



Drinking Water Model Update

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April 16-17, 2019

- ❖ Objectives/Schedule Update
- ❖ Community Profiles and Categories
- ❖ Information Request Tracking Update
- ❖ Geographic Information System (GIS) Mapping
- ❖ Hydraulic Model
- ❖ Next Steps

☐ Potable Water Supply (PWS) System – Hydraulic Models

- Evaluate current water supply systems and potential integration
- Hydraulic Model as a tool for development and evaluation of water supply alternatives
- Evaluate feasibility of these alternatives for 2020 through 2040 conditions.
- Collaboration with groundwater modeling efforts

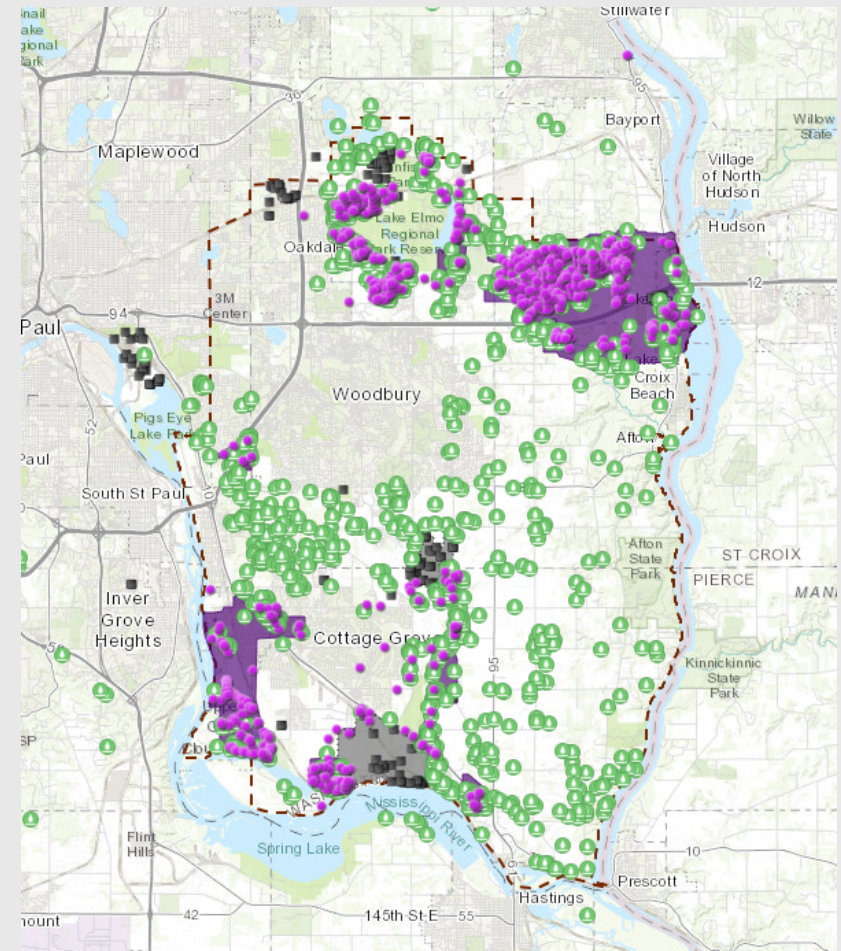
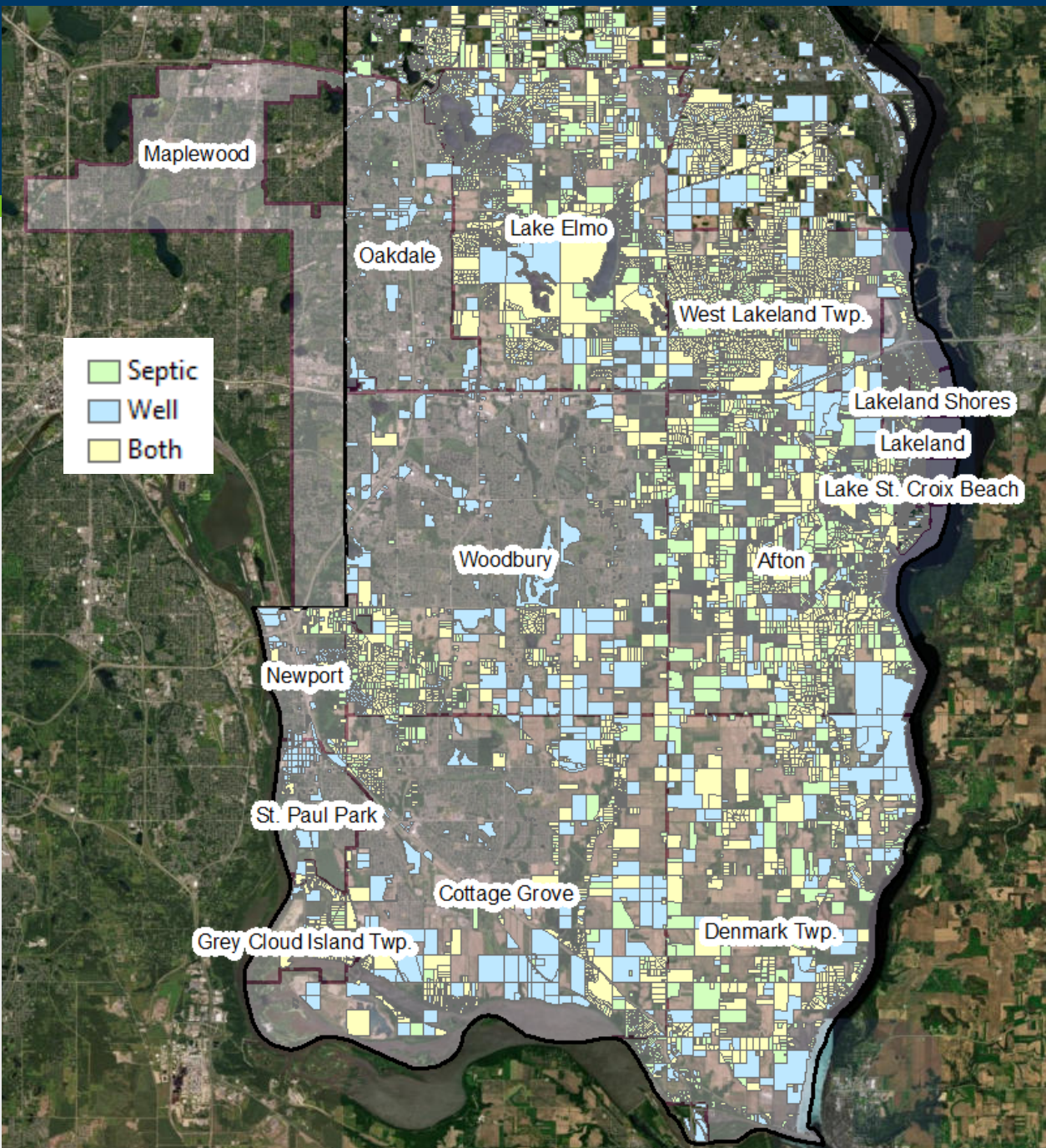
☐ Public Water Supply Model Schedules

- Task 1 – Construct integrated depiction of existing infrastructure
 - Include communities' capital improvement program (CIP) projects within the next two (2) years
 - Update water use demands for 2020
 - Distribute integrated model framework and assumptions to communities for review and feedback
 - Complete setup of initial base model of existing infrastructure and demands by May 3, 2019
- Task 2 – Use models to evaluate alternatives
 - Test hydraulic feasibility and requirements for each alternative based on the integrated model
 - Update water use demands for 2040 to determine long-term impacts
 - Reconcile alternatives with comprehensive plans and proposed infrastructure projects

☐ Community Categories

- Private Wells Only – mostly rural townships
 - Afton, Denmark, Grey Cloud Island, Prairie Island Indian Community, West Lakeland, other Washington County
- Data Supplied by Washington Co. and the Minnesota Well Index
- Supplemented by Septic Tank data
- Will not be modeled but mapped in GIS
- Wells will be used in spatial analysis depending on GW model and extent of contamination.

❖ Private Wells



☐ Community Categories

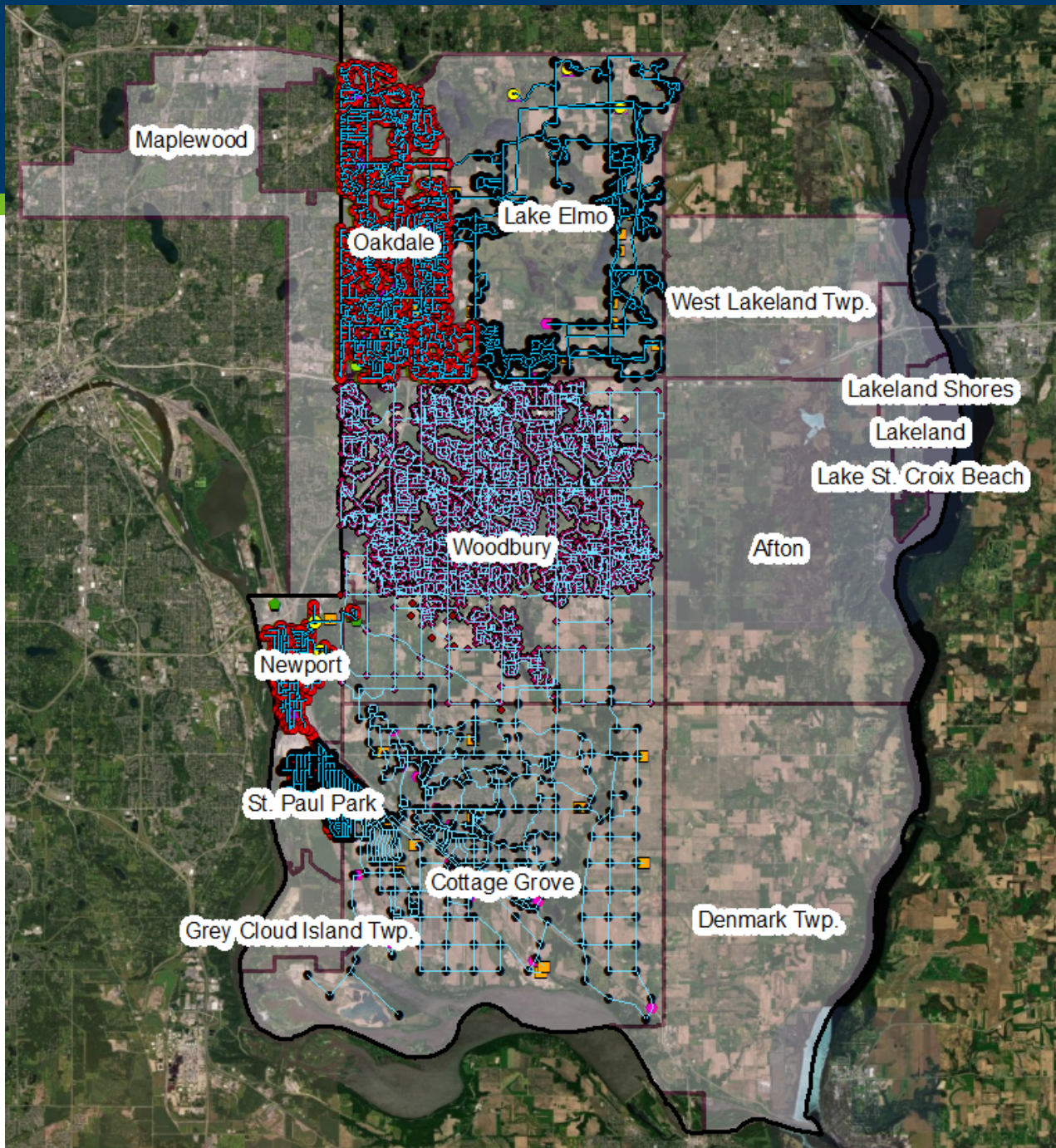
- Public Water Supply and Private Wells – suburban and rural residential
 - Cottage Grove – WaterCAD and GIS,
 - Oakdale – WaterCAD and GIS,
 - Newport – GIS
 - Lake Elmo – InfoWater/GIS
 - St. Paul Park – InfoWater/GIS
 - Woodbury – InfoWater/GIS Requested Additional Files
 - Lakeland – SEH Gathering Old WaterCAD
 - Maplewood – GIS

❖ INFORMATION REQUEST TRACKING UPDATE

□ Information Requested from Communities








- Task Objective – collect system information necessary to populate data fields for Existing Infrastructure Base Model
- Initial Data Request List
- GIS Mapping
- Working with communities:
 - Request missing information
 - Clarify operational data
 - Verify assumptions with communities and gather feedback
- Tracking spreadsheet available on SharePoint Site

❖ GIS Mapping



- Importance of GIS Mapping:
 - Need to map PWS in GIS for spatial analysis
 - GIS intermediary between InfoWater and WaterCAD
 - GIS mapping simplified WaterCAD import process.
- GIS Process:
 - GIS data was organized for consistency between communities and formatted for WaterCAD

❑ Conversion of GIS Elements to WaterCAD elements

- Wells → Reservoirs 
- Mains and laterals → Pipes 
- Control and System Valves → PRVs & GPs 
- Pumps 
- Tanks 
- Junctions 
- Hydrants 

FID	Shape *	LABEL	GIS_ID	IS_ACTIVE	ZONE	DIAMETER	MATERIAL	HW_C	LENGTH_S	USER_LD	Source
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2	Polyline		NEW-PIP-0003	1		6	Cast Iron	0	0	0	MPCA_DataRequer
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Properties - Pipe - P-49 (967)

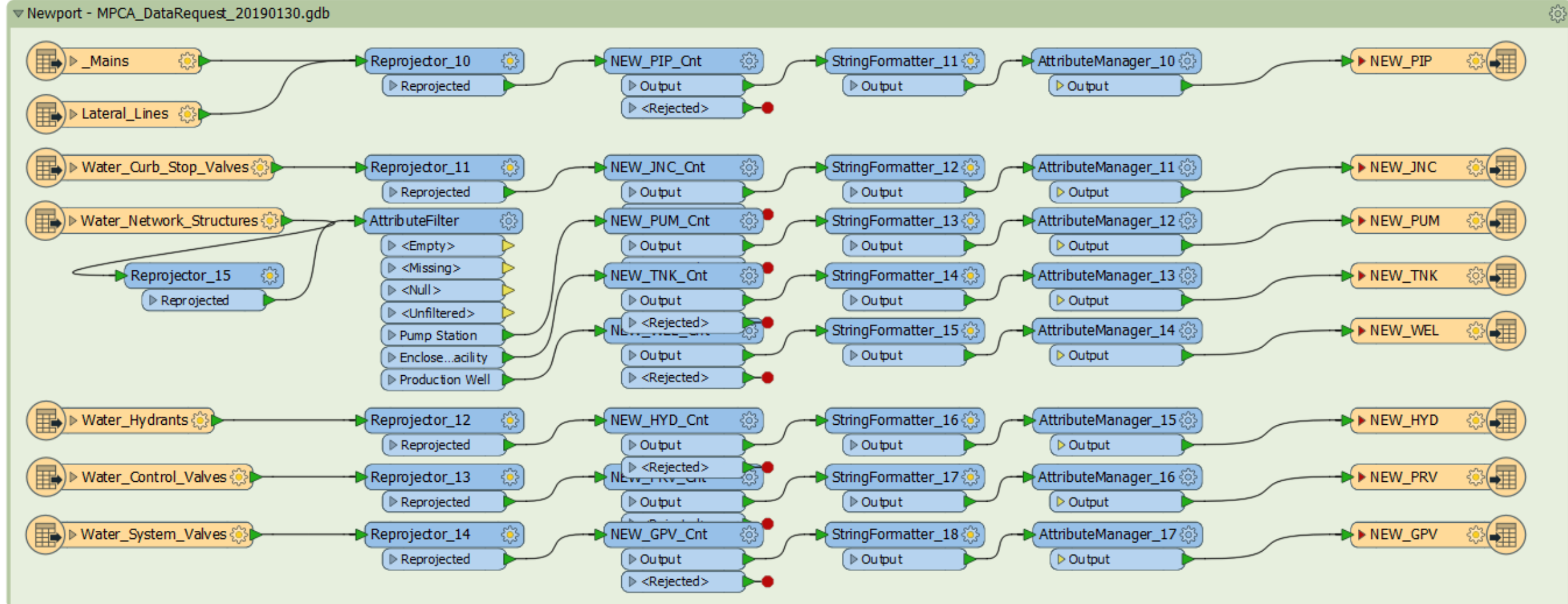
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Property Search

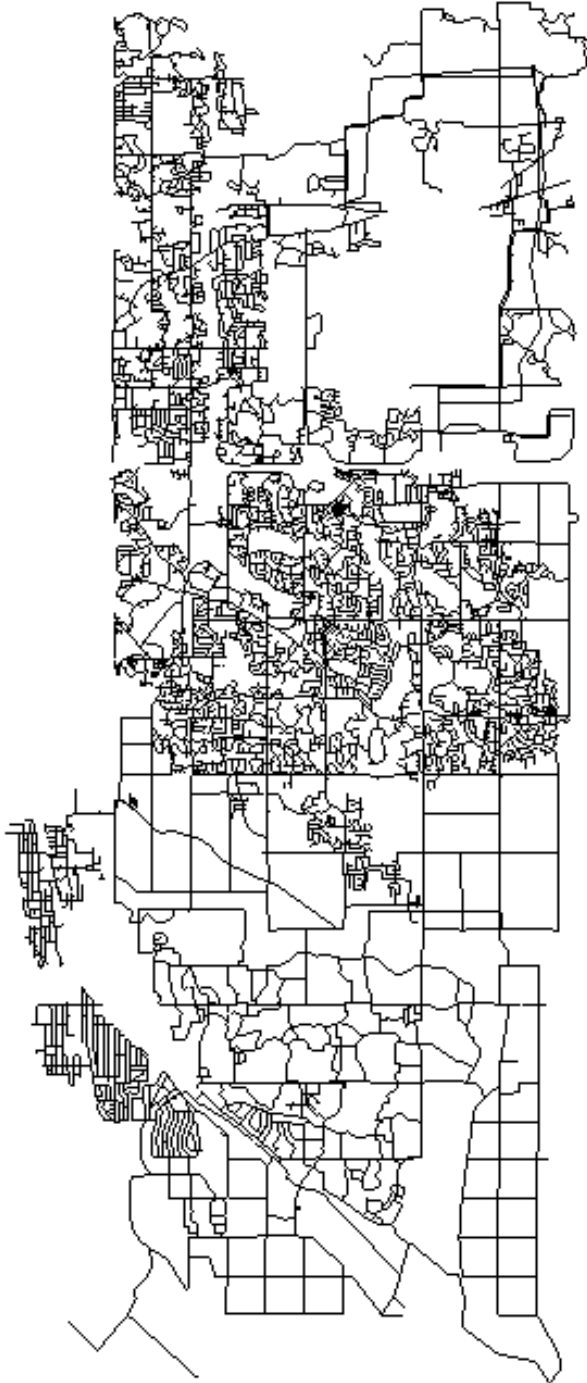
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 - Label: P-49
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 - Description:
 - Hyperlinks: <Collection: 0 items>
 - Start Node: J-40
 - Stop Node: J-29
 - Node Reversal: <Reverse Start/Stop>
- <Geometry>**
 - Geometry: <Collection: 2 items>
- Active Topology**
 - Is Active?: True
- Failure History**
 - Number of Breaks: 0
 - Use Local Duration of Pipe Failure Hist: False
 - Duration of Pipe Failure History (years): 0
 - Pipe Break Group: <None>
 - Cost of Break (\$): 0.00
- Initial Settings**
 - Status (Initial): Open
- Operational**
 - Controls: <Collection>
- Physical**
 - Zone: <None>
 - Diameter (in): 12.0
 - Material: Ductile Iron
 - Hazen-Williams C: 120.0
 - Has User Defined Length?: True
 - Length (User Defined) (ft): 1.440
 - Length (ft): 1.440
 - Has Check Valve?: False
 - Specify Local Minor Loss?: True
 - Minor Loss Coefficient (Local): 0.000
 - Installation Year: 0
- Transient (Physical)**
 - Wave Speed (ft/s): 0.00
- Water Quality**
 - Specify Local Bulk Reaction Rate?: False
 - Bulk Reaction Rate (Local) ((mg/L)¹⁻ⁿ): 0.000
 - Specify Local Wall Rate?: False
 - Wall Reaction Rate (First Order) (ft/day): 0.000
- Results**
 - Flow (gpm): -557
 - Velocity (ft/s): 1.58
 - Headloss Coefficient (ft/ft): 0.001

❖ GIS to WaterCAD



- ❑ Creating uniform/consistent shapefiles for each community
- ❑ Importing shapefiles into WaterCAD models
 - Standardized import process
 - Existing vs. proposed conditions
 - Creation of junctions
 - Connectivity of pipes
 - Enabled QA/QC
- ❑ Currently importing and requesting info or making assumptions

❖ WaterCAD Models



❑ Existing WaterCAD Models

- Oakdale
- Cottage Grove
- Lakeland

❑ Imported Models

- St. Paul Park (InfoWater)
- Lake Elmo (InfoWater)
- Woodbury (InfoWater)
- Newport (GIS)

- Work with communities and consultants to collect any missing data and verify assumptions
- Gather feedback
- Calibrate model and perform QA/QC
- Provide completed initial base model by May 3rd

- Develop and evaluate feasibility of alternatives
- Work with communities for 2040 scenarios
- Incorporate groundwater modeling efforts

Thank you!

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