STANDARDIZED DATA EXCHANGE FORMATS
FOR THE STORMWATER MONITORING COALITION

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1.0   INTRODUCTION

One goal of the southern California Stormwater Monitoring Coalition (SMC) is to compile monitoring data from separate monitoring programs to make regionwide assessments. Thus far, this task has been difficult because the various monitoring programs have differing project goals and objectives, differing mandates from regulatory agencies, differing sampling designs, differing laboratory analytical methods, and incompatible information management systems. The goal of the current document is to increase the communication among stormwater monitoring agencies by utilizing these agencies for developing standardized data exchange formats (Table 1). The comparability issues that revolve around goals, objectives, and study designs are being addressed through a related, but separate document (Bernstein and Schiff in prep).

The SMC member agencies, which includes all seven of the phase I municipal stormwater National Pollutant Discharge Elimination System (NPDES) permittees and all three Regional Water Quality Control Boards (RWQCBs) that regulate the stormwater permittees, store and analyze their data in separate data systems. Some agencies use complex, custom-designed relational database structures and advanced statistical software. Others use simple spreadsheets. In some instances, agencies maintain data in only in hardcopy or electronic equivalents (i.e. scanned documents). The result is an inability for permittees, regulatory agencies, or other interested organizations to quickly or easily exchange information to compare their local data or for compiling data to make larger regional-scale assessments.

Many of these obstacles have been surmounted through the use of standardized data exchange formats (SDEF). For example, numerous data types are shared effortlessly among the more than five dozen participants of the Regional Marine Monitoring of the southern California Bight (Cooper et al. 1998). The State Water Resources Control Board is using a similar approach for compiling beach monitoring data statewide (reference?). SDEF are a structure for sharing data. The value and versatility of SDEFs is that it does not specify what format or software should be used by any member agency. SDEFs only stipulate what data should be shared and a common structure for transferring the data. If a common data structure is used, then the data can be shipped in any software including ASCII code. Once transferred, each agency can import, store, and analyze the data in any format or software they wish. This precludes the need for purchasing new information technologies (i.e. hardware or software) or for hiring specialty staff; SDEFs can be accomplished with the existing information technology infrastructure.

1.1   Objectives and Goals of the Document

The objective of this guidance manual is to capture the data types and structure for SDEFs for stormwater monitoring data. The goal of this document is to create a series of defined data tables, which can be related to one another through commonly defined fields, that will describe the basic elements of each agencies monitoring program. Whenever, two agencies share data, the minimum data requirements defined herein shall be the default data structure.

This guidance manual is a living document. Permittees may wish to use this guidance document for receiving data from their contractors and/or regulatory agencies may wish to use this guidance document for receiving data from their permitees. It should be revisited periodically as the data needs for the SMC evolve. The SDEFs can be easily expanded to include new and different data types as new monitoring techniques, or data assessment needs, develop.

Table 1. Collaborators for developing stormwater monitoring standardized data exchange formats for the Stormwater Monitoring Coalition.

Contact Name	Company
Brock Bernstein	Workgroup facilitator

Larry Cooper	Southern California Coastal Water Research Project
Linda Garcia	Riverside County Flood Control District
Fred Gonzales	Los Angeles County Department of Public Works
Phil Hammer	San Diego Regional Water Quality Control Board
Bruce Moore	Orange County Public Facilities and Resources Department
Kenneth Schiff	Southern California Coastal Water Research Project
Bob Smith	Independent Consultant
Xavier Swammikannu	Los Angeles Regional Water Quality Control Board
Mitzi Taggart	Heal the Bay
JoAnne Weber	San Diego County Department of Environmental Health
Bob Whittaker	Santa Ana Regional Water Quality Control Board
Darla Wise	Ventura County Watershed Protection Division
Matt Yeager	San Bernardino Flood Control District

How to use this document:

The tabular descriptions of each data type give useful information to the person(s) responsible for constructing the tables. The first column contains the exact name for the field or the column name as it should be used for data submissions. Do not add spaces or other characters to the field names. Field names that are bolded are intended to indicate a combination of fields that provide a unique value within the table.

The second column describes the type of variable to be used for the data in the field. The variable types are:
- Text   any alphanumeric character
- Numbernumbers with decimal places or whole numbers only, no decimal places
- Y/N   Boolean indicating Yes or No
- Memo   unlimited number of alphanumeric characters

The third column indicates whether the field is mandatory or not.
- Y   indicates that the field is mandatory,
- *   indicates that the field is conditionally mandatory
- N   indicates the field is not mandatory.
- R   indicates that the field is recommended, but not mandatory.

The fourth column indicates the intended use for the field and a reference to a look up list containing a constrained list of values allowable in that field.

Optional Tables

Some of the tables in this document are only offered as an option for reporting and are not required. These tables are labeled as optional tables in each section of the relational structures. The optional tables are Rain Gauge data, Toxicity Batch, Toxicity Results, and Toxicity Water Quality.

2.0   RELATIONAL STRUCTURES

This document describes nine tables that include data about stations, station occupation, microbiology results, chemistry batches (quality assurance), chemistry results, flow, rain, storm events, field collected results, and 16 different lookup tables. Look up tables have predefined field options to maintain common syntax. For each table in this document, there is a table purpose, guidelines for use, and a table summary that lists and defines fields (field type, field description, etc.).

Table Relationship Diagram
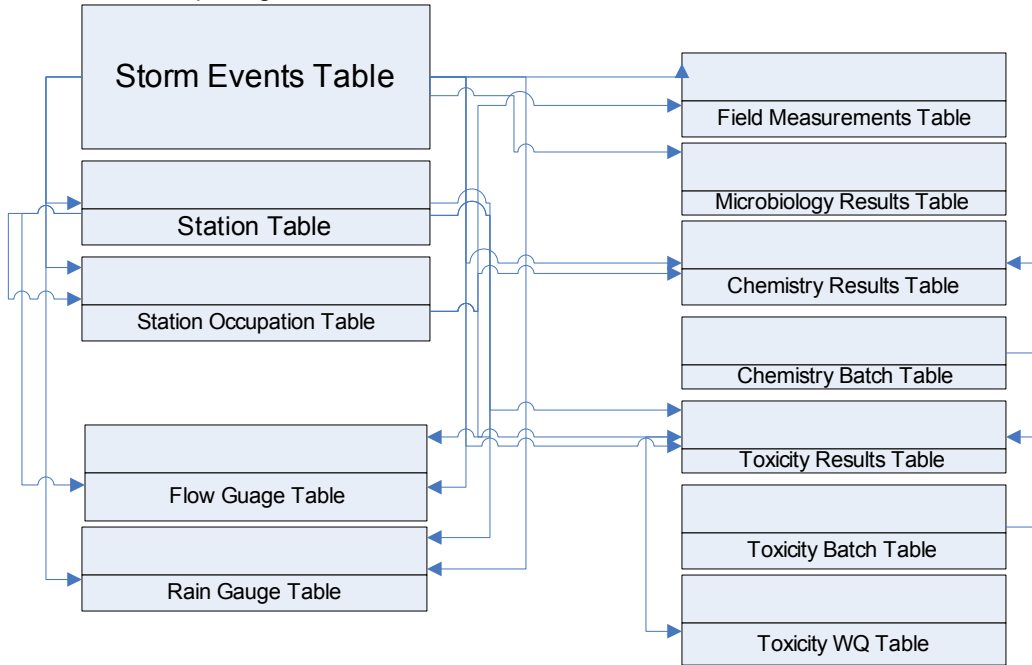
2.1 Storm Events

PURPOSE: The purpose of this table is to provide a unique identifier that will be used to link all tables for analytical purposes. The StormID may be expressed in any format at the discretion of the agency. This variable is not intended to provide a formal definition for what constitutes as storm, it is only used as an aid to analysis.

TABLE GUIDELINES: Each record will be unique based on a combination of StormID and Agency. The data exchange file will be named STORMMASTER.XXX.

Example Data:

Field Name	Type	Required	Description
StormID	Text	Y	A unique identifier for each storm assigned by

			each agency.
Agency	Text	Y	From luList01_AgencyCodes
Comments	Text	N	Additional remarks.

2.2   Station Table

PURPOSE: The station table is central to data relations in the database. Each record represents a description of a geographical location including stationID, latitude and longitude data. This table may be appended as stations are added by the monitoring agencies.

TABLE GUIDELINES: Each record will be unique based on a combination of StationID and Station Owner. The data exchange file will be named STATIONMASTER.XXX.

Example Data:

Field Name	Type	Required	Description
StationID	Text	Y	A geographic location label
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
Description	Text	Y	Required if Zone = Yes. A general description of the stations.
Latitude	Double	Y	Required if Zone = No. Decimal degrees to 5 decimal places (NAD 83)
Longitude	Double	Y	Required if Zone = No. Decimal degrees to 5 decimal places (NAD 83). Expressed as negative number.
StationType	Text	Y	The type of station based on its analytical usage.
HUC	Text	Y	Hydrologic Unit Code (must be consistent with state geo web database) From luList09_Hydrologic Unit Codes

LandUse	Text	N	The land use associated with the station. From luList06_LandUses
DrainageArea	Number	*	The area of the drainage in which the station is located. Required for stations with the StationType = MassEmmission
DrainageAreaUnits	Text	*	The units associated with the drainage area from luList28_Units
ChannelType	Text	Y	The type of channel associated with the station from luList07_ChannelTypes
FlowType	Text	Y	The type of flow normally associated with the station form luList03_FlowTypes

2.3　　Station Occupation Table

PURPOSE: The Station Occupation Event table contains environmental condition data collected when the sample is taken. Each record represents the conditions at the station where the sample was collected.

TABLE GUIDELINES: The combination of the fields StationID, StationOwner, SampleStartDate, SampleStartTime, FieldSampleType, and SamplingOrganization will ensure that each record in the table is unique. The data exchange file will be named StationOccupation.XXX

EXAMPLE DATA:

TABLE STRUCTURE:

Field Name	Type	Required	Description
StationID	Text	Y	A geographic location label from the station table
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for each storm event from the Matching the Storm Events table.
FieldSampleType	Text	Y	The type of sample collected from luList04_SampleTypes.
SampleStartDate	Date/Time	Y	The date the sample collection started

			expressed as dd-mmm-yyyy.
SampleStartTime	Date/Time	Y	The time the sample collection started expressed as 24 hour time hhmm.
SampleStartTimeUnits	Text	Y	From luList28_Units.
SampleEndDate	Date/Time	Y	The date the sample collection ended expressed as dd-mmm-yyyy.
SampleEndTime	Date/Time	Y	The time the sample collection ended expressed as 24 hour time hhmm.
SampleEndTimeUnits	Text	Y	From luList28_Units.
SamplingOrganization	Text	Y	The agency code from luList01_AgencyCodes.
SampleDepth	Number	Y	The depth at which the sample was taken expressed in meters.
SampleDepthUnits	Text	Y	From luList28_Units.
Latitude	Number	*	The latitude of the sample expressed in decimal degrees to five decimal places (NAD83).
Longitude	Number	*	Decimal Degrees to five places (NAD 83) expressed as a negative number.
WeatherCode	Text	Y	The weather code from luList08_WeatherCodes.
WaterOutletflowing	Text	Y	If the station is a water outlet is water flowing?
StationFailReason	Text	*	From luList40_EventFailCodes. Was the station abandoned for any reason? The default values will be None. *Required if the sample was not collected
Comments	Text	N	Additional comments.

2.4   Field Measurements

PURPOSE: This table contains the raw qualified data as collected by field crews

TABLE GUIDELINES: The combination of the fields StationID, StationOwner, StormID, SampleDate, SampleTime, and SamplingOrganization will ensure that each record in the table is unique. The data exchange file will be named StationOccupation.XXX

EXAMPLE DATA:

NAME	TYPE	REQUIRED	DESCRIPTION
StationID	Text	Y	A geographic location label from the station table.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for each storm event.
SampleDate	Date/Time	Y	The date the sample was collected expressed as dd-mmm-yyyy.
SampleTime	Date/Time	Y	The time the sample was collected.
SamlingOrganization	Text	Y	From luList01_AgencyCodes.
ParameterCode	Text	Y	The parameter being measured.
Qualifier	Text	Y	A qualifier for the result.
Result	Number	Y	The numerical value of the result.
Units	Text	Y	The units of the result.
Comments	Text	N	Additional Remarks.

2.5   Microbiology Results

PURPOSE: The Microbiology results table contains bacteriological results data. Each record represents the results of an individual sample including collected samples and QA check samples. SamplingOrganization is carried in both the results table and the event table because one agency may collect samples that are analyzed by another laboratory.

TABLE GUIDELINES: The combination of the fields StationID, StationOwner, StormID, SampleStartTime, SampleStartDate, AnalysisDate,ParameterCode, LabCode, LabRep, and SampleType will ensure that each record is unique in the table. The data exchange file will be named MicrobiologyResults.XXX

EXAMPLE DATA:

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TABLE STRUCTURE:

Field Name	Type	Required	Description
StationID	Text	Y	A geographic location label from tblStations.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for each storm event.
SampleID	Text	N	The laboratory internal sample identifier.
SampleStartTime	Date/Time	Y	The time the sample was collected in 24 hour time expressed as hhmm.
SampleStartTimeUnits	Text	Y	From luList28_Units.
SamplingOrganization	Text	Y	From luList01_AgencyCodes.
SampleStartDate	Date/Time	Y	The date the sample was analyzed expressed as dd-mmm-yyyy.
ProcessingStartTime	Date/Time	N	The time the testing was started expressed as hhmm.
ProcessingStartTimeUnits	Text	N	From luList28_Units.
AnalysisDate	Date/Time	N	The date the sample was analyzed expressed as dd-mmm-yyyy.
ParameterCode	Text	Y	What type of bacteria are being analyzed from luList15_ParameterCodes
Qualifier	Text	N	Qualifier for the result, from luList11_QualifierCodes.
Result	Number	Y	The numerical results of the test.
Units	Text	Y	The units for the results from luList28_Units.
LabRep	Number	Y	The count of the lab replicate.
LabCode	Text	Y	From luList01_AgencyCodes.
AnalysisMethod	Text	Y	The Method used to do the analysis from luList24_Analysis Methods.
SampleType	Text	Y	From luList04_SampleTypes.
Comments	Text	N	Additional comments.

2.6   Chemistry Batch Data

PURPOSE: This table contains information about preparation methods and dates within each lab. A batch is defined as a group of samples with which the QA results are associated. For some labs, QA data is associated with the preparation batch while other labs associate the QA data with analytical batches.   Samples prepared in the same batch may move through the lab in different analytical batches. To minimize redundant data entry, the preparation batch information has been broken off into a separate table and is related to the tblChemistryResults through the PreparationBatchID code. Each record in this table represents all information common to each preparation batch.

TABLE GUIDELINES: The QABatch and AnalyticalLabCode fields will ensure that each record in the table is unique. The data exchange file will be named ChemistryBatchData.XXX

EXAMPLE DATA:

TABLE STRUCTURE:

Field Name	Type	Required	Description
QABatch	Text	Y	The code for all of the samples processed in the same preparation batch.
PreparationCode	Text	Y	The PreparationCode from luList25_PreparationCodes.
PreparationDate	Date/Time	Y	The date the sample was extracted expressed as dd-mmm-yyyy.
AnalyticalLabCode	Text	Y	Agency code from luList01_AgencyCodes.
Comments	Text	N	Additional comments.

2.7   Chemistry Results

PURPOSE: The purpose of the chemistry results table is to document the analysis results for water chemistry. Each record represents a result from a specific analysis for a particular parameter at a single station or a single QA sample. This table will also contain all supporting QA sample results.

This table contains some information that will be derived from field data in order to differentiate samples collected at a single station, but at multiple times.

SPECIAL CASES:

Results vs. TrueValue:

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The reported result is the number gathered from the analytical instrument. The "True Value" is the concentration of the parameter in the reference sample. The purpose of the "True Value" is to facilitate the calculation of percent recovery. The True Value is only reported for matrix spikes. A True Value of –99 will be reported for all other samples.

Since the mean True Value of Certified reference materials is considered of little use, the range values for the minimum and maximum for parameters in the certified reference material will be carried in an ancillary table within the analytical database and will not be described here.

Matrix spikes:
The reported result is the number gathered from the instrument and is the net amount recovered from the sample after being corrected for the concentration from the non-spiked sample. For spiked samples the "True Value" is the concentration of the parameter added to the sample before analysis. Percent recovery will be calculated by dividing the result by the True Value times 100.

Recovery corrected data:
This is not reported because it can be calculated using the True Value of the reference material processed within the same batch.

Lab Duplicates:
Lab duplicates are defined as duplicate samples taken from the same jar. The result for each duplicate will be numbered starting at one, e.g. the result for the first duplicate will have a LabDuplicate of 1 and the result for the second duplicate will have a LabDuplicate of 2, etc. Replicate samples taken in the field will have separate sample ID numbers and a LabDuplicate of 1.

Non-Detects:
If the result is not reportable, a qualifier of "ND" should be used and the result reported as –99. In the case where the result is below method detection level or below the reporting level, but is being reported anyway, a qualifier of BMDL (below method detection limit) or BRL (below reporting level) should be used and the result reported.

QA Samples:
The field SampleType is used to distinguish QA and blank data from actual sample results. Since the QA samples are usually blanks, spikes, or certified reference materials, they do not have a station number associated with them. In this case the value "0000" will be used as the StationID. These samples will be associated to other samples with the same PreparationBatch code. These samples require a true value to allow for the calculation of percent recovery.

Units:
Values expressed in parts per billion will carry the units tag of MG/L. Values expressed in parts per million will carry the units tag of UG/L.

TABLE GUIDELINES: The combination of the fields StationID, StationOwner, StormID, QABatch, FieldSampleType, Matrix, SampleType, ParameterCode, LabDuplicate, and AnalyticalLabCode will ensure that all records in the table are unique. The data exchange file will be named ChemistryResults.XXX

EXAMPLE DATA:

TABLE STRUCTURE:

Field Name	Type	Required	Description
StationID	Text	Y	A geographic location label from tblStations.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for each storm event.
FieldSampleType	Text	Y	The type of sample collected in the field from luList04_SampleTypes.
SampleStartDate	Date/Time	Y	The date the sample was collected expressed as dd-mmm-yyyy.
SampleStartTime	Date/Time	Y	The time the sample was collected expressed as 24 hour time hhmm.
SampleTimeUnits	Text	Y	From luList28_Units.

SamplingOrganization	Text	Y	From luList01_AgencyCodes.
QABatch	Text	Y	The code for all samples processed in the same batch.
Matrix	Text	Y	The test material from luList14_TestMatrices.
SampleType	Text	Y	The type of result from luList04_SampleTypes.
ParameterCode	Text	Y	The measured parameter from luList15_ParameterCodes.
Qualifier	Text	N	Any necessary qualifier from luList11_QualifierCodes.
Result	Number	Y	Dry wt for sediment / wet weight for tissue.
Units	Text	Y	Units for the result from LuList28_Units.
MeasurementBasis	Text	Y	Wet weight, Dry weight, or Liquid Sample WW / DW / LS from luList17_MeasurementBasisCodes.
FieldDuplicate	Number	Y	Count from the field.
LabDuplicate	Number	Y	Count from the laboratory.
LabSampleID	Text	N	Unique sample identifier for the reporting agency.
TrueValue	Number	N	Required for all Spiked Samples only.
MDL	Number	Y	Method Detection Limit based on 40CFR136.
RL	Number	Y	Reporting Level as defined in metadata.
AnalyticalLabCode	Text	Y	Agency code from luList01_AgencyCodes.
AnalysisDate	Date/Time	Y	The date the samples were analyzed expressed as dd-mmm-yyyy.
AnalysisMethod	Text	Y	The method used to analyze the samples.
Comments	Text	N	Additional remarks.

2.8   Toxicity Batch Information

This table is optional for reporting purposes.

PURPOSE: This table is used to record information specific to each test batch processed in the laboratory and is used as supporting documentation for the Toxicity Test data. Each record represents specific information common to a group of samples processed at the same time and is pertinent to all replicates processed. This table includes the QA/QC data needed to document the test results.

TABLE GUIDELINES: Each record will be unique based on a combination of the fields QABatch and AnalyticalLabCode. The data exchange file will be submitted with the name TOXICITYBATCH.XXX.

EXAMPLE DATA:

TABLE STRUCTURE:

Field Name	Type	Required	Description
QABatch	Text	Y	The batch code for the sample processing batch.
AnalyticalLabCode	Text	Y	The agency code from luList01_AgencyCodes of the processing laboratory.
Species	Text	Y	The species code from luList34_ToxicitySpecies.
Protocol	Text	Y	The test protocol from luList35_ToxicityProtocols.
TestDate	Date/Time	Y	The starting date of the test expressed as dd-mmm-yyyy.
Matrix	Text	Y	The test matrix from luList36_ToxicityMatrices.
TestDuration	Number	Y	The duration of the test expressed in days.
TestDurationUnits	Text	Y	From luList28_Units (Days or Hours).
Temperature	Number	Y	The temperature at which the test was conducted (degrees C).
TemperatureUnits	Text	Y	From luList28_Units.
TestAcceptability	Text	Y	Evaluation of the test results from luList39_ToxicityTestAcceptabilityCodes.
Comments	Text	N	Additional remarks.

2.9 ToxicityResults

This table is optional for reporting purposes.

PURPOSE: The Toxicity table carries data relevant to sediment or water toxicity tests and their replicates. Each record represents the results of an individual replicate for an individual species processed in a batch of replicates.

 TABLE GUIDELINES: Each record will be unique based on a combination of the fields StationID, StationOwner, StormID, SampleType, QABatch, AnalyticalLabCode, Species/TestType, Dilution, Concentration and LabRep. The data exchange file will be submitted with the file name TOXICITYRESULTS.XXX.

EXAMPLE DATA:

TABLE STRUCTURE:

Field Name	Type	Required	Description
StationID	Text	Y	A geographic location label from the station table.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for the storm from the storm event table.
SampleType	Text	Y	Sample type from luList04_SampleTypes.

QABatch	Text	Y	Batch number for batch processed samples.
AnalyticalLabCode	Text	Y	The agency code from luList01_AgencyCodes.
Species/TestType	Text	Y	Test species from luList34_ToxicitySpecies.
Dilution	Number	Y	The dilution factor expressed as a proportion.
Concentration	Number	Y	Concentration in mg/L.
ConcentrationUnits	Text	Y	From luList28_Units.
EndPoint	Text	Y	The type of end point from luList37_ToxicityEndPoints.
LabRep	Number	N	Count.
Value	Number	Y	The numerical result of the test.
QACode	Text	Y	The quality assurance code from luList39_ToxicityTestAcceptabilityCodes.
Comments	Text	N	Additional remarks.

2.10   ToxicityWQ

This table is optional for reporting purposes.

PURPOSE: This table is used to document water quality during the course of a toxicity test. Each record represents a measurement of an individual water quality parameter at a specific time interval during the course of the test batch.

TABLE GUIDELINES: Each record will be unique based on a combination of the fields StationID, StationOwner, QABatch, Parameter, Matrix, TimePoint, LabRep, and AnalyticalLabCode. The data exchange file will be submitted with the file name TOXICITYWQ.XXX.

EXAMPLE DATA:

TABLE STRUCTURE:

Field Name	Type	Required	Description
StationID	Text	Y	A geographic location label from the station table.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
QABatch	Text	Y	The batch code for the sample processing batch.
Matrix	Text	Y	The test matrix from luList36_ToxicityMatrices.
Dilution	Number	Y	The dilution factor expressed as a proportion.
Concentration	Number	Y	Concentration expressed in mg/L.
ConcentrationUnits	Text	Y	From luList28_Units.
TimePoint	Number	Y	The number of days from the start of the test.
Parameter	Text	Y	The water quality parameter being measured from luList15_ParameterCodes.
Qualifier	Text	N	Any necessary qualifier from luList11_QualifierCodes.
Value	Number	Y	The numerical result for the parameter.
ValueUnits	Text	Y	Any necessary qualifier from luList11_QualifierCodes.
LabRep	Text	Y	The number of the replicate in which the measurement was taken.
AnalyticalLabCode	Text	Y	From luList01_AgencyCodes.
Comments	Text	N	Additional remarks.

2.11   Flow Gauge Data

PURPOSE: The purpose of this table is to capture the raw flow data. It is generally intended to accept data from instruments, but can also be used to store manual flow measurements.

TABLE GUIDELINES: Each record will be unique based on a combination of StationID, StationOwner, StormID, SampleDate, SampleTime, and SamplingOrganization. The data exchange file will be reported with the file name FLOW.XXX.

EXAMPLE DATA:

FieldName	Type	Required	Description
StationID	Text	Y	A geographic location label.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for each storm event.
SampleDate	Date/Time	Y	Date of the measurement expressed as dd-mmm-yyyy.
SampleTime	Date/Time	Y	Time of the measurement on the 24 hour clock expressed as hh:mm:ss.
SamplingOrganization	Text	Y	From luList01_AgencyCodes.
Level	Number	N	Water level expressed in inches.
Velocity	Number	N	Velocity expressed in feet per second.
Flow	Number	Y	Flow expressed as cubic feet per second.
FlowType	Text	Y	From luList03 FlowTypes.
FlowMeasurementQuaifier	Text	Y	From luList11_QualifierCodes.

2.12   Rain Gauge Data

This table is optional for reporting purposes.

PURPOSE: The purpose of this table is to contain summary rain gauge data from rain gauges in the watershed.

TABLE GUIDELINES: Each record will be unique based on a combination of the fields StationID, StationOwner, and StormID.. The data exchange file will be reported with the file name RainMeasures.XXX

EXAMPLE DATA:

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FieldName	Type	Required	Description
StationID	Text	Y	A geographic location label.
StationOwner	Text	Y	The agency that owns the station from luList01_AgencyCodes.
StormID	Text	Y	A unique identifier for each storm event.
CumulativeInches	Number	Y	The amount of rain accumulated for the storm.

APPENDIX 1. LOOK UP LISTS.

Look up list 01 Agency Codes

Code	Description
ABC	Aquatic Bioassay and Consulting Inc.
AETLI	American Environmental Testing Laboratory Inc.
Agoura Hills HDPW	Agoura Hills Department of Public Works
AlhambraDPW	Alhambra Department of Public Works
Aliso Viejo	City of Aliso Viejo
ArcadiaDPW	Arcadia Department of Public Works
ArtesiaDPW	Artesia Department of Public Works
ASSOC	Associated Laboratories
AzusaDPW	Azusa Department of Public Works
Baldwin ParkDPW	Baldwin Park Department of Public Works
Bell GardensDPW	Bell Gardens Department of Public Works
BellflowerDPW	Bellflower Department of Public Works
BellPW	Bell Department of Public Works
Beverly HillsDPW	Beverly Hills Department of Public Works
BradburyDPW	Bradbury Department of Public Works
BurbankDPW	Burbank Department of Public Works
CalabasasDPW	Calabasas Department of Public Works
CamarilloDPW	Camarillo Department of Public Works
Carlsbad	City of Carlsbad
CarsonDPW	Carson Department of Public Works
CerritosDPW	Cerritos Department of Public Works
Chula Vista	City of Chula Vista
ClaremontDPW	Claremont Department of Public Works
CommerceDPW	Commerce Department of Public Works
ComptonDPW	Compton Department of Public Works
Coronado	City of Coronado
CovinaDPW	Covina Department of Public Works
CRG	CRG Labs
CSD	City of San Diego
CSDDPW	County of San Diego Department of Public Works
CudahyDPW	Cudahy Department of Public Works
Culver CityDPW	Culver City Department of Public Works
Dana Point	City of Dana Point
Del Mar	City of Del Mar
Diamond BarDPW	Diamond Bar Department of Public Works
DowneyDPW	Downey Department of Public Works
DuarteDPW	Duarte Department of Public Works
El Cajon	City of El Cajon
El MonteDPW	El Monte Department of Public Works
El SegundoDPW	El Segundo Department of Public Works
Encinitas	City of Encinitas
Escondido	City of Escondido
FillmoreDPW	Fillmore Department of Public Works
GardenaDPW	Gardena Department of Public Works
GlendaleDPW	Glendale Department of Public Works
GlendoraDPW	Glendora Department of Public Works
Hawaiian GardensDPW	Hawaiian Gardens Department of Public Works

HawthorneDPW	Hawthorne Department of Public Works
Hermosa BeachDPW	Hermosa Beach Department of Public Works
Hidden HillsDPW	Hidden Hills Department of Public Works
HTB	Heal The Bay
Huntington ParkDPW	Huntington Park Department of Public Works
Imperial Beach	City of Imperial Beach
IndustryDPW	Industry Department of Public Works
InglewoodDPW	Inglewood Department of Public Works
IrwindaleDPW	Irwindale Department of Public Works
KLI	Kinnetic Laboratories Inc.
La Canada FlintridgeDPW	La Canada Flintridge Department of Public Works
La Habra HeightsDPW	La Habra Heights Department of Public Works
La Mesa	City of La Mesa
La MiradaDPW	La Mirada Department of Public Works
La PuenteDPW	La Puente Department of Public Works
La VerneDPW	La Verne Department of Public Works
LABS	Los Angeles Bureau of Sanitation
LACDPW	Los Angeles County Department of Public Works
LACSD	Los Angeles County Sanitation Districts
LADWP	Los Angeles Department of Water and Power
Laguna Beach	City of Laguna Beach
Laguna Hills	City of Laguna Hills
Laguna Niguel	City of Laguna Niguel
Laguna Woods	City of Laguna Woods
Lake Forest	City of Lake Forest
LakewoodDPW	Lakewood Department of Public Works
LARWQCB	Los Angeles Regional Water Quality Control Board
LawndaleDPW	Lawndale Department of Public Works
Lemon Grove	City of Lemon Grove
LomitaDPW	Lomita Department of Public Works
Long BeachDPW	Long Beach Department of Public Works
LynwoodDPW	Lynwood Department of Public Works
MalibuDPW	Malibu Department of Public Works
Manhattan BeachDPW	Manhattan Beach Department of Public Works
MaywoodDPW	Maywood Department of Public Works
MEC	MEC Analytical Systems Inc.
Mission Viejo	City of Mission Viejo
MonroviaDPW	Monrovia Department of Public Works
MontebelloDPW	Montebello Department of Public Works
Monterey ParkDPW	Monterey Park Department of Public Works
MoorparkDPW	Moorpark Department of Public Works
Murrieta	City of Murrieta
MWH	Montgomery Watson Laboratories
National City	City of National City
NorwalkDPW	Norwalk Department of Public Works
Oceanside	City of Oceanside
OCPFRD	Orange County Public Facilities and Resources Department
OCSD	Orange County Sanitation Districts
OjaiDPW	Ojai Department of Public Works

ORWD	Orange County Water District
OxnardDPW	Oxnard Department of Public Works
Palos Verdes EstatesDPW	Palos Verdes Estates Department of Public Works
ParamountDPW	Paramount Department of Public Works
PasadenaDPW	Pasadena Department of Public Works
Pico RiveraDPW	Pico Rivera Department of Public Works
PomonaDPW	Pomona Department of Public Works
Port HuenemeDPW	Port Hueneme Department of Public Works
Poway	City of Poway
PSD	Port of San Diego
Rancho Palos VerdesDPW	Rancho Palos Verdes Department of Public Works
Rancho Santa Margarita	City of Rancho Santa Margarita
RCFCD	Riverside County Flood Control District
Redondo BeachDPW	Redondo Beach Department of Public Works
Rolling Hills EstatesDPW	Rolling Hills Estates Department of Public Works
Rolling HillsDPW	Rolling Hills Department of Public Works
RosemeadDPW	Rosemead Department of Public Works
San BuenaventuraDPW	San Buenaventura Department of Public Works
San Clemente	City of San Clemente
San DimasDPW	San Dimas Department of Public Works
San FernandoDPW	San Fernando Department of Public Works
San GabrielDPW	San Gabriel Department of Public Works
San Juan Capistrano	City of San Juan Capistrano
San Marcos	City of San Marcos
San MarinoDPW	San Marino Department of Public Works
Santa ClaritaDPW	Santa Clarita Department of Public Works
Santa Fe SpringsDPW	Santa Fe Springs Department of Public Works
Santa MonicaDPW	Santa Monica Department of Public Works
Santa PaulaDPW	Santa Paula Department of Public Works
Santee	City of Santee
SARWQCB	Santa Ana Regional Water Quality Control Board
SBFCD	San Bernardino Flood Control District
SCCWRP	Southern California Coastal Water Research Project
SDCC	San Diego County Copermittees
SDCDEH	San Diego County Department of Environmental Health
SDCRAA	San Diego County Regional Airport Authority
SDRWQCB	San Diego Regional Water Quality Control Board
Sierra MadreDPW	Sierra Madre Department of Public Works
Signal HillDPW	Signal Hill Department of Public Works
Simi ValleyDPW	Simi Valley Department of Public Works
SMBRP	Santa Monica Bay Restoration Project
SMURF	Santa Monica Urban Runoff Facility
SOCWA	Southern Orange County Wastewater Authority
Solana Beach	City of Solana Beach
South El MonteDPW	South El Monte Department of Public Works
South GateDPW	South Gate Department of Public Works
South	South Pasadena Department of Public Works

PasadenaDPW	
Temecula	City of Temecula
Temple CityDPW	Temple City Department of Public Works
Thousand OaksDPW	Thousand Oaks Department of Public Works
TorranceDPW	Torrance Department of Public Works
VCWPD	Ventura County Watershed Protection Division
VernonDPW	Vernon Department of Public Works
Vista	City of Vista
WalnutDPW	Walnut Department of Public Works
WECK	Weck Laboratories
West CovinaDPW	West Covina Department of Public Works
West HollywoodDPW	West Hollywood Department of Public Works
Westlake VillageDPW	Westlake Village Department of Public Works
WhittierDPW	Whittier Department of Public Works

Look up list 02 Station Types

Code	Description
CRW	Coastal Receiving Water
CSDO	Coastal Storm water Drain Outfall
HE	Harbor/Estuary
IB	Indicator Bacteria
ICID	Reconnaissance
LU	Land Use
ME	Mass Emissions
RG	Rain Gauge
TMDL	TMDL Monitoring
SB	Stream Bioasssessment

Look up list 03 Flow Types

Code	Description
TV	Time to fill volume of known container
SF	Speed of floating object/Cross-sectional wetted surface area
PM	Pressure transducer/Manning equation
PW	Pressure transducer/Weir equation
PR	Pressure transducer/rating curve
PA	Pressure transducer/Area-Velocity sensor
BM	Bubbler/Manning equation
BW	Bubbler/Weir equation
BR	Bubbler/rating curve
BA	Bubbler/Area-Velocity sensor
SM	Staff gauge/Manning equation

SW   Staff gauge/Weir equation
SR   Staff gauge/rating curve

Look up list 04 Sample Types

Code	Description
CHK	Laboratory Check Sample
CRM	Certified Reference Material
DB	Dilution Blank
DUP	Duplicate
EB	Extraction Blank
FBLANK	Final Blank at end of batch
FWBLANK	Fresh water blank
IBLANK	Initial Blank at start of batch
ICAL	Intercalibration Result
LCM	Laboratory Control Matierial
MS	Matrix spike and matrix spike duplicate
QA	Quality Assurance value
RESULT	Numerical Result of analysis
SB	Sampling blank
SRM	Standard Reference Material
SWBLANK	Seawater blank
TWC	Time weighted composite
SG	Surface Grab
DIG	Depth integrated grab
BG	Bottom mounted grab
FWC	Flow weighted composite

Look up list 05 Ordinal Directions

Code	Description
E	East
N	North
NE	Northeast
NR	Not Recorded
NW	Northwest
S	South
SE	Southeast
SW	Southwest
W	West
XX	Calm

Look up list 06 LandUses

Code	Description
AGRI	Agricultural (incl. farmlands, orchards, nurseries)
OPEN	Open Space (undeveloped within developed area)
PARK	Developed (Recreation Fields, Maintained Landscape) Park Land
WILD	National Forests
INDUS	Industrial (excluding Petroleum related activities)
PETROL	Oil Refinery, Distribution Center
RESID	Residential
DEVEL	On-going Major Development
GOVT	Military Installation
EDUC	School, College, University
COMM	Commercial

Look up list 07 Channel Types

Code	Description
ETRAP	Earthen Trapezoidal
RCTRAP	Reinforced Concrete Trapezoidal
RCRECT	Reinforced Concrete Rectangular
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
CMP	Corrugated Metal Pipe
NAT	Natural (sides and bottom)
ERBOT	Earthen Bottom
GABI	Reinforced Gabion Sides
RIPRAP	Reinforced Riprap Sides
PUMPSTN	Pump Station Outlet
DAMOUT	Dam Outlet

Look up list 08 Weather Codes

Code
Clear
Drizzle
Fog
Fog and Drizzle
Haze
NR
Overcast
Partly Cloudy

Code
Rain
Thunderstorm

Look up list 09 Hydrologic Unit Codes

Code	Description

http://www.epa.gov/nerlesd1/land-sci/southern_california/geodata/hucs_10digit.html

Look up list 11 Qualifier Codes

Code	Description
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
A	Count base on calculation of Aliquot
AE	Analyst Error
BMDL	Below Method Detection Limit (requires a -99 result)
BRL	Below Reporting Level
CT	Contaminated
DNQ	Detected but not quantified
E	Estimated
I	Inerference
None	None
NA	Not Analyzed
ND	Not Detected
NS	Not Sampled

Look up list 13 Tidal Stages

Code
Ebb
Flood
NR
Slack

Look up list 14 Test Matrices

Code	Description
SOLVENT	Extraction Solvent
FRESHWATER	Fresh water
EX	Extract

Code	Description
DW	Dilution Water
SEAWATER	Sea Water
SEDIMENT	Sediment

Look up list 15 Parameter Codes

Code	Description
1,6,7-Trimethylnaphthalene	PAH
1-Methylnapthalene	PAH
1-Methylphenanthrene	PAH
2,4'-DDD	PCB
2,4'-DDE	PCB
2,4'-DDT	PCB
2,6-Dimethylnaphthalene	PAH
2-Methylnapthalene	PAH
2-phenyldecane	LAB
2-phenyldodecane	LAB
2-phenyltetradecane	LAB
2-phenyltridecane	LAB
2-phenylundecane	LAB
3-phenyldecane	LAB
3-phenyldodecane	LAB
3-phenyltetradecane	LAB
3-phenyltridecane	LAB
3-phenylundecane	LAB
4,4'-DDD	PCB
4,4'-DDE	PCB
4,4'-DDT	PCB
4-phenyldecane	LAB
4-phenyldodecane	LAB
4-phenyltetradecane	LAB
4-phenyltridecane	LAB
4-phenylundecane	LAB
5-phenyldecane	LAB
5-phenyldodecane	LAB
5-phenyltetradecane	LAB
5-phenyltridecane	LAB
5-phenylundecane	LAB
6-phenyldodecane	LAB
6-phenyltetradecane	LAB
6-phenylundecane	LAB
7&6-phenyltridecane	LAB
7-phenyltetradecane	LAB

Code	Description
Acenaphthene	PAH
Acenaphthylene	PAH
aChlordane	PCB
Acid Volitile Sulfide	AVS
Aluminum	METAL
Ammonium	Inorganic
Anthracene	PAH
Antimony	METAL
Arsenic	METAL
Barium	METAL
Benz[a]anthracene	PAH
Benzo[a]pyrene	PAH
Benzo[b]fluoranthene	PAH
Benzo[e]pyrene	PAH
Benzo[g,h,i]perylene	PAH
Benzo[k]fluoranthene	PAH
Beryllium	METAL
Biphenyl	PAH
Cadmium	METAL
Chlorophyll a	Nutrient
Chromium	METAL
Chrysene	PAH
Copper	METAL
Dibenz[a,h]anthracene	PAH
Dissolved Oxygen	Oxygen
Enterococcus	Bacteria
Fecal Coliforms	Bacteria
Fluoranthene	PAH
Fluorene	PAH
gChlordane	PCB
Hydrogen Sulfide	Inorganic
Indeno(1,2,3-c,d)pyrene	PAH
Iron	METAL
Lead	METAL
Lipid	LIPID
Mercury	METAL
Naphthalene	PAH
Nickel	METAL
NO2	Nutrient
NO2/NO3	Nutrient
NO3	Nutrient
NPH	
OI	

Code	Description
o-phosphate	Nutrient
PCB 101	PCB
PCB 105	PCB
PCB 110	PCB
PCB 114	PCB
PCB 118	PCB
PCB 119	PCB
PCB 123	PCB
PCB 126	PCB
PCB 128	PCB
PCB 138	PCB
PCB 149	PCB
PCB 151	PCB
PCB 153	PCB
PCB 156	PCB
PCB 157	PCB
PCB 158	PCB
PCB 167	PCB
PCB 168	PCB
PCB 169	PCB
PCB 170	PCB
PCB 177	PCB
PCB 18	PCB
PCB 180	PCB
PCB 183	PCB
PCB 187	PCB
PCB 189	PCB
PCB 194	PCB
PCB 201	PCB
PCB 206	PCB
PCB 28	PCB
PCB 37	PCB
PCB 44	PCB
PCB 49	PCB
PCB 52	PCB
PCB 66	PCB
PCB 70	PCB
PCB 74	PCB
PCB 77	PCB
PCB 81	PCB
PCB 87	PCB
PCB 99	PCB
PCB153168	PCB

Code	Description
Percent Fines	Inorganic
Perylene	PAH
pH	Inorganic
Phaeo	Nutrient
Phenanthrene	PAH
Pyrene	PAH
Salinity	Inorganic
Selenium	METAL
Si(OH)4	Nutrient
Silver	METAL
SubPAR	Light
Tail Movement	
TerPAR	Light
TOC	TOC
Total Ammonia	Inorganic
Total Coliforms	Bacteria
Total Nitrogen	TN
Total Sulfide	Inorganic
Total Suspenede Solids	TSS
Unionized Ammonia	Inorganic
Zinc	METAL

Look up list 17 Measurement Basis Codes

Code	Description
DW	Dry Weight
WW	Wet Weight
LS	Liquid Sample

Look up list 19 Current Directions

Code	Description
DC	down coast
IN	Indeterminant
NC	no current
UC	up coast

Look up list 24 Analysis Method Codes

Code	Description
AlpKem RFA 300 Series Nutrient Analyzer	AlpKem RFA 300 Series Nutrient Analyzer

Code	Description
CHN	EA1108 CHN Elemental Analyzer
Colilert 18	Idexx
CVAA	Cold Vapor Atomic Absorption Analysis
Entrolert	Idexx
EPA 160.2	Total Suspended Solids analysis method
EPA200.7	
EPA200.8	
EPA206.2	
EPA245.5	
EPA270.2	
FAA	Flame Atomic Absorption Spectrometer
FIAS	Flow Injection Analysis System
FIMS	Flow Injection Mercury System
FLUORO	Fluiorometric analysis method for chlorophyll a and phaeopigment
GCECD	CG/ECD
GCMS	GS/MS
GFAA	Graphite Furnace Atomic Absorption Analysis
Gravimetric	Sediment Grain Size Sieve Analysis
HAA	Hydride Atomic Absorption Analysis
ICPAES	Inductively Coupled Plasma Atomic Emmision Spectrometer
ICPMS	Inductively Coupled Plasma Mass Spectrometer
IONGCMS	Ion Trap GC/MS
MARPCN I	High temperature combustion method
Mettler H54AR Balance	
MF	Membrane Filtration
MTF	Multiple Tube Fermentation
NA	Not analyzed
NR	Missing data
PCB Congeners Consistent with NPDES method 608	
PSEP86	Sediment Grain Size
Real Time	
SM2540D	
SM4500NH3	
SM4500NO3	
SM4500P	
SW6010	
SW7060	
SW7740	
SW8081	
SW80818082	
SW8270	

Code	Description
Turner Designs 10-005R Fluorometer	
Wet Sieve Analysis	
XX	
Sedigraph 5100	Sediment Grain Size (Silt/Clay fraction)
Turner Designs 10-AU Fluormeter	
Visual Accumulation Tube	Sediment Grain Size (fine sand fraction)
FILTERED	0.45 Micron USGS Groundwater Capsule

Look up list 25 Preparation Method Codes

Code	Description
90% Acetone	90% Acetone Extract for chlorophyll a and phaeopigment
ASE	Accelerated Solvent Extraction
Conventional Oven	Conventional Oven
EPA245.5	Mercury in Sediment (Cold Vapor with Permanganate Digestion)
EPA3050A	Strong Acid Hot Plate Method (EPA3050A)
EPA3050B	Strong Acid Hot Plate or Microwave Method (EPA3050B)
EPA3051	Strong Acid Microwave Method (EPA 3051)
EPA3052	
EPA3052/3050B	
EPA3053	
EPA3055	Strong Acid Hot Plate Method (EPA 3055)
MASE	Microwave Assisted Solvent Extraction
MgNO3	Magnesium Nitrate
NA	No Applicable Prepcode
NR	Missing data
PSEP86	Sediment Grain Size
ROLLER	Roller Table Extraction
SFE	Supercritical Fluid Extraction
Solvent extraction	Solvent extraction
SONIC	Ultrasonic Extraction
SOXHLET	Soxhlet Solvent Extraction
Varian-EPA245.5	

Look up list 27 Surf Conditions

Code	Description
High(7+)	Surf height greater than seven feet.
Low(1-3)	Surf height between one and three feet.
Mid(4-6)	Surf height between four and six feet.

Look up list 28 Units

Code	Description
C	Degrees Centigrade
CFU/100ml	Colony Forming Units
CM	Centimeters
DAYS	Days
FT	Feet
G	grams
HOURS	Hours
KG	Kilograms
KTS	Knots
M	Meters
MG/KG	Milligrams per Kilogram
MG/L	Milligrams per liter
MPN/100ml	Most Probable Number
PERCENT	Percent
PSDT	Pacific Daylight savings time
PST	Pacific Standard Time
PSU	Practical Salinity Units also called parts per thousand
UG/L	micrograms per liter

Look up list 30 Missing Value Codes

Code	Description
Date	01/Jan/SampleYear
Time	2300 incremented in minutes for multiple records at the same station
Numerical	-99
Text	NR

Look up list 34 ToxictySpecies/TestType

Code	Description
EE	Eohaustorius estuarius
SP	Strongylocentrotus purpuratus
MB	Mysidopsis bahia
CD	Ceriodaphnia dubia
PP	Pimephales promelas
SC	Selenastrum capricornutum
HA	Hyallela azteca

Look up list 35 ToxicityProtocols

Code	Description

Code	Description
ASTM 1853	ASTM. 1997. E 1853-96
EPA 1994	EPA amphipod test method (EPA/600/R-94/025)
EPA 4425	From standard methods.
USGS F10.6	From standard methods.
USGS F10.7	From standard methods.
USGS SOP F10.6	Sea Urchin Fertilization Toxicity Test
USGS SOP F10.7	Sea Urchin Embryological Development Test
EPA/600/4-91/002	EPA Ceriodaphnia and Selenastrum test methods (EPA/600/4-91/002)
EPA/600/4-90/027F	EPA Pimephales test method (EPA/600/4-90/027F)
EPA/600/R-99/064	EPA Hyallela test method-modified (EPA/600/R-99/064)
EPA/600/R-95/136	EPA Mysidopsis and Sea Urchin test methods (EPA/600/R-95/136)

Look up list 36 ToxicityMatrices

Code	Description
BS	bulk sediment
DW	Dilution Water
EL	elutriate
EX	extract
IW	interstitial water
OL	overlaying water
RT	reference toxicant

Look up list 37 ToxicityEndPoints

Code	Description
B[a]Peq	Benzo [a] Pyrene equivalents
DV	Percent Normal Pluteus Stage
EC50	median effective concentration
FP	Fertilized Percent
IC50	median inhibitory concentration
RL	relative luminescence
SP	survival percent

Look up list 38 ToxicityWaterQualityParameters

Code	Description	Units
COND	Conductivity	uSiemens
DO	Dissolved Oxygen	mg/L
H2S	Hydrogen Sulfide	mg/L
NH3T	Total Ammonia	mg/L
NH3U	Unionized Ammonia	mg/L
PH	pH	pH
SAL	Salinity	g/L
ST	Total Sulfide	ug/L
TEMP	Temperature	C

Look up list 39 ToxicityTestAcceptabilityCodes

Code	Description
A	Acceptable data for analysis
AEHJ	Combination Code
AH	Combination Code
AHJ	Combination Code
AJ	Combination Code
AK	Combination Code
C	Reduced number of replicates
CDEH	Combination Code
D	Control performance criteria not met
DE	Combination Code
DEH	Combination Code
DJ	Combination of codes D and J
E	Sample stored > 14 days
EK	combination of codes E and K
G	Reference test missing or outside limits
H	Water quality data incomplete
HD	Combination Code
J	Minor deviation in test conditions
K	Incoming sample temperature exceeds limits
Q	Control did not meet replicate acceptability criterion (>or=80% in any one rep)

Look up list 40 Event Failure Codes

luList40_EventFailureCodes	
FailCode	**FailureReason**
A	Canted
B	Washed
C	Poor Closure
D	Disturbed Surface
E	< 5 cm pentreation
F	>5 & < 8 cm penetration
G	Fouled Net
H	Torn Net
I	No contact w/ bottom
J	improper distance/Time
K	Irregular Bottom
L	Beyond Border
M	Kelp Bed
N	Obstructions
None	No Failure
O	
Other	Comment Required
P	
Q	> 200m
R	Abandoned
S	Rocky Bottom
T	pre abandoned
U	Rough weather
V	Not within 10% of Target Site Depth