

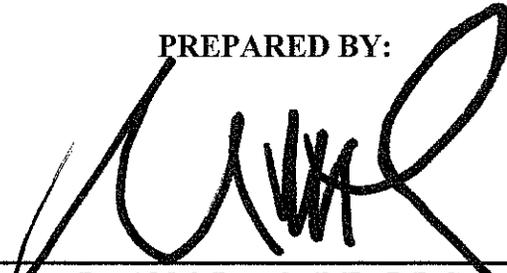
**STATUS REPORT AND CORRECTIVE ACTION PLAN FOR THE
CHELTENHAM TOWNSHIP SANITARY SEWER SYSTEM**

for

**CHELTENHAM TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
8230 Old York Road
Elkins Park, PA 19027**

**June 8, 2010
Revised through August 20, 2010**

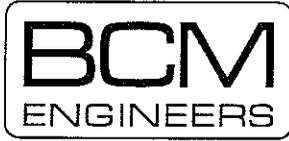
PREPARED BY:



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August 20, 2010

Ms. Jenifer Fields
Pennsylvania Department Of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401-4915

Subject: Cheltenham Township, Montgomery County, PA
Sanitary Sewer System
Corrective Action Plan – August 2010
BCM Project No. 57.30617.0002

Dear Ms. Fields:

On behalf of Cheltenham Township, BCM Engineers is submitting to you herewith a final Corrective Action Plan (CAP) that describes the Township's proposed plan to improve its sanitary sewer collection system. This CAP has been revised based upon comments received and topics discussed during meetings with the Department on July 12, 2010 and August 11, 2010.

We respectfully request that you review the attached CAP and verify that it addresses your comments and is satisfactory to the Department based on our previous discussions. If you have any questions regarding it or require additional information, please contact me at (610) 313-3100. Thank you.

Very truly yours,

Michael T. Postick, P.E.
Project Manager

MTP:sws

Enclosure

cc: Jesse Goldberg, PADEP
Cheltenham Township Board of Commissioners
David Kraynik, Cheltenham Township Manager
David Lynch, P.E., Cheltenham Township
Rudy Kastenhuber, Cheltenham Township
Joseph Bagley, Esq., Cheltenham Township Solicitor

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**STATUS REPORT AND CORRECTIVE ACTION PLAN FOR THE
CHELTENHAM TOWNSHIP SANITARY SEWER SYSTEM**

August 2010

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CHELTENHAM TOWNSHIP SANITARY SEWER SYSTEM**

August 2010

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**STATUS REPORT AND CORRECTIVE ACTION PLAN (“CAP”) FOR THE
CHELTENHAM TOWNSHIP SANITARY SEWER SYSTEM**

August 2010

INTRODUCTION

In an effort to reduce and ultimately eliminate sewer surcharging and sanitary sewer overflows from the Cheltenham Township sanitary sewer collection system, and to concurrently create capacity within the system for future residential and nonresidential connections, the Township initiated an infiltration and inflow (“I/I”) reduction and sewer system rehabilitation program in the year 2000. The Township also engaged in the development and completion of several Corrective Action Plan Milestones set forth by the Pennsylvania Department of Environmental Protection (“PADEP”) in a Consent Order and Agreement signed in 2006.

Although the Township’s ongoing sewer system rehabilitation program has reduced flows, the Township continues to face problems relating to infiltration and inflow, sewer system surcharging and SSOs. This revised CAP establishes new milestone activities to further reduce and ultimately eliminate sewer surcharging and SSOs and create additional capacity within the system for future residential and non-residential development

SECTION 1 CLEANING, TELEVISIONING AND GROUTING PROGRAM

Cheltenham Township began its CTVG program with Phase 1 in 1999. The program started at the west end of the Township and proceeding eastward. With the completion of Phase 5 of the CTVG program on August 31, 2009, nearly 100% of the sewer system has been inspected and cleaned. The system was also grouted where needed. Sewer cleaning methods included bucketing¹, normal or heavy cleaning², heavy grease removal and root cutting³. Bucketing and one or more other cleaning methods were used in Township sewers depending on the observations made during televising. Refer to the notes at the end of this Section for a description of these methods.

As of August 2009, the CTVG Program resulted in the completion of the following:

Length of pipe CTVG	106.38	Miles
Inch-Miles of pipe CTVG ⁴	1,011.69	Inch-Miles
Number of joints tested	147,087	Total
Joint length ⁵	69.09	Miles
Grout applied	125,148	Gallons
Joint length grouted ⁶	33.1	Miles
Percent of joint length grouted	47.9	%
Heavy grease removal and root cutting	29.03	Miles
Heavy cleaning	43.38	Miles

With the exception of approximately 1,500 linear feet of sanitary sewer, the entire sanitary sewer collection system was cleaned, televised and grouted. Only two (2) small sections of the system were not televised as described below:

- Approximately 1000 LF of 12-inch clay sewer installed between Fisher Road and Aspen Way has not been CTVG'd because of private property access issues.
- Approximately 500 LF upstream, of a sumped manhole buried 40' below a parking field at the JC Melrose Country Club.

¹ Bucketing is the winching through the sewer pipe of a clam-shell bucket with the bucket's open end in the direction of pull. If an object is too heavy for the bucket, the clam shell opens and the object passes through the clam shell. For larger pipe sizes (i.e. 27-inch to 33-inch diameter), a 24-inch diameter bucket was used. Root masses hanging from the top or sides of the pipe are not removed by bucketing.

² Normal cleaning consists of 1 to 2 passes through a sewer pipe section with a high pressure water jet (2,000 psi and 60 gallons per minute). Heavy cleaning consists of 3 or more passes through the section with the high pressure water jet. Normal and heavy cleaning is capable of removing minor root masses.

³ Heavy grease and root cutting consists of winching a root cutting device through a pipe section. The device removes root intrusions as well as significant grease buildup. This requires an additional pass through the pipe section in addition to any normal or heavy cleaning.

⁴ Inch-Miles of pipe is the summation of the products of the length in miles of each pipe diameter and each pipe diameter in inches. It is used to convey the magnitude of the CTVG Program.

⁵ Joint Length is the summation of the circumference lengths of the joints for the various pipe diameters.

⁶ Joint Length Grouted is based upon an average of 1.5 gallons of grout applied per 8-inch diameter joint. One gallon of grout seals approximately 1.396 feet of joint with a grout surface area (i.e. tube or cylinder) with a surface area of 3.75 feet square.

SECTION 2 FLOW ANALYSES

Cheltenham Township has been conducting continual monitoring and data compilation of the flow conveyed from Interceptor A into the Philadelphia Water Department (“PWD”) sanitary sewer system. A flow meter, referred to as meter MH1, is located near the point of interconnection with the PWD system and was installed in November of 2006. It measures nearly all of the Township’s wastewater flow in addition to flow generated by Abington Township, Jenkintown Borough, Springfield Township and PWD. It is therefore very representative of the Cheltenham Township Sanitary System Service area’s wastewater flow behavior during both wet and dry weather.

Table 2.1 on the following page includes a basic summary of annual flow data for the time period between January 2007 and December 2009. This data includes the total flow from the Township.

From this basic data analysis coupled with the information obtained from the CTVG program and other I/I reduction efforts and observations, the following conclusions can be made:

1. Average flows from the Township decreased between 2007 and 2008 by over half a million gallons per day, which is equivalent to slightly more than 2,000 EDUs. This was due to the Township’s I/I reduction efforts in combination with the fact that there was six inches less rainfall in 2008 versus 2007. 2008 was a relatively drier year.
2. Note that the meter was removed between April 2009 and June 2009 for sewer maintenance purposes.
3. Rainfall increased in the Township considerably between 2008 and 2009, particularly in December of 2009. There was over 13 inches more rainfall in 2009 versus 2008.
4. Average flows from the Township increased between 2008 and 2009 by approximately 866,000 gallons per day, based on monthly averages. This was due obviously to higher rainfall, but observations have shown that groundwater levels became consistently abnormally higher during the last quarter of 2009. This increases infiltration considerably especially in those portions of the sewer where the CTVG program showed evidence of extensive but minor cracking with no visible infiltration at the time of televising when groundwater levels were lower. The Township and BCM Engineers believe that these portions of the sewer, which were not yet immediately rehabilitated since they had no visible infiltration, most likely develop infiltration during high groundwater levels to have a significant cumulative impact.

5. An analysis was made of the ratios of flows over rainfall for each year. This ratio gives an indication of how strongly the system reacts to rainfall. These ratios decreased between 2008 and 2009 (0.258 MGD per Inch of Rainfall to 0.182 MGD per Inch of Rainfall). This indicates that although the Township still experiences difficult I/I problems and that much additional reduction efforts are needed, it appears that the efforts done to date have had the effect of reducing the magnitude of the I/I to some extent. In other words, flows in 2009 would have most likely been even higher if the Township had not implemented the I/I reduction efforts it completed to date.

SECTION 3 SANITARY SEWER OVERFLOWS (SSOs)

3.1 History

An SSO is any unplanned discharge of untreated Sanitary Sewer effluent outside of the Sanitary Sewer Collection, Conveyance and/or Wastewater Treatment Systems. Cheltenham Township classifies an SSO as either "Wet Weather" or "Dry Weather." A Wet Weather SSO occurs either during or just after a storm event and is the result of hydraulic overloading of the sewer system by infiltration and/or inflow. A Dry Weather SSO occurs primarily during dry weather (although it can occur during wet weather) and is the result of blockages within the sewer: grease, roots, diapers, etc. Wet Weather SSOs adversely impact the water quality of receiving watercourses, while Dry Weather SSOs only adversely impact the receiving watercourse if the sewage effluent drains to the watercourse. In Cheltenham Township almost all of the Dry Weather SSOs do not drain to a watercourse (Sewage effluent is usually contained within a basement or on a property.).

The Township for several years has dealt with SSOs of varying degrees of frequency and magnitude due to weather and groundwater conditions. Note the following comments and observations relating to recent SSO activity:

1. In 2009, there were noted increases in SSOs. This was due primarily to the fact that total rainfall in 2009 was 13.68 inches greater than 2008, particularly during the 4th quarter of 2009. This obviously increased both wet weather infiltration and stormwater inflow. It also progressively increased groundwater levels, adding to infiltration even during dry weather. The Shoemaker Road driveway area is still a critical area for SSOs. In 2009, four (4) SSOs occurred at this location.
2. In March of 2010, there was a very large rainfall event beginning on March 12 and ending on March 15. Approximately 3.64 inches of rainfall was recorded during this event. This significant event resulted in severe surcharging of Interceptor A and resulted in SSOs at manholes on the Shoemaker Road driveway. Also, atypically high groundwater levels in the area in combination with this severe rain event created a sustained SSO and/or surcharging at the Shoemaker Road driveway several days after the rain event ceased. Surcharging was also evident in a manhole at a critical location along Mill Road.

The sustained surcharging in Interceptor A at that time resulted in a loss of sanitary sewer services to some residences.

3.2 Current SSO Management

The Township continues to monitor Interceptor A very closely during any significant rain event. Typically, the Township calls AQUA Wastewater Management (“AWM”) to dispatch its pumper trucks if the sewage level rises above a critical manhole rung in the observation manhole immediately upstream of the Shoemaker Road SSO area. The last time AWM was engaged to pump sewage from the observation manhole started during the 3.64 inch long duration rainfall event that began on March 13, 2010. Pumping continued until April 10, 2010.

The severe rain event on March 13, 2010, in combination with high groundwater levels, was a unique situation in that it brought about sustained surcharging in Interceptor A and equally sustained SSOs on Shoemaker Driveway. These SSOs were significant in volume and resulted in an uncontrolled discharge of untreated wastewater into Tookany Creek. The surcharging also resulted in the loss of sewer service to eight (8) private residences. Immediately eliminating the SSOs was not possible, therefore the Township sought methods to attempt to reduce its impacts while at the same time returning sewer service to the private residents.

During the week of April 5, 2010, the Township, at PADEP’s direction, pumped wastewater from a manhole downstream of Church Road and discharge it to a controlled, in-ground settling basin in Ogontz Field. Although not desirable, this course of action enabled the Township to at least control the SSO, apply a degree of solids removal and disinfection, and maintain private residence sewer service. The Township pumped wastewater into the basin whenever the levels in specific observation manholes reached critical surcharge levels. This method continued to be conducted until May 3, 2010 for that particular event and was used again on July 13, 2010.

Cheltenham Township and BCM Engineers realize that these SSO management methods are emergency actions and are not considered proper or acceptable methods. As a result, the Township and BCM Engineers analyzed the correction action items described in Section 4 as potential long term solutions.

SECTION 4 CORRECTIVE ACTION ALTERNATIVES EVALUATIONS

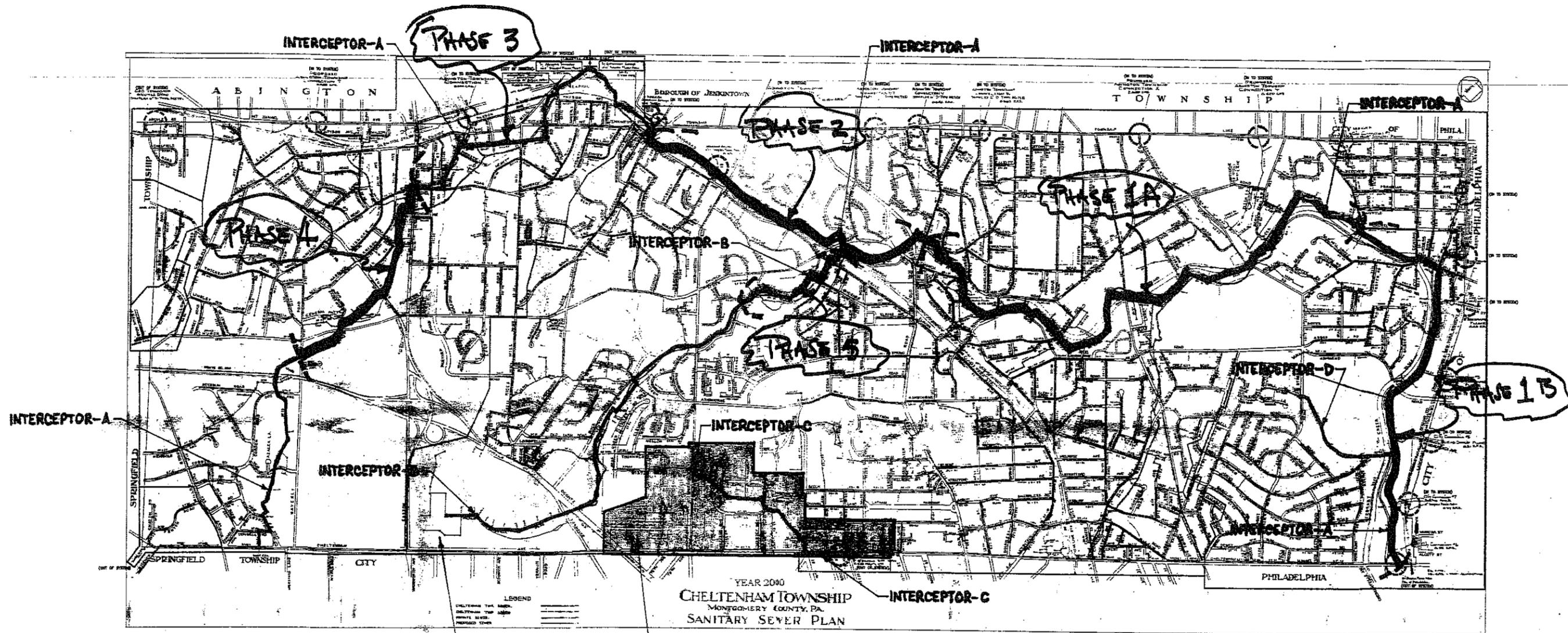
Although progress has been made by the Township in enacting and maintaining an I/I and SSO reduction program, the continued presence of SSOs and the conveyance of sustained high peak flows to the PWD's system reveals that more is needed. The I/I and flow reduction program currently being enacted by the Township, and expanded herein, will be an ongoing program and will be reduced in magnitude only when SSOs have been eliminated to the maximum extent practicable and wet versus dry weather flow variations have been brought to acceptable levels.

In an effort to reduce flows and the occurrences of SSOs, the Township has evaluated several potential alternatives. These alternatives are described and evaluated in the following sections. Based on these evaluations, a final Corrective Action Plan has been prepared and is defined in Section 5.

4.1 Interceptor A Interim Bypass Pumping

The severity of the SSO situation at Shoemaker Road driveway and in Ogontz Field as described in Sections 3.1 and 3.2 makes the prevention of a reoccurrence of an SSO of that caliber the Township's greatest priority. Arguably the most efficient method of ensuring this does not occur in the immediate future is to transfer excess wastewater that could potentially overflow onto the ground surface and/or into the Tookany Creek during wet weather into a sewer that has the capacity to receive and convey it. With respect to Interceptor A, inspections have shown that the severe surcharging occurs in the section of Interceptor A between Laurel Avenue and the Shoemaker Road driveway. This section is referred to as Phase 1A on Figure 4.1. The Interceptor diameter ranges between 22 inches to 27 inches in this section. At Laurel Avenue, Interceptor A increases in size to 30 inches in diameter. Further downstream, at Old Soldiers Road, Interceptor A increases to 33 inches in diameter. Neither the 30-inch nor the 33-inch portions of Interceptor A have experienced any SSOs or significant surcharging in 2008 and 2009. Therefore, an immediate but temporary solution to mitigate the SSO problem on Interceptor A is to install an interim bypass pumping system that removes excess flow from Interceptor A upstream of the Shoemaker Road driveway and Ogontz Field SSO area and transfers it via an above-ground force main pipe to the 30-inch diameter section of Interceptor A.

The Township and BCM Engineers thoroughly investigated the pumping requirements, force main pipe location and alignment, pipe material and sizing, pipe restraint requirements, etc. needed to develop a functional bypass pumping system. The selected system would utilize three (3) above-ground suction lift pumps and approximately 16,300 linear feet of 24-inch diameter HDPE force main placed adjacent to the Tookany Creek (essentially along the same alignment as the existing Interceptor A). A final proposal from Godwin Pumps for the installation of this system was received on May 5, 2010 for a



cost of \$1,292,040.08. The Township issued a Notice to Proceed to Godwin Pumps on July 8, 2010. The Township received an authorization for the system from PADEP on July 16, 2010 in the form of a PA State Programmatic General Permit ("PASPGP-3"). Refer to Figure 4.2 for a drawing of the proposed interim bypass pumping system layout.

This system has a very strong advantage in that it would enable the Township to prevent the noted severe SSOs from occurring while permanent solutions are enacted. Although temporary, this is a very effective, rapid solution.

Note also that this alternative was contingent upon the negotiation, approval and execution of a new agreement with PWD to allow for, among other aspects, acceptance of additional flows from the Township. Refer to Section 4.5.

4.2 Act 537 Planning

Cheltenham Township currently does not have its own official, approved Act 537 Sewage Facilities Plan. The Township has been made aware by PADEP that the development of an Act 537 Plan is absolutely essential. Development and approval of an Act 537 Plan would have the following advantages:

1. It would formally establish updated sewer system demand/usage and as a result set acceptable intermunicipal agreement limits.
2. It would require the development of new, up to date intermunicipal agreements with Abington Township, the Borough of Jenkintown and Springfield Township.
3. It would establish a firm plan for rehabilitation of the regional system tributary to Cheltenham Township, not just the system directly owned by the Township.
4. It would enable the Township to more effectively manage future system connections.
5. It would require contributing municipalities to engage in flow reduction programs if studies proved that the municipalities were generating excessive wet weather flows.

The Township has received proposals from five (5) qualified engineering firms to prepare an Act 537 Plan that encompasses not only Cheltenham Township but all other municipalities ultimately tributary to Interceptor A, namely Abington Township, Springfield Township, Jenkintown Borough, and the City of Philadelphia. The Township intends to award a contract for the Act 537 Plan on September 15, 2010.

4.3 Replacement of Interceptor A

Another alternative to prevent the SSOs that have occurred primarily along the critical Shoemaker Driveway section of Interceptor A is to replace the downstream portions of the Interceptor that are potentially hydraulically restrictive (i.e., have inadequate capacity for the high wet weather flow) with newer, larger diameter pipe. The Township and BCM Engineers have investigated the feasibility of the alternative of replacing Interceptor A between Adams Avenue at the point of interconnection with the PWD system to Shoemaker Road/Forest Avenue. This amounts to approximately 4.1 miles and includes not only the critical section described in Section 4.1 but additional downstream sections. Replacement of this portion of Interceptor A could be completed in phases and be prioritized according to which phases have the most deficient capacities given the current wet weather flow. It is estimated that replacement of Interceptor between Adams Avenue and Shoemaker Road/Forest Avenue would cost approximately \$20.48 million.

This alternative would accomplish the same purpose as the bypass pumping system described in Section 4.1 above. However, it would be a permanent, below-grade gravity piping system, which has the disadvantage that it cannot be implemented quickly and would require surveying, design, bidding and a relatively lengthy construction period. Completion of the initially selected phase would require a minimum of 2 to 3 years.

Interceptor A serves not only Cheltenham Township, but also portions of Abington Township, Jenkintown Borough, Springfield Township, and the City of Philadelphia. It is essentially the main interceptor sewer in a regional system. It is in the Township's best interest to obtain input from each contributing municipality concerning their present and future needs and to establish financial commitments and agreements with these municipalities to support their proportional share of any replacement or expansion of Interceptor A. This can be done through the development and approval of a regional Act 537 Plan. Determining the exact existing and future wastewater conveyance needs on Interceptor A and comparing these demands with the Interceptor's capacity is essential and will show if replacement is needed, where it may be needed, and what size replacement sewer should be installed. Therefore, it is recommended that the Township should not initiate immediate plans for the replacement of any portion of Interceptor A until an Act 537 Plan is complete and it is determined that the Act 537 Plan firmly establishes the need for replacement and/or expansion.

Given the fact that Interceptor A functions properly during dry weather, it is highly probable that the Interceptor is properly sized for the EDU wastewater loading it conveys and only experiences critical surcharging and SSOs during very heavy rainfall and/or high groundwater levels. Removing enough I/I to eliminate critical surcharging and SSOs during wet weather would therefore preclude the need to enact a very costly replacement of Interceptor A as an immediate priority. The Township believes it is better to pursue other immediate, aggressive I/I reduction efforts throughout the Township's entire collection system over the next five (5) years such as sewer lining, point repairs, lateral rehabilitation, etc. and evaluate their impact before pursuing replacement of large

portions of Interceptor A. Evaluation of the benefits of I/I reduction efforts shall be made after their completion during significant rain events. If after three (3) years of rehabilitation efforts it is revealed that not enough I/I is being removed to create a beneficial reduction in flows in Interceptor A, the Township shall reconsider the replacement of sections of Interceptor A.

4.4 Elimination of Poor Interceptor A Alignment

1. Interceptor A Sag at Jenkintown Creek

In late September 2008 during the televising of Interceptor A, the CTVG personnel discovered that the 66 foot section of Interceptor A that crosses Jenkintown Creek was sagged or sumped at least three (3) feet below the intended gravity gradeline. This 27-inch diameter clay pipe was half filled with debris, and twenty recycling bins of sediment, grit, and rocks were removed from this section. The cleaning of this one section obviously removed a significant flow restriction from this system.

Subsequently, BCM Engineers investigated this sag more closely to determine what would be needed to rectify the problem. In the fall of 2009, it was discovered via site surveying that in addition to the sag between the manholes, the sanitary manhole immediately upstream of the creek crossing was also constructed below the intended design grade. The invert of this manhole is in fact lower than the downstream manhole, creating a low point and “negative” capacity in the sewer beneath the creek. This in conjunction with the sag described above is creating a reduction in the Interceptor A capacity at this location. Both the sag and the low point manhole are also causes for regular solids deposition in this portion of the Interceptor, which further restrict flow. Based on hydraulic calculations describing this location, it has been estimated that the low point manhole requires a surcharge to the top of the Interceptor pipe nearly a half mile upstream in order to create enough hydraulic head to convey a wet weather flow of 15 MGD through the interceptor sag at the creek crossing. Even normal, dry weather flow obviously requires a degree of surcharging to force the wastewater through this section of “negative” capacity.

Prior to the sustained sewer SSO event experienced by the Township in March and April of 2010, BCM Engineers had been developing design plans and specifications to replace the 66 feet of Interceptor A beneath Jenkintown Creek with a new pipe having sufficient capacity to convey existing average and peak flows. Under this design, the low point manhole would also be replaced with a manhole at the proper location and elevation that would eliminate the low point.

Both the Township and BCM Engineers believe this project would be potentially useful in reducing upstream surcharging in Interceptor A. The great majority of SSO incidents from Interceptor A are near Shoemaker Road approximately 1.7 miles upstream of the Jenkintown Creek crossing location.

There are difficulties in the design and construction of this project due to the fact that the Interceptor at the creek crossing is very shallow, leaving very little clearance between the top of the sewer and the creek bed. Full concrete encasement over the pipe and up to the creek bed along with the installation of dual sewers at this location are most likely needed to create a functional system that creates greater capacity while still providing some cover over the sewer. A more effective solution would be to extend the replacement as a single pipe a considerable distance downstream where the sewer is deeper, thereby creating a steeper slope for the replacement sewer. This would make the replacement sewer deeper at the creek crossing, would allow for more cover over the pipe, and would eliminate the need for dual sewers. The result would be a more efficient design, but at a much more expensive cost.

It is therefore recommended that this project should not begin immediately for the following reasons:

- a. The more efficient solution to the sag would be to extend the replacement sewer a much longer distance downstream, and it is more cost effective to include such work in any future extensive replacements of Interceptor A that may become necessary after the completion and evaluation of other I/I reduction and rehabilitation efforts or if recommended by the Act 537 Plan.
- b. The installation and operation of the bypass pumping system described in Section 4.1 will allow the Township to bypass this sag in the event of wet weather surcharging and will prevent the sag from contributing to any SSOs while other system rehabilitation efforts are undertaken and while the Act 537 Plan is being completed.
- c. The conclusions of the Act 537 Plan will determine if, or to what extent, Interceptor A needs to be replaced regardless of I/I reduction efforts. If replacement is warranted, the Act 537 Plan will also provide information that will allow for the calculation of the proper Interceptor replacement size. It is advisable to complete this analysis before replacing any portion of Interceptor A.

If the Act 537 Planning finds that Interceptor A does not have to be replaced, or if other rehabilitation efforts prove to be very effective and thereby eliminate the need for an extensive replacement of sections of Interceptor A, then the Township will eliminate the sag at Jenkintown Creek starting in year three of the CAP.

2. Removal of Sharp Bends on Interceptor A

Sharp bends at manholes are hydraulically restrictive and can contribute to surcharging. The Township has studied Interceptor A to locate bends that would be suitable for elimination. Several primary locations are described below:

- a. Two (2) bends in the 24-inch portion of Interceptor A near the SEPTA Bridge 10.12, which crosses the Tookany Creek adjacent to Cheltenham Hills Drive. **The realignment/relocation project to remove these bends was completed in 2009.** This realignment eliminated the flow-restricting, sharp-angle bends in Interceptor A and also removed the Interceptor and a manhole from its location within the Tookany Creek.
- b. Two (2) sharp 90-degree bends in the 24-inch portion of Interceptor A by 7859 Mill Road.
- c. A sharp 90-degree bend in the 27-inch portion of the Interceptor at Kleinheinz Pond adjacent to the Tookany Parkway. This is also an area of high groundwater and thus potential infiltration as well, which will make a replacement at this location even more effective in reducing SSOs.
- d. A sharp 90-degree bend in the 22-inch portion of Interceptor A near Church Road and Meetinghouse Road.
- e. Two (2) sharp bends in the 22-inch portion of Interceptor A near Washington Lane.

Similar to the sag in Interceptor A at Jenkintown Creek discussed above, removal of these sharp bends should not begin immediately. It would be more conducive to include the work to remove these bends in any future extensive replacements of Interceptor A that may become necessary after the completion and evaluation of the Act 537 Plan and other I/I reduction and rehabilitation efforts. If the Act 537 Plan and/or other efforts prove that extensive Interceptor A replacement is not necessary, these bends will be eliminated starting in year three of the CAP.

A point to reiterate regarding the immediate replacement of portions of Interceptor A (i.e., Phase 1B, the Jenkintown Creek Sag or Sharp Bends Elimination) is that the existing sewer invert elevations must match the end points of any replacement section. This would lock in the existing poor vertical alignment of Interceptor A and would prevent the elimination of over 8 vertical feet of drop manhole elevation differential in four manholes in Phase 1A and 1B (See Figure 4.1). For this reason, and as discussed above in this Section, it is recommended that replacements of sections of Interceptor A be postponed until other recommended rehabilitation efforts described herein, and the Act 537 Plan, are completed and analyzed.

4.5 Development of a New Intermunicipal Agreement with PWD

The potential alternatives described in Sections 4.1 and 4.3 would enable the Township's Interceptor A to convey additional flow, which in turn will help to keep wastewater "in the pipe" and eliminate related SSOs. By increasing system capacity more flow will be conveyed to PWD. This prompted the need for an updated agreement between the Township and PWD. Until recently, the agreement being used was developed in the 1980s and was very out of date. It did not effectively consider existing exceedances of the agreement's flow limits, nor did it account for even greater increases in flow that would occur due to the implementation of the alternatives described above, were such alternative selected for action.

In June 2010, several exchanges of revisions to a draft agreement were made by both the Township, BCM Engineers and PWD in anticipation of the potential implementation of CAP alternatives, in particular the Bypass Pumping System described in Section 4.1. The Township also met directly with PWD personnel to discuss the terms of a new agreement. A new agreement was finalized on June 30, 2010. In short, the primary points described in the new agreement are the following:

1. A re-establishment of maximum wastewater flows the Township can convey to PWD. By agreement, the Township can convey a maximum of 18 cubic feet per second (cfs) through Interceptor A to PWD.
2. The exchange of flow measurement information between PWD and the Township.
3. Conditions of acceptance of the Interceptor A bypass pumping system described in Section 4.1.
4. Determination of the monetary penalties the Township will face for exceedance of any established flow limits. Under the new agreement, PWD agrees to waive all exceedance charges for a period of 5 years from the date of execution of the agreement.
5. Planning for elimination of flow exceedances.
6. Industrial pretreatment.
7. Billing and management fees.
8. Contributions to the Tookany/Tacony-Frankford Partnership (See Section 4.15 below).

4.6 Development of New Intermunicipal Agreements with Abington Township, Springfield Township and the Borough of Jenkintown

The sewer service agreements that Cheltenham Township currently has with Abington Township, Springfield Township and the Borough of Jenkintown are considerably out of date, as the initial versions of these agreements also began in the 1920s. There have been various amendments since that time and as a result, they lack consistency with several

items, most importantly the precise determination of flow limits and resulting exceedance penalties.

The combined flows from Abington Township, Springfield Township and the Borough of Jenkintown amount to over 40% of the total flow that Cheltenham Township conveys to PWD; therefore, it is imperative that the Township and these interconnecting municipalities begin the development of new agreements. Final development and completion of such agreements will require information such as current and future wastewater needs that will be studied by the municipalities in the Act 537 Plan discussed in Section 4.2. Since this will take two (2) years to complete, in the interest of time the Township will initiate the process of developing new agreements immediately and allow the process to continue concurrently with the development of the Act 537 Plan.

The Township intends to use its new agreement with PWD as a model for the other intermunicipal agreements. While the Township will begin the process of developing and negotiating the new intermunicipal agreements immediately, the Township requests PADEP's assistance in bringing other municipalities to the table for final negotiations and adoption of new intermunicipal agreements.

4.7 Sewer System Rehabilitation

Sewer surcharging and the occurrences of SSOs in the Township are the result of stormwater and groundwater that has infiltrated into the sewer system or that has entered the system via a direct connection (i.e., inflow). Under the PADEP Consent Order and Agreement with the Township dated June 7, 2006, the Township was required to clean, televise and grout the entire sewer system owned and operated by the Township. This was described in Section 1. Televising the sewer system enabled the Township to note all locations where infiltration was visible, where the sewer system was significantly deteriorated, and where the sewer system showed evidence of less severe deterioration that has the potential for infiltration even if visible infiltration was not seen. Grout was applied at locations where minor infiltration was visible, where the pipe had minor deterioration, or where pipe joints failed testing. Grouting was conducted wherever and whenever it was applicable during the time the sewer was televised.

The basic qualitative results of the televising program can be summarized briefly as follows:

1. Large, significant single sources of infiltration or severe sewer damage were not discovered.
2. Visible infiltration was not common or heavy. However, this may be due to the fact that the televising was often conducted during dry weather and low groundwater levels.
3. Only a few locations were discovered where the sewer could be defined as "broken". In these cases, holes roughly six inches in diameter, or offset joints,

were sometimes discovered. No significant infiltration was seen at these locations.

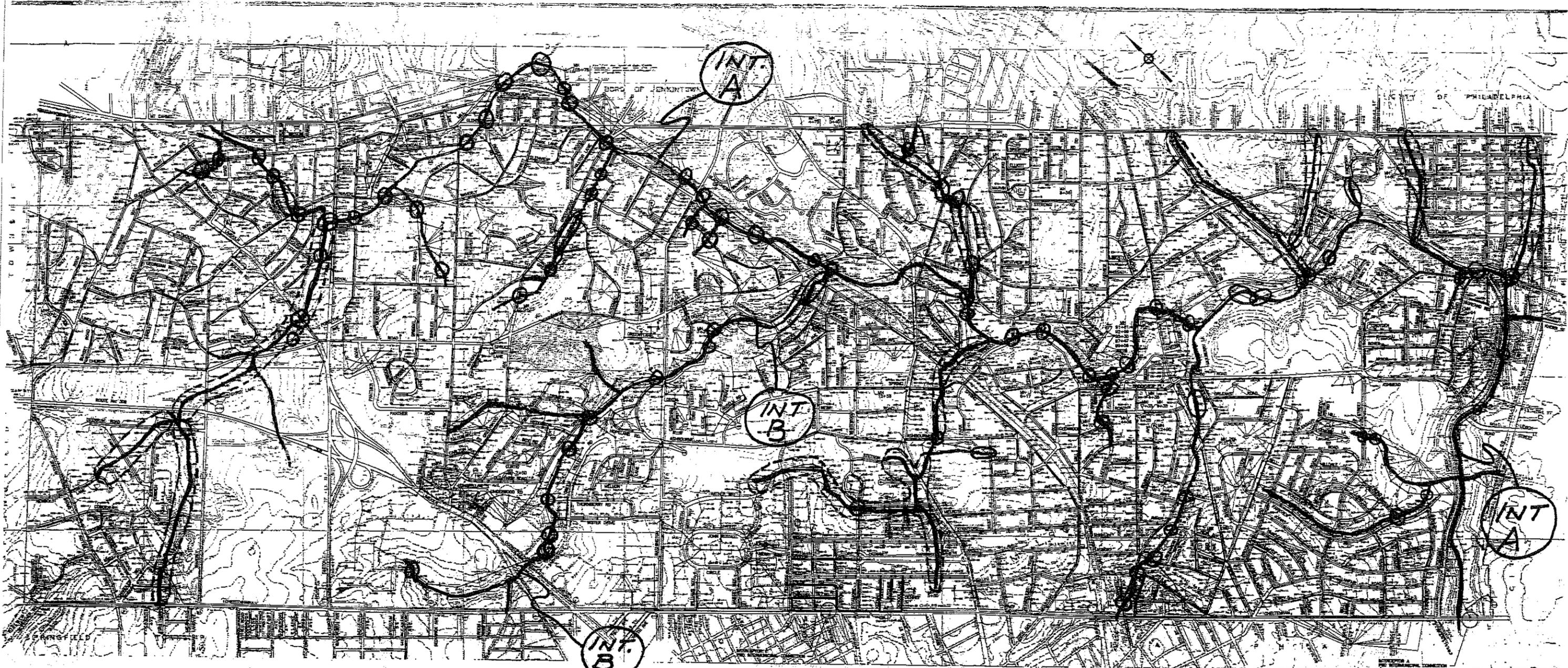
Given the above, the Township and BCM Engineers have concluded that the major source of the sustained high wet weather flows experienced by the Township must result from the summation of many points of small infiltration throughout the Township's sewer system. The infiltration from each of these points increases considerably when groundwater tables reach very high levels.

Another potential source of localized I/I in the sewer system results from sewers that are in poor condition located beneath or adjacent to Township streams. This is especially true if the sewers are near the ground surface or even exposed. In June 2010, Township personnel discovered a section of 12-inch clay sewer that crossed a creek in a right-of-way between Fisher Road and Aspen Way that had a 6-inch x 8-inch break at the top of the pipe. During dry weather approximately 1/8 of an inch of weir flow (i.e., 0.002 MGD or 7.6 EDUs) from the creek entered the break. During wet weather significant inflows could occur (i.e., Orifice Flow with 3 feet of head creating inflow of 1.95 MGD or 7428 EDUs). This break was sealed immediately. In light of this discovery, it is recommended that the Township conduct an immediate inspection of all sewers that cross, or are located directly adjacent to, all Township creeks or watercourses. Any sewers in these areas that exhibit the potential for significant I/I (e.g., exposed sewers with visible breaks) shall be added to the list of sewers prioritized for rehabilitation. This inspection shall consist of any or all of the following procedures as needed to make an accurate analysis:

1. Visual ground surface inspection.
2. Flow monitoring or depth monitoring upstream and downstream of critical sections as determined by the visual inspections.
3. Re-review of already completed televising data.
4. Re-televising of these sewer sections, if necessary.

See Figure 4.3 for a plan showing Cheltenham Township watercourses and identifying Sanitary Sewers crossing and/or running parallel and close to watercourses.

Since all useful grouting has been completed as required by the Consent Order and Agreement of 2006, what remains for the Township to complete is to rehabilitate the remaining deficiencies discovered by televising the sewers or by the additional local inspections described above. The Township will begin rehabilitating not only those sanitary sewer pipes where significant deterioration has been discovered, but also those sewers where even minimal cracking or deterioration has been discovered in areas that are subject to occasional high groundwater conditions. Based upon data analyzed under the CTVG program, flow monitoring, the sump pump inspection program, Township personnel knowledge of high groundwater or "wet" areas, and the results of a recent night study of manhole flow levels, several areas of the Township have been determined to be priority areas. They are shown on Figure 4.4. It is recommended that Phase 1 of a sewer system rehabilitation program take place in these priority areas and consist of either sewer lining, local point repair sewer replacements, private sewer lateral rehabilitation, or



LEGEND

- TRANSVERSE CROSSING OF WATERCOURSE BY SANITARY SEWER; 82 TOTAL
- ⋯ SANITARY SEWER RUNNING ALONG AND CLOSE TO WATERCOURSES; 32,000 LF (6 MILES)

FIGURE 4.3
CHELtenham TOWNSHIP CORRECTIVE ACTION PLAN
 PLAN SHOWING CHELTENHAM TOWNSHIP WATERCOURSES AND IDENTIFYING SANITARY SEWERS CROSSING AND/OR RUNNING PARALLEL AND CLOSE TO WATERCOURSES
 SCALE AS SHOWN

8/20/2010

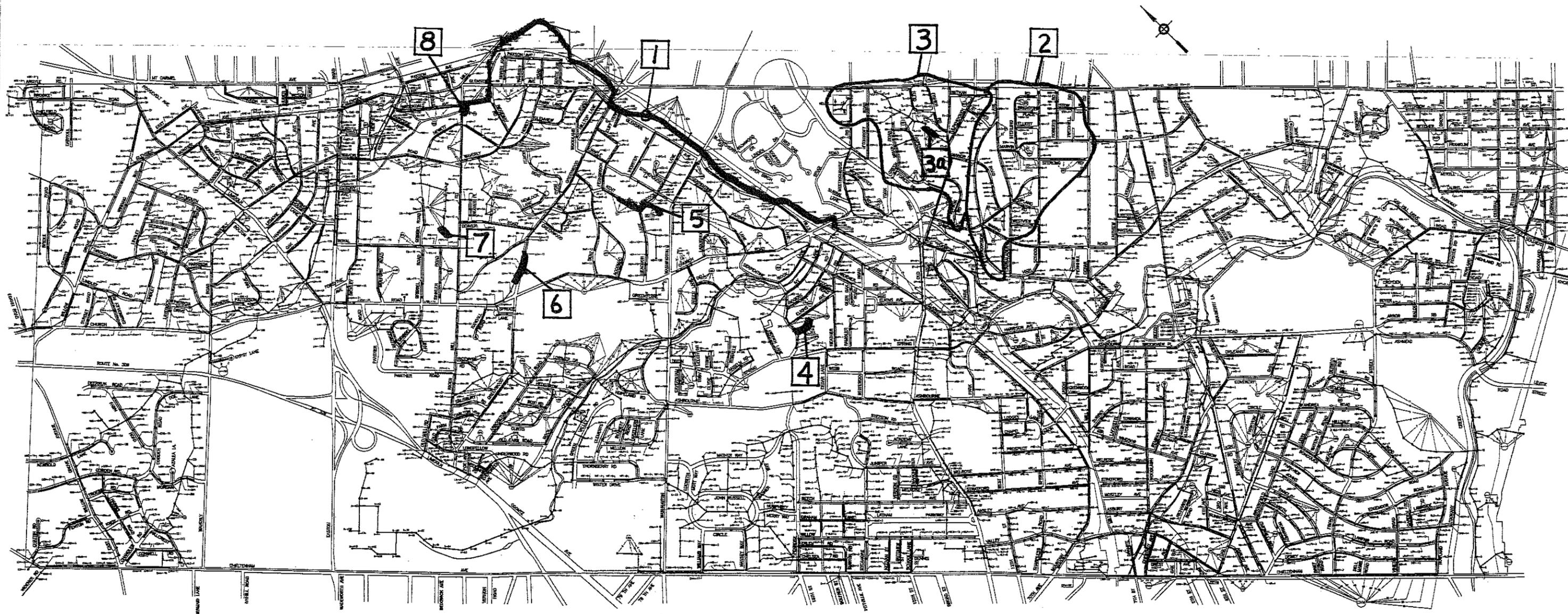


FIGURE 4.4
CHEL TENHAM TOWNSHIP CORRECTIVE ACTION PLAN
PLAN SHOWING SANITARY SEWER SYSTEM REHABILITATION
PRIORITY AREAS

SCALE AS SHOWN 8/20/2010

combinations of these methods. Private sewer lateral rehabilitation is discussed in Section 4.8, below.

Specific sewer project locations and the corresponding rehabilitation that is to be completed in these locations during this Phase 1 are shown in Table 4.1. Some noteworthy areas of planned rehabilitation are as follows:

1. Lining of Interceptor A in the vicinity of Cheltenham Hills Drive/Glenside Avenue between Church Road and Rices Mill Road, which is suspected to be a source of infiltration based on Township personnel knowledge and CTVG data.
2. Replacement of a section of broken 8-inch pipe in the right-of-way between Gribbel Road and Rices Mill Road.
3. Relocation of the 12-inch sewer exposed beneath the creek in the right-of-way between Fisher Road and Aspen Way.

The Township will also conduct short term flow monitoring of the sewer subbasins in the priority areas where rehabilitation is to occur both before the work commences and after it is completed in order to determine its effect on wet and dry weather flows. If this rehabilitation work does not prove to reduce infiltration or SSOs significantly, the Township will then define other areas potentially in need of rehabilitation and improve the sewers in these additional Township areas. These potential new areas shall be referred to as Phases 2 and 3, if needed.

TABLE 4.1

**CHELTENHAM TOWNSHIP CORRECTIVE ACTION PLAN
PLANNED SEWER SYSTEM REHABILITATION PHASE 1**

August 2010

Project Identification No.	Intended Rehabilitation	Rehabilitation Metric (Approximate)	Streets Affected
1	Lining and replacment of tuberculated cast iron interceptor sections	9,000 LF	Rices Mill Road, Glenside Avenue, Chelten Hills Drive, Church Road
2	Lining	17,950 LF	Brookside Avenue, Shoemaker Road, Manor Road, Waring Road, Cadwalader Avenue, Marvin Road, Sterling Road, Brighton Place, Elliot Road, Roberts Road, Stowe Road
3	Lining	14,780 LF	Meetinghouse Road, Foxcroft Road, Township Line Road, Green Briar Road, Forest Hills Drive, Aspen Way, Fisher Road, Glen Road, Tulpehocken, Road, Bethan Road, St. James Place, Caleb Way
	Replacement and relocation	175 LF	Fisher Road/Aspen Way
4	Replacement	600 LF	Hilton Lane and Serpentine Lane
5	Lining and Point Repair	minimal	Kent Road and Heacock Lane
6	Manhole repair and point repair	minimal	Greenwood Avenue north of Church Road
7	Replacement	minimal	Rices Mill right-of-way
8	Manhole repair	minimal	Rices Mill Road
Total Sewer Rehabilitation Length =			42,505 Linear Feet (LF)
Total Sewer Rehabilitation Length =			8.1 Miles

4.8 Private Sewer Lateral Rehabilitation

Private sewer laterals can be considerable sources of infiltration into the sewer system. The Township intends to conduct a program of lateral rehabilitation.

To accomplish this, the Township shall begin to undertake the following:

1. Establish proper ordinance(s) that allow for lateral inspection and rehabilitation or replacement.
2. Establish an ordinance that requires the inspection and, if necessary, the rehabilitation of private laterals during and prior to the sale of a property.
3. Rehabilitate or replace, over an eight (8) year period, the laterals in four priority areas (Areas A through D) as described in Table 4.2.

Table 4.2 lists the areas and corresponding streets in the Township where lateral rehabilitation is planned and lists the number of laterals in those areas that are to be repaired or replaced. Approximately 1,700 laterals are proposed for repair or rehabilitation. Figure 4.5 shows the proposed areas of private sewer lateral rehabilitation.

The Township also intends to conduct a groundwater level monitoring study beginning in the fall of 2010. The study will determine the groundwater elevation throughout the Township during both dry and wet weather periods. This will be accomplished through the installation of 25 or more small diameter piezometers at various locations and the recording of the groundwater level at these locations at regular intervals. The study data will generate two topographic "surfaces": one of the existing sanitary sewer elevations and one of the groundwater level. By comparing these two surfaces, the Township can determine which sections of the sanitary sewer are below the groundwater. The areas where the sewers are consistently below groundwater are more susceptible to infiltration. Knowing where relatively higher groundwater levels are in comparison to the sewer elevations will serve to confirm that the chosen lateral rehabilitation Areas A through D are in fact the proper areas to conduct such rehabilitation.

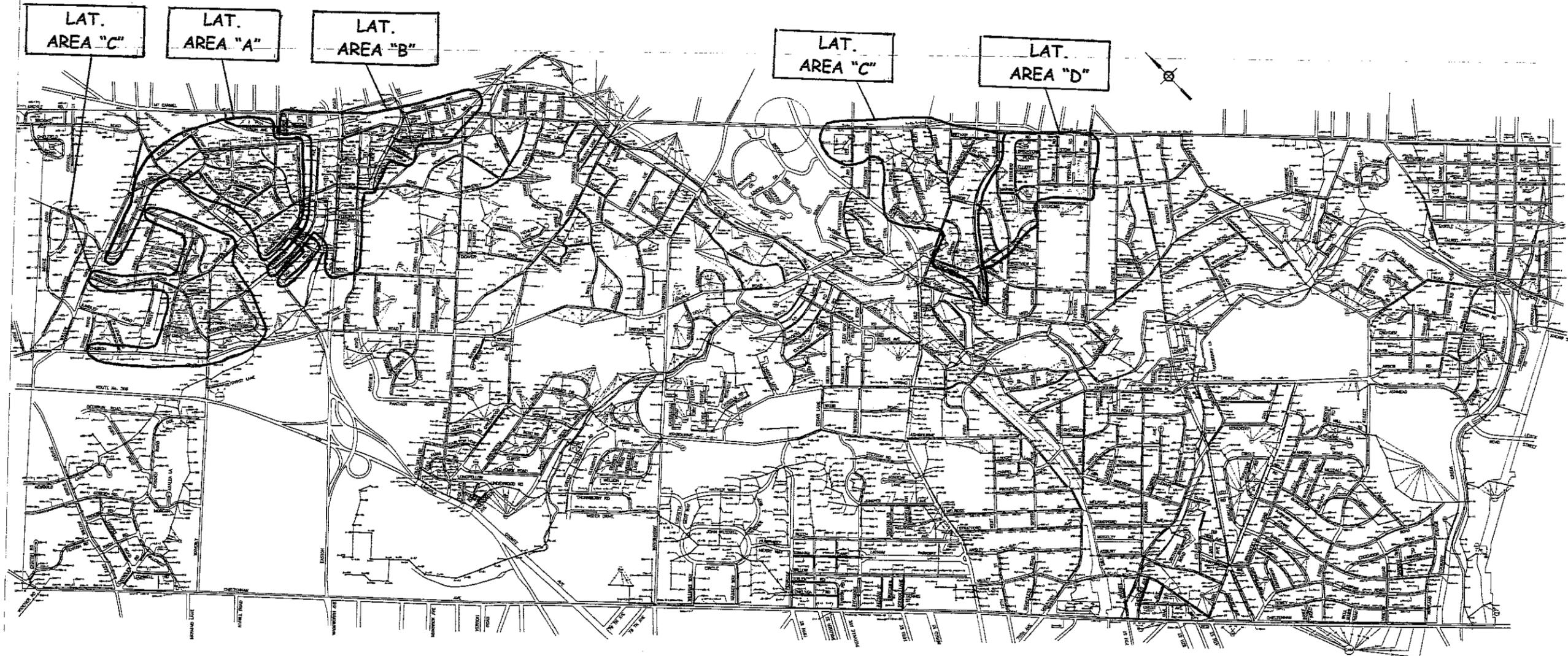
Similar to the sewer rehabilitation work described in Section 4.7, the areas chosen for lateral rehabilitation were determined based upon the observations and conclusions made during the CTVG program, flow monitoring, the sump pump inspection program, Township personnel general knowledge of high groundwater or "wet" areas, and the results of a recent night study of manhole flow levels. These areas are primarily **illustrative** and are meant to show the magnitude of lateral rehabilitation that is intended. It is most probable that the lateral rehabilitation work will occur in these areas. **However, it is recommended that the Township adjust the precise boundaries of these areas as needed depending upon the results of the groundwater monitoring study and the observations made during the actual lateral rehabilitation work.** The PADEP must be aware that this work will be "dynamic" and adjustment may need to be made in order to ensure that the laterals that are most in need of rehabilitation are

**Table 4.2
Planned Private Lateral Rehabilitation Areas**

Area A		Area B	
<u>Street Name</u>	<u>Lateral Quantity</u>	<u>Street Name</u>	<u>Lateral Quantity</u>
Glenside Ave	132	Mt. Carmel Ave.	21
Winding Way	40	Huber St.	12
East Ave.	29	Wilson Ave.	14
Clayton Ave.	2	Ruralside Ave.	4
Montier Rd.	45	Harrison Ave.	136
Berkeley Rd.	43	Easton Rd.	54
Radcliffe Rd	2	Bickley Rd.	80
Buttonwood Rd.	14	New St.	17
Cherry Lane	16	Keswick Ave.	38
Lynnwood Ave.	22	Parkside Lane	9
Lismore Ave	68	Brookdale Ave.	51
Springhouse La.	12	Paxson Ave.	56
Oak Rd.	59	Rices Mill Rd	1
Tyson Ave.	<u>16</u>	Beaver Rd.	<u>13</u>
TOTAL	500	TOTAL	500

Area C		Area D	
<u>Street Name</u>	<u>Lateral Quantity</u>	<u>Street Name</u>	<u>Lateral Quantity</u>
Church Rd.	21	Cadwalder Rd.	35
Laverock Rd.	35	Sterling Rd.	47
Patricia Drive	8	Brighton Place	5
Twickenham Rd.	34	Elliot Rd.	3
Plymouth Rd.	41	Marvin Rd.	43
Lindley Rd.	1	High School Rd.	21
Waverly Rd.	42	Roberts Rd.	24
Limekiln Pike	49	Twitchell Rd.	16
Township Line Rd.	10	Cedar Rd.	<u>19</u>
Meetinghouse Rd.	14	TOTAL	213
Foxcroft Rd.	17		
Greenbriar Rd.	16		
Forest Hills Drive	7		
Aspen Way	30		
Glen Rd.	17		
Fisher Rd.	12		
Forest Ave.	6		
Tulpehocken Rd.	22		
St. James Place	2		
Brookside Rd.	59		
Shoemaker Rd.	<u>49</u>		
TOTAL	492		

Note: The streets and lateral locations listed above are illustrative only. The actual location of lateral rehabilitation is subject to adjustment based upon the results of the groundwater monitoring study as well as conditions observed in the field during the lateral rehabilitation work.



GRAPHIC SCALE

FIGURE 4.5
 CHELTENHAM TOWNSHIP CORRECTIVE ACTION PLAN
 PLAN SHOWING PRIVATE LATERAL REPLACEMENT AREAS
 SCALE AS SHOWN 8/20/2010

addressed, while laterals having little I/I contribution are avoided. **Therefore, under this CAP, the exact location of the rehabilitation work may require revision as the project progresses. However, the Township will not significantly change the number of laterals rehabilitated.**

4.9 Roof Drain Inspections and Disconnection

Roof drains that are connected to the sanitary sewer system are a significant inflow source. During the Private Sewer Lateral Rehabilitation Program the same properties where lateral rehabilitation will occur will be checked for roof drains connected to the sanitary sewer system. If found, the roof drains will be disconnected from the sanitary sewer system.

The Township will establish an ordinance that requires during and prior to the sale of a property the inspection of all roof drains on the property and, if necessary, the disconnection and redirection of any roof drains that are connected to the sanitary sewer.

4.10 Manhole Inspection Program Analysis and Rehabilitation

As required by the PADEP Consent Order and Agreement dated June 7, 2006, the Township must inspect all manholes within the Township's sewer system. The Township will have completed these inspections in the summer of 2010. The purpose of the manhole inspection program is to determine the physical condition of each manhole, identify those manholes in need of rehabilitation or replacement, and if possible, quantify any visible manhole infiltration.

As part of an overall infiltration and inflow reduction program, manhole rehabilitation is essential. The Township will therefore engage in regular, scheduled rehabilitation of those manholes noted as defective in the inspection program.

4.11 Construction and Operation of a Holding Tank

In the event that the flow limits imposed on the Township by PWD warrant regular exceedance charges in the future, or due to other circumstances, PWD requires the Township to retain excess flows above the agreement flow limits, the Township may need to construct excess flow holding tank facilities. The Township could accomplish this through the construction and operation of a below grade concrete holding tank or multiple tanks. Considering the length and severity of the SSOs experienced by the Township in March of 2010, the Township could potentially need to install a holding tank with a volume approaching 30 million gallons just to manage the SSO surcharges (i.e. daily SSO of approximately 2 million gallons for a duration of 14 days). Required tank capacity would be even larger if it were to contain excess flows above PWD limits,

which could be possible in wet weather even in the absence of SSOs. Such a tank could potentially cost approximately \$40 million to \$110 million depending on exact size and location.

Due to its excessive construction cost, regular operational costs, probable public opposition, limited land space, and the fact that a holding tank would not actually reduce I/I, it is not a corrective action alternative that the Township should pursue. The Township should only potentially reconsider this alternative if, after at least five (5) years of implementation, other CAP items prove ineffective.

4.12 Construction and Operation of a Wastewater Treatment Plant

The conditions that would warrant the potential consideration of a holding tank as described in Section 4.11 would also be applicable to the construction and use of a wastewater treatment plant. A treatment plant would need to be constructed near the Township's point of interconnection with PWD in order to treat all of the flow conveyed by Interceptor A. A plant would cost at least \$140 million. This cost includes land acquisition, considerable excavation and site development, concrete and steel facility construction, piping, access, engineering, permitting, etc. This does not include yearly operation and maintenance costs.

A treatment plant would enable the Township to avoid regular exceedances of flow limits to PWD and subsequently, burdensome financial exceedance charges. However, in order for a treatment plant to be an effective part of SSO elimination, portions of Interceptor A would need replacement as described in Section 4.3. This would add to the cost of this alternative.

For the same reasons that a holding tank is not a feasible alternative, the Township should not consider the construction of a wastewater treatment plant at this time.

4.13 Development of a FOG Ordinance

The Township is currently developing a "Fats, Oils and Grease" (FOG) ordinance that will adequately address both residential and non-residential grease incidents. Enacting and enforcing such an ordinance would be useful in reducing SSOs caused by system grease buildup clogging rather than excessive flows. Such clogging can create dry weather SSOs and magnify the severity of wet weather high flow SSOs. The Township will enact a FOG ordinance.

4.14 Private Property Buyout

Another alternative that could serve to prevent SSOs in the Shoemaker Road driveway area and eliminate the situation where sewer service must be denied to certain private

properties due to sewer lateral backups is to actually purchase affected properties, relocate the property owners, and construct new "surge" manholes at each of the existing manholes where SSOs have occurred. Eight (8) properties in the Township would be affected. These surge manholes would be located on or near the affected properties and would be constructed with above-ground top lid elevations set well above the high water level observed in the sewer during extreme wet weather. This would result in manholes with lid elevations several feet above the ground elevation. A preliminary estimate of the cost of this alternative is approximately \$4.1 million.

Although this is a potential option for eliminating SSOs, it would face considerable public opposition and as a result would take a lengthy amount of time to implement. It also would require extensive hydraulic analysis and visual inspections of the tributary sewer system in this area to ensure that the selected properties and manholes are in fact the only properties and manholes that are affected. This would involve significant risk. Also, this alternative is not a typical method of SSO management, nor does it preclude the need to do any other further infiltration reduction work. Therefore, it is not a recommended CAP alternative.

4.15 Tookany/Tacony-Frankford Partnership Contribution

At the request of PWD, and as a condition of the acceptance by PWD of the new agreement with the Township, the Township will be increasing the amount of its contribution to the Tookany/Tacony-Frankford Partnership. This organization is a nonprofit group created to coordinate the government, residents, and businesses that all have a staked interest as neighbors and stewards of this urban stream watershed. By contributing to this organization, the Township will be able to foster greater public awareness of its efforts to eliminate sanitary sewer operational difficulties and will be able to assist the organization in its environmental causes.

The Township currently donates funds to this organization but will be increasing its annual contribution to \$40,000 in January of 2011.

4.16 Public Water Conservation

Another program that can prove beneficial for the Township is to encourage both residential and commercial sewer system users to reduce their water consumption, thereby reducing system demand. One way for the Township to accomplish this is to become an active member of the Environmental Protection Agency (EPA) WaterSense Program. This will help to educate system users about the benefits of water conservation and will help them to implement methods to specifically conserve water. The cost to the Township is minimal and would directly involve the Township's Environmental Advisory Council. Information on the WaterSense Program is attached to the Appendix.

The Township will promote the use of water saving devices by its residents and businesses to help reduce wastewater flows. Such devices shall include the following:

1. Low- flow showerheads
2. High efficiency (i.e., low flow flush) toilets
3. “Dual” flush toilets
4. High efficiency clothes washers and dish washer

Even a small but consistent reduction of water consumption can have a significant impact. For example, if 7,000 residences or EDUs in the Township reduced water consumption by 10%, over 180,000 gallons per day of wastewater could potentially be removed from the system.

4.17 Sump Pump Inspection

Milestones Event 4 of the 2006 Consent Order requires the Township to complete its Sump Pump Inspection Program and have all illegal connections to the Sanitary Sewer hard-piped to the outside of the building completed by 2012. To date the Township has inspected approximately 60% of Township properties.

The Township respectfully requests a one (1) year extension to 2013 to complete this program.

SECTION 5 CORRECTIVE ACTION PLAN

Based on the alternatives analyses and discussions contained in Section 4, Cheltenham Township proposes that the following action items, as described in Section 4 and refined in scope in this section, shall be the components of a new Correction Action Plan (“CAP”) intended to prevent future SSOs and adequately reduce deleterious infiltration and inflow into the Township’s sanitary sewer system:

5.1 Cheltenham Township Sanitary Sewer System Corrective Action Plan

1. Interceptor A Interim Bypass Pumping
 - a. The Township has begun the installation of the interim bypass pumping system and anticipates its completion by September 2010.

2. Act 537 Planning

The Township shall develop, complete and gain approval of an Act 537 Plan that contains, but may not be limited to, the following:

 - a. The determination of the current and future needs of Cheltenham Township and all municipalities tributary to Cheltenham Township.
 - b. Development of revised, updated agreements with each contributing municipality.
 - c. Development of a plan for regional infiltration and inflow reduction.
 - d. Determination of the need for replacement/expansion of portions of Interceptor A.

3. Development of a new intermunicipal agreement with PWD. Note that this was completed in June of 2010.

4. Development of new intermunicipal agreements with Abington Township, Springfield Township and the Borough of Jenkintown

5. Sewer system rehabilitation

- a. The Township will immediately conduct additional inspections of all sanitary sewers beneath or directly adjacent to all Township creeks or bodies of water. If sources of I/I are discovered during these inspections, the sewers at these locations shall be rehabilitated accordingly.
- b. The Township will conduct flow monitoring of rehabilitation priority area subbasins before and after the rehabilitation work in these areas.
- c. The Township will install cast-in-place lining, and will perform minor, short length point replacements, in eight (8) areas in the Township. The areas where this will take place and the extent of the rehabilitation are shown in Figure 4.4 and defined in Table 4.1, respectively. This shall constitute Phase 1 of the Township's sewer rehabilitation projects.
- d. The Township will evaluate the effectiveness of the lining and point repairs after their completion via flow monitoring analyses. If this rehabilitation work does not prove to reduce infiltration or SSOs significantly, the Township will then define other areas potentially worthy of rehabilitation and rehabilitate the sewers in these additional Township areas. This would potentially be a in future phases of rehabilitation projects, if necessary. This cycle of rehabilitation and monitoring will continue as necessary until the availability of sewers in need of rehabilitation has been exhausted.

6. Private sewer lateral rehabilitation

The Township will complete the following:

- a. The development and adoption of an ordinance that allows for private lateral inspection and rehabilitation or replacement by the Township and an ordinance that requires the inspection and, if necessary, the rehabilitation of private laterals during and prior to the sale of a property.
- b. Completion of a groundwater monitoring study.
- c. The rehabilitation or replacement, over an eight (8) year period, of approximately 1,700 laterals in priority areas. The priority areas where lateral rehabilitation is potentially planned are shown on Figure 4.5. The quantity and probable location of the lateral rehabilitation is defined in Table 4.2.
- d. The evaluation of the effectiveness of lateral rehabilitation after work has been completed through the analysis of flow monitoring data recorded before and after lateral rehabilitation or replacement.

If more infiltration and SSO reduction efforts are still needed, the Township commits to rehabilitating additional private laterals. This cycle of rehabilitation and monitoring will continue as necessary until the availability of private laterals in need of rehabilitation has been exhausted.

7. Roof Drain Inspections and Disconnection

The Township will complete the following:

- a. The development and adoption of an ordinance that allows for private roof drain inspection and disconnection by the Township of any roof drains that are connected to the sanitary sewer system.
- b. The development and adoption of an ordinance that requires the inspection of private roof drains and, if necessary, the removal and redirection of private roof drains connected to the sewer system during and prior to the sale of a property.
- c. The Township will inspect the roof drains of all residential and non-residential users planned for lateral rehabilitation in the areas shown on Figure 4.5. The roof drains will be inspected at the same time lateral rehabilitation is occurring. If it is discovered at that time that the roof drain or drains are connected to the sanitary sewer system, the roof drains shall be disconnected from the sanitary sewer system.

8. Manhole Inspection Program and Rehabilitation

- a. Upon completion of the manhole inspections, the Township shall analyze the inspection data and determine which manholes are in need of rehabilitation.
- b. The Township shall then complete the appropriate manhole rehabilitation work.

9. Development of a FOG Ordinance

10. Tookany/Tacony-Frankford Partnership Contribution

- a. The Township shall increase its annual contribution to \$40,000 as a requirement of a new agreement with PWD.

11. Public Water Conservation

- a. The Township will become an active member of the Environmental Protection Agency (EPA) WaterSense Program.

12. Sump Pump Inspections
 - a. The Township will continue its Sump Pump Inspection Program.

13. Interceptor A Replacement
 - a. If the Act 537 Plan finds that Interceptor A or parts thereof need to be replaced, the Township will do so.

14. Elimination of Jenkintown sag and Sharp Bends on Interceptor A
 - a. If the Act 537 Plan does not recommend replacement of Interceptor A, the Township will eliminate the Jenkintown Creek sag and sharp bends on Interceptor A.

The Cheltenham Township Correction Action Plan Schedule is given in Table 5.1. The Cheltenham Township Corrective Action Plan Bar Chart Schedule is shown on Table 5.2.

TABLE 5.1

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
1	Interceptor A Interim Bypass Pumping System	July 2010	October 2010
2	Act 537 Planning	September 2010	September 2012
3	New intermunicipal agreement with PWD		Completed June 2010
4	Intermunicipal agreements		
	a. Development and negotiation of new intermunicipal agreements with Abington Township, Springfield Township and Borough of Jenkintown	August 2010	June 2012
	b. Final negotiation and adoption of new intermunicipal agreements with Abington Township, Springfield Township and Borough of Jenkintown	June 2012	December 2012
5	Sewer system rehabilitation Phase 1		
	a. Inspections of sewers crossing or near creeks or bodies of water		
	1) Visual inspections (82 crossings; 6 miles longitudinally)	September 2010	September 2011
	2) Upstream and downstream flow and/or depth measurements, existing televising data review, re-televising, etc.	October 2010	December 2011
	b. Pre-rehabilitation flow monitoring	November 2010	May 2011

TABLE 5.1 (continued)

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
5	Sewer system rehabilitation Phase 1 (continued)		
	c. Sewer system rehabilitation Phase 1 areas (Refer to Table 4.1)		
	ID 1: Interceptor A - Rices Mill Road to Church Road - Lining	November 2010	December 2012
	ID 2: See Table 4.1 and Figure 4.4 – Lining	November 2010	December 2011
	ID 3: See Table 4.1 and Figure 4.4 – Lining	November 2010	December 2011
	ID 3a: Fisher Road to Aspen Way Sewer Replacement	November 2010	December 2011
	ID 4: Hilton Lane and Serpentine Lane Sewer Replacement	November 2010	December 2011
	ID 5: Kent Road and Heacock Lane Lining and Point Repair	November 2010	December 2011
	ID 6: Greenwood Avenue Manhole and Point Repair	November 2010	December 2011
	ID 7: Rices Mill right-of-way Sewer Replacement	November 2010	December 2011
	ID 8: Rices Mill Manhole Repair	November 2010	December 2011

TABLE 5.1 (continued)

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
5	Sewer system rehabilitation Phase 1 (continued)		
	d. Post-rehabilitation flow monitoring for ID 2 and ID 3	January 2012	July 2012
	e. Flow monitoring analyses and determination of rehabilitation effectiveness for ID 2 and ID 3	July 2012	September 2012
	f. Post-rehabilitation flow monitoring for ID 1	September 2012	May 2013
	g. Flow monitoring analyses and determination of rehabilitation effectiveness for ID 1	June 2013	July 2013
	h. Sewer system rehabilitation - Phase 2 (if required)	July 2013	December 2014
	i. Sewer system rehabilitation - Phase 3 (if required)	June 2015	July 2016
6	Private sewer lateral rehabilitation		
	a. Development and adoption of lateral inspection and rehabilitation ordinances	September 2010	March 2011

TABLE 5.1 (continued)

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
6	Private sewer lateral rehabilitation (continued)		
	b. Groundwater Monitoring Study	October 2010	June 2011
	c. Sewer lateral rehabilitation areas		
	1) Area A (500 Laterals)		
	Pre-rehabilitation flow monitoring	November 2010	May 2011
	Lateral rehabilitation	October 2011	December 2012
	Post-rehabilitation flow monitoring	December 2012	June 2013
	Flow monitoring analysis	May 2013	July 2013

TABLE 5.1 (continued)

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
6	Private sewer lateral rehabilitation (continued)		
	2) Area B (500 Laterals)		
	Pre-rehabilitation flow monitoring	September 2012	May 2013
	Lateral rehabilitation	May 2013	July 2014
	Post-rehabilitation flow monitoring	August 2014	December 2014
	Flow monitoring analysis	January 2015	February 2015
	3) Area C (492 Laterals)		
	Pre-rehabilitation flow monitoring	September 2014	May 2015
	Lateral rehabilitation	May 2015	July 2016
	Post-rehabilitation flow monitoring	August 2016	December 2016
	Flow monitoring analysis	January 2017	February 2017

TABLE 5.1 (continued)

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
6	Private sewer lateral rehabilitation (continued)		
	4) Area D (213+ Laterals)		
	Pre-rehabilitation flow monitoring	September 2016	May 2017
	Lateral rehabilitation	May 2017	July 2018
	Post-rehabilitation flow monitoring	August 2018	December 2018
	Flow monitoring analysis	January 2019	February 2019
7	Roof Drain Inspections and Disconnections		
	a. Development and adoption of roof drain inspection and disconnection ordinances	September 2010	March 2011
	b. Area A inspections and disconnections	October 2011	December 2012
	c. Area B inspections and disconnections	May 2013	July 2014
	d. Area C inspections and disconnections	May 2015	July 2016
	e. Area D inspections and disconnections	May 2017	July 2018

TABLE 5.1 (continued)

CHELTENHAM TOWNSHIP CORRECTION ACTION PLAN SCHEDULE

AUGUST 2010

	CAP ITEM	START DATE	SCHEDULE OR COMPLETION DATE
8	Manhole Inspection Program Analysis and Rehabilitation		
	a. Analysis of manhole inspection program data	March 2011	September 2011
	b. Manhole rehabilitation	January 2012	December 2015
9	Development of a FOG ordinance	Currently ongoing	June 2011
10	Tookany/Tacony-Frankford Partnership Contribution	Starting January 2011	Ongoing
11	Public Water Conservation		
	a. Membership in the EPA WaterSense Program	Immediately	Ongoing
12	Sump Pump Inspections and Removal (if required)	Ongoing	June 6, 2013
13	Replacement of Interceptor A (or parts thereof) if required by Act 537 Planning	October 2012	December 2015
14	Elimination of Jenkintown Sag and Sharp Bends on Interceptor A if Act 537 Planning does <u>not</u> recommend replacement of Interceptor A	January 2013	January 2015

TABLE 5.2

CHELTENHAM TOWNSHIP CORRECTIVE ACTION PLAN
COMPLETION SCHEDULE

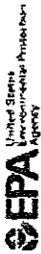
August 2010

CAP ITEM	COMPLETION SCHEDULE																																					
	2010		2011				2012				2013				2014				2015				2016				2017				2018				2019			
	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th				
6 Private sewer lateral rehabilitation																																						
a. Development and adoption of lateral inspection and rehabilitation ordinances	9/10				3/11																																	
b. Groundwater Monitoring Study	10/10				6/11																																	
c. Sewer lateral rehabilitation areas																																						
1) Area A (500 laterals)																																						
Pre-rehabilitation flow monitoring	11/10				5/11																																	
Lateral rehabilitation					10/11									12/12																								
Post-rehabilitation flow monitoring													12/12																									
Flow monitoring analysis														5/13																								
2) Area B (500 laterals)																																						
Pre-rehabilitation flow monitoring														9/12																								
Lateral rehabilitation																																						
Post-rehabilitation flow monitoring																																						
Flow monitoring analysis																																						
3) Area C (492 laterals)																																						
Pre-rehabilitation flow monitoring																																						
Lateral rehabilitation																																						
Post-rehabilitation flow monitoring																																						
Flow monitoring analysis																																						
4) Area D (213+ laterals)																																						
Pre-rehabilitation flow monitoring																																						
Lateral rehabilitation																																						
Post-rehabilitation flow monitoring																																						
Flow monitoring analysis																																						

APPENDIX

EPA WATERSENSE PROGRAM INFORMATION





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