the TCEQ Project Manager for inclusion in SWQMIS. These two files must follow the format described below (examples are provided later in this chapter). These files are related to each other through the Tag ID, which is described in Chapter 6. There is a one-to-many relationship between the Event file and the Results file with multiple records in the Results file for each Event (monitoring/sampling event). An Event record is defined as a unique sampling regime conducted at a specific date, place (station ID and depth), and time. For example, an Event record describes the collection of a "metals in sediment" sample at station 12049 on 5 February 2014, 13:00 hours. Water, tissue, sediment, and distinct types of biological (nekton, habitat, benthic) samples are all considered separate Event records in the Event file. Each Event record must have a unique Tag ID. Instantaneous field measurements (grabs) collected immediately before or after 24-hour monitoring are also considered separate Event records and the submitting entity may not report it under the same Tag ID as the 24-hour data. Fields marked as Data Value Required = "Y" must be completed prior to data submission.

Sample/Event File Format

Each record in the Events File consists of the fourteen fields described below; fields may or may not contain data. Fields must be in the order listed in the table below. For a grab sample, if a field is only appropriate for composite sample (noted with a "C" in the Data Value Required column), the field should still be present for that record in the Events file, but left blank. The fields marked with a "Y" in the Data Value Required column must contain either a text or numeric value for every sample collected. Except for the 'Comment' field, these fields must contain only numeric or alpha characters, as designated in field descriptions. No punctuation (such as quotation marks, commas, periods, etc.) can be accepted. **Sample/Event File Format**

Field Name	Data Field Required	Length	Data Value Required	Description
Tag ID	Y	7[1]	Y	Key field that is common to both the Events and Results file. Each Tag ID is unique in the Events file. The first 1- or 2-digits must match the Tag Prefix assigned to the submitting agency.
Station ID	Y	5	Y	A unique 5-digit code that identifies each sampling station. This number is generated by the database in response to the submission of a SLOC Request to DM&A (see SWQM DMRG Chapter 3). Data collected at new stations cannot be loaded into SWQMIS until the station ID has been assigned by TCEQ DM&A.

End date	Y	10	Y	Date the sample was collected. Reported as MM/DD/YYYY. Leading zeros are required for month and day. For composite samples this is the last date a sample or measurement was collected.
End time	Y	5	Y	The time the sample was collected. Reported in military (24-hour, MM:HH) format. For composite samples, this is the time the last sample was collected. Leading zeros are required where applicable (for example, 09:30).
End depth	Y	6	Y	The depth in meters at which the sample was collected. For composite samples, the deepest depth at which the sample was collected.
Start date	Y	10	C	This field requires a value for composite samples only and is the sample collection start date. If this field is not blank, then Start time, Start depth, Category, and Type must also contain a data value. If a sample is not a composite, this field should be blank. Reported as MM/DD/YYYY.
Start time	Y	5	C	This field requires a value for composite samples only and is the sample collection start time. If this field is not blank, then Start date, Start depth, Category, and Type must also contain a data value. If a sample is not a composite, this field should be blank. Leading zeros are required where applicable (for example, 09:30).

Field Name	Data Field Required	Length	Data Value Required	Description
Start depth	Y	6	C	This field requires a value for composite samples only and is the depth nearest the water surface for sample collection (in meters). If this field is not blank, Start time, Category, and Type must also contain a data value. If a sample is not a composite, this field should be blank.
Category	Y	1	C	This field requires a value for composite samples only and should correspond to the following codes: T=time, S=space, B=both, and F=flow weight. If this field is not blank, then Start date, Start time, Start Depth, and Type must also contain a data value. If a sample is not a composite, this field should be blank. Examples: 24-hour DO monitoring is a composite over time only (T). Sediment monitoring is monitoring across space (S). Neckton monitoring occurs across time and space (B). I don't know what flow weight monitoring is.
Type	Y	2	C	This field requires a value for composite samples only and should correspond to the following codes: ## = number of grabs in composite, CN = continuous, GB = number of grabs is unknown. If the data value is a single digit, a leading zero is required (for example, 3 grabs in composite =”03"). If a sample is not a composite, this field should be left blank.
Comment	Y	135	N	This is the text field for any observational data available for the event. If there is no observational data, this field should be left blank.
Submitting Entity	Y	2	Y	The code that indicates the entity responsible for submitting data to the TCEQ, usually the QAPP holder. Valid codes are assigned by the TCEQ, and presented in the SWQM DMRG Chapter 4. (Formerly known as Source Code 1).
Collecting Entity	Y	2	Y	The code that indicates the entity actually collecting samples in the field. Valid codes are assigned by the TCEQ. This document lists these codes in the SWQM DMRG Chapter 4. (Formerly known as Source Code 2).
Monitoring Type	Y	2	Y	The code used to identify the type of sampling that is being reported in the dataset for a unique tag. TCEQ assigns valid codes, and they are listed in the SWQM DMRG Chapter 4. (Formerly known as Program Code).

[1] Tag ID can accept up to nine characters. However, seven characters is the norm.

The generic format of the Sample/Event file:

Tag|Station Id|End Date|End Time|End Depth|Start Date|Start Time|Start Depth|Category|Type|Comment|Submitting Entity|Collecting Entity|Monitoring Type

Example records for a Sample/Event file:

Grab:

0012345|16789|10/11/2013|14:30|0.3||||||Water green|LC|LC|RT

Composite:

0012345|16789|10/11/2013|09:45|0.6|10/11/2013|10:00|0.3|S||Sunny and warm|LC|LC|RT

Profile:

L150001|15301|01/05/2014|14:15|0.3|||||||LC|LC|RT

L150002|15301|01/05/2014|14:16|6|||||||LC|LC|RT

L150003|15301|01/05/2014|14:17|9|||||||LC|LC|RT

24 Hour:

R150001|15301|01/15/2013|14:15|0.3|01/14/2013|14:00|0.3|T|24||LC|LC|CS

Tissue:

0012345|13270|12/12/2003|11:15|2|12/12/2003|14:15|0.3|B|04|Coots feeding|LC|LC|RT

Results File Format

The Results file may have one or multiple records for each Event record. Each record consists of the nine fields described below; fields may or may not contain data. Fields must be in the order listed in the table below. If a value for the field is not appropriate, the blank field must still be present for the record in the Results file. These fields must contain only numeric or alpha characters, as designated in field descriptions. No punctuation (such as quotation marks, commas, periods, etc.) can be accepted.

Results /Event File Format

Field Name	Data Field Required	Length	Data Value Required	Description
Tag ID	Y	7[1]	Y	Unique code connecting the water quality sample results to a Tag ID in the Events file. The same code is assigned to all results that came from the same water quality sample. Therefore, there will be many results with the same Tag ID, which all match a single record in the Events file.
End date	Y	10	Y	The date the sample was collected. Reported as MM/DD/YYYY. This date needs to match the End date in the Events file for the specified Tag ID. Leading zeros are required for month and day.
Parameter Code	Y	5	Y	The 5-digit parameter code that identifies the substance being measured. Leading zeros are required where applicable (for example, 00400).
GT/LT	Y	1	N	If the value determined is a "<" value, report "<" in this field. If the value determined is a ">" value, then report a ">" in this field. Otherwise, leave blank.

Field Name	Data Field Required	Length	Data Value Required	Description
Value	Y	8	Y	This is the level or test result of the substance being measured and is reported in the units defined in the parameter code description found in SWQMIS.
LOD	Y	8	N	This is the Limit of Detection for this parameter.
LOQ	Y	8	N	This is the Limit of Quantitation for this parameter.
Qualifier Code	Y	2	N	Formerly referred to as Remark Code. See the SWQM DMRG Chapter 10 for a list of codes and their definitions.
Verify Flag	Y	1	N	If Value is outside the minimum/maximum range defined in SWQMIS (SWQM DMRG Chapter 2), the data submitter must place a "1" in this field to indicate that s/he has verified the data value. If the value cannot be verified, the submitting entity must add a qualifier code (SWQM DMRG Appendix E) in the Qualifier Code field.

[1] Tag ID can accept up to nine characters. However, seven characters is the norm.

The generic format of the Results file:

Tag|End Date|Parameter|GT/LT|Value|LOD|LOQ|Qualifier Code|Verify Flag

Example records for a Results file:

Grab**:**

0012345|10/11/2013|00061|<|1||||

0012345|10/11/2013|00940||53|||BL|

Composite:

0012345|10/11/2013|00221||24||||

0012345|10/11/2013|00209||18||||

0012345|10/11/2013|00210||22||||

0012345|10/11/2013|00211||14|||PE|1

Profile**:**

L150001|01/14/2014|00010||18.3||||

L150002|01/14/2014|00010||17.6|||J|1

24 Hour**:**

R150001|01/02/2014|00216||7.9||||

R150001|01/02/2014|00220||24||||

R150001|01/02/2014|00218||11.5||||

Tissue**:**

0012345|12/12/2013|74990||016||||

0012345|12/12/2013|74995||59||||

0012345|12/12/2013|81615||1||||

0012345|12/12/2013|00039||92||||1

0012345|12/12/2003|84100||2|||SP|

LIMS File Format

- This file format is specifically for laboratories (the Houston TCEQ Lab as well as other contract labs) that submit data directly to a DM&A Data Manager. All TCEQ partners and contractors should submit data in the event and results file format previously described in this chapter.
- Fields are pipe ("|") delimited.
- Alpha fields do not contain quotation marks.
- Fields cannot contain the pipe character.
- Fields must be in the order specified.
- Files do not contain a header row.

LIMS File Format Example

LIMS Sample/Event File Format

Field Name	Data Field Required	Length	Data Value Required	Description
Sample Number/Lab ID	Y	Up to 10 characters	Y	This is the ID assigned to the sample by the lab.
Station ID	Y	Consistent with station IDs	Y	Must be a valid existing station ID in SWQMIS.
Tag ID	Y	Up to 30 characters	Y	This is the RFA number.
Sample Date/ Time	Y	Exactly 17 characters	Y	DD-MON-YYYY HH:MM (e.g. 10-DEC-2005 20:05)
Sample Collected By (Name)	Y	Up to 40 characters	Y	This is the SWQMIS user ID for the SWQM FO who collected the sample.
Region ID	Y	Up to 2 characters	Y	This must be a number. Region ID should be provided on RFA by collector. Valid region numbers are: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, or 99 (99=Central Office staff).

Field Name	Data Field Required	Length	Data Value Required	Description

End Collection Depth	Y	Up to 10 characters	Y	The depth in meters at which the sample was collected. For composite samples, the deepest depth at which the sample was collected. Must be a number.
Composite Type	Y	Up to 2 characters	Composite Samples Only	The number of grabs that comprise a composite sample. May be 00-99, or GB (for unknown number of grabs). If leading zero isn't included (e.g., "2"), the system will still accept it.
Composite Category	Y	Exactly 1 character	Composite Samples Only	Use one of the following codes that represent the category of composite sampling (only used for composite samples): "T" (time), "S" (space), "B" (both time and space), or "F" (flow weighted).
Start Date/Time	Y	Exactly 17 characters	Composite Samples Only	DD-MON-YYYY HH:MM (e.g. 10-DEC-2005 20:05) This is the start date/time of composite samples.
Start Sample Collection Depth	Y	Up to 10 characters	Composite Samples Only	This is the start depth (only used for composite samples). It must be a number.

Field Name	Data Field Required	Length	Data Value Required	Description
Submitting Entity	Y	Exactly 2 characters	Y	This is the entity submitting the data. Valid codes are assigned by the TCEQ, and presented in the SWQM DMRG Chapter 4.
Collecting Entity	Y	Exactly 2 characters	Y	This is the entity collecting the data. Valid codes are assigned by the TCEQ, and presented in the SWQM DMRG Chapter 4.
Monitoring Type	Y	Exactly 2 – 4 characters	Y	This indicates the type of sampling being conducted. Valid codes are assigned by the TCEQ, and presented in the SWQM DMRG Chapter 4.
Quality Control Type	Y	Exactly 1 character	N	Code indicating the type of QC sample, if applicable.

The generic format of the LIMS Sample/Event file:

Sample Number/Lab ID |Station Id|Tag ID|End Date End Time|Collector|End Depth|Composite Type|Composite Category|Start Date Start Time| Start Depth|Submitting Entity|Collecting Entity|Monitoring Type|Quality Control Type

LIMS Results File Format

Field Name	Data Field Required	Length	Data Value Required	Description
Sample Number/Lab ID	Y	Up to 10 characters	Y	This is the ID assigned to the sample by the lab. This field must match the associated Sample Number/Lab ID provided in the Event File.
Parameter Code	Y	Exactly 5 characters	Y	Leading zeros are kept by the system. Include the leading zeros in the submitted Results File.
Result	Y	Up to 10 characters	Y	Must be either all numeric, "<" followed by a number, or ">" followed by a number.
Data Qualifier Code	Y	Exactly 2 characters	N	Valid data qualifier code
MDL	Y	Up to 8 digits	N	This is the Method Detection Limit. The values may range from 0 to 99,999,999.
RL	Y	Up to 8 digits	N	This is the Reporting Limit. The values may range from 0 to 99,999,999.
Note/Comment	Y	Up to 4000 characters	N	Notes/comments are required if there was a note/comment necessitated by the laboratory
Person Doing Analysis	Y	Up to 50 characters	Y	This is the first initial and the full last name of the laboratory analyst

The generic format of the LIMS Results file:

Sample Number/Lab ID | Parameter| Result| Qualifier Code|MDL|RL| Comment|Lab Analyst

Chapter 8 – Data Review

All data must be verified prior to its submittal to the SWQMIS database. An example checklist that may assist with data verification is provided here.

Contractors submitting data through TCEQ water programs must use the procedures, checklists, and/or forms required by their contracts (for example, TMDL data review checklists, CRP data summaries, or NPS data review checklists) to document data review.

SWQMIS Data Loading Report

The DM&A Team assists in data verification and validation prior to loading into SWQMIS. The SWQMIS data loader is a tool that performs checks of data flat files. The SWQMIS data loader in the Test environment of SWQMIS can be used by contract data submitters to test their data deliverables prior to submitting the data to their TCEQ project manager. This data loader tool helps the data provider confirm that the dataset is correct in format and complete in content. The data checks also ensure that DM&A can upload the data to the Production environment of SWQMIS without errors. The loading tool also produces a summary report used for further diagnostics of any errors. Project managers can use this report for secondary data review.

Data Dictionary for the SWQMIS Data Loading Validator Report

Submitting and Collecting Entities and Monitoring Types

This section of the report identifies all the combinations of Submitting Entity, Collecting Entity, and Monitoring Type Codes reported in the dataset, and descriptions of the codes are provided.

Frequency of Parameter Occurrence

This section of the report identifies the parameter codes, parameter descriptions, and the number of times the parameter appears in the dataset. Also includes the minimum "less-than" value, maximum "less-than" value, minimum "greater-than" value, maximum "greater-than" value, minimum quantifiable value, maximum quantifiable value, and mean values from the dataset.

Stations in Dataset

This section of the report identifies submitted station IDs. Descriptions are provided for each station, along with the Basin ID and number of sampling events for each station.

Outliers (Requires verification prior to loading.)

This section of the report identifies the tag IDs, station descriptions, end dates, parameter codes, less than/greater than symbols, and values reported in the dataset that fall outside the predefined screening levels. The screening levels are listed in this section of the report as the minimum and maximum. If the minimum and/or maximum screening values need to be revised, complete a Parameter Code Request and submit to DM&A according to the process outlined in Chapter 2 in the SWQM DMRG.

Historical Basin Comparison

This section of the report provides each measurement that does not fall between the historical minimum and maximum value for a parameter in a basin. Dataset values outside the historical data levels for the basin-parameter code combination along with Tag ID, basin ID, station ID, parameter code, less-than/greater-than symbol, and the reported value are retrieved from the provided dataset. Historical minimum value, historical maximum value, historical mean value, and historical number of samples reported for the basin-parameter code combination are calculated using the most recent data (5-year period) currently in SWQMIS in that basin for that parameter.

Historical Station Comparison

This section of the report provides each measurement that does not fall between the historical minimum and maximum value for a parameter at that station. Tag ID, station ID, station description, parameter code, less-than/greater-than symbol, and the reported value are retrieved from the provided dataset. Historical minimum value, historical maximum value, historical mean value, and historical number of samples reported for the station-parameter code combination are calculated using the most recent data (5-year period) currently in SWQMIS at that station for that parameter.

Highest Values per Parameter

This section of the report provides the top ten highest values for each parameter code within the data set. Reported fields include station ID, station description, end date, end time, parameter code, less-than/greater-than symbols, value, and end depth.

Lowest Values per Parameter

This section of the report provides the top ten lowest values for each parameter code within the data set. Reported fields include station ID, station description, end date, end time, parameter code, less-than/greater-than symbols, value, and end depth.

Data Management Review

In addition to the verification checks automatically performed by the SWQMIS data loading tool, TCEQ data managers also perform verification and validation checks using output from the Data Loading Validator Report. Using the report as a guide, data managers compare the quality assurance (QA) document associated with the data load (QAP, QAPP) to the report output. The data manager verifies that the data are intended to be stored in SWQMIS and that the proper signatures appear on the QA document. The data manager then verifies that the sampling dates coincide with the effective date of the QA document. The use of the correct Tag Prefix is verified, as well as the use of proper Submitting Entity, Collecting Entity, and Monitoring Type codes. The data managers also verify all station IDs and parameter codes in the Data Loading Validator Report against stations and parameters described in the project QA document. Finally, the data managers ensure that the data submitter has verified all outliers in the data set. In the event that the data managers find discrepancies between the data set and the quality assurance document, the data managers will contact the TCEQ Project Manager for resolution.

Data Not Adhering to QA Document Requirements

If submitted data is identified as not meeting the project's data quality objectives as stated in the project QAPP, the data manager will return the data set to the TCEQ Project Manager. The data manager will provide a Water Quality Planning Division (WQPD) Data Resubmittal Form to the project manager. It is the project manager's responsibility to ensure completion of the form detailing any excursions of the report from the QA document. The project manager, in consultation with the TCEQ QA Specialist will decide on a course of action that addresses the excursion. The project manager will also submit to data management any relevant documentation detailing the excursion from the QA document; often this documentation is recorded directly on the Data Resubmittal Form. When the agreed-to course of action is complete, the project manager, QA specialist, and data manager all sign the form. The project manager resubmits the data set, the Data Resubmittal Form, and any necessary documentation to the data manager. Once the data has been successfully loaded into SWQMIS, the Data Resubmittal Form will also be stored in the database to accompany the project's QA document(s). The Data Resubmittal process may also be initiated by the project manager upon preliminary review of submitted data.

Chapter 9 – Data Corrections

For corrections to data in the SWQMIS database, a SWQM Data Correction Request (DCR) form is submitted to DM&A. The data correction procedures in this chapter have been developed to maintain and document the integrity and reliability of the data in the SWQMIS.

SWQM Data Correction Request Description

To request a data correction in SWQMIS, TCEQ staff submit a SWQM Data Correction Request form to the DM&A data managers. Omissions of information on the form may delay completion of a request and/or require a DM&A data manager to contact the requestor for more information. Requests may be submitted either by standard mail or e-mail. See the Documentation section below for additional information about specific types of requests.

Data Correction Process

In general, it is the responsibility of the individual or program that submitted the data to prepare a Data Correction Request form when necessary.

Submitting entities (contractors or cooperators) should complete and submit a DCR form to their TCEQ project manager for corrections to their own data. They may also work cooperatively with their TCEQ project manager to request corrections to data other groups have submitted. The TCEQ project manager forwards DCR forms to the DM&A data managers for processing.

TCEQ staff who discover errors in their own data should submit a completed DCR form directly to their program's DM&A data manager. TCEQ staff should contact the appropriate TCEQ project manager to inquire about other data they believe to be incorrect.

Upon receipt of the DCR form, DM&A data managers review the request and perform any necessary impact analysis. The impact analysis may require obtaining further information from the requestor or other affected parties.

Once the analysis is complete and a course of action selected, a DM&A data manager either completes the data correction manually or replies to the DCR submitter if an alternative decision is made.

The DM&A data manager sends a confirmation of the DCR completion to the requestor via e-mail.

Data Correction Required Information

Action Code

Record in the Action Code column the appropriate code for either 'Add', 'Flag', or 'Correct' (A, F, or C).

A = Add; use this code to add information to a sample existing in the database.

F = Flag; use this code to qualify data with a Data Qualifier Code (see App. E).

C = Correction; use this code to correct a value existing in the database. If a correction is required, all fields on the Existing line and the necessary fields on the Correction line must be filled out.

Tag ID

Record in the Tag ID column the Tag ID or Sample Set ID of the sample to be corrected.

Station ID

Record in the Station ID column the Station ID that identifies the location of the sample.

End Date

Record in the End Date column the End Date of the sample in mm/dd/yyyy format.

End Time

Record in the End Time column the End Time of the sample in 24-hour format.

End Depth

Record in the End Depth column the End Depth of the sample.

Data Source

Record in the Data Source columns the data source of the sample: Submitting Entity, Collecting Entity, and Monitoring Type.

Parameter Code

Record in the Parameter Code column the parameter code for the sample.

Value

Record in the Value column the measured value in the sample.

Data Qualifier

Provide any data qualifier code applicable to the value.

Verify Flag

If the value is outside the database minimum-maximum range for this parameter code, verify that the value is accurate by entering a "1".

Documentation

Lab Errors

When the analyzing laboratory reports errors or necessary corrections, documentation from the lab will be considered sufficient documentation to proceed with a correction without an explicit request from the FOD sample collector.

Large-Volume Data Correction Requests

When requesting corrections to large numbers of records (more than 25), DM&A requires that requestors submit an electronic list of the records to be updated in addition to the DCR form. This is to protect data integrity and to document the intent of the request with complete clarity. This electronic list should include all fields on the DCR form (Tag ID, Station ID, End Date, End Time, End Depth, Data Source information, plus Parameter Code, and Value if applicable). Spreadsheets (such as Excel files) and pipe-delimited text files are acceptable formats. Contact DM&A with any questions regarding these instructions or the data correction process.

Chapter 10 – Data Qualification

Data stored in SWQMIS must be collected or acquired under a TCEQ-approved Quality Assurance Plan (QAP) or Quality Assurance Project Plan (QAPP). Each quality assurance (QA) document sets forth Data Quality Objectives (DQOs) for the data generated by the monitoring project. These DQOs establish the minimum data quality acceptable for the project. SWQMIS is an archival repository for the agency's surface water quality data and any data stored may be used by a variety of users with diverse purposes. It is strongly encouraged that all data is stored in SWQMIS, and any data not meeting the DQOs set forth in the quality assurance document be qualified accordingly[1].

Data then becomes readily available in SWQMIS for all system users. The system users may then determine whether the data are of sufficient quality for their intended use.

Data Management and Analysis (DM&A) qualifies data that has not met DQOs using the data qualifier codes listed in Appendix E of this document. If a program area discovers data stored in SWQMIS that should be qualified, a Data Correction Request should be submitted to DM&A so that the qualifier can be added in SWQMIS. DM&A will consult with the program area that originally submitted the data before qualifying that data.

Instructions for qualifying records associated with Field Blank, Equipment Blank and Field Split QC failures are provided on the following page. A list of Data Qualifier Codes is provided in Appendix E of the DMRG.

[1] Data should be submitted to SWQMIS in accordance with the quality assurance document under which the data is collected. Not all QA documents allow qualified data to be submitted to SWQMIS.

SWQM Program Quality Control Sample Validation and Qualification

The Quality Assurance Advisory Committee has adopted validation procedures for Field and Equipment Blank Quality Control (QC) failures and Field Split QC failures. DM&A staff will use this procedure when validating laboratory data submitted from the SWQM Program.

Field Blank QC Failure

1. At time of validation, the data manager identifies the type of analysis that was performed on the Field Blank (FB).

Note: Field Blanks are required for total metals in water samples and are optional for other types of monitoring (per **SWQM Procedures Manual: Vol I**). **If the sample is a total metals in water sample, the data manager identifies the associated ambient sample for each FB QC failure and qualifies the parametric results in the associated ambient sample's Sample Set.**

2. If the sample is not a total metals in water sample, the data manager determines the date the sample was collected.
3. The data manager then requests a copy of the field notebook for that day from the appropriate region.
4. Once the data manager receives the copy of the field notebook, parametric values are qualified in the Sample Sets for ambient samples collected the same day as the failure with the appropriate data qualifier.

Equipment Blank QC Failure

5. At time of validation, the data manager identifies the type of analysis that was performed on the Equipment Blank (EB).

Note: Equipment Blanks are required for dissolved and total metals in water samples and optional for other types of monitoring (per **SWQM Procedures Manual: Vol I**). **If the sample is a dissolved or total metal in water sample, the data manager determines the associated ambient sample for each EB QC failure and qualifies the failed parametric values in the associated ambient Sample Set. If the sample is not a dissolved or total metals in water sample, the data manager identifies the date the sample was collected.**

6. The data manager then requests a copy of the field notebook for that day from the appropriate region.
7. Once the data manager receives the copy of the field notebook copy, the parametric values are qualified for samples that are associated with the sample whose equipment blank failed QC. The ambient sample's parametric data for each of those associated samples is also qualified with the appropriate qualifier.

Field Split QC Failure

In the event that a parametric value for a Field Split fails QC, the data manager qualifies the same parametric values in the one Sample Set that is associated with the Field Split.

Chapter 11 – Database Reports

SWQMIS is capable of generating several types of reports, details of which are provided in this chapter.

Most reports are available in three formats: HTML (formatted report viewed in Internet Explorer), CSV (Comma Separated Values - opens in Excel), and PIPE delimited (ASCII flat text for importing into other applications). All report outputs can be saved to your own computer. Most reports will print from HTML on letter-size paper although you may have to use landscape setting. Reports are generated using Query Builder which allows you to build your query criteria using 'And/Or' logic.

To access SWQMIS:

For users inside and outside the TCEQ firewall to access the Production environment of SWQMIS, select the following link: https://www80.tceq.texas.gov/SwqmisWeb/.

For users inside and outside the TCEQ firewall to access the Test/UAT environment of SWQMIS, select the following link: https://www8tst0.tceq.texas.gov/SwqmisWeb/.

Types of Reports

Comparison Information Report

The Comparison Information Report is used to view information such as assessment screening levels, flow statistics, narrative criteria, numeric criteria, outlier screening values, reference values, or water effect ratios. The report is also useful for checking for site-specific standards or as a general reference tool.

Monitoring Station Inventory Report

The Monitoring Station Inventory Report displays any or all attributes of any or all monitoring stations. This is useful for simple viewing or creating reference documents.

Parameter Inventory Report

The Parameter Inventory Report allows you to query any number of water quality parameters and their attributes. This is useful for creating reference documents or just viewing parameter attributes like units of measurement, media, or methods used to analyze the parameter.

Raw Data Report

The Raw Data Report generates only a PIPE delimited text file of data from any number of stations in either the traditional two-file Event/Result format or a one-file combined format (Event metadata included on every line with the Result data). This report is primarily for data requests for contractors or cooperators familiar with TCEQ data formats.

RFA Status Report

This report was designed to aid data managers in validating data collected by TCEQ Regional Staff. Generally only data managers use this report.

Sampling History Report

The Sampling History Report generates counts of parameters collected at any number of stations during a specified time period. The report bases the counts on certain parameters that are representative of the type of sampling being counted. For instance, the presence of a result for Aluminum in Water might indicate a 'Metals in Water' sampling event. This report is good for tracking monitoring activities through time. It might also be useful for checking the completeness

of a monitoring effort.

Selective Data Report

The Selective Data Report allows retrieval of monitoring data at any number of stations for any number of parameters. The report allows for retrieving data in a 'horizontal' format for easier use in spreadsheets. The report also has a summary function that will provide counts of exceedances (where screening criteria exist) and basic statistics. This report limits output to 100 stations, 1,000 parameters, and 50,000 rows of results.

Single Parameter Report

The Single Parameter Report provides a statistical analysis of measurement results for a single parameter (there are also a few hierarchical parameter sets) at up to 20 stations. The report will display the measurement values, count exceedances of criteria for parameters with numeric criteria (Standards), and provide statistical summaries of the data. There are also several options for marking data by season and month. The data can be easily imported into Excel for graphing.

Upload Tracking Info Report

This report is used to track the various datasets that are loaded by data managers into SWQMIS. Generally only data managers use this report.

Biological Raw Data Report

The Biological Raw Data report allows you to create a text file of event data, results data, or a combination of the two for monitoring stations according to the criteria you specify. If the sample event has at least one biological sample set then the event is treated as a biological event and all the data from this sample event will be generated in the report output. The physical and chemical data associated with the biological event will also be reported in the biological raw data report.

Sampling Advanced Search

This report is available for data managers to use in validating data collected by TCEQ Regional Staff. The report is also available for TCEQ Regional Staff to search for data already manually entered into SWQMIS and available at Pre-Production status levels Pre-RG and Pre-DM. The report has three checkboxes that allow the user to select for "Only Unvalidated Sample Sets", "Only Outliers" or "Only Acquired Data Sample Sets".

Data Requests

In the event that none of these database reports are appropriate, you can contact the data manager of your program area via email to request data. Please include as much detail about your target dataset as possible in the e-mail. Please use the Standard Data Request Form or Non-Standard Data Request Form when submitting your request. Complete and submit the form using the appropriate instructions.

Chapter 12 – Biological Data Recording and Reporting

Introduction

This chapter describes the methods used to report biological data to the SWQMIS database. Prior to sampling for biological data, a Quality Assurance Project Plan (QAPP) or Quality Assurance

Plan (QAP) must be in place. The QAPP or QAP must include specific details about scheduled biological monitoring. The QAPP or QAP must include language that communicates that the data deliverable will be submitted only in an electronic format (no paper packets can be submitted). SWQMIS uses the Sample Event and Sample Set structure. This structure is a one-to-many relationship with one Sample Event (the entire biological monitoring event) containing multiple Sample Sets. Each Sample Set represents an individual biological Sampling Category, such as Nekton Electrofishing, Nekton Seining, or Benthic Macroinvertebrates Rapid Bioassessment Qualitative. The sample trip, made up of these individual Sample Sets, is the Sample Event. The following sections provide detail on reporting biological data through manual data entry (TCEQ Regional and Central Office Staff) or through flat file loading (TCEQ Partner Agencies and Contractors).

Biological Data Specifics – All Providers

Each biological Sample Event is composed of Sample Sets. Some of these Sample Sets are biological (Nekton Electrofishing, Nekton Seining, etc) and some are non-biological (24 Hour Data and Routine Chemistry), but all are included in the Sample Event. Each biological Sample Set must include the Parameter Code 89888 which identifies that Sample Set as containing biological data. The value selected for Parameter Code 89888 will be determined by the Sampling Category (see Table 12.1).

To see how parameters are grouped under each sampling category, refer to Chapter 6 of the DMRG Commonly Reported Parameter Codes for Biological Data.

Table 12.1 Values for Sampling Category Parameter Code 89888

Biological Data Reporting	
Values for Sampling Category Parameter Code 89888	
Value	Value Description
1011	Nekton Summary and Metadata
1012	Nekton Electrofishing
1013	Nekton Seining
1014	Nekton Observation
1015	Nekton Hoop Net
1016	Nekton Hook and Line
1017	Nekton Castnet
1018	Nekton Trawl
1019	Nekton Water Intake Screen
10111	Nekton Gill Net
2011	Benthic Macroinvertebrates Rapid Bioassessment Qualitative
2012	Benthic Macroinvertebrates Quantitative Protocol
2013	Benthic Macroinvertebrates Other Protocol
3011	Habitat TCEQ Parts 1, 2, and 3 Protocol
3012	Habitat EPA EMAP Protocol
4011	Algae Diatoms
4012	Algae Soft Benthic Not Diatoms
4013	Algae Phytoplankton
4014	Algae Visual Algal Assessment
501	Zooplankton
601	Macrophytes
6011	Macrophytes Seagrass
6012	Macrophytes Freshwater
6013	Macrophytes Other

Data providers must record and report biological data in adherence to the QAPP/QAP under which the data was collected.

Careful attention must be given to the reporting of each data type or sampling category, and the list of parameters expected for each data type and sampling category. See Chapter 6 for the Commonly Reported Parameter Codes and Table 12.1 for specific values used to report for Parameter Code 89888 for each sampling category.

Biological data must be reported by the end of the fiscal year following the year it was collected, or as specified in the data provider's contract. Data providers must record and report biological data in a specific manner, as described in this chapter.

TCEQ Regional and Central Office Staff

TCEQ staff report their biological data via manual data entry into SWQMIS and select the data type and sampling category on the Sample Set metadata screen.

TCEQ staff is required to create Sample Events and Sample Sets, and report biological data electronically through SWQMIS within the fiscal year following the year that the data were

collected. When TCEQ staff enters and publishes data, SWQMIS assigns the data the status of pre-production data management (PREDM).

Note that when reporting biological data via manual data entry, data are reported with a Sample Type of 'C' for Composite, a Composite Category of 'B' for both Time and Space, and a Composite Type of 'CN' for Continuous. All of these fields are required when submitting biological data to SWQMIS (see Chapter 7).

BLOB Files

Reporting biological monitoring data also requires attaching Binary Large Object (BLOB) files to the SWQMIS Sample Event and/or Sample Sets. BLOB files reported with the biological data include site maps, the Stream Physical Characteristics Worksheet with the transect data, fish

voucher photos, or other biological data-related images. The BLOB file attachment must be named in a format that includes the station ID, water body name, sample end date, and type of file (e.g., 13486-GreensCreek-24May2013-HabitatTransectWorksheets).

BLOB files can be attached at the Sample Event and Sample Set levels in SWQMIS by all TCEQ staff permitted to enter field data into SWQMIS. The maximum size for each attachment is 15 MB and a maximum of 5 attachments can be added to each Sample Event and/or Sample Set. The maximum allowed length of the required attachment description is 250 characters.

TCEQ data validators typically expect five BLOB files for each Sample Event for biological data. These are shown in Table 12.2 below.

Table 12.2 Typical BLOB Files

BLOB	Form/Description	Attached To
ALM checklist*	Aquatic Life Monitoring and Habitat Assessment Checklist	Sample Event
Site map*	A map of the area where biological data collection has occurred; samples were collected	Sample Event
Voucher photos	See SWQM Procedures Manual, Volume 2, for guidance on vouchering that applies to the entire biological Sample Event	Nekton Summary and Metadata Sample Set
Habitat transect photos	File that contains photos	TCEQ Habitat Protocol Sample Set
Habitat transect worksheet	Stream Physical Characteristics Worksheet with the transect data	TCEQ Habitat Protocol Sample Set
Other	Any other file discussed between the collector and the TCEQ project manager and specified in the QA document	Sample Event or Sample Set as discussed with TCEQ project manager

*The ALM Checklist and Site Map are often combined into a single BLOB.

For individual Sample Sets, there can be more than one attachment. Each attachment, when open, should display the Monitoring Station ID, Collection Date and where possible, the Station Short Description. All voucher photos for a single SWQMIS Sample Event should be combined into one document whether or not several different collection methods were used (shocking, seining, etc.); please include species names next to voucher photos. Likewise, all habitats transect photos for a single Sample Set should be combined into one document; please include the view orientation next to these photos. These attachments may be in a PDF format, Microsoft Word format, or PowerPoint format. BLOB examples are provided at the end of this chapter.

Laboratory Information Management System (LIMS)

If a Sample Event involves TCEQ staff collecting biological data as well as water samples for analysis, a Request for Analysis (RFA) form is required. In addition, staff must create a Sample Set within the biological Sample Event for the lab data (one Sample Set per RFA). See Chapter 14 for details on RFAs. The laboratory then reports these data to DM&A, and they are loaded into SWQMIS by a TCEQ data manager.

TCEQ Partner Agencies and Contractors

Biological Data Contractor Deliverables

Partners and contracted monitoring entities report biological data via pipe delimited flat files. A separate Tag ID should be assigned for each type of data collected during a biological sampling event. Each Tag ID represents a SWQMIS Sample Set and must include a record for parameter code 89888 if the Sample Set is reporting one of the Sampling Categories listed in Table 12.1.

There is no difference in format between biological data flat files and routine surface water quality monitoring data flat files that are delivered by a TCEQ partner agency or contractor (see Chapter 7 of the DMRG for the flat file format). Chapter 6 of the DMRG references biological data Sampling Categories and indicates the Sampling Category value, Composite Type and Category, and parameter descriptions with codes the TCEQ project managers anticipate to be reported. Each record should be assigned a Tag ID such that related parameters are grouped together into Sample Sets based on the value that is entered for parameter code 89888. The preferred method of delivery of biological data is in an electronic format as data deliverables; TCEQ project managers will accept hard-copies of biological data forms in addition to, rather than in lieu of, electronically formatted data. The electronic files submitted should consist of the ASCII pipe-delimited flat files, plus any additional files specified by the project manager or contract. BLOB files would be included as additional files. The additional files will be loaded as attachments to the electronic data in SWQMIS at the SWQMIS Sample Event and Sample Set levels by TCEQ. Electronic data provided by partner or contract entities should include a README.txt file that lists each BLOB submitted. Each line or record in this list includes three elements: 1) the BLOB file name, 2) a description of the BLOB, and 3) the Sample Event or Sample Set ID to which the BLOB should be attached. Providing this information helps the TCEQ staff attach BLOB files to the correct Sample Event or Sample Set in the Production environment of SWQMIS.

The partner or contractor-collected data is provided to the TCEQ following a test upload by the partner or contractor into the Test environment of SWQMIS. If the test upload is successful, the data deliverable will then be provided to the TCEQ Project Manager.

Required Files for Biological Data Submissions:
ASCII Pipe-Delimited EVENT Text File
ASCII Pipe-Delimited RESULT Text File

README.txt File
BLOB Files

Event File Format
The generic format of the Sample/Event file is shown below:
TagID|StationID|EndDate|EndTime|EndDepth|StartDate|StartTime|StartDepth|
Category|Type|Comment|SubmittingEntity|CollectingEntity|
MonitoringType

Results File Format
The generic format of the Results file is shown below:
TagID|EndDate|ParameterCode|GT/LT|Value|LOD|LOQ|QualifierCode|VerifyFlag
The Results file will have one or more records associated with each Event record. Please remember to include one record for parameter 89888 in each biological Sample Set.

README File Format
The generic format of the README file is shown below:
File|Description|Tag ID
If the file will be attached to a Sample Event, please enter 'Sample Event Level' in the Tag ID field.

Examples
The following examples are provided:
README file
ALM Summary Report and Site Map
Voucher Photos
Habitat Photos
Habitat Worksheet

EXAMPLE 1: README File

File|Description|Tag ID
17471-LlanoRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the Llano River sampling event.|Sample Event Level
17471-LlanoRiver-21May2013-FishVoucherPhotos.pdf|Voucher photos for May 21, 2013 Llano River fish collection.|L109655
17471-LlanoRIver-21May2013-HabitatTransectPhotos.pdf|Habitat transect photos for the May 21, 2013 Llano River sampling event.|L109644
17471-LlanoRiver-21May2013-HabitatTransectWorksheets.pdf|Habitat transect data and map for the May 21, 2013 Llano River sampling event. |L109644
17471-LlanoRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the Llano River sampling event.|Sample Event Level
17471-LlanoRiver-10Jul2013-FishVoucherPhotos.pdf|Voucher photos for the July 10, 2013 Llano River fish collection.|L109623
17471-LlanoRIver-10Jul2013-HabitatTransectPhotos.pdf|Habitat transect photos for the July 10, 2013 Llano River sampling event.|L109669
17471-LlanoRiver-10Jul2013-HabitatTransectWorksheets.pdf|Habitat transect data and map for the July 10, 2013 Llano River sampling event.|L109669
17472-PedernalesRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the Pedernales River sampling event.|Sample Event Level
17472-PedernalesRiver-30Mar2013-FishVoucherPhotos.pdf|Voucher photos for the March 30, 2013 Pedernales River fish collection.|L109629
17472-PedernalesRiver-30Mar2013-HabitatTransectPhotos.pdf|Habitat transect photos for the March 30, 2013 Pedernales River sampling event.|L109628
17472-PedernalesRiver-30Mar2013-HabitatTransectWorksheets.pdf|Habitat transect data and map for the March 30, 2013 Pedernales River sampling event.|L109628
17472-PedernalesRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the Pedernales River sampling event.|Sample Event Level
17472-PedernalesRiver-09Jul2013-FishVoucherPhotos.pdf|Voucher photos for the July 9, 2013 Pedernales River fish collection.|L109636
17472-PedernalesRiver-09Jul2013-HabitatTransectPhotos.pdf|Habitat transect photos the for the July 9, 2013 Pedernales River sampling event.|L109635

17472-PedernalesRiver-09Jul2013-HabitatTransectWorksheets.pdf|Habitat transect data and map for the July 9, 2013 Pedernales River sampling event.|L109635

20641-ColoradoRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the Colorado River sampling event.|Sample Event Level

20641-ColoradoRiver-26Mar2013-FishVoucherPhotos.pdf|Voucher photos for the March 26, 2013 Colorado River fish collection.|L109656

20641-ColoradoRiver-26Mar2013-HabitatTransectPhotos.pdf|Habitat transect photos for the March 26, 2013 Colorado River sampling event.|L109654

20641-ColoradoRiver-26Mar2013-HabitatTransectWorksheets.pdf|Habitat transect data and map for the March 26, 2013 Colorado River sampling event.|L109654

20641-ColoradoRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the Colorado River sampling event.|Sample Event Level

20641-ColoradoRiver-31Jul2013-FishVoucherPhotos.pdf|Voucher photos for the July 31, 2013 Colorado River fish collection.|L109662

20641-ColoradoRiver-31Jul2013-HabitatTransectPhotos.pdf|Habitat transect photos for the July 31, 2013 Colorado River sampling event.|L109653

20641-ColoradoRiver-31Jul2013-HabitatTransectWorksheets.pdf|Habitat transect data and map for the July 31, 2013 Colorado River sampling event.|L109653

20662-SanSabaRiver-2013-ALMSummaryReport.pdf|Summary, ALM checklist, site map, precipitation and flow graph for the San Saba River sampling event.|Sample Event Level

20662-SanSabaRiver-27Mar2013-FishVoucherPhotos.pdf|Voucher photos for the March 27, 2013 San Saba River fish collection.|L109642

EXAMPLE 2: ALM Summary Report and Site Map – page 1 of 3

Aquatic Life Monitoring and Habitat Assessment Checklist

Background Information

Name of water body: _____

Segment number: _____Station ID:_____

On segment: Yes No

Permit number, if applicable:_____Circle monitoring objective: ALM ALU UAA RWA

Historic stream characterization:

Intermittent	Intermittent with perennial pools sufficient to support significant aquatic life use	Perennial	Unknown

Basis for historic stream characterization (describe):

Current aquatic life use designation (if classified segment or site specific standard determined):
ExceptionalHigh Intermediate Limited

Current assessment status on the (year)_____ Water Quality Inventory, 305(b) Report:
Supported Partially Supported Not Supported Concern Not Assessed

Field data entry (FDE) information: Date entered into FDE: _____RTAG #:
(TCEQ regional biologists only)

Field data (CRP partners only): Tag #:

Objective for Aquatic Life Use Assessment

Is this water body supporting its designated uses? Yes No Reason:
Known or potential causes of aquatic life use concern or impairment:

Identify sources of pollution:
Point source: Yes No Identify:
Nonpoint source: Yes No Identify:

Ambient toxicity tests in water body? Yes No

Results:

	Sediment Chronic	Sediment Acute	Water Chronic	Water Acute
Significant effect				
No significant effect				

Monitoring Information

Biological monitoring conducted during index period (03/15 to 06/30 and 10/01 to 10/15) and critical period (07/01-09/30).

Stream characterization event 1, date:

Dry	Pools covering_____% of the_meters assessed	Flowing at cfs (measured)

Note: If sampling event for a RWA, characterize the receiving stream upstream of the existing discharge point or downstream of the proposed discharge point.

Stream characterization event 2, date:

Dry	Pools covering_____% of the_meters assessed	Flowing at cfs (measured)

Describe conditions which may have adversely affected stream during each sampling event (for example, recent rains, drought, and construction):

EXAMPLE 2: ALM Summary Report and Site Map – page 2 of 3

Nekton sampling event 1:

Minimum 15-minute (900 seconds) electrofishing: Yes No
Minimum 6 seine hauls (or equivalent effort to sample 60 meters): Yes No
Fish sampling conducted in all available habitat types: Yes No
If no, please describe why:

Benthic macroinvertebrate sampling event 1:

Indicate method(s) used:
Rapid bioassessment (5-minute kicknet or snags):

Quantitative (Surber, snags, or dredge):

Habitat assessment event 1:
TCEQ habitat protocols: Yes No

Stream flow measurement event 1:
Instantaneous measurement: Yes No
USGS gauge reading: Yes No

Nekton sampling event 2:
Minimum 15-minute (900 seconds) electrofishing: Yes No
Minimum 6 seine hauls (or equivalent effort to sample 60 meters): Yes No
Fish sampling conducted in all available habitat types: Yes No
If no, please describe why:

Benthic macroinvertebrate sampling event 2:
Indicate method(s) Used:
Rapid bioassessment (5-minute kicknet or snags):
Quantitative (Surber, snags or dredge):

Habitat assessment event 2:
TCEQ habitat protocols: Yes No
If no, flow, wetted channel width, photographs, description of bank conditions relative to first event, and description of canopy cover conditions relative to first event must be provided in this packet.

Stream flow measurement event 2:
Instantaneous measurement: Yes No
USGS gauge reading: Yes No

Assessment Results (Optional)

Fish community index event 1:
Exceptional High Intermediate Limited
Fish community index event 2:
Exceptional High Intermediate Limited

Benthic macroinvertebrate community index event 1:
Exceptional High Intermediate Limited
Benthic macroinvertebrate community index event 2:
Exceptional High Intermediate Limited

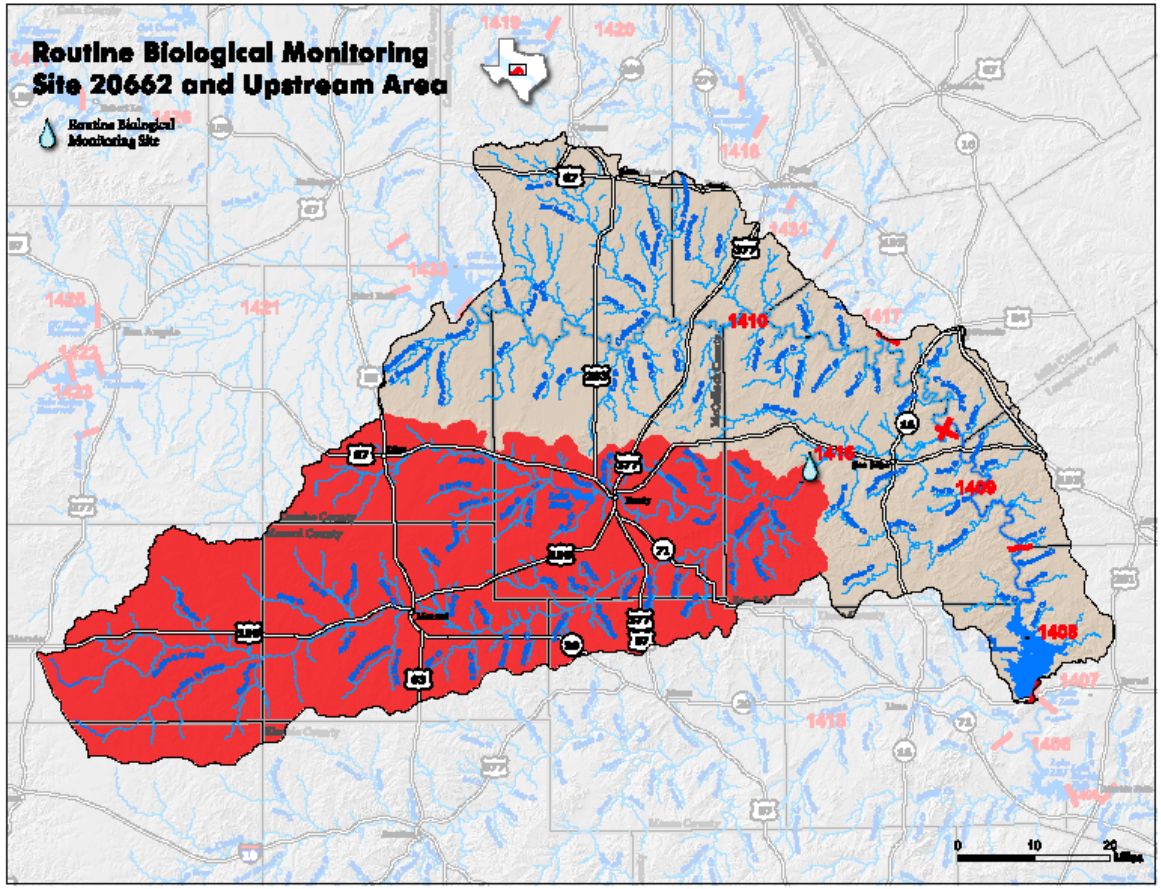
Habitat index event 1:

Exceptional	High	Intermediate	Limited

Habitat index event 2:

Exceptional	High	Intermediate	Limited

EXAMPLE 2: ALM Summary Report and Site Map – page 3 of 3



Example 3: Voucher Photos – page 1 of 2

San Saba River at San Saba CR 340 fish voucher photos
TCEQ ID 20662 03/27/2013

Aplodinotus grunniens

Astyanax mecicanus

Example 3: Voucher Photos – page 2 of 2

San Saba River at San Saba CR 340 fish voucher photos
TCEQ ID 20662 03/27/2013

Carpiodes carpio

Cyprinella lutrensis

Example 4: Habitat Photos – page 1 of 2

San Saba River at San Saba CR 340
TCEQ ID 20662

Habitat Transect Photos
03/27/2013

Upstream View

Left Bank View

Transect 1

Right Bank View

Downstream View

Example 4: Habitat Photos – page 2 of 2

San Saba River at San Saba CR 340
TCEQ ID 20662

Habitat Transect Photos
03/27/2013

Upstream View

Left Bank View

Transect 2

Right Bank View

Downstream View

Example 5: Habitat Worksheet – page 1 of 2

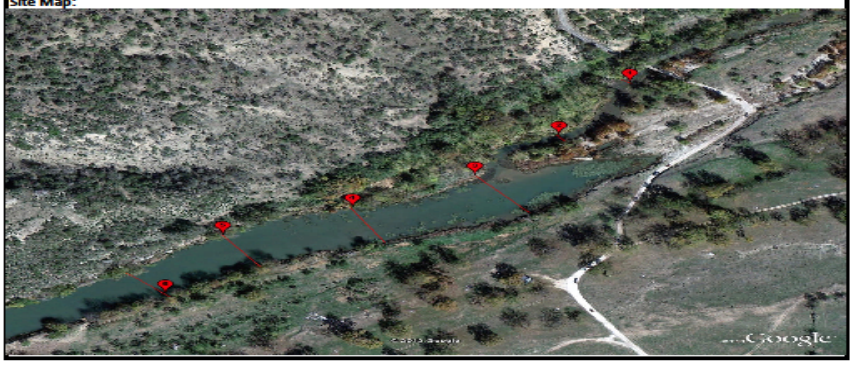
Stream Physical Characteristics Worksheet

Observers:	Djurecka, Dcowan, Jwoods,CPetri, FM			Date:	3/27/2013	Time:	11:00
Weather Conditions:	Partly Cloudy, 45 deg F, N wind at 15 mph						
Stream:				Site ID:	20662	Segment:	
Location of site:	San Saba River at San Saba CR 340					Reach:	500 m
Obs Stream Uses:	Recreation, Agriculture						
Stream Type:	(perennial)		intermittent with perennial pools				
Stream Bends:	4	Well Defined: 2	Mod Defined: 2		Poor Defined: 0		
Aesthetics	wilderness	(natural)	common		offensive		
Channel Obstr/Mods:	0				Number of Riffles: 1		
Channel Flow Status:	high	(moderate)	low		no flow		

Riparian Vegetation	Left	Right	Stream Flow: 31 cfs	Max Pool Depth: 3.5 m
% Trees	15	8		Max Pool Width: 57 m
% Shrubs	10	3	Transect placement relative to a fixed point:	
% Grassess&Forbs	27	36		
% Cult. Fields	0	0		
% Other	48	53		

Notes:

Site Map:



Example 5: Habitat Worksheet – page 2 of 2

Habitat Transect Data

Date	3/27/2013
Site	San Saba River at San Saba CR 340
TCEQ ID	20662

	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6
Stream Type (Riffle,Run,Glide, or Pool)	RI	G	RU	P	P	P
Stream Width	23.8	12.4	24	57	57	50.5
Left Bank Slope	90	60	15	125	125	90
% Left Bank Erosion	15	25	40	75	80	80
Left Bank Width of Natural Buffer Vegetation	>20	>20	>20	>20	>20	>20
Right Bank Slope	75	25	3	35	90	25
% Right Bank Erosion	70	70	5	80	70	70
Right Bank Width of Natural Buffer Vegetation	>20	>20	>20	>20	>20	>20
% Tree Canopy	32.4	39.7	0.0	47.1	50.0	50.0
Dominant Substrate Type (1=clay,2=silt,3=sand, 4=gravel,5=cobble, 6=boulder,7=bedrock,8=other)	5	2	3	2	7	2
Stream Depth at Point 1	0.10	0.02	0.03	0.28	0.10	0.50
Stream Depth at Point 2	0.03	0.18	0.25	1.00	1.28	1.45
Stream Depth at Point 3	0.04	0.36	0.43	0.90	1.90	2.60
Stream Depth at Point 4	0.00	0.55	0.22	0.70	1.94	3.22
Stream Depth at Point 5	0.12	0.75	0.53	0.72	1.88	3.50
Stream Depth at Point 6	0.15	0.80	0.22	0.88	2.00	3.44
Stream Depth at Point 7	0.23	0.76	0.16	0.93	2.00	3.38
Stream Depth at Point 8	0.13	0.72	0.18	1.12	1.90	3.30
Stream Depth at Point 9	0.14	0.45	0.20	1.35	1.94	3.20
Stream Depth at Point 10	0.07	0.31	0.15	1.03	1.63	2.01
Stream Depth at Point 11	0.03	0.03	0.12	0.30	0.30	0.65
% Substrate Gravel or Larger	98	30	5	40	50	0
Maximum Thalweg Depth	0.23	0.8	0.53	2	2	3.5
% Instream Cover	85	15	30	25	10	10
Macrophyte Abundance 1=Abundant, 2=Common, 3=Rare,4=Absent	2	2	1	1	4	3
Algae Abundance 1=Abundant, 2=Common, 3=Rare,4=Absent	2	3	3	3	3	3
Left Bank % Trees	20	10	0	20	25	15
Left Bank % Shrubs	40	0	15	0	0	5
Left Bank % Grasses, Forbs	20	60	45	20	5	10
Left Bank % Cult Fields	0	0	0	0	0	0
Left Bank % Other	20	30	40	60	70	70
Right Bank % Trees	10	10	0	10	5	10
Right Bank % Shrubs	20	0	0	0	0	0
Right Bank % Grasses, Forbs	20	30	80	20	30	35
Right Bank % Cult Fields	0	0	0	0	0	0
Right Bank % Other	50	60	20	70	65	55
Trasect Latitude	31.19072	31.19003	31.18950	31.18908	31.18872	31.18794
Trasect Longitude	-98.90272	-98.90322	-98.90381	-98.90467	-98.90558	-98.90600

Chapter 13 – Monitoring Type Codes

Monitoring Type Codes are assigned by DM&A at the request of TCEQ Programs—CRP, SWQM, CWQMN, TMDL, WQ Standards, NPS. These codes are used to designate the bias and intent of sample collection.

Data reporting entities request new codes by submitting a Submitting Entity/Collecting Entity/Monitoring Type/Tag Prefix Request and Review Checklist to DM&A.

Submitting entities can obtain this form from multiple locations. For SWQMIS users, the forms are in the SWQMIS module named 'Forms'. Those with access to the TCEQ via the internet can locate the forms on the DM&A Form page.

Choosing the Appropriate Monitoring Type Code

Below is the guidance for choosing the appropriate codes. When planning a new monitoring project always consult with your program area, who will coordinate with the program area data manager to determine the appropriate code(s) to be used. For some monitoring projects more than one Monitoring Type Code may be used.

Characters One and Two

The first two characters of the Monitoring Type Code is used to convey information about bias in sampling to end data users, so the first two characters of the code are determined by any targeted sampling conditions.

Code	Description	Use this code if your samples are:
RT	Routine Monitoring	scheduled in advance without intentionally trying to target any certain environmental condition; Samples are collected regardless of the conditions encountered
BS	Biased Season	scheduled for a certain time of year because the sample means to capture the conditions characteristic of that time of year; samples are collected regardless of the flow condition encountered
BF	Biased Flow	not precisely scheduled in advance because they target a certain flow condition that must be present in order for the sample collection to occur
BE	Biased Event	not typically scheduled in advance; monitoring is reactive to an emergency condition
CD[1]	Continuous Data	LEADS data generated by the CWQMN— monitoring intent not characterized
CE[1]	Continuous Event	individual measurements from continuous monitoring targeted toward a specific event— code the summary statistics “BE”

Code	Description	Use this code if your samples are:
CF[1]	Continuous Flow	individual measurements from continuous monitoring targeted toward certain flow conditions—code the summary statistics “BF”
CS[1]	Continuous Season	individual measurements from continuous monitoring targeted toward a certain time of year—code the summary statistics “BS”
CT[1]	Continuous Routine	individual measurements from continuous monitoring not intentionally targeted toward any environmental condition—code the summary statistics “RT”

[1]Continuous monitoring samples include CWQMN, and the individual grab samples that are collected during continuous sonde deployments such as 24-hr DO monitoring.

Characters Three and Four

The last two characters of the code are determined by the intent or objective of the monitoring activity.

Code	Description	Use this code if your monitoring is:
UA	Use Attainability Analysis	a structured scientific assessment of the factors affecting the attainment of uses of a water body
SI	Source Identification	monitoring intended to establish the origin of a recognized impairment or degradation of the water body the project is monitoring
RW	Receiving Water Assessment	a structured scientific water quality characterization of a water body that is or will be receiving run off or discharge from a permitted entity
LF	Load Contributions	intended to define or quantify the amount of loading of a certain parameter or parameters a water body is receiving
PD	Permit Development	related to permit actions not covered by another monitoring type code
SD	Standards Development	related to standards development and is not covered by another code
BA	BMP Effectiveness Monitoring	related to BMP effectiveness monitoring and is not covered by another code
TF	Model Calibration and Verification	related to calibrating or verifying an environmental model and is not covered by another code
WD		

Examples of Four Character Codes

RTWD	Routine monitoring solely intended to understand the basic physical, environmental, and human elements of the watershed
RTBA	Routine monitoring for determining effectiveness of Best Management Practices (BMPs)
RTLF	Routine monitoring intended to define or quantify the amount of loading of a certain parameter or parameters a water body is receiving
RTSI	Routine monitoring intended to establish the origin of a recognized impairment or degradation of the water body the project is monitoring
BFWD	Biased Flow- Monitoring solely intended to understand the basic physical, environmental, and human elements of the watershed
BFBA	Biased Flow- Monitoring targeted towards biased flow or runoff event and for determining effectiveness of Best Management Practices (BMPs)
BFLF	Biased Flow - Monitoring intended to define or quantify the amount of loading of a certain parameter or parameters a water body is receiving
BFSI	Biased Flow - Monitoring intended to establish the origin of a recognized impairment or degradation of the water body the project is monitoring
BFUA	Biased Flow - Monitoring is a structured scientific assessment of the factors affecting the attainment of uses of the water body being monitored
BFTF	Biased Flow - Monitoring related to calibrating or verifying an environmental model and is not covered by another code
BFSD	Biased Flow – Monitoring related to standards development and is not covered by another code

Note that RT and BS can be used without a 3rd and 4th character, as long as the sampling is intended to establish baseline conditions of the monitoring site

Quality Assurance Codes

These codes are used to identify quality assurance sample events, and do not require the 3rd and 4th character codes.

Code	Description
CQ[1]	Continuous QA
EB	Equipment Blank
FB	Field Blank
FS	Field Split
TB	Trip Blank
QA	Quality Assurance

[1]Continuous monitoring samples include CWQMN, and the individual grab samples that are collected during continuous sonde deployments such as 24-hr DO monitoring.

Retired Monitoring Type Codes

These codes are no longer in use, but are still associated with historical data.

AC	Arroyo Colorado Assessment—for Arroyo Colorado Shrimp Farm Project
AF	Biased flow monitoring targeted toward certain flow conditions (e.g. runoff event) and collected by an automated sampling device.
BN	Biological—not for use determination (collection consistent with TCEQ protocol, does not meet TCEQ vouchering requirement)
CM	Citizen monitoring
DI	Diel sampling—multiple field measurements conducted over a 24-hour period and/or summary 24-hour D.O. statistics
DL	303(d) List related monitoring—additional sampling to further characterize the extent and severity of 303(d) listed impairments
ER	Ecoregion study
EX	Experimental analytical samples—samples from test sites and equipment samples set to the lab for analysis.
FL	Flow monitoring study—flow monitoring to support permit actions
GR	TCEQ Data Management general review
IS	Intensive/systematic—sub-watershed monitoring on a cyclical basis
NA	DQO's not appropriate for 305(b) Assessment
NI	DQO's not appropriate for 305(b) 24 hour data
NP	Nonpoint source sampling—samples that characterize non-point source loading
NS	Non-surface water sampling
RG	Rio Grande Toxic Substance Study—for TCEQ Central Office RGTSS only
RS	Real-time continuous monitoring
SE	Special event—sampling done at fish kills, spills, flood events, etc.
SS	Special study—for monitoring scheduled as part of an approved special study
TI	24-hour sampling collected under a TMDL QAPP; multiple field measurements conducted over a 24-hour period and/or summary 24-hour D.O. statistics
TM	Targeted monitoring
TN	Sampling collected under a TMDL QAPP, but not appropriate for 305(b) assessment
TQ	Sampling collected under a TMDL QAPP and is appropriate for 305(b) assessment
TS	Targeted Monitoring Special Study—site specific monitoring to support permit actions
XN	SWQM acquired nonpoint source sampling
XR	SWQM acquired routine/baseline water sampling
XS	Data acquired by SWQM for special studies
XX	Type of sampling unknown—historical data

Chapter 14 – Request for Analysis Form

A Request for Analysis Form (RFA) is used only by TCEQ field collectors to request laboratory analysis of samples. Additional information is provided below.

Life Cycle of an RFA

1. Collector creates an RFA in SWQMIS.
2. Collector collects water, sediment and biological samples in the field.
3. Collector matches these samples with their associated RFAs.
4. Collector ships samples with their associated RFA to the lab for analysis.
5. Laboratory processes samples and RFAs.
6. Lab sends RFAs and Lab Reports to DM&A.
7. DM&A reviews RFAs and Lab Reports prior to validating data in SWQMIS.
8. DM&A validates data and sends the validated RFAs and Lab Reports to Regions.
9. Regions file and keep RFAs according to the retention schedule.

How Many RFAs are Needed?

1	RFA for each media type—water, sediment, tissue are always submitted on separate RFAs
1	RFA for each of the following monitoring types;
	routine monitoring (RT)
	equipment blank (EB) for dissolved metals
	field blanks (FB) for both total metals and total Hg on single RFA
	Example: ambient metals-in-water samples collected
1	RFA for all metals in ambient water (dissolved, total, and total Hg)
1	RFA for the equipment blank (for dissolved metals)
1	RFA for the field blanks (both total metals and total Hg on single RFA)

RFA Fields

Information Provided by Field Staff

The following RFA information is auto-generated by SWQMIS or filled in by the sample collector.

RFA Tag

Auto-generated by SWQMIS when an RFA is created

Region

Auto-populated by SWQMIS using region assigned to the RFA Generator's email address

Generator's Email ID

Auto-populated by SWQMIS using the login information of the user

Lab

Select the laboratory that will analyze the samples

PCA

Project Code entered by collector

Station ID

Enter the sample Station ID

Segment ID

Auto-populated by SWQMIS using the selected Station ID

Collector

Select collector's name

Description

Auto-populated by SWQMIS using the Station ID

Submitting Entity

Select the entity submitting the data to SWQMIS; default SE is "WC"(TCEQ)

Collecting Entity

Select the entity collecting the samples; default CE is "FO" (TCEQ Regional Office)

Monitoring Type

Select the monitoring type based on purpose, refer to DMRG Chapter 13

Associated Samples – Tag ID

Select or enter associated RFA Tag IDs for all sample types collected at the station (ambient and QC, if applicable)

Associated Samples – PC

Enter the program code for each Tag ID for ambient or QC samples

Grab Sample -

Date

Enter the grab sample date

End Time

Enter the grab sample time

End Depth

Enter the grab sample depth

Composite Sample –

Start Date

Enter the composite sample start date

End Date

Enter the composite sample end date

Start Time

Enter the composite sample start time

Start Depth

Enter the composite sample start depth

End Depth

Enter the composite sample end depth

Composite Category

Enter the composite category: T=Time; S=Space; B=Both; F=Flow Weight
T = Time (is not weighted)
S = Space (is not weighted)
B = Both (Time and Space)
F = Flow Weighted (Flow-Weighted Mean Concentrations)

NOTE: For the calculation of the FWMC, data on the concentration, sample time window and flow are required for each sample. The concentration in each sample is weighted by both the time and the flow that accompanied it. The FWMC represents the total load for the time period divided by the total discharge for the time period.
The equation for calculating the FWMC[1] is:

$$FWMC = \frac{\sum_{1}^{n}(c_i * t_i * q_i)}{\sum_{1}^{n}(t_i * q_i)}$$

where q_i = flow in the i^{th} sample

Composite Type

Enter the composite type (# of grabs)

Lab Info –

Specific Conductance

Enter the field specific conductance value

Field pH

Enter the field pH value

No. containers

Enter the number of containers accompanying this RFA

Bacteria Bottle Lot #

Enter the bacteria bottle lot number

Hazards or Special Instructions

Record any hazards or special instructions for the lab

The following RFA information is filled out by the laboratory receiving the samples.

Information Provided by Laboratory Staff -

Lab #

A unique Lab ID that identifies the RFA and associated samples when received by the laboratory.

Received by Lab –

Initials

Record initials of lab staff receiving the sample(s)

Date

Record the date that the samples were received by the lab

Time

Record the time that the samples were received by the lab

Cooler Temp

Record the cooler temperature

pH checked

Circle yes if the pH was checked and no if it was not

Notes

Lab staff records any notes regarding receipt information

Chemicals in Water

Circle only those tests requested

Metals in Water

Circle only those tests requested

Sediment

Circle only those tests requested

Organics in Water

Circle only those tests requested

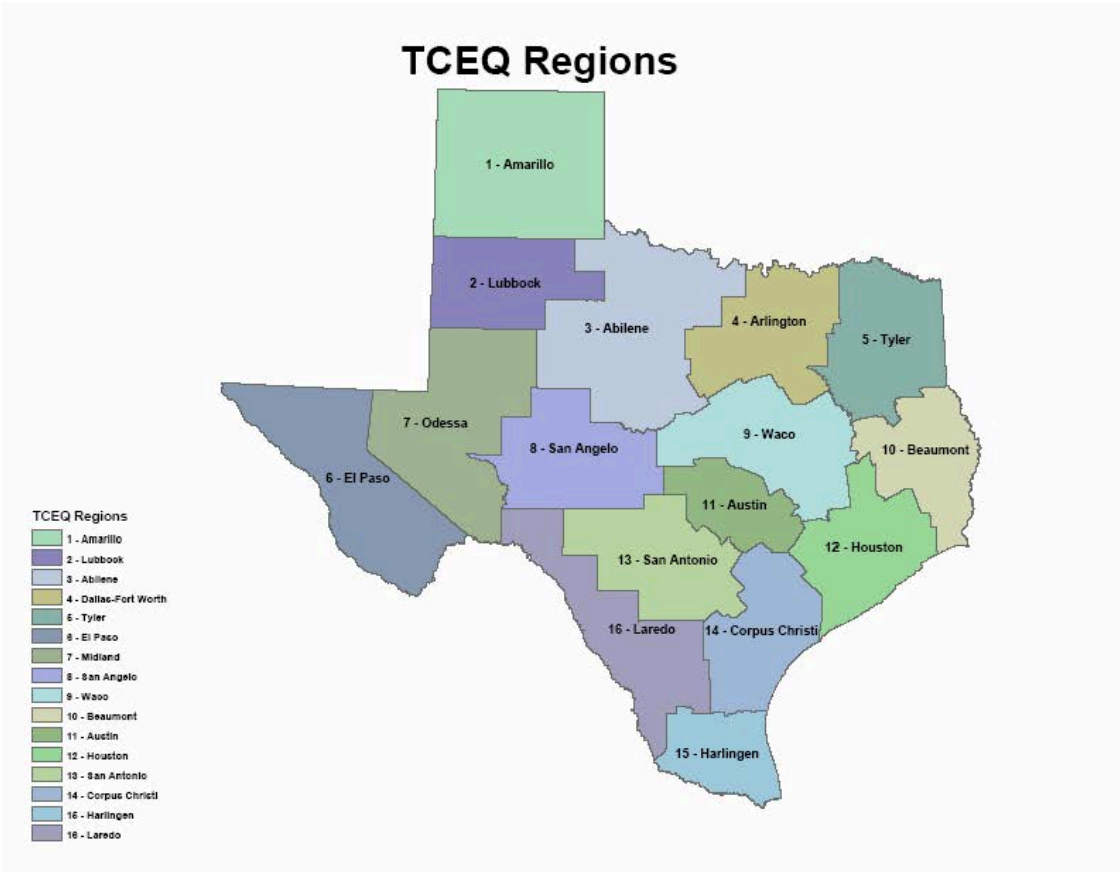
Tissue

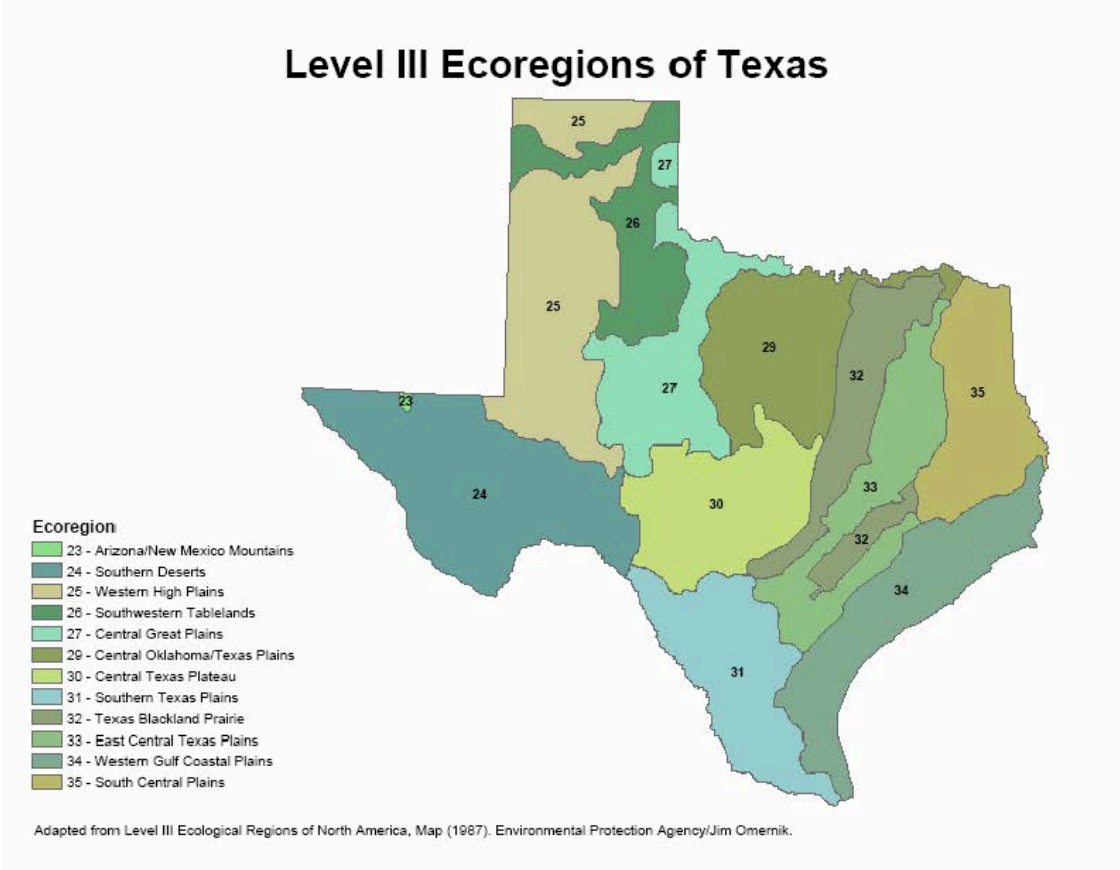
Circle only those tests requested

Additional Information

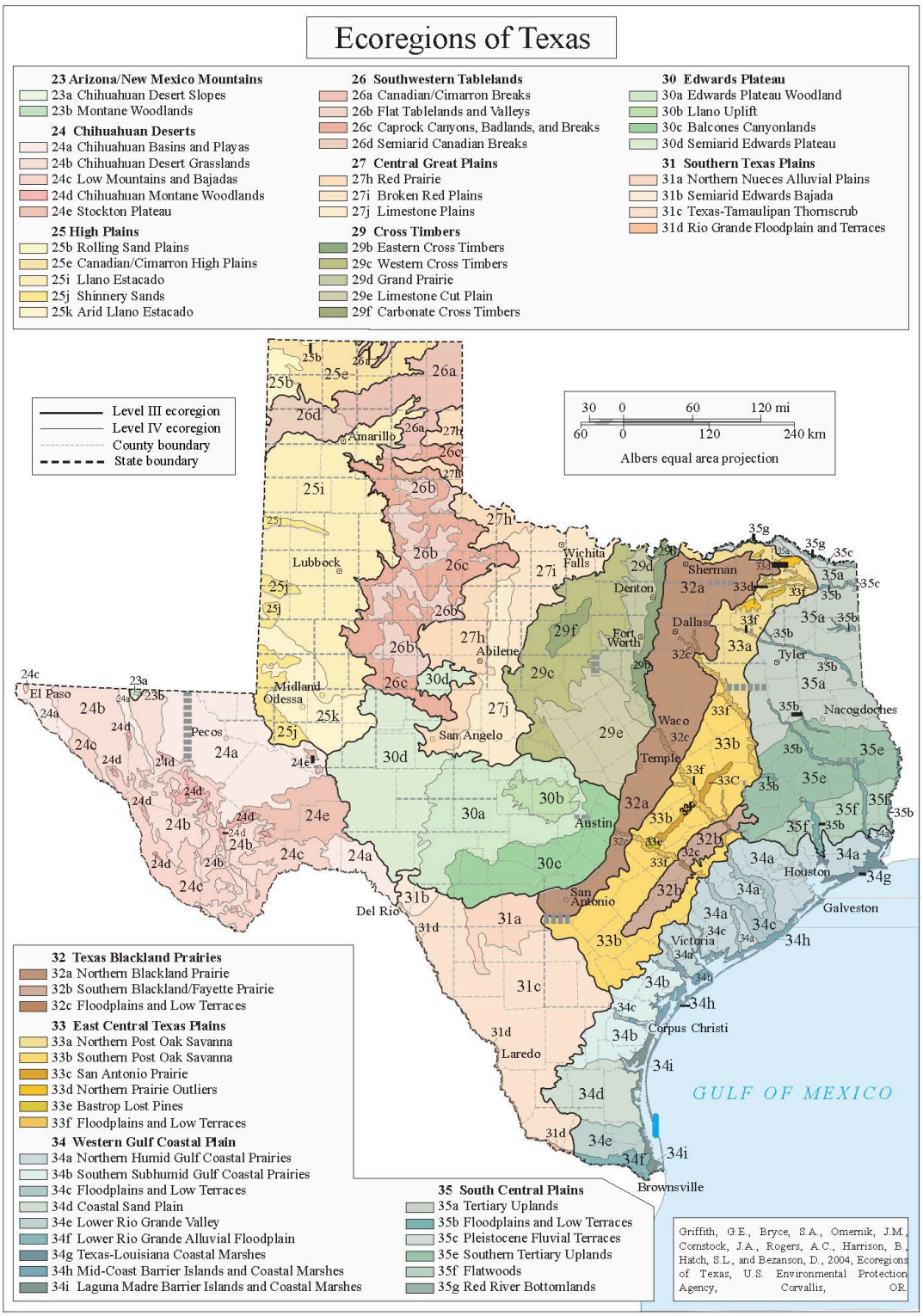
SWQM Procedures Volume 1

Appendix A – Maps



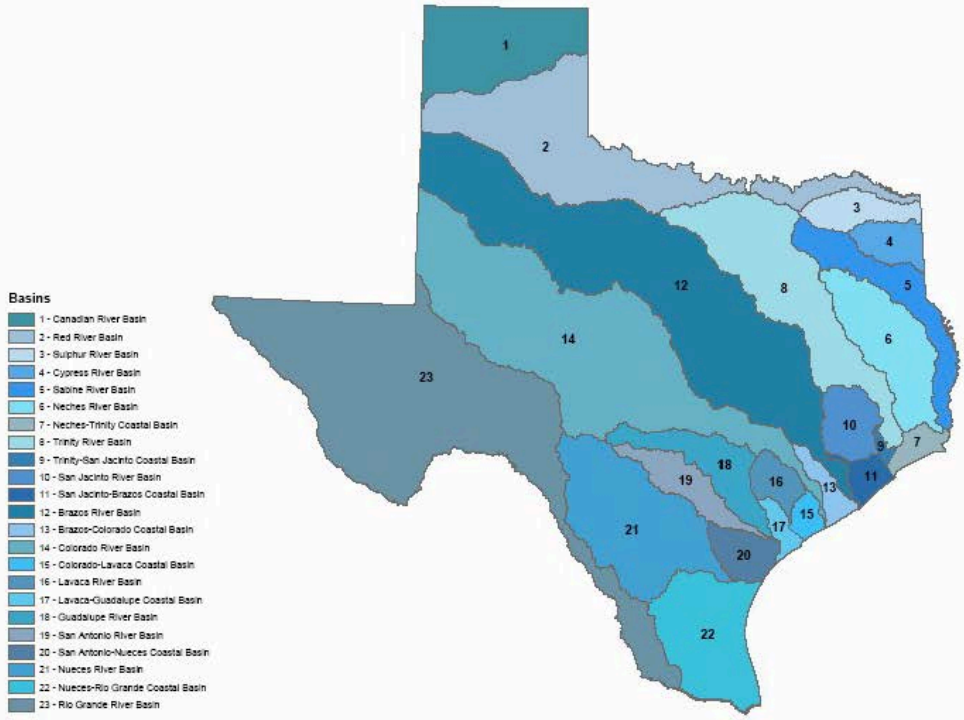

Level III Ecoregions of Texas
25
27
26
25
29
32
35
27
23
24
30
33
32
34
31
Ecoregion
23 - Arizona/New Mexico Mountains
24 - Southern Deserts
25 - Western High Plains
26 - Southwestern Tablelands
27 - Central Great Plains
29 - Central Oklahoma/Texas Plains
30 - Central Texas Plateau
31 - Southern Texas Plains
32 - Texas Blackland Prairie
33 - East Central Texas Plains
34 - Western Gulf Coastal Plains
35 - South Central Plains
Adapted from Level III Ecological Regions of North America, Map (1987). Environmental Protection Agency/Jim Omernik.

A-2


Ecoregions of Texas
23 Arizona/New Mexico Mountains
23a Chihuahuan Desert Slopes
23b Montane Woodlands
24 Chihuahuan Deserts
24a Chihuahuan Basins and Playas
24b Chihuahuan Desert Grasslands
24c Low Mountains and Bajadas
24d Chihuahuan Montane Woodlands
24e Stockton Plateau
25 High Plains
25b Rolling Sand Plains
25e Canadian/Cimarron High Plains
25i Llano Estacado
25j Shinnery Sands
25k Arid Llano Estacado
26 Southwestern Tablelands
26a Canadian/Cimarron Breaks
26b Flat Tablelands and Valleys
26c Caprock Canyons, Badlands, and Breaks
26d Semiarid Canadian Breaks
27 Central Great Plains
27h Red Prairie
27i Broken Red Plains
27j Limestone Plains
29 Cross Timbers
29b Eastern Cross Timbers
29c Western Cross Timbers
29d Grand Prairie
29e Limestone Cut Plain
29f Carbonate Cross Timbers
30 Edwards Plateau
30a Edwards Plateau Woodland
30b Llano Uplift
30c Balcones Canyonlands
30d Semiarid Edwards Plateau
31 Southern Texas Plains
31a Northern Nueces Alluvial Plains
31b Semiarid Edwards Bajada
31c Texas-Tamaulipan Thornscrub
31d Rio Grande Floodplain and Terraces
Level III ecoregion
Level IV ecoregion
County boundary
State boundary
30 0 60 120 mi
60 0 120 240 km
Albers equal area projection
32 Texas Blackland Prairies
32a Northern Blackland Prairie
32b Southern Blackland/Fayette Prairie
32c Floodplains and Low Terraces
33 East Central Texas Plains
33a Northern Post Oak Savanna
33b Southern Post Oak Savanna
33c San Antonio Prairie
33d Northern Prairie Outliers
33e Bastrop Lost Pines
33f Floodplains and Low Terraces
34 Western Gulf Coastal Plain
34a Northern Humid Gulf Coastal Prairies
34b Southern Subhumid Gulf Coastal Prairies
34c Floodplains and Low Terraces
34d Coastal Sand Plain
34e Lower Rio Grande Valley
34f Lower Rio Grande Alluvial Floodplain
34g Texas-Louisiana Coastal Marshes
34h Mid-Coast Barrier Islands and Coastal Marshes
34i Laguna Madre Barrier Islands and Coastal Marshes
35 South Central Plains
35a Tertiary Uplands
35b Floodplains and Low Terraces
35c Pleistocene Fluvial Terraces
35e Southern Tertiary Uplands
35f Flatwoods
35g Red River Bottomlands
Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas, U.S. Environmental Protection Agency, Corvallis, OR.
Amarillo
Lubbock
Wichita Falls
Sherman
Denton
Dallas
Fort Worth
Abilene
Midland
Odessa
Pecos
San Angelo
Waco
Temple
Austin
Houston
Galveston
San Antonio
Victoria
Corpus Christi
Laredo
Del Rio
Brownsville
El Paso
Tyler
Nacogdoches
GULF OF MEXICO

A-3

Texas River and Coastal Basins



A-4

Appendix B – EPA Stream Station Types

Table 4 - EPA Level 1 Stream Station Type Codes and Definitions (one level 1 type code required)

Type Code	Definition
STREAM	Station samples from a stream. A naturally occurring, freshwater, free-flowing, channeled body of surface water, with regular or seasonal flow, that empties into an ocean, lake, reservoir or another stream. Includes rivers.
CANAL	Station samples from a canal. An artificial, channeled waterway used for navigation, drainage, land irrigation, etc. Includes drainage ditches.
LAKE	Station samples from a lake. An inland body of water, naturally formed.
RESERV	Station samples from a reservoir. A man-made body of water formed by damming or obstructing a stream or river (many 'lakes' are actually reservoirs).
TDLSTR	Tidal streams, e.g., most rivers 'Below Tidal'.
SPRING	Station samples from a spring. A natural flow of groundwater from the earth, which feeds into a stream or body of water on the surface.
POND	Small ponds, i.e., stock tanks, reflecting pool. Not wastewater lagoons.
WELL	Station samples from a well. An artificial excavation from which groundwater is drawn or through which liquid waste is disposed by injection.
FWTLND	Station samples from a freshwater wetland. A tract of soft, wet land saturated and sometimes partially covered with freshwater (where the water table is at or near the surface of the land) or where the surface is covered by shallow freshwater due to seasonal flooding or tidal conditions. Includes swamps and freshwater marshes.
PIPE	Station samples at or within a man-made facility. Includes water supply, wastewater treatment and industrial sites, sewers.
OCEAN	Station samples from an ocean, the open sea.
ESTURY	Station samples from an estuary. That part of a river or stream or other body of water having un-impaired connection with the open sea, whose water is measurably diluted by freshwater derived from land drainage, lagoons, bays.
SWTLND	Station samples from a saltwater wetland. A tract of soft, wet land sometimes partially covered with salt, brackish, or estuarine waters, or the surface of the land is covered by shallow saltwater due to tidal conditions.

Table 5 - EPA Level 2 Stream Station Type Codes and Definitions (one level 2 type code required)

Type Code	Definition
AMBNT	Monitoring ambient conditions of the environment. Includes facility intakes pulling directly from an ambient source (for example, STREAM/AMBNT/MUN/INTAKE).
NONAMB	Monitoring at or within a man-made facility. Compliance monitoring falls into this category. Includes sites where facility discharge has directly influenced or impacted though not necessarily polluted the environment (for example, PIPE/NONAMB/OUTFL/NTRTMT).

Table 6 - EPA Level 3 Stream Station Type Codes and Definitions (required if level 1 code is PIPE; otherwise optional)

Type Code	Definition
MUN	Municipal (incorporated). Includes water supply or wastewater treatment facilities.
IND	Industrial facility.
CMBMI	Combined MUN and IND.
AGRI	Agricultural site. Includes raw crops, feedlots, grazing, and silviculture (forestry).
DOMEST	Domestic (residential) domicile or facility. Includes water supplies and on-lot septic systems for private dwellings.
DISPOS	Waste (solid or liquid) disposal site.
ABANDN	The site from which samples are gathered is abandoned.
NTRTMT	No pollution abatement has been performed.
PTRTMT	Some, but not all, of the intended pollution abatement has been performed.
TREATD	All of the intended pollution abatement has been performed.
CMBTRT	Combined treatment, where treatment status does not clearly fall into one of the categories defined above. Includes unknown treatment status.
SEWER	Monitoring within a sewer (See level 5 for further identification).
INPLNT	Inside a treatment facility. This type is used in conjunction with plant location co-defined within the STORET User Handbook.

Table 7 - EPA Level 4 Stream Station Type Codes and Definitions (required if level 1 code is PIPE; otherwise optional)

Type Code	Definition
INTAKE	Intake or influent.
OUTFL	Outfall, discharge or effluent.
CMBSRC	Combined source (INTAKE and OUTFL).

Table 8 - EPA Level 5 Stream Station Type Codes and Definitions (required if level 1 is PIPE; otherwise optional)

Type Code	Definition
BIO	Biological monitoring site (for BIOS Field Survey System).
FISH	Plant or animal matter sampling site.
HAZARD	Site of hazardous or toxic waste or substances.
MONITR	Source monitoring site, monitors a known problem or to detect a specific problem.
NET	Fixed site network station.
NONPNT	Nonpoint source pollution. Includes eutrophication, acidification, thermal change, organic nutrients, sedimentation, and hydromodification.
RUNOFF	Stormwater runoff.
SANSWR	Sanitary sewer.
STMSWR	Stormwater sewer.
SUPPLY	Water supply storage or treatment facility.

Appendix C – Fish Tissue Data Reporting Guidance

Notes: TCEQ staff collecting fish tissue must submit separate RFAs for each species of fish collected. See Chapter 14 for additional information on completing RFAs. Only TCEQ staff use the RFA form.

All tissue sampling is considered a special study and requires a quality assurance plan that outlines the purpose and type/number of samples required.

Tissue Samples—Recording Data on the RFA

Metadata

Using SWQMIS, the collector completes the metadata area on the upper front portion of the RFA. See Chapter 14 for information on completing an RFA. Following sample collection, the collector completes the Composite Sample section of the RFA.

Composite Sample

A fish tissue sample is always reported as a composite sample (e.g., time and space when electrofishing) even if only one fish is collected. Required fields for composite samples are

- Start Date
- Start Time
- Start Depth—measured, in meters, from the water surface and is the shallowest depth encountered while sampling
- End Date
- End Time
- End Depth—measured, in meters, from the water surface and is the deepest point encountered while sampling
- Composite Category—recorded as "B" for time and space
- Composite Type—equal to the number of individuals in the sample; also record the same number on the lower back portion of the RFA

Additional RFA Data Recording

The collector also completes the area on the lower back portion of the RFA labeled Tissue. This area of the RFA has options for the tissue type or portion of the fish submitted to the laboratory (Parameter Code 74995). Circle either whole fish or fillet; and refer to a more extensive list of anatomical (tissue type) codes in the Data Management Reference Guide (DMRG), Chapter 6. Fields are provided for three other criteria—species, EPA Species Code (Parameter Code 74990), and # of individuals (Parameter Code 81614). Refer to the DMRG, Chapter 6, Commonly Used Parameter Codes, for the various Texas species parameter codes. Record the number of individuals in the sample. This number must agree with the number recorded in Composite Type. Finally, circle the desired suite of analyses to be conducted on the sample. Options are metals, pesticides, organics, or semivolatile organics.

For information on tissue sample collection and target species see SWQM-V1, Chapter 7.

Tissue Samples—Reporting Required Data

TCEQ data collectors with data entry access to SWQMIS report data from the RFA along with information in the following tables unless otherwise instructed in a project specific QAPP. TCEQ data collectors report this data through the SWQMIS sample set and result data entry system just like other field data is reported to SWQMIS. Once the user is in the SWQMIS Sampling module, locate the sample event and input the Fish Tissue Metadata and Results. Select Sample-Other for the Quality Control Type, Observation for the Data Type, Tissue Sample Metadata for the Sampling Category, and Other should be the Sample Type. Remember to also select the Tissue Type and Species, and to make the correct data input for a Composite sample type.

If data management functions are being performed by a contracting entity, report the data using ASCII pipe-delimited file formats found in Chapter 7 of the SWQM DMRG. This typically applies to CRP/TMDL/NPS contractors, SWQM contractors, or other state agencies such as the Texas Department of State Health Services (TDSHS) or the Texas Parks and Wildlife Department (TPWD) that do not have access to the SWQMIS manual data entry system.

See the tables below for guidance on entering tissue sample data.

Metadata for Tissue Sample Set - Analytical Data (Manual Data Entry)

Metadata Element	What to Enter
Quality Control Type	Sample-Other
Monitoring Type	As specified in QA document
Data Type	Analytical Result
Sampling Category	Metals–in-tissue, pesticides-in-tissue, semivolatiles-in-tissue, or volatile organics-in-tissue
Medium	Other
Sample Type	C (Composite)
Start, End, and Deepest Depth	Report values for all three depth fields in meters
Composite Category and Type	Report the category as "B" for both Time and Space, and Type represents the number of organisms sent to the laboratory
Tissue Type and Species	Select the tissue type and species from the system drop-down lists

Metadata for Tissue Sample Set – Metadata (Manual Data Entry)

Metadata Element	What to Enter
Quality Control Type	Sample-Other
Monitoring Type	As specified in QA Document
Data Type	Observation
Sampling Category	Tissue sample metadata
Medium	Other
Sample Type	C (Composite)
Start, End, and Deepest Depth	Report values for all three depth fields in meters
Composite Category and Type	Report the Category as B for both Time and Space, and Type represents the number of organisms sent to the laboratory
Tissue Type and Species	Select the tissue type and species from the system drop-down lists

Common Fish Tissue Specimen Parameters

Parameter Code	What to Enter	Reference
5-Digit, Texas Species Code	Number of individuals	Sample collected, and DMRG, Chapter 6

74990	EPA Species Code	DMRG, Chapter 6
74995	Anatomical Part Code	DMRG, Chapter 6
81614	Number of individuals in tissue sample	Sample collected
81615	Number of species in tissue sample	Always use one species per tissue sample, value=1
00039	Length in millimeters (if one fish)	Sample collected
00019	Weight in grams (if one fish)	Sample collected
84100	Sex of sample	1=male, 2=female, 3=mixed, 4=unknown

Tissue Samples - Completing the Fish Collection Reporting Form

The Fish Collection Reporting Form is used by TCEQ staff when reporting fish collection activities to SWQM-Central Office (SWQM-CO) staff. The Fish Collection Reporting Form is located in Chapter 7 of the SWQM-V1 (Figures 7.1 and 7.2). Fish tissue collection events conducted within each region are compiled and reported annually to SWQM-CO. SWQM-CO will tally and submit the information to TPWD to fulfill the scientific collection permit requirements. Refer to the Fish Collection Reporting Form for guidance on reporting data for the TPWD Permit Requirements. **Note**: Please do not attach this form to a SWQMIS Sample Event or Sample Set as a BLOB file.

Appendix D – Geographic Information Codes

Codes for SLOC Requests

The following codes are for use in SLOC Requests through the SWQMIS database and are values for fields listed in Chapter 3. If any entity or program submitting a SLOC Request finds that no appropriate code exists for its needs, please contact Cathy Anderson at <cathy.anderson@tceq.texas.gov> or (512) 239-1805.

For further reference on data standards, data sources, and other useful links, also consult the TCEQ Geographic Information Systems website at <http://www.tceq.texas.gov/gis/index>.

Horizontal Reference

Code	**Definition**
FAC_CEN	Center of Facility
FAC_NW	Northwest Corner of Facility
FAC_NE	Northeast Corner of Facility

FAC_SW	Southwest Corner of Facility
FAC_SE	Southeast Corner of Facility
FAC_ENTR	Main Entrance of Facility
STRUC_CEN	Center of Structure/Building
STRUC_NW	Northwest Corner of Structure/Building
STRUC_NE	Northeast Corner of Structure/Building
STRUC_SW	Southwest Corner of Structure/Building
STRUC_SE	Southeast Corner of Structure/Building
STRUC_ENTR	Main Entrance of Structure/Building
OTHER	Other

Horizontal Datum

Code	**Definition**
NAD83	North American Datum of 1983
NAD27	North American Datum of 1927
WGS84	World Geodetic System of 1984
UNKWN	Horizontal Datum Unknown

Horizontal Collection Method

Code	**Definition**
GPS_DIFF	Global Positioning System (GPS) - Differential Correction
GPS_UNSPECIFIED	Global Positioning System (GPS) - Non-Differentially Corrected
INTERPOLATION-MAP	Map Interpolation - Digital
INTERPOLATION-PHOTO	Photo Interpolation - Digital
CENSUS BLOCK-1900-CENTROID	Census 1990 - Block Centroid
CENSUS-OTHER	Census Other
ADDMAT_INT	Address Matching - Intersection
ADDRESS MATCHING HOUSE NUMBER	Address Matching - House Number
ADDRESS MATCHING-OTHER	Address Matching - Other
ADDMAT_CL	Address Matching - Center Line
INTERPOLATION-SATELLITE	Interpolation Satellite Imagery
INTERPOLATION-SPOT	Interpolation Satellite Imagery - SPOT
UNKNOWN	Method Unknown

Horizontal Accuracy

Code	Definition
DOQQ	1-Meter DOQQ with an accuracy of 5 meters
TOPO	Has an accuracy of 12 meters
GOOGLE MAP	Uses 1-Meter DOQQ's with an accuracy of 5 meters
GIS	Uses 1-Meter DOQQ's with an accuracy of 5 meters
GPS UNIT	The accuracy level reported by the GPS unit

Elevation Datum

Code	Definition
NGVD_88	North American Vertical Datum of 1988
NGVD_29	North American Vertical Datum of 1929
UNKNOWN	Vertical Datum Unknown

Elevation Method

Code	Definition
DEM_10	Digital Elevation Model - 10 Meter
DEM_30	Digital Elevation Model - 30 Meter
DEM_60	Digital Elevation Model - 60 Meter
DEM_90	Digital Elevation Model - 90 Meter
TOPO	Digital 7.5' United States Geological Survey (USGS) Topographic Map
SURVEY	Ground Survey
GPS_SURV	Global Positioning System (GPS) - Survey Grade Receiver

Appendix E – Data Qualifiers
QC-related Codes

Code	Definition	Description and Usage
AA	Limit Of Quantitation (LOQ) greater than Ambient Water Reporting Limit (AWRL)	The LOQ associated with the reported value is greater than the AWRL. Where this data qualifier is used, the limit of quantitation should be provided in the comments field.

AQ	Value above quantitation range	The value reported was derived from a response that fell beyond the upper end of the instrument's calibration range. The measurement has an increased level of uncertainty associated with it.
BQ	Analyte concentration was less than the limit of quantitation (LOQ) but greater than the limit of detection (LOD)	The analyte concentration was less than the limit of quantitation but greater than the limit of detection. The value has an increased level of uncertainty associated with it. Where this data qualifier is used, the limit of quantitation (LOQ) and limit of detection (LOD) should be provided in the comments field.
FB	Field Blank Failure	The result from a field blank (field blank, instrument blank, trip blank, etc.) fell outside project-specific acceptance limits. The specific blank that failed, field blank result, acceptance limits, and possible cause(s) for the failure should be provided in the comments field.
FD	Field Split or Field Duplicate Precision Failure	The precision between the results from the sample and its field split or duplicate fell outside project-specific acceptance limits. The precision measurement criteria and possible cause(s) for failure should be provided in the comments field.
LB	Method/Laboratory Blank Failure	The result from a laboratory blank (method blank instrument blank sterility check etc.) fell outside project-specific acceptance limits. The specific blank that failed, blank result acceptance limits, and possible cause(s) for the failure should be provided in the comments field.
LD	Sample/Lab Duplicate Precision Failure	The precision between the results from the sample and its laboratory duplicate fell outside project-specific acceptance limits. The precision measurement criteria and possible cause(s) for failure should be provided in the comments field.
LQ	Limit of Quantitation (LOQ) Check Sample Recovery Failure	The recovery of the LOQ Check Sample fell outside project-specific acceptance limits. The recovery acceptance limits and possible cause(s) for failure should be provided in the comments field.
LR	Lab Control Sample/Lab Control Sample Duplicate (LCS/LCSD)	The recovery of the LCS or LCSD fell outside project-specific acceptance limits. The recovery, acceptance limits, and possible cause(s) for the failure should be provided in the comments field.
LP	LCS/LCSD Precision Failure	The precision between the LCS and LCSD results fell outside project-specific acceptance limits. The precision measurements, criteria, and possible case(s) for failure should be provided in the comments field

Code	Definition	Description and Usage
LS	Other Laboratory Spike Recovery Failure	The recovery of a laboratory spike (other than LCS/LCSD/Matrix Spike/Matrix Spike Duplicate) fell outside project-specific acceptance limits, and possible cause(s) for the failure should be provided in the comments field.
MR	Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery Failure	The recovery of the MS or MSD fell outside project-specific acceptance limits. The recovery, acceptance limits, and possible cause(s) for the failure should be provided in the comments field.
MP	MS/MSD Precision Failure	The precision between the MS and MSD results fell outside project-specific acceptance limits. The precision measurement, criteria, and possible cause(s) for failure should be provided in the comments field.

OR	Results Based on Colony Count Outside Method-prescribed Range	The result was based on colony counts that were outside the method-prescribed range. The measurement has an increased level of uncertainty associated with it. The method-prescribed range for colony counts and the number of colonies counted should be provided in the comments field.
ZZ	Other QC Failure(s)	This qualifier must be used in only one of two instances: a) when more than one QC failure affects the reported result or b) when a qualifier with more specificity is not available to describe the failure. If this qualifier is used specific details must be included in the comments field to assist data users in evaluating the usability of the reported result. Note: For bacteriological analysis this code should be applied when positive or negative controls do not yield expected results.

Other Codes

Code	Definition	Description and Usage
BN	Biological specimen not vouchered.	Biological specimen not vouchered.
CU	Value deemed unreasonable by collector	Collector deems value unreasonable, although value not an outlier and all QC requirements were met. Collector must provide a brief justification for assigning this qualifier.
DU	Duplicate Data	If duplicate data are accidentally loaded into SWQMIS, this qualifier is used to alert the user that certain data points may weight analysis.
ES	Estimated Value	A simple alert to the data user that this is not an analytically derived value. A description of the procedure used to derive the result must be provided in the comments field.
F	Value from Unpreserved Sample	A sample that should have been preserved was not. Potential bias should be described in the comments field.
H	Hold Time Exceeded	A sample was analyzed beyond the allowable holding time specified in the QAPP, laboratory method, or other applicable procedure. The magnitude of the exceedance and potential bias should be described in the comments field.
I	Interference	Interference occurred during analysis. The value has an increased level of uncertainty associated with it. The nature of the interference and potential bias should be described in the comments field.
J	Value from Preserved Rather than Unpreserved Sample.	A sample that should have remained unpreserved was preserved. The nature of the preservation error and potential bias should be described in the comments field.
M	Instrument Failure	Instrument failure occurred during analysis. Details should be included in the comments field.
MX	Method Experimental	This qualifier indicates the value was obtained using alternative or experimental methods. The method used must be described in the comments field.
NQ	Data Not Collected Under a QAPP	This code indicates a value is not collected according to a QAPP. This code should only be applied when a QAPP does not exist. It should not be applied when data are collected outside a QAPP effective period or for any QAPP variances.
O	Shipping Error	The sample was received when a deficiency occurred during shipping. This qualifier may indicate such circumstances as an open or damaged shipping container. Details must be provided in the comments field.
OQ	Outlier value deemed questionable by collector	Values outside the SWQMIS minimum/maximum screening levels for that parameter are examined by the data collector. Those that are reasonable for the conditions at the sample location (usually based on the professional expertise of the collector) are verified. Those that are not reasonable are qualified with this code to indicate that some unknown error may have occurred to impact the result.
R	Improperly Collected Sample	The sample was not collected according to QAPP, sampling method, or other method requirements. Details and potential bias must be described in the comments field. Note: This code should not be used in cases where the value's data quality is not impacted (e.g., monitoring at sites or frequencies not listed in QAPP, monitoring using different parameter codes, etc.).
T	Preservation Temperature Exceeded	During storage or transport, the temperature of the sample fell outside specified acceptance limits. Details should be provided in the comments field. Note: this code should not be applied to results from samples that arrived

		at the lab outside of temperature acceptance limits on the same day as collection if those samples were received on ice.
UR	Value deemed unreasonable by TCEQ data validator.	Value is clearly unreasonable but there is not sufficient documentation to determine the specific cause of the problem or allow proper correction of the value. Data validator should provide a brief justification for assigning this qualifier.

Retired Codes

Code	Definition	Description and Usage
A	Not Analyzed	This code has been used in the past in datasets where not all parameters in a standard suite were reported. This code is not currently in use.
B	Bactericidal Effect Indicated	Elements of the sample or preservative are known or have been observed to have an effect on certain or all bacteria present. This qualifier alerts data users that bacteria values may reflect this impact.
BK	Field Blank Precision Failure	The result from a Field Blank (field blank, instrument blank, trip blank, etc.) fell outside the project-specific acceptance limits, and possible cause(s) for the failure must be provided in the comments field.
BL	Blank did not meet SWQM QA criteria	If the blank sample associated with this measurement did not meet SWQM QA criteria, this qualifier marks the data point for exclusion from 305(b) assessment analysis.
C	Chlorine Present	Chlorine present in the sample or during analysis may have affected this result.
D	Did Not Pass All Q.C. Criteria	This qualifier may aid in decisions regarding data usability, in combination with details that may be in the sample notes describing which criteria were not met.
E	Lab Error	This qualifier may be used if several errors apply or if a description of the specific error would not aid in data usability decisions.
G	No Sample Submitted	This code has been used in the past for samples where expected/scheduled analyses could not be performed. This code is not currently in use.
IO	Incomplete & Unofficial	An alert to the data user that this value is associated with a sample missing required information such as sample depth or sample time. Any available details should be included in the sample notes.
K	Statistically Unreliable	Collector or analyst review revealed this result to be unreliable or unreasonable. See also code OQ, which may be applicable.
L	Call Lab	This qualifier may be used if several errors apply or if the error requires more explanation than is practical to include in the sample notes. Information from the lab is necessary to make a decision about data usability for parameters with this qualifier.
ME	Method Experimental	This qualifier may indicate that the value was obtained using alternative or experimental methods. These methods are documented in their specific QAPP but not approved for SWQM 305(b)/303(d) assessment.
N	Container Leaking	A sample container arrived at the lab leaking. Effect on the sample and the resulting data is unknown or unquantifiable. Any available details should be included in the sample notes.
ND	Material Specifically Analyzed	This qualifier is a value added remark, usually used when a result value of “less than” the analytical limit is reported. It indicates that while the

	For But Not Detected	reported value is correct, the material was not detected at all.
NO	Data Not Collected Under Approved Agency QAPP	These data may be acquired from outside sources without the complete verification and validation against the SWQM QAPP. They may also be data associated with a TCEQ project collected outside its QAPP effective period.
P	Total Does Not Warrant TCLP	This informative remark does not indicate that the result is questionable. It is simply a notation to alert the data user that a result value from a fraction analysis is not high enough to necessitate a Toxicity Characteristic Leaching Procedure. The result from fraction analysis is sufficient to make a determination of compliance or toxicity.
PE	Presumptive Evidence of Presence of Material	A simple alert to the data user that this may not be an analytically derived value. This qualifier may also be used to mark an analytical value when the presence of that parameter suggests that another material not specifically analyzed for may be present. Any available details should be included in the sample notes.
PV	Presence of Material Verified But Not Quantified	This code has been used in the past for samples where the analyte quantity was above the limit of detection but below the limit of quantitation. Values with this qualifier are not suitable for use in quantitative data analysis. This code is not currently in use.
Q	Quantity Not Sufficient	This code has been used in the past for samples where expected/scheduled analyses could not be performed due to insufficient sample volume. This code is not currently in use.
RP	RPD outside accepted recovery limits	This qualifier may aid in decisions regarding data usability, in combination with details that may be in the sample notes describing the actual RPD value associated with the QC sample.
S	Container Broken in Shipment	This code has been used in the past for samples where expected/scheduled analyses could not be performed due to loss or contamination of the sample. This code is not currently in use.
SP	Split did not meet SWQM QA criteria	The split sample criteria documented in the SWQM QAPP were not met for this parameter. Any available details about which criteria were not met should be included in the sample notes.
SR	Spike recovery outside accepted recovery limits	This qualifier may aid in decisions regarding data usability, in combination with details that may be in the sample notes describing the actual spike recovery value associated with the QC sample.
U	Reported Values Less Than Detection Limit	The analysis returned a value statistically unreliable based on the capability of the instrument.

References

(1) Texas Commission on Environmental Quality. 2012. Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods. Publication Number RG-415, August 2012, Austin TX.

(2) Texas Commission on Environmental Quality. 2014. Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data. Publication Number RG-416, May 2014, Austin TX.