

Water System Asset Management

Small System Case Study



Millersburg Area Authority, Millersburg, PA

By:

Jere Troutman

Jere Troutman -- Background

- Retired as Manager of Millersburg Area Authority in 2015
- Currently serving as DEP Outreach Assistance Provider – assist small water systems with developing Asset Management Plans



Description of Water System

- Millersburg Area Authority is a Municipal Water and Sewer Authority, located in Dauphin County, Pennsylvania.
- The water company was originated in 1890 as a privately owned company, and was purchased by the Authority in 1948.

Then (1971)

- Serve 1200 Customers (0.250 MGD)
- 3 Functional Wells (0.300 MGD)
- 6 Springs (surface water impacted) (0 to 0.6 MGD)
- Treatment Plant – Disinfection only (0.300 MGD)
- 1 MG Open Concrete Reservoir
- 14 Miles – Mains (8 miles >75 years)
- Incomplete System Map
- 62% Unaccounted-For Water
- Declining Rate Structure – some < Production Cost
- No Budget or Capital Improvements Plan

By 2016

- Served 2000 Customers (0.340 MGD)
- 9 Wells, 6 Springs & Surface Intake (1.4 MGD)
- Filter Plant (1 MGD)
- 3 Standpipes (2.5 MG)
- 28 Miles of Mains
 - by 2016: <1 mile > 75 years
- GIS / Mapping
- 10% Unaccounted-For Water
- One Rate per 1,000 Gallons
- Budgets, 20 year Capital Improvement Plan

Geographic Information System (GIS)-Based Asset Management

- Initial intent was to establish a standard mapping system
- Discussed with our engineer & reviewed current mapping/records
- Recommended ESRI Arc View version 3.2 GIS
- Currently use ESRI version Arc 10.1



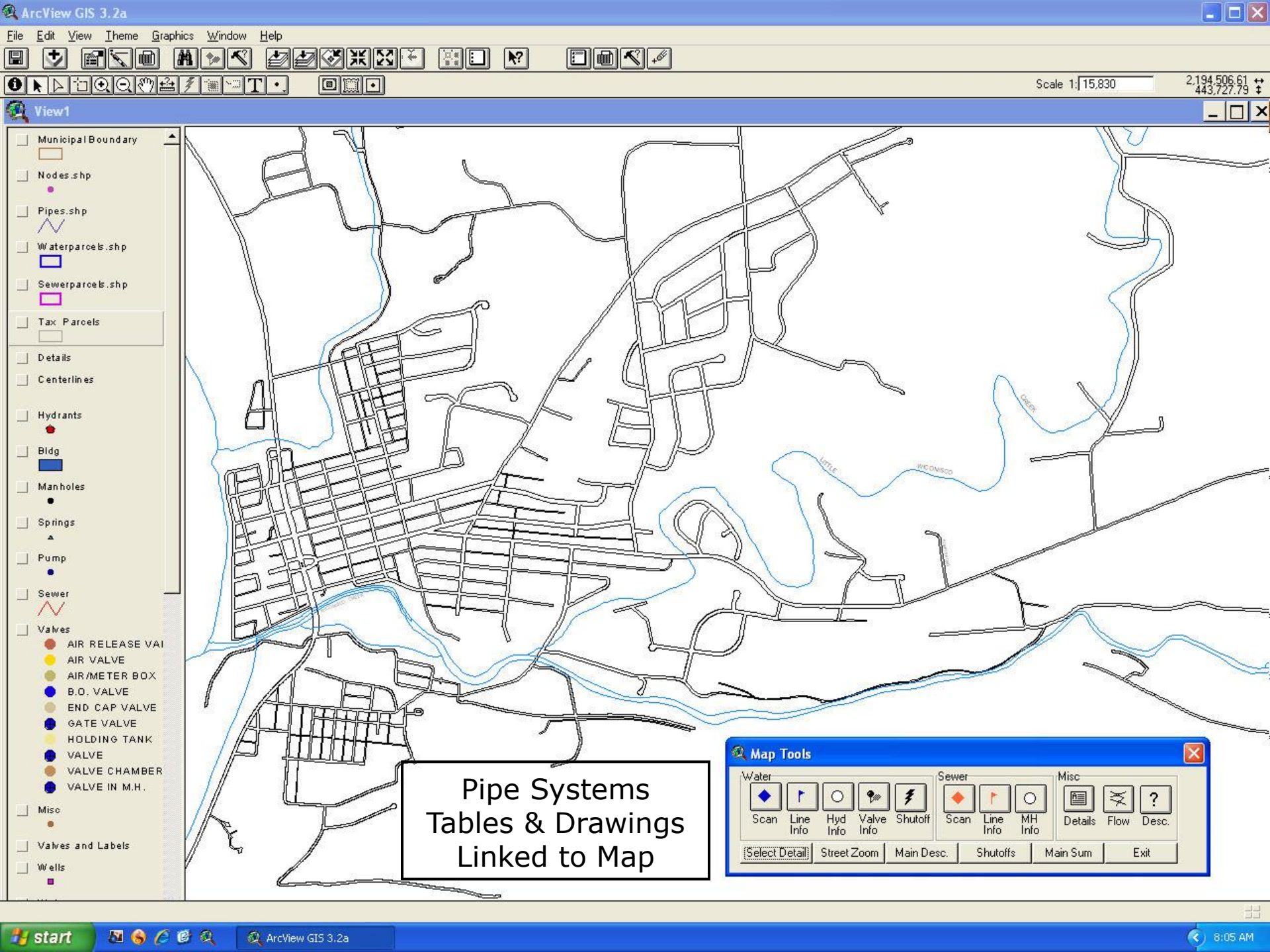
Geographic Information System (GIS)

Developed by: Gannett Fleming / GEO Decisions
ESRI ARC – View Software

- Initiated in 1998
- Seamless Base Mapping of our Water & Sewer Systems
- Added Themes (Layers) from our County GIS
 - Aerial Photos
 - Tax Parcels & Related Data

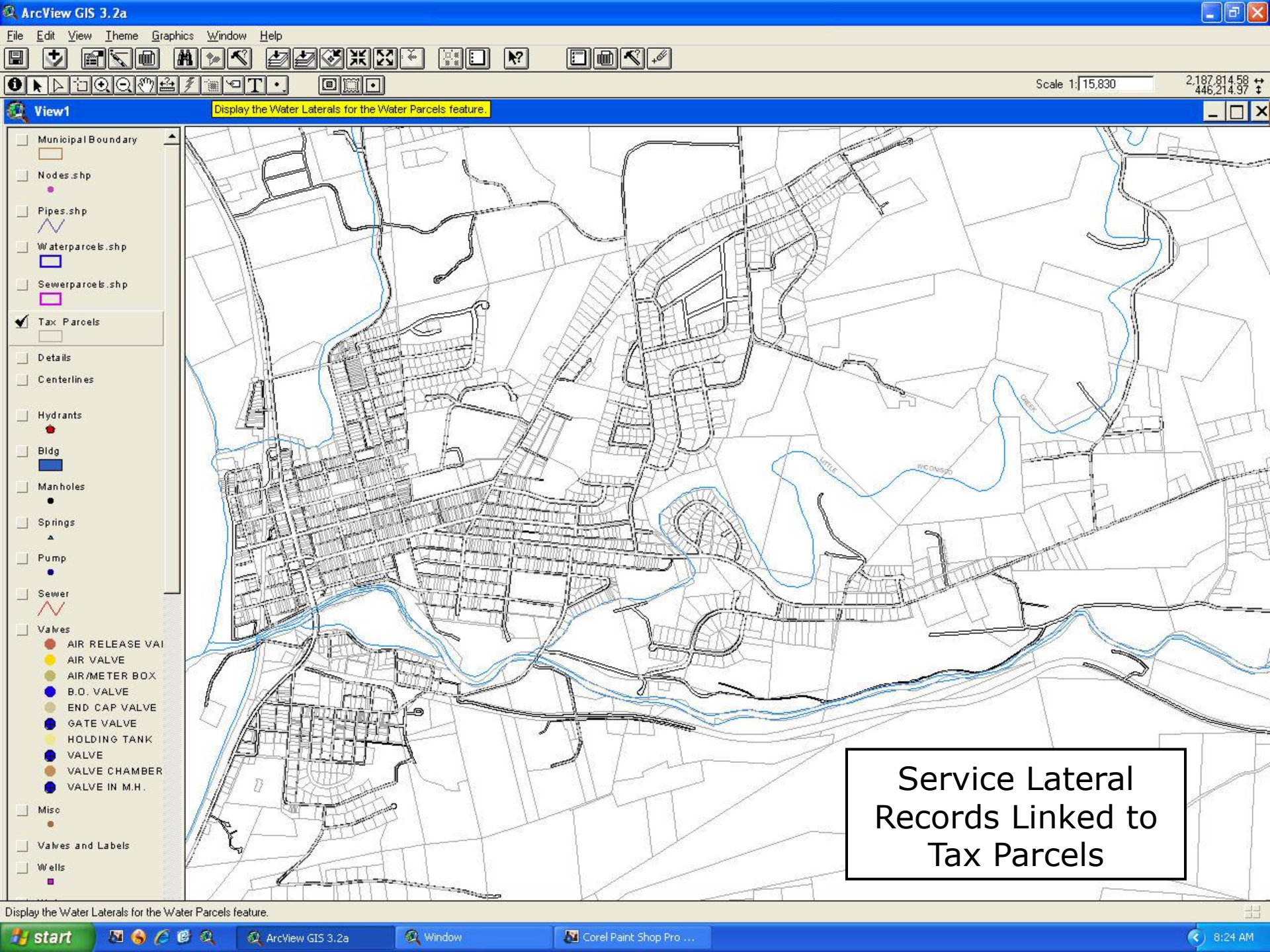
Geographic Information System (GIS)

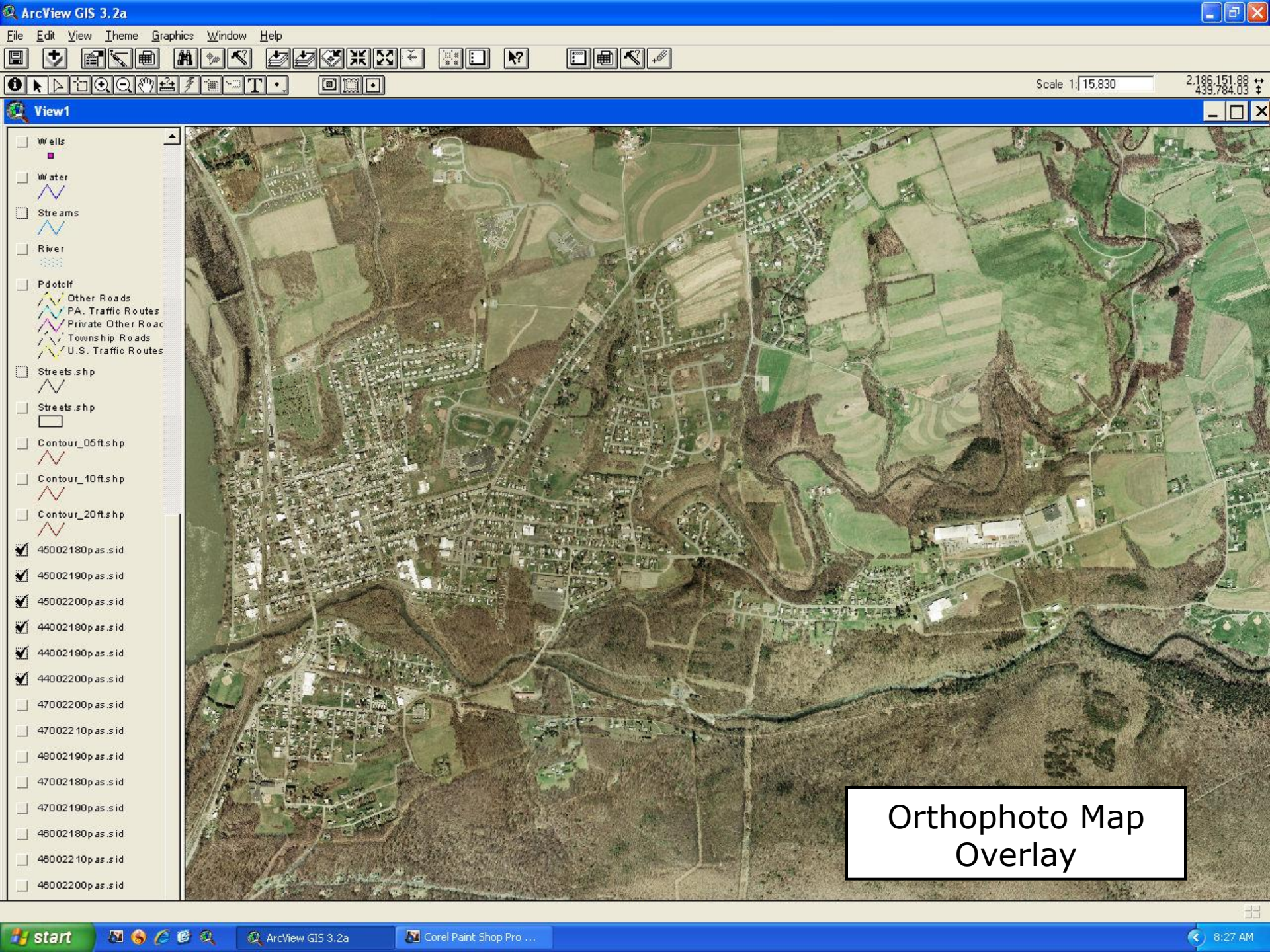
- Incorporated > 3,000 Scans, linked to specific features or areas
 - Detailed Construction Drawings up to 24" x 36"
 - Record of Every Main in the System
 - Record of Every Main Line Valve in the System
 - Record of Every Fire Hydrant in the System
 - Individual Property Water Service Line Reports
 - Water Supply Well Report Sheets
- Select a feature to display a scan and, if desired, print the scan



Geographic Information System (GIS)

- Can display identification of mains, valves, hydrants, wells & other related facilities with:
 - Descriptions
 - I.D. #'s
- Historic Information i.e. :
 - Maintenance Performed
 - Repairs Made
 - Installation Date







Geographic Information System (GIS)

- Incorporated water distribution system model – flow and pressure data
- Available to our operators at their respective facilities

Water Main Condition Rating

Rating	Pipe Condition Description			Score
1	Excellent			6
2	Good			7 to 8
3	Fair			9 to 14
4	Poor			15 to 17
5	Severe Problems			18

	<u>1 Point</u>	<u>2 Points</u>	<u>3 Points</u>
Age	<31 Years	31 to 75 Years	>75 Years
Tuberculation	Minor	Moderate	Severe
Exterior Corrosion	Minor	Moderate	Severe
Water Quality Problems	Minor	Moderate	Severe
Pipe Breaks	Minor	Moderate	Severe
Accessibility for Repairs	Minor	Moderate	Severe
(Degree of Difficulty)			

Water Main Condition Rating

Example

				<u>Score</u>
Age	32 years	=	2 Points	
Tuberculation	Severe	=	3 Points	
Water Quality Problems	Severe	=	3 Points	
Pipe Breaks	Moderate	=	2 Points	
Accessibility for Repairs	Moderate	=	2 Points	
Total		=	12 Points	

12 Points is a *Fair* condition with a rating of 3.

Water Main Condition Rating

Column N

Column P

RATING: (Total Score of 6) = **1 = Excellent**; (7 to 8) = **2 = Good**:
(9 to 14) = **3 = Fair** (15 to 17) = **4 = Poor**; (18) = **5 = Severe Problems**

RATING	POINTS (1 Minor; 2= Moderate; 3=Severe Problems)						TOTAL SCORE	Rating Date	Age	Age
	Age	Tuberculation	Exterior Corrosion	Wr.Quality Problems	Pipe Breaks	Ease of Repairs			(Years)	(Rating)
1	1	1	1	1	1	1	6	2016	25	1
1	1	1	1	1	1	1	6	2016	20	1
2	2	1	1	1	2	1	8	2016	35	2
2	2	1	1	1	1	1	7	2016	33	2
2	2	1	1	1	1	1	7	2016	33	2
3	3	2	1	1	2	3	12	2016	84	3
1	1	1	1	1	1	1	6	2016	6	1
1	1	1	1	1	1	1	6	2016	30	1

Budgeting – Annual & Long Term

- Budgeting/Rate Committee – Board Members & Manager
- Various Funds Established for Long Term Capital Improvements and Maintenance Needs
- Projects are prioritized based on need, and other project scheduling (i.e. Township road projects)

Water Department Budget

Special Project/Capital Improvm't Fund (2016-2018)

	Budgeted 2016	Budgeted 2017	Budgeted 2018
.			
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Cash Balance from prev. year....	\$365,000	\$385,000	\$460,000
Projected Income.....	\$665,000	\$685,000	\$705,000
Disbursements			
O & M Expenses.....	\$425,000	\$450,000	\$475,000
Projects.....	\$220,000	\$160,000	\$ 55,000
Balance	\$385,000	\$460,000	\$635,000

Water Department Budget

Breakdown of Balance (2016-2018)

<u>Breakdown of Balance</u>	Budgeted 2016	Budgeted 2017	Budgeted 2018
Standpipe Maintenance Fund.....	\$ 0	\$ 50,000	\$100,000
Equipment Replacement Fund....	\$ 2,000	\$ 9,000	\$ 18,000
Special Plant Maintenance Fund...	\$130,000	\$170,000	\$210,000
Water Meter Replacement Fund..	\$ 35,000	\$ 35,000	\$ 35,000
Capacity Expansion Fund(Tap Fees)	\$ 71,000	\$ 74,000	\$ 76,000
Special Projects and Capital Improvements	\$147,000	\$122,000	\$196,000
Total	\$385,000	\$460,000	\$635,000

Projects

2016

- Repaint Cloverly Acres Standpipe..... \$ 220,000

2017

- Rising Sun Booster Station Upgrade..... \$ 120,000
- Continue Water Meter Replacement..... \$ 40,000

2018

- Replace Water Plant Turbidimeters..... \$ 15,000
- Continue Water Meter Replacement..... \$ 40,000

Water Department – 2018

Rate Committee: B. Margerum, M. Riland, N. McCarron

Income..... \$705,000

Expenses

Operation Maint. Admin..... \$473,000 67%

Standpipe Maint. Fund..... \$ 50,000

Projects Fund/Meter Repl..... \$135,000

Eqpt / Vehicle Repl Fund..... \$ 7,000

Special Plant Maint. Fund..... \$ 40,000

\$232,000 33%

Total Expenses..... \$705,000

Projected Water & Sewer Rates

		<u>2016</u>	<u>2017</u>	<u>2018</u>
Water Rate/1000 Gal.		\$ 6.05	\$ 6.25	\$ 6.45
Sewer Rate/1000 Gal.		\$ 7.60	\$ 8.00	\$ 8.40
Average Water		\$24.20	\$25.00	\$25.80
Average Sewer		\$30.40	\$32.00	\$33.60
Monthly Total		\$54.60	\$57.00	\$59.40
		<u>x 12</u>	<u>x 12</u>	<u>x 12</u>
Annual Total		\$655.20	\$684.00	\$712.80

- MAA sends quarterly bills to 1/3 of the customers each month
- Average billing is based on usage 12,000 gallons per quarter (4,000 gal per month)

Summary

- Millersburg System Sustainability
 - Long-term Capital Improvement Plan
 - Projected budgeting to accommodate the plan
 - Establishment of Accounts for major maintenance projects and Capital Improvements Projects
 - Members of governing board assist in Planning/Budgeting
 - Document Benefits of Asset Management

