CEDEN

California Environmental Data Exchange Network

Tissue Data Submission Guidance Document

Updated January 8, 2019

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List of Acronyms

CEDEN	California Environmental Data Exchange Network
LABQA	Laboratory Quality Assurance
RDC	Regional Data Center
SWAMP	Surface Water Ambient Monitoring Program
QAO	Quality Assurance Officer

List of Terms

Controlled Vocabulary	Controlled vocabulary refers to codes and associated definitions maintained within CEDEN to ensure comparability between and among data sets. Current controlled vocabulary contained within associated lookup lists can be found at: http://ceden.org/CEDEN_checker/Checker/LookUpLists.php. The process for adding new values can be found at: http://ceden.org/vocabulary_request.shtml.
Data Checker	Web-based automated tool that assists data submitters in examining their data sets against the required LookUp lists, formats and business rules.
LookUp Lists	Controlled vocabularies are maintained within the CEDEN database as "LookUp Lists" and are managed through individual RDCs to maintain comparability between RDCs and throughout data sets available through CEDEN.
Native Sample	Native sample refers to the environmental sample collected and analyzed. The native sample can be compared to field quality assurance samples (e.g. field duplicate, field blank) and laboratory quality assurance samples (e.g. laboratory duplicate, matrix spike).
Primary Key	Uniquely identifies each row in a table and is comprised of a set of columns. No two distinct rows in a table can have the same combination of column values. Required for record uniqueness.
Data Type	Refers to the type of format required for a specific column heading in CEDEN templates. Data type examples include: integer (whole numbers), text, date and time, and decimal.

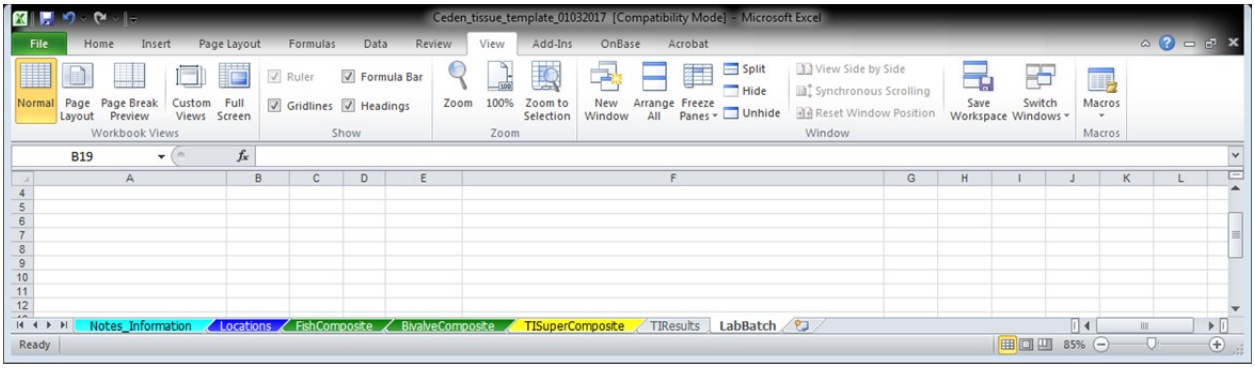
Introduction

This document is designed to provide guidance on reporting requirements for electronic data to be entered in the California Environmental Data Exchange Network (CEDEN) templates. Detailed below are definitions of data elements and rules for formatting Tissue data within the CEDEN Tissue template. For information on entering laboratory QA samples and field generated QA samples see Appendix A. Please review the entire Tissue Data Submission Guidance Document prior to filling out or submitting the CEDEN Tissue Template. If you have any questions regarding these guidelines, contact your Regional Data Center (RDC) for help.

Regional Data Center (RDC)	Contact	Phone Number	Email
Central Coast RDC	Stacey Swenson	831/771-4114	sswenson@mlml.calstate.edu
Central Valley RDC	Melissa Turner	530/756-5200	mturner@mlj-llc.com
San Francisco RDC	Cristina Grosso	510/746-7371	cristina@sfei.org

Tissue Data Submission Steps

To submit tissue data to CEDEN, start with the CEDEN_Tissue_Template Excel file, which can be found at: http://ceden.org/ceden_datatemplates.shtml. In this template you will find the seven data tables (each a separate worksheet) required for submitting tissue data. This file can be named at the discretion of the user; however, the Excel sheet tabs **MUST** be named **Locations**, **FishComposite**, **BivalveComposite**, **TISuperComposite, TIResults** and **LabBatch** respectively.



CEDEN Tissue Template Tables

Below describes what is included and submission requirements for each of the six tables in the CEDEN Tissue Template:

1. Locations
    a. Holds information about location sampled
    b. Required only if actual unique latitudes and longitudes were recorded for each sampling event.
2. FishComposite
    a. Used to record composite, organism, and tissue processing information for fish.

    b. Required only if fish tissue is collected and must be submitted with TIResults and LabBatch tables.
3. BivalveComposite
    a. Used to record composite, organism, and tissue processing information for bivalves.
    b. Required only if bivalve tissue is collected and must be submitted with TIResults and LabBatch tables.
4. TISuperComposite
    a. Used to record tissue super composite information.
    b. Required only if super composite information was compiled and must be submitted with the FishComposite and/or BivalveComposite, TIResults, and LabBatch tables.
5. TIResults
    a. Used to record all of the chemistry results for tissue analysis
    b. Required and must be submitted with either the FishComposite and/or BivalveComposite and LabBatch tables.
6. LabBatch
    a. Used to record lab batch information necessary for analyzing the data
    b. Required and must be submitted with either the FishComposite and/or BivalveComposite and TIResults tables.

The guidelines in the following sections will assist you in getting your data into the CEDEN Tissue Template tables. However, if at any time you have questions more specific to your data, (e.g. adding new codes to LookUp lists) contact your local RDC.

Once you have placed your data into the CEDEN Tissue Template tables, visit your RDC's website to check and submit your data. Regional Data Center information can be found at: http://www.ceden.org/data_centers.shtml. The online data submission process includes specific checks on your data to ensure both data integrity and comparability with other data sets. Once your data has passed all of the checks it will be uploaded into the centralized CEDEN database and become available through the CEDEN website (www.ceden.org).

Tissue Template Data Tables

Locations Table

PURPOSE:

The locations table contains specific information about the locations sampled. Actual latitudes and longitudes are recorded here for each sampling event. In the event that only target latitudes and longitudes were recorded, it is sufficient to rely on the stations and associated details approved during the controlled vocabulary request process.

COLUMN REQUIREMENTS:

Columns within the CEDEN Tissue Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be completed in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be completed with known values, whenever possible. If the actual value is unknown, then the given default value **must** be used. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationCode
SampleDate
ProjectCode
CoordinateNumber
ActualLatitude
ActualLongitude
Datum

Desired Columns:

EventCode
ProtocolCode
AgencyCode
LocationCode
CoordinateSource

Not Required Columns:

SampleComments
GeometryShape
Elevation
UnitElevation
StationDetailVerBy
StationDetailVerDate
StationDetailComments

LOCATIONS TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationCode*	Text	**Yes**	25	Station LookUp	A code representing the StationName and site and should be unique within CEDEN. A single waterbody may have multiple stations. StationCodes and station information must be submitted to the CEDEN system via the new vocabulary request process before lab data can be submitted.
SampleDate*	Date/ Time	**Yes**	20		Refers to the date the sample was collected in the field. Formatted as dd/mmm/yyyy.
ProjectCode*	Text	**Yes**	25	Project LookUp	References the project that is associated with the sample.
EventCode	Text	**Desired**	20	Event LookUp	Represents the primary reason (e.g. water quality, tissue or bioassessment sampling) of the sampling event at a particular station and date.
ProtocolCode	Text	**Desired**	50	Protocol LookUp	Represents the sampling protocol used, which includes the set of methods, methodology and/or specifications, such as "MPSLDFG_Field_v1.0." Established protocols may be used or Regions may document their own sampling protocols. Use "Not Recorded" when environmental samples are taken using unknown protocols.
AgencyCode	Text	**Desired**	20	Agency LookUp	Refers to the organization or agency that collected the sample. Use "Not Recorded" if unknown.
SampleComments	Text	No	255		Comments related to the GIS station information verification.
LocationCode	Text	**Desired**	50	Location LookUp	Describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations. Use "Not Recorded" if unknown.
GeometryShape	Text	No	50	Variable Codes LookUp; Geometry-ShapeList	Physical shape of the location. Example values are Line, Point, or Polygon.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CoordinateNumber	Integer	**Yes**			Number of the coordinate recorded at a Location; e.g. 1 for Points (target and actual coordinates), 1 and 2 for Lines. Default value equals 1 if unknown.
ActualLatitude	Decimal	**Yes**			Represents the actual latitude for the sample site in decimal degrees with 5 decimal places.
ActualLongitude	Decimal	**Yes**			Represents the actual longitude for the sample site in decimal degrees with 5 decimal places (must be negative).
Datum	Text	**Yes**	10	Variable Codes LookUp; DatumList	The Datum field records the datum that was used on the GPS Device to record the GPS measurements. Example = NAD83. If the datum is unknown, use "NR."
CoordinateSource	Text	**Desired**	50	Variable Codes LookUp; Coordinate-SourceList	Describes how the coordinate was measured. For example, if measurement was taken from a map or GPS. Use "NR" if unknown.
Elevation	Decimal	No			Elevation at which the sample was taken. Example = 1.
UnitElevation	Text	No	2	Variable Codes LookUp; Unit-Elevation-List	Unit of the Elevation measurement. Example = m
StationDetailVerBy	Text	No	100		Agency or person who performed the verification of the station detail information.
StationDetailVerDate	Date/ Time	No			Date the station detail information was verified; formatted as dd/mmm/yyyy.
StationDetailComments	Text	No	255		Comments related to the station detail information.

FishComposite Table

PURPOSE:

The purpose of the FishComposite table is to hold the tissue collection, organism, composite and tissue processing information for fish. Each record represents the composite mean of a specific sample collected at a specific site on a specific date. Both environmental and LABQA samples should be included in this worksheet.

COLUMN REQUIREMENTS:

Columns within the CEDEN Tissue Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be completed in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be completed with known values, whenever possible. If the actual value is unknown, then the given default value **must** be used. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationCode
SampleDate
ProjectCode
CollectionTime
CollectionMethodCode
Replicate
OrganismID
OrganismName
TotalLength
UnitLengthFish
TissueID
TissueName
CompositeID
CompositeType
CompositeReplicate

Desired Columns:

EventCode
ProtocolCode
AgencyCode
LocationCode
CollectionDeviceName
TisSource
LifeStageCode
Sex
PartsPrepPreservationName
OrganismGroup
CompAgencyCode

Not Required Columns:

SampleComments	SizeDescr
GeometryShape	Age
TissueCollectionComments	Anomaly
TagNumber	EntryDateTime
TotalCount	TissueWeight
PartCreated	UnitTissueWeight
SampleID	PartsComments
ForkLength	CompositeWeight
LengthSource	UnitCompositeWeight
Weight	HomogDate
UnitWeightFish	CompositeComments
WeightSource	
ProcessedOrganismsExpandedFishComments	

FISHCOMPOSITE TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationCode*	Text	**Yes**	25	Station LookUp	A code representing the StationName and site and should be unique within CEDEN. A single waterbody may have multiple stations. StationCodes and station information must be submitted to the CEDEN system via the new vocabulary request process before lab data can be submitted.
SampleDate*	Date/ Time	**Yes**			Refers to the date the sample was collected in the field; formatted as dd/mmm/yyyy.
ProjectCode	Text	**Yes**	25	Project LookUp	References the project that is associated with the sample.
EventCode	Text	**Desired**	20	Event LookUp	Represents the primary reason (e.g. water quality, tissue or bioassessment sampling) of the sampling event at a particular station and date.
ProtocolCode	Text	**Desired**	50	Protocol LookUp	Represents the sampling protocol used, which includes the set of methods, methodology and/or specifications, such as "MPSL-DFG_Field_v1.0." Established protocols may be used or Regions may document their own sampling protocols. Use "Not Recorded" when environmental samples are taken using unknown protocols. For LabQA samples utilize "Not Applicable."
AgencyCode	Text	**Desired**	20	Agency LookUp	Refers to the organization or agency that collected the sample. This should be listed on the Chain of Custody (COC) document that accompanies the samples from the field. Use "Not Recorded" if unknown.
SampleComments	Text	No	255		The comments field should be used for any notes or comments specifically related to the sample collection.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LocationCode	Text	**Desired**	50	Location LookUp	Describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations. Use "Not Recorded" if the location that an environmental sample was taken is unknown. For LabQA samples, utilize "Not Applicable."
GeometryShape	Text	No	50	Variable Codes LookUp; Geometry-ShapeList	Physical shape of the location. Example values are Line, Point, or Polygon.
CollectionTime*	Date/ Time	**Yes**	20		Refers to the time when the first sample of a sampling event at a specific station was collected in the field. Format equals hh:mm. Use "00:00" if the time sampling started is unknown.
CollectionMethodCode	Text	**Yes**	50	Collection Method LookUp	Refers to the general method of collection such as Net or Shock. Use "Not Recorded" when the method of collecting an environmental sample is unknown. Use "Not Applicable" for LabQA samples.
Replicate*	Integer	**Yes**			Used to distinguish between replicates created at a single collection in the field. The default value is 1. Replicate samples are collected at the same station and date. Therefore, samples collected on different dates from the same station should both have a Replicate value of 1. Utilize this field for pre-composite replicates.
CollectionDeviceName	Text	**Desired**	50	Collection Device LookUp	Name of the CollectionDevice. Use "Not Recorded" if unknown.
TisSource	Text	**Desired**	10	Variable Codes LookUp; Tis-SourceList	References the original source of the collected organism. Bivalves could be Res (Resident) or Trans (Transplant) while fish are NA (Not Applicable). Use "NR" is the source is unknown.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
TissueCollection Comments	Text	No	255		Describes any comments relating to the collection of the tissue sample for laboratory analysis.
OrganismID	Text	**Yes**	255		Unique identifier assigned to the organism by the field crew or the agency that first has possession of the field data sheets and of the fish.
OrganismName	Text	**Yes**	100	Organism LookUp	Refers to the organism name (FinalID) of the organism collected. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
TagNumber	Text	No	50		References the individual tag number assigned to and placed on the organism (usually only fish).
LifeStageCode	Text	**Desired**	50	LifeStage LookUp	Unique code referencing the stage of life of the organism; e.g. adult, juvenile Use "NR" if the life stage is unknown.
TotalCount	Integer	No			Total count of alive organisms in the tissue sample associated with the same OrganismID.
PartCreated	Yes/ No	No			References whether a subsequent part was created from the OrganismID, i.e. "Yes" would be populated if any portion of the processed organism was taken for analysis.
SampleID	Text	No	40		Unique identifier supplied by the sampling agency and is used to track the organism.
ForkLength	Decimal	No			The measured length of the organism from the most forward point, with mouth closed, to the center of the fork in the tail.
TotalLength	Decimal	**Yes**			The measured length of the organism from the most forward point of the head, with mouth closed, to the farthest tip of the tail.
UnitLengthFish	Text	**Yes**	2	Variable Codes LookUp; UnitLength-FishList	Refers to the units used in measuring the length of the fish. Preferably in mm.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LengthSource	Text	No	5	Variable Codes LookUp; Length-SourceList	The physical location where the length measurements were recorded; e.g. field, lab
Weight	Decimal	No			Weight of the entire fish.
UnitWeightFish	Text	No	2	Variable Codes LookUp; UnitWeight-FishList	Refers to the units used in measuring the weight of the fish. Preferably in grams.
WeightSource	Text	No	5	Variable Codes LookUp; Weight-SourceList	The physical location where the weight measurements were recorded; e.g. field, lab
SizeDescr	Text	No	50		Description of the grouping of organisms by size; e.g. small, large, 100-150cm
Age	Text	No	10		Describes the age of the organism.
Sex	Text	**Desired**	10	Variable Codes LookUp; SexList	Refers to the sex of the organism; e.g. M, F, Unk Default value equals NR.
Anomaly	Text	No	50	Variable Codes LookUp; AnomalyList	Describes any anomalies that may be on or in the organism; e.g. Deformityskeletal, Lesion, Parasite
ProcessedOrganisms ExpandedFish Comments	Text	No	255		Records any comments relating to the ProcessedOrganismsExpandedFish, e.g. the location of the anomaly.
TissueID	Text	**Yes**	255		Unique identifier that is assigned to the tissue part. Is used to differentiate between different parts of the same fish or can differentiate composited fish vs. an individual fish. If unknown please utilize a format containing station, date, species and a unique identifier, example "630PVL031_101807_Oncorhynchusmykis_1."

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CompositeID	Text	**Yes**	255		Unique identifier supplied by the Compositing Agency to identify the composited tissue parts. It can refer to either the original Composite or the SuperComposite where multiple Composites are combined to create a SuperComposite.
CompositeType	Text	**Yes**	100	Variable Codes LookUp; Composite-TypeList	Indicates the type of composite, e.g. Normal, SuperComposite.
CompositeReplicate	Integer	**Yes**			The composite replicate number is used to distinguish between replicate composites. The default value equals 1.
CompositeWeight	Decimal	No			Weight of the total Composite or SuperComposite used in the analysis. Use "-88" if the actual weight is unknown.
UnitCompositeWeight	Text	No	255	Variable Codes LookUp; Unit-Composite-WeightList	Refers to the units used in measuring the weight of the Composite or SuperComposite.
HomogDate	Date/ Time	No			Date the Composite or SuperComposite was homogenized. Date format is dd/mmm/yyyy. Use "01/Jan/1950" if the actual date the process was performed is unknown.
OrganismGroup	Text	No	50	Variable Codes LookUp; Organism-GroupList	Organism group of the sample, e.g. Fish, Bivalves, Crustacean, Mammal, Bird or Amphibian. BR: The default for LABQA is Not Applicable except for CRMs. The CRM should reflect the correct organism group. Default value of Not Recorded is utilized for environmental samples.
CompAgencyCode	Text	**Desired**	20	Agency LookUp	Agency that physically created the Composite or SuperComposite. Default value of Not Recorded if unknown.
CompositeComments	Text	No	255		Describes any comments related to the Composite or SuperComposite.

BivalveComposite Table

PURPOSE:

The purpose of the BivalveComposite table is to hold the tissue collection, organism, composite and tissue processing information for bivalves. Each record represents the composite mean of a specific sample collected at a specific site on a specific date. Both environmental and LABQA samples should be included in this worksheet.

COLUMN REQUIREMENTS:

Columns within the CEDEN Tissue Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be completed in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be completed with known values, whenever possible. If the actual value is unknown, then the given default value **must** be used. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationCode	**OrganismName**
SampleDate	**TissueID**
ProjectCode	**TissueName**
CollectionTime	**CompositeID**
CollectionMethodCode	**CompositeType**
Replicate	**CompositeReplicate**
OrganismID	

Desired Columns:

EventCode	**LifeStageCode**
ProtocolCode	**Sex**
AgencyCode	**PartsPrepPreservationName**
LocationCode	**OrganismGroup**
CollectionDeviceName	**CompAgencyCode**
TisSource	

Not Required Columns:

SampleComments
GeometryShape
TissueCollectionComments
TagNumber
TotalCount
PartCreated
SampleID
BivalveID
Count
ShellLength
ShellWidth
UnitShellLengthWidth
LengthWidthType
BeginWeight
EndWeight
UnitWeightBivalve
BivalveSex
SizeDescrBivalve
EntryDateTime
TissueWeight
UnitTissueWeight
PartsComments
CompositeWeight
UnitCompositeWeight
HomogDate
CompositeComments
ProcessedOrganismsExpandedBivalvesComments

BIVALVECOMPOSITE TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationCode*	Text	**Yes**	25	Station LookUp	A code representing the StationName and site and should be unique within a study design.
SampleDate*	Date/ Time	**Yes**			Refers to the date the sample was collected in the field. Formatted as dd/mmm/yyyy. Default value equals 01/Jan/1950 if unknown.
ProjectCode	Text	**Yes**	25	Project LookUp	References the project that is associated with the sample.
EventCode	Text	**Desired**	20	Event LookUp	Represents the primary reason, i.e. water quality, tissue or bioassessment sampling, of the sampling event at a particular station and date.
ProtocolCode	Text	**Desired**	50	Protocol LookUp	Represents the sampling protocol used, which includes the set of methods, methodology and/or specifications, such as MPSL-DFG_Field_v1.0. Established protocols may be used or Regions may document their own sampling protocols. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
AgencyCode	Text	**Desired**	20	Agency LookUp	Refers to the organization or agency that collected the sample. This should be listed on the Chain of Custody (COC) document that accompanies the samples from the field. Default value equals Not Recorded if unknown
SampleComments	Text	No	255		The comments field should be used for any notes or comments specifically related to the sample collection.
LocationCode	Text	**Desired**	50	Location LookUp	Describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
GeometryShape	Text	No	50	Variable Codes LookUp; Geometry-ShapeList	Physical shape of the location. Example values are Line, Point, or Polygon.
CollectionTime*	Date/ Time	**Yes**	20		Refers to the time when the first sample of a sampling event at a specific station was collected in the field. Format equals hh:mm. Default value equals 00:00 if unknown.
CollectionMethodCode	Text	**Yes**	50	Collection Method LookUp	Refers to the general method of collection such as Bag. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
Replicate*	Integer	**Yes**			Used to distinguish between replicates created at a single collection in the field. Default value is 1. Replicate samples are collected at the same station and date. Therefore, samples collected on different dates from the same station should both have a value of 1 for FieldReplicate. Utilize this field for pre-composite replicates.
CollectionDeviceName	Text	**Desired**	50	Collection Device LookUp	Name of the CollectionDevice. Default value equals Not Recorded if unknown
TisSource	Text	**Desired**	10	Variable Codes LookUp; TisSource-List	References the original source of the collected organism; e.g. resident, transplant. Bivalves could be Res (Resident) or Trans (Transplant) while fish are NA (Not Applicable). Default value equals NR if unknown
TissueCollection Comments	Text	No	255		Describes any comments relating to the collection of the tissue sample for laboratory analysis.
OrganismID	Text	**Yes**	255		Unique identifier assigned to the organism by the field crew or the agency that first has possession of the field data sheets and of the fish.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
OrganismName	Text	**Yes**	100	Organism LookUp	Refers to the organism name (FinalID) of the organism collected. The default value of "Not Recorded" is utilized for environmental samples if unknown. For LabQA samples utilize "Not Applicable."
TagNumber	Text	No	50		References the individual tag number assigned to and placed on the organism (usually only fish).
LifeStageCode	Text	**Desired**	50	LifeStage LookUp	Unique code referencing the stage of life of the organism; e.g. adult, juvenile Default value equals NR.
TotalCount	Integer	No			Total count of alive organisms in the tissue sample associated with the same OrganismID.
PartCreated	Yes/ No	No			References whether a subsequent part was created from the OrganismID, i.e. Yes would be populated if any portion of the processed organism was taken for analysis.
SampleID	Text	No	40		Unique identifier supplied by the sampling agency and is used to track the organism.
BivalveID	Integer	No			Unique identifier (when combined with OrganismID) that is assigned to the organism. The default is "1."
Count	Integer	No			The actual number of organisms represented by the BivalveID. The default is "1."
ShellLength	Decimal	No			The actual measured length of the shell of the individual organism. When a group of organisms are measured and averaged, enter the average length of the shell.
ShellWidth	Decimal	No			The actual measured width of the shell of the individual organism. When a group of organisms are measured and averaged, enter the average width of the shell.
UnitShellLengthWidth	Text	No	10	Variable Codes LookUp; UnitShell-Length-WidthList	Refers to the units used in measuring the length and width of the organism. When a group of organisms are measured and averaged, enter the unit as avg xx where xx refers to the unit.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LengthWidthType	Text	No	10	Variable Codes LookUp; Length-WidthType-List	Describes the type of length or width measurement recorded; e.g. Ca (Carapace), Ab (Abdomen), TL (Total Length). If two different types of measurements were recorded, enter the primary type here and the secondary type in the ProcessedOrganismsExpanded-BivalvesComments field.
BeginWeight	Decimal	No			Weight of the bivalve organism at the start date.
EndWeight	Decimal	No			Weight of the bivalve organism at the end date.
UnitWeightBivalve	Text	No	10	Variable Codes LookUp; UnitWeight-BivalveList	Refers to the units used in measuring the weight of the bivalve.
BivalveSex	Text	No	10	Variable Codes LookUp; SexList	Refers to the sex of the organism; e.g. M, F, Unk
SizeDescrBivalve	Text	No	50		Description of the grouping of organisms by size; e.g. small, large, 100-150cm. This field is to be used at discretion of the project as a grouping characteristic. Used only when sizes are estimated. Not populated if individual shell measurements are recorded.
ProcessedOrganisms ExpandedBivalves Comments	Text	No	255		Records any comments relating to the ProcessedOrganismsExpandedBivalves. Include the number of animals involved in the weight and length measurements if it is different from the count number.
TissueID	Text	**Yes**	255		Unique identifier that is assigned to the tissue part. Is used to differentiate between different parts of the same fish or can differentiate composited fish vs. an individual fish. If unknown please utilize a format containing station, date, species and a unique identifier, example "410VHHME1_022807_Mytilus californianus_1."

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
TissueName	Text	**Yes**	50	Tissue LookUp	Name of the tissue part used in the composite and analysis. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
PartsPrepPreservationName	Text	**Desired**	50	PrepPreservation LookUp	References the preparation or preservation method performed on the tissue part in order to create the composite. This does not include the Preparation Preservation of the composite itself, e.g. freezing, drying or acidifying. If no preparation or preservation method was performed the default value is None. Default value equals Not Recorded if unknown.
EntryDateTime	Date/ Time	No			Reflects the date and time when the template is filled out and can be used as a way to group data entry.
TissueWeight	Decimal	No			Measured weight of the tissue part included in the composite.
UnitTissueWeight	Text	No	5	Variable Codes LookUp; UnitTissue-WeightList	Refers to the units used in measuring the weight of the tissue part.
PartsComments	Text	No	255		Records any comments relating to the tissue parts.
CompositeID	Text	**Yes**	255		Unique identifier supplied by the Compositing Agency to identify the composited tissue parts. It can refer to either the original Composite or the SuperComposite where multiple Composites are combined to create a SuperComposite.
CompositeType	Text	**Yes**	100	Variable Codes LookUp; Composite-TypeList	Indicates the type of composite, e.g. Normal, SuperComposite.
CompositeReplicate	Integer	**Yes**			Composite replicate number used to distinguish between replicate composites. Default value equals 1
CompositeWeight	Decimal	No			Weight of the total Composite or SuperComposite used in the analysis. Default value is -88.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
UnitCompositeWeight	Text	No	255	Variable Codes LookUp; Unit-Composite-TypeList	Refers to the units used in measuring the weight of the Composite or SuperComposite.
HomogDate	Date/ Time	No			Date the Composite or SuperComposite was homogenized. Date format is dd/mmm/yyyy. Default value equals 01/Jan/1950 if unknown.
OrganismGroup	Text	**Desired**	50	Variable Codes LookUp; Organism-GroupList	Organism group of the sample, e.g. Fish, Bivalves, Crustacean, Mammal, Bird or Amphibian. BR: The default for LABQA is Not Applicable except for CRMs. The CRM should reflect the correct organism group. Default value of Not Recorded is utilized for environmental samples.
CompAgencyCode	Text	**Desired**	20	Agency LookUp	Agency that physically created the Composite or SuperComposite. Default value equals Not Recorded if unknown.
CompositeComments	Text	No	255		Describes any comments related to the Composite or SuperComposite.

TISuperComposite Table

PURPOSE:

This table contains tissue super composite information. Super composites are formed when multiple composite samples are combined to create a super composite sample. Super composite samples allow for multiple composites, for example 2 different fish composites (normal composites), from one lake to be combined for a single lake wide sample (super composite). Each record within the TISuperComposite tab represents an original composite combined to create a super composite.

COLUMN REQUIREMENTS:

Columns within the CEDEN Tissue Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be completed in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be completed with known values, whenever possible. If the actual value is unknown, then the given default value **must** be used. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

SuperCompositeID CompositeType
CompositeReplicate
CompositeSourceID

Desired Columns:

OrganismGroup Not Required Columns:

CompositeWeight
UnitCompositeWeight
CompositeSourceWeight
UnitCompositeSourceWeight
HomogDate
CompAgencyCode
CompositeComments

TISUPERCOMPOSITE TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
SuperCompositeID*	Text	**Yes**	255		Unique identifier supplied by the Compositing Agency to identify the composited tissue parts. It can refer to either the original Composite or the SuperComposite where multiple Composites are combined to create a SuperComposite.
CompositeType	Text	**Yes**	100	Variable Codes LookUp; Composite-TypeList	Indicates the type of composite, e.g. Normal and SuperComposite. In the Composite template, only Normal will be recorded. In the SuperComposite template, only SuperComposite will be recorded. In the Results template, Normal and SuperComposite is recorded for samples and LABQA is recorded for LABQA.
CompositeReplicate	Integer	**Yes**			Composite replicate number used to distinguish between replicate composites. The default value is "1."
CompositeWeight	Decimal	No			Weight of the total Composite or SuperComposite used in the analysis. Default null value is "-88."
UnitCompositeWeight	Text	No	255	Variable Codes LookUp; Unit-Composite-WeightList	Refers to the units used in measuring the weight of the Composite or SuperComposite.
CompositeSourceID	Text	**Yes**	255		Unique identifier supplied by the Compositing Agency to identify the composited tissue parts in the SuperComposite. This CompositeID must match the original CompositeID used in the SuperComposite.
CompositeSource Weight	Decimal	No			Weight of the portion of the original Composite used to create the SuperComposite.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
UnitCompositeSource Weight	Text	No	255	Variable Codes LookUp; Unit-Composite-Source-WeightList	Refers to the units used in measuring the weight of the SuperComposite.
HomogDate	Date/ Time	No			Date the Composite or SuperComposite was homogenized. Date format is dd/mmm/yyyy. Default value equals 01/Jan/1950 if unknown.
OrganismGroup	Text	**Desired**	50	Variable Codes LookUp; Organism-GroupList	Organism group of the sample, e.g. Fish, Bivalves, Crustacean, Mammal, Bird or Amphibian. Default value equals Not Recorded if unknown.
CompAgencyCode	Text	No	20	Agency LookUp	Agency that physically created the Composite or SuperComposite.
CompositeComments	Text	No	255		Describes comments related to the Composite or SuperComposite.

Tissue Results Table

PURPOSE:

The purpose of the tissue results table is to hold all chemistry results data. Each record in the Tissue Results sheet represents a result from a specific analysis for a particular parameter of a single composite or for a single QC sample. Both the environmental and LABQA should be included in this worksheet.

COLUMN REQUIREMENTS:

Columns within the CEDEN Tissue Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be completed in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be completed with known values, whenever possible. If the actual value is unknown, then the given default value **must** be used. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

CompositeID
CompositeType
CompositeReplicate
LabBatch
AnalysisDate
SampleTypeCode
MatrixName
MethodName
AnalyteName
FractionName
UnitName
LabReplicate
Result
ResQualCode
MDL
RL
QACode

Desired Columns:

OrganismGroup
ComplianceCode
DilutionFactor
PrepPreservationName
PrepPreservationDate
DigestExtractMethod
DigestExtractDate

Not Required Columns:

CompositeComments
ExpectedValue
LabSampleID
TissueResultComments

RESULTS TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CompositeID*	Text	**Yes**	255		Unique identifier supplied by the Compositing Agency to identify the composited tissue parts. It can refer to either the original Composite or the SuperComposite where multiple Composites are combined to create a SuperComposite.
CompositeType*	Text	**Yes**	100	Variable Codes LookUp; Composite-TypeList	Indicates the type of composite, e.g. Normal, SuperComposite. In the Composite template, only Normal will be recorded. In the SuperComposite template, only SuperComposite will be recorded. In the Results template, Normal and SuperComposite is recorded for samples and LABQA is recorded for LABQA.
CompositeReplicate*	Integer	**Yes**			Composite replicate number used to distinguish between replicate composites. The default value is "1."
OrganismGroup	Text	**Desired**	50	Variable Codes LookUp; Organism-GroupList	Organism group of the sample, e.g. Fish, Bivalves, Crustacean, Mammal, Bird or Amphibian. The default for LABQA is Not Applicable except for CRMs. The CRM should reflect the correct organism group. Default value of Not Recorded is utilized for environmental samples.
CompositeComments	Text	No	255		Describes comments related to the Composite or SuperComposite.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LabBatch*	Text	Yes	35		The LabBatch is a unique code, provided by the laboratory, which represents a group of samples processed together. It groups all environmental samples with their supporting QC samples and will be used to verify completeness. This field is the primary key to ensure record uniqueness. To ensure uniqueness in the CEDEN system, the LabAgencyCode may be appended to this value when loaded to CEDEN. Please use a standard format to construct a composite Lab Batch. Format as LabBatch a dash – and the AgencyCode. Example: Batch1SCCWRP.
AnalysisDate	Date/ Time	Yes			Date and time the sample was processed on the analytical instrument. Formatted as dd/mmm/yyyy hh:mm. Default value equals 01/Jan/1950 00:00 if unknown.
SampleTypeCode*	Text	Yes	20	Sample Type LookUp	Refers to the type of sample collected or analyzed. Default value equals Not Recorded if unknown.
MatrixName*	Text	Yes	50	Matrix LookUp	Refers to the sample matrix, e.g. samplewater. Default value equals Not Recorded if unknown.
MethodName*	Text	Yes	50	Method LookUp	Refers to the analysis method used by the laboratory to analyze the sample. Default value equals Not Recorded if unknown.
AnalyteName*	Text	Yes	100	Analyte LookUp	Name of the analyte or parameter for which the analysis is conducted and result is reported. The LookUp list includes the acceptable abbreviation or name of the variable used by the database, enabling consistency across reporting.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
FractionName*	Text	**Yes**	50	Fraction LookUp	Specific descriptor of the Analyte. For example, metals are often expressed as total or dissolved and therefore this description should be used within the fraction field.
UnitName*	Text	**Yes**	50	Unit LookUp	Refers to how the chemistry result is measured or expressed.
LabReplicate*	Integer	**Yes**			Used to distinguish between replicates created in the laboratory. It differentiates the original field sample that was analyzed from all subsequent laboratory duplicates. Default is 1.
Result	Text	**Yes**	50		Final numeric result of a given analyte, stored as text to retain trailing zeros. The result should be reported with the appropriate number of significant figures. Result may be left blank as long as an appropriate ResQualCode is provided.
ResQualCode	Text	**Yes**	10	ResQual LookUp	Qualifies the analytical result of the sample. Default value equals "=."
MDL	Decimal	**Yes**			The MDL (method detection limit) is the lowest possible calculated detection limit associated with a given method and analyte. The MDL should be reported on the lab summary sheet with the associated measured result. If an MDL is not listed on the lab summary sheet, then use "-88" with a QACode of "NMDL."
RL	Decimal	**Yes**			Minimum value below which data are documented as non-quantifiable. It is the reporting limit for the sample analyzed, as determined by the laboratory. Default value of "-88" is utilized for analytes such as surrogates.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
QACode*	Text	**Yes**	30	QA LookUp	Applied to the result to describe any special conditions, situations or outliers that occurred during or prior to the analysis to achieve the result. The default code, indicating no special conditions, is "None." Default value equals NR if unknown. If more than one code should be applied to a record, the convention is to list them in alphabetical order separated by commas and no spaces.
ComplianceCode	Text	**Desired**		Data Compliance LookUp	Code referencing the Compliance with the associated QAPP. Default value equals NR if unknown.
DilutionFactor	Integer	**Desired**			Factor by which a sample was diluted and is reported as a whole number. It is equal to the final volume divided by the initial volume of solution, or DF = Vf ÷ Vi. If no dilution was performed, the default value is "1."
ExpectedValue	Decimal	No			Concentration of the analyte in a reference standard, laboratory control sample or matrix spike sample or the value expected to obtain from analysis of the QC Sample. This consists of the native sample result concentration plus the spike amount. For surrogate samples, the expected value should be 100, representing 100%.
PrepPreservationName	Text	**Desired**	50	PrepPreservation LookUp	References the preparation or preservation method performed on the samples prior to analysis. Default value equals Not Recorded if unknown.
PrepPreservationDate	Date Time	**Desired**			Date and time the preparation or preservation was started. Default value equals 01/Jan/1950 00:00 for unknown or null values.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
DigestExtractMethod	Text	**Desired**	50	Digest Extract LookUp	References the digestion or extraction method performed on the sample prior to analysis. Default value equals Not Recorded if unknown.
DigestExtractDate	Date Time	**Desired**			Date and time the digestion or extraction was started. Default value equals 01/Jan/1950 00:00 for unknown or null values.
LabSampleID	Text	No	35		Recommended field intended to provide lab specific identification for an analyzed sample.
TissueResultComments	Text	No	130		Holds any comments related to the tissue results or analysis of the sample.

LabBatch Table

PURPOSE:

The tissue LabBatch table contains information about lab batches performed by the analyzing laboratory i.e. qualifies batches within the TIResults table. A batch represents a group of samples processed together. It groups all environmental samples with their supporting QA samples. Review method or project specific requirements for specific batch definitions. Each project or method might have different requirements for a batch. An example batch for methods with no digestions or extractions would include, all samples (including QA samples) processed by a single lab, within a 24-hour period, using a single preparation (preparation preformed before analysis not for creating the composite) and analytical method. An example batch for methods with digestions or extractions would include all samples, processed by a single lab, digested or extracted together, using a single preparation (preparation preformed before analysis not for creating the composite) and analytical method. In some cases, a batch may include analyses for several analytes (as with most pesticides). If your project requires QA samples these are expected to be submitted with each batch.

COLUMN REQUIREMENTS:

Columns within the CEDEN Tissue Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be completed in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be completed with known values, whenever possible. If the actual value is unknown, then the given default value **must** be used. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

LabBatch LabAgencyCode

Desired Columns:

LabSubmissionCode
BatchVerificationCode

Not Required Columns:

SubmittingAgencyCode LabBatchComments

LABBATCH TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LabBatch*	Text	**Yes**	35		The LabBatch is a unique code, provided by the laboratory, which represents a group of samples processed together. It groups all environmental samples with their supporting QC samples and will be used to verify completeness. This field is the primary key to ensure record uniqueness. To ensure uniqueness in the CEDEN system, the LabAgencyCode may be appended to this value when loaded to CEDEN. Please use a standard format to construct a composite Lab Batch. Format as LabBatch a dash – and the AgencyCode. Example: Batch1SCCWRP.
LabAgencyCode*	Text	**Yes**	20	Agency LookUp	LabAgencyCode refers to the organization, agency or laboratory that performed the analysis on the sample. Default value equals Not Recorded if unknown.
LabSubmissionCode	Text	**Desired**	10	Lab Submission Lookup	The LabSubmissionCode is a unique batch qualifier code assigned to the LabBatch as a whole by the analyzing laboratory which references the quality of the data in the LabBatch. The LabSubmissionCode should be reviewed by the Project Manager or other appropriate person to ensure that the code has been applied based on project specific data quality objectives and criteria. Default value equals NR if unknown.
BatchVerificationCode	Text	**Desired**	10	Batch Verification Lookup	Unique code referencing the Verification of a Batch. If the Batch Verification used is not found in the lookup list please contact your Regional Data Center for assistance. Default value equals NR if unknown.

TISSUE TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
SubmittingAgencyCode	Text	No	20	Agency LookUp	Organization or agency that is responsible for submission of the data to the database. This agency may be different from LabAgencyCode if the analytical data were subcontracted to another agency.
LabBatchComments	Text	No	255		LabBatchComments records any comments relating to the LabBatch as a whole. Comments should explain any irregularities in sample processing.

Appendix A: Specific Entry for Laboratory Generated QA Samples

INTRODUCTION

Appendix A has been created to give additional guidance regarding business rules and formatting of quality assurance data generated in the laboratory. The following sections on Compositing LabGenerated QA Samples and Laboratory QA Samples list example values that can be used to ensure comparability with other QA samples generated with different projects. The example values are listed for a subset of the Tissue Template columns and are associated with descriptions and business rules to further guide the data generator in how to format quality assurance data. The examples only reference a subset of the columns in the Tissue Template; the Tissue Data Submission Guidance Document main body should be used as a reference for definitions and associated lookup lists for how to populate the additional columns not addressed in the examples.

1. COMPOSITING LAB-GENERATED QA SAMPLES

The sections below provide examples for entering the following types of data into the tissue templates:

1.1. Composite Blind Duplicate Samples

1.1 COMPOSITE BLIND DUPLICATE SAMPLES

Table 1 is an example of the values that should be entered for compositing laboratory generated QA samples within the tissue template columns. Descriptions are included in Table 1 (Description & Business Rules) to further address formatting specifications, give additional details and note business rules.

Table 1. Example values to be used for composite blind duplicate samples within the TIResults tab

For these samples, all fields describing the Sample, Location, Collection, Processed Organism, Processed Organism Expanded and Parts remain the same as the native sample.

Tissue Template Header	Value	Description & Business Rules
CompositeID		Will appear blind to analyzing laboratory. Should be renamed similar to native composite sample at project management level after all associated results have been loaded into the database.
CompositeType		Provided by compositing laboratory. Same as native field sample
Composite Replicate	1	Utilize "1" for composite blind duplicates of a single environmental sample
	2	Utilize "2" for the second composite blind duplicate of single environmental sample
OrganismGroup		Provided by compositing laboratory. Same as native field sample
SampleTypeCode	CompBLDup	CompBLDup is utilized to describe the composite blind duplicate

Tissue Template Header	Value	Description & Business Rules
LabReplicate	1	
Matrix		Provided by compositing laboratory. Same as native field sample

2. LABORATORY QA SAMPLES

The sections below provide examples for entering the following types of data into the tissue templates:

2.1. Samples that are generated or created by a laboratory (LABQA)
2.2. Environmental samples that are modified by a laboratory for QA purposes (e.g. matrix spikes)

2.1 LABORATORY GENERATED QA SAMPLES (LABQA)

All samples generated from within the laboratory, such as a LabBlank, Laboratory Control Spike (LCS), or Certified Reference Material (CRM), are entered into the tissue template according to specific business rules. Table 1 is an example of the values that should be entered for laboratory generated QA (LABQA) samples within the tissue template columns. Descriptions are included in Table 2.0 and 2.1 (Description & Business Rules) to further address formatting specifications, give additional details and note business rules.

Table 2.0 Example values to be used for laboratory generated QA samples (LABQA) for a subset of the columns within the TIResults tab.

Tissue Template Header	Value	Description & Business Rules
CompositeType	LABQA	LABQA is used as the CompositeType for any sample generated in the laboratory including LabBlank, LCS and CRMs.
Composite Replicate	1	
OrganismGroup	Not Applicable	For LabBlanks and LCS's utilize "Not Applicable"
		For CRM's utilize the organism group of the CRM e.g. Fish Bivalves, Crustacean, Mammal, Bird or Amphibian
SampleTypeCode		Select from SampleTypeLookup list.
Matrix	tissue	Tissue is used when a laboratory is utilizing a solvent, water or nothing
	blankmatrix	Blankmatrix is used when a laboratory is utilizing commercially generated product.
LabReplicate	1	
	2, 3 etc	Utilize only if it is truly a replicate of the LABQA sample.

Table 2.1 Example values to be used for laboratory generated QA samples (LABQA) for a subset of the columns within the FishComposite/BivalveComposite tab.

Tissue Template Header	Value	Description & Business Rules
StationCode	LABQA	LABQA is used as the station code for any sample generated in the laboratory including LabBlank, LCS and CRMs.
SampleDate	01/01/1950	SampleDate reflects the null date of 1/1/1950. Formatted as dd/mmm/yyyy.
ProjectCode		Populate with applicable ProjectCode within Project LookUp or use default value of "Not Applicable."
EventCode	TI	For tissue events use "TI." See the EventCode LookUp list for additional EventCodes and associated definitions. The EventCode should be consistent with the environmental samples in the same batch.
ProtocolCode		Populate with applicable ProtocolCode within Protocol LookUp or use default value of "Not Applicable"
AgencyCode		Organization or agency that analyzed the sample. Select from Agency LookUp list. Or utilize null value of "Not Recorded."
LocationCode	Not Applicable	LABQA samples are generated in the laboratory and therefore are associated with a LocationCode of "Not Applicable."
GeometryShape		Leave blank
CollectionTime	00:00	LABQA are associated with 00:00 time for collection since they are generated in the laboratory. BR: There are situations within a batch when two identical sample types are used for QA reasons and the only way to differentiate between them is to give them each a different CollectionTime. For example, when more than one CNEG is analyzed in the same but are not replicates of each other, one CollectionTime should be 0:00 and the other 0:15, increasing the time by 15 minutes for each additional sample. Adjusting the Replicate to differentiate between samples is also acceptable.
CollectionMethodCode	Not Applicable	LABQA samples are generated in the laboratory and therefore are not associated with a sample LocationCode.
Replicate	1	BR: There are situations within a batch when two identical sample types are used for QA reasons and the only way to differentiate between them is to give them each a different CollectionTime (See collection time for details) or Replicate
CollectionDeviceName	None	LABQA samples are generated in the laboratory and therefore are associated with a CollectionDeviceName of "None."
TissueSource	NA	LABQA samples are generated in the laboratory and therefore are associated with a TissueSource of "NA" for Not Applicable.

Tissue Template Header	Value	Description & Business Rules
OrganismID	LABQA	LABQA is used as the OrgainismID for any sample generated in the laboratory including LabBlank, LCS and CRMs
OrganismName	Not Applicable	LABQA samples are generated in the laboratory and therefore are associated with a OrganismName of "Not Applicable."
LifeStageCode	NR	LABQA samples are generated in the laboratory and therefore are associated with a LifeStageCode of "NR" for Not Recorded.
PartCreated	No	LABQA samples are created from the OrganismID and no part is created for laboratory QA therefore "No" is applied to the PartCreated column.
TissueName	Not Applicable	LABQA samples are generated in the laboratory and therefore are associated with a TissueName of "Not Applicable."
TissueID	LABQA	LABQA is used as the null value for TissueID for any sample generated in the laboratory, including LabBlank, LCS and CRMs because LABQA samples do not exist prior to the composite table.
PreparationPreservation	None	No preparation or preservation is performed on LABQA samples so it is populated with the default null value of "None"
TissueWeight	-88	"-88" is used as a null value for LABQA samples.
UnitTissueWeight	g	Utilize unit that matches environmental samples. "g" for grams is most commonly used.
CompositeType	LABQA	LABQA is used as the CompositeType for any sample generated in the laboratory including LabBlank, LCS and CRMs.
CompositeReplicate	1	

BR = Business Rule

2.2 LABORATORY MODIFIED QA SAMPLES

There are several types of samples discussed in this section that are generated or modified within the laboratory. The first is a matrix spike, which is a modified, or analyte-spiked, field sample. The second is a laboratory generated duplicate of a field sample. At times, laboratories use samples not generated through the data generator's project to satisfy project specific batch QA requirements. This third type is a non-project sample.

2.2.1 MATRIX SPIKE AND LABORATORY DUPLICATE SAMPLES

For matrix spike samples (collected by the project) and laboratory duplicate samples performed on project sample (native field sample), all fields describing the sample (StationCode, EventCode, ProtocolCode, LocationCode, SampleDate, CollectionTime, CollectionMethodCode, CollectionDepth,

UnitCollectionDepth, ProjectCode, AgencyCode) remain the same as the native sample. For matrix spike samples, the only fields that are different than the native field sample are SampleTypeCode and potentially the Replicate. For laboratory generated duplicate samples, the only field that is different than the native field sample is the LabReplicate. Table 2 lists the column headers in the tissue template that describe the sample and give example values and associated descriptions/business rules to aid the data generator in populating those fields for their own data.

Table 3.0 Example values to be used for matrix spike and laboratory duplicate samples created from project specific samples (native field sample) within the TIResults tab.

Tissue Template Header	Value	Description & Business Rules
CompositeID		Same as native composite sample
CompositeType		Same as native composite sample
Composite Replicate	1	
OrganismGroup		Same as native composite sample
SampleTypeCode	MS1	Matrix Spike performed on a composite with a composite replicate of 1
	MS2	Matrix Spike performed on a composite with a composite replicate of 2
	MSBLDup	Matrix spike performed on a CompBLDup
Matrix		Same as native composite sample
LabReplicate	1	Utilize for matrix spike
	2	Utilize for matrix spike duplicates and lab-generated duplicates

2.2.1.1 Matrix Spike Samples performed on Field Duplicates

Table 3 describes the way to format matrix spike samples performed on field duplicates (Replicate = 2), field blind duplicates (FieldBLDup), and composite blind duplicates (CompBLDup) in CEDEN as well as coding duplicate samples.

Table 4. Formatting field duplicates and matrix spikes.

		Tissue Template Header		
	Descriptions	**Sample Type Code**	**Replicate**	**Lab Replicate**
1	**One environmental sample: sampled or split in triplicate**			
	Single environmental sample or composite	Grab or Composite	1	1
	Field duplicate of single environmental sample or composite	Grab or Composite	2	1

	Descriptions	Tissue Template Header		
		Sample Type Code	Replicate	Lab Replicate
	Second field duplicate of single environmental sample or composite	Grab or Composite	3	1
2	**One environmental sample: sampled or split in triplicate and submitted to the laboratory blind (unknown to the laboratory)**			
	Single environmental sample or composite	Grab or Composite	1	1
	Field blind duplicate of single environmental sample	FieldBLDup or CompBLDup	1	1
	Second field blind duplicate of single environmental sample	FieldBLDup or CompBLDup	2	1
3	**One pair of MS/MSD: associated to one grab or composite**			
	Single environmental sample or ubmittal	Grab or Composite	1	1
	Matrix spike of single environmental sample	MS1	1	1
	Matrix spike duplicate of single environmental sample	MS1	1	2
4	**One pair of MS/MSD: associated to one grab or composite with field duplicate present**			
	Single environmental sample or composite	Grab or Composite	1	1
	Field duplicate of single environmental sample or composite	Grab or Composite	2	1
	Matrix spike of single environmental sample	MS1	1	1
	Matrix spike duplicate of single environmental sample	MS1	1	2
5	**One pair of MS/MSD: associated to one field duplicate**			
	Single environmental sample or composite	Grab or Composite	1	1
	Field duplicate of single environmental sample or composite	Grab or Composite	2	1
	Matrix spike of field duplicate sample	MS2	1	1
	Matrix spike duplicate of field duplicate sample	MS2	1	2
6	**One pair of MS/MSD: associated to one field blind duplicate**			
	Single environmental sample or composite	Grab or Composite	1	1

	Descriptions	Tissue Template Header		
		Sample Type Code	Replicate	Lab Replicate
	Field blind duplicate of single environmental sample or composite blind duplicate	FieldBLDup or CompBLDup	1	1
	Matrix spike of field blind duplicate sample or composite blind duplicate	MSBLDup	1	1
	Matrix spike duplicate of field blind duplicate sample or composite blind duplicate	MSBLDup	1	2
7	**Two pairs of MS/MSD: one associated to the grab and one associated to the field duplicate**			
	Single environmental sample or composite	Grab or Composite	1	1
	Field duplicate of single environmental sample or composite	Grab or Composite	2	1
	Matrix spike of single environmental sample	MS1	1	1
	Matrix spike duplicate of single environmental sample	MS1	1	2
	Matrix spike of field duplicate sample	MS2	1	1
	Matrix spike duplicate of field duplicate sample	MS2	1	2

2.2.2 NON-PROJECT MATRIX SPIKE AND DUPLICATE SAMPLES (000NONPJ)

At times, laboratories use samples not generated through the project to satisfy batch QA requirements. These samples have different formatting rules, which are displayed in Table 5.0 and 5.1. In most cases, non-project samples have no sample collection information since they are used only to satisfy batch QA requirements.

Table 5.0 Example values to be used with non-project (000NONPJ) matrix spike and duplicates samples and associated business rules for within the TIResults tab.

Tissue Template Header	Value	Description & Business Rules
CompositeType		For 000NONPJ samples utilize the CompositeType of the 000NONPJ sample or the default value of "Normal" if it is not known.
Composite Replicate		Utilize Composite Replicate of 000NONPJ sample or default value of 1 if not known.
OrgainismGroup		Organism group of the sample, e.g. Fish, Bivalves, Crustacean, Mammal, Bird, or Amphibian, or Not Recorded if it is not known.

Tissue Template Header	Value	Description & Business Rules
SampleTypeCode		Select from the SampleTypeCode LookUp list for 000NONPJ laboratory duplicates otherwise utilize "Composite" if SampleType unknown.
	MS1	"MS1" is used for laboratory matrix spikes created with 000NONPJ samples. See Table 3: Formatting field duplicated and matrix spikes for additional business rules regarding matrix spikes.
Matrix		Utilize Matrix of 000NONPJ sample or default value of "tissue" if not known.
LabReplicate	1	Utilize for matrix spikes
	2	Utilize for matrix spike duplicates and lab-generated duplicates
QACode	QAX	QAX is associated with 000NONPJ samples when the native sample is not included in the batch reported;
	None	If the batch includes the native 000NONPJ sample result as well as the laboratory quality assurance 000NONPJ sample, "None" or appropriate QACode to indicate recoveries outside criteria or other QA issues (see QACode Lookup list).

Table 5.1 Example values to be used with non-project (000NONPJ) matrix spike and duplicates samples and associated business rules for within the FishComposite/BivalveComposite tab.

Tissue Template Header	Value	Description & Business Rules
StationCode	000NONPJ	"000NONPJ" is the StationCode associated with an environmental sample that was collected by a different project but used for laboratory quality assurance purposes (i.e. duplicate or matrix spike)..
SampleDate		Utilize SampleDate of 000NONPJ sample or null date of 1/1/1950 if unknown. Formatted as dd/mmm/yyyy. Sample date must be equal to or before the analysis date.
ProjectCode		Utilize Projectcode of 000NONPJ sample or default value of "Not Applicable" if not known.
EventCode	TI	For tissue events use "TI." See the EventCode LookUp list for additional EventCodes and associated definitions. The EventCode should be consistent with the environmental samples in the same batch.
ProtocolCode		Utilize ProtocolCode of 000NONPJ sample or default value of "Not Applicable" if not known.
AgencyCode		Organization or agency that analyzed the sample. Select from Agency LookUp list otherwise utilize "Not Recorded" if unknown.
LocationCode		Utilize LocationCode of 000NONPJ sample or null value of "Not Recorded" if not known.

Tissue Template Header	Value	Description & Business Rules
GeometryShape		Leave blank
CollectionTime		Utilize CollectionTime of 000NONPJ sample or null value of 00:00 if not known. BR: There are situations within a batch when two identical sample types are used for QA reasons and the only way to differentiate between them is to give them each a different CollectionTime. For example, when more than one LabBlank, CRM, or LCS is digested, extracted, or analyzed in the same batch on the same day but are not replicates of each other, one CollectionTime should be 0:00 and the other 0:15, increasing the time by 15 minutes for each additional sample. Adjusting the Replicate to differentiate between samples is also acceptable.
CollectionMethodCode		Utilize CollectionMethodCode of 000NONPJ sample or null value of "Not Recorded" if not known.
Replicate		Utilize Replicate of 000NONPJ sample or default value of "1" if not known. BR: There are situations within a batch when two identical sample types are used for QA reasons and the only way to differentiate between them is to give them each a different CollectionTime (See collection time for details) or Replicate.
CollectionDeviceName		Utilize CollectionDeviceNameof 000NONPJ sample or leave blank if not known.
TissueSource		Utilize TissueSource of 000NONPJ sample or default value of "NA" for "Not Applicable" if not known
OrganismID		Utilize OrganismID of 000NONPJ sample or default value of "000NONPJ" if not known.
OrganismName		Utilize OrganismName of 000NONPJ sample or default value of "Not Applicable"
LifeStageCode		Utilize LifeStageCode of 000NONPJ sample or null value of "NR" for not recorded if not known
PartCreated		Utilize PartCreated of 000NONPJ sample or default value of "Yes."
TissueName		Utilize TissueName of 000NONPJ sample or default value of "Not Applicable" if not known.
TissueID		Utilize TissueID of 000NONPJ sample or default value of "000NONPJ" if not known.
PreparationPreservation		Utilize PreparationPreservation of 000NONPJ sample or default value of "None" if not known.
TissueWeight		Utilize Tissue Weight of 000NONPJ sample or null value of "88" if not known

Tissue Template Header	Value	Description & Business Rules
UnitTissueWeight		Utilize UnitTissueWeight of 000NONPJ sample or utilize unit that matches environmental samples. “g” for grams is most commonly used.
CompositeType		Utilize CompositeType of 000NONPJ sample or default value of “Normal” if not known.
CompositeReplicate		Utilize Composite Replicate of 000NONPJ sample or default value of 1 if not known.
CompositeWeight		Utilize CompositeWeight of 000NONPJ sample or null value of “-88” if not known
UnitCompositeWeight		Utilize UnitCompositeWeight of 000NONPJ sample or utilize unit that matches environmental samples. “g” for grams is most commonly used.
CompAgencyCode		Organization or agency that analyzed the sample
HomogDate		Utilize HomogDate of 000NONPJ sample or null date of 1/1/1950. Formatted as dd/mmm/yyyy.

BR = Business Rule

Appendix B: Tissue Data Submission Guidance Documentation Amendments

AMENDMENTS

Amendments made to the CEDEN Tissue Data Submission Guidance Document are documented within Table 1.

Table 1. Amendments made to the Tissue Data Submission Guidance Document.

Date of Amendment	Document Section	Amendment Summary	Amendment Details
August 23rd 2013	List of Acronyms	Added acronyms.	Added SWAMP and QAO to the List of Acronyms.
August 23rd 2013	Stations Table: Column Requirements	Updated required field designations for Stations Table.	Updated required field designations for Stations Table. Required Columns: Added: StationAgency, SWRCBWatTypeCode. Desired Columns: Added: CoordinateSource Removed: LocalWatershed, LocalWaterbody, Counties_2004_County, SWRCBWatTypeCode, CalWater_2004_RB. Not Required Columns: Added: EventType1, EventType2, EventType3, LocalWaterShed, LocalWaterBody, Counties_2004_COUNTY, CalWater_2004_RB, NHD_PlusCatchmentComID. Removed: CalWater_2004_SWRCBNUM2 HydrologicUnit
August 23rd 2013	Stations Table	Added Additional Resources section to Stations Table.	Added an "Additional Resources" section to the Stations Table after Column Requirements.
August 23rd 2013	Stations Table: Stations Table Structure: StationSource	Updated StationSource LookUp list and definition.	Updated StationSource LookUp List from blank to "AgencyLookUp or ProjectLookUp." Updated Definition from "Agency or project that created the station." To "Agency or project that submitted the station to CEDEN".
August 23rd 2013	Stations Table: Stations Table Structure	Added new fields to the Stations Table.	Added new fields to Stations Table Structure: StationAgency, EventType1, EventType2, EventType3 and NHD_Plus_CatchmentComID.

Date of Amendment	Document Section	Amendment Summary	Amendment Details
August 23rd 2013	Stations Table: Stations Table Structure: AddDate	Added format information to AddDate	Added "Format as dd/mmm/yyyy" to the AddDate definition.
August 23rd 2013	Stations Table: Stations Table Structure	Added default value information to Stations Table definitions.	Added default value information to the description field within the Stations Table for CoordinateNumber, Datum, CoordinateSource, SWRCBWatTypeCode
August 23rd 2013	Stations Table: Stations Table Structure: State	Added LookUp list information to State.	Updated State LookUp List from blank to "VariableCodesLookUp".
August 23rd 2013	Stations Table: Stations Table Structure	Updated Stations Table template header names.	Updated Stations Table template header names: "NHD24K_GNIS_Name" to "NHD_24K_v2_GNIS_Name", "NHD24k_Reachcode" to "NHD_24k_v2_ReachCode", "NHD24k_HUC12" to "NHD_24k_v2_HUC_12" and "NHD24k_Hu_12_Name" to "NHD_24k_v2_Name".
August 23rd 2013	FishComposite Table: Column Requirements	Updated required field designations for FishComposite Table.	Updated required field designations for FishComposite Table. Required Columns: Removed: PreparationPreservation. Desired Columns: Added: EventCode, LifeStageCode, Sex, PrepPreservationName, OrganismGroup, CompAgencyCode. Removed: ForkLength, TotalLength, UnitLengthFish, Weight, UnitWeightFish, OrganismID; Not Required Columns: Added: ForkLength, TotalLength, UnitLengthFish, Weight, UnitWeightFish, OrganismID; Removed: EventCode.
August 23rd 2013	FishComposite Table: FishComposite Table Structure	Updated FishComposite Table template header names.	Updated FishComposite Table template header name "PreparationPreservation" to "PrepPreservationName".

Date of Amendment	Document Section	Amendment Summary	Amendment Details
August 23rd 2013	FishComposite Table: FishComposite Table Structure	Added default value information to FishComposite Table definitions.	Added default value information to the description field within the FishComposite Table for SampleDate, ProtocolCode, AgencyCode, LocationCode, CollectionTime, CollectionMethodCode, CollectionDeviceName, TisSource, OrganismName, LifeStageCode, Sex, TissueName, PrepPreservationName, CompositeReplicate, OrganismGroup and CompAgencyCode.
August 23rd 2013	BivalveComposite Table: Column Requirements	Updated required field designations for BivalveComposite Table.	Updated required field designations for BivalveComposite Table. Required Columns: Removed: PreparationPreservation. Desired Columns: Added: EventCode, PrepPreservationName, CompisiteID, CompositeType, CompositeReplicate; Removed: Count, ShellLength, ShellWidth, UnitShellLengthWidth, LengthWidthType; Not Required Columns: Added: Count, ShellLength, ShellWidth, UnitShellLengthWidth, LengthWidthType; Removed: EventCode.
August 23rd 2013	BivalveComposite Table: BivalveComposite Table Structure	Updated BivalveComposite Table template header names.	Updated BivalveComposite Table template header name “PreparationPreservation” to “PrepPreservationName”.
August 23rd 2013	BivalveComposite Table: BivalveComposite Table Structure	Added default value information to BivalveComposite Table definitions.	Added default value information to the description field within the BivalveComposite Table for SampleDate, ProtocolCode, AgencyCode, LocationCode, CollectionTime, CollectionMethodCode, CollectionDeviceName, TisSource, OrganismName, LifeStageCode, TissueName, PrepPreservationName, CompositeReplicate, HomogDate, OrganismGroup and CompAgencyCode.

Date of Amendment	Document Section	Amendment Summary	Amendment Details
August 23rd 2013	TISuperComposite Table: Column Requirements	Updated required field designations for TISuperComposite Table.	Updated required field designations for TISuperComposite Table: Desired Columns: Added: OrganismGroup; Removed: CompositeWeight, UnitCompositeWeight, CompositeSourceWeight, UnitCompositeSourceWeight; Not Required Columns: Added: CompositeWeight, UnitCompositeWeight, CompositeSourceWeight, UnitCompositeSourceWeight; Removed: OrganismGroup.
August 23rd 2013	TISuperComposite Table: TISuperComposite Table Structure	Added default value information to TISuperComposite Table definitions.	Added default value information to the description field within the TISuperComposite Table for HomogDate and OrganismGroup.
August 23rd 2013	Tissue Results Table: Column Requirements	Updated required field designations for Tissue Results Table.	Updated required field designations for Tissue Results Table: Desired Columns: Added: OrganismGroup; Removed: Expected Value. Not Required Columns: Added: Expected Value; Removed: OrganismGroup.
August 23rd 2013	Tissue Results Table: Tissue Result Composite Table Structure	Updated Tissue Result Table template header names.	Updated Tissue Result Table template header name “PreparationPreservation” to “PrepPreservationName” and “PreparationPreservationDate” to “PrepPreservationDate”.
August 23rd 2013	Tissue Results Table: Tissue Results Table Structure	Added default value information to Tissue Results Table definitions.	Added default value information to the description field within the Tissue Results Table for OrganismGroup, AnalysisDate, AampleTypeCode, MatrixName, MethodName, ResQualCode, QACode, ComplianceCode, PrepPreservationName, PrepPreservationDate, DigestExtractMethod and DigestExtractDate.
August 23rd 2013	LabBatch Table: Column Requirements	Updated required field designations for LabBatch Table.	Updated required field designations for LabBatch Table: Required Columns: Added LabAgencyCode. Desired Columns: Removed LabAgencyCode.

Date of Amendment	Document Section	Amendment Summary	Amendment Details
August 23rd 2013	LabBatch Table: LabBatch Table Structure	Added default value information to LabBatch Table definitions.	Added default value information to the description field within the LabBatch Table for LabAgencyCode, LabSubmissionCode and BatchVerificationCode.
October 18th 2013	FishComposite Table: FishComposite Table Structure	Added default value information to FishComposite Table definitions.	Added default value information to the description field within the FishComposite Table for HomogDate.
October 18th 2013	TISuperComposite Table: TISuperComposite Table Structure	Updated typo for OrganismGroup template header within TISuperComposite Table.	Updated TISuperComposite Table template header "OgranismGroup" to "OrganismGroup".
October 18th 2013	Introduction	Updated Southern California RDC contact information.	Updated Southern California RDC contact information from Shelly Moore to Marlene Hanken contact information.
January 3rd, 2017	Introduction and all tables	Removed references to Stations tab	Removed the Stations section and references to Stations tab, updated effected screen shot, and modified StationCode definition to note that station codes must be established through the new vocabulary request process prior to ubmittal.
January 3rd, 2017	All	Updated use of quotes	Replaced single quotes with double quotes.
January 3rd, 2017	All tables	Updated description of "desired" fields	Added reference to using default values when actual values are not know for "desired" fields in the "Column Requirements" paragraph.
January 3rd, 2017	List of Terms	Updated links	Added current links for the LookUp lists and vocabulary request process.
January 3rd, 2017	Introduction	Updated Central Coast RDC contact information	Updated the Central Coast RDC contact information from Mark Pranger to Stacey Swenson.
January 3rd, 2017	FishComposite	OrganismID	Marked as a required field.
January 3rd, 2017	BivalveComposite	OrganismID	Marked as a required field.
January 3rd, 2017	FishComposite	PrepPreservationName	Changed to PartsPrepPreservationName
January 3rd, 2017	BivalveComposite	PrepPreservationName	Changed to PartsPrepPreservationName
January 3rd, 2017	All tables	Modified use of "default" wording	Changed most instances of "Default equals…if unknown" to "Use…if unknown."
January 3rd, 2017	All	Various edits	Removed double spaces and duplicate words and other small edits.
January 3rd, 2017	Locations Table and Chemistry Results Table	Updated StationCode definition	Included that StationCode must be unique within CEDEN, not just within the study design, as previously stated.

Date of Amendment	Document Section	Amendment Summary	Amendment Details
March 14, 2017	Fish Composite Table	TotalLength	Marked as a required field.
March 14, 2017	Fish Composite Table	UnitLengthFish	Marked as a required field.
January 8th, 2019	Introduction	Updated RDCs	Removed SCCWRP as current RDC.
January 8th, 2019	All tables	Variable Code List references	Added references to the appropriate lists in the Lookup List columns for fields that rely on Variable Codes.
January 8th, 2019	All sections	Updated wording for "desired" (default required) fields	Changed "should" to "must" for "desired" fields in the "Column Requirements" paragraphs.
January 8th, 2019	All tables	Format changes	Changed shading, font, and alignment of tables as needed for consistency.
January 8th, 2019	FishComposite and BivalveComposite Tables	Moved SampleID	Moved the SampleID column so that it comes after "PartCreated" to better represent the purpose of the field.
January 8th, 2019	FishComposite and BivalveComposite Tables	Updated Sample ID definition	Changed SampleID definition from referencing the "sample" to the "organism."