

**Application of Pennsylvania-American Water Company for Acquisition of  
the Wastewater Assets of Royersford Borough  
66 Pa. C.S. §1329  
Application Filing Checklist – Water/Wastewater  
Docket No. A-2020-3019634**

22. Other requirements - demonstrate compliance with the following:
- b. For **wastewater** system acquisitions, provide a copy of the DEP-approved Act 537 Official Sewage Facilities Plans for the affected municipalities.

**RESPONSE:**

- b. See enclosed a copy of the DEP-approved Act 537 Official Sewage Facilities Plans for Royersford Borough attached as **Appendix A-22-b**.





COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL RESOURCES  
1875 New Hope Street  
Norristown, Pennsylvania 19401  
215-270-1975

MAY 21 1987

Barbara H. Bowman, Secretary  
Limerick Township  
646 West Ridge Pike  
Limerick, PA 19468

Re: Royersford Borough 537 Update &  
Rerating Study  
Limerick Township, Montgomery County

Dear Ms. Bowman:

Please be advised that we completed our review of your municipality's updated official sewage facilities plan entitled "Borough of Royersford, Montgomery County, Pennsylvania Wastewater Treatment Plant Rerating and 537 Plan Revision Report" as prepared by PSC Environmental Services, Inc., as amended. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the study is hereby granted.

If you have any questions regarding this matter, please feel free to contact me at the above number.

Very truly yours,

JOSEPH A. FEOLA  
Regional Water Quality Manager

cc: Montgomery County Planning Commission  
Lewis E. Ritter  
Permits Section  
Planning Section  
Re 80 WQ78.2

BOROUGH OF ROYERSFORD  
WASTEWATER TREATMENT PLANT  
REPERATING AND ACT 537 PLAN REVISION REPORT

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APPENDIX

FLOW DIAGRAM - WASTEWATER TREATMENT PLANT

ROYERSFORD BOROUGH SEWER LINES

AREA ROAD PROPOSALS

ZONING MAP

COST ESTIMATE - RERATING ALTERNATIVE

ATTACHMENTS

ROYERSFORD COMPREHENSIVE PLAN

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

ZONING ORDINANCE

1985 CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT REPORT

BOROUGH OF ROYERSFORD  
WASTEWATER TREATMENT PLANT  
RERATING AND ACT 537 PLAN REVISION REPORT

INTRODUCTION

Requests from developers for sewer service and wastewater treatment capacity have stimulated the Borough to consider alternative measures which could be taken to provide the services to developers within the Borough of Royersford and in areas of the Townships of Limerick and Upper Providence immediately surrounding the Borough.

Wastewater from the proposed developments would be connected to existing sewers, flow through Borough sewers, and be treated at the Borough's wastewater treatment plant.

Analysis of sewer, interceptor and pumping station capacities show that the proposed additional wastewater can be accepted without creating capacity overload problems. Some pumping station pumps may need to be replaced due to age and reliability of equipment, but capacities are adequate.

The wastewater treatment plant capacity is 0.54 MGD, and its design population is 5400 people. The maximum three consecutive month average flow for 1985 was 0.504 MGD, thereby leaving a reserve capacity of only 0.036 MGD or 36,000 gallons per day.

Growth projections which are developed in greater detail within the report show that in the next five years the population served could increase by 2000 to 2500 people, and additional wastewater generated from the growth is estimated to be 0.15 MGD to 0.20 MGD.

The report shows that rerating the plant capacity to 0.75 MGD, including making the necessary improvements to primary settling tanks and the chlorine contact tanks, and the addition of a third raw sewage pump, is

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the most cost-effective alternative for satisfying the projected capacity needs over the next five years. Additional growth beyond the five-year period would necessitate construction of a plant expansion including most likely settling tanks, biological facilities, digestion facilities, and any additional facilities that an upgrading may require.

The current NPDES permit which was recently issued requires that the plant effluent meet the following parameters:

<u>Parameter</u>	<u>Monthly Average</u>	<u>Weekly Average</u>
Flow	0.54 MGD	N/A
BOD <sub>5</sub>	30 mg/l	45 mg/l
Suspended Solids	30 mg/l	45 mg/l
Fecal Coliform	200 col./100 ml	N/A
pH - units	6.0 minimum - 9.0 maximum	

The rerating alternative is not only the most cost effective, but it can be accomplished quickly in proper time phase with the proposed developments so that capacity is available before the need is established through residential construction. Full compliance with the NPDES permit can be achieved throughout the growth period through the rerating alternative.

Most of the growth will occur in the Townships. The Borough's regulations included in its Subdivision and Land Development Ordinance, Zoning Ordinance, and Comprehensive Plan will be incorporated into all intermunicipal agreements with the Townships so that uniform quality of construction, etc., will be achieved in this manner.

1.0 EVALUATION OF EXISTING WASTEWATER TREATMENT AND CONVEYANCE SYSTEMS

1.1 Identification and Description of Wastewater Treatment System

The existing wastewater treatment plant is owned by the Borough of Royersford. The plant is operated by Royersford Borough personnel. The plant is located in Upper Providence Township just east of the most southern portion of the Borough between the Reading Railroad tracks and the Schuylkill River.

The receiving stream is the Schuylkill River. The point of discharge is 40°10'46" Latitude and 75°32'14" Longitude. The ultimate effluent disposal area is the receiving stream.

The current NPDES permit requirements for the plant effluent are as follows:

<u>Parameter</u>	<u>Limitation</u>	
	<u>Monthly Average</u>	<u>Weekly Average</u>
Flow	0.54 MGD	N/A
BOD <sub>5</sub>	30 mg/l	45 mg/l
Suspended Solids	30 mg/l	45 mg/l
Fecal Coliform	200 col./100 ml	N/A
pH	6.0 minimum - 9.0 maximum	

To date almost no effluent limitation violations have been committed with respect to concentration and quantity. On rare occasions, flow violations occur on an instantaneous maximum basis under extreme conditions of heavy rainfall. Recently steps have been taken to reduce recorded flows by replacing an out-of-date meter which was reading erroneously high, installing watertight inserts in manhole covers, repairing leaking manholes, and televising and grouting main sewer lines.



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The existing sewage treatment plant is a two stage biofiltration plant which was designed for secondary treatment of 0.54 MGD. There is two stage anaerobic digestion. Digested sludge is hauled by tank truck to farmlands where it is used as a fertilizer and soil conditioner.

Approximately 50% of the influent flows to a pumping station at the plant site by gravity. That sewage is pumped to the influent chamber and mixes with the other 50% of the sewage which flows to the influent chamber by gravity. All influent is screened and comminuted at the influent channels.

---

The flow is directed to the primary settling tanks where settleable and floating solids are removed. The primary effluent flows to the primary wetwell from which it is pumped to the primary biofilter. The primary biofilter effluent flows directly to the primary settling tank.

Overflow of the primary wetwell enters the secondary wetwell. The secondary wetwell also receives flow from the secondary settling tanks. Secondary wetwell contents are pumped to the secondary biofilter and the secondary biofilter effluent flows back to the secondary settling tank. Overflow of the secondary settling tank and secondary wetwell is directed to the chlorine contact tank. The chlorinator is equipped with an automatic switchover feature. When a chlorine cylinder is empty, a spare cylinder is automatically put on line. The effluent is disinfected and discharged through the outfall sewer to the Schuylkill River. Prior to disinfection, the flow is metered by a new (1986) flow meter and rectangular weir installed in a rectangular channel.

The involved process of dosing and recirculation through the biofilters and settling tanks brings pollutants in contact with aerobic organisms which inhabit the biological growth that coats the biofilter media. The aerobic organisms feed upon the pollutants and, in so doing, reduce the concentration of pollutants in the wastewater.

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Primary and secondary sludges settle in the primary settling tank. They are withdrawn periodically and pumped to the primary anaerobic digester. In the digesters the sludge's organic content is reduced to a stable level. Digested sludge is stored in the secondary digesters until it is hauled to farmland by Contractor Henry Reifsnnyder, who has permitted agricultural sites.

The following basis of design sets forth pertinent data on unit capacities of the existing plant facilities and how rerating the plant to 0.75 MGD compares favorably to current design criteria which is set forth in the DER Sewerage Manual.

---

The components of and design data for the existing plant are as follows:

### 1. Comminuting Devices

- |                        |   |
|------------------------|---|
| a. Number of Units     | Two (2) - one on each plant influent line |
| b. Auxiliary Equipment | Bypass bar screens                        |

### 2. Raw Sewage Pumps

- |                    |  |
|--------------------|--|
| a. Number and Type | Two (2) - one constant speed submersible and one variable speed non-clog centrifugal   |
| b. Capacity        | Constant speed submersible pump - 720,000 gpd; variable speed pump - 432,000 gpd   |
| c. Controls        | Centrifugal pump is provided with automatic controls to discharge at approximately the same rate as raw sewage influent; constant speed submersible pump is controlled by a level switch |

$$Q_{AV} = 0.75 \text{ mgd}$$

$$Q_{PK} = 1.5 \text{ mgd}$$

$$\frac{1}{2} Q_{PK} = 0.75 \text{ mgd}$$

≠ Need more  
pump capacity

3. Primary Settling Tanks

- |   |   |
|---|---|
| a. Number of Units                                    | Two (2) rectangular tanks   |
| b. Dimensions   | 72' x 16' wide; water depth varies from 9.5' to 10.5' deep  |
| c. Capacity   | 86,170 gallons each   |
| d. Detention Period<br>(including recirculation)      | 2.55 hours @ 540,000 gpd design ✓<br>flow; 2.26 hours @ 750,000 gpd ✓<br>design flow  |
| e. Surface Settling Rate<br>(including recirculation) | 703 gpd/sq.ft. @ 540,000 gpd design ✓<br>flow; 795 gpd/sq.ft. @ 750,000 gpd ✓<br>design flow ✓                                |
| f. Weir Overflow Rate<br>(including recirculation)    | 50,625 gal/ft. of weir @ 540,000 gpd<br>design flow; 9,531 gal/ft. of weir<br>@ 750,000 gpd with modifications                |
| g. Sludge Collection<br>Equipment                     | Mechanical sludge scrapers to sludge<br>hoppers; telescopic valves for<br>sludge withdrawal                                   |
| h. Scum Collecting<br>Equipment                       | Sludge scraper flights also act as<br>scum collectors to a skimmer pipe;<br>scum collection box can be pumped<br>to digesters |

4. Primary Trickling Filter

- |   |  |
|---|--|
| a. Number of Units                                | One (1) with rotating distributor<br>arms  |
| b. Dimensions                                     | 55'-0" diameter, media depth 3'-6",<br>6" freeboard; 2,375 sq.ft. of<br>surface area; 8,311 cu.ft. of<br>media |
| c. Hydraulic Loading<br>(including recirculation) | ✓ 455 gpd/sq.ft. @ 540,000 gpd design<br>flow; 455 gpd/sq.ft. @ 750,000 gpd<br>design flow                     |

*0.0545 hr*  
*@ 1.08 mgd*

*20 mgd/acre*

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d. Organic Loading (including recirculation) 130 lbs/day/1000 cu.ft. @ 540,000 gpd design flow; 130 lbs/day/1000 cu.ft. @ 750,000 gpd design flow

### 5. Secondary Trickling Filter

a. Number of Units One (1) with rotating distributor arms

b. Dimensions 55'-0" diameter, media depth 3'-6", 6" freeboard; 2,375 sq.ft. of surface area; 8,311 cu.ft. of media

c. Hydraulic Loading (including recirculation) *@ 1.08 mgd* ~~771~~ *771* gpd/sq.ft. @ 540,000 gpd design flow; *771* gpd/sq.ft. @ 750,000 gpd design flow

d. Organic Loading (including recirculation) 130 lbs/day/1000 cu.ft. @ 540,000 gpd design flow; *147* lbs/day/1000 cu.ft. @ 750,000 gpd design flow

### 6. Final Settling Tanks

*(Same size as primary settling tanks)*

a. Number of Units Two (2) rectangular tanks

b. Dimensions 72' x 16' wide; water depth varies from 9.5' to 10.5' deep

c. Capacity 86,170 gallons each

d. Detention Period (including recirculation) 2.55 hours @ 540,000 gpd design flow; 2.26 hours @ 750,000 gpd design flow

*2300 #* e. Surface Settling Rate (including recirculation) 703 gpd/sq.ft. @ 540,000 gpd design flow; 795 gpd/sq.ft. @ 750,000 gpd design flow

f. Weir Overflow Rate (including recirculation) 6,835 gpd/ft. of weir @ 540,000 gpd design flow; 7,722 gpd/ft. of weir @ 750,000 gpd design flow *vs 10,000 gpd/ft*

*Peak hourly*  
 $2 \times 0.75 = 1.5$   
 $+ \text{recirculation } 1.087$   
2.58 mgd

$SSR = 1122 \text{ gpd/ft}^2$   
*vs*  
 $1200 \text{ gpd/ft}^2$  *OK*

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g. Sludge Collection Equipment      Mechanical sludge scrapers to sludge hoppers; telescopic valves for sludge withdrawal

### 7. Chlorine Contact Tanks

a. Number of Units      Two (2) rectangular tanks  
 b. Dimensions      No. 1 - 13'-9" x 9'-1" with 5'-7" S.W.D.; No. 2 - 14'-0" x 8'-9" with 5'-7" S.W.D.  
 c. Capacity      No. 1 - 5,300 gallons; No. 2 - 5,180 gallons      Total = 10,480 gal.  
 d. Detention Period      28 minutes @ 540,000 gpd design flow; 30 minutes @ 750,000 gpd with modifications

### 8. Sludge Digestion Facilities

a. Number of Units      Two (2) *anaerobic*  
 b. Description      One with floating cover and one with fixed cover  
 c. Capacity      *primary?* → Floating cover digester - 45,000 gallons; *secondary.* → fixed cover digester - 312,694 gallons      Total = 47,700 ft<sup>3</sup>  
 d. Digester Loading      Current population of approximately 4500 equals 10.63 cu.ft./capita; projected population of 7500 equals 6.37 cu.ft./capita

*how will modifications increase capacity (see last page)*

The collection system was constructed in 1937 as a WPA Project. In general, sewers constructed at this time were durable but a minimum of emphasis was placed upon using pipe joint materials that were watertight. Therefore, when the groundwater table rises above the

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elevation of the pipes, groundwater infiltration could cause flow increases. Sewers found to be leaking in a plug and weir analysis were televised, grouted and externally repaired where needed.

The two pumping stations located at Tenth Avenue and at Green Street are in average to good condition. The Green Street Station is 22 years old. It has two 4" Chicago pumps which are 22 years old. There is some clogging of pumps due to there being no screening facilities, but otherwise the operation is satisfactory.

The Tenth Avenue Station is 49 years old. It is equipped with one 4" self-priming Buffalo pump and one Peabody-Barnes pump, four gate valves, and two check valves. ~~The building is in sound condition.~~

The sewage treatment plant as previously described consists of a pumping station and chlorine room, influent chamber, two primary settling tanks, a control building, two final settling tanks, a primary and secondary biofilter and a digester which were constructed 33 years ago. Existing Imhoff tanks were converted to two secondary digesters. The structural portions of all these facilities are in sound condition with the exception of the biological filter retaining walls.

The remaining portion of this section deals with the mechanical equipment. The main pumping station at the plant has two pumps. The one pump is a 6" Flygt submersible pump which is 13 years old, and it is in good condition. The other pump is a 4" Peabody-Barnes self-priming pump which is 5 years old. It is in good condition. The Peabody-Barnes pump is a variable speed pump and it is used as the lead pump.

There are two comminutors. One comminutes the flow of the pumping station and the other comminutes the flow which reaches the plant by gravity. Both are 33 years old. The pumping station comminutor is scheduled to be replaced in 1986 by a sewage grinder known as a Muffin Monster.

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The primary biological filter pumps are 33 years old. Both pumps were rebuilt in 1975.

The rotary distributor arm of the primary biological filter has been replaced in 1974. The center column bearings and races were replaced in 1985. The media, boxes, and main air-intake and effluent discharge channel are in good condition. The cap of the primary filter retaining wall should be reconditioned as previously described.

The secondary settling tank sludge collection mechanism should be replaced as soon as the equipment is available.

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~~The chlorine contact tanks have wooden baffles. Defective baffles should be replaced above the water line. The chlorinator was replaced in 1985, and the chlorine room was relocated to a lower level which is more convenient for cylinder delivery.~~

A schematic flow diagram is included in the Appendix of this report.

As previously mentioned, the plant's design capacity is 0.54 MGD. The average daily flows for 1983, 1984 and 1985 are 0.328 MGD, 0.385 MGD and 0.410 MGD, respectively. The wet weather load for the three years is 0.404 MGD for 1983, 0.484 MGD for 1984 and 0.505 MGD for 1985. At the present time there are consummated agreements with two other municipalities which result in capacity allocations. The following table outlines the allocations:

<u>Municipality</u>	<u>Description</u>	<u>Allocation</u>
1. Limerick Township	Existing agreement	In a defined service area, about 100 connections are served
2. Upper Providence Township	Existing agreement	8 connections are served including Spring Ford Senior High School

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The objective of the Act 537 Plan Revision is to have the plant rerated to be able to accommodate several other proposed capacity allocations as described below:

<u>Municipality</u>	<u>Description</u>	<u>Proposed Allocation</u>
1. Royersford	Buckwalter Mills Project	236 residential units plus office and commercial connections
2. Upper Providence Township	Cha-Mar (agreement is in draft form)	40 connections .
3. Limerick Township	Cutler Group	70,000 gpd
4. Limerick Township	Dinnocenti Development	Undetermined
5. Limerick Township	Chapel Calcinore	65 connections

There is no scheduled upgrading of the treatment facilities, most likely due to the Schuylkill River having the assimilative capacity to continue accepting a secondary effluent at the Royersford point of discharge. There are presently no connection limitations imposed by DER because responsible action has always been taken in a timely manner by the Borough in order to limit violations and minimize overloads.

Reserve capacity obtained through the plant rerating and infiltration/inflow abatement will be used for planned growth within the Borough of Royersford and the Townships of Upper Providence and Limerick. Growth impetus has been provided by the 17-mile Route 422 highway construction which directly connects these municipalities to the King of Prussia area and then directly to Philadelphia via the vastly improving Schuylkill Expressway.



Royersford and its immediate surroundings, more so than ever, have become desirable as a residential area to people working in the King of Prussia/Philadelphia areas because of the easy access provided by Route 422 to the commercial and industrial center of eastern Pennsylvania.

The treatment facilities and collection system are operated by Borough personnel under the direct supervision of Mrs. Sophie Simon, Superintendent, and Mr. Robert L. Weikel, Borough Manager. Considering the age of the plant, it is in a well maintained and improving condition. An excellent preventive maintenance program is in effect along with a planned replacement program which extends five years beyond the present date. Expenditures are scheduled to be made to cover the planned improvements. Revenues are raised through community growth and/or sewer rate increases. Examples of recent improvements made include replacement of the chlorination facilities and chlorination equipment housing, replacement of the digesting sludge recirculation pump, replacement of the primary recirculation pump, replacement of primary digester gas piping and gas regulation equipment, replacement of the flow meter, replacement of a sewage grinder, replacement of a biological filter distributor, replacement of the mechanical equipment motor control center, upgrading of the plant electrical service, and replacement of settling tank sludge collection equipment. Additional laboratory equipment has been purchased to expand the plant's testing capabilities.

Almost needless to say, past equipment problems have necessitated replacements whenever it was no longer economically feasible to repair equipment.

Industrial flows received are limited to wastewater from a manufacturer of ice cream and wastewater from an industrial laundry which launders garments which are worn by workers in nuclear power plants. The ice cream wastewater is not pretreated. The laundry

waste is pretreated and regulated by the Nuclear Regulatory Commission. At the present time industrial waste loading upon the system is light. Past experience with industries has left the Borough with an experience of having to reduce industrial loading through industrial pretreatment of a bleach and dye wastewater. That experience necessitated the development of a stringent sewer use ordinance and an in-place system of screening industrial applicants, limiting industrial loadings, and monitoring industrial discharges.

1.2 Identification and Description of Sewer System Components

There is a main collection system which is located throughout the Borough of Royersford which conveys wastewater into the wastewater treatment plant. The Royersford system is owned by the Borough of Royersford.

There are two sewer line segments which extend into two surrounding townships. An 8" sanitary sewer extends into Limerick Township. Presently 100 connections are served. A second 8" sewer segment extends into Upper Providence Township. Served by this sewer are seven residential units and the Spring Ford Senior High School. These two sewer segments each have a minimum capacity of 0.45 MGD.

The Royersford Borough collection system consists of 57,730 linear feet of 8" to 15" diameter T.C. sewers ranging in depth from 4' to 14'. There are 500 linear feet of 8" and 12" C.I. sewers under railroad tracks. There are 10,500 linear feet of 6" diameter house connection sewers. There are 3200 linear feet of 8" C.I. force main. There are 218 manholes. The Royersford sewage flows through 8", 10" and 12" diameter street sewers which have carrying capacities ranging from 0.45 MGD to 1.6 MGD. Most of the street sewer flow is collected by the 15" diameter First Avenue Interceptor which conveys the flow to the wetwell at the wastewater treatment plant. The 15" First Avenue Interceptor's capacity is 2.5 MGD. Due to all wastewater not

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being able to flow entirely by gravity, there are two pumping stations with the system which discharge at points from which the wastewater can flow the remaining distance by gravity. There is one pumping station known as the Tenth Avenue Pumping Station, which has a capacity of 0.648 MGD. This station pumps about 20% of the entire plant flow. The other station is known as the Green Street Pumping Station. It pumps about 5% of the entire plant flow and its capacity is 0.50 MGD.

As mentioned previously, the average flow for 1983 was 0.328 MGD and the wet weather flow was 0.404 MGD. In 1984 the yearly average flow was 0.385 MGD and the wet weather flow was 0.484 MGD. In 1985 the ~~yearly average flow was 0.410 MGD and the wet weather flow was~~ 0.504 MGD. The magnitude of these flows during recent years has not overloaded any of the collection sewers, interceptor sewers or pumping stations. There have been no flow conditions which have necessitated bypass pumping, overflowing manholes or flooding of basements.

By comparison of the flows with the system capacities mentioned, it can be seen that there is considerable reserve capacity in collection sewers, pumping stations and the interceptor.

At the present time, capacity is allocated on an as-needed basis; however, as capacities are heavily taxed by proposed sewer extensions into residential developments, by agreement developers will be required to make all necessary improvements in order to maintain adequate reserve capacity and in order to maintain all conveyance and treatment facilities in efficient operating condition.

Maintenance of the collection system during 1984 consisted of the following items:

1. Watertight manhole inserts were installed in twenty-five manholes.

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2. Six manhole covers and two manhole frames were replaced.
  3. One main sewer stoppage on Washington Street which was caused by root intrusion was cleared.
  4. A manhole leak survey is being performed and leaks are being repaired when they are found.
  5. Valves in the Tenth Avenue Pumping Station have been replaced so all valves are operative and equipment can be removed without having the force main drain back into the station. Three ball centric valves and two check valves were replaced.
- 
6. At the Tenth Avenue Pumping Station, the Peabody-Barnes pump was rebuilt, the interior was repainted and several 3/4" copper lines were replaced.
  7. At the Green Street Pumping Station, two force main cracks were repaired by utilizing repair clamps.
  8. Dead-end manholes were flushed and much of the collection system was flushed.

Past problems were infiltration of pipe joints when high groundwater conditions prevailed. The problem has been minimized through television inspection and joint grouting. As the need arises for additional televising and grouting, it will be done to minimize infiltration.

### 1.3 Identification of Sludge Generation, Transport and Disposal Methods

All sludge is generated from sewered areas of Royersford Borough and the sewer segments that are extended to Upper Providence Township and Limerick Township. No septage is discharged into the plant or the collection system.

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About 2,500 to 3,000 gpd of primary and trickling filter humus are pumped to the anaerobic digestion system. About 0.4 to 0.5 million gallons of digested sludge are removed from the secondary digester per year. The digested sludge is applied to agricultural land by a contractor in liquid form.

The liquid sludge is applied by Contractor Henry Reifsnyder to any and all of the sites for which Reifsnyder has permits. At the sites, operation consists of some top dressing and mostly subsurface injection of liquid sludge.

The authorities responsible for sludge disposal are the Royersford Borough Council and Contractor Henry Reifsnyder.

---

2.0 PHYSICAL DESCRIPTION OF PLANNING AREA

2.1 Boundaries and General Physical Characteristics of the Planning Area

The planning areas of Royersford Borough, Upper Providence Township and Limerick Township are shown on the plot plan of sanitary sewers, both existing and proposed, which are shown on the figure entitled Sewer Lines - Royersford Borough, included in the Appendix of this report.

Sewers, pumping stations, the First Avenue interceptor, the wastewater treatment plant and the receiving stream, and the Schuylkill River are shown on the sewer plot plan.

2.2 Comparison and Analysis of Population Information

The Borough's population has increased very slowly over the years, and there is every indication that Borough growth will continue slowly due to essentially all land within the Borough being developed, and all streets are presently sewered. The exception is certainly the Buckwalter Mills proposed project in which 236 residential units are planned to be constructed along with several office-type and commercial connections. The following table illustrates past growth rates from which projections can be made.

<u>Year</u>	<u>Population</u>
1920	3278
1940	3605
1960	3969
1980	4238

Considering the proposed Buckwalter Mills project, the Borough population should be about 5000 people by 1990.

The objective of the Act 537 Plan Revision is to have the plant rerated to be able to accommodate several other proposed capacity allocations as described below:

<u>Municipality</u>	<u>Description</u>	<u>Proposed Allocation</u>
1. Royersford	Buckwalter Mills Project	236 residential units plus office and commercial connections
2. Upper Providence Township	Cha-Mar (agreement is in draft form)	40 connections

There is no scheduled upgrading of the treatment facilities, most likely due to the Schuylkill River having the assimilative capacity to continue accepting a secondary effluent at the Royersford point of discharge. There are presently no connection limitations imposed by DER because responsible action has always been taken in a timely manner by the Borough in order to limit violations and minimize overloads.

Reserve capacity obtained through the plant rerating and infiltration/inflow abatement will be used for planned growth within the Borough of Royersford and the Townships of Upper Providence and Limerick. Growth impetus has been provided by the 17-mile Route 422 highway construction which directly connects these municipalities to the King of Prussia area and then directly to Philadelphia via the vastly improving Schuylkill Expressway. There are watershed areas within Limerick Township which may allow flow into the Royersford Plant, on an interim basis.

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Population projections for Royersford coincide well with Pennsylvania and Montgomery County population projections so there is no need for population projections to be changed based upon growth patterns established over the past five to ten years.

Therefore, the majority of the growth which is expected to impact upon this sewer service area will occur in portions of Limerick Township and Upper Providence Township which can logically be served by the Royersford sewer system.

Present sewer service extended to Upper Providence Township includes the connection of seven homes and the Spring Ford Senior High School.

Under consideration in Upper Providence Township is the Cha-Mar Development which is limited to 40 connections by proposed agreement. At 2.9 persons per connection, an additional 116 persons will be served.

In a defined service area of Limerick Township there are presently 100 homes served. At 2.9 people per connection, there are 290 people served.

Based upon present developer activity, it appears that the greatest growth will occur in Limerick Township providing that sewer service and treatment plant capacity are available. In the near future, people in Limerick Township could be served by Royersford, on an interim basis, if the development were in a watershed that allowed flow to Royersford.



## Appendix A-22-b

Population projections for Royersford coincide well with Pennsylvania and Montgomery County population projections so there is no need for population projections to be changed based upon growth patterns established over the past five to ten years.

Therefore, the majority of the growth which is expected to impact upon this sewer service area will occur in portions of Limerick Township and Upper Providence Township which can logically be served by the Royersford sewer system.

Present sewer service extended to Upper Providence Township includes the connection of seven homes and the Spring Ford Senior High School.

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Under consideration in Upper Providence Township is the Cha-Mar Development which is limited to 40 connections by proposed agreement. At 2.9 persons per connection, an additional 116 persons will be served.

In a defined service area of Limerick Township there are presently 100 homes served. At 2.9 people per connection, there are 290 people served. There are presently three proposed developments in Limerick Township. [The Cutler Group has requested 70,000 gpd of capacity so it apparently expects to serve an additional 700 to 900 people. Chapel Calcinore has requested capacity to serve 65 connections so it intends to serve 189 people. The Dinnocenti Development has not stated its capacity request.]

Based upon present developer activity, it appears that the greatest growth will occur in Limerick Township providing that sewer service and treatment plant capacity are available. In the near future, an additional 1500 people in Limerick Township could be served by Royersford.

## Appendix A-22-b

As the connected population approaches 7000 to 7500 about the year 1990, all existing plus related capacity will be in use or committed to use. It will then be necessary for the plant to be expanded and, if required, upgraded before additional commitments can be made to prospective developers. At this time it is planned that developers who need capacity will be expected to make capital contributions in proportion to capacity needs of their development. Plant ownership will remain with the Borough of Royersford.

Drinking water is available in the service area through services provided by the Citizens Utilities Water Company. At this time the water supply appears to be abundant so growth should not be limited by availability of water.

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As previously stated, Route 422 highway construction connecting Royersford and its surroundings to King of Prussia, etc., is the major factor in residential growth. Favorable mortgage interest rates encourage residential development at this time.

3.0 PLANNING OBJECTIVES AND NEEDS

3.1 Identification of Wastewater Planning

An Act 537 Sewage Facilities Plan was prepared for Montgomery County until recently. The current policy is that each municipality within Montgomery County is required to update its own Plan.

To our knowledge, none of the Royersford wastewater collection system or treatment plant construction costs were funded by either P.L. 84-660 or P.L. 92-500 construction grants. The majority of the collection system and the original primary treatment plant were built under the WPA federal program about 1937.

Each year since the inception of the program, a Chapter 94 Municipal Wasteload Management Report was prepared for the Borough by its engineer, who is now known as PSC Environmental Services, Inc.

A COWAMP 208 study was prepared for the Delaware River Basin Commission by Betz, Converse, Murdoch. Royersford Borough, Upper Providence Township, and Limerick Township were included in the planning effort.

Wastewater planning has been carried out according to these plans. Present planning consists of planned growth in developments through capacity regulation and rerating of the wastewater treatment plant, making the necessary improvements, to meet capacity needs.

Subdivisions not previously contemplated are to be included in wastewater planning by Borough and Township Resolutions which will be submitted to DER.

3.2 Planning Adopted Pursuant to Act 247 Pennsylvania Municipalities  
Planning Code

Figure V-1, located between pages V-4 and V-5 of the Royersford Borough Comprehensive Plan, is a map which shows land use of the Borough. It shows which areas are dedicated for Residential, Commercial, Industrial, Utility, Institutional, Agricultural, Woodland and Recreational Use. A copy of the Comprehensive Plan is included with this submittal.

The Royersford Comprehensive Plan was prepared by the Montgomery County Planning Commission as the Planning Consultant under the terms of a contract signed by the Pennsylvania Department of Commerce, Royersford Borough and the Montgomery County Planning Commission. The document is the most complete presentation of data ever accumulated concerning the Borough of Royersford. More than two and one-half years of fact finding and various forms of research went into its preparation. It can readily be concluded from this statement that the efforts of the County and the Borough have been well coordinated, thus minimizing planning inconsistencies.

For a comparison of proposed land use and existing sewage facilities planning, your attention is directed to page II-9 of the Royersford Comprehensive Plan and the Subdivision and Land Development Ordinance, pages 50 and 51.

Subdivision regulations that establish lot sizes are shown in V-1 through XIII-8 of the Royersford Zoning Ordinance and on page 43 of the Royersford Subdivision and Land Development Ordinance. None of the lot sizes are predicated on sewage disposal methods since the existing Borough is sewered and the small unsewered portion will be sewered when it is developed.

In addition to the Buckwalter Mills Project which was previously discussed, there are eight acres of land dedicated for residential development. To date there are no firm plans to develop the eight acres of land. Therefore, there is no subdivision map showing location of all subdivisions and there are no records or maps which show undeveloped lots approved in each identified subdivision and their schedule for development.

The Royersford Zoning Ordinance addresses flood plain limitations and special protection areas. Section XIV-1 through XIV-15 contains flood plain limitations. Storm water management is covered on pages 47 and 48 of the Royersford Subdivision and Land Development Ordinance.

The land use planning and flood plain/storm water management programs set forth in the Zoning Ordinance and the Subdivision and Land Development Ordinance are fully compatible.

The use of flood plain land and restrictions which apply to use of flood plain land are fully covered in the Zoning Ordinance, Section XIV-1 through XIV-15.

### 3.3 Consistency of Wastewater Treatment Planning with Other Environmental Plans

The rerating project involves rerating the existing 0.54 MGD plant to 0.75 MGD of capacity. The project does not involve selection of a site. The site has been used for wastewater treatment since 1937. Sewers and the interceptor have been in existence since 1937. Therefore, concern over consistency with the Comprehensive Water Quality Management Plan and antidegradation objectives in designated watersheds is minimal, and compatibility based upon almost 50 years' experience has been very satisfactory.

The Chapter 94 Wasteload Management Report for 1985 recognized that the annual average flow was 0.410 MGD. The maximum three consecutive monthly average flow for September, October and November averaged 0.505 MGD. The existing capacity of 0.54 MGD is being approached, and the reserve capacity is about 0.036 MGD based upon deducting the maximum three consecutive month average from the capacity of 0.54 MGD. The capacity needs previously described over the next five years approach 0.2 MGD so the need to increase the plant's capacity is clearly established.

There is no inconsistency between the plant's capacity rerating and the State Water Plan recommendations with specific respect to yield deficiency, allocation, allocation deficiency, storage capacity, treatment deficiency, filtration plant capacity and filtration plant deficiency. Citizens Utilities Water Company will satisfy any water supply deficiencies that would arise by developing additional well sources. To our knowledge there are no restrictions on water sources in this area or difficulties in obtaining satisfactory water yield from wells.

No mining occurs in Royersford Borough.

3.4 Analysis of Sewage Planning Needs to Provide Adequate Wastewater Treatment with Identified Growth Areas in the Municipalities

The rate of growth has been very gradual over the past years; however, with the previously described highway construction and favorable interest rates, a more rapid rate of growth should soon be experienced.

As each growth area is developed, utilities, including sanitary sewers, will be constructed by developers according to approved specifications as set forth in the Subdivision and Land Development Ordinance. Existing wastewater treatment facilities are not adequate

## Appendix A-22-b

to accept area growth of about 2000 people who would generate an additional 150,000 to 200,000 gpd of wastewater. Therefore, the Borough is taking the necessary steps to have wastewater treatment facilities capacity rerated and making the necessary improvements so that there is full compatibility between growth and wastewater treatment facilities capacity.

Within five years, the population served by this plant could reach 7000 to 7500, with about 5000 to 5500 persons served within the Borough and the remaining population served residing in Limerick Township and Upper Providence Township. The ten-year growth projection should show the minimum population served being 8500 persons with a maximum served population being 10,000 persons.

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4.0 PLANNING AND FACILITIES ALTERNATIVES, EVALUATIONS AND RECOMMENDATIONS

4.1 Identification and Analysis of Alternatives

Currently the entire Borough of Royersford is served by the sanitary sewer system. An adjoining section of Upper Providence Township which serves eight connections, including the Spring Ford Senior High School, is also sewered under an intermunicipal agreement. An adjoining area containing approximately 100 connections in Limerick Township is also sewered under an intermunicipal agreement.

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Considerable development is planned for the Royersford area. The limited availability of capacity at the Royersford sewage treatment plant is the major constraining factor. Wastewater from the proposed developments will be conveyed through gravity sewers to the Royersford sewer system and to the Borough's sewage treatment plant for treatment.

There are no nearby sanitary sewer collection systems or treatment facilities in a position to accept wastewater from these proposed developments at this time.

If the capacity of the treatment facility is not increased, the development of this area will be severely limited.

Treatment plant alternatives are essentially established by past actions and existing facilities. Increasing the capacity can be accomplished by modification of the existing facilities very economically in order to have the plant rerated to a higher capacity.

Another alternative would be to construct additional tankage and install additional treatment equipment. Since the existing plant utilizes the trickling filter process, additional trickling filter or rotating biological contactor units would most likely be constructed.



4.2 Planning Alternatives Undertaken to Meet Existing and Future Sewage Disposal Needs

The Royersford Borough Comprehensive Plan addresses the long term revitalization and continued development of the Borough. The Borough of Royersford Subdivision and Land Development Ordinance sets forth sound economic land development and subdivision regulations as they relate to sewage disposal.

At this time there are no subdivisions in the final planning stage. Estimated locations and estimated sewage flows from proposed development were presented previously in this report.

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The Borough submits a Chapter 94 Wasteload Management Report annually to DER. A copy of the 1985 report is submitted as an attachment to this report.

4.3 Proposed Growth and Sewerage Planning

As stated previously, the Borough is nearly completely developed. One development within the Borough is proposed to add 236 residential units plus office and commercial connections to the sewer system.

The potential for growth in the adjoining Upper Providence and Limerick Townships is greater. Increasing the sewage treatment plant capacity would allow this proposed development as well as other development to progress.

It is estimated that the rerating of the sewage treatment plant capacity to 0.75 MGD would provide sufficient capacity for the proposed developments to proceed for the next five to seven years.

5.0 EVALUATION OF ALTERNATIVES

The evaluation of each alternative to increase the sewage treatment plant capacity, based on cost of construction, is as follows:

Alternative No. 1 - Rotating Biological Contactors

Estimated Construction Cost	\$735,000
Engineering, Legal and Administration	<u>80,000</u>
Total	\$815,000

Alternative No. 2 - Trickling Filters

Estimated Construction Cost	\$892,500
Engineering, Legal and Administration	<u>85,000</u>
Total	\$977,500

Alternative No. 3 - Rerating with Modifications to Existing Equipment

Estimated Construction Cost	\$132,065
Engineering, Legal and Administration	<u>39,619</u>
Total	\$171,684

A detailed breakdown of Alternative No. 3 is included in the Appendix of this report.

A no action alternative would limit growth of residential, commercial and industrial development, which would adversely affect community economic conditions.

The construction of package sewage treatment facilities for large developments was eliminated due to high construction, operation and maintenance costs when compared to the cost of the Royersford plant rerating alternative.

## Appendix A-22-b

The remaining discussion under this section deals with the clearly selected Alternative No. 3.

Financing will be done through contributions from developers wishing to connect to the sewer system and through the reserve funds of the Sewer Revenue Account. Administration costs will be increased. Costs of operation and maintenance will increase about \$28,000 per year. User fees will not be increased. As stated, no funding sources are needed. The rerated plant is expected to meet all requirements of the NPDES permit. Increased operating costs will be offset by revenue from new connections.

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Sludge management is done very effectively and legally in Royersford. Digested liquid sludge is applied to agricultural land by Contractor Henry Reifsnnyder, who has obtained permits from DER for all sites used. At the present time, the sludge management program needs no improvement. The most cost-effective alternative is being used.

6.0 INSTITUTIONAL EVALUATION AND RECOMMENDED ALTERNATIVE

6.1 Governmental Authority Providing Wastewater Treatment Services

At the present time, wastewater collection and treatment services are solely provided by the Royersford Borough. The sections of sanitary sewers in Limerick and Upper Providence Townships are operated and maintained by the respective Townships. Sewage is treated by Royersford under an intermunicipal agreement.

6.2 Existing Wastewater Treatment Authority, Its Present Performance and Past Actions

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The indebtedness of the Royersford Authority has been satisfied. The Authority was phased out when its debt was satisfied. The Borough has adequate available staff and administrative resources. The Borough has the legal authority to implement wastewater planning recommendations. The necessary sewer ordinances are in place to permit operation, maintenance, inspection and testing; imposing rates and user fees; maintaining offices; purchasing equipment; restrain violations; negotiate agreements with other municipalities; and to raise capital for construction and operation of wastewater facilities.

6.3 Institutional Alternatives Necessary to Implement the Recommended Official Plan

Royersford Borough, Limerick Township and Upper Providence Township will need to pass a resolution adopting the rerating alternative as part of the official Act 537 Plan. Copies of the resolutions will be forwarded to the DER Permits Section.

No new authorities will be needed to implement the Plan.

6.4 Justification for the Chosen Alternative for Implementing the Recommended Official Plan

The justification for choosing Alternative No. 3 is the economic feasibility of the alternative and the effective use of existing facilities.

6.5 Necessary Administrative and Legal Activities to Assure Plan Implementation

As stated previously, the Act 537 Plan resolution must be passed by the Borough, Limerick Township and Upper Providence Township. No authorities have to be formed. No new ordinances are required. No rights-of-way, easements or land transfers are necessary to implement the rerating alternative. The intermunicipal agreements will be revised as the need arises.

7.0 SELECTED WASTEWATER TREATMENT ALTERNATIVE

Alternative No. 3, Rerating with Modifications to Existing Equipment, best meets the Borough's wastewater treatment needs over the next five to seven years due to the economics of maximizing the use of existing facilities.

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8.0 IMPLEMENTATION SCHEDULE

The schedule of implementation for carrying out the recommended official Plan is as follows:

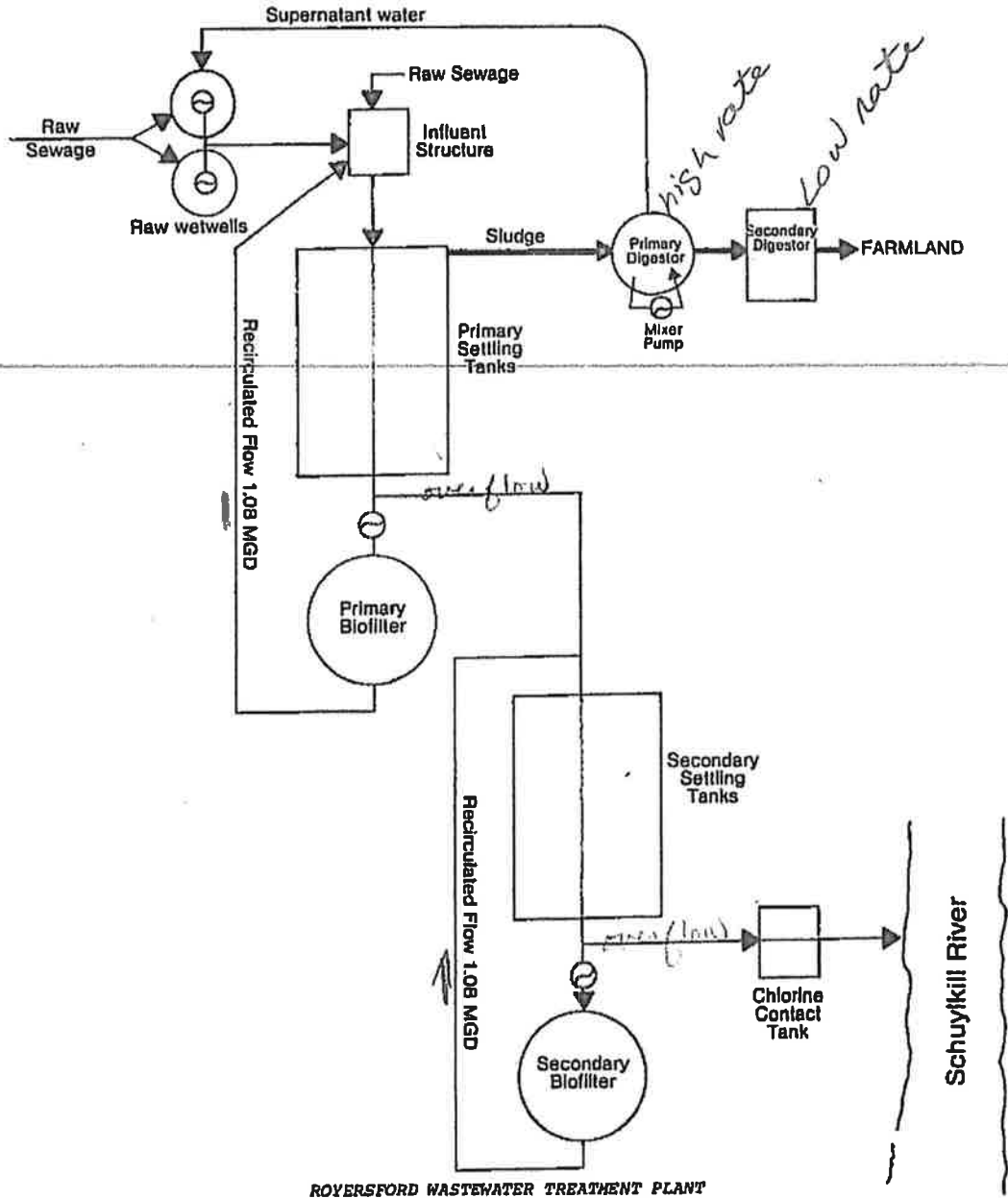
Adoption of Resolutions	2 Months
Design of Plant Modifications	3 Months
Bidding and Award of Contract	3 Months
Construction	<u>4 Months</u>
Total	12 Months

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APPENDIX

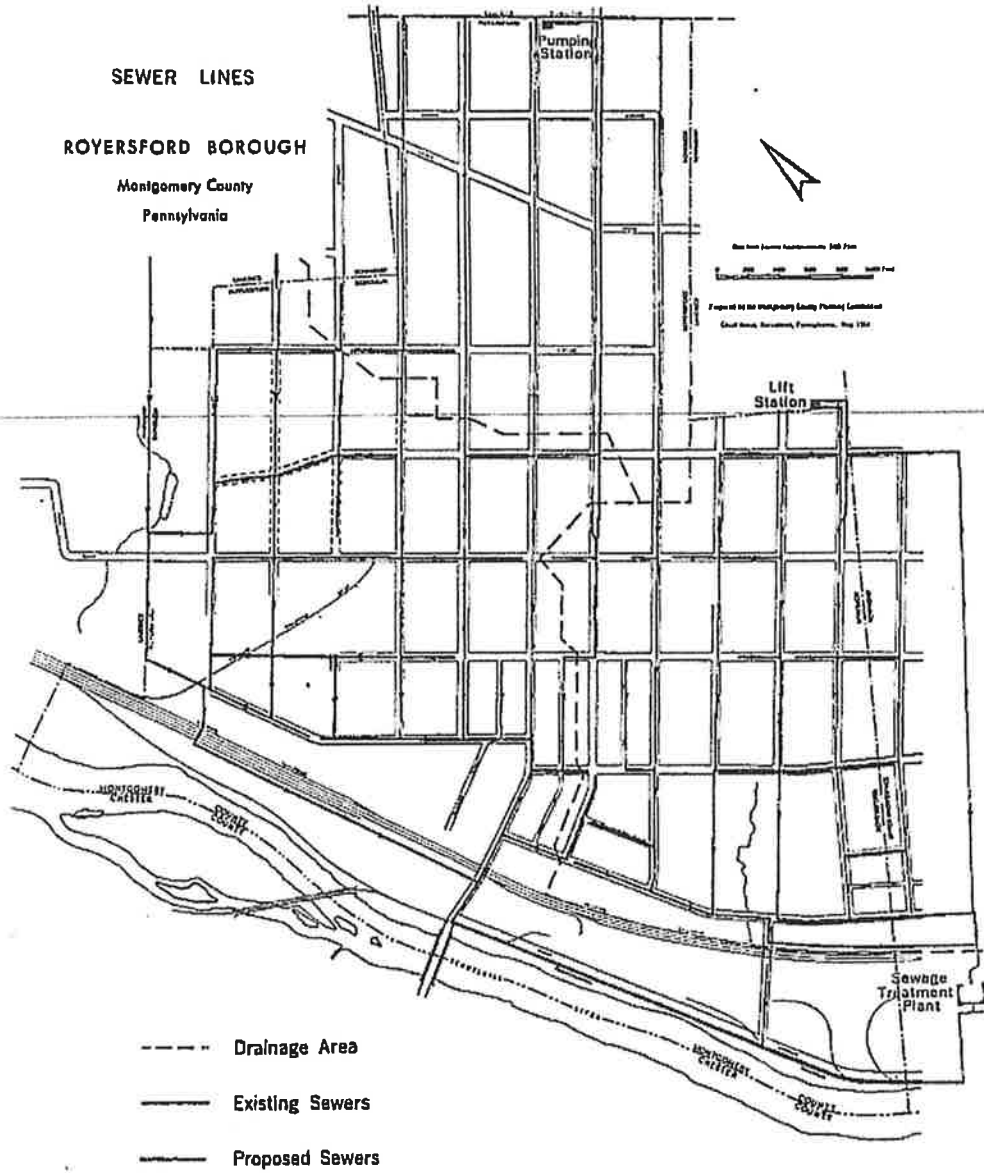
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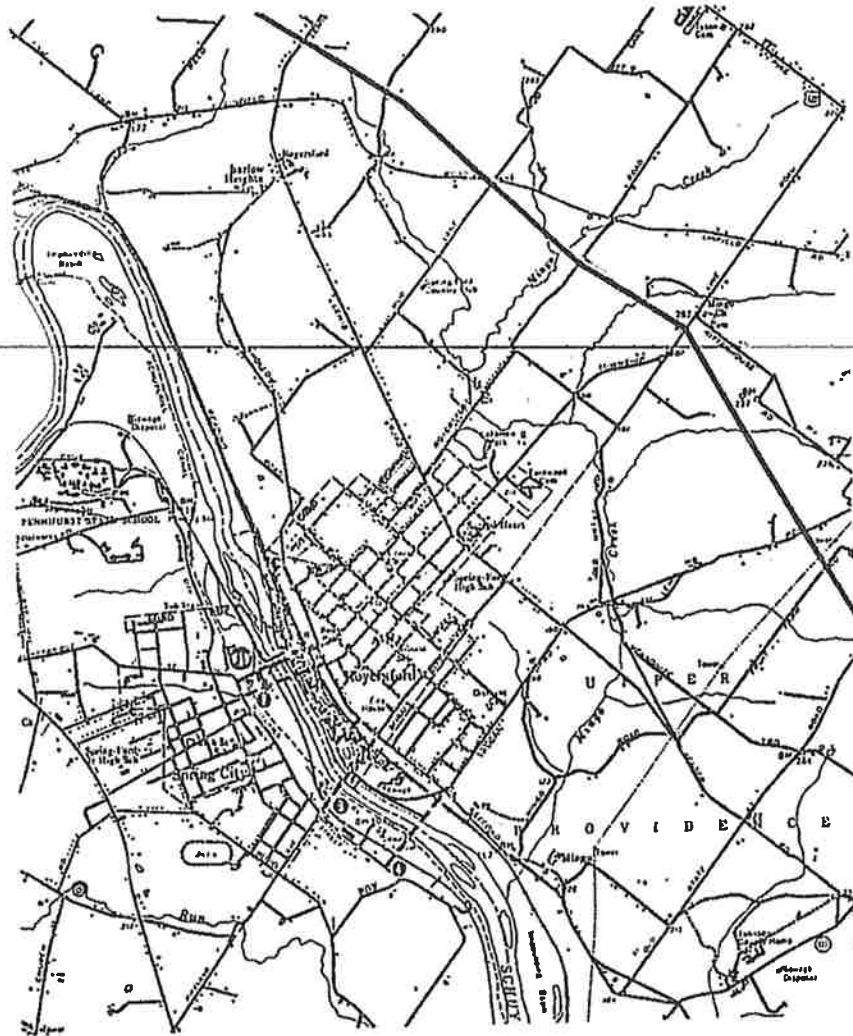
ROVERSFORD WASTEWATER TREATMENT PLANT

Flow Diagram

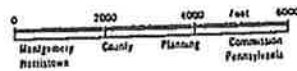


Source: Borough Engineer, Sanders and Thomas, Pottstown, Penn.

**AREA ROAD PROPOSALS**  
 Royersford Borough, Pennsylvania

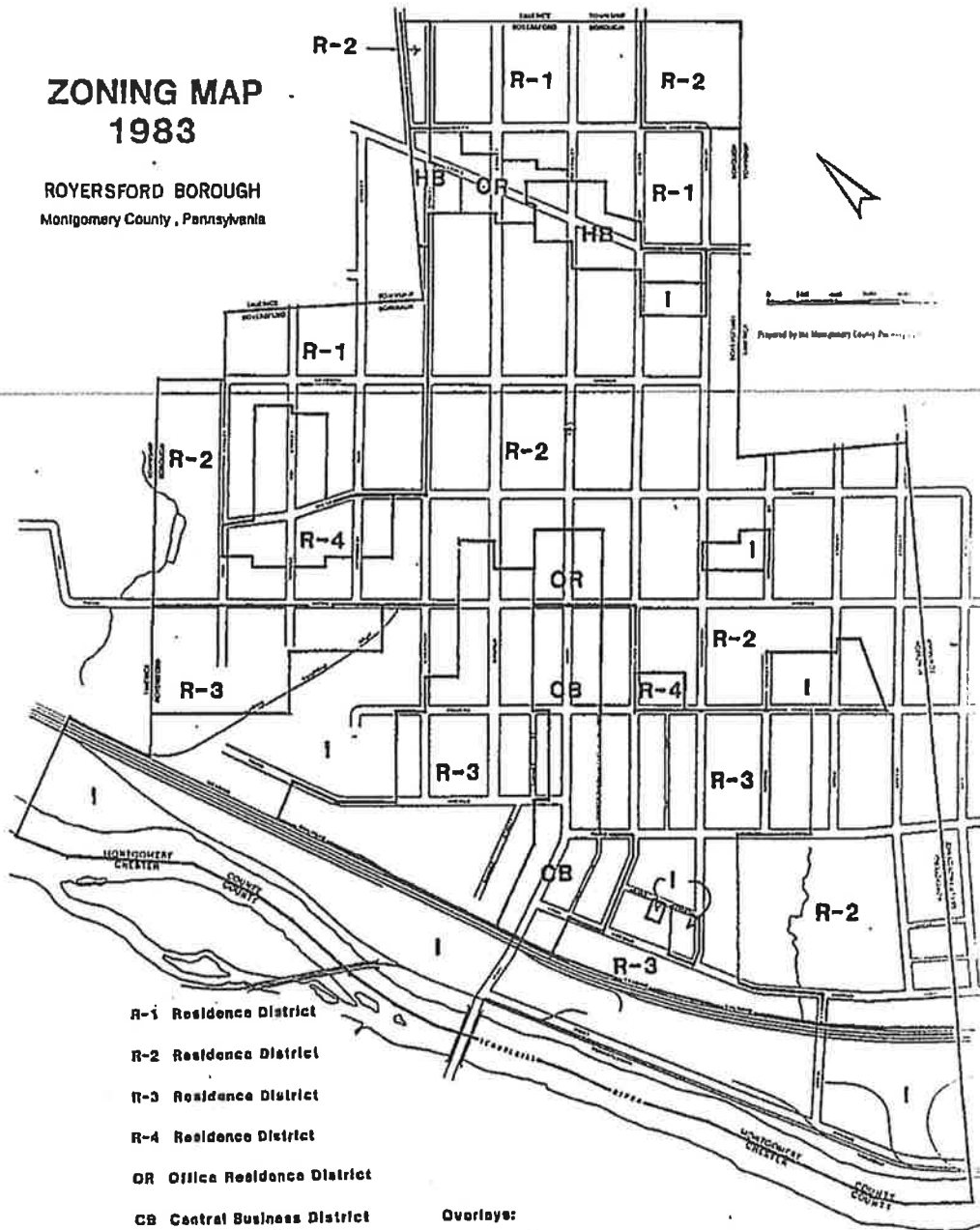


- ROAD ADDITIONS AND REALIGNMENTS
- Ⓜ PROPOSED MAIN STREET BRIDGE WIDENING
- ALTERNATE BRIDGE PROPOSALS
- ② WALNUT STREET — NEW STREET HIGH LEVEL BRIDGE
- ③ GREEN STREET — PIKELAND AVENUE HIGH LEVEL BRIDGE
- ① VAUGHN ROAD BRIDGE AND EXTENSION



**ZONING MAP  
1983**

**ROYERSFORD BOROUGH**  
Montgomery County, Pennsylvania



- R-1 Residence District
- R-2 Residence District
- R-3 Residence District
- R-4 Residence District
- OR Office Residence District
- CB Central Business District
- HB Highway Business District
- I Industrial District

- Overlays:**
- INS Institutional District
  - FP Floodplain Conservation District

BOROUGH OF ROYERSFORD

COST ESTIMATE  
FOR PROPOSED MODIFICATIONS TO  
WASTEWATER TREATMENT PLANT  
NECESSARY FOR RERATING PLANT CAPACITY  
TO 750,000 GPD

Modifications to Primary Settling Tank

Install Concrete Beams	\$ 2,500
Cut Holes in Existing Concrete	4,800
Install New Fiberglass Weir Troughs	22,500
Install New Scum Pipe	10,000
Replace Sludge Collectors	27,300
Replace Idler Sprockets	3,400
<b>Sub-Total</b>	<b>\$ 70,500</b>

Modifications to Chlorine Contact Tank

Install New Weirs	\$ 1,050
Replace Wood Baffles	1,950
Replace Sluice Gates	12,000
Replace Manhole Steps	1,650
<b>Sub-Total</b>	<b>\$ 16,650</b>

Addition of a Third Raw Sewage Pump

Install New 6" Submersible Pump in Existing Wetwell	\$ 25,000
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Mobilization and General Requirements	\$ 8,700
Contingency - 10%	11,215

<b>Total Estimated Construction Cost</b>	<b>\$132,065</b>
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Engineering - 20%	\$ 26,413
Legal and Fiscal - 5%	6,603
Administrative - 5%	6,603

<b>TOTAL ESTIMATED PROJECT COST</b>	<b><u>\$171,684</u></b>
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*Secondary Sludge Collectors (P 10)  
T.F. wall repairs (P 9)*

