



Version 1.1

**User Guide
and
Reference Manual**

STORET Technical Support

1-800-424-9067

December 29, 1998

United States Environmental Protection Agency
Office of Water

STORET

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Welcome to the Modernized STORET

Welcome

Welcome to the modernized STORET. This new system represents the culmination of six years of work by many people like yourself, people from all levels of government and the private sector engaged in the activity of monitoring the environment. Those of you who used the old system located on the EPA Mainframe will find the new STORET to be a major departure from what you were accustomed to; for those of you who are using STORET for the first time, we hope you find the functionality you expected to in a system which was designed to store water quality and biological monitoring results.

If you want to explore this new system in more depth or learn about some of the more technical aspects of STORET, the first topic in this section, "Where to Find the Information You Need", points you to other sources of information.

Modernization - The Story

The Environmental Protection Agency's Office of Water, together with its Office of Administration Resources Management has re-engineered the Office of Water's primary marine and freshwater water quality and biological ambient monitoring and information systems, STORET, BIOS, and ODES. This project, begun in 1991, and completed in 1998 represents a first for the Agency in the area of large systems re-engineering. STORET, BIOS, and ODES contain over 250 million parametric observations from over 850,000 sampling stations nationwide. These data, collected primarily by States, and other Federal Agencies represent an investment of over \$2.2 billion. These systems are the Agency's primary sources of point and non-point source ambient water quality and biological monitoring data.

This new system is designed to meet emerging data and information needs associated with watershed level environmental protection. This new system will also facilitate the data sharing activities and spatial assessment requirements necessary for successful local watershed protection programs.

STORET Production v1.1 is a public domain system and is delivered free upon request. Your feedback is always appreciated.

Background

The features of the new system were carefully engineered to meet the information requirements of the federal, state, and local clients engaged in ambient water quality and biological monitoring activities of all kinds. The process of identifying the functions which make up these activities, and identifying information generated by, and needed to, conduct them is known as Information Engineering (IE).

IE employs a common repository of analytical tools to construct models of data relationships and process flows to efficiently design an information system to store data for an organization. To support the IE approach the STORET project team used the Texas Instruments I-CASE tool set, Information Engineering Facility™. This product was later acquired by Sterling Software and renamed Cool:Gen, to capture detailed data requirements.

The STORET modernization project began in early 1992 with a series of system requirements gathering workshops across the United States. EPA conducted over 15 of these workshops, known as Joint Requirement Planning Sessions (JRPS), and involved well over 600 current STORET, Biological

Subsystem (BIOS), and Ocean Data Evaluation System (ODES) users, as well as their middle and senior managers in the requirements identification process. These workshops were attended by representatives from many State and local governments, and several environmental organizations. From the results of these workshops the Agency generated a high level logical data architecture, and formulated five critical success factors for the new system:

1. It must be easy to get data in to and out of the system.
2. The system must have a menu access and browse capability.
3. The system must support the storage of quality assurance and quality control (QA/QC) information on a project and result basis.
4. The system must be flexible and able to change with the changing needs of its users.
5. The system must provide a wide range of standard output formats, i.e., dBASE, Lotus, ASCII... including the GIS environment.

The next steps conducted during 1993 and 1994 included the completion of the business area analysis, construction of logical data model, and the prototyping of system functional requirements. The STORET development team produced several prototypes which were tested by users during National Conferences held in 1994, 1995, and 1996. Results of these user testing sessions were translated into system changes and in some cases new system capability and functionality.

During 1997, and the first half of 1998 the STORET development team completed the Help functions, initial Batch Data Entry, and produced the initial Reporting Module. Batch Data Entry and Report Module development continued after the release of Production v1.0. Enhancements to these areas are part of Production 1.1. Additional enhancements will be part of the Production v2.0 release.

Where to Find Information You Need

Help on Procedures:

Help is the primary source of information about the new STORET. Each screen in the STORET Application has a "Help" button. Click this button to access the Help Facility, where you will find not only specific Help for the current screen, but you can view the entire Help Contents, use the Help "Index", and search for text by using the "Find" Tab. Also you may press "F1" while the cursor is on any data entry field for context sensitive Help.

STORET User Guide: (This Book)

The STORET User Guide contains a System Overview, Installation Instructions, and Detailed discussion about special topics of interest to the Monitoring Community.

STORET Homepage on the Internet:

Accessible from the EPA Office of Water Homepage, the STORET Homepage is the source of the latest information about the new STORET. You will find documents, and articles of interest to the monitoring public at large. The homepage will also be the source of system updates. Its universal resource locator (URL) is: <http://www.epa.gov/OWOW/STORET/>.

STORET E-Mail:

User Assistance may be E-mailed at storet@epamail.epa.gov. This E-mail is answered by our STORET User Assistance technical staff.

STORET User Assistance:

The STORET User Assistance is available 7:00 am to 3:30 PM east coast time, **1-800-424-9067**.

US Mail Correspondence:

STORET User Assistance
OW/OWOW/AWPD - 4503-F
U. S. Environmental Protection Agency
401 M St., SW
Washington, DC 20460

Installation and Setup

System Requirements

The STORET Application Software is designed to be installed under both Windows® 95 and Windows® NT Operating Systems. The software requires 16 MB of RAM, but we recommend 32 MB. You will need about 100 MB of hard disk space to install the application and its data reporting and batch update modules. You will need a CD-ROM drive to install the STORET System, either built in or attached as an external device.

While the STORET application will run on any processor which can run Windows® 95 or Windows® NT, it will perform better as you increase your clock speed. Excellent results may be obtained with a Pentium 200 MHZ machine. The monitor must support VGA (640 x 480) , but you may prefer to run STORET at higher resolutions, up to 1024 x 768.

The STORET Database (data files and tables) may be supported either on the Windows® 95 or Windows® NT workstation, through the use of the Personal Oracle™ Database Product (version 7.3.3 or version 7.3.4 for STORET), or through a network connection to a remote database server running the Enterprise Oracle™ Server in any convenient version.

If you intend to run the Stand-Alone (Personal) STORET, you should plan on an additional 500 MB of hard drive space for the components of the Oracle™ Product Suite, and the data files.

If you will be installing the STORET database on an enterprise server, your local Data Base Administrator (DBA) will determine the appropriate space allocations for the tables and indexes of STORET. A "typical" install script may be found on the distribution CD, and may be used with minor modifications to assist in this process. STORET can be installed in as little as 100 MB, but we recommend a 500 MB install for enterprise server setups.

Installation of Stand-alone

The STORET installation CD, together with the enabling 3.5 inch activation diskette will install a complete functioning STORET Database and all associated software, provided your workstation is running Windows® 95 or Windows® NT and Personal Oracle™ for Windows® 95 and Windows® NT, version 7.3.3 or version 7.3.4. The CD is distributed with detailed instructions for the install. Simply follow these instructions. If you need assistance, you may call STORET Technical Support on 1-800-424-9067.

Installation of the database and associated software will use about 400 MB of hard disk capacity.

Installation of Server

If you intend to support the STORET database on a server, with remote client workstation access, then the STORET Application Software must be installed on each client workstation, following the "Software Only" path with the installation CD. STORET's software is **NOT** copy protected. You may install any number of copies. You may, if you choose, install the STORET application on your server, and your clients may access it from there.

Your server is under control of your local DBA, and we will supply him/her with a "typical" install script for the STORET database, which we expect to be modified prior to its execution, and an Oracle™ "IMPORT" file to be used to populate the database with its reference data. Further, we expect the Oracle™ DBA to manage the assignment of userIDs to the individuals who will require access to STORET. Oracle™ "roles" are supplied with STORET to facilitate the management of privileges for these users.

EPA has a DBA on staff, available at our STORET Technical Support hot-line, to assist your DBA if needed.

Installation of Reporting Module

The STORET reporting module is installed by running the "setup.exe" file that is located under "Reports" folder on the CD.

Activation and Setup of your Organizations

Each copy of STORET is accompanied by an "Activation" diskette. This diskette accomplishes several important functions, including the installation of the Organization Codes you will use when storing data.

Every Organization Code, which is granted the authority to create STORET data, is registered by EPA so that it is unique at the national level. Further, every distributed copy of STORET is assigned a unique serial number. Your activation diskette permanently links your Organization Codes to your serial number, and records this information in your copy of STORET. Later, during your normal operation of STORET, when you export a copy of your data to EPA, the national STORET warehouse software will check the serial number and Organization Code list in your export against the national list, and in this way we avoid inadvertently receiving data from an unauthorized source.

To activate STORET, first execute the "Start Database" program from the STORET v1.1 program group. Then, with the diskette in the "a:" drive, use the Windows® 95 / Windows® NT "RUN" choice from the START Menu to launch the "setup" file from this diskette. Activation of your copy of STORET takes only a moment.

Note: You do not have to activate STORET in order to run it. Each copy of STORET comes with a "DEMOTEST" Organization Code pre-activated. You may start STORET and experiment with this "DEMOTEST" data to familiarize yourself with the workings of STORET. Data placed under Organization "DEMOTEST" will be ignored by the national STORET warehouse.

After your Organization Code(s) have been activated, you must still give selected users the power to update each one. You should start STORET using the userID "storuser", which should have been assigned the STORET role of "supervisor" (designated "S" in the table). From the Initial STORET Screen, select "System Administration", and from the next screen, select "User Account Maintenance". From the list of userIDs registered in STORET, you may highlight any one, and by selecting "Change" you can alter the role of this user, *or* by selecting "Update

Authority", you can display the list of STORET Organization Codes which this user can update. By adding (or deleting) Organization Codes in this list, you can completely control the Authority granted to the selected user.

When any user logs in to STORET, and selects "Data Maintenance", STORET displays a list of all the Organization Codes which exist on your copy of STORET, and shows which ones you may update with an asterisk (*) in the first column. The example Organization, "DEMOTEST", should always show this asterisk.

Your First Day with STORET

Getting Started (Stand-alone STORET System):

Once you have installed Oracle™, the STORET Application, and the STORET Reporting Module you are ready to get started.

First Time Entry:

1. Start Oracle™:
The Oracle™ data base kernel must be started before the STORET Application. To start Oracle™, click on "Start Database" in the "Storet System v1.1" folder located under "Programs" in the Windows Start Menu.
2. Start STORET Application:
Click on "STORET Application" in the "Storet System v1.1" folder located under "Programs" in the Windows Start Menu. An Oracle™ pop-up logon window will appear. Your userID must be STORUSER, and the password will be STORUSER as well. Click LOGON. If you are starting STORET for the first time the "Initial User Data Entry" screen appears. This screen appears only once, and registers the STORET Administrator. This first user will be granted "Supervisor" authority for the STORET Application. All subsequent users must be created in the Oracle™ environment and STORET Application access defined in the System Administration area of the Application by the "Supervisor".

For the stand-alone version the user should confirm that the "STORUSER" User ID appears in the "UserID" display box in the upper left hand side of the screen. If a different UserID appears here, you have not logged on using the UserID STORUSER. You must click "Cancel" and restart the STORET application and Logon as STORUSER. If this field comes up blank, your installation of STORET is incomplete. You must click "Cancel" and exit from STORET. Run the "Un-install" utility from the CD-ROM, then re-install the data base from the STORET CD-ROM. If "STORUSER" is present in the "UserID" display box the user should enter his/her "First Name" and "Last Name" in the appropriate data entry boxes, and click "Accept" to proceed.

Every Subsequent System entry:

1. Start Oracle™, see above.
2. Start STORET Application:

Double-click the STORET Program Group on your Windows® 95 / Windows® NT desktop to open the STORET folder. Locate and click the EPA water drop icon to start the STORET Production v1.1 Application. Next you will see the Main Menu screen for the STORET Application, you will also see a "Oracle™ 7 Logon Information" screen

Database:	2:stor
SQL ID:	storuser
Password:	storuser

Retype any fields needed, and supply the password. The password is **storuser**. Click "login" button. Single click the "Data Maintenance" button at the bottom of the screen. The next screen you see will be the "O1 Organization Maintenance List". Check to see that the Organization IDs supplied for your copy of STORET from the STORET Administrators are listed. To see the demonstration data double-click the Organization "DEMOTEST" .

Teaching STORET About Your Business

In order to fully realize the potential of the modernized STORET System, you must take advantage of its many customizing capabilities. Over time, through your efforts to inform STORET about codes and defaults which represent the way you do business, STORET will become able to help you with most of your data entry and manipulation chores. A good rule to remember is: if you are having trouble putting data in STORET, you haven't taught STORET enough about your business.

We are all engaged in basically the same business: Environmental Monitoring and Reporting. STORET has been designed to meet the information needs of anyone engaged in this basic business. However, we all conduct this business in different ways, so at the same time, STORET can learn details of how you conduct your business, and later return these details in ways which will help you manage and document your STORET data.

Compiling Information for STORET

As you begin teaching STORET about your business, it will be important to have ready access to the following things:

1. Station descriptions, including a unique identifier for each station, a latitude/longitude location, and a State code or name. Also very useful are county codes and hydrologic unit (HUC) codes. Stations may have an unlimited number of alias identifiers, each of which must be unique within your organization, so think about how these might be determined.

Only those stations which have a latitude/longitude and State (or State-county) are considered complete, and are permitted to "go active" (receive data) in STORET.

2. Project descriptions, including a unique identifier for each project. STORET fully supports the Windows® / Windows® NT "Cut" and "Paste" capability, so it would be an excellent idea to have word processor versions of your project descriptions available as you attack this area of STORET. Pasting selected text from the actual Project Plan directly into STORET will save hours of unneeded typing.

Once a project has been described, it must be linked to one or more stations before field results may be stored. Neither a station nor a project can be used for field work until this assignment is made.

3. Trips and site visits. STORET must associate all field activities (except those generated by a probe or data-logger) with a trip and site visit. STORET will expect you to provide identifiers and descriptions for trips and visits which generate data. If your organization does not now assign identifiers to trips and visits, you must invent a scheme and do this within STORET. Trip IDs must be unique within your organization, and site visit IDs must be unique within the trip.
4. Field activity IDS. STORET will expect unique identifiers for samples. These are almost always assigned using a standard procedure within your organization, and you must have access to the locally assigned sample ID for each sample. When the field activity is a Msr/Obs (measurement or observation), it still must have a STORET identifying code. If your organization does not now assign identifiers to both kinds of activity, you must be prepared to do this manually in STORET.
5. Standard Operating Procedures. STORET must know about standard procedures you follow for the collection of samples, the handling and transport of samples, any sample preparation done prior to lab analysis, and the lab methods you use. Before attempting to identify these items to STORET, you must compile materials which document these methods and procedures, and have them readily available as you describe them to STORET. Unique identifying codes are required in STORET for these procedures, as well as names and descriptions. Be prepared to assign these codes as you enter the data.

STORET will already have a significant list of lab methods known to EPA from its experience in this area, and you may freely adopt our methods for your own use. However, you are not limited to our list, and may identify and describe procedures used by your organization which are not found on any of our lists, or which represent deviations from protocols documented in our list.

6. Equipment descriptions. STORET will require that you identify equipment used in the conduct of both field and lab activities. Just as with SOPs, you should compile local materials which document equipment your organization uses to collect samples and specimens, and additional equipment used in laboratory analyses of these samples. Be prepared to assign identifiers to categories of equipment, and within any one category, be prepared to identify and describe the various ways in which you configure your equipment, again with unique identifying codes.

As with project descriptions, you may save a lot of work here by finding computer files which hold the descriptions, from which you can cut and paste the needed text.

7. Bibliographic citations. Many of the items you describe to STORET can be extended by reference to one or more bibliographic citations. STORET comes with an initial list of these citations, but you may freely add to it entries which identify other literature which helps to describe your business, its procedures, and its equipment.
8. Characteristic groups. In STORET, a characteristic is merely something you have decided to evaluate and report. Typically a characteristic is a pollutant, such as a dangerous metal, or a toxic chemical. However, all of the following are also characteristics:

Site conditions like weather and flow. Physical measurements often made directly during the site visit.

Biological observations like habitat evaluation or species diversity. Taxonomic names are characteristics.

Properties of the sample other than its pollutant evaluation, like its pH, DO, Secchi depth, and so forth.

Because you often obtain field results in predictable lists of characteristics, you can (and should) create mirrors of these lists in STORET. In such a list, each row represents one characteristic, and holds defaults to be used during data entry for things like unit of measure. So that you may reference one of these default rows during batch data entry of STORET data, each row should have an identifying code which is unique within the group.

Think carefully about the assignment of these row identifiers, as it may be possible to use them to match up reports coming out of the lab with the appropriate defaults.

Having a robust set of characteristic groups and their defaults is the single thing which can make the largest difference in your workload as you enter data into STORET.

System Overview

The new STORET is divided into two major sections: Data Maintenance, and System Administration. The Data Maintenance is by far the largest, and is the area in which most activity takes place. Organizations, Projects, Sampling Stations, Trips, Station Visits and Monitoring Activities are described and recorded in the Data Maintenance section. The System Administration area, on the other hand, houses the support functions necessary for the operation and maintenance of the data base itself. House keeping functions such as "final deletion" of Station Descriptions, Personnel, the maintenance of User Accounts and Security, use of the Export function to move or backup the data base all take place in the System Administration section.

Data Maintenance Section

The Data Maintenance Section had three distinct areas: Organization Information, Operational Activities, and Monitoring Activities.

Organization Information

There may be many Organizations in the new STORET. Each Organization is at the top of its own data pyramid, which includes not only its own description, but the descriptions of its Projects, Sampling Stations, Trips, Stations Visits, and Monitoring Activities and their associated Results.

Organizations will also own metadata, or data describing their data. Organizations will own lists of organizations and people with whom they work. Organizations have the ability to customize the data base to reflect their preferences or usual practices associated with their monitoring activities. The Organization may create a list of the Field and Laboratory Analytical Procedures or Methods it requires in its monitoring activities to generate Results, or lists and descriptions of sampling equipment, field preservation techniques, or sample collection protocols it commonly uses during these activities.

The ability to customize the data base in this fashion is extremely important in that it gives the Organization the ability to accurately document not only sampling results but the entire process leading to the results; how and with what equipment the sampled was collected, how the sample was preserved and transported, what sample preparation and analytical methods were employed by the laboratory to generate the results.

Operational Activities

Stations

Stations may be created without limit by an organization. The new STORET promotes the view that a typical sampling station may be either a point or a study area. If you are describing a study area, note that in addition to a station's latitude/longitude Point of Record, any number of additional latitude/longitude pairs may be stored with the station, and may be designated to describe its boundary (Boundary Points, as a polygon) or to describe specific spots within the study area where activities may be conducted (Sampling Points). In addition, each station may include the descriptions of any permanent sampling grid (Grid Origin Lat/Long) or sampling transect line (Transect Origin, and unlimited Transect

Sampling Points Lat/Longs). For facility sites, additional locational data may be entered for the individual end-of-pipe locations, and for well sites, a field of individual wells may be described.

STATIONS MUST BE LINKED TO PROJECTS IF DATA ARE TO BE STORED. This link is of the kind "many-to-many", which means that any one station may be linked to many projects, and any one project may be linked to many stations.

Location is very important to EPA, all monitoring activities must be associated with a Lat/Long location, so that samples, field measurements and observations can be linked to the location they represent.

Sites may participate in external reference schemes, and may carry identifiers from these schemes. For example, a site in new STORET might have an NPDES number, and also be assigned a code to represent it within a state regulatory program. In addition, any site which contributes data to a project may be assigned a project-specific identifier to assist project staff in easily identifying it.

Projects

Monitoring activities are organized by Project. The Organization may describe an unlimited number of Projects. Project descriptions are kept in summary form in the new STORET. The Project description must include a list of Stations that will be used by the Project. Monitoring activities and their analytical results will be linked directly to all the projects they support. Projects may in turn be linked to programs, and because programs may be defined broadly to include the projects of several organizations, data from any field activity may be easily shared among both organizations and projects.

Project descriptions will permit the linking of data quality objectives and other quality control plan items to a broad spectrum of data. In this way, the needs of users for data quality descriptors can be met with a minimum of data entry effort.

Monitoring Activities

Trips, Sampling and Results

Trips and station visits are the high level activities conducted in support of a project, and through which data collected in the field are associated with specific stations and dates. Some data, generated by automated devices (data loggers) can be entered directly by describing the device and treating each continuous period of operation as a series of data-producing field activities, and will not be associated with a trip.

Trip descriptions include the names of the Projects to be supported, Stations to be visited, descriptions of high level Quality Control (QC) samples to be used (Trip Blanks, Field Spikes, etc.), as well as, site and sample level QC samples which are linked directly to their corresponding individual(s) samples.

Each station visit becomes an opportunity to make field measurements, record observations about both the site and the environment at the site during the visit, and to collect samples. Individual Stations may be visited more than once during a trip, and monitoring activities may occur repeatedly during each visit.

Monitoring activities performed during a Station Visit are of two basically different types: sampling activities, which involve the removal of some material to a remote location (e.g. Lab) for analysis, and/or measurement/ observation activities, where the results are obtained while in the field, and no samples are taken. During any one visit, you may conduct many activities of either type. Monitoring activities are more fully described in the following:

Measurements and Observations

Information gathered in the field through the process of measuring or observing the environment during a Station Visit may be recorded in the new STORET. These data may include physical conditions of the station itself, status of any equipment permanently located at the station, biological habitat assessments, weather observations, and simple field-determined physical or chemical data.

Samples

Samples are described according to the medium sampled, and the intent for which they were collected. Methods and equipment used to collect samples are fully described, by linkage to lists of methods and equipment created by the Organization.

STORET will accept descriptions of the sample collection process which address the complete spectrum of water monitoring and sampling of the biological community. For large area samples, such as trawls, details such as the lat/long of Start and End points, time fished, speed over bottom, gear deployment depth, bottom conditions under the trawl, and others can all be recorded.

Samples can be created from other samples, by compositing, splitting, or subsampling. Each new sample is linked to its "parent(s)", so that it can be georeferenced and traced back to all the events which might influence its results.

Results

There are three types of results in the new STORET:

1. Value, the result of a procedure or direct measurement or observation, for example ml/l, deg C, # counted.
2. A selection from a "Choice List" for a given Characteristic, for example, Sex ="Male", Stream Condition="Flood Stage". In both cases the result was picked from a list provided for each Characteristic by the system.
3. Free Text is the last Type of result, for the Characteristic of "General Observation" the result is user entered up to 1999 characters. Examples of Characteristics and their likely results are as follows:

Mercury is a substance characteristic. Its result values may be quantity found (mg/l), or certain comments like "Not Detected", or "detected but not Quantified".

Water Temperature is a physical characteristic. Its result values are numeric, (deg C, or deg F).

Sex is a physical characteristic. Its result values are taken from a multiple "choice list" provided by the system.

General Observation is a descriptive characteristic. Its result values are free text, up to 1999 characters.

Micropterus dolomieu (Smallmouth Bass) is a taxon characteristic. Its result values are counts or counts per unit area.

How you enter results, and the rules which are applied, depend on the medium sampled, sampling intent, and the kind of characteristic being measured.

Each result is attached to a monitoring activity. If the activity was the collection of a water sample, the results are qualified by all the methods used to collect, handle, store, and process that sample. The results may be further qualified by the identity of the lab performing the analytical work, and equipment and methods used in this process. Statistical information concerning confidence intervals may be supplied, and for results which are not quantified, detection status and quantitation status may be stored. Results which are counts or percentages may be qualified by the range of some size or weight variable which they represent.

Biological results are handled in different ways. For a "catch", the biota may be grouped and regrouped repeatedly for counting, weighing, or measuring. For example, one grouping might be by taxon, and the counts recorded for purposes of computing taxonomic diversity and richness. Another grouping might be a user-defined histogram or class frequency table of fish lengths within a species, and yet another might be to record counts and weights of only adults, or only gravid females, or any other category the analyst might request.

Automated Data Recording Results

Up to now, all results were tied to a Station Visit, which was tied to a Trip, which was conducted in support of one to many Projects. There are a class of results for which this sequence is not followed, Automated Data Recording Results. In this area the user creates and describes "Data Logger Installations", each installation must take place at a Station described by the Organization. Each "Installation" may have one to many "Operating Periods". Each "Operating Period" may vary in length and consists of a set results generated by the automatic interrogation of a array of probes at a user specified preset interval. Interrogation timing, and the composition of the probe array may vary from "Operating Period" to "Operating Period" at any one "Installation". Each "Operating Period" must be assigned to at least one Project. Consequently, Projects may accumulate results without having participated in any Trips.

System Administration Section

In order to clearly differentiate the day-to-day transactions which supply field data to STORET from those operations needed to properly administer a database, these administrative functions have been housed in a single area of the STORET software called Data Administration.

Within the data administration area, you may suspend and reinstate various records which have a participatory relationship to your field activities, such as personnel assigned to tasks, procedures used to analyze samples, and so forth. Stations that have been suspended (and therefore are not available for update) may be deleted here, or reinstated. National (meaning multi-agency) programs may be created and linked to projects, and incomplete sets of results from field activities may be cleaned out of the system.

Also, it is here that userIDs are given authority to manipulate the data of an organization, and it is here that they lose that authority if required. Also it is from within the data administration area that the export of your data to the EPA Central Data Warehouse is accomplished.

Reports

The new STORET emphasizes the delivery of data to the end user, in the form most compatible with the intended analysis. A variety of data delivery formats is envisioned which will facilitate the export of STORET data onto the local workstation, from which it may be portrayed statistically or graphically, or imported into a Geographic Information System (GIS). Users will have broad latitude in defining these export formats. In addition, certain aids to data interpretation will be available on our server, to enable data browsing and to provide data summaries.

Demo Data-What Do They Tell Me?

Before you begin to place your operational data in STORET, you should spend some time "dabbling" with the demonstration and test data we have supplied under the Organization Code of "DEMOTEST". As was stated above, these data are present and accessible even if you have not yet "activated" your copy of STORET for real data. You may see all the DEMOTEST data by highlighting items and requesting the "Change" option on any screen. You have our permission to add any data to this Organization that you wish, to change any data you find there, or to delete anything you wish. We intended these data to represent a model for you to follow as you prepare your real data for STORET.

We have fully described the DEMOTEST Organization (including documenting the Organization's monitoring business in the Preferences and Defaults area), created some Sampling Stations, described some Projects, described some monthly sampling Trips, created some Stations Visits, and described some Monitoring Activities. We have tried to provide an illustration of the various types of samples the new system is able to store, along with sample documentation and results. Our purpose is to provide enough data and information to exercise all the capabilities of the three major segments of the Data Maintenance section. These data are not real, they are provided for demonstration purposes only. You may use the Reporting Module to generate an example of each Report using these demo data.

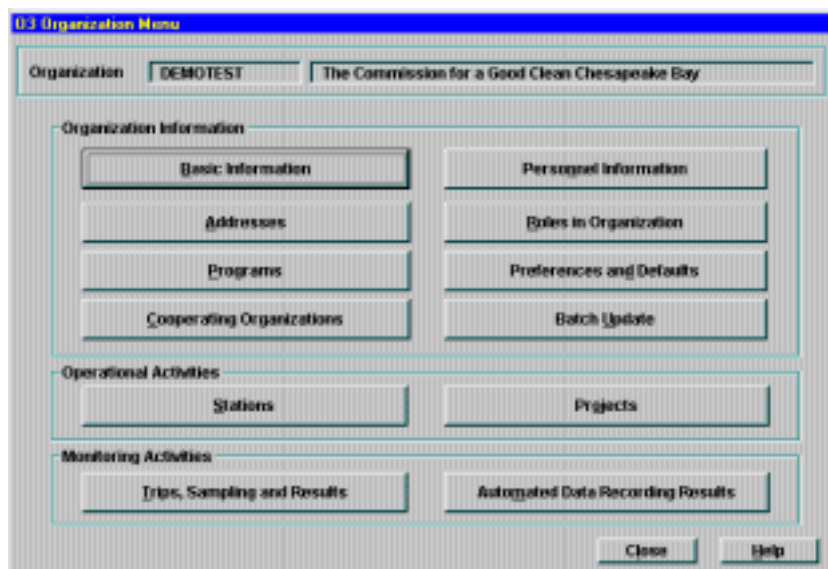


Figure 1. The Organization Menu. All of the STORET data manipulation functions can be accessed from here.

As you wander around the demonstration data, pay particular attention to the many areas within the preferences and defaults section, as a well-thought-out set of preferences and defaults will dramatically improve the STORET system's ability to help you manage your business. Also, carefully examine some of the complex data entry scenarios, such as the biological data entry area, to understand how your data generating actions can be described in STORET.

Because our data export procedures will ignore all the DEMOTEST data at our central site, you can think of DEMOTEST as a kind of scratch-pad, in which you can experiment with impunity. Enjoy this demonstration data, and give STORET a good workout.

Storing Station Descriptions

To begin your tour of the more interesting facets of the new STORET system, you should mouse through a variety of Stations descriptions. This section of the new system has been greatly expanded and should offer you some insight into the Station description area and provide you with some examples of how the new system handles complex Station descriptions.

Once you have double clicked the "DEMOTEST" Organization you will find yourself on the "Organization Menu" screen of the data base (refer to Figure 1 above). Single click the "Stations" button and examine the list of DEMOTEST Stations.

1. For an example of a Well Station double click on "CBC-001" Easton Public Drinking Supply". Single click on the "Well" button and mouse through a detailed Well description. Remember that in this system a single Station may be a Well field and have as many as 99 individual well descriptions. This example has two wells described.

The screenshot shows a software window titled "AL7 Absolute Location Data Entry". It contains several input fields and buttons. At the top, there are two text boxes: "Station" with the value "CBC-008" and "Blackwater National Wildlife Refuge". Below these are "Type" (a dropdown menu showing "SAMPLING") and "Sequence No." (a text box with "2"). The next section is for coordinates, with "Latitude" (38 25 12.5000) and "Longitude" (76 13 31.6500) fields. Below these are "-OR-" labels and "North" and "West" dropdown menus. Further down are "Decimal Minute Latitude" (38 25.2683) and "Decimal Minute Longitude" (76 13.6275) fields. The "Geopositioning" section includes a "Method" dropdown (GPS-Code/Geodetic), a "Scale" text box, a "Datum" dropdown (North American Datum 1983), and a "Measurement Date" text box (12-09-1991). At the bottom are four buttons: "Elevation Information", "Accept", "Cancel", and "Help".

Figure 2. Latitude and Longitude are entered together with a description of the method used for their determination.

2. For an example of an Area Station double click on "CBC-008" Blackwater National Wildlife Refuge. Then click on the "Geographic Areas", then the "Latitude/Longitude" button to see a list of all the Lat/Long points which have been described for this Station. Refer to Figure 2 above for the data entry screen for one of its points.
3. For an example of an Facility Station double click on "CBC-004" Hampton Iron Works. Then click on the "Facility" button. Examine the "SICs" codes assigned to this Facility, and the Pipes described for this Station. Remember that each Pipe described for this Station may have an "End of Pipe" Lat/Long location.

Continue in this fashion, examine as many Station descriptions as you wish.

Exit from the Station list and click into the "Project" section. Double click either of the listed Projects and single click "Stations on Project". Any Station may be associated with many Projects, and any Project with many Stations. A Station must be associated with at least one Project before data may be reported for it.

Storing Specific Kinds of Monitoring Activities

We have provided examples of some of the more complex types of samples commonly encountered by the researcher. These samples take advantage of the "Preferences and Defaults" area of Organization Information section as described above in the section "Teaching STORET About Your Business".

Measurements and Observations:

For this data base Measurements are defined as: *Those activities conducted in the field, usually involving the use of instruments of some sort, which produce environmental results without the creation of samples to be evaluated elsewhere.* Examples include direct field measurements like flow measurements, water temperature measurements, probe measurements like pH or dissolved oxygen, and others.

For this data base Observations are defined as: *Those activities conducted in the field which yield results without the use of instruments and usually rely on the judgement of the observer.* Examples include habitat evaluations, certain meteorological observations, and general observations about conditions at the station.

From the "Organization Menu" click "Trips, Samples and Results", select trip "02-1991-1", Monthly Sampling-February-1. You will see the "Field Trip Menu", then click the "Trip Summary" button, you will be presented with a list of all field activities conducted from each station visit which occurred during the trip, you will also see a list of all Field QC Samples used during the Trip.

1. Field Measurement and Observation
For an example of a Station direct measurement field activity double click on either Activity Id "02-91-003-01" or "02-91-003-05". For either of these once you are looking at the "Field Activity Menu" click the "Results" button. Spend some time mousing through the Results area. On your way out, mouse through the remaining buttons on the "Field Activity Menu".
2. Habitat Evaluation
For examples of Habitat Evaluations, double click on "02-91-022-09" for an example of a "System Defined" evaluation (an evaluation where all the characteristics are selected from the system list of characteristics), or "02-91-023-01", "02-91-023-06", "02-91-023-07" for examples of "User Defined" evaluations (characteristics entered and defined by the user in the Preferences and Defaults section).

Samples

The definition of Sample for this data base is as follows: *Samples are collections of material found in the environment at a station, and taken elsewhere for analysis and evaluation.*

Using the same Trip as above.

1. Water Column Chemistry

For an example of a Water Column Chemistry Sample double click on either Activity Id "02-91-003-02" or "02-91-003-03". For either of these once you are looking at the "Field Activity Menu" click the "Results" button. Spend some time mousing through the Results area. On your way out, mouse through the remaining buttons on the "Field Activity Menu".

Activity ID	Category	Replicate #	Start Date	Start Time
02-91-022-04	Routine Sample	0	02-02-1991	19:30:00
02-91-022-06	Routine Sample	0	02-02-1991	18:40:00

Figure 3. Description of a composite sample created from "parent" samples also stored in STORET.

2. Composite Sample

For an example of a Composite Sample which, parents also stored in the data base double click on Activity Id "02-91-022-07". Refer to Figure 3 above for an example of the screen describing this sample. Once you are looking at the "Field Activity Menu" click the "Results" button. Spend some time mousing through the Results area. On your way out, mouse through the remaining buttons on the "Field Activity Menu", pay special attention to the "Basic Information" area of the sample, notice at the bottom of the screen are listed the "Assigned Parents" of this sample. You may composite only samples of like medium, from within a single station visit. Remember that a Station description may contain many Lat/Long points, some of which may be Sampling Points. As a result, you may choose to describe those stations from which you plan to create Composites as area stations within which are located many Sampling Points. You may also have Composite Samples whose parents are not known to the system, or whose parents are of no importance to your business.

FA22 Sample From Sample Data Entry

Station: CBC-022 Visit #: 1

Subject Taxon: Icterus nelsoni

ID: 02-91-022-05 Medium: Biological

Intent: Tissue

Bio Part: Epible portion

Creation Date and Time: MM/DD/YYYY HH:MM:SS Zone
02-02-1991 18:12:00 EST

Duration: 0 Units:

Total Sample Volume: =Blank

Weight: 10.00 0

Activity ID	Category	Replicate #	Start Date	Start Time
02-91-022-04	Routine Sample	0	02-02-1991	19:30:00

Buttons: Assign Parent, Accept, Cancel, Help

Figure 4. Description of a tissue sample created by extraction from a biological individual also stored as a sample in STORET.

3. **Tissue Sample**
For an example of a Tissue Sample (the example is a "Created from Sample" Category Type) double click on either Activity Id "02-91-022-05". Refer to Figure 4 above. Once you are looking at the "Field Activity Menu" click the "Results" button. Spend some time mousing through the Results area. On your way out, mouse through the remaining buttons on the "Field Activity Menu". The "Created from Sample" would also apply to field split samples as well. Pay attention to the "Basic Information" section of the Activity Menu, notice that at the bottom of the screen is the Parent Sample of this Tissue Sample.
4. **Sediment Grain Size Analysis**
For an example of a Sediment Grain Size Analysis double click on either Activity Id "02-91-022-02". Once you are looking at the "Field Activity Menu" click the "Results" button. Spend some time mousing through the Results area. On your way out, mouse through the remaining buttons on the "Field Activity Menu". Sediment chemistry samples are just like water column samples except they have a medium of "Sediment".
5. **Biological Individual Organism**
For an example of a Biological Individual Sample double click on either Activity Id "02-91-022-04" or "02-91-022-06". Once you are looking at the "Field Activity Menu" click the "Results" button. Spend some time mousing through the Results area. On your way out, mouse through the remaining buttons on the "Field Activity Menu". The Biological Individual Sample is the only allowable parent of a Tissue Sample of the Category of "Created from Sample". In which case the Tissue Sample inherits all the Sample Collection information (including Location) from its Assigned Parent. You may, however, create a Tissue Sample that is of the Category of "Routine Sample" for which Parent information is not important, or unknown.

6. Biological Taxon Abundance

For an example of a Biological Taxon Abundance Sample double click on the Activity Id "02-91-022-08". Once you are looking at the "Field Activity Menu" click the "Results" button. You will see a list of "Result Groups". Only a Taxon Abundance activity has result groups. With the result group concept, you may group a biological catch in many different ways, counting and re-counting the individuals within the groups to effectively produce several different analyses of the same catch.

The first group should always be the Multi-taxon Population Census, which answers both general abundance and diversity questions. This Multi-taxon Population Census may be done only once per sample. Other groupings may be done and re-done at will.

All the other groupings of counts are for a single taxon, and involve either summary statistics for the group as a whole (e.g. average trout weight), or tabulations of measurements for individuals within the group, or histogram-style counts of the categories within the group (e.g. number of adult females, number with weights between 6 and 12 grams, etc). Notice that because you can group the same critters more than once, you may choose to perform two or more histogram analyses on the same variable, for example to accommodate researchers who classify fish lengths differently.

Examine the list of Characteristics we chose to describe each group, and the results we recorded for them, to develop an understanding of the power of this result group concept.

Also examine Activity ID "02-91-023-02", which is a benthic macroinvertebrate sample. Click on "Results", and select the Single Taxon Frequency Classes group, to see how the counts of the various lifestages of the *Hydropsyche betteni* species were reported. This is typical of the "frequency class" style of reporting.

7. Trawl Sample

For an example of a sample collected by trawl, go to Trip ID 03-1991-1, "Monthly Sampling-March 1". In the Trip Summary, select Activity ID 03-91-014-01, a routine biological sample. Click on the "Sample Collection/Creation Procedure" button, and note that the Gear Type (Net/Horizontal Tow) identifies this as a trawl sample to STORET. Trawl samples are reported for the station at which the trawl is recovered from the water for examination of its catch. Click the "Actual Activity Location" button, and notice that for a trawl, both a start and stop latitude/longitude are permitted. The Trawl Start point must be selected from among the many latitude/longitude points described for all the stations visited on this trip. The Trawl Stop point must come from among the latitude/longitude points described for the current station visit.

Data Logger Results.

Click "CLOSE" to exit from the trip results area, and click "CLOSE" on subsequent screens until you return to the screen entitled "O3 - Organization Menu". Its lower right button is labeled "Automated Data Recording Results". Click it to enter the section where you may report results obtained by installing an automated data collection device (e.g. Hydrolab® DataSonde Series 3 or 4, YSI® 6XXX data logger) in the field. Highlight the logger ID CBCDL-01, and click "Change" to examine its basic description. Highlight it again, and click "Operating Periods" to examine the occasions when this logger was installed at one of your stations. Highlight the Operating Period ID 022-001 and click "Change" to examine the parameters which describe this period. Highlight it again,

and click "Characteristics" to examine the list of probes with which it is equipped, and finally highlight it and click "Results" in order to examine the actual data it generated.

Batch Data Entry

General Information

At this time, the Batch Data Entry process is restricted to the addition of new data to the data base. You may not use this process to edit data already present in the data base. This process may be used to add Station Visits, Monitoring Activity descriptions and Monitoring Activity Results to a Trip(s) and to add data to Data Logger Installations/Operating Periods which have already been described in the data base. This process supports all types of samples and measurements/observations supported by the data base, including habitat assessment and data logger results.

To take advantage of this process an Organization must complete the "Preferences and Defaults" section of the application. The process makes use of codes created by the Organization throughout the data base to completely describe Monitoring Activities and Results.

The Process

The batch data entry process in STORET-X begins with the capture of valid data in a **flat ASCII (text)** file, with fields separated by commas, and text enclosed in quotes. There are many ways to accomplish this, for example, by import from some external source of data like a Laboratory Information Management System (LIMS). This type of file can be created using a flat text editor like the Windows® Notepad or Wordpad products, or will be exported from a spreadsheet such as Excel™, Lotus™, or Quattro™.

However you create the file, once it exists and you believe its content to be correct, you enter the STORET Application Program and select the "Batch Update" button from the Organization Menu Window (O3), and follow instructions there. STORET will examine the file for validity and unless errors are found, enter your data into the data base immediately.

If errors are found, an error log will be presented which will identify the errors, and you must edit your source of data (the flat file or other source) to eliminate the problems. Certain errors will require that you add additional information to your copy of STORET. Once the necessary changes are made, you may try again. This process may be repeated as often as necessary to obtain data entry. If you have trouble identifying an error, you can obtain further information about its definition by viewing its details via the "Error Code Explanation" button from the error log window.

The Batch File

In the Batch File, database update instructions must be placed one to a line, as in the following trip monitoring example:

```
Organization ID,DEMOTEST,  
Trip ID,TRIP01,  
Station ID,CHESBAY-001,  
Visit Number,1,  
Activity ID,SAMP01,*ADD,  
Activity Type,Sample,
```

Activity Category,Routine Sample,
Medium,Water,
Start Date,04-02-1998,

Each line consists of a header phrase or prompt, which tells STORET what kind of data the line contains, and one or more data fields, separated by commas, which contain the actual data. Spaces are *not* permitted between fields. Blank lines are *not* permitted in the file. All dates *must* be formatted as “MM-DD-YYYY”.

Note: There is no case sensitivity requirements for the header or the detail portions of the lines. The system takes care of this for you. Notice the trailing comma at the end of each line in the example above. This is required in order for the system to know when the end of the input string has been reached. When the data field is text, or has embedded commas it must be surrounded by quotes. See the following examples:

Result,3,"Storm, with rain, wind, and hail",

If no commas are imbedded, then quotes are not necessary since the system will read until the next comma.

Result,3,Storm with rain,

There are two forms of Batch Files, the Monitoring Activity Form and the Data Logger Form. Each Batch File form is comprised of sections. The sections must appear in order, an order which mimics the sequence of data entry used on the Graphic Interface windows of the STORET application. These two forms of batch files are described below:

Monitoring Activity Form:

Organization Section:

Identifies the STORET organization for which you are storing data.

Trip Section:

Identifies the Trip for which you are storing data.

Station Visit Section:

Identifies or creates the Station Visit for which you are storing data. For created Station Visits the “*ADD” prompt must follow the "Station Id" prompt. For Station Visits which are already described in the data base you need only provide the Station ID following the “Station Visit” prompt. The “Station Visit” prompt must be followed directly by the “Station Visit” prompt. All other Station Visit descriptors must appear between the “Visit Number” prompt and the first “Activity ID” prompt. Visit descriptor headers may be in any order within this area.

Monitoring Activity Section:

Identifies the monitoring activity for which you are storing data. All Monitoring Activity descriptors must appear between the “Activity ID” and the first “Char Group ID” prompts. Monitoring Activity descriptors may be in any order within this area.

Results Section:

Identifies the Characteristic Groups and associated Result Row, and Row Values to be added to the monitoring activity. It also identifies Biological Result Groups and their associated Results which are to be added to the monitoring activity. All Bio Result Group descriptors must appear between the "Bio Result Group" prompt and the first "Char Group ID" prompt. For Single Taxon Frequency Groups, all headers must appear before the "Common Class" or "Bio Condition" prompts.

Certain sections in this form may repeat. The Monitoring Activity and Results sections may repeat for each field activity being stored for a single Station Visit. Similarly, the Station Visit, Monitoring Activity and Results sections may repeat for all "Station Visits", "Monitoring Activities" and "Results" being described for a given Trip.

Data Logger Form:

Organization Section:

Identifies the STORET organization for which you are adding data.

Installation Section:

Describes the data logger installation for which you are adding data.

Operating Period Section:

Describes an operating period and characteristics (probes used in the data logger array) being measured by an automated data logger.

Results Section:

Identifies each data logger scan and its associated results.

With this form the "Results Section" may repeat within "Operating Period Section" which in turn may repeat within the "Data Logger Section". Here again, within each section, the Batch Data Entry process recognizes specific prompts for data entry. These prompts are specific and must appear in the file as are described in detail in the next section.

Keyword and Format Reference

Monitoring Activity Form

Detailed information for the use of each prompt in each section of the Monitoring Activity Form of the Batch File is presented below. Prompts are described for each section.

Organization Section

Organization ID

Mandatory. The first line of every batch file must identify the STORET organization to which you wish to add data. From the STORET interactive windows, the "Batch Update" option must be selected from within the target Organization.

Example:

Organization ID,DEMOTEST,

Trip Section

Trip ID

Mandatory. Identifies the trip for which you are adding data. The entry of the trip and its description must be accomplished using the STORET interactive windows *before* you reference the **Trip ID** in the batch.

The trip must also be linked to at least one properly described project, and any stations to be updated in the batch must be linked to a project supported by the trip.

Example:

Trip ID,02-1991-2,

Station Visit Section

Station ID

Mandatory. Identifies the sampling station/study area for which you are adding data.

Example:

Station ID,CBC-014,

As stated above, only stations which have been selected to be visited on the Trip may be included here.

Visit Number

Mandatory. The unique number identifying which station visit (among other visits during the same trip) for which you are adding data. If this station visit has already been described to STORET, you need only provide the **Visit Number** for which you are adding data. If the station visit does not already exist in the data base you may use the Batch Process to create it. To indicate that you wish the Batch process to create the

“Station Visit”, you must include “*ADD” to the end of the **Visit Number** line. See examples of both below:

Examples:

Station ID,CBC-014,
Visit Number,1, (add data to a existing Station Visit #1)
Visit Number,1,*ADD, (Batch will create Visit #1 for the Station in
the preceding Station ID line)

Arrival Date

Optional. For Station Visits which are already stored in the data base the Arrival Date is defaulted to be the start of the trip, unless edited by the Organization. For Station Visits which are created by the Batch you may want to provide an “Arrival Date”. The calendar date on which the visit began, formatted as **MM-DD-YYYY**.

Note: **Arrival Date** may be omitted, and will default to the "Trip Start Date" as previously supplied to STORET.

Example:

Arrival Date,12-25-1991,

Arrival Time

Conditionally optional, Mandatory if Arrival Time Zone is supplied. The time of day at which the visit began, formatted as **HH:MM:SS**.

Example:

Arrival Time,13:45:34,

Arrival Time Zone

Optional. Valid values are:

GMT	Greenwich Mean Time
AST	Atlantic Standard Time
EST	Eastern Standard time
CST	Central Standard Time
MST	Mountain Standard Time
PST	Pacific Standard Time
ADT	Atlantic Daylight Time
EDT	Eastern Daylight Time
CDT	Central Daylight Time
MDT	Mountain Daylight Time
PDT	Pacific Daylight Time
AK	Alaska Standard Time
GU	Guam Standard Time
HI	Hawaii Standard Time

Example:

Arrival Time Zone,EST,

Departure Date

Optional. The calendar date on which the visit ceased, formatted as **MM-DD-YYYY**.

Example:

Departure Date,12-26-1991,

Departure Time

Conditionally optional. Mandatory if **Departure Time Zone** is supplied. May not be used unless **Departure Date** has been supplied. The time of day at which the visit ceased, formatted as **HH:MM:SS**.

Example:

Departure Time,15:15:12,

Departure Time Zone

Optional. Valid values are shown under **Arrival Time Zone**, above.

Example:

Departure Time Zone,EST,

Visit Comments

Optional. Free text up to 254 characters, recording field notes as well as the condition of the Station itself.

Example:

Visit Comments,"Station destroyed, nothing remains",

Monitoring Activity Section

Activity ID

Mandatory. Identifies the field activity (often a sample) for which you are adding data. If this activity is a replicate, its **Replicate Number** must follow the **Activity ID**, separated by a comma. The **"*ADD"** instruction must end the line. All following entries until the Next "Activity ID", "Organization ID", "Trip ID", or "Station ID" prompt are assumed to describe the activity and its results.

Examples:

Activity ID,abc-001,*ADD	(adds Activity abc-001)
Activity ID,abc-001,1,*ADD	(adds Activity abc-001, replicate 1)

Activity Type

Mandatory. Identifies the type of activity. Valid values are:

Sample
Field Msr/Obs

Example:

Activity Type,Sample,

Activity Category

Mandatory. Identifies the type of activity. Valid values are:

For Sample activities *only*

Routine Sample
Field Replicate
Depletion Replicate
Field Spike
Integrated Time Series
Integrated Flow Proportioned
Integrated Horizontal Profile
Integrated Vertical Profile
Composite w/o Parents
Composite-with Parents
Created from Sample

For Field Msr/Obs activities *only*

Routine Msr/Obs
Replicate Msr/Obs
Routine Habitat Assessment
Replicate Habitat Assessment

Example:

Activity Category,Routine Sample,

Medium

Mandatory. Identifies the sampled medium for activities which are samples, or the measured medium for activities which are measurements or observations. Valid values are:

Water
Sediment
Soil
Air
Biological (samples *only*)

Example:

Medium,Water,

Intent

Mandatory if **Medium** is Biological. Otherwise, this field does not apply. Identifies the reason or purpose for the field activity. Valid Values are:

Individual
Taxon Abundance
Tissue

Example:

Intent,Taxon Abundance,

Community

Mandatory if **Medium** is Biological and **Intent** is Taxon Abundance. Otherwise, this field does not apply. Identifies the name of the biological community from which the sample was taken. Valid values are:

Aquatic Vegetation
Terrestrial Vegetation
Corals
Benthic Macroinvertebrates
Mammals
Birds
Reptiles
Amphibians
Fungi
Bacteria/Virus
Periphyton
Phytoplankton/Zooplankton
Ichthyoplankton
Fish/Nekton

Example:

Community,Fish/Nekton,

Field Activity Subject Taxon

Mandatory if **Medium** is Biological and **Intent** is Individual or Tissue. It is not applicable for Biological Created from Sample. Identifies which organism composes the sample. Consists of a valid **Characteristic Search Name** followed by its **Species Number**, if required. Valid values for species number are: sp.1, sp.2, sp.3, sp.4, sp.5, sp.6, sp.7, sp.8, and sp.9.

Examples:

Field Activity Subject Taxon,Esox,sp.1,
Field Activity Subject Taxon,Micropterus salmoides,

Biopart

Mandatory if **Medium** is Biological and **Intent** is Tissue. Identifies the portion of the organism on which analysis will be done. Consists of a valid **Bio Part Name**.

Examples:

Biopart,Gills,
Biopart,Liver,
Biopart,"Fish fillet, left, skin on",

Parent ID

Mandatory if **Activity Category** is "Created from Sample" or "Composite-with Parents". Not applicable for any other category type. Identifies a "parent sample" **Activity ID** that matches the sample profile being created. If the parent activity is a replicate, its **Replicate Number** must follow the **Activity ID**, separated by a comma. The parent activity must already have been described to STORET and must be drawn

from the current station visit. Only one parent may be assigned to a sample of the type “Created from Sample”; however, multiple parents are required for “Composite-with Parents”. **If "Parents" are to be part of the same batch, they must precede their child samples in the batch file.**

Example Created from Sample:

Activity ID,batch01,*ADD
Activity Type,sample,
Activity Category,created from sample,
Medium,water,
Parent ID,Water1,

Example Composite-with Parents:

Activity ID,batch04,*ADD
Activity Type,sample,
Activity Category,composite-with parents,
Medium,water,
Parent ID,batch01,
Parent ID,batch02,
Parent ID,batch03,

Start Date

Mandatory. The calendar date on which the activity began, formatted as **MM-DD-YYYY**.

Example:

Start Date,12-25-1991,

Note: Start Date may be omitted, and will default to the Site Visit Arrival Date as previously supplied to STORET.

Start Time

Conditionally optional. Mandatory if **Start Time Zone** is supplied. The time of day at which the activity began, formatted as **HH:MM:SS**.

Example:

Start Time,09:15:00,

Start Time Zone

Optional. Valid values are shown under **Arrival Time Zone**, above.

Example:

Start Time Zone,EST,

Stop Date

Optional. The calendar date on which the activity ceased, formatted as **MM-DD-YYYY**.

Example:

Stop Date,12-25-1991,

Stop Time

Conditionally optional. Mandatory if **Stop Time Zone** is supplied. May not be used unless **Stop Date** has been supplied. The time of day at which the activity ceased, formatted as **HH:MM:SS**.

Example:

Stop Time,09:45:00,

Stop Time Zone

Optional. Valid values are shown under **Arrival Time Zone**, above.

Example:

Stop Time Zone,EST,

Field Activity Comments

Optional. Free text up to 254 characters, recording comments originating from members of the field crew regarding the Field Activity.

Example:

Field Activity Comments,"sample contamination by Dr. Manning suspected",

Depth

Optional. Depth at which the activity occurred, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the **Depth**, separated by a comma.

Examples:

Depth,16.25,ft,

Depth,3,m,

You may not use this **Depth** prompt on the same activity as the **Upper Depth** and **Lower Depth** range descriptors.

Relative Depth

Optional. May be used with a measured depth, or by itself. Valid values are:

Surface

Midwater

Near Bottom

Bottom

Subbottom

Example:

Relative Depth,Near Bottom,

Upper Depth

Optional. For activities which span a range of depths, the depth nearest to the surface, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the depth, separated by a comma, as shown in **Depth**, above.

Example:
Upper Depth,3,m,

The **Upper Depth** record may not be supplied for the same field activity as the **Depth** record.

Lower Depth

Conditionally optional. Mandatory if **Upper Depth** is supplied. For activities which span a range of depths, the depth farthest from the surface, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the depth, separated by a comma, as shown in **Depth**, above.

Example:
Lower Depth,5,m,

The **Lower Depth** record may not be supplied for the same field activity as the **Depth** record.

Depth Measured From

Optional. Free text up to 30 characters, describing the reference point from which depth measurements for this activity were obtained, usually "Surface" or "Mean Sea Level". For activities which take place from a boat, may be "Keel" or some other reference point.

Example:
Depth Measured From,Surface,

Zone Type

Optional. The name of the aquatic zone in which the activity occurred. Valid values are:

Epilimnion
Mesolimnion
Hypolimnion
Epibenthic
Mesobenthic
Hypobenthic

Example:
Zone Type,Epibenthic,

Thermocline

Optional. An indicator of where the activity occurred with respect to the thermocline. Valid values are:

A (above)
I (in)
B (below)

Example:
Thermocline,B,

Pycnocline

Optional. An indicator of where the activity occurred with respect to the pycnocline.
Valid values are:

A (above)
I (in)
B (below)

Example:
Pycnocline,I,

Halocline

Optional. An indicator of where the activity occurred with respect to the halocline.
Valid values are:

A (above)
I (in)
B (below)

Example:
Halocline,A,

Volume

Optional. The volume of the collected sample, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the volume, separated by a comma. Valid units are ml, l, oz, pt, qt, and gal.

Examples:
Volume,250,ml,
Volume,5,l,

Weight

Optional. The weight of the collected sample, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the weight, separated by a comma. Valid units are mg, g, oz, and lb.

Examples:
Weight,6.45,mg,
Weight,5,lb,

Duration Time

Optional. The duration of the field sample collection event, formatted as **ZZZ. Units** must be supplied behind the duration time, separated by a comma. Valid units are minutes, hours, days, and months.

Examples:

Duration Time,60,minutes,
Duration Time,1,hours,

Data File Name Location

Optional. Free text (no commas or quotes please) up to 60 characters (may be a computer "url" or "filespec") which identifies the location of a file containing the raw or electronic copy of the data for this activity.

Example:

Data File Name Location,Manning002 on the ships terminal,

Container

Optional. The type of container used to collect and hold the sample. "Container", "Container Color", "Container Size", "Temperature Preservation", and "Chemical Preservation Storage Procedure" are covered in the "Preferences and Defaults" section of the application, and can all be defaulted with a **Sample Transport ID** (described below). Valid values are:

Aluminum Dish
Aluminum Foil Wrap
BOD Bottle
Cubitainer
Glass Bottle
Glass Vial
HDPE Bottle
HDPE Vial
Nalgene Bottle
Nalgene Vial
Plastic Bottle
Plastic Bag
Polyethylene Bottle
Polyethylene Vial
Polypropylene Bottle
Polypropylene Vial
Teflon Bottle
Teflon Vial

Example:

Container,HDPE Bottle,

Container Color

Optional. The type of container used to collect and hold the sample. "Container", "Container Color", "Container Size", "Temperature Preservation", and "Chemical

Preservation Storage Procedure" are covered in the "Preferences and Defaults" section of the application, and can all be defaulted with a **Sample Transport ID** (described below). Valid values are:

Amber
Clear
Green
Black
Translucent (yes it is spelled that way)
Opaque

Example:
Container Color, Clear,

Container Size

Optional. The size of the container used to hold the collected sample, formatted as **ZZZZ.ZZ**. **Units** must be supplied behind the size, separated by a comma. "Container", "Container Color", "Container Size", "Temperature Preservation", and "Chemical Preservation Storage Procedure" are covered in the "Preferences and Defaults" section of the application, and can all be defaulted with a **Sample Transport ID** (described below). Valid units are ml, l, oz, pt, qt, and gal.

Examples:
Container Size, 250, ml,
Container Size, 5, l,

Temperature Preservation

Optional. The type of temperature preservation technique employed to transport and store the sample. "Container", "Container Color", "Container Size", "Temperature Preservation", and "Chemical Preservation Storage Procedure" are covered in the "Preferences and Defaults" section of the application, and can all be defaulted with a **Sample Transport ID** (described below). Valid values are:

None
On Ice
Frozen/Dry Ice
Refrigerated/Cooled
Frozen/Refrigerated
Freeze Dried

Example:
Temperature Preservation, On Ice,

Chemical Preservation Storage Procedure

Optional. Free text up to 254 characters, describing any chemical preservation and storage procedures that were employed. "Container", "Container Color", "Container Size", "Temperature Preservation", and "Chemical Preservation Storage Procedure" are covered in the "Preferences and Defaults" section of the application, and can all be defaulted with a **Sample Transport ID** (described below).

Example:

Chemical Preservation Storage Procedure,"pH adjusted to <2.0 with H₂SO₄, cooled to 4 C",

Transport Storage Comments

Optional. Free text up to 254 characters, recording any additional handling, transport and storage comments for the sample.

Example:

Transport Storage Comments,"Dr. Manning put the sample in the back of his truck and drove off down the road to the next Station",

Sample Transport ID

Optional. The ID associated with a "Sample Transport and Storage" default you previously entered in STORET. This default spec can substitute for much of the information above.

Example:

Sample Transport ID,SPS-002,

Note: Use of the transport ID to indicate defaults will conflict with some of the descriptors above, and cause errors. You should use either the defaults, or the individual descriptors, but not both.

Sample Collection Procedure ID

Mandatory if **Activity Type** is "Sample", and **not permitted** otherwise. The ID associated with a "Field Sample Collection Procedure" you previously entered in STORET.

Example:

Sample Collection Procedure ID,CP-090,

Field Gear ID

Mandatory if **Activity Type** is "Sample", and **not permitted** otherwise. The ID associated with a specific piece of Field Gear used to collect this sample. The **Field Gear ID** already exists in STORET, and is associated with the "Gear Configuration ID" in the "Preferences and Defaults" section. The **Field Gear ID** is associated with the "Gear Type" selected for the "Sample Collection Procedure" described in the "Preferences and Defaults". The **Field Gear ID** can be seen on "P28 Gear Configuration Maintenance List" in the "Preferences and Defaults" section.

Example

Field Gear ID,msoth,

Note: If the Sample Collection Procedure does not require gear, then this line does not apply.

Gear Configuration ID

Optional. The ID associated with one Gear Configuration describing the specific piece of Field Gear used to collect this sample. The Gear Configuration ID must already exist in STORET, and be valid for the Gear and Sample Collection Procedure as entered in STORET.

Example:

Gear Configuration ID,cbg-016,

Gear Deployment Comments

Optional. Free text up to 254 characters, providing further information about the deployment and/or use of the specified Field Gear used to collect the sample. Exceptions or deviations from the defined terms of the Field Sample Collection Procedure are also captured here.

Example:

Gear Deployment Comments,"A mis-communication resulted in Dr. Manning deploying the trawl while the Captain was backing down to come on station. Six hours of net repair required."

Location

Optional. The actual location point at which the Field Activity took place, if other than at the Station point of record. The Type Code and Sequence number of any Absolute Location Point (ALP) described in STORET for this Station. Valid values for the Type Code are:

*POINT OF RECORD
SAMPLING
BOUNDARY
WELL HEAD
END OF PIPE
GRID ORIGIN
TRANSECT ORIGIN
TRANS SAMPLING

Note: (1) If omitted, the location will default to the latitude and longitude of the station point of record.

Examples:

Location,*POINT OF RECORD,0,
Location,SAMPLING,1,
Location,BOUNDARY,2,

(2) If the gear type is "Net/Horizontal Tow", then use associated **Trawl Start** and **Trawl Stop** headers (discussed below) in place of **Location**.

Additional Location Comments

Optional. Used in conjunction with **Location**. Free text up to 254 characters, describing the actual point of sampling. If the field activity did not take place at an

absolute location point, the additional location comments might include the distance, bearing and vector from a known absolute location point.

Example:

Additional Location Comments,"free text",

Trawl Start

Mandatory if gear type is Net/Horizontal Tow. **Trawl Start** and **Trawl Stop** are used in place of **Location**. Represents the start latitude/longitude for the tow indicated as the Station ID, Type Code and Sequence number of any ALP described in STORET for any Station listed on the Trip. Valid values for the Type Code are shown under **Location**, above.

Examples:

Trawl Start,CBC-002,*POINT OF RECORD,0,
Trawl Start,CBC-002,SAMPLING,1,

Trawl Stop

Optional if gear type is Net/Horizontal Tow. **Trawl Start** and **Trawl Stop** are used in place of **Location**. Represents the stop latitude/longitude for the tow, if other than the Station point of record, indicated as the Station ID, Type Code and Sequence number of any ALP described in STORET for the current Station. Valid values for the Type Code are shown under **Location**, above.

Note: If omitted, the stop location will default to the latitude and longitude of the station point of record.

Examples:

Trawl Stop,CBC-001,*POINT OF RECORD,0,
Trawl Stop,CBC-001,BOUNDARY,2,

Trawl Start Depth to Bottom

Optional if gear type is Net/Horizontal Tow. Records the distance from the surface to the bottom for the start point, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the start depth, separated by a comma. Valid units are shown in **Depth**, above.

Example:

Trawl Start Depth to Bottom,34,ft,

Trawl Stop Depth to Bottom

Optional if gear type is Net/Horizontal Tow. Records the distance from the surface to the bottom for the stop point, formatted as **ZZZZZ.ZZ**. **Units** must be supplied behind the stop depth, separated by a comma. Valid units are shown in **Depth**, above.

Example:

Trawl Stop Depth to Bottom,45,ft,

Trawl Start Additional Location Comments

Optional. Used in conjunction with **Trawl Start**. Free text up to 254 characters, describing the actual start point of sampling. If the field activity did not take place at an absolute location point, the additional location comments might include the distance, bearing and vector from a known absolute location point.

Example:

Trawl Start Additional Location Comments,"free text",

Trawl Stop Additional Location Comments

Optional. Used in conjunction with **Trawl Stop**. Free text up to 254 characters, describing the actual stop point of sampling. If the field activity did not take place at an absolute location point, the additional location comments might include the distance, bearing and vector from a known absolute location point.

Example:

Trawl Stop Additional Location Comments,"Free Text",

Voltage

Conditionally optional if gear type is Electroshock. **Mandatory** if any Electroshock operational details are provided. Identifies the magnitude of the electromotive force (volts) applied to the electroshock equipment that was used to collect the sample, formatted as **ZZZ.ZZZ**.

Example:

Voltage,12.00,

Current Type

Conditionally optional if gear type is Electroshock. **Mandatory** if any Electroshock operational details are provided. Identifies the type of current that was produced by the electroshock equipment. Valid values are AC and DC.

Example:

Current Type,DC,

Amperage

Optional if gear type is Electroshock. Identifies the magnitude of the current (amperes) produced by the electroshock equipment while collecting the sample, formatted as **ZZZ.ZZZ**.

Example:

Amperage,3.50,

Pass Count

Optional if gear type is Electroshock. Refers to the number of times the electroshock gear was swept through the water from which the sample was collected. Valid values are 1 through 9.

Example:

Pass Count,4,

Pass Length

Optional if gear type is Electroshock. Refers to the distance through which the electroshock was swept on each pass through the water from which the sample was collected, formatted as **ZZZZ**. If more than one pass was made, enter the average length of a pass. **Units** must be supplied behind the pass length, separated by a comma. Valid units are ft and m.

Examples:

Pass Length,10,ft,
Pass Length,5,m,

Pulse Rate

Optional if gear type is Electroshock. Identifies the number of times the electric current is interrupted in one second during use of the gear, formatted as **ZZZ**. This rate is measured in pulse/second.

Example:

Pulse Rate,45,

Total Energized Time

Optional if gear type is Electroshock. Identifies the total energized time, formatted as **ZZ**. **Units** must be supplied behind the time, separated by a comma. Valid units are seconds, minutes, and hours.

Examples:

Total Energized Time,30,minutes,
Total Energized Time,1,hours,

Electroshock Comments

Optional if gear type is Electroshock. Free text up to 254 characters describing the electroshock operation.

Example:

Electroshock Comments,"A small mis-adjustment by Dr. Manning resulted in a nice dinner, but we won't be coming back here soon to sample for *M. salmoides*. ",

Sampling Duration

Conditionally optional if gear type is Net/Non-Tow, Net/Vertical Tow, or Trap/Substrate. **Mandatory** if any Trap Net operational details are provided. Identifies the sampling duration, formatted as **ZZ.ZZ**. **Units** must be supplied behind the duration, separated by a comma. Valid units are minutes, hours, and days.

Example:

Sampling Duration,25,min,

Orientation to Current

Optional if gear type is Net/Non-Tow, Net/Vertical Tow, or Trap/Substrate. Indicates the relation of the trap or net's mouth to the current. Valid values are Down Current, Into Current, and Cross Current.

Example:
Orientation to Current,Into Current,

Trap Net Relative Current Direction

Optional if gear type is Net/Non-Tow, Net/Vertical Tow, or Trap/Substrate. Identifies the direction of water current movement relative to the mouth of the trap/net. Measured in degrees (0-360), formatted as **ZZZ**.

Examples:
Trap Net Relative Current Direction,045,

Trap Net Relative Wind Direction

Optional if gear type is Net/Non-Tow, Net/Vertical Tow, or Trap/Substrate. Identifies the direction of wind movement relative to the mouth of the trap/net. Measured in degrees (0-360), formatted as **ZZZ**.

Example:
Trap Net Relative Wind Direction,045,

Trap Net Comments

Optional if gear type is Net/Non-Tow, Net/Vertical Tow, or Trap/Substrate. Free text up to 254 characters describing the trap or net operation.

Example:
Trap Net Comments,"free text",

Fished Duration

Conditionally optional if gear type is Net/Horizontal Tow. **Mandatory** if any Trawl/Horizontal Tow operational details are provided. Identifies the length of time the net was fishing, formatted as **ZZ.ZZ**. **Units** must be supplied behind the duration, separated by a comma. Valid units are minutes and hours.

Example:
Fished Duration,2,hours,

Fished Distance

Optional if gear type is Net/Horizontal Tow. Identifies the distance covered while fishing, formatted as **ZZZ.ZZ**. **Units** must be supplied behind the distance, separated by a comma. Valid units are ft, m, mi, km, and nmi.

Example:
Fished Distance,5,nmi,

Boat Speed

Optional if gear type is Net/Horizontal Tow. Indicates the boat speed during fishing, formatted as **ZZ.Z**. **Units** must be supplied behind the boat speed, separated by a comma. Valid units are knots and mph.

Example:
Boat Speed,2,mph,

Trawl Relative Current Direction

Optional if gear type is Net/Horizontal Tow. Identifies the direction of water current movement relative to the bow heading of the trawling boat. Measured in degrees (0-360), formatted as **ZZZ**.

Example:
Trawl Relative Current Direction,045,

Trawl Relative Wind Direction

Optional if gear type is Net/Horizontal Tow. Identifies the direction of wind movement relative to the bow heading of the trawling boat. Measured in degrees (0-360), formatted as **ZZZ**.

Example:
Trawl Relative Wind Direction,090,

Trawl Comments

Optional if gear type is Net/Horizontal Tow. Free text up to 254 characters, describing additional comments about the towing operation.

Example,
Trawl Comments,"free text",

Project ID

Optional, but highly recommended. The Project ID of one of the projects associated with this trip, with which this particular field activity is to be linked. Any one field activity may be linked to one or more Projects by repetition of the Project ID record in the input batch file. This prompt may appear many times in a single sample because a single sample may be assigned to many of the Projects participating in the Trip.

Example:
Project ID,cpcb-001,

Person

Optional, but highly recommended. The Last Name and First Name of a person who performed this activity. For activities performed by multiple people, this record may be repeated. Each person named must have been previously identified for the Organization through the STORET interactive windows.

Examples:
Person,Smith,John,
Person,Jones,Mary,

Results Section (General)

The General Results section prompts are used for entry of data from all Samples and Measurements /Observations **except** those of the Biological/Taxon Abundance type. Biological/Taxon Abundance will be described in the next Results section.

This section gives you the ability to specify a "Characteristic Group" from the "Preferences and Defaults" section of the application and provide "Results" on a "Row" by "Row" basis using the Row ID listed in the identified "Characteristic Group". For each "Result" you have the ability to provide a number of additional pieces of information. The additional pieces of information may form a repeating group within the Results area (e.g., for each "Result" you may also provide "Result Comments", "Result Value Status", "Result Lab ID", "Result Analysis Date", "Result Analysis Time", and "Result Analysis Time Zone"). These prompts must follow the "Result" value they qualify. All these qualifiers are optional. In addition, you have the ability to provide a "Reference Point From/To" for physical measure characteristics. If you were to use all these qualifiers for each result in your input file, the file might look like the following example:

```
Char Group ID,CG-012,  
Result,1,1.89,  
Result Comments,"free text description of the result value",  
Result Value Status,F,  
Result Lab ID,ED-001,  
Result Analysis Date,12-25-1991,  
Result Analysis Time,09:35:00,  
Result Analysis Time Zone,EST,  
Result,2,4.98,  
Result Comments,"free text description of the result value",  
etc.
```

Or your group may look as simple as the following:

```
Char Group ID,CG-012,  
Result,1,0.988,  
Result,2,2.666,  
Result,3,2.998,  
Result,4,2.555,  
Result,5,1.467,  
Result,6,1.922,  
Result,7,2.612,  
Result,8,2.939,  
Result,9,2.515,  
Result,10,1.407,
```

Char Group ID

Mandatory. For entry of **Results**. Identifies the Characteristic Group for which you want to add "Results", this prompt must always precede a "Result,Row ID,Value" line. A single sample may contain many Characteristic Group references.

Examples:

Char Group ID,CG-012
Result,4,3.98,
Char Group ID,CG-003
Result,3,1.092,

In the above example you would be reporting a result from Char Group "CG-0112" for "Row 4", and from Char Group "CG-003" for "Row 3". The sample profiles for these two groups must match (e.g., both are Water Samples).

Result

Mandatory. For entry of **Results**. Values on this row include the **Row ID** of a valid row in the **Char Group**, and the actual data value being reported. The form of the line is "Result,Row ID, reported value,".

Examples:

Char Group ID,GRP001,
Result,1,1.753,
Result,2,2.897,
Result,3,12.75,

The row in the Characteristic Group carries not only the name of the substance or quantity, but also defaults for such things as units, methods, sample fraction, and much more.

Certain conditions of detection and quantification are stored through the use of special text in lieu of the value. They are:

ND	-	not detected
DNQ	-	detected but not quantified
PAQ	-	present, above quantification limit
PBQ	-	present, below quantification limit

Examples:

Char Group ID,GRP001,
Result,1,ND,
Result,2,PBQ,

Note: This header is not used for Biological Single Taxon Individual or Single Taxon Frequency Classes. For Individuals, use the **Individual** header. For biological condition Single Taxon Frequency Classes, use the **Bio Condition** and **Bcount** headers. For physical condition Single Taxon Frequency Classes, use the **Common Class** and **Pcount** headers. Each of these headers is described below.

Result Comments

Optional. Free text up to 1999 characters describing of the result value. This comment will correspond to the most recently referenced **Result** row in the input file. Result comments are not applicable for Single Taxon Individual, Single Taxon Group Summary, or Single Taxon Frequency Class **Biological Result Groups**.

Example:

Result Comment,"free text up to 1999 characters",

Reference Point From/To

Optional. Used to indicate the point from and to which a physical measurement, such as surface elevation or stream width, was taken. The **From** and **To** points (entered in that order) are each free text up to 20 characters. This information will correspond to the most recently referenced **Result** row in the input file. Reference points are not applicable for **Biological Result Groups**.

Examples:

Reference Point From/To,Left Bank,Sample Point,

Result Value Status

Optional. Enter the status of the Result value. Acceptable values are "P" for Preliminary and "F" for Final. If this line is omitted, then Final is assumed. The status will correspond to the most recently referenced **Result** row in the input file. Value status entry is not allowed for Single Taxon Individual, Single Taxon Group Summary, or Single Taxon Frequency Class **Biological Result Groups**.

Example:

Result Value Status,P,

Result Lab ID

Optional. Enter the **Laboratory ID** that uniquely identifies the laboratory used to obtain the result. The laboratory will be associated to the most recently referenced **Result** row in the input file. Laboratory is not allowed for Single Taxon Frequency Class **Biological Result Groups**.

Example:

Result Lab ID,ED-001,

Result Analysis Date

Optional. The calendar date of analysis for the result, formatted as **MM-DD-YYYY**. The analysis date will correspond to the most recently referenced **Result** row in the input file. Analysis date is not allowed for Single Taxon Frequency Class **Biological Result Groups**.

Example:

Result Analysis Date,12-25-1991,

Result Analysis Time

Conditionally optional. **Mandatory** if **Result Analysis Time Zone** is supplied. May not be used unless **Result Analysis Date** has been supplied. The time of day at which the analysis for the result was done, formatted as **HH:MM:SS**. The analysis time will correspond to the most recently referenced **Result** row in the input file. Analysis time is not allowed for Single Taxon Frequency Class **Biological Result Groups**.

Example:

Result Analysis Time,14:30:00,

Result Analysis Time Zone

Optional. Valid values are shown under **Arrival Time Zone**, above. The analysis time zone will correspond to the most recently referenced **Result** row in the input file. Analysis time zone is not allowed for Single Taxon Frequency Class **Biological Result Groups**.

Example:

Result Analysis Time Zone,EST,

Result Section (Biological/Taxon Abundance)

For Biological/Taxon Abundance samples there are a series of specific prompts, some apply to only one Bio Result Group Type. The following is a list of batch file prompts which are allowed for each Bio Result Group Type. Notice the abbreviated text in lieu of each type of Bio Result Group.

Multi-Taxon Population Census (MTPC):

Bio Result Group,Group ID,MTPC,
Bio Result Group Description,
Char Group ID,
Result,Row ID,Value,
Result Value Status,
Result Comments,

Single Taxon Group Summary (STGS):

Bio Result Group,Group ID,STGS,
Bio Result Group Subject Taxon,
Bio Result Group Description,
Count,
Char Group ID,
Result,Row ID,value,
Result Value Status,
Result Comments,

Single Taxon Frequency Classes/Biological Condition (STFC):

Bio Result Group,Group ID,STFC,
Bio Result Group Subject Taxon,
Bio Result Group Description,
Type Indicator,B,
Bio Condition,
Bcount,

Single Taxon Frequency Classes/Physical Condition (STFC):

Bio Result Group,Group ID,STFC,
Bio Result Group Subject Taxon,
Bio Result Group Description,

Type Indicator,P,
Sex,
Lifestage,
Common Class,
Pcount,

Single Taxon Individuals (STI):

Bio Result Group,Group ID,STI,
Bio Result Group Subject Taxon,
Bio Result Group Description,
Count,
Char Group ID,
Result,Individual #,Row ID,Value,
Result Value Status,
Result Comments,

Bio Result Group

Mandatory for samples where **Medium** is Biological and **Intent** is Taxon Abundance. Identifies the Bio Result Group for which you are recording results. Includes a unique **Bio Result Group ID** and **Type**. There are four types of result groups that are allowed for **Type**. These types are stored through the use of special text in lieu of the value. Valid values are:

MTPC	-	Multi-Taxon Population Census
STGS	-	Single Taxon Group Summary
STI	-	Single Taxon Individual
STFC	-	Single Taxon Frequency Classes (Biological Conditions and Physical Conditions)

Batch, like the Application, requires the creation of the Bio Result Group prior to the entry of Biological results. Multiple groups can be added in batch for a given Field Activity. Depending on the Type, subsequent records may be necessary (e.g., **Count**, **Bio Result Group Subject Taxon**).

Examples:

Bio Result Group,01,MTPC,
Bio Result Group,02,STGS,
Bio Result Group,03,STFC,
Bio Result Group,04,STI,

Note: (1) If the group is Single Taxon Frequency Classes, then use **Type Indicator** (described below) to indicate whether it is a physical measure or biological condition.

(2) A taxon abundance sample can have only a single result group of the type Multi-Taxon Population Census, but it can have an unlimited number of the remaining types. **If multiple groups are provided for a given Field Activity, then the Multi-Taxon Population Census group must be referenced first.**

(3) If there are multiple Bio Result Groups per Field Activity, then all Result data pertaining to a given Bio Result Group must be provided in the input file before another Bio Result Group is introduced.

Count

Mandatory for **Single Taxon Individual** and **Single Taxon Group Summary**. Not applicable for Multi-Taxon Population Census or Single Taxon Frequency Classes. For Single Taxon Individual, represents the total number of individuals in the group. For Single Taxon Group Summary, represents the total number of organisms in the summary group. Use the following format: **ZZZZZ**.

Example:

Bio Result Group,04,STI,
Count,10,

Type Indicator

Mandatory for **Single Taxon Frequency Classes**. Not applicable for any other type of group. Valid values are B (for biological condition) and P (for physical condition).

Example:

Bio Result Group,03,STFC,
Type Indicator,P,

Bio Result Group Subject Taxon

Mandatory for all groups **except Multi-Taxon Population Census**. It is not applicable for Multi-Taxon Population Census. Identifies the organism that was the focus of the study. Consists of a valid **Characteristic Search Name** followed by its **Species Number**, if required. Valid species numbers are sp.1, sp.2, sp.3, sp.4, sp.5, sp.6, sp.7, sp.8, and sp.9. If the Search Name includes commas, then enter the name in quotes.

Examples:

Bio Result Group,02,STGS,
Bio Result Group Subject Taxon,Esox,sp.1,

Bio Result Group Description

Optional. Free text up to 254 characters, providing additional description of the result group.

Example:

Bio Result Group Description,"free text description",

Sex

Optional for **Single Taxon Frequency Classes - Physical Conditions**. Not applicable for any other type of group. Identifies the similarity when the entire group of individuals share the same sex. Valid values are Female, Male, Indeterm., and Hermaphrod.

Example:

Sex, Male,

Lifestage

Optional for Single Taxon Frequency Classes - Physical Conditions. Not applicable for any other type of group. Identifies the similarity when the entire group of individuals share the same lifestage. Valid values are:

Adult
Budded
Egg
Exfoliate
First Form
First Instar
Flowering
Foliate
Fruited
Gravid
Imwcap
Juvenile
Larva
Larva Exuvia
Late Instar
Mid Instar
Naiad
Non-Gravid
Nymph.
Post Larva
Pupa
Pupal Exuvia
Roe Present
Second Form
Seed
Seedling
Spent
Subimago
Y.O.Y.
Yolk Larva

Example:

Lifestage, Adult,

Individual

Mandatory for Single Taxon Individual Results only. Used in place of the **Result** prompt. Enter the **Individual Number** (based on the **Count** of Individuals defined for the **Bio Result Group**), **Row ID** of a valid row in the **Char Group**, and the actual data value being reported. The data value portion follows the same rules as given in the **Result** header described above. The form of the line is "Individual, Individual #, Group Row ID, value,".

Examples:

Bio Result Group,45CF,STI,
Bio Result Group Subject Taxon,Micropterus salmoides,
Count,2,
Char Group ID,GRP001,
Individual,1,1,12.75,
Individual,1,2,45.4,
Individual,1,3,male,
Individual,2,1,17.75,
Individual,2,2,67.4,
Individual,2,3,female,

Bio Condition

Mandatory for Single Taxon Frequency Class/Biological Condition. Does not apply to any other type. Consists of a primary and optional secondary biological parameter from which **Bcount** results are based. Valid values are Lifestage and Sex. The primary and secondary conditions must be different. The primary condition is **Mandatory**. Valid combinations are:

Bio Condition,Sex,Lifestage,
Bio Condition,Sex,
Bio Condition,Lifestage,Sex,
Bio Condition,Lifestage,

Example:

Bio Result Group,03,STFC,
Bio Result Group Subject Taxon,Micropterus salmoides,
Count,50,
Type Indicator,B,
Bio Condition,Sex,Lifestage,

Bcount

Mandatory for Single Taxon Frequency Class/Biological Condition only. Consists of a **Primary Class Descriptor (Mandatory)**, **Secondary Class Descriptor (Optional)**, and **Class Result Count**. Valid values for the Primary Class Descriptor are all possible parameters for the primary condition that was specified for the **Bio Condition**. Likewise, valid values for the secondary class descriptor are based on the possible parameters for the secondary condition if provided for the **Bio Condition**. Sex and Lifestage parameters are listed under **Sex** and **Lifestage** above. The Class Result Count requires the format **ZZZZZZZZ.ZZZZZ**. Multiple **Bcount** rows may be provided for a given **Bio Condition**; however, the same primary and secondary descriptor combination cannot be repeated.

Examples:

Bio Condition,Sex,Lifestage,
Bcount,Female,Adult,50,
Bcount,Male,Larva,10,

Bio Condition,Sex,

Bcount,Female,,5, *(The second comma is required.)*
Bcount,Male,,10,

Bio Condition,Lifestage,
Bcount,Audult,,25, *(The second comma is required)*
Bcount,Larva,,30,

Common Class

Mandatory for Single Taxon Frequency Classes/Physical Condition only. **Type Indicator** for the **Bio Result Group** must be "P". Consists of a **Common Class Descriptor Subject** and **Unit of Measure** from which **Pcount** results are based. The Common Class Descriptor Subject is a valid **Characteristic Search Name** that was used to group the individuals. The Unit of Measure must be a valid measurement for the common class descriptor.

Example:

Bio Result Group,03,STFC,
Bio Result Group Subject Taxon,Micropterus salmoides,
Count,50,
Type Indicator,P,
Common Class,"Length,Fork(Fish)",in,

Pcount

Mandatory for Single Taxon Frequency Classes/Physical Condition only. Must immediately follow **Common Class**. Consists of a **Lower Range Value** and **Upper Range Value** for the current class, formatted as **ZZZZZ.ZZ** followed by a **Class Result Count**, formatted as **ZZZZZZZZ.ZZZZZZ**. Overlapping groups are not allowed.

Examples:

Common Class,"Length,Fork (Fish)",in,
Pcount,5,10,5,
Pcount,10,15,10,
Pcount,15,20,3,

Automated Data Logger Results

Data Logger Form

Detailed information for the use of each prompt in each section of the Data Logger Form of the Batch File is presented below. Prompts are described for each section.

Organization Section

Organization ID

Mandatory. Identifies the STORET organization for which you are entering data. From the STORET interactive windows, the "Batch Update" option must be selected from the same **Organization ID** which appears in the batch file.

Example:
Organization ID,DEMOTEST,

Installation Section

Installation ID

Mandatory. Identifies a piece of equipment in the field that records environmental characteristic measurements at preset intervals over a period of time. The group of characteristics measured depends on configuration of the logger's probes. The entry of the logger, its **Installation ID**, and its description must be accomplished using the STORET interactive windows *before* you reference it in the batch. The logger's medium must be the same as the medium for the Characteristic Group identified in **Char Group ID**.

Example:
Installation ID,123,

Operating Period Section

Op Log

Mandatory. Identifies the Operating Period **Log File Name** that holds data logger results from a specific sampling time interval, for a given characteristic measurement configuration.

Example:
Op Log,abc,

Char Group ID

Mandatory. Identifies the Characteristic Group in STORET that will be associated with a **Data Logger**. For entry of **Results**. To uniquely identify the substance or quantity being reported, users must supply a **Char Group ID** on this record, and a **Row ID** from within that group on the **Row ID** record for each reported result. The entry of Characteristic Group and its description must be accomplished using the STORET interactive windows *before* you reference it in the batch.

The STORET Characteristic Group type must be "Data Logger" if it is to be used in batch. The STORET Characteristic Group medium, for example water, must be the same as the STORET Automated Data Logger medium in order for these two entities to be used in batch. Each operating period has one set of characteristics, so each **OP Log** line has one corresponding **Char Group ID** line.

Example:
Char Group ID,abcd,

Row ID

Mandatory. Identifies the individual characteristic(s) in the Characteristic Group identified in **Char Group ID** for which result values exist in the **OP Log**. The listing of the Row IDs in this prompt indicates the order in which the result values in the **OP Log** are to be processed. As always, the assignment of Characteristics to Characteristic Groups must be accomplished using the STORET interactive windows *before* you reference this association with **Row ID** in the batch.

The row in the Characteristic Group carries not only the name of the substance or quantity, but also defaults for such things as units, methods, sample fraction, and much more. These defaults must be complete in STORET, including **Row ID**, before you reference **Row ID** in the batch.

Values appear on the header line as RowID,#,#,#, ... , n, where there are n characteristics assigned to the identified Characteristic Group. The order of row ids here is the order in which the corresponding result values should be placed on the **Result** line. Each operating period has one set of characteristics, so each **OP Log** is followed by one **Row ID**.

Example:

Organization ID,DEMOTEST,
Installation ID,crsdl-01,
OP Log,123abc,
Char Group ID,abcd,
Row ID,1,2,3,

For the above Characteristic Group, Characteristic Row 1, Characteristic Row 2, and Characteristic Row 3 are being reported. They result values will appear in that order in the following **Result** rows. However, if the data logger file lists these characteristics horizontally in a different order, the **Row ID** prompt might look like this: **Row ID,3,1,2,**. The sequence of row IDs in this prompt should be governed by the data logger file, not the Characteristic Group.

Results Section

The Results section prompts are used for entry of all Data Logger Results. This section gives you the ability to provide "Results" on a "Row" by "Row" basis on a single line for a given sampling point in time or array scan. The order of the results must be in the same order as the row IDs listed in the **Row ID** line.

Record Date

Mandatory. Used as the first part of a two part unique identifier for each "field activity" ("field activity" refers to a single logger scan of the probe array). The second part of the identifier is the actual time of the array scan or sampling, e.g., "12-25-1991 122500". This part two of the identifier appears in the **Result** prompt described below. The **Record Date** only needs to be provided when there is a change in the date and must be in the format **MM-DD-YYYY**.

Example:

```
Organization ID,DEMOTEST,
Installation ID,crsdl-01,
OP Log,123abc,
Char Group ID,abcd,
Row ID,1,2,3,
Record Date,01-01-1997,
Result,120000,10.19,9.78,12.75,
Result,121500,9.19,11.78,13.25,
Result,123000,10.18,9.8,12,
      "      "
      "      "
Record Date,01-02-1997,
Result,120000,10.19,9.78,12.75,
Result,121500,9.19,11.78,13.25,
Result,123000,10.18,9.8,12,
```

Creation of Field Activities for the desired Operating Period identified in **OP Log** must be accomplished using the STORET interactive windows *before* you reference them in the batch. For Automated Data Loggers, Field Activities are automatically created by STORET when start date/time, stop date/time, interval time, and project have been defined for the Operating Period.

Result

Mandatory. For entry of **Results**. Values on this row include the *time* of measurement and actual data values for the characteristics being reported, in **Row ID** order.

Example:

```
Organization ID,DEMOTEST,
Installation ID,crsdl-01,
OP Log,123abc,
Char Group ID,abcd,
Row ID,1,2,3,
Record Date,01-01-1997,
Result,120000,10.19,9.78,12.75,
Result,121500,9.19,11.78,13.25,
Result,123000,10.18,9.8,12,
```

Time must be in the format HHMMSS (no colons). This time plus the preceding **Record Date** uniquely identifies a Field Activity or array scan for the **Data Logger**. No duplicate Field Activities are permitted. Null results are permitted. The number of **Result** lines in the batch must equal the number of Field Activities in the Operating Period in STORET. All **Results** are numeric. Created **Result** records will assume all the default values in STORET. Out-of-range values (as defined in the defaults) will be allowed, but cause a warning to be issued in the batch log file. The number of Results on the line, including nulls, must match the number of characteristics in the group.

Hints for entry of batch data from spreadsheets.

Often, the batch file will be created by export from a spreadsheet environment, because the data may be supplied in that form from the lab or other data source. If you work with spreadsheets to move data into a STORET batch, keep the following hints in mind.

1. Define **all** the columns to be exported from the spreadsheet as **text**. Even those with numeric data. Let STORET sort out the numbers.
2. Specify "Comma Delimited" (often "CSV") format for the export file. Most spreadsheets will automatically supply quotes where needed to delimit text fields with imbedded commas.
3. Keep an empty spreadsheet with the STORET headers already in column 1, and a "standard" set of header rows describing a typical sampling event, to permit easy creation and population of a new data entry sheet.
4. If you are receiving data from a lab or other source, and data values are supplied with identifier codes, use these codes as Row IDS in one of your Characteristic Groups, to avoid having to change them as you pass data to STORET.
5. Do not make redundant entries, they will be treated as errors. For example, repeating the **Station ID** before each sample is an error.
6. You may find it easier to use a flat text editor like Notepad to construct the batch file, rather than first creating a spreadsheet and then exporting the CSV file.
7. If you find you are doing a lot of work to construct valid batch files, think about your use of customized codes and defaults in STORET. There should be an easy way to do almost every data entry task.
8. Once you get a successful data entry format working, keep it in both electronic (save the file) and hard-copy (print the file) as an aid to future work.

EPA and the Central STORET Data Warehouse

With the release of Production Version 1 of the modernized STORET System, STORET will, for the first time, become a fully decentralized database. All responsibility for the operation and maintenance of STORET will now reside with the end users, each of whom will own a customized copy of STORET, within which only their own data will reside, and over which they will exercise complete control. The STORET software, designed to make local manipulation of this data manageable for the user, will be installed on top of each user's customized database, and this combined installation of the STORET database and its associated software will operate independently of EPA and the Office of Water.

The autonomy provided by such an architecture is one of the major improvements in the STORET System, but it represents such a sea change away from the legacy environment that many of our client partners are unsure of the division of responsibility it entails.

In the new STORET architecture, EPA will provide the technical design of the database, and control which fields will exist as well as the field properties. EPA will provide the data to initialize certain tables (e.g. the County and State table), and will own some (but not all) of the data in others (e.g. the Citation table, which will contain some initial data, but which clients may extend). EPA will also provide all of the application software as executable files for your local desktop workstation needed to update STORET. Our client partners will be expected to provide the Oracle® database environment (Personal or Server version) within which STORET will reside. As in the past, our tradition of high quality support will be provided via the toll-free number **1-800-424-9067**. All of the environmental data will be provided by our client partners, who will maintain complete control over it at all times.

Maintenance of the database design and the software will be provided by EPA, and updates as they become necessary will be in the form of new versions and releases. We expect version 2 to contain improvements to the software, for example. Maintenance of certain tables of reference information will also be the responsibility of STORET staff.

In order to both provide this degree of independence, and at the same time meet the need for a centrally aggregated database of North American water quality, we have adopted the data warehouse concept. While the real work of data maintenance will proceed in the field, we will at the same time maintain a warehouse consisting of the combined data from all of our client partners, and will provide access to this warehouse to the general public via the World Wide Web.

What is the Data Warehouse

A data warehouse is an aggregation of related data, maintained centrally, and easily accessed by a broad community of users with minimal skills. The STORET Data Warehouse is no exception.

EPA will maintain (at no expense to its client partners) a centrally located copy of all the data being held in STORET servers around the country. This warehouse copy of STORET will be accessible via simple Internet Web Browsers (like Netscape or Microsoft Internet Explorer), and visible to the public at large. It will contain all STORET data which our client partners have uploaded to it.

Uploads of client data to this warehouse will be performed at intervals determined by each client, taking into account any administrative requirements imposed by EPA through its business relationships with the

client's organization. Clients will control which results should be published to the public in this way, and which should not.

Upload datasets will be produced using the "EXPORT DUMP" utility as supplied in the Oracle™ product, and following the markup of client-owned data for publication status. Files created in this way will be shipped to EPA (usually electronically, as in FTP), and merged into the warehouse together with data sent from other clients. Each time a STORET organization sends data to the warehouse, it will supplant all data previously sent by the organization. In this way, the client database will be the master copy, while the STORET Data Warehouse will be the slave copy.

Accessing the Warehouse

Any individual with an Internet web browser can access the STORET Data Warehouse. You do NOT need the STORET software to use the warehouse.

Once attached to the home page for the STORET Data Warehouse, users may invoke any of the data queries offered there, or examine any of the pre-formatted displays, including maps and graphics. There will be no charge for any service offered in this way.

You may NOT use the STORET software to update warehouse data directly. The STORET software will only work while attached to a specific client-controlled STORET database (either on your PC or on an Oracle™ server you control).

Exporting My Data to EPA and the STORET Data Warehouse

Every Oracle™ installation comes equipped with a set of database manipulation utilities, including two which permit database backup and restore, called EXPORT and IMPORT. The import utility was used at your site when you initially installed the STORET database, and normally you (or more likely your data base administrator) will use the export utility to create backups of your STORET data from time to time.

Each time you use this export utility to create a database "dump" you may choose to send it (or a copy of it) to the STORET Data Warehouse. From this dump file, our data base administrator will be able to create an exact copy of your database, including markers you placed there as you indicated data to be published. The published data will be merged into the STORET Data Warehouse, and will become visible to the general public as soon as the merge is complete.

Export dump files sent to us by our client partners will be kept at our site, and in the event of a computer-related catastrophe, you may ask us to return your most recent export, and from it you can rebuild your STORET database from scratch. This "off-site backup" service is a fortuitous byproduct of our warehouse data management strategy.

The export/merge process is expected to be fully automated by release 2 of STORET, and should not cost end users anything.

STORET Detail Description

Data Maintenance

Organization Information

This section allows the user to completely describe an Organization to the STORET Data Base. In addition to the description of the Organization itself the user will have the opportunity to describe many details about how the Organization conducts environmental monitoring. This section documents how the Organization does environmental monitoring. These details facilitate data entry and separate the new STORET from the normal data base used to store environmental data. These information also provide context for the result values stored in the data base and facilitate future data use.

Basic Information

To arrive at this area the user must have selected a "Organization ID" from the list provided in the "Organization Maintenance List". This ID will become the "Code" for the about-to-be-created-organization. All Organization codes are provided by EPA and are unique to the STORET environment, each copy of STORET is shipped with a number of nationally unique organization codes. These codes are registered with EPA. After selecting a code to represent his/her Organization the user must edit in all relevant information. The user MUST select from a organization "Type" from the list provided by the system which best characterizes the organization. The user MUST also provide an organization name. The user may further describe the organization and also provide a name of a "Parent Organization".

Addresses

The user has the ability to provide both "physical" and "electronic" addresses for his/her organization. The user can provide up to three "physical" addresses; *Mailing*, *Shipping*, and *Located at*. The user also has the ability to provide an unlimited number of five kinds or "electronic" addresses; *Fax*, *Internet*, *Office Phone*, *Commercial Network*, *Other*. For each electronic address the user can provide a comment to further qualify the electronic address, i.e., Director's Phone.

Programs

Programs can be considered a grouping mechanism for Projects, there are two kinds of programs in this system; 1) "Organization Programs" which can be used to group the organizations' Projects by similar themes/purposes, and 2) "National Programs" which are used to group Projects from many Organizations (multi-organizational) by similar themes/purposes. In this area the user can create and describe Programs for his/her Organization and assign Projects to them. In addition, and for reference only, the user can view any national Programs which are in the system. The user is not able to assign Projects to National Programs in this area. This ability to group Projects into Programs will facilitate data retrieval.

Cooperating Organizations

The user has the ability to list other Organizations which cooperate with his/her Organization in the conduct of Projects. For each Cooperation Organization the user can provide both a point of contact and both "physical" and "electronic" addresses, (see *Addresses* for details on entering Addresses information).

Personnel Information:

The user has the ability to create a list of people of interest to the Organization, record their affiliation, and provide a number of electronic addresses for each. The user should consider this list to be the master list of the "active personnel", those people who participate in Projects, take Trips to Sampling Stations, Collect Samples, and make Field Observations. This area also has a "Suspend" function which removes the person from this active list, but not from the system, and places them in the "Personnel Status Maintenance" area in "System Administration". This area also has a "Show Suspended" function so the list of "suspended" personnel can be reviewed. Any user with "Supervisor" access status may enter the "System Administration" and re-instate a "suspended person".

Roles in Organization:

This area provides the user with the opportunity to assign "roles" to each person in the "Personnel Information" list created above. A single person may have many roles in the Organization. This function was included in the database because we, at the national level, need to know who in the Organization is the "STORET Primary Contact". Any one person may have many roles in an Organization.

Batch Update:

At this time, the Batch Entry process is restricted to the addition of new data to the data base. You may not use this process to edit data already present in the data base. This process may be used to add Station Visits, Monitoring Activity descriptions and Monitoring Activity Results to a Trip(s) and to add data to Data Logger Installations/Operating Periods that have already been described in the database. This process supports all types of samples and measurements/observations supported by the data base, including habitat assessment and data logger results.

Preferences and Defaults:

This section can be a real time saver during data entry. Here the Organization is able to document many of the components of its environmental monitoring activities. The STORET administrators have provided many references common to environmental monitoring activities, in addition, the Organization has the ability to create and describe many of these monitoring components which are specific to their activities.

Field/Lab Analytical Procedures & Equipment.

This area provides the Organization an opportunity to both describe its' own field and laboratory analytical procedures (procedures employed either in the field and/or in the lab which generate numeric values for a chemical and/or field measurement) or adopt analytical procedures provided by the system. In either case the user **MUST** specify those chemicals and/or field measurements for which the Organization specific method and/or the adopted method produces results. The assignment of chemical/field characteristics to each method is **VERY IMPORTANT** because during the results data entry the system will provide, for selection, only those procedures either created or adopted, which have the result characteristic listed. For example, after entering a lead value for a sample the user selects "Field/Lab Procedure", the system will then show the user all procedures which have the characteristic "lead" listed, the user will **ONLY** see those procedures for which lead is listed.

Lab Sample Preparation Procedures

This area is similar to the "Field/Lab Analytical Procedures & Equipment" in that the Organization has the ability to create and/or adopt from a system list laboratory sample preparation procedures. In this case, however, the user does not have to provide characteristics for each procedure. In the Results area, when the user selects "Lab Sample Prep" the system will provide **ALL** the sample preparation procedures (without regard to characteristic) which have either been created and/or adopted in this using this system function.

Characteristic Groups and Defaults

This area allows the user to create lists of characteristics and their defaults which may be of repeated interest to the organization, i.e., a list of common chemicals examined for in every water sample, a list of species (macro inverts, fish) usually observed and counted during a kick net sample. A Group may contain the components of a habitat classification system. Such a Group may be composed of either user defined, or system defined members which may be evaluated or scored in the Result area. These Groups may be Project specific, River/Stream specific, Sampling Station specific, etc.

These Groups play a fundamental role in Batch Data Entry, each Group must have an unique ID, and each member of each Group must also have an ID if the Group is to be used in the Batch Data Entry process.

When entering results for a sample or field observation the user will be able to select from his Organizations' lists of Groups and/or directly search the Characteristic List provided by EPA. This ability is a enormous time saver when entering results and the use of this feature is **HIGHLY** recommended.

Laboratories

If your Organization employs analytical labs to perform sample analysis during their operations they can create a list of labs and their addresses here. During the result entering process, the user will be able to select from this list of labs and assign one to each result.

Citations

The Organization can use citations to clarify , support, or to provide detail for the information it provides the data base. In this area the Organization can create and describe citations. The STORET Administrators have provided a list of common citations, i.e., ASTM Methods etc. Both Organization entered and STORET provided citations can then be assigned to: Field/Lab analytical methods, Project descriptions, Habitat Classification Scheme descriptions, and Field Sample Collection Procedures.

External Station ID Schemes

The Organization may identify its sampling stations by additional names or labels, i.e., USGS station label, project specific station label, labels that might identify the station in other data bases...etc. This feature provides the ability to identify and describe those schemes. Later during sample station establishment the user has the ability to select from this list of schemes and provide a number of station specific labels.

Sample Collection/Creation Procedures

This feature allows the Organization to create a list of field ***sample collection and creation procedures*** only, these procedures generate samples- not results. Procedures for generating results from samples, direct field measurements, or observations are described in the "Field/Lab Analytical Procedures & Equipment. In this section each procedure is described by a Unique ID, Name, Gear Type, Description Text, and a Citation clarifying this procedure. The list of sample collection procedures created here will be available for selection in the Results area during the sample description portion of data entry.

Gear/Equipment Configurations

This feature allows the Organization to create a list of sample collection gear configurations for each Gear Type selected in the previous section. If, for example, the user selected the Gear Type "Net/horizontal Tow" and the Field Sampling Gear "Otter Trawl" the user would be able to describe a configuration for a Otter Trawl which consists of an ID number, Configuration Name, and a detailed description of the Trawl itself. The user may create as many Otter Trawl Configurations as necessary to cover field operations. The user will be able to select from this list of field gear specific configurations during the sample description portion of the results area.

Sample Preservation, Transport, & Storage

This feature allows the detailed description of sample preservation, transport and storage profile. This description includes a Unique ID, Profile Name, Container/Size, Container Color, Temperature Preservation employed (on ice, refrigerated, etc.), Chemical Preservative and Storage Procedure used. The user can create a list of specific sample transport and handling profiles, i.e., Mercury Sample/Water, DDT Sample/Tissue, Total Recoverable Metals/Water,...etc. The user will be able to select from this list of Sample Transport and Storage configurations during the sample description portion of the results area.

QC Sample Creation, Transport & Storage Defaults

This feature allows for a detailed description of field QC samples. The user can provide a QC sample name, select from a list of QC sample types, provide Container/Size, Container Color, Method and Reagents Used in the creation of the QC Sample, and provide a description of the Handling, Transport, and Storage of the sample. This list is indexed by QC Sample Type Name and portions of the list will be selectable during the Trip QC Sample Description process.

Operational Activities

Stations

This area allows the Organization to describe the location of Sampling Stations. In addition, the Organization can associate the Station with certain spatial features, such as, River Reach 1, River Reach 3, USGS eight digit HUC, Native America Lands, States, Counties, Major Estuaries, Oceans, Facilities. The user is presented with a list of Sampling Stations showing "Station ID", "Complete" indicator, and Station "Name". If no Stations exist, the user will be presented with the "Basic Station Information" data entry screen.

Basic Station Information

The user has the ability to provide Station ID, Station Name, and is asked to pick from a list of Primary and Secondary Station Types. The user may also provide additional information; Establishment Date, Water Depth, general Station Description, Ecoregion Name, Travel Directions, Influence Area, and Station location in relationship to the Zone of Initial Dilution (ZID, this is relevant for Clean Water Act Section 301h dischargers only).

Geographic Areas

Upon completing and exiting the "Basic Station Information" data entry area the user will see that the only button lit will be the "Geographic Areas" selection. This area provides the user the ability to provide Latitude/Longitudes for the Station and to associate the Station with a State and County, Ocean/Estuary/Great Lake (depending upon the "Primary and Secondary" Station

Type selected in the "Basic Station Information" area), Native American Land, FIPS Hydrologic Unit, River Reach RF1, River Reach RF 3, National Resource Conservation Service Watershed.

Latitude/Longitude

A Sampling Station can be a single point, or a Sampling Station may be an area described by a series of boundary points. The first Latitude/Longitude entered for a Sampling Station is defined by the system as its "Point of Record". The "Point of Record" is the location which determines the Station's association with a State, County, USGS HUC, RF1, RF3, Native American Land, Ocean/Estuary/Great Lake, and NRCS Watershed. After the "Point of Record" has been entered, the user may enter a series of "Boundary Points" which must be sequenced to define the Station area. In addition, to "Point of Record" and "Boundary Points" the user may enter any number of "Sampling Points" for the Station. A Station must have at least a "Point of Record" to be used for data storage. In short, a Sampling Station may have many Lat/Longs associated with it, one of which (the first one entered) will be the Station's "Point of Record", many "Boundary Points" which are sequenced to describe the Station area, and many "Sampling Points" also sequenced. This area has several required entries:

State/County/Province

Based on the latitude and longitude of the station the system will provide a list of candidate State and Counties. The user can select from the list, or search the list of counties by State directly. The data base supports two assignments of state/county for each sampling station; a *Primary*, and *Secondary*. For all Stations, except "Ocean, Estuary, and Great Lake stations" at least a *Primary* State/County assignment must be made to complete the Station description. Only "Complete" Stations (as indicated by the "complete" flag on the "Station Maintenance List Screen" may be assigned to Projects, only stations assigned to Projects may store data. For Ocean, Estuary, and Great Lake stations all State/County assignments are optional. These stations each have a unique set of requirements for completeness, see the entry screen for each.

Ocean/Estuary/Great Lake

When the Station Type is Ocean, Estuary, or Great Lake this section provides the user with additional location descriptors. For example, an Ocean Station has additional descriptors for; Ocean Name, Near Shore/Off Shore indicator, Distance to Shore and Reference Point identifier, Bottom Topography text field, and Loran C readings for the Station. A Great Lake Station has; Great Lake Name, Additional Location Name (Bay, inlet, river mouth, etc.), Distance to Shore and Reference Point. An Estuary has; Name of major estuary system, Additional Location Name, Distance to Shore and Reference Point. For each of these stations, the green data entry fields on their respective screens indicate the requirements for completeness.

Native American Land

Based on the State assigned to the Sampling Station the system will provide a candidate list of Native American Lands. For stations without a State assignment (Oceans, Great Lakes, Estuaries) the system presents the "Native American Land" list starting with Alaska. The user may select the one which most applies.

FIPS Hydrologic Unit

Based on Latitude and Longitude of the *Point of Record* (see Latitude/Longitude section) the system will provide a candidate list of USGS eight digit hydrologic unit codes ((HUCs). For Ocean, Estuary, and Great Lake Stations which are not located within HUC boundaries, the system will provide a blank screen, if a HUC assignment is desired, the user should use the "Search" button to retrieve a list of HUCs for assignment. The user may assign only one HUC to the Station.

RF1 River Reach

Based on the HUC selected by the user, the system will provide a candidate list of River Reach 1 (RF1) codes for Station assignment. The user may select only one RF1 for each Station. After selecting the RF1 segment the user has the opportunity to provide both a river mile location and indicate if the Station is located on the RF1 segment itself.

RF3 River Reach

The user may provide the River Reach 3 (RF3) number for the Station. The first eight digits of the RF3 number represent the USGS HUC code while the user may provide up to 12 additional digits.

NRCS Watershed

Like RF3 the Natural Resources Conservation Service Watershed designator inherits its first eight digits from the USGS HUC. The user may provide up to eight additional digits for this descriptor.

Addresses

The Address section for Sampling Station is similar to the *Addresses* Section for Organization. The user has the ability to provide three kinds of physical addresses and a unlimited number of electronic addresses for each Sampling Station.

External Station ID Schemes

The user has the ability to select from the list of *External Station ID Schemes* created in the organization *Preferences and Defaults* section and provide one label for the Sampling Station from each scheme. This ability to provide unlimited "alias" names for a single Sampling Station is a very powerful feature. These "alias" may act as keys into other data systems, i.e., the Organization and USGS are using the same sampling station, the Organization has its ID for the station as does USGS. The Organization creates a External Reference Scheme of "USGS Station IDS" and labels its' Station with the corresponding USGS Station ID thereby creating a key into the USGS data base at the station level.

Facility

This section is accessible only when "*Primary station Type*" is "*Facility*". This section provides for the description of the facility through the association of the Facility with SIC codes and the description and status of discharge pipes.

SICs:

The user has the ability to select as many Standard Industrial Classification (SIC) codes as appropriate to describe the facility. SICs codes are important because they provide incite to facility discharges.

Pipes:

The user can describe up to 999 pipes for each Facility. The user can record; Pipe Status, Pipe Treatment, Pipe Flow, Discharge Frequency, Pipe Use, provide a Description, and provide the Receiving Water name for each pipe. In addition the user can provide "*End of Pipe*" latitude and longitude for each pipe.

Wells

This section is accessible only when "*Primary Station Type*" is "*Well*". A Sampling Station can have up to 999 wells. The user may describe each Well at the Sampling Station in terms of; Basic Well Information, Latitude/Longitude/Elevation, Well Shaft and Geologic Information, Well Pumps, Well Logs, and list Legal Entities (Owner, Operator, Driller).

Basic Well Information:

For each Well located at the Sampling Station the user may provide information on Well Status, Well Use, Water Primary Use, and details about the construction of the Well.

Latitude/Longitude:

For each Well located at the Sampling Station the user may provide a latitude, longitude (*Well Head*) and elevation and related method and datum information.

Interval:

For each well located at the Sampling Station the user may provide a complete Well shaft/geostrata description. The user has the ability to provide a start and stop depth

and detail information for each of the following: Well Casings, Well Fills, Well Geologic Strata including the presence of water, Well Lithologic Strata, Well Hole (shaft diameters), and Well Openings (screens). The reference tables for Geologic Unit and Lithologic Unit have been provided by USGS.

Pump:

Each well located at the Sampling Station may have none to many pumps installed. The user may provide a complete Pump history, including Installation Date, Removal Date, Manufacturer, Model, S/N, Intake Depth, and Pump Location.

Log:

Each well located at the Sampling Station may have none to many well logs. The user may provide a log history including Log Type, Log Format, Date, and Location of the Log.

Well Legal Entities:

For each well located at the Sampling Station the user may provide the name and physical addresses of a Driller, Owner, and Operator.

Spring

This section is accessible only when "*Primary Station Type*" is "*Spring*". The user may describe the spring in terms of Improvements made to the Spring, Spring Water Flow, Geologic Unit accessed by the Spring, and Lithologic Unit in which the Spring is located. Geologic Unit and Lithologic Unit names have been provided by USGS.

Permanent Grid

Each Sampling Station may have none or one *Permanent Grid*. This is different from a grid that may be established at the time of sampling, and not returned to for future sampling. This Grid is intended to support repeatable sampling activities, and may have physical markers permanently installed to indicate its location and orientation. The user may describe the Grid as follows: X-Axis Length, Y-Axis Length, Cell Size, Grid Labeling Scheme (Free Text), and Grid Description (Free Text). In addition, the user may provide the latitude and longitude of the "*Grid Origin Point*".

Permanent Transect

Each Sampling Station may have none or one *Permanent Transect*. Like *Permanent Grid* this is meant to be permanently established and to support repeatable field monitoring activities. The user may provide: Overall Length, Distance Between Points, Transect Labeling Scheme (Free Text), and Transect Description. In addition, the user may provide the latitude and longitude of all *Transect Sampling* points, the first Latitude and longitude entered is defaulted to be the *Transect Origin*, additional points must have a sequence number provided by the user.

Projects

This area allows the Organization to describe Projects for which it has primary responsibility. This area also provides for the assignment of Sampling Stations to each Project. For a Project description to be complete it must have certain areas in the "Basic Information" completed and it must have at least one Sampling Station assigned. Only Projects with "Complete" descriptions are allowed to participate in sampling "Trips". Projects must participate in "Trips" in order to have Samples and Results assigned to them. Projects may have *Operation Periods* from Data Logger Installations assigned to the with no "Trip" required.

Project Description

This area provides for the complete project description, in addition to Project ID, State Date, Planned Duration, and Name, the user has the ability to fully describe the Project. The Project description has been divided into several sections; Project Purpose, Project Study Area, Project Design-Sampling Frequency, How/Where to Obtain Complete Plan, Quality Assurance Project Plan Summary, and Measurement Specific Quality Objectives. Each of these fields may contain up to 2000 characters, and all currently accept windows cut and paste functions.

Voucher Specimen Collection

This feature allows for the description of voucher specimen collections used during the Project to voucher taxonomic identifications.

Programs for Project

This feature allows for the assignment of the Project to one or many Programs for which the Organization has primary responsibility. This feature also allows the Project to be assigned to one or many "National" or Multi-Organization Programs. A "National Program" is a group of Projects being conducted by different Organizations sharing a common purpose/theme. The ability to assign Projects to Organization specific Programs and Multi-Organization Programs greatly aids in data retrieval, just knowing the Program Name will allow retrieval of all the Program Projects and their associated data.

Cooperating Organizations

This feature allows for the identification of other Organizations which may also be participating in the Project. Selection is made from a list of cooperating Organizations created in the Organization area. None to many Cooperating Organizations are allowed for each Project.

Citations for Project

This feature allows the user to associate the Project with one or more citations from the list of Citations created in the "Preferences and Defaults" section of Organization.

Stations on Project

For a Project to participate in a Trip, have a Visit, own Monitoring Activities and Results, it must have assigned at least one Sampling Station. The user is presented with a list of complete Sampling Stations (a "complete" sampling station is one with a complete station description, see Sampling Station section) and is allowed to select one to many Sampling Stations that will be used in the Project.

Station Roles on Project

This feature allows the user to assign roles to each Sampling Station which has been selected for the Project, i.e., a Station may be a "Reference" Station for the Project. Any one Sampling Station may have many roles for the Project to which it is assigned, and any one Sampling Station may have different roles on each Project to which it is assigned.

Personnel/Roles on Project

This feature allows the user to select people involved in the Project and at the same time assign them a role in the Project. The user is presented with the list of people created in the "*Personnel Information*" section of the Organization area and allowed to pick those people engaged in the Project, at the same time assigning them one or many roles for the Project, i.e., John Smith will be assigned to the Project and will be the *Project Manager*, and a *Taxonomist* on the Project.

Monitoring Activities

Trips, Sampling, and Results

In this area the Organization describes its activities in the collection and recording of data. Trips are identified and described, and QA/QC activities which relate to activities conducted during the trip are recorded. Trips are linked to those *Projects* they support, and through this linkage, inherit information about *Stations* which may be visited, and *Personnel* who may conduct activities. This area is entered from the "Organization Modification" (central switchyard) screen. Field activities (sampling is only one kind) are all described in this area. Each Field Activity is associated with a single Station Visit. A Trip Summary button is provided here as a convenient way to review all field activities conducted during the trip, sorted either chronologically, or by Station visited.

Basic Information

The user is required to create a trip record by assigning a Trip ID and Trip Start Date. It is strongly advised that the optional Trip Name be entered. The user may provide additional information on Trip Stop Date, Time of Day, Trip Leader, Trip Vehicle or Ship, and free text items describing the Trip Plan and additional Comments.

Projects Supported by Trip

Users are required to link each Trip to as many Projects as the Trip supports. Further data entry is inhibited until the Trip is linked to at least one Project.

Stations Visited on Trip

From the Projects assigned to the Trip, a list of candidate Stations is generated, and the user selects those to be visited on the Trip by highlighting the desired stations and clicking the "Assign" button. For any Trip designed to visit all the project's stations, the "Assign All" button is provided as a convenient short-cut.

QC Sample Descriptions

Quality Control (QC) samples created for the Trip, are recorded here. QC samples described have no Sampling Station assignment (no Lat/Long association) nor do they need any. For example, *Reagent Blanks*, *Field Blanks*, *Trip Blanks*, *Field Spikes*, all these types of QC samples need only to be assigned to the Field Samples they represent. Such an assignment takes place in the "*QC Sample to Sample*" section in the Trip area. There are other QC samples which do need a Sampling Station association, i.e., *Field Split*, or *Field Replicate* Sample, these QC samples are described during the "*Station Visit*".

Basic Information

The user must provide a ID, and Sample Type. Additionally, each QC Sample may have a Name, a creation date and time, a Sample Volume, and text comments.

Method, Transport, and Storage

The user must identify the kind of container used, and optionally its size. The user may further describe the container color, and using text comments, describe the sample Method, Reagents Used, and its Handling, Transport, and Storage. If the Organization has established default sets for QC Sample Handling, Transport, and Storage, one may be retrieved here and used in lieu of manual data entry.

Results

Following analysis of a QC Sample by the Lab, results of the analysis are stored here. The procedures for storing the results for a QC sample are identical to those described below for the results of chemical samples.

Personnel for QC Samples

The user may identify the person(s) responsible for the QC Sample Creation. The user selects the desired person(s) from the list of Personnel created by the Organization in the Organization Information section of the data base.

Station Visit

A station visit is a stop on a trip for the purposes of taking measurements, making observations, or collecting samples. During any trip, any station may be visited many times. During any one visit, any number of measurement, observational, or sample collecting activities may occur.

Basic Information

From a list of Stations to be Visited (created while describing the Trip, above), the user selects a specific station, and assigns a visit number to uniquely differentiate this visit from other visits to the Station during the trip. The arrival date is initially defaulted to the Trip Start Date, but may be edited. Time of day and the departure date and time may be added. Free text describing conditions at the site may also be added.

Samples, Measurements, and Observations

Clicking this button leads to the description of field activities and the recording of actual results. The user is then prompted to select the kind of monitoring activity to be described. The user must select one.

Sample

Samples are collections of material found in the environment at the site, and taken elsewhere for analysis and evaluation. Examples include water samples, sediment samples, and biological samples, among others. The nature of the results to be obtained for a sample depend on the medium sampled and the intent for which the sample was collected.

Measurements and Observations

Measurements are those activities conducted in the field, usually involving the use of instruments of some sort, which produce environmental results without the creation of samples to be evaluated elsewhere. Examples include flow measurements, water temperature measurements, probe measurements like pH or dissolved oxygen, and others. Observations are those activities conducted in the field which yield results without the use of instruments and usually relay on the judgement of the observer. Examples include habitat evaluations, certain meteorological observations, and general observations about conditions at the station.

Sample from Sample

Used to describe a sample created by extracting a portion from another sample, already described. Some information concerning the new sample is deduced from the "parent" sample, and some is not. Sample from Sample (Created

from Sample) must be described for the same Station Visit as the Parent. Examples are Phytoplankton Samples extracted from Water Samples, and Tissue Samples extracted from Biological Individual Samples.

Composite of Samples

Describes a sample created by combining other samples. Samples to be combined must be of the same basic type, and the "parent" samples will determine much of the description of the composite. All Parent samples must be described during the Station Visit as the Composite. Remember, a Station may be an entire Lake. Results may be recorded independently for each parent, and the composite.

Field Set Descriptions

In this section the user creates Field Sets for the Station Visit. A Field Set is an arbitrary user-defined grouping concept for monitoring activities. This optional capability provides a mechanism by which the user might, for example, link a water sample to a meteorological observation, or link a micro-habitat evaluation to a biological sample. The user may define any number of Field Sets, and once each has been defined, it may be used to group together any number of monitoring activities which occurred during the Station Visit. Any one monitoring activity may be associated with many Field Sets.

Group Activities by Field Sets

In this section the user is able to assign monitoring activities to Field Sets (created above). This button becomes active only after a Field Set has been identified and described.

QC Sample to Sample

In this area the user may assign any one of the QC samples which were prepared for the Trip ("*QC Sample Descriptions*") to any or all of the samples collected during the Trip. The system provides a "*Sample QC to Activity Assignment*" screen where the user may highlight the individual QC sample in the upper box, and click on any or all of the samples from the Trip which appear in the lower box. The user may then review his assignment on the "*Sample QC to Activity Maintenance*" screen.

Note: This is the ONLY place in the system where this assignment takes place, if the user does not perform this activity there will be NO QC samples assigned to ANY environmental samples. Future evaluation of the environmental results from this Trip will suffer.

Project to Monitoring Activity

For Trips which support multiple Projects, the user must assign each monitoring activity to its appropriate Project. For single Project Trips, this assignment is done automatically by the system. A single monitoring activity may be assigned to many Projects.

Result Descriptions for Samples and Measurements & Observations

After the user has selected between "Sample", "Measurement & Observation", "Sample from Sample", or "Composite of Samples". The user is presented with a series of screens, in which, the user has the ability to fully describe the monitoring activity.

Trip Summary

The Trip Summary is a convenient list of all monitoring activities conducted during the trip. This list may be ordered chronologically or by Station and Visit. By highlighting a Monitoring Activity, and clicking "Change" button at the bottom of the screen the user can edit sample information and results. The user can not create monitoring activities here, that can only be done through "Station Visit".

Basic Information

There is a customized "Basic Information" screen for each of the monitoring activities, but they differ only slightly, and fundamental information remains the same. The user must provide; "Activity ID", "Medium", "Activity Category" (if activity category is "Field Replicate or Depletion Replicate" the user must provide a *replicate number*. If the medium is "Biological" an "Intent" is also required. If the "Intent" is "Individual" a "Subject Taxon" is required. If the "Intent" is "Tissue" a "Subject Taxon" and "Bio Part" are required. If the "Intent" is "Taxon Abundance" then "Community" is required. The user must also provide a "Start Date". In the system "Start Date" is defaulted to the Trip Begin Date.

Sample Collection/Creation Procedures

On this screen the user must identify the "Sample Collection/Creation Procedure" used to generate the Sample, identify the "Gear" used to collect the Sample, and optionally provide any "Gear Deployment Comments". Clicking the double-arrow button to the right of "Procedure" displays the list of "Sample Collection/Creation Procedures" described by your organization in the Preferences and Defaults" section of Organization Information. If the list displayed is not complete, you may create a "Procedure" by clicking on the "Add Field Procedure" button at the bottom of the screen. Once a procedure has been selected, its gear type is used to create another multiple choice list of actual sampling gear, this list is displayed by clicking the double-arrow at the right of the "Gear" field. The user must select from this list, or may add a Gear by clicking the "Add Gear Configuration" button at the bottom of the screen. The user may optionally add text comments describing any unusual aspects of your deployment of this collection gear in the actual field activity.

Sample Preservation, Transport, and Storage

Details concerning the sample container and your post-collection handling of the sample are entered here. The "Defaults" button will display the list of default "Sample Preservation, Transport, and Storage" created by the Organization in the "*Preferences and Defaults*" section of the *Organization Information* section. After selection of a default profile, the user may edit each data entry field. The user may also enter Comments about the Transport and Storage of the Sample.

Actual Activity Location

Content of this screen defaults to the latitude and longitude of the station "Point of Record". Every station has a "*Point of Record*". You may click the double arrow button to examine the station for Lat/longs of any additional sampling points identified for the station, and select a different point. Further, you may supply any additional information identifying the actual activity. Comments such as "High Water. Sampled from shoreline, not centerline." might be placed here. For Samples with Gear Type of "*Net/Horizontal Tow*", this screen will contain two Lat/Long entries, "Start Information", and "Stop Information". Clicking the double-arrow beside "Start Information" displays a list of all the Lat/Longs for all the Stations Visited on the Trip, clicking the double-arrow beside "Stop Information" displays a list of all the Lat/Longs for the current Station Visit.

Activity Depth and Stratification

Various descriptors of the activity depth may be entered on this screen. In addition to measured depth, there are several relative terms available with respect to features of the water column. You may choose all which apply.

Net, Trawl, Electroshock Details

The data entry screen which displays under this button is determined by the "Gear Type" of the sample collection procedure. A different screen appears for sample procedures of "Net/Horizontal Tow", "Electroshock", and "Net/Non-Tow". All screens contain information on sampling effort and equipment settings/configuration. Considerable detail about the deployment and use of the collection gear may be entered here. For non-biological sampling activities, this button is disabled.

Personnel Performing Activity

This screen displays the list of Personnel created in Organization Information, the user may multi-select personnel to assign to the sample.

Result Values (ALL EXCEPT Medium=Biological + Intent=Taxon Abundance)

For all monitoring activities except those with "Medium=Biological" and "Intent=Taxon Abundance" the system will provide the user with a choice:

1. "Search Characteristics"
This selection presents the "Characteristic Selection" screen which allows the user to search the master characteristics reference table directly and multi-click to add characteristics to his result list.

Note: The master list of characteristics is controlled by the central STORET Database Administrator. Additions or changes to this list must be formally requested through STORET User Assistance. The list supplied with this system was derived from the old STORET System, and may be missing characteristic names important to your monitoring activities. Please make every effort to advise us of any and all such names, so that they may be added as soon as possible.

2. "Search Organization Characteristic Group"
This selection presents the user with a list of "Groups" from his Organization's "Characteristic Groups & Defaults" group list located in the "Preferences and Defaults" section. The system will ONLY present a list of Groups whose "Field Activity", "Medium" match those of the sample whose results are being entered. In addition, when "Medium" is "Biological", "Intent" (in this case either "Individual" or "Tissue") must also match.

Note: Most users find that their lists of characteristics tend to be very repetitive from sample to sample. Much of the time and effort of data entry can be eliminated by the careful construction, in "Characteristic Groups & Defaults", of lists of selected characteristics which often appear together in the analysis and evaluation of a single sample.

The user may use one or both of these search methods to construct/edit his result list. The user is presented with this search choice by selecting the "Add" button from the "Result Maintenance List" screen. The user may arrange the list on the screen into an order which makes data entry as easy as possible, by highlighting a row and exercising the "Cut", "Copy", and "Paste After" buttons on the screen. This same kind of custom sort can be pre-selected in the preferences and defaults area as well, and preserved there for future use.

Note: The "Save Group" feature, which will allow the content and arrangement on the screen to be named and placed directly into the "Characteristic Groups & Defaults" preferences area.

Entering Results

By using a combination of the search methods above the user will be able to create and sequence a list of characteristics for which data are to be entered. To enter the result value and further describe the result the user must highlight a characteristic on the screen and proceed as follows:

Clicking the button labeled "Result" takes you to one of several screens, depending on the characteristic on that row. On a typical result screen you will have a field available for the value, and where applicable, units. For substances, detection conditions may be selected in lieu of value entry. The default detection condition, "Detected and Quantified", requires a value. Other detection conditions do not.

Clicking the button labeled "Field/Lab Procedure" displays a list of methods your Organization has identified as acceptable for determinations of the selected characteristic. If this list is incomplete or inaccurate you should return to "Organization Preferences and Defaults" and make corrections or additions there as needed, and then retry the data entry. Highlight and Assign the appropriate procedure.

Clicking the button labeled "Lab Sample Prep" takes you to a list of Laboratory Sample Preparation Procedures which your organization has created/adopted in the "Lab Sample Preparation Procedures" section of "Preferences and Defaults". If this list is incomplete or inaccurate you should return to "Organization Preferences and Defaults" and make corrections or additions there as needed, and then retry the data entry. Highlight and Select the appropriate procedure.

Clicking the button labeled "Lab Info" takes you to a screen on which you can identify the name of the Laboratory, and considerable information about its processing for this analyte, including its detection and quantification limits during processing. Names of labs are drawn from a list prepared under "Organization Preferences and Defaults". You may need to return to this area from time to time to add additional labs.

This completes the fundamental steps in data entry. The next section concerns only Biological Samples of the Taxon Abundance intent.

Result Values (Medium=Biological + Intent=Taxon Abundance)

For results where the Sample "Medium=Biological", "Intent=Taxon Abundance", and "Community=any selection" the user must describe sample results through the creation of a series of *"Result Groups"*. The user may create as many *"Result Groups"* and in any combination as fully describe the sample and results. All *"Result Groups"* except *"Multi-taxon Population Census"* are "taxon specific" (not necessarily species specific) each taxon may be sub-grouped as many times as necessary to tabulate all desired counts. There are four kinds of result groups:

1. Multi-taxon Population Census:
This group represents the total count by taxa observed in the sample. Taxonomic Names may be of any "Taxonomic Rank", "Species Numbers" may be added to all "Ranks" above "Species". The user may select a list of taxa from the "Characteristic Groups & Defaults" list, or search the system "Characteristic Reference Table" directly to

create a list of taxa for results entry. A result need not have this type of Group, but if it does, it may have only one.

2. **Single Taxon Frequency Classes:**
A biological "catch" may be subdivided by taxon, and each single-taxon subset may be sub-grouped according to your specifications, and the sub-groups counted and tabulated. This Group has two sub-groups; *Physical Measures*, used to describe histograms of size or weight within a taxon, and *Biological Condition* used to tabulate counts by sex or lifestage within a taxon.
3. **Single Taxon Group Summary:**
Once the "catch" is subdivided by taxon, rather than recording data for each individual within the group, you may summarize the group according to such items as its number of individuals, its average weight or length, and maxima and minima of various measures describing its members.
4. **Single Taxon Individuals:**
Again subdividing by taxon, you may record results on an individual basis. For example, you may wish to measure and weigh each member of the taxon. This Group provides the ability to record individual observations by taxon. You must record the same Characteristics for each member of the Group. Your Characteristic selection applies to each member of the Group.

Basic Information

Each Group discussed above has a "Basic Information" screen. The user will be required to provide a "Group ID" for every group. The user will be required to provide a "Subject Taxon" for groups except "Multi-Taxon Population Census". The user may further provide a group name for each group and a description. Additionally, for a "Single taxon Frequency Classes" group the user must select either frequency analysis by either "Physical Measures" (recording the number of individuals within user defined size or weight classes with optional group descriptors of sex and/or life stage) or by "Biological Condition" (recording the number of individuals by lifestage and/or sex with no additional group descriptors). For a group of type "Single Taxon Summary" the user must provide the "Total Number in the Group" and a "Count Type". For a group of type "Single Taxon Individuals" the must provide "Total Number of Individuals".

Characteristics

For all groups except "Single Taxon Frequency Classes" the user must provide characteristics, (the user picks characteristics for "Single Taxon Frequency Classes" directly on the Result screen). For all the remaining group types the

user may select directly from the "master list of characteristics" provided by the STORET Administrators and/or from the list of characteristic groups created by the Organization in the *"Preferences and Defaults"* area of Organization. For *"Multi-Taxon Population Census"* groups the characteristics are limited to taxonomic names. For *"Single Taxon Group Summary"* and *"Single Taxon Individuals"* the characteristics are limited to the *"Biological Physical"* group of characteristics from the "master list of characteristics". In addition, the user may sequence the list of characteristics by using the *"Cut"*, *"Copy"*, and *"Paste After"* functions on the *"Result Group Characteristic Maintenance (RG4)"* screen.

Note: You can greatly simplify this task by creating "Characteristic Groups" with lists of frequently observed taxa, under the "Preferences and Defaults" area. Once the taxon names list is complete and properly sequenced, click "Close" .

Entering Results

The system provides a customized *"Result"* screen for each *"Result Group"* type.

Multi-Taxon Population Census:

In addition to the Taxon Count for each Characteristic listed, the user may record information about the "Count Type" (Actual, Calculated, or Estimated), "Statistic Type" (taken from a long list of descriptors like, Maximum, Mean, MPN, Percentiles), and provide a "Comment" (up to 1999 characters). The user may also record "Functional Feeding Group", "Taxon Pollution Tolerance", and "Trophic Level" for each Taxonomic Characteristic. If the Count is the result of a formal "Procedure" established by the Organization and described in the "Field/Lab Analytical Procedure & Equipment" section of the "Preferences & Defaults" area, and for which the Taxonomic Characteristic is listed as a "Characteristic", the user may associate such a "Counting Procedure" with each "Count" recorded.

Single Taxon Frequency Classes

For this group the user is provided with a customized result screen for each type of *"Frequency Analysis"*.

Physical Measures

The user may designate a sex and/or a lifestage. Then the user may designate a specific measure (for example "Length" or "Weight") selected from the "Biological Physical" class of characteristics from the "master list of characteristics", "Unit", and "Count Type" as the class variables. Using the fields labeled "Lower", "Upper", "Count"

and "Save" at the lower right, the user may construct a frequency histogram. The user may create other groups of this kind without limit.

Biological Condition

The user may choose either Sex or Lifestage as the primary classifier, and optionally the other as the secondary classifier. The user must provide a "Value Type". Using the data entry boxes at the lower right, the user may provide class descriptors and associated counts. The user may create other groups of this kind without limit.

Single Taxon Group Summary

For this group, the user records results of Characteristics in "summary form" for all the "Subject Taxon" individuals in the group. Statistic Type for result values in this Group are all most always "Mean", "Minimum", or "Maximum".

Single Taxon Individuals:

For this group, the user chooses characteristics similarly to those selected for a group summary, except that the intent here is to evaluate every individual in the group for these measures.

On the results screen, a numerical sequence list of individuals appears at the top right. Highlight one individual, and click "Show". The specific characteristics for that individual are displayed. Highlight any row in this display, and click "Result" to make additions or changes.

Automated Data Recording Results

This area allows the user to describe Data Loggers, Data Logger Installations at Stations, Data Logger Operating Periods individual Installations, and enter Data Logger Results for Operating Periods. Each Operating Period must be assigned to at least one Project, but may also be assigned to many Projects.

System Administration

General

The System Administration section contains many functions which are invoked to manage data, data access, and the data base structure. This section should only be accessed by a knowledgeable user. The following summary should provide some insight into the components of this section:

Analytical Procedure Administration:

This area provides the STORET Administrator the ability to manage "Field/Lab Analytical Procedures" which have been suspended by their owning Organization. The display lists Organization the Procedure was "Suspended From", the "Procedure Source" or owner, "Procedure ID", and the "Procedure Name". The STORET Administrator may "Delete/Unadopt", or "Reestablish Procedure" each Procedure listed in the display. If a Procedure is used in a Result Description it may NOT be "Deleted" (in the case of a Organization owned Procedure) nor "Unadopted" (in the case of a system provided Procedure). The STORET Administrator may "Reestablish" (return the Procedure to the "Suspended From" Organization) any Procedure at anytime. A Reestablished Procedure carries its complete description and its list of Characteristics and is re-added to the "Suspended From" Organization's "Field/Lab Analytical Procedures & Equipment" section of the "Preferences Defaults" area. The Procedure may then be used in Result Value descriptions.

Personnel Status Maintenance:

This area provides the STORET Administrator the ability to manage an Organization's Personnel. The display provides a list of all Personnel which have been "Suspended". The display lists the suspended from "Organization ID", "Last Name", "First Name", and the personnel's "Affiliation". The STORET Administrator may "Re-activate Person", "Change", or "Delete" any entry on the display list. Any person listed as "Responsible for a Monitoring Activity" may not be deleted, however change is allowed. Re-activation returns the person to the Organization's Personnel List, complete with all "Electronic Addresses" previously associated with the person. The person is then able to participate once again in Organization activities.

Station Administration:

This area provides the STORET Administrator the ability to manage Organization's Stations. The display provides a list of all Stations from all Organizations which have been suspended. The screen displays "Organization ID", "Station ID", "Station Name", "Date Suspended", and the Station "Complete" indicator. The STORET Administrator may "Delete" any one Station (only if no Monitoring Activities are linked to the Station), and "Reestablish Station". Reestablishment returns the Station and its complete description to the owning Organization's list of Stations.

National Programs:

In this area the System Administrator has the ability to create, describe, and manage "National Programs". A "National Program" can best be thought of as a "multi-organization" Program, containing Projects from many Organizations. A National Program may not be deleted if it contain Projects.

User Account Maintenance:

This area provides the STORET Administrator the ability to manage Users and their "read" and/or "write" access to individual Organizations within the STORET data base. All users must first have an Oracle™ "UserID" and "Password". The Oracle™ UserID of "STORUSER" and Password "STORUSER" were automatically created during the installation process for the stand-alone version of the data base. This STORUSER UserID is VERY IMPORTANT and is the only UserID allowed to grant privileges to other users within the STORET database. A special userID, SYSTEM (password STORET) has also been created, and has been granted D.B.A. authority within your copy of Personal Oracle™, and is the only userID which may perform EPA issued Data Base Updates and Data Base Export procedures.

All new users must first be issued an Oracle™ "UserID" and "Password". The Personal Oracle™ Navigator has functions for the maintenance of Oracle™ Logon IDS. Also, EPA has provided a SQL script (@Cr_user1.sql) which must be run from within Oracle™ SQL+ to create a new Oracle™ Logon ID/Password, and grant the privileges necessary to connect to the STORET Data Base. Any Oracle™ environment may contain many Data Bases and User IDS, and the privileges assigned to each user establish boundaries on the nature of the work they are permitted to do..

Once connected to the STORET Data Base it is the STORET Administrator who must determine each User's level of access to each Organization within the data base. In this section the STORET Administrator can further define the User and grant "read" or "write" access to each of the Organizations within the Data Base. The STORET Administrator may even grant "System Administration" Privileges within the STORET Data Base (access to the System Administration section).

Export Data:

This area provides the local Oracle™ Data Base Administrator the ability to invoke the Oracle™ "Export" utility either for purposes of creating a data base back-up or for creation of a file to be transferred to the EPA STORET Central Data Warehouse.

APPENDIX A

STORET Batch Error Messages

STORET Batch Error Messages

B00001 File could not be found or read.

Probable typographic error in the file name or path.

B00002 File/Instructions out of sequence.

Batch Terminated.

See documentation for mandatory data sequencing rules.

B00003 Batch ORG ID does not match current selected ORG.

Batch Terminated.

The **Organization ID** found in the batch file is different from the one you are using on the Interactive screens. Either correct the file, or "CLOSE" screens in STORET until you can switch organization codes, and then try again.

B00004 Trip ID not found in STORET.

The **Trip ID** found in the batch file does not match any Trip ID in your organization's data. You may not reference a Trip in the batch until it has been identified and described to STORET using the interactive screens. Either correct the file, or use the STORET interactive screen software to create the Trip ID, and then try again.

B00005 Station ID not found in STORET.

The **Station ID** found in the batch file does not match any Station ID associated with this Trip ID in your organization's data. You may not reference a Station in the batch until it has been identified and described to STORET using the interactive screens, and associated with the Trip ID. Either correct the file, or use the STORET interactive screen software to create the Station ID and/or associate it with this **Trip ID**, and then try again.

B00006 Station Visit ID not found in STORET.

The **Station Visit ID** found in the batch file does not match any Station Visit ID associated with this Trip and Station in your organization's data. You may not reference a Station Visit in the batch until it has been identified and described to STORET using the interactive screens. Either correct the file, or use the STORET interactive screen software to create the Station Visit ID, and then try again.

B00007 Field Activity ID not found in STORET.

The **Field Activity ID** found in the batch file does not match any Field Activity ID associated with this Station Visit in STORET. If you were trying to use the batch file to create the Field Activity, you have not supplied a valid ***ADD** instruction on this record. Otherwise, either return to the STORET interactive screens and describe the proper field activity, or correct the Field Activity ID in your batch file, and then try again.

B00008 Field Activity is incomplete in STORET.

Before you can add results to a Field Activity, it must have a complete description in STORET. A minimal field activity has an ID, a medium, an activity category, and a start date. Samples must have collection procedures, collection gear, and actual activity location. Biological activities have additional requirements.

B00009 Duplicate Field Activity in run.

In your batch run, all data for one field activity must appear in a single block, headed by the Field Activity ID. If the same Field Activity ID appears again later in the run, it is assumed to be an error.

B00011 Duplicate Result found for Field Activity.

In examining the database as it prepares for your update, STORET found that the target field activity contained duplicate result rows. You may not update this field activity until this error is corrected.

B00012 Characteristic Group ID not found in STORET.

The **Char Group ID** supplied in the batch does not match the ID of any characteristic group in your organization.

B00013 Characteristic Group does not match Field Activity Type.

The **Char Group ID** supplied in the batch must be valid for the activity type of the field activity being updated.

B00014 Characteristic Group does not match Field Activity Medium.

The **Char Group ID** supplied in the batch must be valid for the medium of the field activity being updated.

B00015 Characteristic Default Row ID not found in STORET.

The **Row ID** referenced on a **Result** transaction was not found in the **Char Group ID** indicated.

B00016 Characteristic defaults are incomplete in STORET.

The defaults associated with this row in the characteristic group are incomplete. For example, a default sample fraction, unit of measure, or lab procedure may be needed, depending on the characteristic named in the row.

B00017 Result value doesn't match acceptable permitted values.

Certain characteristics may have only values selected from a short list of permitted values. On this transaction, a value not in the list for its characteristic was supplied.

B00018 Invalid characters in Result value string.

For results which are numeric, characters are supplied which prevent proper conversion from the text form to the numeric form. May be triggered by typographic errors in "special" values like **ND** (not detected).

B00019 More than one sign present in Result value string.

During conversion from your result text to a numeric value, an arithmetic sign (+/-) was detected more than once.

B00020 More than one decimal present in Result value string.

During conversion from your result text to a numeric value, a decimal point was detected more than once.

B00021 Sign must be in position 1 of result.

During conversion from your result text to a numeric value, an arithmetic sign was found somewhere other than in position 1.

B00022 Result value string has more than 8 digits to the left of the decimal.

In STORET, no decimal result may have more than 8 digits to the left of the decimal point. Maximum format is +**ZZZZZZZZ.ZZZZZ**.

B00023 Result value string has more than 5 digits to the right of the decimal.

In STORET, no decimal result may have more than 5 digits to the right of the decimal point. Maximum format is +**ZZZZZZZZ.ZZZZZ**.

B00024 Space is imbedded in the Result value string.

A result value may not contain any space(s).

B00025 Duplicate Result found for Characteristic: *row id, name*

Two (or more) result rows have the same characteristic and associated defaults. Rows are tested for uniqueness by comparing their characteristic name, sample fraction, and certain other default descriptors.

B00026 Result value left blank.

Null or blank results may not be created with the batch update.

B00027 Warning: Result value is outside acceptable range for this characteristic.

This result has failed the user-specified edit check for permissible range, as found in the row of the characteristic group. This is only a warning. Data values are stored anyway.

B00028 Input file line header unrecognized.

Batch Terminated.

The data file is not in flat ASCII text format, with comma delimited fields and quoted text, or the file contains a misspelled or illegal header.

XXXXXXXXXXXX

B00029 Field Activity Type Name is invalid.

The **Activity Type** for this field activity is not one of the permitted values.

B00030 Field Activity Medium Type Name is invalid.

The **Medium** for this field activity is not one of the permitted values.

B00031 Field Activity Start Date is either blank or zero.

A **Start Date** record is present, but its value is not valid. Start date is **mandatory** and must be non-zero, and formatted **MM-DD-YYYY**.

B00032 Field Activity Start Time is either blank or zero.

A **Start Time** record is present, but has no valid value. If present, start time must be non-zero, and formatted **HH:MM:SS**.

B00033 Field Activity Start Time Zone is invalid.

The **Start Time Zone** is mandatory if the **Start Time** is present, and it must be one of the permitted values.

B00034 Field Activity Stop Date is either blank or zero.

A **Stop Date** record is present, but has no valid value. If present, stop date must be non-zero, and formatted **MM-DD-YYYY**.

B00035 Field Activity Stop Time is either blank or zero.

A **Stop Time** record is present, but has no valid value. If present, stop time must be non-zero, and formatted **HH:MM:SS**.

B00036 Field Activity Stop Time Zone is invalid.

The **Stop Time Zone** is mandatory if the **Stop Time** is present, and it must be one of the permitted values.

B00037 Field Activity Depth to Activity Msr is either blank or zero.

A **Depth** record is present, but has no valid value. If present, depth must be non-zero, and formatted **ZZZZZ.ZZ**.

B00038 Text to number measure conversion failed.

Attempts to convert the text form of a depth, volume, weight, container size measure, etc. to a valid number have failed. Check the field(s) for imbedded blanks, text characters (zero vs "oh" for example), multiple decimal points, sign out of place, and so forth.

B00039 Field Activity Depth to Activity Unit Code is blank or invalid.

The **Units** portion of the **Depth** record is not valid. Units must be either **ft** or **m**.

B00040 Field Activity Relative Depth Name is invalid.

The **Relative Depth** for this field activity is not one of the permitted values.

B00041 Field Activity Upper Depth to Activity Msr is either blank or zero.

An **Upper Depth** record is present, but has no valid value. If present, upper depth must be non-zero, and formatted **ZZZZZ.ZZ**.

B00042 Field Activity Depth to Activity Msr Unit Code is blank or invalid.

The **Units** portion of one of the **Upper/Lower Depth** records is not valid. Units must be either **ft** or **m**.

B00043 Field Activity Lower Depth to Activity Msr is either blank or zero.

A **Lower Depth** record is present, but has no valid value. If present, lower depth must be non-zero, and formatted **ZZZZZ.ZZ**.

B00044 Field Activity Depth Reference Point Text is blank.

A **Depth Measured From** record is present, but has no text value.

B00045 Field Activity Zone Type Name is invalid.

The **Zone Type** for this field activity is not one of the permitted values. Valid values are:

Epilimnion
Mesolimnion
Hypolimnion
Epibenthic

Mesobenthic
Hypobenthic

B00046 Field Activity Thermocline is invalid.

The **Thermocline** value is not one of the permitted values. Valid values are:

A (above)
I (in)
B (below)

B00047 Field Activity Pycnocline is invalid.

The **Pycnocline** value is not one of the permitted values. Valid values are:

A (above)
I (in)
B (below)

B00048 Field Activity Halocline is invalid.

The **Halocline** value is not one of the permitted values. Valid values are:

A (above)
I (in)
B (below)

B00049 Sample Total Volume is either blank or zero.

A **Volume** record is present, but has no valid value. If present, volume must be non-zero, and formatted **ZZZZZ.ZZ**.

B00050 Sample Total Volume Unit Code is blank or invalid.

The **Units** portion of the **Volume** record is not one of the permitted values.

B00051 Sample Total Weight is either blank or zero.

A **Weight** record is present, but has no valid value. If present, weight must be non-zero, and formatted **ZZZZZ.ZZ**.

B00052 Sample Total Weight Unit Code is blank or invalid.

The **Units** portion of the **Weight** record is not one of the permitted values.

B00053 Sample Container Type Name is invalid.

The **Container Type Name** value is not one of the permitted values.

B00054 Sample Container Color is invalid.

The **Container Color** value is not one of the permitted values.

B00055 Sample Container Size is either blank or zero.

A **Container Size** record is present, but has no valid value. If present, **Container Size** must be non-zero, and formatted **ZZZZ.ZZ**.

B00056 Sample Container Size Unit Code is blank or invalid.

The **Units** portion of the **Container Size** record is not one of the permitted values.

- B00057** Sample Temperature Preservation Type Name is invalid.
The **Temperature Preservation** value is not one of the permitted values.
- B00058** Sample Duration Time is either blank or zero.
A **Duration Time** record is present, but has no valid value. If present, **Duration Time** must be non-zero, and formatted **ZZZ**.
- B00059** Sample Duration Units is blank or invalid.
The **Units** portion of the **Duration Time** record is not one of the permitted values.
- B00060** Sample Transport ID not found in STORET.
The **Sample Transport ID** supplied in the batch does not match the ID of any "Sample Transport and Storage" default set in your organization.
- B00061** Field Collection Procedure ID not found in STORET.
The **Sample Collection Procedure ID** supplied in the batch does not match the ID of any "Field Sample Collection Procedure" in your organization.
- B00062** Absolute Location Point invalid for Station.
The **Location** reference to an absolute location point supplied in the batch does not identify any point defined for the station you are updating. Both the point type and its sequence number must match.
- B00063** Project ID invalid for Trip and Station.
The **Project ID** supplied in the batch to link the field activity to a project does not match a project supported by this trip, or does not have this station assigned to it. Check the projects supported by the trip and the stations assigned to these projects in STORET as needed.
- B00064** Project referenced more than once for this Field Activity.
You have used multiple **Project ID** records to link the field activity to several projects, and have repeated yourself.
- B00065** Person is inactive. Can't be assigned to Field Activity.
The **Person** named is currently in "suspended" status in your STORET database. People in your organization may be suspended (for STORET purposes) if you determine that they are not available to perform field work or lab work relating to STORET data. Suspended persons may be reactivated if appropriate.
- B00066** Person not found in STORET.
The **Person** named in the batch file does not match any Person in your organization's data. You may not reference a Person in the batch until it has been identified and described to STORET using the interactive screens. Either correct the file, or use the STORET interactive screen software to create the Person, and then try again.
- B00067** Person referenced more than once for this Field Activity.
You have used multiple **Person** records to link the field activity to several people, and have repeated yourself.
- B00068** Field Activity mandatory fields are missing.

One or more mandatory field activity descriptors has been omitted. Note that some items are conditionally mandatory, depending on the presence of related items.

B00069 Field Activity already exists.

The **Activity ID** supplied with the ***ADD** option already exists in STORET for the trip and station visit you are updating.

B00070 Field Activity Category Type Name is invalid.

The **Activity Category** supplied in the batch is not one of the permitted values.

B00071 Field Activity Category Type Name requires a Replicate Number.

The **Activity Category** supplied with the batch is one of the replicate activities, and you have omitted the **Replicate Number** field on the **Activity ID** record.

B00072 Field Activity Replicate Number is not applicable for this Category Type Name.

The **Activity Category** supplied with the batch is *not* one of the replicate activities, and you may not supply a **Replicate Number** field on the **Activity ID** record.

B00073 Field Activity Start Date is less than Station Visit Arrival Date.

The **Start Date** (and **Start Time**) for a field activity must not precede the arrival date and time found in the station visit description in STORET.

B00074 Field Activity Start Time Zone without Start Time.

The **Start Time Zone** record is present, but no **Start Time** was supplied.

B00075 Field Activity Stop Time without Stop Date.

The **Stop Time** for a field activity may not be stored without the **Stop Date**. For activities completed on the same date as they are started, the **Stop Date** will be the same as the **Start Date**.

B00076 Field Activity Stop Date is less than Start Date.

The **Stop Date** (and **Stop Time**) may not precede the start date and time for a field activity.

B00077 Field Activity Stop Time Zone without Stop Time.

The **Stop Time Zone** record is present, but no **Stop Time** was supplied.

B00078 Field Activity Depth to Activity and Upper/Lower Depths cannot both be entered.

You may not enter both a depth range (i.e. **Upper Depth** and **Lower Depth**), and a specific **Depth** for a field activity.

B00079 Field Activity Relative Depth and Upper/Lower Depths cannot both be entered.

You may not enter both a depth range (i.e. **Upper Depth** and **Lower Depth**), and a **Relative Depth** for a field activity.

B00080 Field Activity Upper and Lower Depths must both be provided if either is provided.

The **Upper Depth** and **Lower Depth** must be entered as a pair. Neither may be entered by itself.

B00081 Field Activity Upper Depth is greater than Lower Depth.

The numeric value of the **Upper Depth** must be less than that of the **Lower Depth**. The **Upper Depth** is the one closest to the surface.

B00082 Field Activity Upper and Lower Depth unit measures do not match.

Although entered separately, the **Units** portion of the **Upper Depth** and **Lower Depth** records must be the same.

B00083 Sample data does not apply for Field Measurement/Observations.

When the **Activity Type** is "Field Msr/Obs", descriptors such as **Volume**, **Weight**, **Container Type Name**, and so forth, may not be specified.

B00084 Field Activity create failed.

The STORET database update for this field activity failed.

B00085 Sample default data already entered yet a default was provided.

The **Sample Transport ID** record was supplied to provide defaults for sample descriptors, and one or more of those descriptors was also present in the batch file.

B00086 Sample create failed.

The STORET database update for this sample failed.

B00087 Field Sampling Procedures are not applicable for Measurement/Observations.

When the **Activity Type** is "Field Msr/Obs", sample collection process descriptors such as **Sample Collection Procedure ID**, **Field Gear ID**, **Gear Configuration ID**, and so forth, may not be specified.

B00088 Field Sampling Procedure is required for Samples.

When the **Activity Type** is "Sample", **Sample Collection Procedure ID** and **Field Gear ID** are mandatory.

B00089 Field Activity Procedure assignment failed.

The STORET database connection between the field activity and its collection procedure failed.

B00090 Field Gear Type doesn't match Field Procedure gear type.

The **Field Gear ID** supplied in the batch represents a gear type which does not match the gear type associated with the **Sample Collection Procedure ID**.

B00091 Field Gear not found in STORET.

The **Field Gear ID** supplied in the batch does not match any field gear specification in STORET.

B00092 Field Activity Field Gear assignment failed.

The STORET database connection between the field activity and its field gear failed.

B00093 Gear Configuration invalid for Organization and/or Field Gear.

The **Gear Configuration ID** supplied with the batch has never been associated with its companion **Field Gear ID** by your organization.

B00094 Field Activity Gear Configuration assignment failed.

The STORET database connection between the field activity and its field gear configuration failed.

B00095 Station ALP Point of Record not found in STORET.

The station whose data you are updating does not have a defined point of record among its absolute location points.

B00096 Actual Activity Location create failed.

The STORET database connection between the field activity and its actual activity location point failed.

B00099 Field Activity Project assignment failed.

The STORET database connection between the field activity and one of its projects failed.

B00100 Field Activity Person assignment failed.

The STORET database connection between the field activity and one of its people failed.

B00101 Medium is not applicable for Habitat or Replicate Habitat Measurements/Observations.

When the **Activity Category** is one of the habitat assessments, the **Medium** record may not be supplied.

B00102 Habitat Class Scheme Characteristic Row ID not found in STORET.

In a **Result** record used with a habitat assessment **Char Group ID**, the **Row ID** supplied in the batch does not match any row ID previously entered in the group in STORET.

B00103 User defined Habitat Result create failed.

The STORET database update for your habitat assessment result row failed.

B00104 Duplicate Habitat Class Scheme Char referenced in Characteristic Group.

Two (or more) rows in the habitat assessment **Char Group ID** contain duplicate characteristics.

B00105 Result text value must be in double quotes.

On a **Result** record, the value is supplied as free text, but is not enclosed in quotes.

B00106 Invalid characters in input string.

You have supplied a numeric value which has non-numeric characters imbedded in it. Check for zero vs "oh", extra dots or signs, "ell" instead of one, or misplaced blanks.

B00107 More than one decimal present in input string.

You have supplied a numeric value which has multiple decimal points.

B00108 Too many digits to the left of the decimal.

You have supplied a numerical value which exceeds the STORET limit for digits to the left of the decimal point.

B00109 Too many digits to the right of the decimal.

You have supplied a numerical value which exceeds the STORET limit for digits to the right of the decimal point.

- B00110** Space is imbedded in input string.
You have supplied a numeric value which has imbedded blank(s).
- B00111** Depth information is not applicable for habitat assessments.
When the **Activity Category** is one of the habitat assessments, you may not supply any of the values and descriptors associated with depth.
- B00200** Field Activity Intent Type Name is invalid.
The **Intent** for this field activity is not one of the permitted values.
- B00201** Field Activity Community Name is invalid.
The **Community** for this field activity is not one of the permitted values.
- B00202** Biological Taxon Abundance samples require a Community Name.
The **Intent** for this Field Activity is Taxon Abundance, but you have omitted the **Community** record.
- B00203** Community Name is only applicable for Taxon Abundance samples.
The **Intent** for this Field Activity has either not been provided or is *not* Taxon Abundance.
- B00204** Bio Part is blank.
A **Biopart** record is present, but has no valid value. If present, **Biopart** must be a valid Bio Part Name as defined in STORET.
- B00205** Data File Name Location is blank.
A **Data File Name Location** record is present, but has no text value.
- B00206** Biopart is not applicable for Biological Taxon Abundance samples.
The **Intent** for this Field Activity is "Taxon Abundance". **Biopart** is only applicable for Tissue samples.
- B00207** Subject Taxon is not applicable for Biological Taxon Abundance samples.
A **Field Activity Subject Taxon** record has been provided for a Taxon Abundance sample. It is only valid for Individual or Tissue samples.
- B00208** Electroshock Voltage Measure is either blank or zero.
An **Voltage** record is present, but has no valid value. If present, **Voltage** must be non-zero, and formatted **ZZZ.ZZZ**.
- B00209** Electroshock Current Type Code is invalid.
The **Current Type** is not one of the permitted values.
- B00210** Electroshock Amperage Measure is either blank or zero.
An **Amperage** record is present, but has no valid value. If present, **Amperage** must be non-zero, and formatted **ZZZ.ZZZ**.
- B00211** Electroshock Pass Length is either blank or zero.
A **Pass Length** record is present, but has no valid value. If present, **Pass Length** must be non-zero, and formatted **ZZZZZ**.

- B00212** Electroshock Pass Length Units is blank or invalid.
The **Units** portion of the **Pass Length** record is not one of the permitted values.
- B00213** Electroshock Pulse Rate Measure is either blank or zero.
A **Pulse Rate** record is present, but has no valid value. If present, **Pulse Rate** must be non-zero, and formatted **ZZZ**.
- B00214** Electroshock Total Energized Time is either blank or zero.
A **Total Energized Time** record is present, but has no valid value. If present, **Total Energized Time** must be non-zero, and formatted **ZZZ**.
- B00215** Electroshock Total Energized Time Units is blank or invalid.
The **Units** portion of the **Total Energized Time** record is not one of the permitted values.
- B00216** Trap Net Operation Detail Sampling Duration Msr is either blank or zero.
A **Sampling Duration** record is present, but has no valid value. If present, **Sampling Duration** must be non-zero, and formatted **ZZ.ZZ**.
- B00217** Trap Net Operation Detail Sampling Duration Units is blank or invalid.
The **Units** portion of the **Sampling Duration** record is not one of the permitted values.
- B00218** Trap Net Operation Detail Orientation to Current is blank or invalid.
The **Orientation to Current** is not one of the permitted values.
- B00219** Trap Net Operation Detail Relative Current Direction Msr is blank.
A **Trap Net Relative Current Direction** record is present, but has no valid value. If present, **Trap Net Relative Current Direction** must be between 0 and 359, formatted **ZZZ**.
- B00220** Trap Net Operation Detail Relative Current Direction Msr must be between 0 and 359.
A **Trap Net Relative Current Direction** record is present, but the value is not within the acceptable range of 0 through 359.
- B00221** Trap Net Operation Detail Relative Wind Direction Msr is blank.
A **Trap Net Relative Wind Direction** record is present, but has no valid value. If present, **Trap Net Relative Wind Direction** must be between 0 and 359, and formatted **ZZZ**.
- B00222** Trap Net Operation Detail Relative Wind Direction Msr must be between 0 and 359.
A **Trap Net Relative Wind Direction** record is present, but the value is not within the acceptable range of 0 through 359.
- B00223** Trawl Operation Detail Fished Duration Msr is either blank or zero.
A **Fished Duration** record is present, but has no valid value. If present, **Fished Duration** must be non-zero, and formatted **ZZ.ZZ**.
- B00224** Trawl Operation Detail Fished Duration Units is blank or invalid.
The **Units** portion of the **Fished Duration** record is not one of the permitted values.
- B00225** Trawl Operation Detail Boat Speed Msr is either blank or zero.

A **Boat Speed** record is present, but has no valid value. If present, **Boat Speed** must be non-zero, and formatted **ZZ.Z**.

B00226 Trawl Operation Detail Boat Speed Units is blank or invalid.

The **Units** portion of the **Boat Speed** record is not one of the permitted values.

B00227 Trawl Operation Detail Fished Distance Msr is either blank or zero.

A **Fished Distance** record is present, but has no valid value. If present, **Fished Distance** must be non-zero, and formatted **ZZZ.ZZ**.

B00228 Trawl Operation Detail Fished Distance Units is blank or invalid.

The **Units** portion of the **Fished Distance** record is not one of the permitted values.

B00229 Trawl Operation Detail Relative Current Direction Msr is blank.

A **Trawl Relative Current Direction** record is present, but has no valid value. If present, **Trawl Relative Current Direction** must be between 0 and 359, and formatted **ZZZ**.

B00230 Trawl Operation Detail Relative Current Direction Msr must be between 0 and 359.

A **Trawl Relative Current Direction** record is present, but the value is not within the acceptable range of 0 through 359.

B00231 Trawl Net Operation Detail Relative Wind Direction Msr is blank.

A **Trawl Relative Wind Direction** record is present, but has no valid value. If present, **Trawl Relative Wind Direction** must be between 0 and 359, and formatted **ZZZ**.

B00232 Trawl Operation Detail Relative Current Wind Msr must be between 0 and 359.

A **Trawl Relative Wind Direction** record is present, but the value is not within the acceptable range of 0 through 359.

B00233 Station is not assigned to the current Trip.

The **Station ID** referenced in the **Trawl Start** record does not match any Station ID associated with this Trip ID in your organization's data. You may not reference a Station in the batch until it has been identified and described to STORET using the interactive screens, and associated with the Trip ID. Either correct the file, or use the STORET interactive screen software to create the Station ID and/or associate it with this **Trip ID**, and then try again.

B00234 Stop Station must be the current Station.

The **Station ID** referenced in the **Trawl Stop** record does not match the current **Station ID** in the batch input file. The stop station must be the same as the station currently visited for this field activity.

B00235 Trawl Start Location is required.

A **Trawl Start Location** record has not been provided, yet the field activity gear type is Net/Horizontal Tow. All trawl field activities require a **Trawl Start Location** and **Trawl Stop Location**.

B00236 Parent Field Activity ID is invalid for Station Visit.

The **Parent Field Activity ID** found in the batch file does not match any Field Activity ID associated with this Station Visit in STORET.

If you were trying to use the batch file to create the Field Activity, you have not supplied a valid ***ADD** instruction on this record. Otherwise, either return to the STORET interactive screens and describe the proper field activity, or correct the Field Activity ID in your batch file, and then try again.

B00237 Parent referenced more than once for this Field Activity.

The **Parent** Field Activity appears in the input file more than once for a given child Field Activity creation.

B00238 Field Meas/obs cannot have a Biological medium.

Activity Category is Field Meas/Obs, yet **Medium** is Biological. Valid **Medium** choices for field measurements/observations are: **air**, **water**, **soil**, and **sediment**.

B00239 Biological samples require an Intent.

The **Medium** of this Field Activity is Biological, but you have omitted the **Intent** record.

B00240 Biological Tissue samples require a Bio Part.

The **Intent** of this Field Activity is Tissue, but you have omitted the **Biopart** record.

B00241 Biological Individual Sample from Samples are not allowed.

An **Intent** record of Individual was found; this is invalid for Sample from Samples. Only Tissue and Taxon Abundance are permitted here.

B00242 Subject Taxon is required for Biological Tissue and Individual samples.

Intent is either Tissue or Individual, yet you have omitted the **Subject Taxon** record.

B00243 Field Activity Depth information is not supported for Sample from Samples or Composite with Parents.

When the **Activity Category** is either Created from Sample or Composite-with Parents, you may not supply any of the values and descriptors associated with depth.

B00244 Bio Part name not found in STORET.

The **Biopart** Name found in the batch file does not match any Biopart Name defined in STORET.

B00245 Sample from Samples require a single parent.

A **Parent ID** record has either been omitted or more than one occurrence of **Parent ID** has been found for this Sample from Sample. One and only one **Parent ID** is required for Sample from Samples.

B00246 Air medium is invalid for Sample from Samples.

When the **Activity Category** is Created from Sample, a **Medium** of Air is not permitted.

B00247 Parent has already been composited; it cannot be used again.

A **Parent ID** of a Composite-with Parents can be reused for another Sample from Sample but *not* for another Composite-with parents. This currently invalidates the data base.

B00248 Parent is invalid for this Field Activity.

The **Parent ID** provided is not a valid candidate for this child field activity. The following business rules are enforced:

1. All parents must be samples.
2. If the child has a **Medium** of Sediment, Air or Soil, then the parent must also have the same medium type.
3. If the Sample from Sample has a **Medium** of Water, then the parent must have a **Medium** of Water, Sediment or Soil.
4. If the Composite-with Parent sample has a **Medium** of Water, then the parent must also have the same medium type.
5. For Biological Tissue Sample from Samples, then the parent must be either Biological Individual or Biological Tissue.
6. For Biological Tissue Composite-with Parents, then the parent must be either Biological Individual with the same Subject Taxon Characteristic or Biological Tissue with a Biopart Name.
7. For Biological Taxon Abundance Sample from Samples, then the parent must have a **Medium** of Water, Sediment or Soil.

B00249 Composite with Parents requires at least two parents.

A **Parent ID** record has either been omitted or only one occurrence of **Parent ID** has been found for this composite sample. At least two **Parent ID** rows are required for Composite with Parents.

B00250 Intent must be Tissue for Biological Composite with Parents.

An **Intent** record of Taxon Abundance or Individual was found which is invalid for Composite-with Parents.

B00251 Mandatory data missing for operational details.

One or more mandatory operational detail descriptors has been omitted. Note that these details are conditionally mandatory. If any operational details are provided, then the mandatory descriptors are required.

B00252 Electroshock Operation Detail creation failed.

The STORET database update for this operational detail failed.

B00253 Trawl Operation Detail creation failed.

The STORET database update for this operational detail failed.

B00254 Trap Net Operation Detail creation failed.

The STORET database update for this operational detail failed.

B00255 Location is not supported for Sample from Samples and Composite-with Parents.

When the **Activity Category** is either Created from Sample or Composite-with Parents, you may not supply any of the values associated with location.

B00256 Text field value left blank.

A text-type record is present, but has no text value.

B00257 Result Comments left blank.

A **Result Comments** record is present, but has no text value.

B00258 Result Comments could not be added.

The STORET database update for this result failed.

B00259 Reference Point data is only applicable for Physical Results.

A **Reference Point From/To** record has been inadvertently supplied for a non-physical result.

B00260 Reference Point From value left blank. Both are required.

A **Reference Point From/To** record has been provided, but the “from” component has no text value. Both the “from” and “to” components are required.

B00261 Reference Point To value left blank. Both are required.

A **Reference Point From/To** record has been provided, but the “to” component has no text value. Both the “from” and “to” components are required.

B00262 Bio Result Group Type Name is blank or invalid.

The Type Name portion of the **Bio Result Group** record is not valid. Valid abbreviated values are:

MTPC - Multi-Taxon Population Census

STGS - Single Taxon Group Summary

STI - Single Taxon Individual

STFC - Single Taxon Frequency Classes (Biological Conditions and Physical Conditions)

B00263 Subject Taxon is blank.

Either the **Field Activity Subject Taxon** or **Bio Result Group Subject Taxon** record is present, but has no valid value. If present, the subject taxon must be a valid Characteristic Search Name as defined in STORET followed by a species number, if required. Valid values for species number are **sp.1** through **sp.9**.

B00264 Subject Taxon Search name not found in STORET.

The **Field Activity Subject Taxon/Bio Result Group Subject Taxon** found in the batch file does not match any Characteristic Search Name defined in STORET.

B00265 Species Number is invalid.

A species number has been provided for a **Field Activity Subject Taxon/Bio Result Group Subject Taxon** Characteristic for which it is not required or the value entered is invalid. Valid values are **sp.1** through **sp.9**.

B00266 Subject Taxon requires a Species Number.

Either a **Field Activity Subject Taxon** or **Bio Result Group Subject Taxon** record has been provided whose Characteristic requires a species number, yet you have omitted the species number.

B00267 Bio Result Group Type Indicator is only valid for Single Taxon Frequency Classes.

A **Type Indicator** record is present, yet the **Bio Result Group** for which it corresponds has a group type name other than Single Taxon Frequency Classes (abbreviated as STFC).

B00268 Bio Result Group Type Indicator is invalid.

The **Type Indicator** for the Bio Result Group is not valid. Valid values are **B** (for Biological) and **P** (for Physical).

- B00269** Bio Result Group Count is either blank or zero.
A **Count** record for the Bio Result Group is present, but its value is not valid. If present, **Count** must be non-zero, and formatted **ZZZZZ**.
- B00270** Sex Name is invalid.
The **Sex** name for the Bio Result Group is not one of the permitted values.
- B00271** Lifestage Name is invalid.
The **Lifestage** name of the Bio Result Group is not one of the permitted values.
- B00272** Sex and Lifestage are only applicable for Physical Conditions.
Either a **Sex** and **Lifestage** record is present, yet the **Bio Result Group** for which it corresponds has a group type name other than Single Taxon Frequency Classes (abbreviated as STFC) or the **Type Indicator** is other than **P** for Physical Condition.
- B00273** Subject Taxon is not applicable for Multi-Taxon Population Census groups.
A **Bio Result Group Subject Taxon** record has been inadvertently provided for a Multi-Taxon Population Census **Bio Result Group**. A subject taxon is required for all group types except Multi-Taxon Population Census.
- B00274** Subject Taxon is required.
Either a **Field Activity Subject Taxon** or **Bio Result Group Subject Taxon** record has not been provided, yet the field activity or result group requires one.
- B00275** Type Indicator is required for Single Taxon Frequency Classes.
A **Type Indicator** record has not been provided, yet the **Bio Result Group** has a group type name of Single Taxon Frequency Classes. Batch needs to know whether this group is a physical or biological condition.
- B00276** Count is required for Single Taxon Group Summary and Individuals.
A **Count** record has not been provided, yet the **Bio Result Group** has a group type name of either Single Taxon Group Summary or Single Taxon Individuals. A summary group count is required for both of these types of groups.
- B00277** Count is not applicable for Single Taxon Frequency Classes or Multi-Taxon Population Census groups.
A **Count** record has been inadvertently provided for a Multi-Taxon Population Census or Single Taxon Frequency Class **Bio Result Group**. A summary group count is required for Single Taxon Group Summary and Single Taxon Individual groups only.
- B00278** A Field Activity can have only one Multi-taxon Population Census.
More than one Multi-Taxon Population Census **Bio Result Group** record has been provided for this field activity. Only one is allowed per field activity.
- B00279** Multi-Taxon Population Census group must be the first one added.
A Multi-Taxon Population Census **Bio Result Group** record is present, yet it is not the first **Bio Result Group** record processed for this field activity. If a Multi-Taxon Population Census group is to be added, it must listed before other groups for the same field activity in the input file.

- B00280** Number in group is greater than Multi-Taxon Population Census Result value.
The **Count** supplied for the current group is greater than the **Result Value/Count** for the same Characteristic as provided in the Multi-Taxon Population Census group.
- B00281** Bio Result Group Subject Taxon associate failed.
The STORET database update for this assignment failed.
- B00282** Duplicate Bio Result Group ID found in STORET for this Field Activity.
In your batch run, all data for one bio result group must appear in a single block, headed by the Bio Result Group ID. If the same Bio Result Group ID appears again later in the run, it is assumed to be an error.
- B00283** Bio Result Group create failed.
The STORET database update for this bio result group failed.
- B00284** Characteristic Groups are not applicable for Single Taxon Frequency Classes.
A **Char Group ID** record has been provided for a Single Taxon Frequency Class **Bio Result Group**. A Char Group is required for all group types except Single Taxon Frequency Classes.
- B00285** Characteristic Group does not match Field Activity Intent.
The **Char Group ID** supplied in the batch must be valid for the intent of the field activity being updated.
- B00286** Characteristic Group does not match Bio Result Group Type Name.
The **Char Group ID** supplied in the batch must be valid for the group type name of the **Bio Result Group** being updated.
- B00287** Individual Number is either blank or zero.
An **Individual** record is present, but the **Individual Number** for this Single Taxon Individual group is either blank or zero. The number must be non-zero and less than or equal to the total **Count** for the group.
- B00288** Individual Number is invalid for this Bio Result Group.
An **Individual** record is present, but the **Individual Number** for this Single Taxon Individual group is invalid. The number must be non-zero and less than or equal to the total **Count** for the group.
- B00289** Bio Result Group Type Indicator does not equal "B" for biological condition.
A **Bio Condition** record is present, but there is either no associated **Type Indicator** record for the bio result group or it is not equal to **B** for biological condition.
- B00290** Primary Condition is blank or invalid.
A **Bio Condition** record is present, but the **Primary Condition** component is invalid. It must be either **Sex** or **Lifestage**.
- B00291** Secondary Condition is invalid.
A **Bio Condition** record is present, but the **Secondary Condition** component is invalid. If the **Secondary Condition** is entered, it must be either **Sex** or **Lifestage**, but it cannot be the same as the **Primary Condition**.

- B00292** Primary and Secondary Conditions cannot be the same.
A **Bio Condition** record is present, but the **Primary** and **Secondary Conditions** are the same.
- B00293** Primary Class Descriptor is blank or invalid.
A **Bcount** result record is present, yet the **Primary Class Descriptor** is invalid. It must be a valid Characteristic Permitted Value of the **Primary Condition**. For example, if the primary condition is "Sex", then one valid primary class descriptor is "Female".
- B00294** Secondary Class Descriptor is required since a Secondary Condition was provided.
The **Secondary Class Descriptor** portion of the **Bcount** result record is missing. If a **Secondary Condition** is provided in the **Bio Condition** record, then there must be an associated **Secondary Class Descriptor** in the **Bcount** record. The **Secondary Class Descriptor** must be a valid Characteristic Permitted Value of the **Secondary Condition**.
- B00295** Secondary Class Descriptor is invalid since a Secondary Condition was not provided.
The **Secondary Class Descriptor** portion of the **Bcount** result record is present, yet there is no corresponding **Secondary Condition** in the **Bio Condition** record.
- B00296** Secondary Class Descriptor is invalid.
A **Bcount** result record is present, yet the **Secondary Class Descriptor** is invalid. It must be a valid Characteristic Permitted Value of the **Secondary Condition**. For example, if the secondary condition is "Lifestage", then one valid secondary class descriptor is "Adult".
- B00297** Duplicate Frequency Class Result found in run.
More than one **Bcount** result record is present with the same **Primary Class Descriptor** and **Secondary Class Descriptor**. If the same **Bcount** record appears more than once in the run, it is assumed to be an error.
- B00298** Bio Result Group Type Indicator does not equal "P" for physical condition.
A **Common Class** record is present, but there is either no associated **Type Indicator** record for the bio result group or it is not equal to **P** for physical condition.
- B00299** Physical Condition subject taxon is blank or invalid.
A **Common Class** record is present, but the **Subject Taxon** component is not valid. It must be a valid Characteristic Search Name as defined in STORET, specifically a valid biological physical measurement.
- B00300** Physical Condition subject taxon must be a valid biological physical measurement.
A **Common Class** record is present, but the **Subject Taxon** component is not a valid biological physical measurement Characteristic as defined in STORET.
- B00301** Unit of Measure could not be found in STORET.
The **Units** portion of the **Common Class** record does not match any Unit of Measure defined in STORET.
- B00302** Unit of Measure is invalid for this Characteristic.
The **Units** portion of the **Common Class** record is invalid for the type of **Subject Taxon** Characteristic provided.

B00304 Lower Bound is invalid or blank.

A **Pcount** result record is present, yet the **Lower Bound Amount** is not valid. It must be non-zero, and formatted as **ZZZZZ.ZZ**.

B00305 Upper Bound is invalid or blank.

A **Pcount** result record is present, yet the **Upper Bound Amount** is not valid. It must be non-zero, and formatted as **ZZZZZ.ZZ**.

B00306 Upper bound amount is less than lower bound amount.

For a given **Pcount** result record, the **Lower Bound Amount** must be less than or equal to the **Upper Bound Amount**.

B00307 Overlapping groups are not allowed.

The lower and upper bounds of this **Pcount** result record overlap with those of another **Pcount** result record for this Single Taxon Frequency Class.

B00308 Sum of counts is greater than the Result value.

The total sum of the **Pcount** result values/counts is greater than the **Result Value/Count** for the same Characteristic in the Multi-Taxon Population Census group.

B00309 Result Comments are not applicable for Single Taxon Individual and Single Taxon Group Summary.

A **Result Comments** record has been provided for a Single Taxon Individual or Single Taxon Group Summary result. This is not supported on the associated online windows.

B00310 Result Reference Point From/To are not applicable for Single Taxon Individual and Single Taxon Group Summary.

A **Reference Point From/To** record has been provided for a Single Taxon Individual or Single Taxon Group Summary result. This is not supported on the associated online windows.

B00311 Result Value Status is blank or invalid.

A **Result Value Status** record is present, but has no valid value. If present, **Result Value Status** must be either **P** (for Preliminary) or **F** (for Final).

B00312 Result Update failed.

The STORET database update for this result failed.

B00313 Cell Form Type Name is blank or invalid.

The **Result Cell Form** is not one of the permitted values.

B00314 Cell Shape Type Name is blank or invalid.

The **Result Cell Shape** is not one of the permitted values.

B00315 Laboratory ID not found in STORET.

The Laboratory ID found in the batch file does not match any Laboratory ID in your organization's data. You may not reference a Lab in the batch until it has been identified and described to STORET using the interactive screens. Either correct the file, or use the STORET interactive screen software to create the Laboratory ID, and then try again.

B00316 Laboratory Result Assignment failed.

The STORET database update for this assignment failed.

B00317 Result Analysis Date is either blank or zero.

A **Result Analysis Date** record is present, but its value is not valid. If present, analysis date must be non-zero, and formatted **MM-DD-YYYY**.

B00318 Result Analysis Time is either blank or zero.

A **Result Analysis Time** record is present, but has no valid value. If present, analysis time must be non-zero, and formatted **HH:MM:SS**.

B00319 Analysis Date is required before entering Analysis Time.

A **Result Analysis Time** record is present, but an associated **Result Analysis Date** record was not provided.

B00320 Analysis Date and Time are required before entering Analysis Time Zone.

An **Result Analysis Time Zone** record is present, but an associated **Result Analysis Date** and/or **Result Analysis Time** record was not provided.

B00321 Analysis Time Zone is blank or invalid.

A **Result Analysis Time Zone** is mandatory if the **Result Analysis Time** is present, and it must be one of the permitted values.

B00322 Result Cell Descriptors are only applicable for Phytoplankton/Zooplankton Multi-Taxon Population Census groups.

Either a **Result Cell Shape** or **Result Cell Form** record is present for a **Community** other than Phytoplankton/Zooplankton or a **Bio Result Group** other than Multi-Taxon Population Census.

B00323 Location Depth to Bottom Msr is either blank or zero.

A **Trawl Start Depth to Bottom** or **Trawl Stop Depth to Bottom** record is present, but has no valid value. If present, it must be non-zero, and formatted as **ZZZZZ.ZZ**.

B00324 Location Depth to Bottom Units is blank or invalid.

The **Units** portion of one of the **Depth to Bottom** records is not valid. Units must be either **ft** or **m**.

B00325 Location Depth to Bottom is not applicable for this Field Activity.

Depth to Bottom records are only applicable for Net/Horizontal Tow activities.

B00326 Station Visit Arrival Date is either blank or zero.

An **Arrival Date** record is present, but its value is not valid. If present, arrival date must be non-zero, and formatted **MM-DD-YYYY**.

B00327 Station Visit Arrival Time is either blank or zero.

An **Arrival Time** record is present, but has no valid value. If present, arrival time must be non-zero, and formatted **HH:MM:SS**.

B00328 Station Visit Arrival Time Zone is invalid.

The **Arrival Time Zone** is mandatory if the **Arrival Time** is present, and it must be one of the permitted values.

- B00329** Station Visit Departure Date is either blank or zero.
A **Departure Date** record is present, but has no valid value. If present, departure date must be non-zero, and formatted **MM-DD-YYYY**.
- B00330** Station Visit Departure Time is either blank or zero.
A **Departure Time** record is present, but has no valid value. If present, departure time must be non-zero, and formatted **HH:MM:SS**.
- B00331** Station Visit Departure Time Zone is invalid.
The **Departure Time Zone** is mandatory if the **Departure Time** is present, and it must be one of the permitted values.
- B00332** Station Visit already exists.
The **Visit Number** supplied with the ***ADD** option already exists in STORET for the trip and station you are updating.
- B00333** Station Visit Arrival Date is less than Trip Start Date.
The **Arrival Date** must be greater than or equal to the start date of the trip.
- B00334** Station Visit Arrival Time Zone without Arrival Time.
The **Arrival Time Zone** record is present, but no **Arrival Time** was supplied.
- B00335** Station Visit Departure Date is less than Arrival Date.
The **Departure Date** may not precede the arrival date for the station visit.
- B00336** Station Visit Departure Time without Departure Date.
The **Departure Time** for the station visit may not be stored without the **Departure Date**.
- B00337** Station Visit Departure Time Zone without Departure Time.
The **Departure Time Zone** record is present, but no **DepartureTime** was supplied.
- B00338** Station Visit create failed.
The STORET database update for this visit failed.
- B00339** Characteristic Group does not match Field Activity Community.
The **Char Group ID** supplied in the batch must be valid for the community of the field activity being updated.
- B00340** Cannot reduce count below number in Single Taxon Frequency Classes.
The **Result Value/Count** for the Multi-Taxon Population Census group is less than the total count/sum of results for the same Characteristic in an existing Single Taxon Frequency Class group.
- B00341** Cannot reduce count below number in Single Taxon Summary Group.
The **Result Value/Count** for the Multi-Taxon Population Census group is less than the **Count** for the same Characteristic in an existing Single Taxon Summary Group.
- B00342** Cannot reduce count to less than the number of individuals.

The **Result Value/Count** for the Multi-Taxon Population Census group is less than the **Count** for the same Characteristic in an existing Single Taxon Individuals group.

B00344 Trawl Location information is not applicable for this Field Activity.

If this is a child Field Activity (i.e., Activity Category is Created from Sample or Composite-with Parents) or if the gear type for this activity is something other than "Net/Horizontal Tow", then trawl location is not permitted.

B20001 Trip ID is not allowed for data logger update. Check input file format.

A Trip Monitoring batch input file was probably mistakenly selected for Automated Data Logger batch update. Run ADL batch again with an ADL batch file, or create an ADL batch file.

B20002 The number of batch input Field Activities does not match the number in STORET

The Automated Data Logger batch program counts the number of **Result** records in the batch for the Operating Period identified in the preceding **Op Log** record, and compares the count with the number of Field Activities for the same Operating Period in STORET. There should be a one-to-one correspondence. The correct number of Field Activities can be determined in STORET by going to OP2 Operating Period Data Entry, under O3 Organization Menu, Automated Data Recording Results.

B20003 Visit Number is not allowed for data logger update. Check input file format.

A Trip Monitoring batch input file was probably mistakenly selected for Automated Data Logger batch update. Run ADL batch again with an ADL batch file, or create an ADL batch file.

B20004 Automated data logger Installation ID not found in STORET.

The **Installation ID** line in the automated data logger batch input file contains an ID that does not match any found in STORET. You may not reference a data logger in the batch until it has been identified and described to STORET using the interactive screens.

Either correct the file, or use the STORET interactive screen software to create the Installation ID, and then try again.

B20005 Operating Period Log File Name not found in STORET.

The Operating Period **Log File Name** found in the batch file does not match any Operating Period Log File Name for the given Automated Data Logger in your organization's data. You may not reference an Operating Period in the batch until it has been identified and described to STORET using the interactive screens. Either correct the file, or use the STORET interactive screen software to create the Operating Period, and then try again.

B20007 Results have already been loaded for the Operating Period.

In Automated Data Logger batch input, once an input Field Activity is validated, the program checks to see if any Result records already exist in STORET for that Field Activity/Operating Period. You cannot add another characteristic group or incrementally add results for an Operating Period. Go to STORET, O3 Organization Menu, and select Automated Data Recording Results to view existing results.

B20008 The number of Row IDs does not match the number of Characteristics in the Char Group.

The **Row ID** record of the Automated Data Logger batch input file should contain the same Row IDs as in STORET for the Characteristic Group identified on the preceding **Char Group ID** record.

B20009 Data logger batch input time contains unexpected characters, not 0 – 9.

A **Result** record in the Automated Data Logger batch input file contains a value following the Result header that contains a character other than 0 to 9. Check input file and make sure Result is followed by time in the format HHMMSS (no colons).

B20010 Data logger batch input time contains unexpected hours, not 0 – 23.

A **Result** record in the Automated Data Logger batch input file is supposed to contain a value following the Result header that is time in the format HHMMSS. The hours (HH) must be 0 to 23. Use two digits.

B20011 Data logger batch input time contains unexpected minutes or seconds, not 0 – 59.

A **Result** record in the Automated Data Logger batch input file contains a value following the Result header that is supposed to be time in the format HHMMSS. The minutes (MM) or seconds (SS) must be 0 to 59. Use two digits.

B20012 Field Activity Date/Time not found in STORET.

In Automated Data Logger batch update input, a combination of date from a **Record Date** record, and time from a **Result** record does not correspond to a STORET Field Activity Start Date and Start Time for the given Operating Period. Correct the date and/or time in the input so that it matches a Field Activity in STORET.

B20014 Warning: There are fewer Results than Row Ids.

In Automated Data Logger batch input, the number of Characteristic Default Row IDs on the **Row ID** record is greater than the number of Result values on a **Result** record which follows it. Add Result values, or change the Characteristic Group on the **Char Group ID** record and Row IDs on the **Row ID** record to match the results.

B20015 There are more Results than Row Ids.

In Automated Data Logger batch input, there are more Result values on the **Result** record than characteristic Row IDs, to which they must be matched, on the preceding **Row ID** record. Delete Result values, or change the Characteristic Group on the **Char Group ID** record and Row IDs on the **Row ID** record to match the results.

B20016 Result create failed.

The STORET database update for this Automated Data Logger Result record failed.

B20017 Date is invalid. Check file for valid date in format MM-DD-YYYY.

The program found a bad character (not 0-9 or -), or month, day, or year out of range. Check date input.

B20018 Data logger batch input time invalid length. Check input for format HHMMSS.

In Automated Data Logger batch input, the time string in a **Result** record must be 6 characters long. Use two digits each for hours, minutes and seconds, without colons.

I00001 For Information Only

Gives the user the record currently being processed. This is for information purposes only