Draft Stormwater Geodata Transfer Standard

As developed by the **Metro Stormwater Geodata Project**

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Water Resources Center

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MSWGP

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Overview, Context and FAQs

Purpose of this document.

The purpose of this document is two-fold; first, it is intended to provide an information-rich resource document about the content of the draft Stormwater Geodata Transfer Standard as developed by the participants of the Metro Stormwater Geodata Project (April 2018 – present) and secondly, to serve as a resource for the entire geospatial, stormwater, engineering, water resources and planning community to reference and review so they can be better prepared to provide comments, suggestions and recommendations for the improvement of the draft standard in development.

What is the Stormwater Geodata Transfer Standard (SGTS)?

This SGTS is simply a set of attribute specifications such as field name, field type, field length and field order as well as a set of standardized terminology and domain values to serve as a means for the translation and aggregation of stormwater geospatial data into a common format.

What is the Metro Stormwater Geodata Project (MSWGP)?

This MSWGP is a voluntary collaborative project comprised of private sector and public sector partners in the Twin Cities metropolitan region. The goal of the MSWGP effort is to create a stormwater geodata transfer standard that reflects the functional needs of the professional community and that contains the attributes, terminology and content—as well as the supporting documentation—to satisfactorily meet those needs.

The MSWGP began with a kick-off meeting in Medina, Minnesota on April 17, 2018. The primary purpose of this kick-off session was to:

- to engage a variety of interested stakeholders
- to present the proposed project and articulate some of the needs for it
- to document the core business needs of the participants
- to determine if there was enough interest from the stakeholder community in the project; and,
- if so, to create an initial Steering Committee to begin developing it.

The MSWGP builds upon initial prior work undertaken between 2008-2010 by state level agencies to create an initial stormwater system data exchange standard. The current MSWGP effort is being co-coordinated by volunteer staff from metro counties and watershed districts who organize and lead the meetings, prepare needed research and contextual materials and document the input from the participants.

The MSWGP Steering Committee—comprised of professionals with backgrounds in engineering, planning, landscape architecture, water resources management, water quality regulation, monitoring, geospatial work, asset management, public works and other disciplines—convened six times between June 2018 and October 2019. In addition to the project Steering Committee, several smaller technical working groups also met to confer on specific details of the standard's development; the result of these groups' dedicated discussion, focus and work is contained within the pages of this document.

Version 0.5 of the Draft Stormwater Geodata Transfer Standard

This document represents the current iteration of the standard in its development. This is draft—called 'version 0.5' (or affectionately just the *'dot five'*)—represents the results of eighteen months of work, discussion, research, revision and review during 2018 and 2019 by the MSWGP participants. By early 2020, the MSWGP Steering Committee felt that a good enough draft was prepared which could be put before the entire statewide stakeholder professional community to solicit their review, comments and suggestions for improvement.

What need or purpose does this proposed standard fulfill?

The Twin Cities metropolitan region is comprised of 186 municipal governments, 7 county governments, 33 watershed management units, numerous state and regional interests, educational campuses and private interests all of whom build, maintain, own and manage surface and subsurface stormwater fixtures and conveyance infrastructure.

As no formally approved or agreed-upon geospatial data standard for creating and maintaining the digital representations of these features exists, each of these agencies has come up with its own unique schema for representing, attributing and maintaining their stormwater assets.

Over the years, this has resulted in as many different schema types as there are agencies maintaining them. This lack of data standardization has led to significant challenges when attempts to combine and align data from several jurisdictions for mapping, modeling and analysis are undertaken. The purpose of this standard is to provide a single, commonly accepted set of attribute specifications (field name, field type, field width, field order, domain values) for transferring data between interests and aggregating stormwater geospatial data from many sources into a common format. The eventual adoption and usage of this standard is intended to facilitate and enhance the ability of geospatial practitioners to share data and to reduce incompatibilities when acquiring, processing, aggregating and disseminating stormwater system geodata.

Additional intended goals for developing a stormwater geodata transfer standard include better integration with asset management software applications, facilitation of flow modeling for water management and emergency response uses, ability to determine ownership and maintenance responsibility of stormwater assets, enhance potential analysis capacity for determining efficacy of installed best management practices, provide the ability to link geodata features to inspection and regulatory reports, ability to edge match features along boundaries and many others.

Is the Stormwater Geodata Transfer Standard a *mandated* standard? Is this something we are going to be required to use? Absolutely not. No data standard developed by and for the geospatial of community in Minnesota are required or mandated. Standards—such as this emerging stormwater geodata transfer standard—are intended to serve as voluntary tools that the members of our profession work to develop collaboratively as a means of working more easily and efficiently with one another. There are no laws, statues, administrative rules or court orders in Minnesota that dictate what a city, county, watershed district or other agency must do with their data in terms of using or maintaining standards. The use of this forthcoming standard and other geodata standards, such as those already adopted for address points, road centerlines and parcels—while encouraged—are completely voluntary.

Is this version 0.5 the "definitive version" of the Stormwater Geodata Transfer Standard?

No. This draft standard has been prepared by the participants of the Metro Stormwater Geodata Project as a beginning point—this initial 'version 0.5' is being submitted and offered to the entire stakeholder community in Minnesota for them to review, critique, provide suggestions and comments on it. This

review period is anticipated to take place during the spring and summer of 2020, and the comments received will be documented, reviewed and considered for modifying the next iteration of the standard. Data standards are strengthened by both the review and input of the professional community and through their usage.

My agency already has geospatial data representing our stormwater network that we use to meet our needs. Why should we care about this newly developing standard?

An agency or interest already creating and managing its data in its own format or schema can certainly maintain its data in its own format. The MSWGP effort is simply proposing and advancing this standard as a transfer standard to meet a variety of needs as expressed by the wider user community. It is our hope that agencies and interests creating or consuming stormwater geodata would consider at very least providing comment on how the proposed v. 0.5 standard might be revised or edited to better meet their existing needs and use cases.

Why go through all the trouble of creating a new and different stormwater geodata standard? Why doesn't everyone simply just use the ESRI Stormwater Data Model?

The v. 0.5 draft Stormwater Geodata Transfer Standard offered by the MSWGP was in many ways inspired by the ESRI Stormwater Geodata Model, as the v. 0.5 uses many of the same terms, concepts, domain values and data categories and has many other similarities to the ESRI model. The key differences are that the v. 0.5 was created to address many additional specific use cases and needs specifically expressed by the user community in Minnesota, such as integration with asset management software, MS4 compliance reporting, integration with field collection methods, flow modeling needs and others. Comparison with, and translation between the ESRI model and the v. 0.5 is anticipated as one of the tests to be conducted during 2020 stakeholder review period. Any agency already using the ESRI Stormwater Model will see the clear similarities between their existing data and the v. 0.5 draft schema format.

Applicability of this standard.

Agencies who produce and maintain geospatial data representing stormwater features are certain to have unique methods, definitions, and criteria for capture and storage of geospatial data representing stormwater features to satisfy their own business requirements and meet their internal agency needs. This standard simply seeks to establish a set of attribute specifications primarily intended for data exchange purposes. This proposed and emerging standard may be used not only to transfer and aggregate data, but also potentially utilized to create, manage and maintain geospatial data for representing stormwater fixtures, assets and conveyance systems within a jurisdiction. This standard in no way attempts to define, change or dictate any agency's existing internal data capture or storage specifications; however, some data producers may find benefit in using the standard to manage and maintain their data.

What does the public stakeholder review of the v. 0.5 draft Stormwater Geodata Standard entail?

The MSWGP team will be collecting and documenting the comments, suggestions, revisions and recommendations received during calendar 2020 on the draft standard. The MSWGP team will use these comments to revise, improve and edit the version 0.5 standard, hopefully improving it and refining it to better satisfy the various needs of the stakeholder community. The creation of geodata standards, including this one for stormwater in Minnesota is best accomplished by using an inclusive and transparent process that encourages input and participation by the entire professional community. The resulting standard which results is a resource that reflects the expertise, needs and intelligence of the professionals who need it and (hopefully) will make use of it.

How are the various stormwater fixtures represented in this draft standard?

There are thirteen (13) unique categories of representation, three as linear features, the remaining ten as point features. Additionally, there is capacity to illustrate both Basins and Best Management Practices (BMPs) as polygon features within the draft standard, this is explained in more detail in the 'Stormwater Standard – Components' section beginning on Page 7 of this document. The table below outlines the general intention of how the data is organized by geometry type in the draft standard.

	Representational Type		
Stormwater Feature Type	**Point**	**Line (Polyline)**	**Polygon**
Pipes		*Primary*	
Channels		*Primary*	
Artificial Paths		*Primary*	
Basins	*Primary*		*Secondary*
Hydraulic Control Structures	*Primary*		
Pollution Control Structures	*Primary*		
Artificial Points	*Primary*		
Inlets	*Primary*		
Outlets	*Primary*		
Manholes	*Primary*		
Lift Stations	*Primary*		
Best Management Practices (BMPs)	*Primary*		*Secondary*
Monitoring	*Primary*		

Project Contacts

Who do I contact if I have questions about this standard or I wish to provide comments on it?

Please contact the following individuals—who are serving as co-coordinators of the Metro Stormwater Geodata Project—they will field your questions and will gladly add your comments to those documented during the v. 0.5 stakeholder review period during 2020.

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Stormwater Standard – Components

Stormwater fixtures vary widely in both their type and function. This variation provides a tremendous challenge to the task of capturing and correctly representing these features with geospatial data. The draft Stormwater Geodata Transfer Standard makes use of the following fifteen data types (referred to as **Components**) for representing stormwater features and assets. Each has been assigned a color, with which it will be associated consistently throughout this and other accompanying documentation.

Components appearing in the draft Stormwater Geodata Transfer Standard:

Pipes (Linear features)
Channels (Linear features)
Artificial Paths (Linear features)
Basins (Point features)
Hydraulic Control Structures (Point features)
Pollution Control Structures (Point features)
Artificial Points (Point features)
Inlets (Point features)
Outlets (Point features)
Manholes (Point features)
Lift Stations (Point features)
Best Management Practices (BMPs) (Point features)
Monitoring Sites (Point features)
Basins (represented as polygons)
Best Management Practices (represented as polygons)

Each of the **Components** are briefly described below. In reference to their applicability to the draft Stormwater Geodata Transfer Standard, the most broad and inclusive intent of the definition is intentional.

Pipes
A pipe is a tube comprised of concrete, metal, plastic or other material that is installed to convey stormwater; pipes are represented with line geometry (polylines) and may vary in their dimension, type, shape, compositional material and lining material.

Channels
A channel is a constructed waterway or natural waterway (either in its original state or modified by human agency) with the primary design purpose to convey stormwater runoff. Channels are represented with line geometry (polylines) and may vary in their dimension, type, shape and lining material.

Artificial Paths
An artificial path is a linear feature intended to represent a line of flow through a water body or overland where no such actual physical pipe, channel or path exists. Artificial paths are represented with line geometry (polylines) and may vary in their type and intended usage and purpose.

Basins
A basin is defined as a site, fixture or natural feature with the capacity to act as a temporary or permanent pool of water as its primary function or intended design. Basins may vary in their type, origin, function and impairment category. Basins are represented with point geometry.
(see also **Basins (represented as polygons)**)

Hydraulic Control Structures
A hydraulic control structure is defined as a fixture installed with the intention to divert, disrupt or halt the flow of stormwater. Hydraulic control structures are represented with point geometry and can vary by type (e.g. dam, deck drain, diversion chamber, weir, etc.).

Pollution Control Structures
A pollution control structure is defined as a fixture installed with the specific intention to reduce or eliminate a water pollutant. Pollution control structures are represented with point geometry and can vary by type (e.g. grit chamber, filtration device, settling device, etc.).

Artificial Point
An artificial point is a point feature intended to represent phenomena that are useful for modeling but do not represent an actual physical asset. Examples include junction points, discharge points and centroids. Artificial points are represented with point geometry and can vary by type.

Inlet
An inlet is a site where stormwater enters the conveyance system. Inlets are represented with point geometry and can vary by both type and shape.

Outlet
An outlet is a site where stormwater discharges out from a pipe, channel or other conveyance. Outlets are represented with point geometry and can vary by both type and shape. Note, **outlets** are not to be confused with **outfalls.** An **outfall** is a type of **outlet**, specifically applied to where water discharges into the Waters of the United States (40 CFR 230.3(s)) or into another municipal separate storm sewer system (MS4) permittees jurisdiction.

Manhole
A manhole is an opening or access point to stormwater utilities which enables repair, maintenance, or inspection activities to take place. Manholes are represented with point geometry and can vary by type.

Lift Stations
A lift station is an installed structure to move stormwater from a lower elevation to a higher elevation where the site elevation or other situational context is not suited for gravity flow alone to move the water. Lift stations include several sub-components including receiving wells (wet wells), screens or filters for removing debris, pumps, valves, piping, control devices all of which may occur within a single enclosed structure. Lift stations are represented with point geometry and can vary by type.

Best Management Practices (BMPs)

Stormwater best management practices (BMPs) encompass a range of fixtures, devices, installations and other measures used to impound, detain, divert, hold, infiltrate and treat precipitation, snowmelt, surface runoff and other stormwater drainage with the intention of reducing the impact of pollutants contained in the water. Best management practices in their general type, filtration material and ground cover type. Basins are represented with point geometry (see also **Best Management Practices (represented as polygons).**

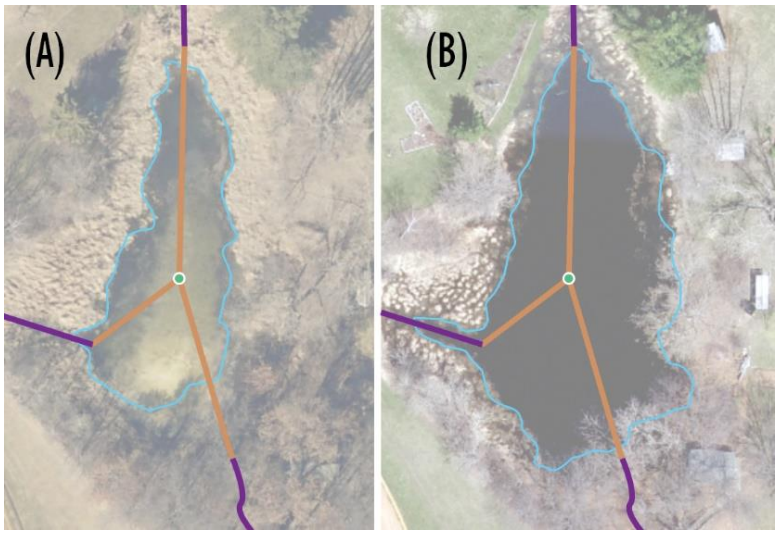
Monitoring Sites

Monitoring sites are locations where water monitoring activities are currently taking place or have taken place in the past at may include installation of a permanent device, temporary device or represent a single-event. Monitoring sites are represented by point geometry and may vary by category, type and status.

Basins (represented as polygons)

As listed above, a **basin** is defined as a site, fixture or natural feature with the capacity to act as a temporary or permanent pool of water as its primary function or intended design. Basins may vary in their type, origin, function and impairment category. In the draft Stormwater Geodata Transfer Standard, basins are primarily represented with **point** geometry, however, it is acknowledged that the representation of basins over and above a certain size as a polygon feature is necessary or a variety of visualization and analysis uses.

The area and extent of the basin feature may vary due to factors in precipitation, erosion or human agency in modifying the structural elements of the feature. In the example at right, the tan lines represent artificial paths, while the purple lines represent channels coming in and out of the basin and the green point (*centroid*) would remain the constant feature representing the basin itself—serving to maintain connectivity to the linear features as the basin may expand or contract over time. In (A) the shoreline (*in light blue*) has contracted, while in (B) the shoreline is larger.



As needed, new shorelines can be created (*via heads-up digitizing, extraction from LIDAR, imported from CAD, GPS point collection on the perimeter of the basin, etc. – of note: a domain of 'polygon creation method' (PolyMethod) is provided in the draft Standard*) but the linear and point features and their topological connection would remain intact to preserve the functionality of the geometry for flow modeling purposes.

Best Management Practices (represented as polygons)

Similar in concept to what was described above for basin data, BMPs would be carried as points; however, there is also capacity in the draft Stormwater Geodata Transfer Standard for creation and maintenance of BMPs as polygon features using the same method listed above.

Stormwater Standard – Elements

Each **Component** is further organized of up to seven different **Elements**. These **Elements** are simply a way of intuitively grouping the various individual attributes within each **Component.** The seven elements in use in the draft Stormwater Geodata Transfer Standard are as follows:

Identification Elements
Type Elements
Dimensional and Positional Elements
Origin and Status Elements
Capacity Elements
Data Elements
General Elements

Each of the Elements are briefly described and defined below. As with the Components, the most broad and inclusive intent of the definition of each Element is intentional. Elements are used to group the attributes in the Excel spreadsheet version of the standard and do not impact the content or functionality of their attributes.

Identification Elements
Identification elements contain the unique IDs, composite IDs and features the form or encompass things to be used as primary or foreign keys.

Type Elements
These elements contain information on the type, either specific or general, about the feature.

Dimensional and Positional Elements
These elements contain information on the dimensional attributes, materials, measurements and related information about the feature.

Origin and Status Elements
This element contains data on the origin, status, ownership of the features and links to other relevant documents.

Capacity Elements
These elements contain data on the capacity (e.g. volume) characteristics of the feature.

Data Elements
These elements contain information on the data representing the fixture, not the fixture itself. In the draft Stormwater Geodata Transfer Standard, any place the characters *_DA* appear in the *database name*, this is a hint that this attribute contains info about the data itself, not the physical stormwater fixture it represents.

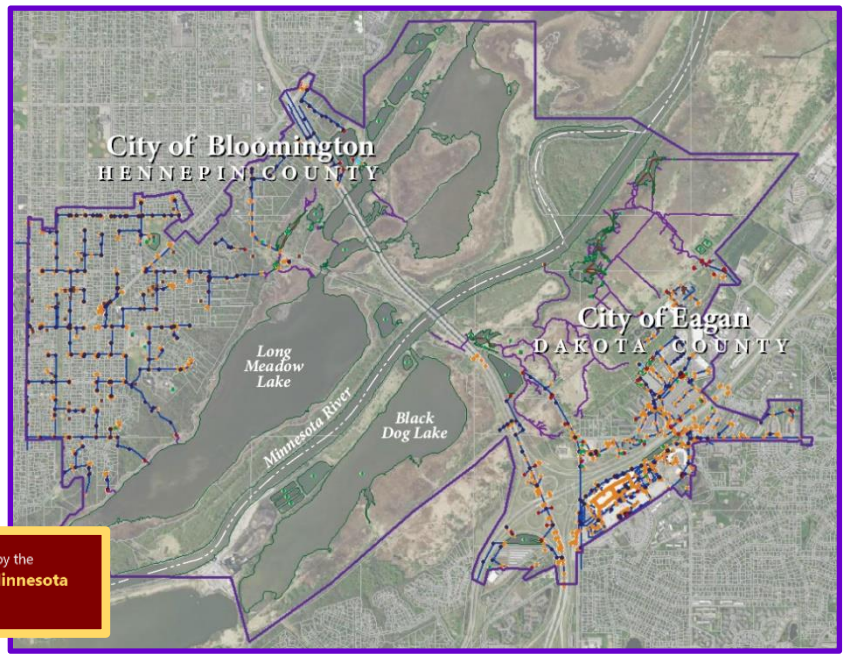
General Elements
These elements indicate in what jurisdiction the fixture is located, codes for those jurisdictions and space for additional comments.

Pilot Study Area – Sample Dataset Available

To enhance the ability of the stakeholder community in becoming familiar with, to review and to test the v. 0.5 draft Stormwater Geodata Transfer Standard, a sample dataset in the v. 0.5 schema format has been prepared and made available for download.

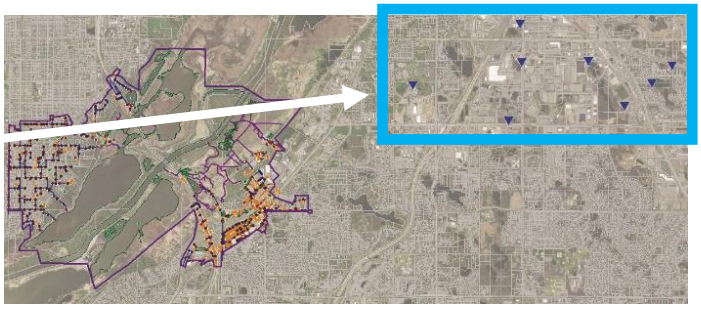
The sample pilot dataset contains two 'storm-shed' areas which drain to the Minnesota River, one in the City of Bloomington, the other in the City of Eagan. The sample pilot site includes a variety of the kinds of stormwater features the draft standard attempts to represent with geospatial data. Additionally, the Minnesota Department of Transportation also maintains several stormwater fixtures and assets in the pilot study area. The pilot site is shown in Exhibit A below.

Exhibit A - Pilot Study Area:
The sample pilot dataset encompasses a total area of 5.87 square miles (3,762 acres) encompassing portions of both Bloomington and Eagan. The dataset includes 49,279 linear feet (9.3 miles) of natural and artificial channels, 154,919 linear feet (29.3 miles) of stormwater pipes, 1122 acres of basins and open water, 58 outlet points, 1042 inlet points, 348 manholes/access points and 16 best practice installation sites.



Funding for the creation of the pilot dataset was provided by the
Water Resources Center of the University of Minnesota
https://www.wrc.umn.edu/

Also, as no stormwater lift stations appear within designated ***sample pilot study site area***, the City of Eagan has also included seven (7) lift station sites to the pilot dataset (*outlined in the **blue box***). These lift station point sites are available with the downloadable ***sample pilot dataset***.

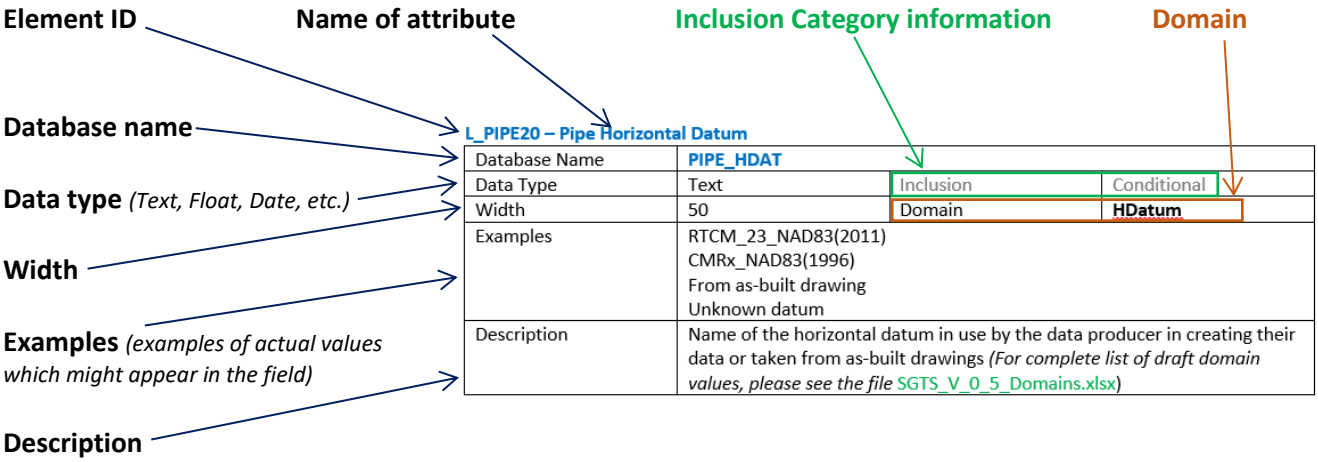


The ***sample pilot dataset*** in the v. 0.5 draft standard format for the area above is available for download in both ESRI geodatabase format (.gdb) and shapefile format (.shp) from the following website: *https://www.metrogis.org/projects/stormsewers.aspx*

Each **Component** contains numerous individual attributes; this document will be organized so each attribute has its own descriptive entry which details its content and example of which is as follows with descriptions of each sub-component:

Element ID:	Example: **L_PIPE1** - this is just a reference (marker) ID telling the user that the attribute is a linear feature (**L**), in the Pipe Component (**PIPE**) and is the first attribute in the list (**1**); the Element IDs will change with each version of the standard as attributes get added or dropped.
Attribute (Alias) Name:	**Pipe ID**
Database Name:	**PIPE_ORID** (these are kept to 10 characters or less)
Inclusion Category:	Mandatory, Conditional, If Available, Optional These are the categories in use by standards adopted by the Minnesota Geospatial Advisory Council (Please see page 14 for explanation)
Field Width:	This indicates the character width of the field (a.k.a. Length)
Domain:	This indicates if the field has a domain of accepted values
Example:	Where applicable and example will be provided
Description:	An additional verbal description of fixture represented

Photographic or illustrative examples of the fixture or object being represented in the data schema may also be provided to offer context to the reader. The graphic below explains the table provided for each descriptor of each attribute presented in the draft v. 0.5 standard:



(descriptive characteristics, links to resources provided or other files are referenced as applicable)

For some attributes in this v. 0.5. draft standard, additional explanations, illustrations, graphics or photos may be provided to offer additional clarity.

"Inclusion" Categories Explained

"Inclusion" is a term used to explain the requirement for the population of a field in a dataset for it to ***comply with the standard.***

Each attribute can be defined as of one of **four types of Inclusion**, these are:

- **Mandatory;**
- **Conditional;**
- **If Available;**
- **Optional;**

Each category is explained in more detail below:

Mandatory: In simple terms, field identified as 'mandatory' needs each record populated to be *compliant with the standard.* The use of the term 'mandatory' indicates nothing more than for the data to be *compliant with the standard* it must have, at minimum, the mandatory fields populated. In a 'mandatory' designation, null values would not be allowed. Further, the term 'mandatory' is ***not*** to be applied to the fulfillment of an agency's request for data (e.g. *"it is 'mandatory' that you provide this data to us"* – this is **not** the intention of the 'mandatory' category in this or any other standard).

Agencies can create and maintain data that does not contain the 'mandatory' fields in any standards. This simply means their data is not compliant with the standard, but in no way does it mean that their data isn't useful or cannot be used.

For example, the field **Pipe ID** is a 'mandatory' field to be populated in the draft MSWGP v. 0.5 data standard, which makes sense as each asset should have its own unique identifier; however, a data producer such as a city may have digitized their stormwater network and while it has usable data, it simply has not applied a unique ID to each pipe in their system. Their data would not be compliant with the standard; but could still be used to fulfill many useful and important mapping and analysis uses.

Conditional: Each field with a 'Conditional' designation is to be populated with a non-null value for each record that is applicable to the feature or for which a specified condition exists. For example, the field **Pipe Shape** is a Conditional field; if the shape of a given pipe asset is not known, the data producer is can reasonably be expected to enter the value 'Unknown' and not to leave the field 'blank' or 'null'.

If Available: Each field with an 'If Available' designation is to be populated—if the data exists—in the data provider's database or system. If a data provider does not have the data, it cannot be populated. For example, the field **Pipe Casing** is an If Available field. As not all pipes types have or require a casing, or the presence of a casing may not be known, it is acceptable to leave unknowns as null values.

Optional: An 'optional' field is one that is not required to be populated, however, inclusion of this data would enhance the value and usability of the data and data producers are encouraged to provide as much data as possible.

*The following sections break down the specific details of each attribute field. They are color-coded by type (Pipes in **Blue**, Channels in **Violet**, Basins in **Green**, etc.) in the document and the accompanying Excel spreadsheet documents.*

Pipe Components

L_PIPE1 – Pipe ID

Database Name	**PIPE_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	STR7209708112209		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer		

L_PIPE2 – Pipe Federated ID

Database Name	**PIPE_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-STR7209708112209		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
27053006642 02-STR7209708112209

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
STR7209708112209 = Example of the locally designated ID for the feature

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

L_PIPE3 – Pipe Type

Database Name	**PIPE_TYPE**		
Data Type	Text	Inclusion	Conditional
Width	90	Domain	**PipeType**
Examples	Pipe, perforated; Pipe, non-perforated; Underdrain, wrapped Underdrain, unwrapped; Drain tile, perforated; Drain tile, non-perforated; Culvert; Other; Unknown; Combined; Force Main-Pressurized; Cattle pass		
Description	Generalized pipe type description		

L_PIPE4 – Pipe Shape

Database Name	**PIPE_SHP**		
Data Type	Text	Inclusion	Conditional
Width	24	Domain	**PipeShape**
Examples	Arched, Barrel, Box, Circular, Cathedral, Cattle pass, Egg shaped, Elliptical, Horseshoe, Oblong, Rectangular, Round, Trapezoidal, Triangular, Tunnel, U-Shaped, Other, Unknown		
Description	Predominant cross-sectional shape configuration of the pipe		

L_PIPE5 – Pipe Material

Database Name	**PIPE_MAT**		
Data Type	Text	Inclusion	Conditional
Width	30	Domain	**PipeMaterial**
Examples	ABS Plastic, Asbestos Cement, Asphalt, Bituminous Fiber-Orangeburg, Brick, Brick Masonry, Cast Iron, Clay Tile (*for complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		
Description	Substance comprising a closed pipe		

L_PIPE6 – Pipe Lining

Database Name	**PIPE_LINE**		
Data Type	Text	Inclusion	If Available
Width	45	Domain	**PipeLining**
Examples	Cured in Place, Fold and form, Deform/Reform, Segmented Panel, Segmented Pipe, Slip Lining, Spray Liner, Spiral Wound, Other, None, Unknown		
Description	Pipe lining method		

L_PIPE7 – Pipe Diameter

Database Name	**PIPE_DIA**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(numerical value in inches)*		
Description	Interior diameter of the pipe in inches Use decimal values; not fractions (*e.g. value is* 16.5 *not* 16 ½ *or* 16-½) Leave off name of measurement (*e.g. value is* 16.5, *not* 16.5" *or* 16.5 in.)		

L_PIPE8 – Pipe Equivalent

Database Name	PIPE_EQA		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	*(numerical value in inches)*		
Description	Value equivalent to a measure of interior diameter—for a pipe that is not round or symmetrical—or if the pipe varies in width/shape from top to bottom - in inches		

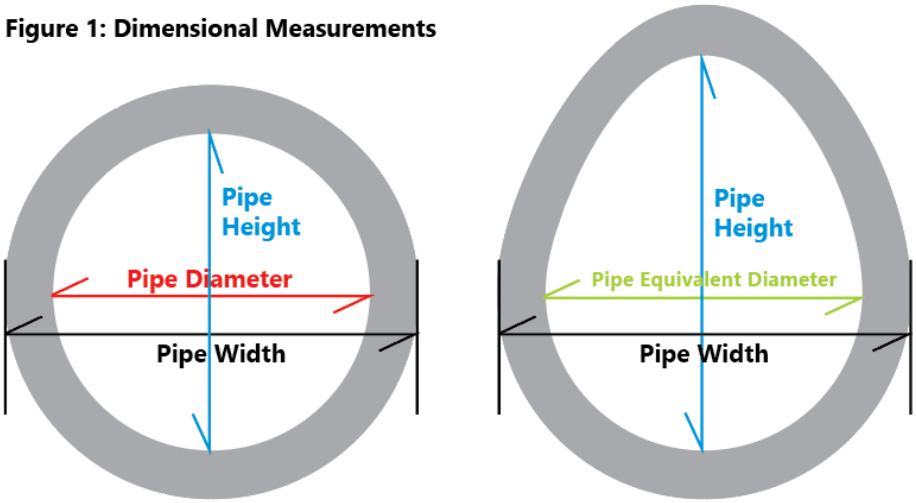
L_PIPE9 – Pipe Height

Database Name	PIPE_HT		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	*(numerical value in inches)*		
Description	Height of the interior of the pipe through its center in inches		

L_PIPE10 – Pipe Width

Database Name	PIPE_WD		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	*(numerical value in inches)*		
Description	Width of the entire diameter (including pipe exterior) of the pipe in inches		

Figure 1: Dimensional Measurements



L_PIPE11 – Pipe Length

Database Name	PIPE_LNG		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	*(numerical value in feet)*		
Description	Length of the pipe in feet		

L_PIPE12 – Pipe Depth

Database Name	**PIPE_DEP**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	*(numerical value in feet)*		
Description	Approximate depth of pipe in feet from the surface of the ground to the top of the pipe. Note: Depth of pipe from the surface or roadway may influence who conducts the maintenance on the pipe		

L_PIPE13 – Pipe Coverage

Database Name	**PIPE_CVG**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(numerical value in feet)*		
Description	A description of the type of ground cover above the pipe (*this is useful for scoping and planning excavation and repair work*)		

L_PIPE14 – Pipe Upstream Invert Elevation

Database Name	**PIPE_IELVU**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(numerical value in feet above mean sea level)*		
Description	Elevation at the bottom of the inside portion of the pipe, at the upstream point		

L_PIPE15 – Pipe Downstream Invert Elevation

Database Name	**PIPE_IELVD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(numerical value in feet above mean sea level)*		
Description	Elevation at the bottom of the inside portion of the pipe, at the downstream point		

L_PIPE16 – Pipe From

Database Name	**PIPE_FROM**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(ID of the upstream fixed asset)*		
Description	The ID (*_ORID) of the asset *from* which the pipe flows		

L_PIPE17 – Pipe To

Database Name	**PIPE_TO**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(ID of the downstream fixed asset)*		
Description	The ID (*_ORID) of the asset *to/toward* which the pipe flows		

L_PIPE18 – Pipe Slope

Database Name	**PIPE_SLOPE**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(Whole number representing percent of slope, e.g. '11' not '0.11')*		
Description	Percent slope of the pipe, expressed as a whole number. Percent is calculated as: [(Rise/Run)*100 = Percent Slope] *(Rise divided by run) multiplied by 100 = Percent Slope*		

L_PIPE19 – Pipe Casing

Database Name	**PIPE_CASE**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag to indicate if pipe has a casing or other protective container present		

L_PIPE20 – Pipe Horizontal Datum

Database Name	**PIPE_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

L_PIPE21 – Pipe Vertical Datum

Database Name	**PIPE_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

L_PIPE22 – Pipe General Location

Database Name	**PIPE_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 NW ½ of T31N R23W S17 121 7th Place East, Saint Paul, MN, 55101 210' south of intersection of Smith Road and US HWY 52 44.957459, -93.277684 Intersection of W 26th Street and Blaisdell Avenue		
Description	Data creator can provide general location information in the form of, PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

L_PIPE23 – Pipe As-Built Drawing Link

Database Name	**PIPEABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

L_PIPE24 – Pipe As-Built Drawing Document

Database Name	**PIPEABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing		

L_PIPE25 – Pipe Status

Database Name	**PIPE_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the pipe		

L_PIPE26 – Pipe Status Date

Database Name	**PIPE_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of last status assessment of the physical pipe		

L_PIPE27 – Pipe Installation Date

Database Name	**PIPE_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the physical pipe		

L_PIPE28 – Pipe Modification Date

Database Name	**PIPE_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the physical pipe		

L_PIPE30 – Pipe Condition

Database Name	**PIPE_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	"Appeared in good condition" "Pipe exposed due to erosion" "Poor"		
Description	PIPE_COND is provided as a 150-character field for written descriptions		

L_PIPE30 – Pipe Condition Date

Database Name	**PIPE_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last condition assessment of the physical pipe		

L_PIPE31 – Pipe Maintenance Agreement Number

Database Name	**PIPE_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of the agreement between agencies for the maintenance of the physical pipe		

L_PIPE32 – Pipe Easement

Database Name	**PIPE_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag to indicate if there is an easement present		

L_PIPE33 – Pipe Consequence of Failure Rating

Database Name	**PIPE_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of pipe asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

L_PIPE34 – Pipe Probability of Failure Rating

Database Name	**PIPE_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of pipe asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

L_PIPE35 – Pipe Criticality to System

Database Name	**PIPE_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

L_PIPE36 – Pipe Ownership **Type**

Database Name	**PIPE_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the pipe		

L_PIPE37 – Pipe Ownership Name

Database Name	PIPE_OWNN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the pipe		

L_PIPE38 – Pipe Maintenance Authority Type

Database Name	PIPE_MAINT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the pipe		

L_PIPE39 – Pipe Maintenance Authority Name

Database Name	PIPE_MAINN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Dakota County State of Minnesota		
Description	**Name** of the entity or agency which maintains the pipe		

L_PIPE40 – Pipe Data Producer/Source Type

Database Name	PIPE_DATAT		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source of the data		

L_PIPE41 – Pipe Data Producer/Source Name

Database Name	**PIPE_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source of the data		

L_PIPE42 – Pipe Date Data Modified

Database Name	**PIPE_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the digital feature representing the pipe		

L_PIPE43 – Pipe Data Producer/Source Name

Database Name	**PIPE_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the pipe (Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset); This can be an individual, department, agency, etc.		

L_PIPE44 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the physical pipe is located;		

L_PIPE45 – CTU Code

Database Name	CTU_ID_TXT		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = unique GNIS code for City of Eagan 02394198 = unique GNIS code for City of Bloomington		
Description	Eight-digit GNIS code representing the municipal unit (CTU = city, township, unorganized territory) where the asset is located; as the leading zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT); GNIS is the Geographic Names Information System code developed by the U.S. Geological Survey and the U.S Board on Geographic Names to promote standardization of names of features with a unique number-based code. *Helpful links:* https://www.usgs.gov/core-science-systems/ngp/board-on-geographic-names https://www.usgs.gov/core-science-systems/ngp/board-on-geographic-names/domestic-names https://en.wikipedia.org/wiki/Geographic_Names_Information_System		

L_PIPE46 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 053		
Description	Three-digit (FIPS/ANSI) code representing the county where the pipe is located; because a linear feature may cross a municipal and/or county boundary, the general rule is that if over half the feature (>50%) is in one jurisdiction, favor that jurisdiction as the location rather than splitting the line at the boundary		

L_PIPE47 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical pipe is located; ; because a linear feature may cross a municipal and/or county boundary, the general rule is that if over half the feature (>50%) is in one jurisdiction, favor that jurisdiction as the location rather than splitting the line at the boundary		

L_PIPE48 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Examples	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

L_PIPE49 – Pipe Comments

Database Name	PIPE_CMNT		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Unsure if this pipe is actually located on the Johnson Property"* *"Pipe is damaged, needs to be replaced based on field inspection May 2019"* *"Polyline from data source digitized in wrong direction"*		
Description	General field for text comments related to either the physical or digital aspects of the pipe feature		

Channel Components

L_CHAN1 – Channel ID

Database Name	CHAN_ORID		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	C117-14-4		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

L_CHAN2 – Channel Federated ID

Database Name	CHAN_FID		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202- C117-14-4		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
27053006642 02-C117-14-4

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
C117-14-4 = Example of the locally designated ID for the feature

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

L_CHAN3 – AUID

Database Name	**CHAN_AUID**		
Data Type	Text	Inclusion	Conditional
Width	12	Domain	**AUID**
Example	04010201-A79 07040008-871		
Description	Assessment Unit ID (to be changed to WIDs – Water Unit IDs) ID for streams, rivers, ditches and other types of open channels		

Consideration of potentially removing this attribute from the MSWGP v. 0.5. dataset;

*AUID/WIDs are not permanent IDs, and the extent of a reach is subject to change over time, influenced by factors such as water quality standards, channelization or restoration work, hydrological influence, and other reasons that influence how the Minnesota Pollution Control Agency (MPCA) conducts water quality work. If the extent of a reach is changed, the WID number will also change. Historical associations are maintained by MPCA. Streams without a specific agency interest associated have an ID of '*HUC8*-999' assigned to them. As the MPCA programs associate stations or attributes with these un-specified waters, new WIDs will be continually assigned* (*https://gisdata.mn.gov/dataset/water-current-stream-wids*).

L_CHAN4 – Channel Type

Database Name	**CHAN_TYPE**		
Data Type	Text	Inclusion	Conditional
Width	30	Domain	**ChannelType**
Examples	Ditch, Trench, Aqueduct, Emergency Overflow, Swale, Stream, Spillway, Lined Channel, Natural Channel, Other, Unknown		
Description	Generalized channel type description		

L_CHAN5 – Channel Design Depth

Database Name	**CHAN_DD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(insert value in feet)*		
Description	Channel design depth in feet (taken from as-built drawings)		

L_CHAN6 – Channel Width

Database Name	**CHAN_WD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(insert value in feet)*		
Description	Channel width measured at surface in feet (or from as-built drawings)		

L_CHAN7 – Channel Length

Database Name	**CHAN_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(insert value in feet)*		
Description	Channel length measured in feet (taken from as-built drawings)		

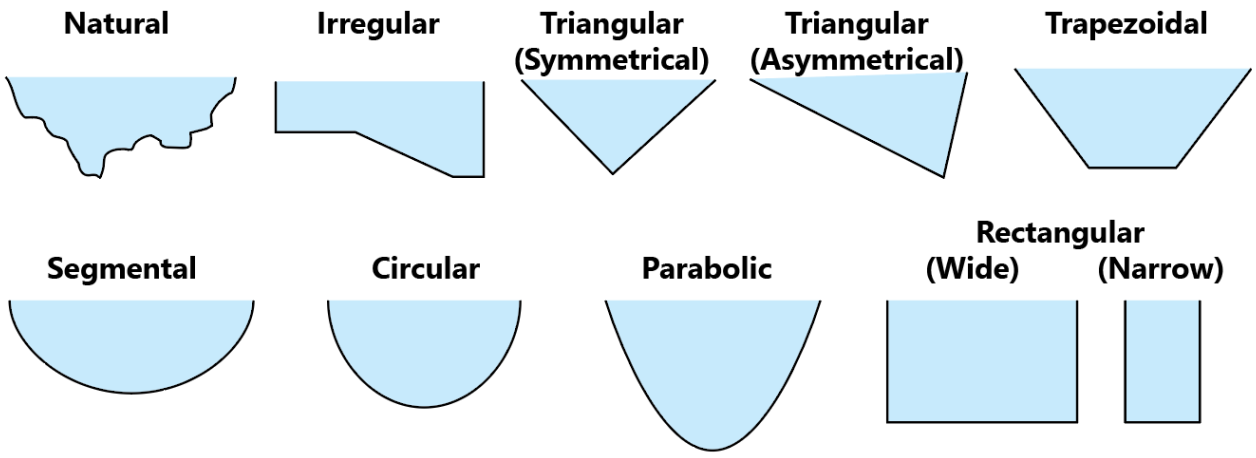
L_CHAN8 – Channel Lining

Database Name	**CHAN_LIN**		
Data Type	Text	Inclusion	Conditional
Width	24	Domain	**ChannelLining**
Examples	"Vegetation, high" "Armored, concrete" "Armored, concrete, bottom only" "Unknown" *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		
Description	A description of the lining material of the channel or ditch		

L_CHAN9 – Channel Shape

Database Name	**CHAN_SHP**		
Data Type	Text	Inclusion	Conditional
Width	24	Domain	**ChannelShape**
Examples	Natural, Irregular, Triangular-Symmetrical, Triangular-Asymmetrical, Trapezoidal, Segmental, Segmental-Two Stage, Parabolic, Rectangular-Wide, Rectangular-Narrow, Other, Unknown		
Description	The cross-sectional shape of a channel or ditch		

Figure 2: Channel Shapes



L_CHAN10 – Channel From

Database Name	**CHAN_FROM**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(ID of the upstream fixed asset)*		
Description	The ID (*_ORID) of the asset *from* which the channel flows		

L_CHAN11 – Channel To

Database Name	**CHAN_TO**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(ID of the downstream fixed asset)*		
Description	The ID (*_ORID) of the asset *to/toward* which the channel flows		

L_CHAN12 – Channel Slope

Database Name	**CHAN_SLOPE**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(Whole number representing percent of slope, e.g. '11' not '0.11')*		
Description	Percent slope of the pipe, expressed as a whole number Percent is calculated as: [(Rise/Run)*100 = Percent Slope]		

L_CHAN13 – Channel Horizontal Datum

Database Name	**CHAN_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

L_CHAN14 – Channel Vertical Datum

Database Name	**CHAN_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

L_CHAN15 – Channel General Location

Database Name	**CHAN_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 NW ½ of T31N R23W S17 14005 South Range Line Road 1100' south of intersection 110th Street and 190th Avenue, W of Strathcona 44.957459, -93.277684 Intersection of Range Line Road and Highway 23		
Description	Data creator can provide general location information in the form of, PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

L_CHAN16 – Channel As-Built Drawing Link

Database Name	**CHANABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

L_CHAN17 – Channel As-Built Drawing Document

Database Name	**CHANABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing		

L_CHAN18 – Channel Status

Database Name	**CHAN_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the channel		

L_CHAN19 – Channel Status Date

Database Name	**CHAN_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of last status assessment of the physical channel		

L_CHAN20 – Channel Installation Date

Database Name	**CHAN_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the physical channel		

L_ CHAN21 – Channel Modification Date

Database Name	**CHAN_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the physical channel		

L_ CHAN22 – Channel Condition

Database Name	**CHAN_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	"Appeared in good condition" "Heavy erosion on western side" "Channel blocked with debris"		
Description	CHAN_COND is provided as a 150-character field for written descriptions		

L_ CHAN23 – Channel Condition Date

Database Name	**CHAN_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the physical channel		

L_ CHAN24 – Channel Maintenance Agreement Number

Database Name	**CHAN_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Number of document ID of agreement between agencies for the maintenance of the physical channel		

L_ CHAN25 – Channel Easement

Database Name	**CHAN_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = there is an easement associated with the feature No = it has been confirmed that there is no easement Unknown = it is unknown if an easement is present		
Description	Flag to indicate if there is an easement present		

L_CHAN26 – Channel Consequence of Failure Rating

Database Name	**CHAN_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of channel asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

L_CHAN27 – Channel Probability of Failure Rating

Database Name	**CHAN_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of channel asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

L_CHAN28 – Channel Criticality to System

Database Name	**CHAN_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

L_CHAN29 – Channel Ownership Type

Database Name	**CHAN_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the channel		

L_CHAN30 – Channel Ownership Name

Database Name	**CHAN_OWNN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the channel		

L_CHAN31 – Channel Maintenance Authority Type

Database Name	**CHAN_MAINT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the channel		

L_CHAN32 – Channel Maintenance Authority Name

Database Name	**CHAN_MAINN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which maintains the channel		

L_CHAN33 – Channel Data Producer/Source Type

Database Name	**CHAN_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source of the data		

L_CHAN34 – Channel Data Producer/Source Name

Database Name	**CHAN_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source of the data		

L_CHAN35 – Channel Date Data Modified

Database Name	**CHAN_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the digital feature representing the channel		

L_CHAN36 – Channel Data Producer/Source Name

Database Name	**CHAN_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the channel (Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset); This can be an individual, department, agency, etc.		

L_CHAN37 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the physical channel is located. Because a linear feature may cross a municipal and/or county boundary, the general rule is that if over half the feature (>50%) is in one jurisdiction, favor that jurisdiction as the location rather than splitting the line at the boundary		

L_CHAN38 – CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 02394198		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located. As the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT)		

L_CHAN39 – County Code

Database Name	**CO_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the channel is located, *please see links on page 25 for additional information;*		

L_CHAN40 – County Name

Database Name	**CO_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical channel is located, because a linear feature may cross a municipal and/or county boundary, the general rule is that if over half the feature (>50%) is in one jurisdiction, favor that jurisdiction as the location rather than splitting the line at the boundary		

L_CHAN41 – State Code

Database Name	**STATE_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

L_CHAN42 – Channel Comments

Database Name	**CHAN_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Unsure if this channel is actually located on the Anderson Property"* *"Channel is heavily eroded and damaged from ATVs"* *"Polyline from data source digitized in wrong direction"*		
Description	General field for text comments related to either the physical or digital aspects of the channel feature		

Artificial Path Components

L_APATH1 – Artificial Path ID

Database Name	**APA_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	AP-XH-00088		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

L_APATH2 – Artificial Path Federated ID

Database Name	**APA_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-AP-XH-00088		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-AP-XH-00088

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
AP-XH-00088 = Example of the locally-designated unique ID for the feature

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

L_APATH3 – Artificial Path Type

Database Name	**APA_TYPE**		
Data Type	Text	Inclusion	Mandatory
Width	45	Domain	**ArtificialPathType**
Examples	"Water connector"		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

L_APATH4 – Artificial Path Length

Database Name	**APA_LNG**		
Data Type	Double	Inclusion	Mandatory
Width	Default	Domain	*(no domain)*
Examples	*(insert value in feet)*		
Description	Artificial path length measured in feet (calculated in GIS)		

L_APATH5 – Artificial Path From

Database Name	**APA_FROM**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(ID of the upstream fixed asset)*		
Description	The ID (*_ORID) of the asset *from* which the artificial path flows		

L_APATH6 – Artificial Path To

Database Name	**APA_TO**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(ID of the downstream fixed asset)*		
Description	The ID (*_ORID) of the asset *to/toward* which the artificial path flows		

L_APATH7 – Artificial Path Slope

Database Name	**APA_SLOPE**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	*(Whole number representing percent of slope, e.g. '11' not '0.11')*		
Description	Percent slope of the artificial path, expressed as a whole number Percent is calculated as: [(Rise/Run)*100 = Percent Slope]		

L_APATH8 – Artificial Path Status

Database Name	**APA_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples*	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the artificial path (as applicable)		

**Obviously, several of these options are not applicable to an artificial path feature*

L_APATH9 – Artificial Path Data Producer/Source Type

Database Name	**APA_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source of the data		

L_APATH10 – Artificial Path Data Producer/Source Name

Database Name	**APA_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source of the data		

L_APATH11 – Artificial Path Date Data Modified

Database Name	**APA_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the digital feature representing the path		

L_APATH12 – Artificial Path Producer/Source Name

Database Name	**APA_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the artificial; this can be an individual, department, agency, etc.		

L_APATH13 —- CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory where the artificial path is located;		

L_APATH14 – CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 02394198		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the artificial path is located As the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT)		

L_APATH15 – County Code

Database Name	**CO_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the artificial path is located, because a linear feature may cross a municipal and/or county boundary, the general rule is that if over half the feature (>50%) is in one jurisdiction, favor that jurisdiction as the location rather than splitting the line at the boundary		

_APATH16 – County Name

Database Name	**CO_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the artificial path is located		

L_CHAN17 – State Code

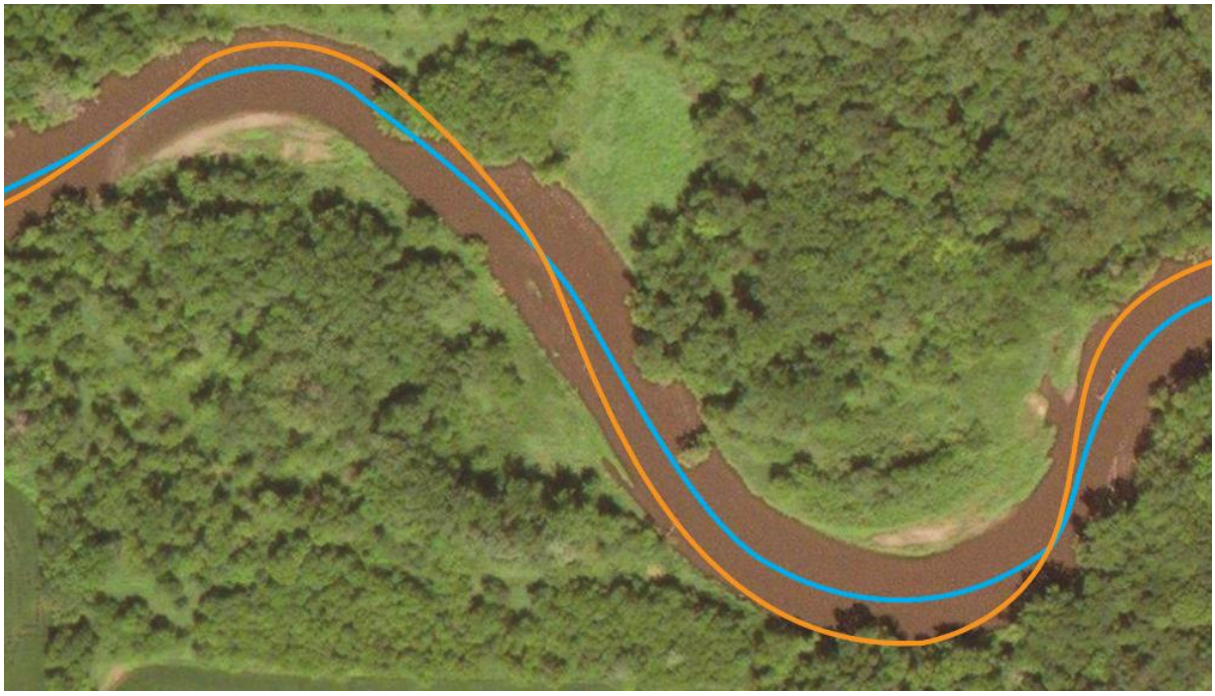
Database Name	**STATE_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

L_APATH18 – Artificial Path Comments

Database Name	**APA_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Created path to replicate known overland flow"* *"Path used for the known thalweg* derived from LIDAR"* *"Water connector through Smith Lake for flow modeling"*		
Description	General field for text comments related to any descriptive aspect of the artificial path feature		

**What the heck is a 'thalweg' anyway?*

"Thalweg" is a term used in geography and geomorphology and often in legal proceedings where a watercourse forms a legal boundary between two jurisdictions. Translated from the original German, 'thalweg' literally means 'valley way' and is the term used for ***the path of the lowest elevation in a waterway, water course or valley****. In the example below, the stream centerline is in light blue, while the thalweg (deepest water course) is shown in orange.*



Basin Components

P_BASN.1 – Basin Unique Identifier

Database Name	**BASN_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	CEB-100020003-009		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_BASN.2 – Basin Federated ID

Database Name	**BASN_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-CEB-100020003-009		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-CEB-100020003-009

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
CEB-100020003-009= Example of the locally-designated unique ID for the basin feature

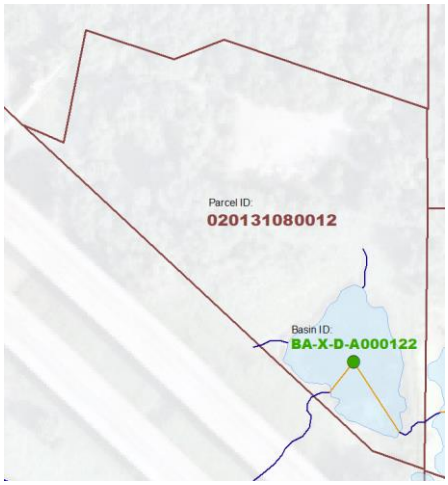
The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_BASN.3 – Basin Local Parcel ID

Database Name	**BASN_PID**		
Data Type	Text	Inclusion	Optional
Width	36	Domain	*(no domain)*
Example			
Description	Unique locally assigned ID of the parcel on which the basin point is located.		

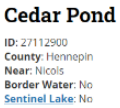
The purpose of the 'Local Parcel ID' is provide the ability to link the ***basin point*** to the ***parcel of land*** on which it is found; by embedding the parcel ID into the basin point, this affords the opportunity for additional relational database linkages and analysis to be made. It is acknowledged and accepted that *basin extent* (*e.g. the polygon representation of the basin*) can potentially extend over numerous parcels, or, in some cases a basin point may be in a right of way or other area where there no parcels IDs are assigned. In these instances, it is up to the data creator make a best fit determination relevant and usable to their circumstance.

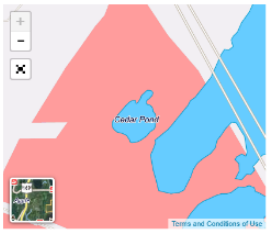


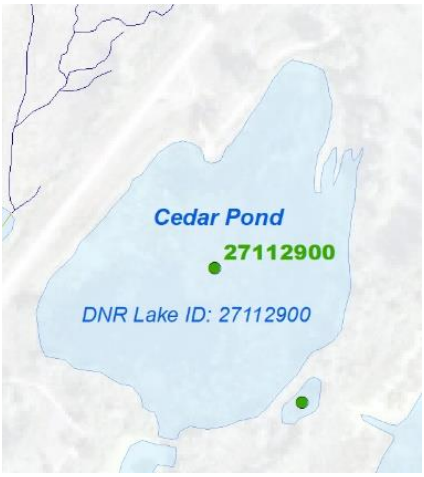
P_BASN.4 – Basin DNR Lake ID

Database Name	**BASN_DNRID**		
Data Type	Text	Inclusion	If Available
Width	10	Domain	*(no domain)*
Example	27112900		
Description	A unique 8-digit identifier for each lake polygon as assigned by the Minnesota Department of Natural Resources (DNR). The value of this field is the DNR Division of Waters lake identification number if one has been assigned. Otherwise, the Lake ID is a unique sequential number.		

A unique 8-digit identifier for each lake polygon as assigned by the Minnesota Department of Natural Resources.





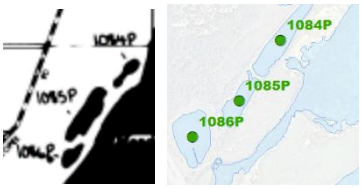


More information is available at the link:
https://www.dnr.state.mn.us/maps/compass/index.html

P_BASN.5 – Basin Public Waters Index (PWI) ID

Database Name	**BASN_PWI**		
Data Type	Text	Inclusion	If Available
Width	12	Domain	*(no domain)*
Example	2P, 1084P, 1085P, 1086P		
Description	A unique ID for bodies of water on the Public Waters Index that meet the criteria of Mn. Stat. 103G.005 and have been mapped under Mn. Stat. 103G.201		

Any basin that has been assigned PWI inventory ID number. The Minnesota Department of Natural Resources is presently in the process of creating geospatial data representing PWI waters. Original paper maps with ID numbers assigned to PWI water are available at the link: *https://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html*



P_BASN.6 – Basin Name

Database Name	**BASN_NAME**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	*(no domain)*
Example	Black Dog Lake, Cedar Pond		
Description	Common name of the basin		

P_BASN.7 – Basin Type

Database Name	**BASN_TYPE**		
Data Type	Text	Inclusion	Mandatory
Width	30	Domain	**BasinType**
Example	Lake, Pond, Wetland, Constructed Wetland, Culvert (centroid), Detention, Impoundment, Filtration with underdrain, Filtration without underdrain, Other, Unknown		
Description	Type of basin		

Within limnology and water resources management, the term 'basin' is a generalized term, but there are many *basin types*, each with specific definitions. The difference between a 'lake' and a 'pond' for example is the presence (in a lake) of an 'aphotic' zone (i.e. *an area where sunlight cannot reach the bottom*) or its absence (as in a pond). Visual analysis may not be enough to correctly attribute each basin feature, additional research may be needed to determine the correct category for each water body represented.

The water body shown at right is an example of a ***constructed wetland*** however it appears as if it were a naturally occurring basin feature.

The table at the top of the next page provides the general description and definition of the various basin types represented in the v. 0.5 of the stormwater geodata standard as offered for public review.

Basin Value	General Definition
Lake	*Water body which contains an 'aphotic' zone (i.e. area where sunlight cannot reach the bottom)*
Pond	*Water body which lacks an 'aphotic' zone (i.e. sunlight can reach all parts of the water body bottom)*
Wetland	*A wetland that occurs in its natural or near-natural state*
Constructed Wetland	*A wetland that occurs as the result of human construction*
Culvert, centroid	*A point that represents the centroid of a line segment representing a culvert*
Detention	*An excavated area or feature adjacent to a waterbody to store water for a limited period of time*
Impoundment	*A body of water formed by a dam or other structure*
Filtration with underdrain	*A filtration system with an underdrain*
Filtration without underdrain	*A filtration system without an underdrain*
Other	*A feature that does not fall into another clear definition category*
Unknown	*Feature type is unknown*

Example of a ***detention*** (dry pond style) feature:

Example of a ***pond*** (constructed) feature:

Example of a ***filtration basin*** (constructed) feature:

P_BASN.8 – Basin Depth

Database Name	**BASN_DEPTH**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in feet)*		
Description	Maximum depth of the basin in feet (as per as-built drawings or as known if a natural feature)		

P_BASN.9 – Basin Area

Database Name	**BASN_AREA**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in acres)*		
Description	Surface of the basin in acres (as per as-built drawings or as known if a natural feature)		

P_BASN.10 – Basin Design Volume

Database Name	**BASN_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in acre-feet)*		
Description	Volume of water the basin was designed to hold (if constructed) or holds naturally		

P_BASN.11 – Basin Design Normal Elevation

Database Name	**BASN_NELV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet-above-sea-level)*		
Description	Normal elevation of the basin above sea level		

P_BASN.12 – Basin Design Flood Stage Elevation

Database Name	**BASN_FELV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet-above-sea-level)*		
Description	100-year flood elevation based on local datum		

P_BASN.13 – Basin Design Bottom Elevation

Database Name	**BASN_BELV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet-above-sea-level)*		
Description	Bottom elevation of the basin (as per as-built drawings or as known if a natural feature)		

P_BASN.14 – Basin Overflow Elevation

Database Name	**BASN_OELV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet-above-sea-level)*		
Description	Elevation at which overflow of the basin takes place (as per as-built drawings or as known if a natural feature)		

P_BASN.15 – Basin Ordinary High-water Level

Database Name	**BASN_OHWL**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet-above-sea-level)*		
Description	Ordinary high-water level (*as defined by **MN Stat. 103G.005, Subd. 14***)		

P_BASN.16 – Basin Horizontal Datum

Database Name	**BASN_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_BASN.17 – Basin Vertical Datum

Database Name	**BASN_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_BASN.18 – Basin General Location

Database Name	**BASN_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 NW ½ of T31N R23W S17 44.957459, -93.277684 Intersection of Sections 1, 2, 11 and 12 within T29N R29E		
Description	Data creator can provide general location information in the form of, PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_BASN.19 – Basin Origin

Database Name	**BASN_ORIG**		
Data Type	Text	Inclusion	Conditional
Width	30	Domain	**BasinOrigin**
Examples	Natural Natural-modified Constructed Restored to original condition Restored to modified condition Unknown Other		
Description	Indication of the origin status of the basin (naturally occurring or the result of human action)		

P_BASN.20 – Basin 303(d) Impairment Status

Database Name	**BASN_303D**		
Data Type	Text	Inclusion	Optional
Width	12	Domain	**BasinImpaired**
Examples	Impaired, Not impaired, Prior impairment, Maintenance At risk, Not applicable, Unknown		
Description	Indication if a water body (lake, stream/river segment) is currently listed on the State of Minnesota impaired/threatened waters list		

This attribute is in reference to Section 303(d) of the Federal Clean Water Act for impaired waters and total maximum daily loads (TMDLs). The U. S. Environmental Protection Agency has granted to the Minnesota Pollution Control Agency the role of monitoring and reporting on impaired waters.

Helpful links and resources which reference water impairments under Section 303(d)
https://www.epa.gov/tmdl
https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list
https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav

P_BASN.21 – Basin As-Built Drawing Link

Database Name	**BASNABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_BASN.22 – Basin As-Built Drawing Document

Database Name	**BASNABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	The document number, ID number, or reference number of the original as-built drawing of the basin		

P_BASN.23 – Basin Status

Database Name	**BASN_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the basin		

P_BASN.24 – Basin Status Date

Database Name	**BASN_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of last status assessment of the physical basin		

P_BASN.25 – Basin Installation Date

Database Name	**BASN_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the physical basin		

P_BASN.26 – Basin Modification Date

Database Name	**BASN_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the physical basin		

P_BASN.27 – Basin Condition

Database Name	**BASN_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	"Appeared in good condition when inspected September 2, 2019" "Heavy erosion on western side"		
Description	BASN_COND is provided as a general 150-character field for written descriptions about the observed or known condition of the basin.		

P_BASN.28 – Basin Condition Date

Database Name	**BASN_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the when the BASN_COND comment was entered/relevant		

P_BASN.29 – Basin Maintenance Agreement Number

Database Name	**BASN_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Number of document ID of agreement between agencies for the maintenance of the physical basin		

P_BASN.30 – Basin Easement

Database Name	**BASN_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_BASN.31 – Basin Consequence of Failure Rating

Database Name	**BASN_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_BASN.32 – Basin Probability of Failure Rating

Database Name	**BASN_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_BASN.33 – Basin Criticality to System

Database Name	**BASN_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_BASN.34 – Basin Ownership Type

Database Name	**BASN_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the basin		

P_BASN.35 – Basin Ownership Name

Database Name	**BASN_OWNN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the basin		

P_BASN.36 – Basin Maintenance Authority Type

Database Name	**BASN_MAINT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the basin		

P_BASN.37 – Basin Maintenance Authority Name

Database Name	**BASN_MAINN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which maintains the basin		

P_BASN.38 – Basin Data Producer/Source Type

Database Name	**BASN_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_BASN.39 – Basin Data Producer/Source Name

Database Name	**BASN_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_BASN.40 – Basin Date Data Modified

Database Name	**BASN_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the basin		

P_BASN.41 – Basin Data Source

Database Name	**BASN_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the basin (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_BASN.42 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the basin is physically is located; if a basin centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the basin in		

P_BASN.43 – CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_BASN.44 – County Code

Database Name	**CO_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the basin is located, *please see links on page 25 for additional information;*		

P_BASN.45 – County Name

Database Name	**CO_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical basin is located		

P_BASN.46 – State Code

Database Name	**STATE_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_BASN.47 – Basin Comments

Database Name	**BASN_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"This basin overflows every April-May"* *"Basin needs maintenance, east wall is eroded"* *"Basin centroid represents the location pre-flood of 2012"*		
Description	General field for text comments related to either the physical or digital aspects of the basin feature		

Hydraulic Control Structures Components

P_HCS.1 – Hydraulic Control Structure Unique Identifier

Database Name	HCS_ORID		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	103-HCHCS-0041-0177		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_HCS.2 – Hydraulic Control Structure Federated ID

Database Name	HCS_FID		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-103-HCHCS-0041-0177		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202**-103-HCHCS-0041-0177**

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
103-HCHCS-0041-0177 Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_HCS.3 – Hydraulic Control Structure Type

Database Name	HCS_TYPE		
Data Type	Text	Inclusion	Mandatory
Width	30	Domain	HCSType
Example	Dam, deck drain, detention tank, ditch block, energy dissipator, diversion chamber, diversion point, diverter, flow restrictor, outlet control structure, etc. (*for complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		
Description	Type of hydraulic control structure		

There are numerous kinds of **hydraulic control structures** listed in domains associated with the MSWGP v. 0.5 draft standard. The MSWGP working group recognizes the limits of a GIS system to be able to fully represent all the various details of each potential kind of structure. With most of the structures, this standard intends mainly to be able to accurately document the position/location of these assets, their essential measurements, their function and their ownership and other common details which would benefit the data users and hopefully provide value to the engineering and asset management data user community.

P_HCS.4 – Hydraulic Control Structure Length

Database Name	HCS_LNG		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_HCS.5 – Hydraulic Control Structure Width

Database Name	HCS_WID		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_HCS.6 – Hydraulic Control Structure Height or Mean Depth

Database Name	HCS_HT		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

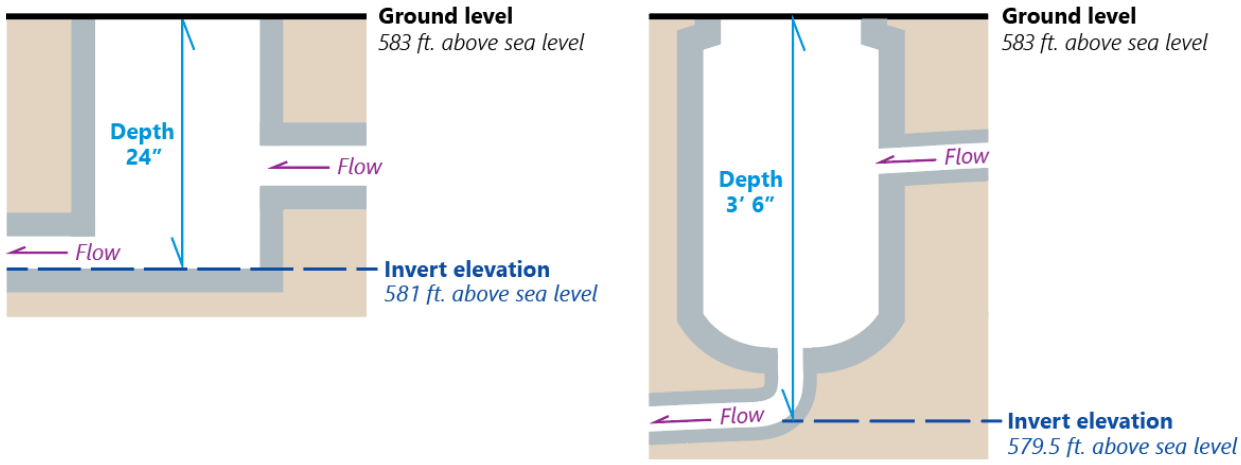
P_HCS.7 – Hydraulic Control Structure Design Volume

Database Name	HCS_VLD		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold (if constructed) or holds naturally;		

P_HCS.8 – Hydraulic Control Structure Invert Elevation

Database Name	HCS_IELEV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in feet above mean-sea-level)*		
Description	The elevation of the *bottom of the inside portion* of the outlet of the structure, in units of feet above mean sea level;		

Figure 3: Invert Elevation Examples



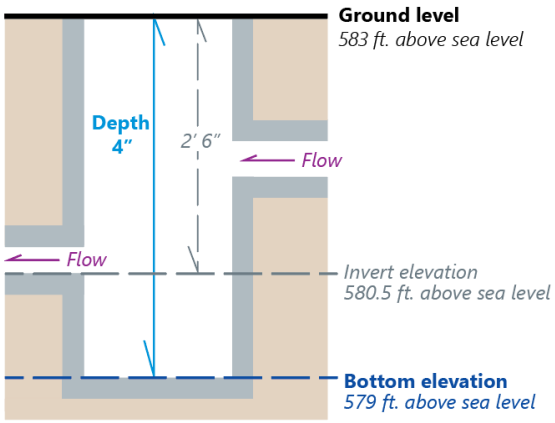
P_HCS.9 – Hydraulic Control Structure Rim Elevation

Database Name	HCS_RELEV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Rim elevation (manholes); elevation of the center of the manhole lid measured from its top in feet above mean sea level		

P_HCS.10 – Hydraulic Control Structure Bottom Elevation

Database Name	HCS_BELEV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Bottom elevation of structure *(differentiated from the invert elevation)*		

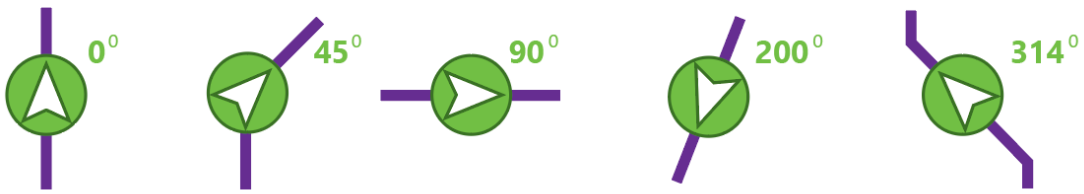
Figure 4: Bottom Elevation Example



P_HCS.11 – Hydraulic Control Structure Rotation

Database Name	HCS_ROTAT		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(value = angle of rotation for cartographic symbol [azimuthal; north = 0°])*		
Description	Recommended angle of rotation for cartographic symbol; this field is used to provide a value for the preferred rotation of the point symbol for proper mapping display; the 360° azimuthal system is used (clockwise rotation) (e.g.: north= 0°, east = 90°, south= 180°, west = 270°)		

Figure 5: Symbol Rotation Examples



P_HCS.12 – Hydraulic Control Structure Horizontal Position Accuracy Value

Database Name	HCS_HPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See P_HCS.13)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_HCS.13 – Hydraulic Control Structure Horizontal Position Unit

Database Name	HCS_HPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Hydraulic Control Structure Horizontal Position Accuracy Value**		

P_HCS.14 – Hydraulic Control Structure Vertical Position Accuracy Value

Database Name	HCS_VPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See P_HCS.15)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_HCS.15 – Hydraulic Control Structure Vertical Position Unit

Database Name	HCS_VPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Hydraulic Control Structure Vertical Position Accuracy Value**		

*Examples of the **prior four attributes** within the context of data in the standard:*

HCS_IELEV	HCS_RELEV	HCS_BELEV	HCS_ROTAT	**HCS_HPAV**	**HCS_HPU**	**HCS_VPAV**	**HCS_VPU**
879.1	882.1	879.1	90.0	**2.1**	**Feet**	**1.4**	**Feet**
880.4	883.9	880.4	0.0	**0.6**	**Meters**	**0.3**	**Meters**
890.7	893.7	890.7	60.0	**0.75**	**Meters**	**0.75**	**Meters**
877.8	890.0	877.8	90.0	**1.8**	**Feet**	**3.0**	**Feet**

***Note**: Ideally, all **horizontal and vertical accuracy indicators** would be in the same unit of measure, however; as this draft standard is offered primarily as a functional transfer standard, the ability to pool data together from different measures into one body of data was initially seen as desirable, with the end-user needing to perform the needed calculations to standardize the data as needed.*

This remains a point open to debate and suggestion as this draft standard is reviewed by the stakeholder community. We welcome thoughts and ideas on how to improve this attribute in the standard.

P_HCS.17 – Hydraulic Control Structure Horizontal Datum

Database Name	**HCS_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_HCS.18 – Hydraulic Control Structure Vertical Datum

Database Name	**HCS_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_HCS.18 – Hydraulic Control Structure General Location

Database Name	**HCS_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	1119 22nd Avenue NE SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 NW ½ of T31N R23W S17 44.957459, -93.277684 55’ NW of intersection of 11th Street SW and Plymouth Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location;		

P_HCS.19 – Hydraulic Control Structure Drawing Link

Database Name	**HCS_ABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_HCS.20 – Hydraulic Control Structure Document

Database Name	HCS_ABDOC		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_HCS.21 – Hydraulic Control Structure Status

Database Name	HCS_STAT		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the hydraulic control structure		

P_HCS.22 – Hydraulic Control Structure Status Date

Database Name	HCS_SDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of last status assessment of the structure		

P_HCS.23 – Hydraulic Control Structure Installation Date

Database Name	HCS_IDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the structure		

P_HCS.24 – Hydraulic Control Structure Modification Date

Database Name	HCS_MDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the structure		

P_HCS.25 – Hydraulic Control Structure Condition

Database Name	HCS_COND		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	“Appeared in good condition when inspected in spring 2018” “Damaged from flooding”		
Description	A 150-character field for subjective written descriptions		

P_HCS.26 – Hydraulic Control Structure Condition Date

Database Name	HCS_CDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last known condition assessment		

P_HCS.27 – Hydraulic Control Structure Maintenance Agreement Number

Database Name	HCS_MAGRN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the structure		

P_HCS.28 – Hydraulic Control Structure Easement

Database Name	HCS_EASM		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_HCS.29 – Hydraulic Control Structure Consequence of Failure Rating

Database Name	HCS_COF		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_HCS.30 – Hydraulic Control Structure Probability of Failure Rating

Database Name	HCS_POF		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_HCS.31 – Hydraulic Control Structure Criticality to System

Database Name	HCS_CRIT		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_HCS.32 – Hydraulic Control Structure Ownership **Type**

Database Name	HCS_OWNT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the basin		

P_HCS.33 – Hydraulic Control Structure Ownership **Name**

Database Name	HCS_OWNN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the structure		

P_HCS.34 – Hydraulic Control Structure Maintenance Authority **Type**

Database Name	HCS_MAINT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_HCS.35 – Hydraulic Control Structure Maintenance Authority Name

Database Name	HCS_MAINN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	Name of the entity or agency which maintains the structure		

P_HCS.36 – Hydraulic Control Structure Holds Water

Database Name	HCS_HOLDS		
Data Type	Text	Inclusion	If Available
Width	10	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag indicating if the structure holds water or not		

P_HCS.37 – Hydraulic Control Structure Infiltration Rate

Database Name	HCS_INFIL		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value for infiltration rate [inches/hour])*		
Description	Rate of infiltration through the bottom of an infiltration device in inches per hour;		

P_HCS.38 – Hydraulic Control Structure Contributing Drainage Area

Database Name	HCS_CDA		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Surface area that discharges to the structure, measured in acres;		

P_HCS.39 – Hydraulic Control Structure Data Producer/Source Type

Database Name	HCS_DATAT		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_HCS.40 – Hydraulic Control Structure Data Producer/Source Name

Database Name	HCS_DATAN		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_HCS.41 – Hydraulic Control Structure Date Data Modified

Database Name	HCS_DAMOD		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_HCS.42 – Hydraulic Control Structure Data Source

Database Name	HCS_DASRC		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_HCS.43 – CTU Name

Database Name	CTU_NAME		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in;		

P_HCS.44 – CTU Code

Database Name	CTU_ID_TXT		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_HCS.45 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information;*		

P_HCS.46 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_HCS.47 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_HCS.48 – Hydraulic Control Structure Comments

Database Name	HSC_CMNT		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Needs maintenance or replacement, north wall cracked"* *"Centroid represents the location pre-flood of 2012"*		
Description	General field for text comments related to either the physical or digital aspects of the basin feature;		

Pollution Control Structures Components

P_PCS.1 – Pollution Control Structure Unique Identifier

Database Name	PCS_ORID		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	77077-4-4410-0001		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_PCS.2 – Pollution Control Structure Unique Identifier Structure Federated ID

Database Name	PCS_FID		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-77077-4-4410-0001		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-77077-4-4410-0001

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
77077-4-4410-0001 = Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_PCS.3 – Pollution Control Structure Type

Database Name	**PCS_TYPE**		
Data Type	Text	Inclusion	Mandatory
Width	30	Domain	**PCSType**
Example	Dam, deck drain, detention tank, ditch block, energy dissipator, diversion chamber, diversion point, diverter, flow restrictor, outlet control structure, etc. (*for complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		
Description	Type of hydraulic control structure		

There are numerous kinds of **pollution control structures** listed in domains associated with the MSWGP v. 0.5 draft standard, the MSWGP working group recognizes the limits of a GIS system to be able to fully represent all the various details of each potential kind of structure. With most of the structures, this standard intends mainly to be able to accurately document the position/location of these assets, their essential measurements, their function and their ownership and other common details which would benefit the data users and hopefully provide value to the engineering and asset management data user community.

Input, ideas and suggestions from stakeholder review of the standard are welcome as to how to improve the **Pollution Control Structure Type** category of the standard.

P_PCS.4 – Pollution Control Structure Length

Database Name	**PCS_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_PCS.5 – Pollution Control Structure Width

Database Name	**PCS_WID**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_PCS.6 – Pollution Control Structure Height or Mean Depth

Database Name	**PCS_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

P_PCS.7 – Pollution Control Structure Design Volume

Database Name	**PCS_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold (if constructed) or holds naturally;		

P_PCS.8 – Pollution Control Structure Invert Elevation

Database Name	**PCS_IELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in feet above mean-sea-level)*		
Description	The elevation of the *bottom of the inside portion* of the outlet of the structure, in units of feet above mean sea level;		

*>> Please see **Figure 3** on on page 58*

P_PCS.9 – Pollution Control Structure Rim Elevation

Database Name	**PCS_RELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Rim elevation (manholes); elevation of the center of the manhole lid measured from its top in feet above mean sea level		

P_PCS.10 – Pollution Control Structure Bottom Elevation

Database Name	**PCS_BELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Bottom elevation of structure *(differentiated from the invert elevation)*		

*>> Please see **Figure 4** on on page 59*

P_PCS.11 – Pollution Control Structure Rotation

Database Name	**PCS_ROTAT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(angle of rotation for cartographic symbol [azimuthal; north = 0°])*		
Description	Recommended angle of rotation for cartographic symbol; this field is used to provide a value for the preferred rotation of the point symbol for proper mapping display; the 360° azimuthal system is used (clockwise rotation) (e.g.: north= 0°, east = 90°, south= 180°, west = 270°)		

*>> Please see **Figure 5** on on page 59*

P_PCS.12 – Pollution Control Structure Horizontal Position Accuracy Value

Database Name	PCS_HPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See also* **P_PCS.13***)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_PCS.13 – Pollution Control Structure Horizontal Position Unit

Database Name	PCS_HPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Pollution Control Structure Vertical Position Accuracy Value**		

P_PCS.14 – Pollution Control Structure Vertical Position Accuracy Value

Database Name	PCS_VPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See also* **P_PCS.15***)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_PCS.15 – Pollution Control Structure Vertical Position Unit

Database Name	PCS_VPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Pollution Control Structure Vertical Position Accuracy Value**		

P_PCS.16 – Pollution Control Structure Vertical Datum

Database Name	PCS_VDAT		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_PCS.17 – Pollution Control Structure Horizontal Datum

Database Name	**PCS_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_PCS.18 – Pollution Control Structure General Location

Database Name	**PCS_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	1119 22nd Avenue NE SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 NW ½ of T31N R23W S17 44.957459, -93.277684 55’ NW of intersection of 11th Street SW and Plymouth Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location;		

P_PCS.19 – Pollution Control Structure Drawing Link

Database Name	**PCS_ABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing of the structure		

P_PCS.20 – Pollution Control Structure Document

Database Name	**PCS_ABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_PCS.21 – Pollution Control Structure Status

Database Name	**PCS_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the pollution control structure		

P_PCS.22 – Pollution Control Structure Status Date

Database Name	**PCS_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of last status assessment of the structure		

P_PCS.23 – Pollution Control Structure Installation Date

Database Name	**PCS_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the physical structure		

P_PCS.24 – Pollution Control Structure Modification Date

Database Name	**PCS_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the physical structure		

P_PCS.25 – Pollution Control Structure Condition

Database Name	**PCS_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	"Appeared in good condition when inspected in spring 2018" "Damaged from flooding"		
Description	A 150-character field for subjective, written descriptions of known or observed condition of the asset		

P_PCS.26 – Pollution Control Structure Condition Date

Database Name	**PCS_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last known condition assessment of the structure		

P_PCS.27 – Pollution Control Structure Maintenance Agreement Number

Database Name	**PCS_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the physical asset		

P_PCS.28 – Pollution Control Structure Easement

Database Name	**PCS_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_PCS.29 – Pollution Control Structure Consequence of Failure Rating

Database Name	**PCS_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_PCS.30 – Pollution Control Structure Probability of Failure Rating

Database Name	**PCS_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_PCS.31 – Pollution Control Structure Criticality to System

Database Name	PCS_CRIT		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_PCS.32 – Pollution Control Structure Ownership Type

Database Name	PCS_OWNT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the structure		

P_PCS.33 – Pollution Control Structure Ownership Name

Database Name	PCS_OWNN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the structure		

P_PCS.34 – Pollution Control Structure Maintenance Authority Type

Database Name	PCS_MAINT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_PCS.35 – Pollution Control Structure Maintenance Authority Name

Database Name	PCS_MAINN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which maintains the structure		

P_PCS.36 – Pollution Control Structure Holds Water

Database Name	PCS_HOLDS		
Data Type	Text	Inclusion	If Available
Width	10	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag indicating if the structure holds water or not		

P_PCS.37 – Pollution Control Structure Infiltration Rate

Database Name	PCS_INFIL		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value for infiltration rate [inches/hour])*		
Description	Rate of infiltration through the bottom of an infiltration device in inches per hour;		

P_PCS.38 – Pollution Control Structure Contributing Drainage Area

Database Name	PCS_CDA		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Surface area that discharges to the structure, measured in acres;		

P_PCS.39 – Pollution Control Structure Data Producer/Source Type

Database Name	PCS_DATAT		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_PCS.40 – Pollution Control Structure Data Producer/Source Name

Database Name	**PCS_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_PCS.41 – Pollution Control Structure Date Data Modified

Database Name	**PCS_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_PCS.42 – Pollution Control Structure Data Source

Database Name	**PCS_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_PCS.43 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in;		

P_PCS.44 – CTU Code

Database Name	CTU_ID_TXT		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_PCS.45 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information;*		

P_PCS.46 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_PCS.47 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

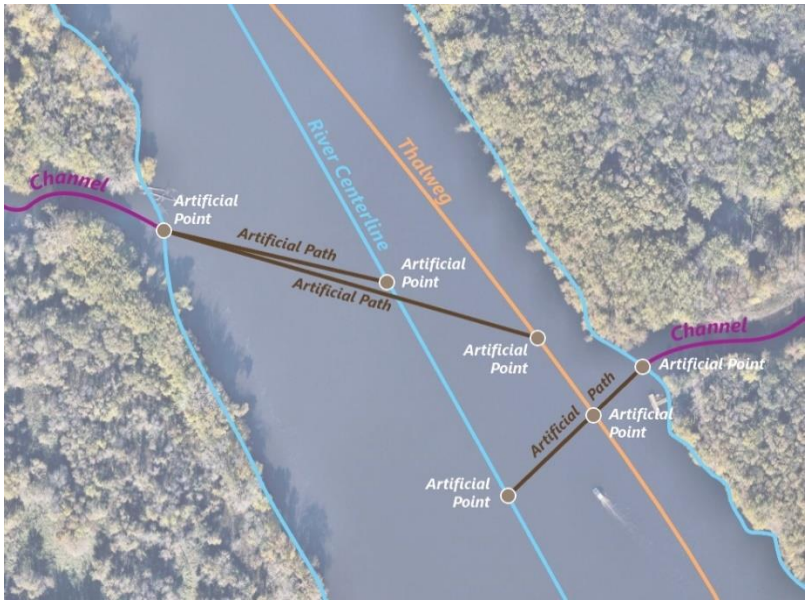
P_PCS.48 – Pollution Control Structure Comments

Database Name	PSC_CMNT		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Needs maintenance or replacement, north wall cracked"* *"Centroid represents the location pre-flood of 2012"*		
Description	General field for text comments related to either the physical or digital aspects of the structure;		

Artificial Point Components

What is an artificial point? An ***artificial point*** is a point feature in the stormwater geodata that does not correspond to an actual physical feature on the landscape, however, it may serve to be useful for the work of modeling, tracking, or facilitating linkages to represent other virtual features in the dataset that correspond to flow analysis or maybe needed for engineering, modeling or asset management.

Within the MSWGP v. 0.5 schema, we have identified 5 'types' of artificial points, these are ***'junction point', 'discharge point', 'centroid'*** (e.g. it may be useful in some situations to have/maintain a centroid of a channel segment or pipe segment), ***'other'*** and ***'unknown'.*** In the hypothetical example at right, a hydraulic modeler may wish to connect various parts of a stream system together. Artificial paths and artificial points can be created and placed to assist the modeler with more effective flow model development.



P_APNT.1 – Artificial Point ID

Database Name	**APT_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	ARTPT-0612-001		
Description	Original unique identifier provided by the original source or data provider; Primary key for the artificial point as used by its creator; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_APNT.2 – Artificial Point Federated ID

Database Name	**APT_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202- ARTPT-0612-001		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example shown in **P_APNT.2** we have a federated ID of:
2705300664202-ARTPT-0612-001

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
ARTPT-0612-001 = Example of the locally-designated unique ID for the feature

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_APNT.3 – Artificial Point Type

Database Name	**APT_TYPE**		
Data Type	Text	Inclusion	Mandatory
Width	45	Domain	**ArtificialPointType**
Examples	Junction point Discharge point Centroid Other Unknown		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

P_APNT.4 – Artificial Point Status

Database Name	**APT_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples*	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the artificial point (as applicable)		

**The attributes of the global MSWGP v. 0.5 domain 'Status' have been applied to Artificial Point; obviously many of these options are not applicable, we welcome recommendations and suggestions for this domain.*

P_APNT.5 – Artificial Point Elevation

Database Name	**APT_ELV**		
Data Type	Double	Inclusion	Conditional
Width	Default	Domain	*(no domain)*
Examples	683.4 *(value indicating feet above sea level)*		
Description	Assigned elevation (in feet above mean sea level) for the artificial point feature		

P_APNT.6 – Artificial Point Data Producer/Source **Type**

Database Name	**APA_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source of the data		

P_APNT.7 – Artificial Point Data Producer/Source **Name**

Database Name	**APT_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source of the data		

P_APNT.8 – Artificial Point Date Data Modified

Database Name	**APT_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the digital feature representing the feature		

P_APNT.9 – Artificial Point Producer/Source Name

Database Name	**APT_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the artificial point; this can be an individual, department, agency, etc.		

P_APNT.10 – CTU Name

Database Name	CTU_NAME		
Data Type	Text	Inclusion	Mandatory
Width	100	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the artificial point is located;		

P_APNT.11 – CTU Code

Database Name	CTU_ID_TXT		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the artificial point is located As the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT)		

P_APNT.12 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the artificial point is located		

P_APNT.13 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Stearns Hennepin		
Description	Name of the county where the artificial point is located		

P_APNT.14 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_APNT.15 – Artificial Path Comments

Database Name	**APT_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Created point for known discharge point"* *"Point is the junction of two streams"* *"Point is where channel discharges at high-water mark of lake"*		
Description	General field for text comments related to any descriptive aspect of the artificial point feature		

Inlet Components

P_IN.1 – Inlet Unique Identifier

Database Name	IN_ORID		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	77456-01265		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_IN.2 – Inlet Federated Identifier

Database Name	IN_FID		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-77456-01265		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-77456-01265

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
77456-01265 = Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

Inlet 'Flag' Attributes: The following ten components (**P_IN.3** through **P_IN.12**) enable the data creator to 'flag' each inlet with the types general features it contains. A single inlet may be flagged with one or more of the following characteristics; it was determined that this approach enables the stormwater data creator to have maximum flexibility for categorizing and attributing the features.

P_IN.3 – Inlet Apron

Database Name	**IN_APRON**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if an apron conveying the stormwater from grade down to the inlet entrance is present;		

P_IN.4 – Inlet Curb Opening

Database Name	**IN_CURB**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if a drainage inlet is an opening in the roadway curb		

P_IN.5 – Inlet Deck Drain

Database Name	**IN_DECK**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate a drainage inlet from a bridge deck or a scupper		

P_IN.6 – Inlet Drop

Database Name	**IN_DROP**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate a drainage inlet with a horizontal or nearly horizontal opening		

P_IN.7 – Inlet Flanking

Database Name	**IN_FLANK**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate a drainage inlet placed on either side of an inlet at low point in a vertical curve to intercept debris as the slope decreases (acts as relief to the inlet at the lower point)		

P_IN.8 – Inlet Grate

Database Name	IN_GRATE		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate a drainage inlet composed of a grate in the roadway section or at the roadside low point or channel;		

P_IN.9 – Inlet Slotted

Database Name	IN_SLOT		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate a drainage inlet is composed of a continuous slot built into the top of a pipe which serves to intercept, collect and transport the flow.		

P_IN.10 – Inlet Trap

Database Name	IN_TRAP		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if a drainage inlet is a trap		

P_IN.11 – Inlet Trench Drain

Database Name	IN_TRDR		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if a drainage inlet is a trench drain		

P_IN.12 – Inlet Sump

Database Name	IN_SUMP		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if a drainage inlet is a sump		

P_IN.13 – Inlet Shape

Database Name	**IN_SHAPE**		
Data Type	Text	Inclusion	Optional
Width	14	Domain	**InletShape**
Examples	Rectangle, Square, Circular, Trapezoid, Other, Unknown, Not applicable		
Description	To provide a description of the predominant cross-sectional shape configuration of the inlet basic shapes of drains/inlet features (as applicable)		

P_IN.14 – Inlet Length

Database Name	**IN_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_IN.15 – Inlet Width

Database Name	**IN_WID**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_IN.16 – Inlet Height or Mean Depth

Database Name	**IN_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

P_IN.17 – Inlet Design Volume

Database Name	**IN_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of depth in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold (if constructed) or holds naturally;		

P_IN.18 – Inlet Invert Elevation

Database Name	**IN_IELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean-sea-level)*		
Description	The elevation of the *bottom of the inside portion* of the outlet of the structure, in units of feet above mean sea level;		

P_IN.19 – Inlet Rim Elevation

Database Name	**IN_RELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Rim elevation (manholes); elevation of the center of the manhole lid measured from its top in feet above mean sea level		

P_IN.20 – Inlet Bottom Elevation

Database Name	**IN_BELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Bottom elevation of structure *(differentiated from the invert elevation)*		

P_IN.21 – Inlet Rotation

Database Name	**IN_ROTAT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(value = angle of rotation for cartographic symbol [azimuthal; north = 0°])*		

>> *(Please see rotation example in Figure 5 on Page 59)*

P_IN.22 – Inlet Horizontal Position Accuracy Value

Database Name	**IN_HPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_IN.23***)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_IN.23 – Inlet Horizontal Position Unit

Database Name	**IN_HPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Inlet Horizontal Position Accuracy Value**		

P_IN.24– Inlet Vertical Position Accuracy Value

Database Name	**IN_VPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_IN.25***)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_IN.25 – Inlet Vertical Position Unit

Database Name	IN_VPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Inlet Vertical Position Accuracy Value**		

P_IN.26 – Inlet Horizontal Datum

Database Name	IN_HDAT		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_IN.27 – Inlet Vertical Datum

Database Name	IN_VDAT		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_IN.28 – Inlet General Location

Database Name	IN_LOC		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	2022 42nd Avenue SW SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 44.957459, -93.277684 34' SE of intersection of 15th Street SW and Connecticut Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_IN.29 – Inlet Drawing Link

Database Name	**IN_ABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_IN.30 – Inlet Document

Database Name	**IN_ABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_IN.31 – Inlet Structure Status

Database Name	**IN_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the structure		

P_IN.32 – Inlet Status Date

Database Name	**IN_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the status assessment of the structure		

P_IN.33 – Inlet Condition

Database Name	**IN_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	“Appeared in good condition when inspected in spring 2018” “Damaged from flooding”		
Description	A 150-character field for subjective written descriptions		

P_IN.34 – Inlet Condition Date

Database Name	**IN_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the condition description in **P_IN.33**		

P_IN.35 – Inlet Installation Date

Database Name	IN_IDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the structure		

P_IN.36 – Inlet Maintenance Agreement Number

Database Name	IN_MAGRN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the structure		

P_IN.37 – Inlet Modification Date

Database Name	IN_MDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the structure		

P_IN.38 – Inlet Easement

Database Name	IN_EASM		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_IN.39 – Inlet Consequence of Failure Rating

Database Name	IN_COF		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_IN.40 – Inlet Probability of Failure Rating

Database Name	IN_POF		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_IN.41 – Inlet Criticality to System

Database Name	IN_CRIT		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_IN.42 – Inlet Ownership Type

Database Name	IN_OWNT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the basin		

P_IN.43 – Inlet Ownership Name

Database Name	IN_OWNN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the basin		

P_IN.44 – Inlet Maintenance Authority Type

Database Name	IN_MAINT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_IN.45 – Inlet Maintenance Authority Name

Database Name	IN_MAINN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Scott County State of Minnesota		
Description	**Name** of the entity or agency which maintains the structure		

P_IN.46 – Inlet Holds Water

Database Name	IN_HOLDS		
Data Type	Text	Inclusion	If Available
Width	10	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag indicating if the structure holds water or not		

P_IN.47 – Inlet Infiltration Rate

Database Name	IN_INFIL		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value for infiltration rate [inches/hour])*		
Description	Rate of infiltration through the bottom of an infiltration device in inches per hour		

P_IN.48 – Inlet Contributing Drainage Area

Database Name	IN_CDA		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Surface area that discharges to the structure, measured in acres		

P_IN.49 – Inlet Storage Volume

Database Name	IN_STVL		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in cubic feet)*		
Description	Storage volume of the inlet, in cubic feet		

P_IN.50 – Inlet Data Producer/Source Type

Database Name	IN_DATAT		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_IN.51 – Inlet Data Producer/Source Name

Database Name	IN_DATAN		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_IN.52 – Inlet Date Data Modified

Database Name	IN_DAMOD		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_IN.53 – Inlet Data Source

Database Name	IN_DASRC		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_IN.54 – CTU Name

Database Name	CTU_NAME		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory name where the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in;		

P_IN.55 – CTU Code

Database Name	CTU_ID_TXT		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_IN.56 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information;*		

P_IN.57 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_IN.58 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_IN.59 – Inlet Comments

Database Name	**IN_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Conflicting records, unable to determine ownership of inlet"* *"Inlet shows extreme vertical cracking on west wall"* *"Centroid does not show correct position of inlet compared to as-builts"*		
Description	General field for text comments related to either the physical or digital aspects of the basin feature		

Outlet Components

P_OUT.1 – Outlet Unique Identifier

Database Name	**OUT_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	56210-65477		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_OUT.2 – Outlet Federated Identifier

Database Name	**OUT_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-56210-65477		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-56210-65477

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
56210-65477= Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

Outlet 'Flag' Attributes: The following eight components (**P_OUT.3** through **P_OUT.10**) enable the data creator to 'flag' each outlet with the types general features it contains. A single outlet may be flagged with one or more of the following characteristics; it was determined that this approach enables the stormwater data creator to have maximum flexibility for categorizing and attributing the features.

P_OUT.3 – Outlet Apron

Database Name	**OUT_APRON**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if an apron is present;		

P_OUT.4 – Outlet Outfall

Database Name	**OUT_OUTFL**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if the features is an outfall;		

>> What is the difference between an outlet and an outfall?

*An **outlet** is any ending or discharge point in a system, whereas an **outfall** is the terminal end of a system where it discharges into a receiving water, or, it leaves one jurisdiction and enters another.*

The definition provided by the Minnesota Stormwater Manual for an outfall is as follows:
***"Outfall"** means the point source where a municipal separate storm sewer system discharges to a receiving water, or the stormwater discharge permanently leaves the permittee's municipal separate storm sewer system (a.k.a. MS4). It does not include diffuse runoff or conveyances that connect segments of the same stream or water systems (e.g., when a conveyance temporarily leaves an MS4 at a road crossing).*

P_OUT.5 – Outlet Discharge Point

Database Name	**OUT_PDIS**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if the features is a discharge point		

P_OUT.6 – Outlet Ditch

Database Name	**OUT_DITCH**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if the features contains a ditch outlet		

P_OUT.7 – Outlet Underground

Database Name	**OUT_UNDER**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if the features is underground (subsurface);		

P_OUT.8 – Outlet Flapgate

Database Name	**OUT_FLGATE**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if the feature has a flapgate.		

Photo at right illustrates an example of a flapgate at an outlet >>

P_OUT.9 – Outlet Tide Chamber

Database Name	**OUT_TDCHM**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag to indicate if the feature has a tide chamber		

This attribute (“**Outlet Tide Chamber”**) *is likely to be removed from the next version of the schema, unless we receive enough confirmation from reviewer, partners, interests and agencies that it is needed or valuable to retain in the standard for their work.*

P_OUT.10 – Outlet Type

Database Name	**OUT_TYPE**		
Data Type	Text	Inclusion	Mandatory
Width	100	Domain	**OutletTypeOptions**
Examples	Pipe Culvert Weir v-notch Weir sharp crested Weir broad crested Weir proportional Weir other Riser structure single outlet Riser structure multiple outlet Drop Slotted Combination Other Unknown		
Description	Domain of values to indicate the specific type of outlet;		

Contributions of additional values and ideas for improvement to this domain are strongly encouraged.

P_OUT.11 – Outlet Length

Database Name	**OUT_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_OUT.12 – Outlet Width

Database Name	**OUT_WID**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_OUT.13 – Outlet Height or Mean Depth

Database Name	**OUT_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

P_OUT.14 – Outlet Design Volume

Database Name	**OUT_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of volume in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold (if constructed) or holds naturally;		

P_OUT.15 – Outlet Invert Elevation

Database Name	**OUT_IELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value of invert elevation in feet above mean-sea-level)*		
Description	The elevation of the *bottom of the inside portion* of the outlet of the structure, in units of feet above mean sea level;		

P_OUT.16 – Outlet Rim Elevation

Database Name	**OUT_RELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Rim elevation (manholes); elevation of the center of the manhole lid measured from its top in feet above mean sea level		

P_OUT.17 – Outlet Bottom Elevation

Database Name	**OUT_BELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean-sea-level)*		
Description	Bottom elevation of structure *(differentiated from the invert elevation)*		

P_OUT.18 – Outlet Inlet Rotation

Database Name	**OUT_ROTAT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(value = angle of rotation for cartographic symbol [azimuthal; north = 0°])*		

>> *(Please see rotation example in Figure 5 on Page 59)*

P_OUT.19 – Outlet Horizontal Position Accuracy Value

Database Name	**OUT_HPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_OUT.20***)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_OUT.20 – Outlet Horizontal Position Unit

Database Name	**OUT_HPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Outlet Horizontal Position Accuracy Value**		

P_OUT.21 – Outlet Vertical Position Accuracy Value

Database Name	**OUT_VPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_OUT.22***)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_OUT.22 – Outlet Vertical Position Unit

Database Name	**OUT_VPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Outlet Vertical Position Accuracy Value**		

P_OUT.23 – Outlet Horizontal Datum

Database Name	**OUT_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_OUT.24 – Outlet Vertical Datum

Database Name	**OUT_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_OUT.25 – Outlet General Location

Database Name	**OUT_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	2116 3nd Avenue SE SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 44.957459, -93.277684 44’ SE of intersection of 44th Street SW and Maine Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_OUT.26 – Outlet Drawing Link

Database Name	**OUT_ABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_OUT.27 – Outlet Document

Database Name	**OUT_ABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_OUT.28 – Outlet Structure Status

Database Name	**OUT_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the structure		

P_OUT.29– Outlet Status Date

Database Name	**OUT_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the status assessment of the structure		

P_OUT.30 – Outlet Condition

Database Name	**OUT_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	*"Appeared in good condition when inspected in spring 2018"* *"Damaged from flooding"*		
Description	A 150-character field for subjective written descriptions		

P_OUT.31 – Outlet Condition Date

Database Name	**OUT_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the condition description in **P_OUT.30 – Outlet Condition**		

P_OUT.32 – Outlet Installation Date

Database Name	**OUT_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the structure		

P_OUT.33 – Outlet Maintenance Agreement Number

Database Name	**OUT_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the structure		

P_OUT.34 – Outlet Modification Date

Database Name	**OUT_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the structure		

P_OUT.35 – Outlet Easement

Database Name	**IN_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_OUT.36 – Outlet Consequence of Failure Rating

Database Name	**OUT_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_OUT.37 – Outlet Probability of Failure Rating

Database Name	**OUT_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_OUT.38 – Outlet Criticality to System

Database Name	**OUT_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_OUT.39 – Outlet Ownership Type

Database Name	**OUT_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the basin		

P_OUT.40 – Outlet Ownership Name

Database Name	**OUT_OWNN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the basin		

P_OUT.41 – Outlet Maintenance Authority Type

Database Name	OUT_MAINT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_OUT.42 – Outlet Maintenance Authority Name

Database Name	OUT_MAINN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Scott County State of Minnesota		
Description	**Name** of the entity or agency which maintains the structure		

P_OUT.43 – Outlet Holds Water

Database Name	OUT_HOLDS		
Data Type	Text	Inclusion	If Available
Width	10	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag indicating if the structure holds water or not		

P_OUT.44 – Outlet Infiltration Rate

Database Name	OUT_INFIL		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value for infiltration rate [inches/hour])*		
Description	Rate of infiltration through the bottom of an infiltration device in inches per hour;		

P_OUT.45 – Outlet Contributing Drainage Area

Database Name	OUT_CDA		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Surface area that discharges to the structure, measured in acres;		

P_OUT.46 – Outlet Storage Volume

Database Name	**OUT_STVL**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in cubic feet)*		
Description	Storage volume of the inlet, in cubic feet		

P_OUT.47 – Outlet Data Producer/Source Type

Database Name	**OUT_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_OUT.48 – Outlet Data Producer/Source Name

Database Name	**OUT_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_OUT.49 – Outlet Date Data Modified

Database Name	**OUT_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_OUT.50 – Outlet Data Source

Database Name	**OUT_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_OUT.51 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory where the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in		

P_OUT.52 –CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_OUT.53 – County Code

Database Name	**CO_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information;*		

P_OUT.54 – County Name

Database Name	**CO_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_OUT.55 – State Code

Database Name	**STATE_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_OUT.56 – Outlet Comments

Database Name	**OUT_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Conflicting records, unable to determine ownership of outlet"* *"Outlet damaged in most recent flood"* *"Data point does not show correct position of outlet compared to as-builts"*		
Description	General field for text comments related to either the physical or digital aspects of structure;		

Manhole Components

P_MH.1 – Manhole Unique Identifier

Database Name	**MH_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	2009-DRL226-RGC		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_MH.2 – Manhole Federated Identifier

Database Name	**MH_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-2009-DRL226-RGC		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-2009-DRL226-RGC

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
56210-65477= Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

Manhole 'Flag' Attributes: The following eight components (**P_MH.3** through **P_MH.10**) enable the data creator to 'flag' each Manhole with the types general features it contains. A single Manhole may be flagged with one or more of the following characteristics; it was determined that this approach enables the stormwater data creator to have maximum flexibility for categorizing and attributing the features.

P_MH.3 – Manhole Cleanout

Database Name	**MH_CO**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is a cleanout		

P_MH.4 – Manhole Gate Valve

Database Name	**MH_GV**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is a gate valve		

P_MH.5 – Manhole Junction Chamber

Database Name	**MH_JC**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is a junction chamber		

P_MH.6 – Manhole Control

Database Name	**MH_CN**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole contains a control device		

P_MH.7 – Manhole Trap

Database Name	**MH_TR**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is a trap		

P_MH.8 – Manhole Split

Database Name	**MH_SPLIT**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is a split		

P_MH.9 – Manhole Sump

Database Name	**MH_SUMP**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is a sump		

P_MH.10 – Manhole Buried

Database Name	**MH_BUR**		
Data Type	Text	Inclusion	Mandatory
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Flag if manhole is buried		

P_MH.11 – Manhole Length

Database Name	**MH_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_MH.12 – Manhole Width

Database Name	**MH_WID**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_MH.13 – Manhole Height or Mean Depth

Database Name	**MH_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

P_MH.14 – Manhole Design Volume

Database Name	**MH_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold (if constructed) or holds naturally;		

P_MH.15 – Manhole Invert Elevation

Database Name	**MH_IELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean-sea-level)*		
Description	The elevation of the *bottom of the inside portion* of the Manhole of the structure, in units of feet above mean sea level;		

P_MH.16 – Manhole Rim Elevation

Database Name	**MH_RELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean-sea-level)*		
Description	Rim elevation (manholes); elevation of the center of the manhole lid measured from its top in feet above mean sea level		

P_MH.17 – Manhole Bottom Elevation

Database Name	**MH_BELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Bottom elevation of structure *(differentiated from the invert elevation)*		

P_MH.18 – Manhole Inlet Rotation

Database Name	**MH_ROTAT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(value = angle of rotation for cartographic symbol [azimuthal; north = 0°])*		
Description	Recommended angle of rotation for cartographic symbol; this field is used to provide a value for the preferred rotation of the point symbol for proper mapping display; the 360° azimuthal system is used (clockwise rotation) (e.g.: north= 0°, east = 90°, south= 180°, west = 270°)		

>> *(Please see rotation example in Figure 5 on Page 59)*

P_MH.19 – Manhole Horizontal Position Accuracy Value

Database Name	**MH_HPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_MH.20***)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_MH.20 – Manhole Horizontal Position Unit

Database Name	**MH_HPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Manhole Horizontal Position Accuracy Value**		

P_MH.21 – Manhole Vertical Position Accuracy Value

Database Name	**MH_VPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_MH.22***)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_MH.22 – Manhole Vertical Position Unit

Database Name	**MH_VPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Manhole Vertical Position Accuracy Value**		

P_MH.23 – Manhole Vertical Datum

Database Name	**MH_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_MH.24 – Manhole Horizontal Datum

Database Name	**MH_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_MH.25 – Manhole General Location

Database Name	**MH_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	2116 3nd Avenue SE SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 44.957459, -93.277684 44’ SE of intersection of 44th Street SW and Maine Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_MH.26 – Manhole Drawing Link

Database Name	**MH_ABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_MH.27 – Manhole Document

Database Name	**MH_ABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_MH.28 – Manhole Structure Status

Database Name	**MH_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the structure		

P_MH.29 – Manhole Status Date

Database Name	**MH_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the status assessment of the structure		

P_MH.30 – Manhole Condition

Database Name	**MH_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	*"Appeared in good condition when inspected in spring 2018"* *"Damaged from flooding"*		
Description	A 150-character field for subjective written descriptions		

P_MH.31 – Manhole Condition Date

Database Name	**MH_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the condition description in **P_MH.30 – Manhole Condition**		

P_MH.32 – Manhole Installation Date

Database Name	**MH_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the structure		

P_MH.33 – Manhole Maintenance Agreement Number

Database Name	**MH_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the structure		

P_MH.34 – Manhole Modification Date

Database Name	**MH_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the structure		

P_MH.35 – Manhole Easement

Database Name	**MH_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_MH.36 – Manhole Consequence of Failure Rating

Database Name	**MH_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_MH.37 – Manhole Probability of Failure Rating

Database Name	**MH_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_MH.38 – Manhole Criticality to System

Database Name	**MH_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_MH.39 – Manhole Ownership Type

Database Name	**MH_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the manhole/structure		

P_MH.40 – Manhole Ownership Name

Database Name	**MH_OWNN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the manhole/structure		

P_MH.41 – Manhole Maintenance Authority Type

Database Name	**MH_MAINT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_MH.42 – Manhole Maintenance Authority Name

Database Name	**MH_MAINN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Scott County State of Minnesota		
Description	**Name** of the entity or agency which maintains the structure		

P_MH.43 – Manhole Data Producer/Source Type

Database Name	**MH_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_MH.44 – Manhole Data Producer/Source Name

Database Name	**MH_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_MH.45 – Manhole Date Data Modified

Database Name	**MH_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_MH.46– Manhole Data Source

Database Name	**MH_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_MH.47 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory where the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in;		

P_MH.48 – CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_MH.49 – County Code

Database Name	**CO_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information;*		

P_MH.50 – County Name

Database Name	**CO_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_MH.51 – State Code

Database Name	**STATE_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_MH.52 – Manhole Comments

Database Name	**MH_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Manhole under 6" of asphalt, excavated on June 12, 2017"* *"Manhole damaged in flooding event August 2019"* *"Data point does not show correct position of manhole compared to as-builts"*		
Description	General field for text comments related to either the physical or digital aspects of structure;		

Lift Station Components

P_LS.1 – Lift Station Unique Identifier

Database Name	**LS_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	LS-516-013		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_LS.2 – Lift Station Federated Identifier

Database Name	**LS_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-LS-516-013		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
2705300664202-LS-516-013

Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
LS-516-013 = Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_LS.3 – Lift Station Type

Database Name	LS_Type		
Data Type	Double	Inclusion	Mandatory
Width	Default	Domain	LiftStationType
Example	Dry Submersible Simplex pump Duplex pump Triplex pump Jockey pump Turbine pump Split-case lift Wet-dry configuration Centrifugal pump Other Unknown		
Description	Total number of wells at the lift station		

Wet-Dry Lift Station

Lift Station with Duplex Pumps

P_LS.4 – Lift Station Number of Wells

Database Name	LS_NOW		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert number of wells*		
Description	Total number of wells at the lift station		

P_LS.5 – Lift Station Number of Pumps

Database Name	LS_NOP		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert number of pumps*		
Description	Total number of pumps at the lift station		

P_LS.6 – Lift Station SCADA System Information

Database Name	LS_SCADA		
Data Type	Text	Inclusion	If Available
Width	100	Domain	(none)
Example	*(Description of SCADA information)*		
Description	Relevant descriptive information about the attendant SCADA system in use at the site		

P_LS.7 – Lift Station Maximum Discharge Capacity

Database Name	LS_MXDCAP		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example			
Description	Relevant descriptive information about the attendant SCADA system in use at the site		

P_LS.8 – Foundation Drain

Database Name	LS_FD		
Data Type	Text	Inclusion	If Available
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Indicates the presence of a foundation drain		

P_LS.9 – Lift Station Sump

Database Name	LS_SUMP		
Data Type	Text	Inclusion	If Available
Width	7	Domain	**YesNoUnknown**
Example	Yes, No, Unknown		
Description	Indicates the presence of a sump		

P_LS.10 – Lift Station Length

Database Name	LS_LNG		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_LS.11 – Lift Station Width

Database Name	LS_WID		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_LS.12 – Lift Station Height

Database Name	**LS_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height of the structure		

P_LS.13 – Lift Station Depth

Database Name	**LS_DEP**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Depth of the structure		

P_LS.14 – Lift Station Design Volume

Database Name	**LS_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold;		

P_LS.15 – Lift Station Invert Elevation

Database Name	**LS_IELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean-sea-level)*		
Description	The elevation of the *invert* of the Lift Station of the structure, in units of feet above mean sea level;		

P_LS.16 – Lift Station Outlet Elevation

Database Name	**LS_OELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean-sea-level)*		
Description	The elevation of the *bottom of the inside portion* of the Lift Station of the structure, in units of feet above mean sea level;		

P_LS.17 – Lift Station Rim Elevation

Database Name	**LS_RELEV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Rim elevation (Lift Stations); elevation of the center of the Lift Station lid measured from its top in feet above mean sea level		

P_LS.18 – Lift Station Bottom Elevation

Database Name	LS_BELEV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value feet above mean-sea-level)*		
Description	Bottom elevation of structure *(differentiated from the invert elevation)*		

P_LS.19 – Lift Station Inlet Rotation

Database Name	LS_ROTAT		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(value = angle of rotation for cartographic symbol [azimuthal; north = 0°])*		
Description	Recommended angle of rotation for cartographic symbol; this field is used to provide a value for the preferred rotation of the point symbol for proper mapping display; the 360° azimuthal system is used (clockwise rotation) (e.g.: north= 0°, east = 90°, south= 180°, west = 270°)		

>> *(Please see rotation example in Figure 5 on Page 59)*

P_LS.20 – Lift Station Horizontal Position Accuracy Value

Database Name	LS_HPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See P_LS.21)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_LS.21 – Lift Station Horizontal Position Unit

Database Name	LS_HPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Lift Station Horizontal Position Accuracy Value**		

P_LS.22 – Lift Station Vertical Position Accuracy Value

Database Name	LS_VPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See P_LS.23)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_LS.23 – Lift Station Vertical Position Unit

Database Name	LS_VPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Lift Station Vertical Position Accuracy Value**		

P_LS.24 – Lift Station Vertical Datum

Database Name	LS_VDAT		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_LS.25 – Lift Station Horizontal Datum

Database Name	LS_HDAT		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_LS.26 – Lift Station General Location

Database Name	LS_LOC		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	2116 3nd Avenue SE SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 44.957459, -93.277684 44’ SE of intersection of 44th Street SW and Maine Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_LS.27 – Lift Station Drawing Link

Database Name	LS_ABLINK		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_LS.28 – Lift Station Document

Database Name	LS_ABDOC		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_LS.29 – Lift Station Structure Status

Database Name	LS_STAT		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the structure		

P_LS.30 – Lift Station Status Date

Database Name	LS_SDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the status assessment of the structure		

P_LS.31 – Lift Station Condition

Database Name	LS_COND		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	*"Appeared in good condition when inspected in spring 2018"* *"Damaged from flooding"*		
Description	A 150-character field for subjective written descriptions		

P_LS.32 – Lift Station Condition Date

Database Name	LS_CDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the condition description in **P_LS.31 – Lift Station Condition**		

P_LS.33 – Lift Station Installation Date

Database Name	LS_IDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the structure		

P_LS.34 – Lift Station Maintenance Agreement Number

Database Name	LS_MAGRN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the structure		

P_LS.35 – Lift Station Modification Date

Database Name	LS_MDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the structure		

P_LS.36 – Lift Station Easement

Database Name	LS_EASM		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_LS.37 – Lift Station Consequence of Failure Rating

Database Name	LS_COF		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_LS.38 – Lift Station Probability of Failure Rating

Database Name	**LS_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_LS.39 – Lift Station Criticality to System

Database Name	**LS_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_LS.40 – Lift Station Ownership Type

Database Name	**LS_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the lift station/structure		

P_LS.41 – Lift Station Ownership Name

Database Name	**LS_OWNN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the lift station/structure		

P_LS.42 – Lift Station Maintenance Authority Type

Database Name	**LS_MAINT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_LS.43 – Lift Station Maintenance Authority Name

Database Name	**LS_MAINN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Scott County State of Minnesota		
Description	**Name** of the entity or agency which maintains the structure		

P_LS.44 – Lift Station Holds Water

Database Name	**LS_HOLDS**		
Data Type	Text	Inclusion	If Available
Width	10	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag indicating if the structure holds water or not		

P_LS.45 – Lift Station Contributing Drainage Area

Database Name	**LS_CDA**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Surface area that discharges to the structure, measured in acres;		

P_LS.46 – Lift Station Storage Volume

Database Name	**LS_STVL**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in cubic feet)*		
Description	Storage volume of the lift station/structure, in cubic feet		

P_LS.47 – Lift Station Data Producer/Source Type

Database Name	LS_DATAT		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_LS.48 – Lift Station Data Producer/Source Name

Database Name	LS_DATAN		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_LS.49 – Lift Station Date Data Modified

Database Name	LS_DAMOD		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_LS.50– Lift Station Data Source

Database Name	LS_DASRC		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_LS.51 – CTU Name

Database Name	CTU_NAME		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territorywhere the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in;		

P_LS.52 – CTU Code

Database Name	CTU_ID_TXT		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_LS.53 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information;*		

P_LS.54 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_LS.55 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_LS.56 – Lift Station Comments

Database Name	LS_CMNT		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"Lift Station damaged in flooding event of August 2019"* *"Data point does not show correct position of Lift Station compared to as-built drawings on file"* *"Lift station was built on the property line"*		
Description	General field for text comments related to either the physical or digital aspects of structure;		

Best Management Practices (BMP) Components

P_BMP.1 – BMP Unique Identifier

Database Name	**BMP_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	09021970-616		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_BMP.2 – BMP Federated Identifier

Database Name	**BMP_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202-09021970-616		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
27053 00664202-09021970-616
Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
LS-516-013 = Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_BMP.3 – BMP Type

Database Name	**BMP_Type**		
Data Type	Text	Inclusion	Mandatory
Width	45	Domain	**BMPType**
Examples	Amended-composted soils, bioretention-rain garden, ditch block, dry pond, filtration basin (no underdrain), filtration basin (with underdrain), filtration bench/shelf (no underdrain), filtration bench/shelf (with underdrain), filtration swale (no underdrain), filtration swale/shelf (with underdrain), green roof, iron enhanced filter, infiltration trench, infiltration basin, sand filter, stormwater pond/wet pond, tree box, offline-basin, permeable pavement, planter, porous pavers, porous concrete, etc. (*for complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		
Description	Indication of the BMP type		

One of the challenges of developing a multi-purpose stormwater geodata standard is how to best capture complex fixtures within the context of points, lines and polygons. The current version of the standard represents BMP fixtures *as points*, however, there may be some features which are better suited for representation as linear features. We encourage stakeholder comments on how to best advance this discussion toward a solution.

Examples of stormwater BMPs

Infiltration basin

Infiltration trench (with mulch)

Filtration with underdrain
(with vegetation-high maintenance)

Filtration pond with iron-enhanced sand

Filtration with underdrain
(with vegetation-high maintenance)

Ditch blocks in channel
(w/ vegetation-low maintenance)

P_BMP.4 – BMP Length

Database Name	**BMP_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the structure		

P_BMP.5 – BMP Width

Database Name	**BMP_WID**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the structure		

P_BMP.6 – BMP Height or Mean Depth

Database Name	**BMP_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

P_BMP.7 – BMP Elevation

Database Name	**BMP_ELV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean sea level)*		
Description	Elevation of structure in mean feet above sea level		

P_BMP.8 – BMP Surface Area

Database Name	**BMP_SAREA**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in square feet)*		
Description	Surface area of the structure, fixture or features in square feet		

P_BMP.9 – BMP Rotation

Database Name	**BMP_ROTAT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Value for preferred rotation angle for display of cartographic feature)*		
Description	Recommended angle of rotation for cartographic symbol; this field is used to provide a value for the preferred rotation of the point symbol for proper mapping display; the 360° azimuthal system is used (clockwise rotation) (e.g.: north= 0°, east = 90°, south= 180°, west = 270°)		

>> *(Please see rotation example in Figure 5 on Page 59)*

P_BMP.10 – BMP Design Volume

Database Name	**BMP_VLD**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in cubic-feet)*		
Description	Volume of water in cubic feet the structure was designed to hold;		

The current version of the MSWGP v. 0.5 draft standard does not presently include the following listed attributes for BMPs, however, these can be included in the next version if they are deemed valuable and needed by the stakeholder community after their review and comment period:

- Invert Elevation
- Outlet Elevation
- Rim Elevation
- Bottom Elevation

The MSWGP Steering Team encourages and welcomes stakeholder feedback, ideas, suggestions and input on how to best represent the wide range of BMP features consistently and effectively in GIS.

P_BMP.11 – BMP Horizontal Position Accuracy Value

Database Name	**BMP_HPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_BMP.12***)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_BMP.12 – BMP Horizontal Position Unit

Database Name	**BMP_HPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **BMP Horizontal Position Accuracy Value**		

P_BMP.13 – BMP Vertical Position Accuracy Value

Database Name	**BMP_VPAV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_BMP.14***)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_BMP.14 – BMP Vertical Position Unit

Database Name	**BMP_VPU**		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **BMP Vertical Position Accuracy Value**		

P_BMP.15 – BMP Vertical Datum

Database Name	**BMP_VDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_BMP.16 – BMP Horizontal Datum

Database Name	**BMP_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_BMP.17 – BMP General Location

Database Name	**BMP_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	2116 3nd Avenue SE SW ¼ of the NE ¼ of the NE ¼ of T29N R24E S12 44.957459, -93.277684 32’ SE of intersection of 34th Street SW and Maine Avenue		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_BMP.18 – BMP Filter Material

Database Name	**BMP_FM**		
Data Type	Text	Inclusion	Conditional
Width	30	Domain	**FilterMaterial**
Examples	Gravel, Biochar, Amended Soil, Rock, Sand-Compost Mix, Sand Filter, Iron-Enhanced Filter, Soil, Spent Lime, Other, Unknown		
Description	Filter material type		

P_BMP.19 – BMP Ground Cover

Database Name	**BMP_GC**		
Data Type	Text	Inclusion	Conditional
Width	30	Domain	**GroundCover**
Examples	Asphalt, Brick, Concrete, Gravel, Mulch, Bare Soil, Vegetation-high maintenance, Vegetation-low maintenance, Vegetation-native, Other, Unknown		
Description	Ground cover type		

P_BMP.20 – BMP Drawing Link

Database Name	**BMP_ABLINK**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert link/URL accessing as-built drawing)*		
Description	URL/weblink to the as-built drawing containing the structure		

P_BMP.21 – BMP Document

Database Name	**BMP_ABDOC**		
Data Type	Text	Inclusion	If Available
Width	150	Domain	*(no domain)*
Example	*(insert document number, ID number, reference number of as-built drawing)*		
Description	Document number, ID number, or reference number of the original as-built drawing of the structure		

P_BMP.22 – BMP Structure Status

Database Name	**BMP_STAT**		
Data Type	Text	Inclusion	Mandatory
Width	20	Domain	**Status**
Examples	Active, Inactive, Failed, Removed, Proposed, Abandoned, Under Construction, Other, Unknown		
Description	Status indicator of the structure		

P_BMP.23 – BMP Status Date

Database Name	**BMP_SDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the status assessment of the structure		

P_BMP.24 – BMP Condition

Database Name	**BMP_COND**		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	*"Appeared in good condition when inspected in spring 2018"* *"Damaged from flooding"*		
Description	A 150-character field for subjective written descriptions		

P_BMP.25 – BMP Condition Date

Database Name	**BMP_CDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the condition description in **P_BMP.24 – BMP Condition**		

P_BMP.26 – BMP Installation Date

Database Name	**BMP_IDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of installation of the structure		

P_BMP.27 – BMP Maintenance Agreement Number

Database Name	**BMP_MAGRN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Example	*(insert example of Maintenance Agreement Number/ID)*		
Description	Document ID of agreement between agencies for the maintenance of the structure		

P_BMP.28 – BMP Modification Date

Database Name	**BMP_MDATE**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	2/14/2020		
Description	Date of the last modification of the structure		

P_BMP.29 – BMP Easement

Database Name	**BMP_EASM**		
Data Type	Text	Inclusion	Conditional
Width	7	Domain	**YesNoUnknown**
Examples	Yes = an easement is present No = no easement is present Unknown = it is unknown if there is an easement present		
Description	Flag to indicate if there is an easement present		

P_BMP.30 – BMP Consequence of Failure Rating

Database Name	**BMP_COF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of consequence of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_BMP.31 – BMP Probability of Failure Rating

Database Name	**BMP_POF**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of severity of probability of failure of asset 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_BMP.32 – BMP Criticality to System

Database Name	**BMP_CRIT**		
Data Type	Text	Inclusion	If Available
Width	1	Domain	**CriticalRating**
Examples	*(see values in Description below)*		
Description	Rating: 1-5 of criticality of the asset (1 = low, 5=high) 1 = Low 2 = Medium Low 3 = Medium 4 = Medium High 5 = High		

P_BMP.33 – BMP Ownership Type

Database Name	**BMP_OWNT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the structure		

P_BMP.34 – BMP Ownership Name

Database Name	**BMP_OWNN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the structure		

P_BMP.35 – BMP Maintenance Authority Type

Database Name	**BMP_MAINT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the structure		

P_BMP.36 – BMP Maintenance Authority Name

Database Name	**BMP_MAINN**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Scott County State of Minnesota		
Description	**Name** of the entity or agency which maintains the structure		

P_BMP.37 – BMP Holds Water

Database Name	**BMP_HOLDS**		
Data Type	Text	Inclusion	If Available
Width	10	Domain	**YesNoUnknown**
Examples	Yes, No, Unknown		
Description	Flag indicating if the structure holds water		

P_BMP.38 – BMP Infiltration Rate

Database Name	**BMP_INF**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in inches per hour)*		
Description	Numerical indicator of infiltration through the bottom of the BMP;		

P_BMP.39 – BMP Designed Treatment Volume

Database Name	**BMP_DTV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in cubic-feet per hour)*		
Description	Volume of water the BMP is designed to treat in cubic fee per hour		

P_BMP.40 – BMP Storage Volume

Database Name	**BMP_STVL**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in cubic feet)*		
Description	Storage volume of the structure, in cubic feet		

P_BMP.41 – Lift Station Contributing Drainage Area

Database Name	**BMP_CDA**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Surface area that discharges to the structure, measured in acres		

P_BMP.42 – BMP Data Producer/Source Type

Database Name	**BMP_DATAT**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which produces or is the source *of the data*		

P_BMP.43 – BMP Data Producer/Source Name

Database Name	**BMP_DATAN**		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	**Name** of entity or agency which produces or is the source *of the data*		

P_BMP.44 – BMP Date Data Modified

Database Name	**BMP_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the structure		

P_BMP.45– BMP Data Source

Database Name	**BMP_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_BMP.46 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory where the structure is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in		

P_BMP.47 – CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_BMP.48 – County Code

Database Name	**CO_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the structure is located, *please see links on page 25 for additional information*		

P_BMP.49 – County Name

Database Name	**CO_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the physical structure is located		

P_BMP.50 – State Code

Database Name	**STATE_CODE**		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_BMP.51 – BMP Comments

Database Name	**BMP_CMNT**		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*"BMP damaged in flooding event August 2019"* *"Data point does not show correct position of BMP compared to as-built drawings on file"* *"BMP was built on the property line"*		
Description	General field for text comments related to either the physical or digital aspects of structure		

Monitoring Components

P_MON.1 – Monitor Unique Identifier

Database Name	**MON_ORID**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Example	MON501-055		
Description	Original unique identifier provided by the original source or data provider; Primary key for the asset as used by the asset owner; Locally-designated ID, containing any combination of letter, hyphens or numbers as needed by the data producer;		

P_MON.2 – Monitor Federated Identifier

Database Name	**MON_FID**		
Data Type	Text	Inclusion	Mandatory
Width	90	Domain	*(no domain)*
Example	2705300664202- MON501-055		
Description	Original unique identifier provided by the original source or data provider with prefix appended to it indicating state, county and municipal code;		

The purpose of the 'federated ID' is to enable the creation of a unique ID which concatenates the original local ID to a set of codes which indicate the jurisdiction in which the pipe is found.

In the example above we have a federated ID of:
27053 00664202-**MON501-055**
Where:
27 = FIPS/ANSI Code for Minnesota
053 = FIPS/ANSI Code for Hennepin County
00664202 = CTU Code for Fort Snelling Unorganized Territory
LS-516-013 = Example of the locally-designated unique ID for the structure

The FIPS and CTU codes are maintained in the **General Elements** of the feature.

Please note: These number codes are already used extensively in other standards already adopted by the Minnesota Geospatial Advisory Council.

P_MON.3 – Monitor Category

Database Name	**MON_CAT**		
Data Type	Text	Inclusion	Mandatory
Width	45	Domain	**MonitorCategory**
Examples	Sensor Monitoring Well Sampler Gauge Other Unknown		
Description	Category of monitoring device placed, used or installed		

P_MON.4 – Monitor Type

Database Name	**MON_TYPE**		
Data Type	Text	Inclusion	Mandatory
Width	45	Domain	**MonitorType**
Examples	Frost sensor Pressure transducer Water level sensor Temperature sensor Conductivity sensor Sonic distance sensor Laser velocity sensor Automated sampler Staff gauge Rain gauge Bubbler for water depth Turbidity sensor pH sensor Dissolved oxygen sensor Algae sensor Chlorophyll sensor Soil moisture gauge Monitoring well, water level only Monitoring well, temporary dewatering, construction Monitoring well, remedial site investigation, water quality Monitoring well, geological, exploratory Monitoring well, general water quality Multi-parameter sensor Frost sensor Other Unknown		
Description	Indication of the specific monitor type		

P_MON.5 – Monitor Length

Database Name	**MON_LNG**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Length in feet of the monitoring component		

P_MON.6 – Monitor Width

Database Name	**MON_WID**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in inches)*		
Description	Width in inches of the monitoring component		

P_MON.7 – Monitor Height or Mean Depth

Database Name	**MON_HT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet)*		
Description	Height or mean depth of the structure		

P_MON.8 – Monitor Elevation

Database Name	**MON_ELV**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Insert value in feet above mean sea level)*		
Description	Elevation of monitoring component in mean feet above sea level		

P_MON.9 – Monitor Rotation

Database Name	**MON_ROTAT**		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*(Value for preferred rotation angle for display of cartographic feature)*		
Description	Recommended angle of rotation for cartographic symbol; this field is used to provide a value for the preferred rotation of the point symbol for proper mapping display; the 360° azimuthal system is used (clockwise rotation) (e.g.: north= 0°, east = 90°, south= 180°, west = 270°)		

>> (Please see rotation example in Figure 5 on Page 59)

P_MON.10 – Monitor Horizontal Position Accuracy Value

Database Name	MON_HPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_MON.11***)*		
Description	Indicator of the accuracy of ***x and y value*** of the structure		

P_MON.11 – Monitor Horizontal Position Unit

Database Name	MON_HPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **Monitor Horizontal Position Accuracy Value**		

P_MON.12 – Monitor Vertical Position Accuracy Value

Database Name	MON_VPAV		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(none)
Example	*Insert numerical value of the positional accuracy (See* **P_MON.13***)*		
Description	Indicator of the accuracy of the ***z value*** of the structure		

P_MON.13 – Monitor Vertical Position Unit

Database Name	MON_VPU		
Data Type	Text	Inclusion	If Available
Width	8	Domain	**AccuracyMeasure**
Examples	Feet Meters		
Description	Indicates unit of measurement (in either feet or meters) for the **MON Vertical Position Accuracy Value**		

P_MON.14 – Monitor Vertical Datum

Database Name	MON_VDAT		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**VDatum**
Examples	Ellipsoidal, NAD83 (HARN) Orthometric, NAVD88 From as-built drawing Unknown datum		
Description	Name of the vertical datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_MON.15 – Monitor Horizontal Datum

Database Name	**MON_HDAT**		
Data Type	Text	Inclusion	Conditional
Width	50	Domain	**HDatum**
Examples	RTCM_23_NAD83(2011) CMRx_NAD83(1996) From as-built drawing Unknown datum		
Description	Name of the horizontal datum in use by the data producer in creating their data or taken from as-built drawings *(For complete list of draft domain values, please see the file* SGTS_V_0_5_Domains.xlsx)		

P_MON.16 – Monitor General Location

Database Name	**MON_LOC**		
Data Type	Text	Inclusion	Optional
Width	100	Domain	*(no domain)*
Examples	South end of Bear Lake Appx. 15' downstream from Xcel Energy outfall on Black Dog Lake 46.546947, -94.281779 Narrow channel between Lower Cullen Lake and Middle Cullen Lake		
Description	Data creator can provide general location information in the form of PLSS description, latitude/longitude coordinates, address, intersection or other descriptive location		

P_MON.17 – Monitor Brand

Database Name	**MON_BRAND**		
Data Type	Text	Inclusion	If Available
Width	50	Domain	*(no domain)*
Examples	*(Insert brand name of monitoring device)*		
Description	Brand of monitoring device		

P_MON.18 – Monitor Device Maintenance

Database Name	**MON_DMAINT**		
Data Type	Text	Inclusion	If Available
Width	75	Domain	*(no domain)*
Examples	*(Insert numerical value and unit type? Example: 3 months?)*		
Description	Period of time between recommended maintenance activities		

P_MON.19 – Monitor Device Maintenance

Database Name	**MON_MNTYPE**		
Data Type	Text	Inclusion	If Available
Width	120	Domain	*(no domain)*
Examples	*(Insert maintenance type of monitoring device)*		
Description	Type of maintenance to be performed		

P_MON.20 – Monitor Manufacturer Date

Database Name	MON_MFDT		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of manufacture of the monitoring device		

P_MON.21 – Monitor Status

Database Name	MON_STAT		
Data Type	Text	Inclusion	If Available
Width	18	Domain	MonitorStatus
Examples	Installed, Active-temporary, Active-continuous, Inactive-monitor in place Other, Unknown		
Description	Status of monitoring device		

P_MON.22 – Monitor Status Date

Database Name	MON_SDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last condition assessment of the monitoring device		

P_MON.23 – Monitor Installation Date

Database Name	MON_IDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of installation of the monitoring device		

P_MON.24 – Monitor Modification Date

Database Name	MON_MDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of most recent modification of the monitoring device		

P_MON.25 – Monitor Expiration Date

Database Name	MON_XDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of expiration of the monitoring device		

P_MON.26 – Monitor Condition

Database Name	MON_COND		
Data Type	Text	Inclusion	Optional
Width	150	Domain	*(no domain)*
Example	*"As of July 2019, monitor is in place and functioning well"*		
Description	A150-character field for subjective written descriptions about the monitoring device		

P_MON.27 – Monitor Condition Date

Database Name	MON_CDATE		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Example	7/31/2020		
Description	Date of the condition description in **P_MON.26 – MON Condition**		

P_MON.28 – Monitor Ownership Type

Database Name	MON_OWNT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which owns the monitoring device		

P_MON.29 – Monitor Ownership Name

Database Name	MON_OWNN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Ramsey County State of Minnesota		
Description	**Name** of the entity or agency which owns the monitoring device		

P_MON.30 – Monitor Maintenance Authority Type

Database Name	MON_MAINT		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	**Type** of entity or agency which maintains the monitoring device		

P_MON.31 – Monitor Maintenance Authority Name

Database Name	MON_MAINN		
Data Type	Text	Inclusion	If Available
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Scott County State of Minnesota		
Description	Name of the entity or agency which maintains the monitoring device		

P_MON.32 – Monitor Contributing Drainage Area

Database Name	MON_CDA		
Data Type	Double	Inclusion	If Available
Width	Default	Domain	(not applicable)
Example	*(insert value in acres)*		
Description	Size of drainage area that discharges to the monitor, measured in acres;		

P_MON.33 – Monitor Data Producer/Source Type

Database Name	MON_DATAT		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**ManagementType**
Examples	Township, City, County, Judicial, State, Regional Agency, State, Federal, Watershed Management Unit, Educational Entity, Private, Other, Unknown		
Description	Type of entity or agency which produces or is the source *of the data*		

P_MON.34 – Monitor Data Producer/Source Name

Database Name	MON_DATAN		
Data Type	Text	Inclusion	Conditional
Width	75	Domain	**AgencyOwnMaintain**
Examples	Buffalo-Red River Watershed District City of Eagan City of Bloomington Metropolitan Council Hennepin County State of Minnesota		
Description	Name of entity or agency which produces or is the source *of the data*		

P_MON.35 – Monitor Date Data Modified

Database Name	**MON_DAMOD**		
Data Type	Date	Inclusion	If Available
Width	Default	Domain	*(no domain)*
Examples	2/14/2020		
Description	Date of last modification to the *digital feature* representing the monitor		

P_MON.36 – Monitor Data Source

Database Name	**MON_DASRC**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	*(no domain)*
Examples	A. Blenkush, Hennepin County GIS Staff C. Magnuson, RWMWD Ramsey County GIS Department Anoka County Public Works		
Description	Name of source, providing agency, interest or company of the digital data representing the structure (*Note: provider of the digital data may differ from owner and/or the maintainer of the physical asset*); This can be an individual, department, agency, etc.		

P_MON.37 – CTU Name

Database Name	**CTU_NAME**		
Data Type	Text	Inclusion	Mandatory
Width	75	Domain	**CTU_Name**
Examples	Eagan Bloomington		
Description	Name of the city, township or unorganized territory where the monitor is physically is located; if a structure centroid point is directly on a boundary between two cities/counties, the data creator may use their discretion as to which municipality or county they place the structure in;		

P_MON.38 – CTU Code

Database Name	**CTU_ID_TXT**		
Data Type	Text	Inclusion	Mandatory
Width	8	Domain	**CTUIDText**
Examples	02394586 = City of Eagan 02394198 = City of Bloomington		
Description	Eight-digit CTU code representing the municipal unit (city, township, unorganized territory) where the asset is located; as the leadings zeros are needed and this is not to be used for any mathematical uses, this ID field is a text field (TXT), *please see the links on page 25 of this document for additional context*		

P_MON.39 – County Code

Database Name	CO_CODE		
Data Type	Text	Inclusion	Mandatory
Width	3	Domain	**CountyCode**
Examples	037 = Dakota County 053 = Hennepin County		
Description	Three-digit (FIPS/ANSI) code representing the county where the monitor is located, *please see links on page 25 for additional information;*		

P_MON.40 – County Name

Database Name	CO_NAME		
Data Type	Text	Inclusion	Mandatory
Width	40	Domain	**CountyName**
Examples	Dakota Hennepin		
Description	Name of the county where the monitor is located		

P_MON.41 – State Code

Database Name	STATE_CODE		
Data Type	Text	Inclusion	Mandatory
Width	2	Domain	*(no domain)*
Example	27		
Description	There is only one value for Minnesota 27 = FIPS/ANSI Code for Minnesota		

P_MON.42 – Monitor Comments

Database Name	MON_CMNT		
Data Type	Text	Inclusion	Mandatory
Width	254	Domain	*(no domain)*
Examples	*(insert comment text)*		
Description	General field for text comments related to either the physical or digital aspects of monitor;		

Basins (As Polygon Features)

P_POLY.1 – (Basin) Polygon Method

Database Name	**POLY_METH**		
Data Type	Text	Inclusion	Mandatory
Width	24	Domain	**PolyMethod**
Example	Digitized GPS point collection LIDAR extract Imagery extract Import from CAD External GIS source Other Unknown		
Description	Method for the creation of the polygon representing the basin feature		

P_POLY.2 – (Basin) Polygon Perimeter

Database Name	**POLY_PERI**		
Data Type	Double	Inclusion	Mandatory
Width	Default	Domain	(not applicable)
Example	(insert value in feet of perimeter of the polygon)		
Description	Value in feet of the perimeter of the polygon representing the basin; Can be calculated within GIS;		

P_POLY.3 – (Basin) Polygon Surface Area

Database Name	**POLY_SAREA**		
Data Type	Double	Inclusion	Mandatory
Width	Default	Domain	(not applicable)
Example	(insert value in feet of perimeter of the polygon)		
Description	Area value (in acres) of the polygon representing the basin; Can be calculated within GIS;		

Best Management Practices - BMPs (As Polygon Features)

P_POLY.1 – (BMP) Polygon Method

Database Name	**POLY_METH**		
Data Type	Text	Inclusion	Mandatory
Width	24	Domain	**PolyMethod**
Example	Digitized GPS point collection LIDAR extract Imagery extract Import from CAD External GIS source Other Unknown		
Description	Method for the creation of the polygon representing the BMP;		

P_POLY.2 – (BMP) Polygon Perimeter

Database Name	**POLY_PERI**		
Data Type	Double	Inclusion	Mandatory
Width	Default	Domain	(not applicable)
Example	(insert value in feet of perimeter of the polygon)		
Description	Value in feet of the perimeter of the polygon representing the BMP; Can be calculated within GIS;		

P_POLY.3 – (BMP) Polygon Surface Area

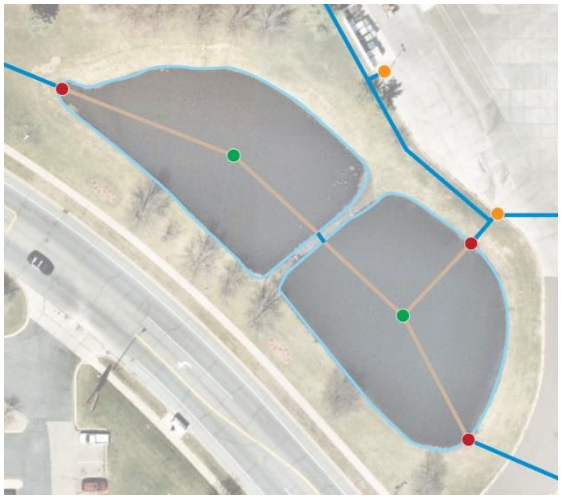
Database Name	**POLY_SAREA**		
Data Type	Double	Inclusion	Mandatory
Width	Default	Domain	(not applicable)
Example	(insert value in feet of perimeter of the polygon)		
Description	Area value (in acres) of the polygon representing the BMP; Can be calculated within GIS;		

Treatment of Polygons in the Draft Standard

As is evident throughout this document, preference is given to **point geometry** as the means to represent non-linear stormwater features. While polygons are important for mapping and visualization, points are to be retained as the main geometry feature for the following reasons:

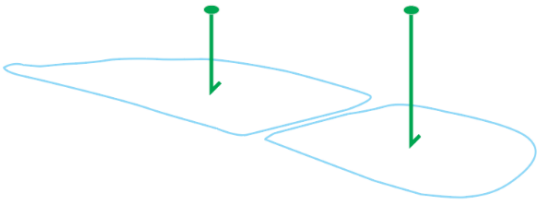
- The ***ever-changing shape of shorelines*** due to seasonal fluctuations, rainfall events, etc.;
- Point features (linked by lines) are better able to ***preserve the network connectivity*** of features;
- Points provide a single, continuous place to maintain the associated attribute data;

While the **point** version of **Basins** and **BMPs** are the primary means of representing these features, the point data can easily be spatially joined in GIS software to the polygon features as they are created and needed.



In the example at right, the two constructed basins would primarily be represented in this draft standard as the **green points** (**Basin** points at their center). These points would have all the attributes of Basins (from pp. 43-55 of this document) associated with them. The points facilitate connections to the incoming pipes, inlets, outlets via artificial paths.

The polygons (shown in light blue) outlining these basin features would have only the three unique attributes associated with them (as listed on page 159 if a **Basin**, or page 160 if a **BMP**) which indicate the method of creation for the polygon, its calculated perimeter and its calculated surface area.



In the lower illustration, the oblique view simply shows that all the data embedded in the point can be quickly spatially joined to the polygon features as needed. Only the data in the point would need to be maintained and updated. A

As new polygons are created being digitized aerial images, extracted from LIDAR, imported from CAD drawing as-builts, etc. a new spatial join can be performed to update the polygon features attributes.