QUEENSTOWN LAKES DISTRICT COUNCIL

ENTERPRISE ASSET MANAGEMENT (EAM)

QLDC THREE WATERS ASSETS

GIS DATA INVENTORY (INTERNAL SCHEMA)

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SECTION 1 – INTRODUCTION

1.1 BACKGROUND

This document has been established to specify the pre-requisite QLDC GIS data inventory for Three Waters Assets - as required prior to transfer into the Enterprise Asset Management (EAM) system.

EAM is a module of the TechnologyOne Administration System and was implemented as the central Asset Management System at QLDC in 2019. EAM features integration with the TechnologyOne Finance module.

The tables within this document indicate a range of GIS data fields and their applicable attribute values, collected from GIS remote sources or assigned internally by QLDC GIS operators. Notwithstanding the fact this data contains a spatially enabled component, it is important to recognise this document is not intended as a QLDC spatial data specification. It is rather a guide for the attribution attached to spatial data, and which may be extracted for use in EAM.

SECTION 2 – GIS DATA

3.1 GIS DATA COLLECTION

Spatial Asbuilt data and certain selected attributes are collected remotely for QLDC by external operators, in accordance with the QLDC document ***Asbuilt Plan Specification Requirements***. The attributes identified for remote collection are also indicated in Section 4. These are a subset of the overall attributes required to complete the Three Waters internal data schema.

Submitted Asbuilt Data is subjected to a QAQC process, before being combined with additional asset attribute values. These are populated internally at QLDC by GIS staff and are identified in Section 4.

On completion, the spatial data is transferred to the QLDC GIS Production Database.

3.2 GIS DATA FORMAT

Three Waters Asbuilt data is initially submitted to QLDC in the ESRI proprietary File Geodatabase (FGDB) format. The QLDC GIS Production Database is held in the Spatial Database Engine (SDE) facility, which operates as a network GIS data repository.

FGDB and SDE databases are compatible with SQL Server.

3.3 EAM DATA TRANSFER

Three Waters spatial data must be returned from SDE to FGDB format for transfer to EAM. Using proprietary systems, attribute values are subsequently mapped into the relevant EAM Asset Register tables. The spatial component is transferred into the EAM FGDB for use in the Embedded Mapping module.

EAM synchronizing and reconciliation functions will be employed to update spatial data and attributes when necessary. Data relationships will be provided via an allocated Global User ID (GUID).

SECTION 3 – DATA SCHEMA

4.1 DATA SETS

Three Waters Assets held in GIS are divided into three main datasets; GIS Symbology is colour coded to provide visual separation.

- WATERSUPPLY (BLUE SYMBOLOGY)
- WASTEWATER (RED SYMBOLOGY)
- STORMWATER (GREEN SYMBOLOGY)

Each dataset contains a set of "features" that describe recorded assets by dividing them into point, polyline or polygon feature classes. For example; a manhole will be located in a point feature class and a pipe will be located in a polyline feature class. Assets that require a calculated area of coverage are represented by a polygon feature class - eg. to display the perimeter of an on-site wastewater disposal field. Facility building footprints may also be mapped using polygon feature classes.

1.1 FEATURE CLASSES & UNIT SUBTYPES

Feature Classes and Unit subtypes are allocated to Datasets according to the following tables; (GIS Colour coding is applied).

WATERSUPPLY

Point Features

Feature Class	UNITTYPE	Description
Hydrant	**HYDRANT**	Fire hydrants
Meter	**FLOW**	Bulk flow meters on mains
Meter	**DOMESTIC**	Domestic water meter located at Toby location on lateral
Node	**JUNCTION**	General pipe junction (Tee, Y, etc)
Node	**END**	End cap
Node	**SAMPLE**	Water quality sampling point
Node	**MISC**	Other nodes, fittings, outlet, bore etc
Valve	**VALVE**	Ball, Gate, Sluice etc
Valve	**AIR**	Air valve
Valve	**PRESSURE**	Pressure reducing, sustaining
Valve	**TOBY**	Toby (on lateral)
Backflow	**2XCV**	Double Check Valve
Backflow	**2XCV-T**	Testable Double Check Valve
Backflow	**A-VB**	Atmospheric Vacuum Breaker
Backflow	**P-VB**	Pressure Vacuum Breaker
Backflow	**RPZ**	Reduced Pressure Zone Device
Backflow	**AIR GAP**	Air Gap

Line Features

Feature Class	UNITTYPE	Description
Main	**MAIN**	Water main
Main	**FALL**	Falling main (reservoir to watermain). No laterals
Main	**RIDER**	Small pipe feeding laterals from main
Main	**RISING**	Rising main (line out of pump station). No laterals
Main	**RACE**	Water race
Lateral	**LATERAL**	House connection (service line)

Polygon Features

Feature Class	UNITTYPE	Description
Pump Station	**TRANSFER**	Transfer pump station
Treatment Plant	**WATERTREAT**	Water treatment plant site (including tanks, pumps etc)
Reservoir	**WATERTANK**	Water reservoir site (including tanks, telemetry, valves etc)
Miscellaneous	**BASE**	?
Miscellaneous	**CABINET**	?
Miscellaneous	**REPEATER**	?

WASTEWATER

Point Features

Feature Class	UNITTYPE	Description
Manhole	**MANHOLE**	Standard manhole
Manhole	**CHAMBER**	Chamber box
Manhole	**LAMPHOLE**	Small manhole / inspection point
Manhole	**PRESSURE**	Pressurised junction
Node	**JUNCTION**	General pipe junction (Tee, Y, etc)
Node	**BEND**	Pipe bend
Node	**END**	End cap
Node	**WEIR**	Weir
Node	**MISC**	Other nodes (outlet etc)
Valve	**VALVE**	Ball, Gate, Sluice etc
Valve	**AIR**	Air valve
Valve	**NON RETURN**	Non return valve

Line Features

Feature Class	UNITTYPE	Description
Main	**SEWER**	Sewer main (gravity line)
Main	**TRUNK**	Main sewer line (large diameter). No laterals
Main	**RISING**	Pressurised rising main (line out of pump station)
Main	**OUTFALL**	Sewer Outfall
Lateral	**LATERAL**	House connection (service line)

Polygon Features

Feature Class	UNITTYPE	Description
Pump Station	**SEWERPUMP**	Sewer pump station
Treatment Plant	**SEWERTREAT**	Sewer treatment plant site (including tanks, pumps etc)

STORMWATER

Point Features

Feature Class	UNITTYPE	Description
Manhole	**MANHOLE**	Standard manhole
Manhole	**CHAMBER**	Chamber box
Manhole	**LAMPHOLE**	Small manhole / inspection point
Meter	**FLOW**	Stormwater flow meter (Gauge)
Node	**JUNCTION**	General pipe junction (Tee, Y, etc)
Node	**END**	End cap
Node	**MISC**	Other nodes
Valve	**VALVE**	Gate valve etc
Inlet	**MUDTANK**	Cesspit, sump, mudtank, catchpit
Inlet	**SOAKPIT**	Soak pit (typically from mudtank)
Structure	**INTAKE**	Inlet to pipe network (headworks etc)
Structure	**INTERCEPT**	Pollution interceptor
Structure	**OUTLET**	Outlet from pipe network (distilling basin, soakage area) etc)

Line Features

Feature Class	UNITTYPE	Description
Main	**STORM**	Stormwater main
Main	**DRAINCOIL**	Perforated subsoil drain
Main	**MUDTANK**	Mudtank (sump) connection
Channel	**CULVERT**	Culvert
Channel	**CHANNEL**	Formed watercourse
Channel	**IRRIGATION**	Irrigation channel
Channel	**OVERLANDFP**	Overland Flowpath
Lateral	**LATERAL**	House connection (service line)

Polygon Features

Feature Class	UNITTYPE	Description
Storage Basin	**BASIN**	Storage/Retention basin
Pump Station	**PUMP STATION**	Stormwater Pump Station

SECTION 4 – DATA ATTRIBUTES

2.1 ATTRIBUTE FIELDS

The attributes required per feature depend on the Feature Type. All features have a group of common attributes. Some Feature Types require further specific attributes. The attributes required per Feature Type are listed in the tables below. The attribute fields designated for **remote collection** are indicated in PURPLE. The underlined attribute names also need to be populated by predefined values (Look up Tables).

2.1.1 COMMON ATTRIBUTE FIELDS FOR ALL FEATURES

Name	Field Type	Field Length	Alias/Description	Lookup Table
UNITDESC	Text	300	Unit Description	
ZCOORD	Double		Surface or Lid-Level Elevation (m) AMSL	
COMMENTS	Text	254	Comments	
INSTDATE	Date		Installation Date	
***ASBUILT**	Text	10	QLDC RM Reference or CAPEX Ref.	
SERVSTAT	Text	10	Service Status	5.5
UNITTYPE	Text	10	Feature Unit Type	1.1
OWN	Text	10	Asset Owner.	5.4
DP_REF	Text	10	Subdivision DP/LT Ref.	
ADDDBY	Text	20	Added By (Name)	
ADDDTTM	Date		Added on (Date)	
DATA_SRC	Text	20	Data Supplied By (Survey Firm)	
MODBY	Text	20	Last Modified By (Name)	
MODDTTM	Date		Last Modified on (Date)	
COMPKEY	Long		Component Key	
COMPTYPE	Long		Component Code	5.1
CONFIDENCE	Text	10	Data Quality Rating	5.12
SCHEME	Text	15	QLDC Infrastructure Network Scheme Name	5.14

*RM references should be in the format **RM012345.** If applicable, add the suffix indicating subdivision stage. eg. **RM12345_1B**

The following features require only the common attributes:

STORMWATER: **INLET, STRUCTURE, PUMP STATION, STORAGE BASIN**

WASTEWATER: **PUMP STATION, TREATMENT PLANT**

WATERSUPPLY: **HYDRANT, NODE, RESERVOIR, PUMP STATION, TREATMENT PLANT, MISCELLANEOUS**

2.1.2 ATTRIBUTE FIELDS FOR POINT FEATURES

Unique Attributes for STORMWATER, WATERSUPPLY & WASTEWATER METER

Name	Field Type	Field Length	Alias/Description	Lookup Table
METERSZ	Double		Nominal Diameter (mm)	
MODELNO	Text	20	Model Number	
INVERTELEV	Double		Invert Elevation (m) AMSL	

Unique Attributes for STORMWATER & WASTEWATER MANHOLE

Name	Field Type	Field Length	Alias/Description	Lookup Table
CVRDIAM*	Double		Lid Diameter (mm)	
BARLDIAM	Double		Manhole Internal Diameter (mm)	
HYDIST *	Double		Invert Elevation (m) AMSL	
WALLTYPE	Text	10	Manhole Construction Material	5.9
MHDEPTH *	Double		Manhole Depth (m)	

*** Not required for LAMPHOLE UNIT TYPES**

Unique Attributes for STORMWATER, WATERSUPPLY & WASTEWATER NODE

Name	Field Type	Field Length	Alias/Description	Lookup Table
INVERTELEV *	Double		Invert Elevation (m) AMSL	

***Not required for BEND or JUNCTION UNIT TYPES**

Unique Attributes for STORMWATER, WATERSUPPLY & WASTEWATER VALVE

Name	Field Type	Field Length	Alias/Description	Lookup Table
VALVESZ	Double		Nominal Diameter (mm)	
VLVFUNCTION	Text	15	Valve Function/Type	5.13
MODELNO	Text	20	Model Number	
INVERTELEV	Double		Invert Elevation (m) AMSL	
VALVSTAT	Text	15	Valve Status (open/closed)	5.10
SERNO	Text	20	Valve Serial Number	

2.1.3 ATTRIBUTE FIELDS FOR POLYLINE FEATURES

Unique Attributes for WATERSUPPLY MAIN

Name	Field Type	Field Length	Alias/Description	Lookup Table
PIPEDIAM	Double		Nominal Internal Diameter (mm)	
* PIPEDIAM2	Double		External Diameter (mm)	
CLASS	Text	20	Pipe Class / PN	5.11
PIPETYPE	Text	10	Pipe Material	5.6
JTTYPE	Text	10	Pipe Joint Type	5.3
DPTH	Double		Typical cover depth to pipe (mm)	
PIPELEN	Double		Pipe Length (m)	

***PE pipes only.**

Unique Attributes for STORMWATER & WASTEWATER MAIN

Name	Field Type	Field Length	Alias/Description	Lookup Table
PIPEDIAM	Double		Nominal Internal Diameter (mm)	
* PIPEDIAM2	Double		External Diameter (mm)	
CLASS	Text	20	Pipe Class / PN	5.11
PIPETYPE	Text	10	Pipe Material	5.6
JTTYPE	Text	10	Pipe Joint Type	5.3
PIPELEN	Double		Pipe Length (m)	
UPSELEV	Double		Upstream Invert Elev (m) AMSL	
DWNELEV	Double		Downstream Invert Elev (m) AMSL	

* **PE pipes only.**

Unique Attributes for STORMWATER, WATERSUPPLY & WASTEWATER LATERAL

Name	Field Type	Field Length	Alias/Description	Lookup Table
PIPEDIAM	Double		Nominal Internal Diameter (mm)	
* PIPEDIAM2	Double		External Diameter (mm)	
CLASS	Text	20	Pipe Class / PN	5.11
PIPETYPE	Text	10	Pipe Material	5.6
JTTYPE	Text	10	Pipe Joint Type	5.3
PIPELEN	Double		Pipe Length (m)	
SRVTYPE	**Text**	**10**	**Connection Type**	5.8

* **PE pipes only.**

Unique Attributes for STORMWATER CHANNEL

Name	Field Type	Field Length	Alias/Description	Lookup Table
UPSELEV	Double		Upstream Invert Elev (m) AMSL	
DWNELEV	Double		Downstream Invert Elev (m) AMSL	
CONMATL	Text	10	Stormwater Channel Surface Type	5.2
CHANSHAPE	Text	10	Channel Shape	
PIPELEN	**Double**		**Pipe Length (m)**	

SECTION 5 – PREDEFINED ATTRIBUTE VALUES

The following tables list pre-defined attribute values that are to be used in **UPPER CASE**. Values are GIS colour coded where specific to a particular dataset. Un-colored values apply across all three datasets.

5.1 COMPTYPE VALUE LOOK-UP TABLES

COMPTYPE Points – Feature Type

Value	Description
12	WaterSupply Hydrant
42	WaterSupply Meter
43	WaterSupply Node
46	WaterSupply Valve
22	Wastewater Manhole
24	Wastewater Node
35	Wastewater Valve
30	Stormwater Manhole
32	Stormwater Node
29	Stormwater Inlet (Mudtank/Soakpit)
49	Stormwater Valve
88	Stormwater Meter
72	Stormwater Structure (Inlet/Outlet Headwall or Intercepter)

COMPTYPE Polyline – Feature Type

Value	Description
41	WaterSupply Main
45	WaterSupply Lateral
21	Wastewater Main
26	Wastewater Lateral
31	Stormwater Main
28	Stormwater Channel
33	Stormwater Lateral

COMPTYPE Polygon – Feature Type

Value	Description
78	WaterSupply Pump Station
99	WaterSupply Treatment Plant
86	WaterSupply Reservoir
70	WaterSupply Miscellaneous
15	Wastewater Pump (Lift) Station
98	Wastewater Treatment Plant
77	Stormwater Pump (Lift) Station
108	Stormwater Storage Basin

5.2 CONMATL VALUE LOOK-UP TABLES

CONMATL (Stormwater Channel Surface Type)

Value	Description
CONC	Concrete Lined
TIMBER	Timber Lined
EARTH	Earth
GRASS	Grass

5.3 JTTYPE LOOK-UP TABLES

JTTYPE (Pipe Joint Type)

Value	Description
CERAMIC	Ceramic Mortar
RRJ	Rubber Ring
WELD	Fusion Welded
SOLVENT	Solvent
LEAD	Lead
BUTT	Butt
GIBAULT	Gibaulted
ZLOCK	Z-Lock (for DI)
FLANGE	Flange Bolted

5.4 OWN LOOK-UP TABLES

OWN (Ownership)

Value	Description
PENDING	QLDC – Pending Asset Vesting
REGION	Otago Regional Council
PRIVATE	Private Ownership

5.5 SERVSTAT LOOK-UP TABLES

SERVSTAT (Service Status)

Value	Description
PROPOSED	Proposed
ACTIVE	Active (In Use or for a new subdivision)
INACTIVE	Out of Service (Not in Use)
ABANDONED	Abandoned
REMOVED	Removed

5.6 PIPETYPE LOOK-UP TABLES

PIPETYPE (Pipe Material)

Value	Description
AC	Asbestos Cement
ALK	Alkathene
CI	Cast Iron
CLSTEEL	Concrete Lined Steel
CLDI	Concrete Lined Ductile Iron
CONC	Concrete
COP	Copper
DI	Ductile Iron
EPOXY	Epoxy Lined
EW	Earthenware
GI	Galvanised Iron
NOVA	Drain Coil
PE100	Polyethylene (High Density)
PE80	Polyethylene (Medium Density)
MPVC	M-Polyvinyl Chloride
PP	Polypropylene
PVC	Polyvinyl Chloride
PVCo	Polyvinyl Chloride (Orientated)
STEEL	Steel
SRSTEEL	Spiral Riveted Steel
SSTEEL	Stainless Steel
UPVC	U-Polyvinyl Chloride

5.7 CHANSHAPE LOOK-UP TABLES

CHANSHAPE (Channel Shape)

Value	Description
NATURAL	Natural Channel / Watercourse
BOX	Box Channel
TRAP	Trapezoidal
DISH	Dished Channel
COMB	Combination

5.8 SRVTYPE LOOK-UP TABLES

SRVTYPE (Connection Type)

Value	Description
RESSTD	Standard Residential
RESMULTI	Residential (Multi-unit)
RESRURAL	Rural Residential
VISITOR	Visitor Accommodation
COMIND	Commercial / Industrial
FARM	Farm (with stock)
SEWERPS	Sewer Pump Station
TOILET	Public Toilet
PARKS	Parks
HOSPITAL	Hospital
SCHOOL	School
OTHCOM	Other Community (Church etc)
POOL	Swimming Pool
FIRE	Fire Fighting
DIALYSIS	Dialysis Connection

5.9 WALLTYPE LOOK-UP TABLES

WALLTYPE (Manhole Material)

Value	Description
CONC	Concrete
STEEL	Steel
POLY	Polyethylene
OTHER	Other

5.10 VALVSTAT LOOK-UP TABLES

VALVSTAT (Valve Operational Status)

Value	Description
Open	Valve open
Closed	Valve closed

5.11 CLASS LOOK-UP TABLES

CLASS (Pipe Class / Pressure Rating)

Value	Description
X	Class 2 Pipe (X)
Y	Class 3 Pipe (Y)
Z	Class 4 Pipe (Z)
SN4	SN4
SN6	SN6
SN8	SN8
SN10	SN10
SN16	SN16
PN4	PN4
PN8	PN8
PN10	PN10
PN12.5	PN12.5
PN16	PN16
PN20	PN20

5.12 CONFIDENCE LOOK-UP TABLES

CONFIDENCE (Data Collection Quality Rating)

Value	Description
High	Survey Quality/GPS
Medium	Non-Survey Quality/Handheld Device
Low	Manual Approximation

5.13 VLVFUNCTION LOOK-UP TABLES

VLVFUNCTION (Valve Function/Use)

Value	Description
BOUNDARY	Boundary (Zone) Valve
LINE	Line Valve
INLET	Inlet Valve
OUTLET	Outlet Valve
SURGE	Surge Valve
WASHOUT	Washout Valve
INTERCON	Interconnection Valve

5.14 SCHEME LOOK-UP TABLES

SCHEME (QLDC Network Scheme Name)

Value	Description
FERNHILL	Fernhill
FRANKTON	Frankton
QUEENSTOWN	Queenstown
KELVIN HTS	Kelvin Heights
QUAIL RISE	Quail Rise
WANAKA	Wanaka
LAKE HAYES	Lake Hayes
LUGGATE	Luggate
ARROWTOWN	Arrowtown
GLENORCHY	Glenorchy
ARTHURS PT	Arthurs Point
LAKE HAWEA	Lake Hawea
QTOWN CBD	Queenstown CBD
ALBERT TN	Albert Town
MAKARORA	Makarora
GIBBSTON	Gibbston Valley
NO SCHEME	No Scheme