STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
WATER INFRASTRUCTURE BRANCH
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT KENTUCKY 40601

February 19, 2015

Mr. Joseph W. Anderson
Princeton WWTP
101 E Market St
Princeton, KY 42445

Re: Asset Inventory for
Princeton WWTP
Caldwell County, Kentucky
AI ID: 499; PLN20120001

Dear Mr. Anderson:

The Department for Environmental Protection, Division of Water (DOW) has reviewed the Asset Inventory Report for the Princeton WWTP dated May 3, 2012, and found it to conform to the requirements contained in administrative regulation 401 KAR 5:006.

The DOW accepts the Asset Inventory Report in lieu of a Facility Plan. Acceptance of the Asset Inventory is hereby given based on the attached Asset Inventory Assessment Report which provides recommendations related to facility planning, operation, and management in an effort to ensure continued compliance with applicable regulations and protection of the waters of the Commonwealth.

Any questions may be directed to our office at (502) 564-3410 or by e-mail to cindy.mcdonald@ky.gov.

Sincerely,

Cindy McDonald

Cindy McDonald, Supervisor
Wastewater Planning Section
Water Infrastructure Branch

CM
Attachment

cc: Jon Allen, Hethcoat & Davis, Inc.

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cc: Jon Allen, Hethcoat & Davis, Inc.

Steven L. Beshear
Governor

Leonard K. Peters
Secretary

Energy and Environment Cabinet
Department for Environmental Protection
Division of Water
300 Fair Oaks Lane
Frankfort, Kentucky 40601
Phone: (502) 564-2150
www.dep.ky.gov

R. Bruce Scott
Commissioner

ASSET INVENTORY ASSESSMENT REPORT
City of Princeton, Caldwell County, Kentucky
AI 499; PLN20120001

An Asset Inventory Report Form titled ***"Asset Inventory Report, City of City of Princeton , Kentucky",*** dated May 3, 2012, has been submitted for approval by the Energy and Environment Cabinet (EEC), in lieu of a Facilities Plan. In accordance with 401 KAR 5:006, the Department for Environmental Protection (DEP) has prepared an Asset Inventory Assessment Report summarizing the wastewater assets and their condition.

The Asset Inventory Assessment Report contains information related to organization structure and wastewater assets and is included in the following sections: A) Existing Wastewater Facilities; B) Water Quality; C) Current Finances and Future Needs; and D) Recommendations.

Interested persons are encouraged to submit comments on this assessment report within thirty (30) calendar days of the issue date. The EEC will take no action on this report until after the public comment period has ended and will evaluate all comments before a decision is made to proceed with approval of the Asset Inventory Report. Written comments are to be forwarded to Cindy McDonald, Supervisor, Wastewater Municipal Planning Section, Water Infrastructure Branch, Division of Water, 200 Fair Oaks 4th Floor, Frankfort, Kentucky 40601, or by e-mail to cindy.mcdonald@ky.gov.

Sincerely,

Peter T. Goodman, Director
Division of Water

CM

ASSET INVENTORY ASSESMENT REPORT
City of Princeton, Caldwell County, Kentucky
AI # 499; PLN20120001

The City of Princeton submitted an Asset Inventory Report Form in lieu of a Facility Plan in May 2012 to demonstrate compliance with 401 KAR 5:006, Wastewater Planning Requirements for Regional Planning Agencies. The City of Princeton governing body is composed of a City Council consisting of six elected members and the Mayor. The Superintendent, Mr. Joey Anderson, (Class II Wastewater Treatment Operator) reports to the Mayor and is responsible for the wastewater treatment plant and collection system operations and maintenance. Hethcoat & Davis currently acts as the City's engineer for municipal projects.

A. Existing Wastewater Facilities

Treatment Plant

The City owns and operates a 1.57 million gallon per day (mgd) wastewater treatment plant (WWTP) and collection system. The WWTP discharges to Eddy Creek of Lake Barkley/Cumberland River, at River mile 15.65, pursuant to Kentucky Pollutant Discharge Elimination (KPDES) Permit No. KY0028401.

The current WWTP, constructed in 1985, replaced a smaller trickling filter /anaerobic digester facility. The WWTP is a secondary treatment facility utilizing the oxidation ditch process with a 1.07 mgd hydraulic capacity. An upgrade occurred in 1990 which expanded the hydraulic capacity to 1.57 mgd with the addition of a third oxidation ditch and clarifier train. Vitrified clay sewers were originally installed in 1929 and through the years have been replaced with PVC pipe. The conventional gravity sanitary sewers (94% of system) and the low pressure force main collection system (6% of system) transport wastewater to the WWTP. Treatment processes consist of preliminary and secondary treatment: influent screw pumps, screening, grit removal, three oxidation ditches, three secondary clarifiers, chlorination/dechlorination, and post-aeration prior to discharge to Eddy Creek. Biosolids produced in the treatment process flow to four sludge holding tanks prior to dewatering on a belt filter press. Dewatered biosolids are disposed of at the permitted landfarming site (Permit #SW01700016). In review of reported flow data for a two year period from May 2011 through April 2013, the average daily flow was 1.05 mgd (67% of the hydraulic design capacity) and a maximum daily flow during rain events of 2.09 mgd; indicating excessive infiltration and inflow (I/I) may be present.

From 2011 through 2013, the effluent quality data from the plant indicate permitted effluent limits for Total Suspended Solids (TSS), as established by the KPDES permit, are being exceeded These limits are presented in Table 1. From 2013 to the present, several Notices of Violations (NOV's) have been issued for exceedances of Whole Effluent Toxicity (WET) limitations. These violations have been referred to the Division of Enforcement for corrective action.

Table 1 KPDES Permit Limits	
Parameter	Limits
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	20.0 mg/l*
Total Suspended Solids (TSS)	30.0 mg/l*
Ammonia-Nitrogen (NH_3-N) : Summer	4.0 mg/l*
Winter	6.0 mg/l*
Dissolved Oxygen	7.0 mg/l (min.)*
Fecal Coliform	200 Col./100 mls***
Total Phosphorus: Summer	Report
Winter	Report
Total Nitrogen	Report
Total Residual Chlorine	0.012 mg/l**
*Monthly Average **Daily Minimum	*** Monthly Geometric Mean

A review of Census data reveals a decrease in the county's population by approximately 2.0% from 1990 to 2010. The City of Princeton has also experienced a steady decline in population since 1990, and since the 2010 Census, the decline has been approximately 9.0%. The Kentucky State Data Center projects the 2.0% decline to continue for the county through 2030. The continual decrease is possibly related to outward migration to other communities for employment. Based on this projected population and a generally accepted standard rate of 100 gallons per capita per day (gpcd), the design capacity of the plant is considered more than adequate and no increase is planned.

The WWTP has been maintained over the years according to its established preventive maintenance program with repairs and replacements being made as necessary.

Collection System

The City is served by a combined gravity and pressure sanitary sewer system consisting of approximately fifty-eight miles of conventional gravity sewers. The remainder of the planning area includes approximately four miles of force main with six (6) lift stations. The City is still using approximately 100,400 LF of the original clay gravity sewers installed prior to 1960, the suspected cause of the majority of I/I problems within the system. In 2009, a Sanitary Sewer Evaluation Study (SSES) was conducted to determine the most problematic areas for I/I. Since then there have been several line replacements from clay to PVC pipe. Future projects include the replacement of approximately 58, 000 LF of clay pipe in Sewershed Basins 7 and 8. This is expected to reduce infiltration and inflow, thereby improving water quality in the Eddy Creek Watershed and, ultimately, Lake Barkley. This replacement is planned for the year 2018.

Critical Assets

Critical assets are those assets having a significant role in the operation of a system. Their failure could be detrimental to the total system or facility components. There are a total of six

lift stations in the system: Cardinal Lane, Ethridge Drive (Industrial Park), Meadow Brook, Pumpkin Center, Varmint Trace, and Walmart. A pump replacement is planned for the Pumpkin Center Pump Station in 2021 to improve pumping and energy efficiency. Because the lift stations have two pumps each and are equipped with emergency generators, the capacity will be maintained and flow will not be interrupted during a power failure (100% redundancy).

The wastewater treatment processes are considered to have 100% redundancy given the ability to maintain the process with a unit out of service. A project is proposed for the addition of a phosphorus removal reactor scheduled for completion in 2016 in anticipation of more stringent effluent phosphorus limits.

B. Water Quality

The planning area is primarily located within the Lower Cumberland River and Tradewater Basin Management Unit and is drained by Goose Creek, Big Spring Branch, Stevens Creek, Phelps Creek, Wiley Creek, an unnamed tributary of Ward Creek of Eddy Creek, Flynn Fork, and Livingston Creek Watersheds. The Eddy Creek, Livingston Creek, and Flynn Fork Watersheds were evaluated in the *Integrated Report to Congress on the Condition of Water Resources in Kentucky, 2012*. Impaired waters in the planning area are presented in Table 2. There are no Special Use Designated Waters, i.e. Exceptional Waters, Reference Reach Waters, or Outstanding National Resource Waters located in the planning area. TMDLs have been established for the impaired segment RM13.15-15.9. The WWTP outfall is located at the upstream end of the impaired segment of Eddy Creek at RM 15.65.

Table 2
List of Impaired Streams
Princeton, Caldwell County, Kentucky

Waterbody & Segment	Impaired Use Assessment	Causes	Sources
Eddy Creek (RM 10.25-13.15)	Partial Support – Warmwater Aquatic Habitat	Unknown	Unknown
Eddy Creek (RM 13.15-15.9)	Non-support – Warmwater Aquatic Habitat Non-support – Primary Contact Recreation	Nitrates, Fecal Coliform, Phosphorus	Wet Weather Discharges, Unknown, Livestock, Crop Production, NPS Discharges, Agriculture, Rural (Residential Areas)

Groundwater is often a source of drinking water supply for humans and animals through wells and springs. The quality of the groundwater can be negatively impacted by both natural and man-made sources. The sensitivity to these potential pollutant sources has been assessed and the Princeton area is rated as having a high sensitivity to groundwater pollution. For this reason, it is important to reduce the I/I and the potential to contaminate groundwater.

Drinking water is supplied to the City of Princeton by Princeton Water and Sewer Commission whose raw water source is Lake Barkley/Cumberland River. No Source Water Assessment and Protection (SWAPP) zones are affected by this wastewater system.

C. Current Finances and Future Needs

The City reported annual revenues of $1,270,638 and expenses of $1,263,076. The current monthly billing rate for residential customers was reported at $29.38 per 4,000 gallons for residential and $39.58 per 4,000 gallons for commercial customers with projected rate increases to $29.80 and $41.56, respectively; an increase of 5%. According to the American Community Survey, the median household income (MHI) is $36,255 making household income an important consideration for future projects and rate increases.

D. Recommendations

- The flow analysis indicated I/I and is reinforced by the fact much of the sewer system is constructed of aging clay pipe. The City is encouraged to continue its efforts to assess and rehabilitate sewers to reduce and prevent excessive I/I as part of their ongoing preventive maintenance and asset management program. It is important to address these issues in order to be aware of the need for funding well ahead of potential projects, to promote more affordable and less onerous increases in sewer user rates.

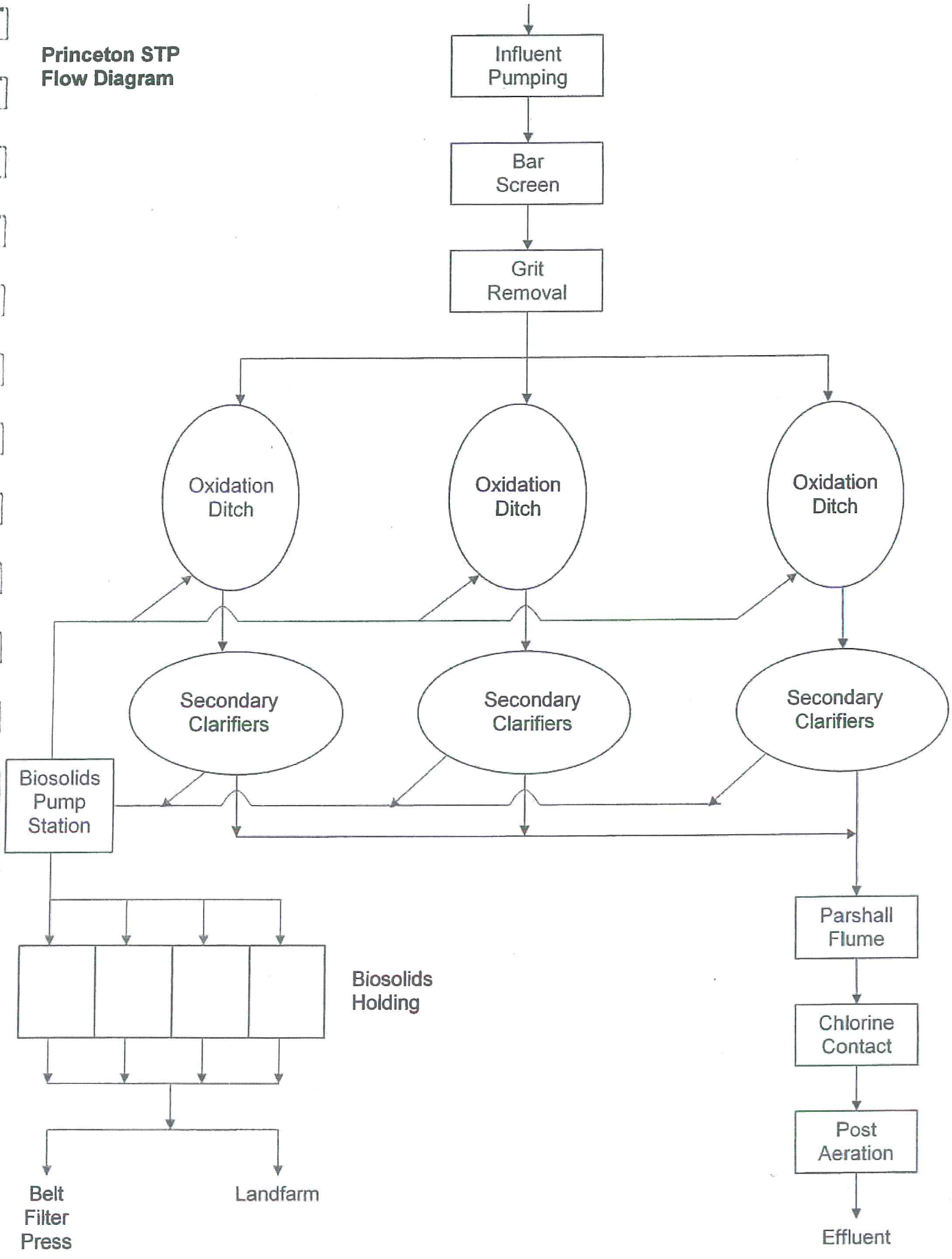
- Annual rates and budgets reviews are encouraged along with moderate rate adjustments to ensure adequacy for long-term planning, operations, and maintenance. The City is encouraged to continue this practice as reported.

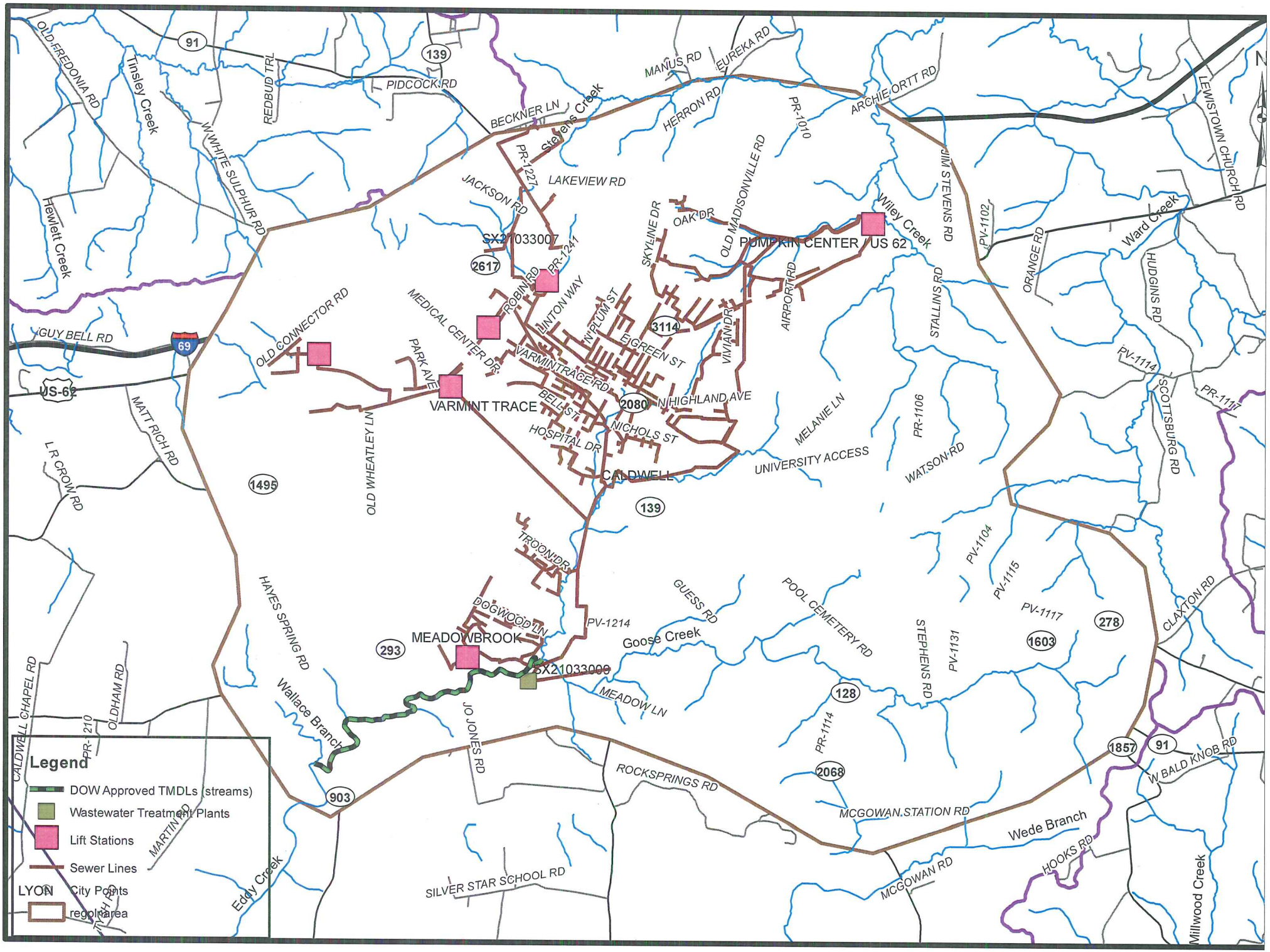
- Growth is decreasing in the county and in the current service area. The planning area may need to be adjusted to increase the number of service connections to help fund future projects.

- The Asset Inventory Report is the basis for a complete asset management program. Tracking the condition of assets, as well as operating a comprehensive preventive maintenance program, is crucial to the efficient operation of a wastewater system. An asset management program is recommended not only for this reason but to maintain the water quality of the receiving streams as well. The Division of Water recommends the City expand on the Asset Inventory Report to track the identified assets and their condition in a format that is useful and easy to manage.

- Updated maps that include the planning area, sewer locations, and pump stations should also be included in the Asset Management Plan.

Princeton STP
Flow Diagram





Princeton AI Service Area

Miles

Map created utilizing da

Princeton Water and Wastewater
Water System Master Plan - Recommended Improvements Summary

5 Year Improvement Recommendations	Description
5A(1)	Booster Pump at Industrial Park Tank (or Mixer/Chlorination System)
5B(1)	8-inch and 10-inch Lines at Super Wal-Mart
5B(2)	6-inch Lines at Robin Road, South Darby Street, Cherry Street, North Harrison Street, Oak Drive (Approx 6,800 LF w/68 Service Reconnections)
5B(3)	Approximately 900 LF of 6-inch Line at Hillview Court (Pressure Zone Change)
5B(4)	Approximately 900 LF of 6-inch Line at Hillview Drive w/8 Service Reconnections (Pressure Zone Change)
5D(1)	Approximately 3,200 LF 8-inch Line at Cadiz Road
5D(2)	Approximately 1,400 LF 8-inch and 4,600 LF 12-inch Lines at Highway 91N
5D(3)	Approximately 1,400 LF 8-inch Line at Highway 62 West
Estimated Project Cost	$1,445,000

10 Year Improvement Recommendations	Description
10D(1)	Approximately 60,000 LF of Replacement of all 2-inch, 3-inch and 4-inch Lines Which Are Not Dead-end Lines With New 6-inch Lines w/600 Service Reconnections Estimated
Estimated Project Cost	$3,524,000

15 Year Improvement Recommendations	Description
15A(1)	Approximately 8,200 LF of 16-inch Transmission Line
15A(2)	Utilization of Altitude Valve at Linton Hill Tank
15A(3)	High Service Pump Controls Changed to Read Levels of Industrial Park Tank
Estimated Project Cost	$1,292,000

20 Year Improvement Recommendations	Description
20B(1)	Approximately 1,400 LF of 6-inch Line at Harvey Lane
20B(2)	Connections to Existing 10-inch Lines
20B(3)	8-inch line at Baldwin Avenue
20D(1)	Approximately 11,700 LF of 10-inch line at Highway 293 North
20D(2)	Approximately 7,400 LF of 6-inch Line at Old Fredonia Road
20D(3)	Approximately 2,250 LF of 6-inch Line at Jeff Watson Road
20D(4)	Approximately 1,950 LF of 6-inch Line at Vivian Road
20D(5)	Approximately 1,200 LF of 6-inch Line at Cooper Circle
20D(6)	Approximately 2,260 LF of 8-inch Line at University Drive
Estimated Project Cost	$1,844,000

Type of Improvement -- "A" Storage Improvement; "B" Pressure Improvement; "C" Flushing Improvement; "D" Fire Flow Improvement