INSTITUTIONAL CONTROL DATA STANDARD

Standard No.: EX000015.1

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This standard has been produced through the Environmental Data Standards Council (EDSC).

The Environmental Data Standards Council (EDSC) is a partnership among US EPA, States and Tribal partners to develop and agree upon data standards for environmental information collection and exchange. More information about the EDSC is available at http://www.envdatastandards.net.

Foreword

The Environmental Data Standards Council (EDSC) identifies, prioritizes, and pursues the creation of data standards for those areas where information exchange standards will provide the most value in achieving environmental results. The Council involves Tribes and Tribal Nations, State and Federal agencies in the development of the standards and then provides the draft materials for general review. Business groups, non-governmental organizations, and other interested parties may then provide input and comment for Council consideration and standard finalization. Draft and final standards are available at http://www.envdatastandards.net.

1.0 INTRODUCTION

The Environmental Protection Agency (US EPA) defines institutional controls (IC) as non-engineering measures, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or to protect the integrity of a remedy by limiting land or resource use. ICs are used when contamination is first discovered, when remedies are ongoing, and when residual contamination remains onsite at a level that does not allow for unrestricted use and unlimited exposure after cleanup. Please note that while ICs will be defined in administrative or legal terms that must generally be filed, they should be expected to change if warranted by changes in the levels of residual contamination to decrease or increase the area with ICs.

This document is organized such that the four core components of an IC (IC Instrument, IC Objective, Location, and Engineering Control) and all auxiliary components that accompany this information (IC Affiliation, IC Resource, and IC Event) are regarded as modules on the same hierarchical level. Within these modules are the data groupings and data elements. Details about how these high-level modules are interrelated are provided in the beginning of each module within section 3.0 of this document. Details about how these modules relate to smaller data blocks and data elements are provided in the **Institutional Control Extensible Markup Language (XML) Schema Definition** available at http://www.exchangenetwork.net

The concept of most importance to the IC Data Standard is that there is no single central entity that defines an IC. A complete IC must contain at a minimum an IC instrument, an IC objective, and the location(s) to which the IC instrument and IC objective pertain. Some subsets of this information are acceptable and may be provided as information is available; however, certain details about data elements are often necessary to provide the needed context for the information being exchanged. Please note that the relationships defined in the beginning of each module are written to guide users on how to provide information for a **complete** IC. The text “zero, one, or more” indicates that the relationship between the two entities is not necessary to define a complete IC. Also note that an engineering control, though an integral aspect of an IC when applicable, is not required to define an IC. Information about an engineering control only needs to be provided if the intent of an IC instrument is to protect the integrity of that engineering control.

It is important to note that IC objectives and use restrictions are not the same. Although an IC objective may be met by the use restrictions of an IC instrument, the IC objective is not a property of the IC instrument and must be captured separately. For example, the objective at a location called ***IC Site*** could be to ***protect the integrity of a landfill cap***. The use restriction (generally found within the language of the IC instrument) could be to ***prohibit entry into IC Site***. This use restriction prevents the disturbance of the landfill cap by restricting access to it, thereby meeting the objective at ***IC Site***. The IC objective describes the desired outcome of implementing an IC at a location, while the use restriction describes what is actually being done to reach that outcome once the IC is implemented. To summarize, an IC instrument has use restrictions that serve to meet IC objectives at specific locations.

It should be noted that all permits transmitted within the scope of ICs are IC instruments or IC resources; however, not all IC instruments and IC resources are permits. For this reason, information about permits must be captured using the IC instrument or IC resource modules of this data standard. Although this

information is being transmitted via XML tags that are not part of the **Permitting Information [EX000021.2] Data Standard**, this data standard mandates that they still be bound by the rules set forth by the **Permitting Information [EX000021.2] Data Standard**.

Note that some of the data elements are prefixed with "IC." A data standard data element should have a name and definition that applies broadly; however, it is important to be cognizant of using names that may have different meanings in different programs. For example, the IC data standard contains the term "IC Objective Name," which is defined as "the name assigned to the intended goal of an IC […]." If the IC data standard used the term "Objective Name" instead, other programs could use that term with a different context and different meaning. The consequence is that one of the primary goals of data standards, to enhance visibility and communication between flows, would be jeopardized.

1.1 Scope

This EDSC standard defines the elements required for describing IC information. It provides information about the implementation, monitoring, enforcement, and termination of instruments (via the IC Event) as well as the objectives they meet, associated locations, affiliates and their roles/responsibilities relevant to the IC, cleanup actions (via the IC Event), technologies, and the documentation related to each of the aforementioned subsets of data.

The IC Data Standard can apply to any IC that is tracked and electronically managed by US EPA, state, tribal, or other desiring or interested entities. The application of this standard is intended for cleanup actions. For example, a permit that is required for drilling drinking water wells where residual contamination remains in an aquifer is an IC. However, an ongoing advisory, such as a pesticides advisory, may not be subject to the standard. Other program areas or database systems related to ICs may implement or use the standard if they believe it will facilitate information transfer.

1.2 Revision History

Date	Version	Description
January 6, 2006	EX000015.1	Initial Environmental Data Standards Council Adoption of base standard and Addendum [EX000015.1 Addendum].

1.3 References to Other Documentation

This data standard relies on other data standards to make it complete and to provide the necessary support. As such, users should reference the normative standards, listed below, and consider them integral to the IC Data Standard. These include the following:

- Bibliographic Reference [EX000007.1] Data Standard
- Biological Taxonomy [EX000018.2] Data Standard
- Chemical Identification [EX000016.2] Data Standard
- Contact Information [EX000019.2] Data Standard
- Facility Site Identification [EX000020.2] Data Standard
- Permitting Information [EX000021.2] Data Standard
- Representation of Date and Time [EX000013.1] Data Standard

This data standard relies on the following technical specification to make it complete:

- Institutional Control Vector Profile [EX000015.1 Addendum] Technical Specification, Addendum to the Institutional Control Data Standard

Users may consider referencing the following informative standards for more support concerning the collection of geospatial information as it relates to ICs:

- FGDC Content Standards for Digital Geospatial Metadata [FGDC-STD-001-1998]
- FGDC CSDGM Extensions for Remote Sensing Metadata [FGDC-STD-012-2002]
- FGDC Framework Data Content Standard Part 5: Governmental Unit and Other Geographic Area Boundaries [DRAFT FGDC-STD-2005]
- FGDC/Spatial Data Transfer Standard (SDTS) Part 5 Raster Profile and Extensions, FGDC Standard [FGDC-STD-002.5-1999]

1.4 Terms and Definitions

For the purposes of this document, the following terms and definitions apply:

Term	Definition
Institutional Control	A non-engineered instrument, such as an administrative and/or legal control, that helps to minimize the potential for human exposure to contamination and/or protects the integrity of a remedy by limiting land or resource use.
IC Instrument	An administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions.
IC Objective	The intended goal of an IC in minimizing the potential for human exposure to remaining contamination and/or protecting the integrity of an engineering control by limiting land or resource use in a particular media.
Location	A physical location or area defined by a geographic area description, a set of facility site descriptions, and/or a geographic coordinate description. Examples of two separate facility site descriptions for a single site are the 12-digit US EPA Site Identifier and the 7-digit Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Site Identifier. These values would be captured through two separate facility site descriptions within the same location.
Engineering Control	A physical technology implemented to minimize the potential for human exposure to contamination by means of control or remediation.
IC Affiliation	Any individual or organization associated with an IC either directly or indirectly. An example of an affiliation with a direct IC relation is a party responsible for monitoring the IC. An example of an affiliation with an indirect IC relation is an owner of a site at which ICs are implemented.
IC Resource	Any document or source of information associated with an IC either directly or indirectly. An example of a resource with a direct IC relation is a document mandating an IC enforcement action. An example of a resource with an indirect IC relation is a map of a site at which ICs are implemented.

IC Event	Any occurrence or action taking place on a specific date or over a period of time, for which data may be collected, processed, distributed, or used for purposes related to ICs.

1.5 Implementation

Users are encouraged to use the XML registry housed on the Exchange Network Web site to download schema components for the construction of XML schema flows (http://www.exchangenetwork.net).

1.6 Document Structure

The structure of this document is briefly described below:

a. Section 2.0 Institutional Control Diagram, illustrates the principal data modules contained within this standard.

b. Section 3.0 Institutional Control Data Standard Table, provides information on the high level, intermediate and elemental IC data groupings. Where applicable, for each level of this data standard, a definition, notes (including lists of example and permissible values when applicable), format, and XML tag are provided. The format column may list the required number of characters for the associated data element, where "A" designates an alphanumeric, "N" designates a numeric, "G" designates a data element group and "D" designates a reference to the **Representation of Date and Time [EX000013.1] Data Standard**.

c. Data Element Numbering. For purposes of clarity and to enhance understanding of data standard hierarchy and relationships, each data group is numerically classified from the primary to the elemental level.

d. Code and Identifier Metadata. Metadata are defined here as "data about data or data elements, possibly including their descriptions" and/or any needed context setting information required to identify the origin, conditions of use, interpretation, or understanding of the information being exchanged or transferred (Adapted from ISO/IEC 2382-17:1999 Information Technology Vocabulary—Part 17: Databases 17.06.05 metadata). Based on the business need, additional metadata may be required to sufficiently describe an identifier or a code. A note regarding this additional metadata is included in the notes column for identifier and code elements. Additional metadata for identifiers may include:

   - Identifier Context, which identifies the source or data system that created or defined the identifier

   Additional metadata for codes may include:

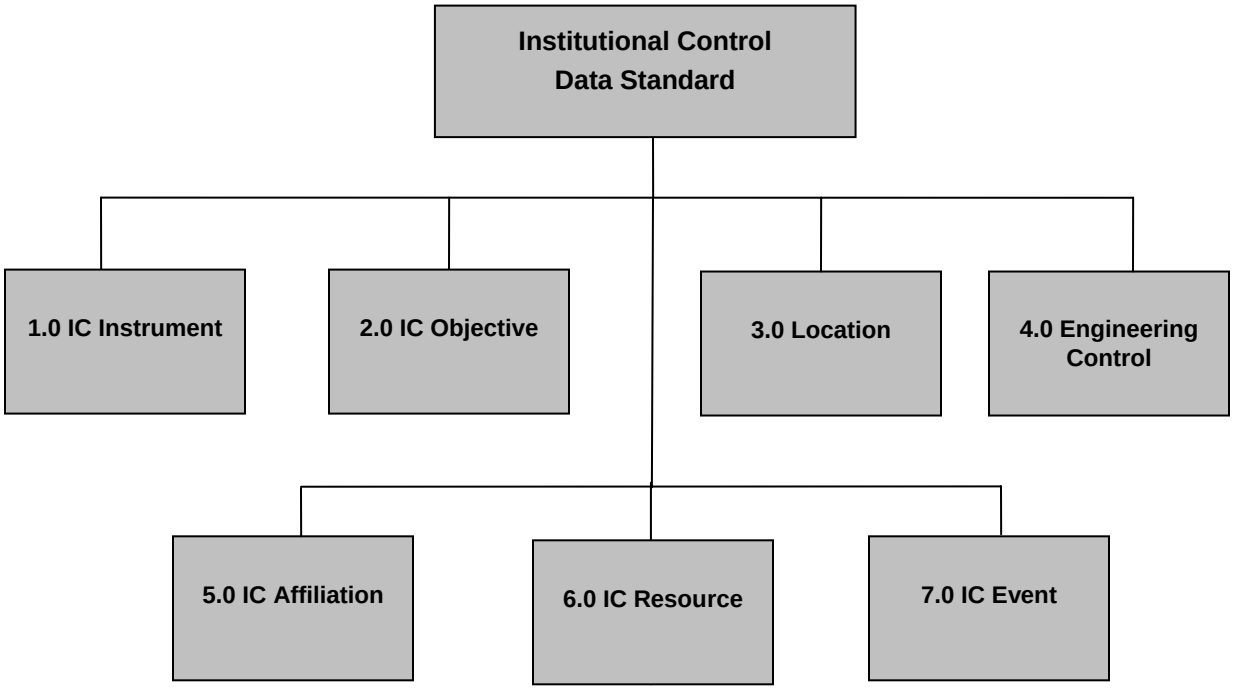
   - Code List Identifier, which is a standardized reference to the context or source of the set of codes
   - Code List Version Identifier, which identifies the particular version of the set of codes
   - Code List Version Agency Identifier, which identifies the agency responsible for maintaining the set of codes
   - Code List Name, which describes the corresponding name that the code represents

e. Appendix A Institutional Control Data Structure Diagram, illustrates the hierarchical classification of the Institutional Control Data Standard. This diagram enables business and technical users of this standard to quickly understand its general content and complexity.

f. Appendix B Lists of Example Values, provides the long lists of example values for data elements that, if included in the text of this standard, would hinder its readability.

2.0 INSTITUTIONAL CONTROL DIAGRAM

This diagram specifies the major data modules that may be used to identify the characteristics of and/or catalog IC information.



3.0 INSTITUTIONAL CONTROL DATA STANDARD TABLE

1.0 IC Instrument

Definition: An administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions.

Relationships:

- Each IC instrument must meet, or intend to meet, one or more IC objectives.
- Each IC instrument must be associated with one or more locations.
- Each IC instrument may protect zero, one, or more engineering controls.
- Each IC instrument may have zero, one, or more affiliations.
- Each IC instrument may be associated with zero, one, or more resources.
- Each IC instrument must be associated with one or more events.

Notes: None.

XML Tag: ICInstrument

Name	Definition	Notes	Format	XML Tag
1.1 IC Instrument Identifier	A unique identifier assigned to an administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions.	*Note 1:* This data element may be used to provide a permit number/identifier. Refer to the Permit Number/Identifier data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information. *Note 2:* Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	ICInstrumentIdentifier

Name	Definition	Notes	Format	XML Tag
1.2 IC Instrument Name	The name assigned to an administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions.	This data element may be used to provide a permit name. Refer to the Permit Name data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information.	A	ICInstrumentName
1.3 IC Instrument Category Name	The major IC classification to which an administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions belongs.	This data element serves to qualify the "IC Instrument Type," data element 1.4. List of Example Values: • Government • Proprietary • Enforcement • Informational	A	ICInstrumentCategoryName
1.4 IC Instrument Type Text	The type of administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions.	*Note 1:* This data element may be used to provide a permit type. Refer to the Permit Type Code data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information. *Note 2:* The types of IC instruments are dependent on the categories involved. A list of example values is provided in Appendix B for Government, Proprietary, Enforcement, and Informational categories.	A	ICInstrumentTypeText
1.5 IC Instrument Lifespan Indicator	The lifespan of an administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions indicated as permanent or temporary.	List of Permissible Values: • Permanent • Temporary	A	ICInstrumentLifespanIndicator

Name	Definition	Notes	Format	XML Tag
1.6 IC Instrument Lifespan Conditions Text	A text description of the conditions upon which the lifespan of an administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions is contingent.	Example: "Protection shall continue until all remedial actions have been completed."	A	ICInstrumentLifespanConditionsText
1.7 Use Restriction	Elements or attributes that describe a land or resource use specifically prohibited or restricted by the language of the IC instrument.	Each IC instrument must have one or more use restrictions.	G	UseRestriction
1.7.1 Use Restriction Type Text	The type of land or resource use specifically prohibited or restricted by the language of the IC instrument.	List of Example Values: • Establish Ground Water Management Zone • Limit Future Land Use • Limit Ground Water Use Activities • Prohibit Any Activity that May Disturb the Integrity of an Engineering Control • Prohibit Disturbance of Soil • Prohibit Excavation • Prohibit Ground Water Well Installation/Construction	A	UseRestrictionTypeText

Name	Definition	Notes	Format	XML Tag
1.7.2 Use Restriction Media Name	The name of the major environmental component contaminated and addressed by the language of the IC instrument.	List of Example Values: • Air • Debris • Ground Water • Leachate • Liquid Waste • Residuals • Sediment • Sludge • Soil • Solid Waste • Subsurface Soil • Surface Soil • Surface Water	A	UseRestriction MediaName
1.7.3 Use Restriction Text	The text extracted from the IC instrument describing the land or resource use specifically prohibited or restricted.	Example: “Land shall not be accessible to the public.”	A	UseRestriction Text

2.0 IC Objective

Definition: The intended goal of an IC in minimizing the potential for human exposure to remaining contamination and/or protecting the integrity of an engineering control by limiting land or resource use in a particular media.

Relationships:

- Each IC objective must be met by, or be planned to be met by, one or more IC instruments.
- Each IC objective must be associated with one or more locations.
- Each IC objective may convey the need to protect zero, one, or more engineering controls.
- Each IC objective may be referenced by zero, one, or more resources.
- Each IC objective may be associated with zero, one, or more events.

Notes: None.

XML Tag: ICObjective

Name	Definition	Notes	Format	XML Tag
2.1 IC Objective Identifier	A unique identifier assigned to the intended goal of an IC in minimizing the potential for human exposure to remaining contamination and/or protecting the integrity of an engineering control by limiting land or resource use in a particular media.	Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	ICObjectiveIdentifier
2.2 IC Objective Name	The name assigned to the intended goal of an IC in minimizing the potential for human exposure to remaining contamination and/or protecting the integrity of an engineering control by limiting land or resource use in a particular media.		A	ICObjectiveName

Name	Definition	Notes	Format	XML Tag
2.3 IC Objective Media Name	The name of the major environmental component contaminated and in which land or resource use needs to be limited.	List of Example Values: • Air • Debris • Ground Water • Leachate • Liquid Waste • Residuals • Sediment • Sludge • Soil • Solid Waste • Subsurface Soil • Surface Soil • Surface Water	A	ICObjectiveMediaName
2.4 IC Objective Text	The text describing the intended goal of an IC in minimizing the potential for human exposure to remaining contamination and/or protecting the integrity of an engineering control by limiting land or resource use in a particular media.	The texts of IC objectives are dependent on the media involved. A list of example values is provided in Appendix B for Air, Debris, Ground Water, Leachate, Liquid Waste, Residuals, Sediment, Sludge, Soil, Solid Waste, Subsurface Soil, Surface Soil, and Surface Water media.	A	ICObjectiveText

3.0 Location

Definition: A physical location or area defined by a geographic area description, a set of facility site descriptions, and/or a geographic coordinate description.

Relationships:

- Each location may be associated with zero, one, or more IC instruments.
- Each location may have zero, one, or more IC objectives.
- Each location may have zero, one, or more engineering controls in place.
- Each location may be associated with zero, one, or more affiliations.
- Each location may be associated with zero, one, or more resources.
- Each location may be associated with zero, one, or more events.

Notes: *Note 1:* Locations may be related to other locations as sub-locations. This allows a hierarchy of locations to be created (e.g., a county with its own location identifier would be a sub-location of a state with its own location identifier).

Note 2: If the geographic coordinates of a location have been established or verified with the aid of one or more geographically referenced raster datasets such as air photos, satellite images, or digital elevation models, those datasets should be included and documented in module 6.0 as IC Resources.

XML Tag: Location

Name	Definition	Notes	Format	XML Tag
3.1 Location Identifier	A unique identifier for a physical location or area.	Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	LocationIdentifier
3.2 Location Association Type Text	The type of relationship between a physical location or area and an associated entity.	The types of location associations are dependent on the entity being associated with the location. A list of permissible values is provided in Appendix B for relationships between the Location and the IC Instruments, IC Objectives, Locations, Engineering Controls, IC Affiliations, IC Resources, and IC Events.	A	LocationAssociationTypeText

Name	Definition	Notes	Format	XML Tag
3.3 Geographic Area	Elements or attributes that provide the address, description, and/or tribal information used to describe a physical location or area.	*Note 1:* Refer to the Address data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the geographic area information needed for data group 3.3: Location Address • Location Address Text • Supplemental Location Text • Locality Name • Location Address State Code • Location Address Postal Code • Location Address County Code • Location Description Text Location Tribe • Tribal Land Name • Tribal Land Indicator *Note 2:* Each location may have only one geographic area description.	G	GeographicArea

Name	Definition	Notes	Format	XML Tag
3.3.1 Locality Type Name	The type of locality.	This data element serves to qualify the "Locality Name" data element in data group 3.3. List of Example Values: • Area of Contamination • Area Name • Borough • City • Containment Cell • Corrective Action Management Unit • Ground Water • Landfill • Municipality • Operable Unit • Parcel Number • Solid Waste Management Unit • Surface Water • Ward	A	LocalityTypeName

Name	Definition	Notes	Format	XML Tag
3.4 Facility Site	Elements or attributes that identify a facility site.	*Note 1:* Refer to the Facility Site Identity data grouping in the **Facility Site Identification [EX000020.2] Data Standard**. The following items are expected to define the facility site information needed for data group 3.4: • Facility Site Identifier • Facility Site Identifier Context • Facility Site Name *Note 2:* Each location may have more than one facility site description; however, each of these descriptions must pertain to the same facility site.	G	FacilitySite
3.4.1 Facility Site Name Context	The text that identifies the source or data system that created or defined the facility site name.	This data element serves to qualify the "Facility Site Name" data element in data group 3.4. List of Example Values: • Brownfields Site Name • CERCLIS Site Name • CERCLIS Site Alias • RCRA Facility Name	A	FacilitySiteNameContext

Name	Definition	Notes	Format	XML Tag
3.5 Geographic Coordinate	Elements or attributes that describe a geographic feature, the coordinates that describe the single point, line, or polygon that constitute the geographic feature, and the metadata that describe the geographic coordinates.	*Note 1:* Refer to the Geographic Feature data grouping in the **Institutional Control Vector Profile [EX000015.1 Addendum] Technical Specification, Addendum to the Institutional Control Data Standard**. *Note 2:* Geographically referenced raster datasets such as air photos, satellite images, or digital elevation models should be included and documented in module 6.0 as IC Resources. *Note 3:* Each location may have only one geographic coordinate description.	G	GeographicCoordinate
3.6 Contaminant Remaining	Elements or attributes that describe a hazardous substance remaining in a particular media of concern at a specific location.	*Note 1:* Each location may have more than one contaminant remaining. *Note 2:* A valid contaminant consists of ***either*** a Chemical ***or*** Biological Taxonomy, but not both.	G	ContaminantRemaining
3.6.1 Contaminant Identifier	A unique identifier for a chemical or biological taxonomy.	Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	ContaminantIdentifier

Name	Definition	Notes	Format	XML Tag
3.6.2 Contaminated Media Name	The name of the major environmental component contaminated.	List of Example Values: • Air • Debris • Ground Water • Leachate • Liquid Waste • Residuals • Sediment • Sludge • Soil • Solid Waste • Subsurface Soil • Surface Soil • Surface Water	A	Contaminated MediaName

Name	Definition	Notes	Format	XML Tag
3.6.3 Chemical	Elements or attributes that describe a hazardous substance.	Refer to the Mandatory Chemical Identification data grouping in the **Chemical Identification [EX000016.2] Data Standard**. The following items are expected to define the chemical information needed for data group 3.6.3: • US EPA Chemical Internal Tracking Number • Chemical Abstracts Service Registry Number • US EPA Chemical Identifier • Chemical Substance Systematic Name • US EPA Chemical Registry Name Refer to the Optional Chemical Identification data grouping in the **Chemical Identification [EX000016.2] Data Standard**. The following items are expected to define the chemical information needed for data group 3.6.3: • Chemical Substance Type Name • Chemical Substance Synonym Name • Chemical Synonym Source Name	G	Chemical

Name	Definition	Notes	Format	XML Tag
3.6.4 Biological Taxonomy	Elements or attributes that describe, identify, name, and classify biological organisms based on degrees of similarity purportedly representing evolutionary (phylogenetic) relatedness.	Refer to the Mandatory Biological Taxonomy data grouping in the **Biological Taxonomy [EX000018.2] Data Standard**. The following items are expected to define the biological taxonomy information needed for data group 3.6.4: • ITIS Taxonomic Serial Number • ICTVdB Taxon Identifier • US EPA Biological Identification Number • Biological Systematic Name • Biological Systematic Context Name • Biological Vernacular Name • Biological Vernacular Context Name • Biological Group Name • Biological Group Context Name	G	BiologicalTaxonomy

4.0 Engineering Control

Definition: A physical technology implemented to minimize the potential for human exposure to contamination by means of control or remediation.

Relationships:

- Each engineering control may be protected by zero, one, or more IC instruments.
- Each engineering control may need protection as conveyed by zero, one, or more IC objectives.
- Each engineering control may be associated with zero, one, or more locations.
- Each engineering control may be associated with zero, one, or more affiliations.
- Each engineering control may be associated with zero, one, or more resources.
- Each engineering control may be associated with zero, one, or more events.

Notes: None.

XML Tag: EngineeringControl

Name	Definition	Notes	Format	XML Tag
4.1 Engineering Control Identifier	A unique identifier assigned to a physical technology implemented to minimize the potential for human exposure to contamination by means of control or remediation.	Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	EngineeringControlIdentifier
4.2 Engineering Control Name	The name assigned to a physical technology implemented to minimize the potential for human exposure to contamination by means of control or remediation.	A list of example values is provided in Appendix B.	A	EngineeringControlName

Name	Definition	Notes	Format	XML Tag
4.3 Engineering Control Media Name	The name of the major environmental component contaminated and associated with a physical technology implemented to minimize the potential for human exposure to contamination by means of control or remediation.	List of Example Values: • Air • Debris • Ground Water • Leachate • Liquid Waste • Residuals • Sediment • Sludge • Soil • Solid Waste • Subsurface Soil • Surface Soil • Surface Water	A	EngineeringControlMediaName

5.0 IC Affiliation

Definition: Any individual or organization associated with an IC either directly or indirectly.

Relationships:

- Each affiliation may be associated with zero, one, or more IC instruments.
- Each affiliation may be associated with zero, one, or more locations.
- Each affiliation may be associated with zero, one, or more engineering controls.
- Each affiliation may be associated with zero, one, or more resources.
- Each affiliation may be associated with zero, one, or more events.

Notes: *Note 1:* A valid affiliation consists of ***either*** an individual ***or*** an organization, but not both.

Note 2: The physical location of an individual or organization must be captured through the location module (module 3.0).

Note 3: Each individual or organization may have more than one type of affiliation with an IC or IC-related entity (e.g., the owner of a facility site may also be the operator of that facility site).

XML Tag: ICAffiliation

Name	Definition	Notes	Format	XML Tag
5.1 Affiliation Identifier	A unique identifier assigned to an individual or organization.	Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	AffiliationIdentifier

Name	Definition	Notes	Format	XML Tag
5.2 Affiliation Individual	Elements or attributes that identify an individual and the nature of their affiliation with some other entity.	Refer to the Point of Contact data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the individual information needed for data group 5.2: • Individual Identifier • Individual Identifier Context • Individual Title Text • Name Prefix Text • First Name • Middle Name • Last Name • Name Suffix Text • Affiliation Type	G	AffiliationIndividual

Name	Definition	Notes	Format	XML Tag
5.3 Affiliation Organization	Elements or attributes that identify an organization and the nature of its affiliation with some other entity.	*Note 1:* Refer to the Point of Contact data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the organization information needed for data group 5.3: • Organization Identifier • Organization Identifier Context • Organization Formal Name • Affiliation Type *Note 2:* The Organization Formal Name and Affiliation Type data elements are required to be provided with the IC Affiliation if the IC Instrument or IC Resource to which it is attached is a permit. This requirement is enforceable by the **Permitting Information [EX000021.2] Data Standard**.	G	AffiliationOrganization

Name	Definition	Notes	Format	XML Tag
5.3.1 Organization Type Name	The type of organization.	This data element serves to qualify the "Organization Formal Name" data element in data group 5.3. List of Example Values: • City Government • Community Group • County Government • Federal Government • Industry Group • Parish Government • State Government • Town Government • Township/Village Government • Tribal	A	OrganizationTypeName

Name	Definition	Notes	Format	XML Tag
5.4 Affiliation Mailing Address	Elements or attributes that identify the mailing address of an individual or organization.	Refer to the Address data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the mailing address information needed for data group 5.4: • Mailing Address Text • Supplemental Address Text • Mailing Address City Name • Mailing Address State Code • Mailing Address Postal Code • Mailing Address Country Code	G	AffiliationMailingAddress
5.5 Affiliation Telephonic	Elements or attributes that identify the telephonic information of an individual or organization.	Refer to the Communication data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the telephonic information needed for data group 5.5: • Telephone Number • Telephone Number Type Name • Telephone Extension Number	G	AffiliationTelephonic
5.6 Affiliation Electronic Address	Elements or attributes that identify the electronic address of an individual or organization.	Refer to the Communication data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the electronic address information needed for data group 5.6: • Electronic Address Text • Electronic Address Type Name	G	AffiliationElectronicAddress

6.0 IC Resource

Definition: Any document or source of information associated with an IC either directly or indirectly.

Relationships:

- Each resource may be associated with zero, one, or more IC instruments.
- Each resource may be associated with zero, one, or more IC objectives.
- Each resource may be associated with zero, one, or more locations.
- Each resource may be associated with zero, one, or more engineering controls.
- Each resource may be associated with zero, one, or more affiliations.
- Each resource may be associated with zero, one, or more other resources.
- Each resource may be associated with zero, one, or more events.

Notes: Geographically referenced raster datasets subject to reference by this module of the data standard should be fully self-documenting and in compliance with **FGDC/Spatial Data Transfer Standard (SDTS) Part 5 Raster Profile and Extensions, FGDC Standard [FGDC-STD-002.5-1999]** as well as the **FGDC Content Standards for Digital Geospatial Metadata [FGDC-STD-001-1998]** and the **FGDC CSDGM Extensions for Remote Sensing Metadata [FGDC-STD-012-2002]** where applicable. To be included as an IC Resource, the embedded metadata must include **complete** spatial reference and data quality descriptions. The external spatial reference should be a known and well-defined system. Within the Spatial Data Quality module, Lineage documentation is particularly important, including radiometric correction and georectification processes. The Logical Consistency module may be used to describe the relationship between the raster dataset and the IC Location, but does not supercede the provision of the “Location Association Type,” data element 3.2 of this data standard.

XML Tag: ICResource

Name	Definition	Notes	Format	XML Tag
6.1 Resource Identifier	An unambiguous reference to the resource within a given context.	*Note 1:* Refer to the Resource Identifier data element in the **Bibliographic Reference [EX000007.1] Data Standard**. *Note 2:* The Resource Identifier data element may be used to provide a permit number/identifier. Refer to the Permit Number/Identifier data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information. *Note 3:* Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	ResourceIdentifier
6.2 Resource Title Text	A name given to the resource.	*Note 1:* Refer to the Resource Title data element in the **Bibliographic Reference [EX000007.1] Data Standard**. *Note 2:* The Resource Title data element may be used to provide a permit name. Refer to the Permit Name data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information.	A	ResourceTitleText
6.3 Resource Subject Text	A topic of the content of the resource.	Refer to the Resource Subject data element in the **Bibliographic Reference [EX000007.1] Data Standard**.	A	ResourceSubjectText

Name	Definition	Notes	Format	XML Tag
6.4 Resource Category Name	The major classification to which a resource belongs.	This data element serves to qualify the "Resource Type" data element in data group 6.5. List of Example Values: • Local • State • Tribal • US EPA	A	ResourceCategoryName
6.5 Resource Type Text	The nature or genre of the content of the resource.	*Note 1:* Refer to the Resource Type data element in the **Bibliographic Reference [EX000007.1] Data Standard**. *Note 2:* The Resource Type data element may be used to provide a permit type. Refer to the Permit Type Code data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information.	A	ResourceTypeText
6.6 Resource Content Format Name	The physical or digital manifestation of the resource.	Refer to the Resource Content Format data element in the **Bibliographic Reference [EX000007.1] Data Standard**.	A	ResourceContentFormatName
6.7 Resource Language Name	A language of the intellectual content of the resource.	Refer to the Resource Language data element in the **Bibliographic Reference [EX000007.1] Data Standard**.	A	ResourceLanguageName
6.8 Resource Rights Text	Information about rights held in and over the resource.	Refer to the Resource Rights data element in the **Bibliographic Reference [EX000007.1] Data Standard**.	A	ResourceRightsText

Name	Definition	Notes	Format	XML Tag
6.9 Resource Presentation Type Text	The means by which a resource is physically presented.	List of Example Values: • Application • Cassette Audio • Compact Disc (CD) Audio • Database • Document • Video Home System (VHS) Tape • Digital Versatile Disc (DVD) Video	A	ResourcePresentationTypeText
6.10 Resource Purpose Text	The purpose that a resource serves.	Each resource may have more than one resource purpose. List of Example Values: • Mandate IC Enforcement Action • Mandate IC Monitoring Action • Reference • Source of Information	A	ResourcePurposeText
6.11 Resource Description	Elements or attributes that describe the details of a resource.	Each resource may have more than one resource description.	G	ResourceDescription
6.11.1 Resource Description Text	An account of the content of the resource.	Refer to the Resource Description data element in the **Bibliographic Reference [EX000007.1] Data Standard**.	A	ResourceDescriptionText
6.11.2 Resource Description Qualifier Text	The qualifier that specifies the meaning of the description associated with a resource.	This data element serves to qualify the "Resource Description," data element 6.11.1.	A	ResourceDescriptionQualifierText

Name	Definition	Notes	Format	XML Tag
6.12 Resource Electronic Address	Elements or attributes that identify the electronic address of a resource.	Refer to the Communication data grouping in the **Contact Information [EX000019.2] Data Standard**. The following items are expected to define the electronic address information needed for data group 6.12: • Electronic Address Text • Electronic Address Type Name	G	ResourceElectronicAddress

7.0 IC Event

Definition: Any occurrence or action taking place on a specific date or over a period of time, for which data may be collected, processed, distributed, or used for purposes related to ICs.

Relationships:

- Each event may be associated with zero, one, or more IC instruments.
- Each event may be associated with zero, one, or more IC objectives.
- Each event may be associated with zero, one, or more locations.
- Each event may be associated with zero, one, or more engineering controls.
- Each event may be associated with zero, one, or more affiliations.
- Each event may be associated with zero, one, or more other events.

Notes: Events may be related to other events as sub-events. This allows dependencies between events to be modeled and allows single events to be referenced by different names with different uses without compromising its original (official) name. For example, there may be an IC monitoring event with a frequency of five years that describes the overall monitoring requirements. Each individual monitoring event (e.g., Five Year Review) that is planned to occur every five years is its own separate event, but each is related to the IC monitoring event as a sub-event. As these Five Year Reviews occur, an actual date of completion may be added. The completion of these sub-events determines the status of the overall IC monitoring event.

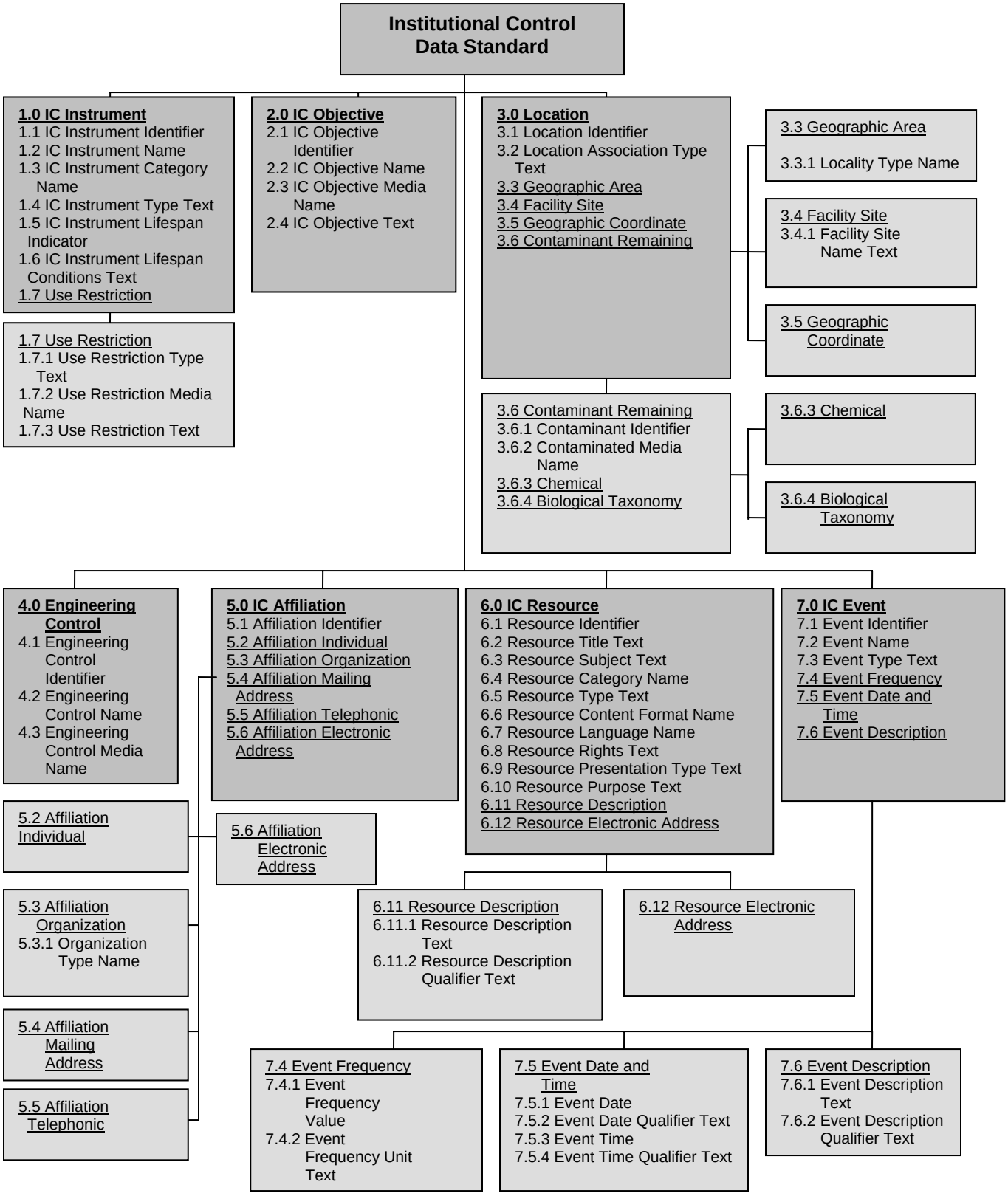
XML Tag: ICEvent

Name	Definition	Notes	Format	XML Tag
7.1 Event Identifier	A unique identifier assigned to an occurrence or action taking place on a specific date or over a period of time.	Based on the business need, additional metadata may be required to sufficiently describe an identifier. This additional metadata is described in section 1.6.d.	A	EventIdentifier
7.2 Event Name	The name given to an occurrence or action taking place on a specific date or over a period of time.	The “Event Name” data element may be used to differentiate between several events having the same value for the “Event Type,” data element 7.3.	A	EventName
7.3 Event Type Text	The type of occurrence or action taking place on a specific date or over a period of time.	A list of example values is provided in Appendix B.	A	EventTypeText

Name	Definition	Notes	Format	XML Tag
7.4 Event Frequency	Elements or attributes that describe the frequency of an event.	Each event may have only one event frequency.	G	EventFrequency
7.4.1 Event Frequency Value	The number denoting the time interval between a series of events allotted to take place.		N	EventFrequencyValue
7.4.2 Event Frequency Unit Text	The unit of measure associated with a time interval between a series of events allotted to take place.	This data element serves to qualify the "Event Frequency Value," data element 7.4.1. List of Examples Values: • Hours • Days • Weeks • Months • Years	A	EventFrequencyUnitText
7.5 Event Date and Time	Elements or attributes that define an event date and/or time.	Each event may have more than one event date and time.	G	EventDateTimeDetails
7.5.1 Event Date	The date that the event has taken or will take place.	Refer to the **Representation of Date and Time [EX000013.1] Data Standard.**	D	EventDate
7.5.2 Event Date Qualifier Text	The qualifier that specifies the meaning of the date that the event has taken or will take place.	This data element serves to qualify the "Event Date," data element 7.5.1. List of Examples Values: • Actual Completion Date • Actual Date • Actual Start Date • Planned Completion Date • Planned Date • Planned Start Date	A	EventDateQualifierText

Name	Definition	Notes	Format	XML Tag
7.5.3 Event Time	The time that the event has taken or will take place.	Refer to the **Representation of Date and Time [EX000013.1] Data Standard**.	D	EventTime
7.5.4 Event Time Qualifier Text	The qualifier that specifies the meaning of the time that the event has taken or will take place.	This data element serves to qualify the "Event Time," data element 7.5.3. List of Examples Values: • Actual Completion Time • Actual Time • Actual Start Time • Planned Completion Time • Planned Time • Planned Start Time	A	EventTimeQualifierText
7.6 Event Description	Elements or attributes that describe the details of the event.	Each event may have more than one event description.	G	EventDescription
7.6.1 Event Description Text	Any description associated with the event.		A	EventDescriptionText
7.6.2 Event Description Qualifier Text	The qualifier that specifies the meaning of the description provided about the event.	This data element serves to qualify the "Event Description Text," data element 7.6.1. List of Examples Values: • Purpose • Objectives • Procedures/Methodologies • Findings • Results/Conclusions • Summary	A	EventDescriptionQualifierText

Appendix A
Institutional Control Data Structure Diagram



Appendix B
Lists of Example Values

Name/XML Tag	Definition	Notes
1.4 IC Instrument Type XML Tag: ICInstrumentTypeText	The type of administrative measure and/or legal mechanism that establishes a specific set of land or resource use restrictions.	This data element may be used to provide a permit type. Refer to the Permit Type Code data element in the **Permitting Information [EX000021.2] Data Standard** for definition and format information. Lists of Example Values: *IC Instrument Type may be one of the following if the IC Instrument Category is Government:* • Base Use Plan • Grant of Environmental Resource (GER) • Ground Water Protection Zone • Ground Water Use Regulation • Local Ordinance • Local Permit - Alteration • Local Permit - Building • Local Permit - Demolition • Local Permit - Development • Local Permit - Excavation • Local Permit - Ground Water Management • Local Permit - Unspecified Type • Local Permit - Well Drilling • Overlay Zoning • State Legislation • Subdivision Regulation • Well Drilling Regulation • Zoning Amendment • Zoning Ordinance • Zoning Variance *IC Instrument Type may be one of the following if the IC Instrument Category is Proprietary:* • Deed Restriction of Unspecified Type • Easement - Affirmative • Easement - Appurtenant • Easement - Conservation • Easement - In Gross • Easement - Negative • Easement - Unspecified Type • Equitable Servitude • Restrictive Covenant • Reservation of Interest *IC Instrument Type may be one of the following if the IC Instrument Category is Enforcement:* • Administrative Order on Consent (AOC) • Consent Decree (CD) • Contract • Federal Interagency Agreement • RCRA 3008(h) Compliance Order

Name/XML Tag	Definition	Notes
		• RCRA Closure Permit • RCRA Compliance Schedule • RCRA Corrective Action Order • RCRA Exposure Information Report • RCRA Inspection Report • RCRA Operating Permit - Part A • RCRA Operating Permit - Part B • RCRA Permit Modification - Part A • RCRA Permit Modification - Part B • RCRA Post-Closure Permit • Report of Spill or Release • Unilateral Administrative Order (UAO) *IC Instrument Type may be one of the following if the IC Instrument Category is Informational:* • Advisory - Agricultural • Advisory - Drinking Water • Advisory - Fishing • Advisory - Food • Advisory - Health • Advisory - Swimming • Advisory - Unspecified Type • Announcement - Radio • Announcement - Television • Announcement - Unspecified Type • Listing - Local Hazardous Waste Registry • Listing - Military Hazardous Waste Registry • Listing - State Hazardous Waste Registry • Listing - Unspecified Type • Notice - Deed Notice • Notice - Notice to State Regulators Before Changes in Land Ownership • Notice - Notice to State Regulators Before Changes in Land Use • Notice - Unspecified Type • One Call System - Local • One Call System - State • One Call System - Unspecified Type • Public Education - Brochure • Public Education - Direct Mailing • Public Education - Door Hanger • Public Education - Fact Sheet • Public Education - Unspecified Type • Publication - Federal Register • Publication - Internet Announcement • Publication - Newspaper/Press Release • Publication - State Register • Publication - Unspecified Type
3.2 Location Association Type XML Tag: LocationAssociationTypeText	The type of relationship between a physical	Refer to the **FGDC Framework Data Content Standard Part 5: Governmental Unit and Other Geographic Area Boundaries [DRAFT FGDC-**

Name/XML Tag	Definition	Notes
	location or area and an associated entity.	**STD-2005]** for definitions of the terminology used for Location-to-Location relationships. Lists of Permissible Values: *Location Association Type may be one of the following if the Location is related to another Location:* • Contains/Covers • Disjoint • Equals • Overlaps • Touches *Location Association Type may be one of the following if the Location is related to an IC Instrument, Engineering Control, or IC Event:* • Applies To • Is Located At *Location Association Type may be one of the following if the Location is related to an IC Objective*: • Applies To *Location Association Type may be one of the following if the Location is related to an IC Affiliation*: • Is Located At • Has Jurisdiction Over *Location Association Type may be one of the following if the Location is related to an IC Resource*: • Describes/Represents/References • Is Located At
4.2 Engineering Control Name XML Tag: EngineeringControlName	The name assigned to a physical technology implemented to minimize the potential for human exposure to contamination by means of control or remediation.	List of Example Values: • Aeration • Air Emissions/Off-Gas Treatment, (N.O.S.) • Air Monitoring • Air Sparging • Air Stripping (Assuming Excavation) • Air Stripping (Assuming Pumping) • Alternate Drinking Water, (N.O.S.) • Alternate Drinking Water, Permanent Replacement • Alternate Drinking Water, Supply Reinstated • Alternate Drinking Water, Temporary Replacement • Biofiltration

Name/XML Tag	Definition	Notes
		• Biological Treatment (In-Situ), (N.O.S.) • Biological Treatment, (Ex-Situ) • Biological Treatment, (N.O.S.) • Bioreactors • Bioremediation (Ex-Situ) • Bioremediation (In-Situ) • Bioremediation Treatment, (N.O.S.) • Bioslurping (Biological Treatment) • Bioslurping (Physical/Chemical Treatment) • Biosparging (Biological Treatment) • Biosparging (Physical/Chemical Treatment) • Bioventing • Cap • Carbon Adsorption • Carbon At Tap • Chemical Reactive Wall • Chemical Reduction/Oxidation (Assuming Excavation) • Chemical Reduction/Oxidation (Assuming Pumping) • Clarification • Co-Metabolic Treatment • Coagulation • Component Separation • Component Separation, (N.O.S.) • Composting • Consolidate • Containment, (N.O.S.) • Controlled Solid Phase Bioremediation • Decontamination • Dehalogenation (BCD) • Dehalogenation (Glycolate) • Dewatering • Dike/Berm • Directional Wells (Enhancement) • Discharge • Disposal • Drainage Ditch • Dual Phase • Dual Phase Extraction • Dust Suppression • Electrokinetics • Encapsulation • Encapsulation or Overpacking • Engineering Control, (N.O.S.) • Equalization • Evaporation • Excavation • Explosive/Unexplosive Ordnance • Extraction

Name/XML Tag	Definition	Notes
		• Filtration • Fixed Film • Flocculation • Free Product Recovery • Fuming Gasification • Gas Collection/Treatment • Grout Curtain • Grouting • High Energy Corona • High Temperature Thermal Desorption • Hot Air Injection • Hot Gas Decontamination • Hot Water or Steam Flushing/Stripping • Hydraulic Control • Hydrofracturing (Enhancement) • Impermeable Barrier • In Situ Well Aeration • Incineration (Assuming Excavation) • Incineration (Assuming Pumping) • Ion Exchange • Landfarming • Leachate Control • Levee • Limited Response • Liner • Liquid Phase Carbon Adsorption (Assuming Excavation) • Liquid Phase Carbon Adsorption (Assuming Pumping) • Low Temperature Thermal Desorption • Membrane Separation • Monitoring (Air Emissions/Off-Gas Treatment) • Monitoring (Other) • Natural Attenuation • Neutralization • Neutralization (Assuming Pumping) • Nitrate Enhancement • No Action • No Further Action • Nutrient Injection • Oil Water Separation • Open Burn/Open Detonation • Open Burn/Open Detonation (Assuming Excavation) • Operations (O) • Operations & Maintenance (O&M) • Other, (N.O.S.) • Oxidation (Air Emissions/Off-Gas Treatment) • Oxidation (Assuming Excavation) • Oxidation (Assuming Pumping)

Name/XML Tag	Definition	Notes
		• Oxygen Enhancement With Air Sparging • Oxygen Enhancement With H2O2 • Passive Treatment Walls • Permeable Treatment Bed (Sludge) • Peroxidation • Physical Separation • Physical/Chemical Treatment, (Ex-Situ) • Physical/Chemical Treatment, (In-Situ.) • Physical/Chemical Treatment, (N.O.S.) (Air Emissions/Off-Gas Treatment) • Physical/Chemical Treatment, (N.O.S.) (Ex-Situ) • Physical/Chemical Treatment, (N.O.S.) (In-Situ) • Phytoremediation (Biological Treatment) • Phytoremediation (Physical/Chemical Treatment) • Pneumatic Fracturing (Enhancement) • Population Relocation, (N.O.S.) • Population Relocation, Permanent • Population Relocation, Returned • Population Relocation, Temporary • Precipitation • Publicly Owned Treatment Works (POTW) • Pump And Treat • Pyrolysis • Reactive Wall • Recovery Wells • Recycling (Assuming Excavation) • Recycling (Assuming Pumping) • Reduction (Assuming Excavation) • Reduction (Assuming Pumping) • Reinjection • Residuals Discharge • Residuals Disposal • Residuals Storage (Temporary) • Revegetation • Reverse Osmosis • Sedimentation • Sheet Piling • Slope Stabilization • Slurry Phase Bioremediation • Slurry Wall • Soil Flushing • Soil Vapor Extraction (Ex-Situ) • Soil Vapor Extraction (SVE) • Soil Washing • Solidification/Stabilization (Ex-situ) • Solidification/Stabilization (In-situ) • Solvent Extraction (Chemical) • Storage - Permanent

Name/XML Tag	Definition	Notes
		• Storage - Temporary • Subsurface Drain • Surface Drainage Control • Surface Water Control • Surfactant Flushing • Temporary Well Head Treatment • Thermal Treatment, (N.O.S.) (Assuming Excavation) • Thermal Treatment, (N.O.S.) (Ex-situ) • Thermal Treatment, (N.O.S.) (In-situ) • Thermally Enhanced Soil Vapor Extraction • Tilling • Treatment, (N.O.S.) (Air Emissions/Off-Gas Treatment) • Treatment, (N.O.S.) (Other) • UV Oxidation • Vapor Extraction • Vapor Phase Carbon Adsorption • Vitrification (Ex-situ) • Vitrification (In-situ) • Water Table Adjustment • Waterline Replacement • Well Head Treatment • Wetlands Replacement • White Rot Fungus
7.3 Event Type XML Tag: EventTypeText	The type of occurrence or action taking place on a specific date or over a period of time.	List of Example Values: • Administrative Order on Consent (AOC) • Alternative Dispute Resolution • Combined Remedial Investigation/Feasibility Study (RI/FS) • Compliance Inspection – Case Development • Inspection • Compliance Inspection – Compliance Evaluation • Compliance Inspection – Compliance Sampling • Compliance Inspection – Reconnaissance or Screening Inspection • Compliance Monitoring – Compliance Inspection • Compliance Monitoring – Compliance Investigation • Compliance Monitoring – Information Request • Compliance Monitoring – Offsite Record Review • Consent Decree (CD) • Enforcement Decision Document • Enforcement – Complaint/Proposed Order • Enforcement – Demand for Stipulated

Name/XML Tag	Definition	Notes
		Penalties • Enforcement – Field Citation • Enforcement – Final Order • Enforcement – Judicial Referral • Enforcement – Letter to Regulated Entity • Enforcement – Letter to State/Tribe • Enforcement – Oral Notification of Violation • Enforcement – Voluntary Compliance • Enforcement – Written Notice of Violation • Explanation of Significant Differences (ESD) • Federal Facility (FF) Feasibility Study (FS) • FF Long Term Response Action (LR) • FF Remedial Action (RA) • FF Remedial Design (RD) • FF Remedial Investigation (RI) • FF RI/FS • FF Removal • Feasibility Study • Federal Interagency Agreement • Five Year Remedy Assessment • IC Enforcement • IC Implementation • IC Monitoring • IC Termination • Long Term Response Action • Memorandum of Understanding • Multi-Site Cooperative Agreement • No Action ROD • Operations and Maintenance • Potentially Responsible Party (PRP) Emergency Removal • PRP FS • PRP LR • PRP RA • PRP RD • PRP Removal • PRP RI • PRP RI/FS • RD Contingency • Re-Use Plan • Record of Decision (ROD) • ROD Amendment • Remedial Action • Remedial Design • Remedial Investigation • Removal • Removal Contingency • Resource Archival • Resource Creation

Name/XML Tag	Definition	Notes
		• Resource Modification • Resource Presentation • Resource Publication • Site Access • Site Security And Maintenance • State Consent Decree • State Order • Unilateral Administrative Order (UAO)