# TOWN OF CHESTERTON, INDIANA COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

**Prepared For:**

**Town Of Chesterton Utilities**
**Chesterton, Indiana**

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**April 2011**

DRAFT

DLZ

ENGINEERS • ARCHITECTS • SCIENTISTS
PLANNERS • SURVEYORS

April 18, 2011

Utility Service Board
Town Of Chesterton
726 Broadway
Chesterton Indiana 46304

RE: Combined Sewer Overflow Long Term Control Plan
DLZ Account No. 1061-5974-70

Dear Distinguished Board Members:

We are pleased to submit ten (13) draft copies of the *Combined Sewer Overflow Long Term Control Plan* for your review. This report details the sewer system, data, treatment and CSO alternatives. Currently your accounting firm is completing a rate analysis. Once that is complete we will be able to complete the Cost/Performance Considerations and Implementation Schedule for CSO Controls in Chapter 5 and the schedule for the post construction monitoring in Chapter 7. We will finalize the Report once we receive comments from the Utility Board, your Staff and the Public Hearing.

We appreciate your continued confidence in DLZ Indiana, LLC and would be more than happy to discuss this report further.

If you have any questions or comments please call our office at (574)236-4400.

Very truly yours,

**DLZ INDIANA, LLC**

Mark H. Nye, P.E.
Public Works Division Manager

Encl: As noted

M:\PROJ\1061\5964 Chesterton LTCP\LTCP\Cover Letter.doc

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With Offices Throughout The Midwest
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**TOWN OF CHESTERTON, INDIANA**
**COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN**

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***Revised April 18, 2011***

# 1.0 CHARACTERIZATION OF THE COMBINED SEWER SYSTEM

## 1.1 Sewer System Description

The Town of Chesterton Utilities combined and sanitary sewer system covers the area shown in **Figure 1.1**.

The Town of Chesterton Utility operates under NPDES Permit No. IN0022578 the Effective date is September 1, 2009 and the expiration date is August 13, 2014. The system includes one (1) permitted combined sewer overflow (CSO), identified as 101, which is located at the Wastewater Treatment Plant.

### 1.1.1 Combined Sewer Overflow 101

Overflow 101 is located in the Influent Structure at the WWTP. **Figures 1.2 and 1.3** show the location and orientation of the overflow weir.

The WWTP is connected to the collection system by a 48" influent sewer. Sewage is screened through a trash rack with 4" openings and is diverted into the WWTP by the overflow weir. A CSO event occurs when the sewage flow exceeds the WWTP peak flow capacity during wet weather. Once a CSO event begins the overflow is screened through bars with 1" openings to remove floatable and other solids larger then 1".

The overflow is metered in the outfall sewer to document the overflow occurrence prior to being mixed with the WWTP effluent and being discharged to the East Branch of the Little Calumet River.

### 1.1.2 Areas Served by Combined Sewers

Combined sewers in Chesterton were constructed, as in most combined sewer systems, until the 1960's. Since that time sanitary and storm sewers have been constructed into new areas of the town as growth has occurred. The Town of Chesterton currently has an ordinance in place that prohibits the construction of new combined sewers.

The areas that are currently served by combined sewers are isolated due to the Towns aggressive program to separate the combined sewers. Areas that still have combined sewers are shown in **Figure 1.4** and include the following:

- Area A - includes storm water inlets in the alleys between 13th and 12th streets and 12th and 11th streets between Broadway and West Indiana Avenue.

- Area B - includes the area bounded by Jefferson Street to the north, Calumet Street to the east, Fifth Street to the west and generally Richter Street to the south.

### 1.1.3 Areas Served by Sanitary Sewers

Sanitary sewers have been constructed in Chesterton since the 1960's. The current sewer use ordinance prohibits the connection of storm water inflow into sanitary sewers. In some areas residents have illegally connected their foundation drains to the sanitary sewers. This has been seen during flow monitoring of the sanitary sewers during wet weather.

The Town now conducts inspections of new construction to prevent the connection of foundation drains to sanitary sewers.

During the last twenty years the Town of Chesterton has been aggressive in the separation of the combined sewers in the older areas of the Town. These areas are shown in **Figure 1.5** along with the approximate year each project was constructed. The separation was accomplished by the construction of new storm sewers and moving the storm inlets from the combined sewers to the storm sewers.

The separation of the combined sewers in the areas shown in **Figure 1.5** has reduced the inflow significantly and has enabled the town to eliminate an overflow at Calumet Road and Broadway that discharged to Coffee Creek.

Though the separation projects removed the storm inlets in the streets from the combined sewers, they did not include the elimination of inflow and infiltration (I/I) from open joints, house laterals, roof down spouts or the disconnection of foundation drains. Because of this there are still wet weather peak flows in the separated sanitary sewer system.

### 1.1.4 Areas Served by Storm Sewers

The Town of Chesterton has a number of outlets for storm drainage in the town. These include:

- Little Calumet River, to the north.

- Coffee Creek and Sand Creek, to the east.
- Pope O'Conner Ditch, to the southeast.
- Swanson Lamport Ditch, to the south.
- Peterson Ditch, to the west.
- Gustafson Ditch to the southwest.

Each of the drainage outlets are tributary to the East Branch of the Little Calumet River.

As discussed in 1.1.3 the Town has been aggressive in the separation of the combined sewers. **Figure 1.5** includes the storm sewers that have been constructed in conjunction with the separation of the combined sewers. Most of the separation projects have been completed with the construction of storm sewers and the disconnection of inlets from the combined sewers and reconnection to the new storm sewer.

As the town has grown since the 1960's new areas of development have included storm drainage systems. These systems are now required as extension of the combined sewers or connection of storm water to the sanitary sewers have been prevented by the sewer use ordinance.

### 1.1.5 Town of Porter

Besides the Town of Chesterton the Utility accepts and treats the sanitary sewage from the Town of Porter. The Porter sewer system is connected to the Town of Chesterton Utilities sewers just up stream of the WWTP on League Drive as shown in **Figure 1.1**. Chesterton Utilities has an agreement with the Town of Porter to treat up to 809,000 GPD. There is no limit to the peak flow in the agreement. The Porter sewage flows are affected by wet weather and contribute to the CSO's at Overflow 101.

### 1.1.6 Indiana Boundary Conservancy District

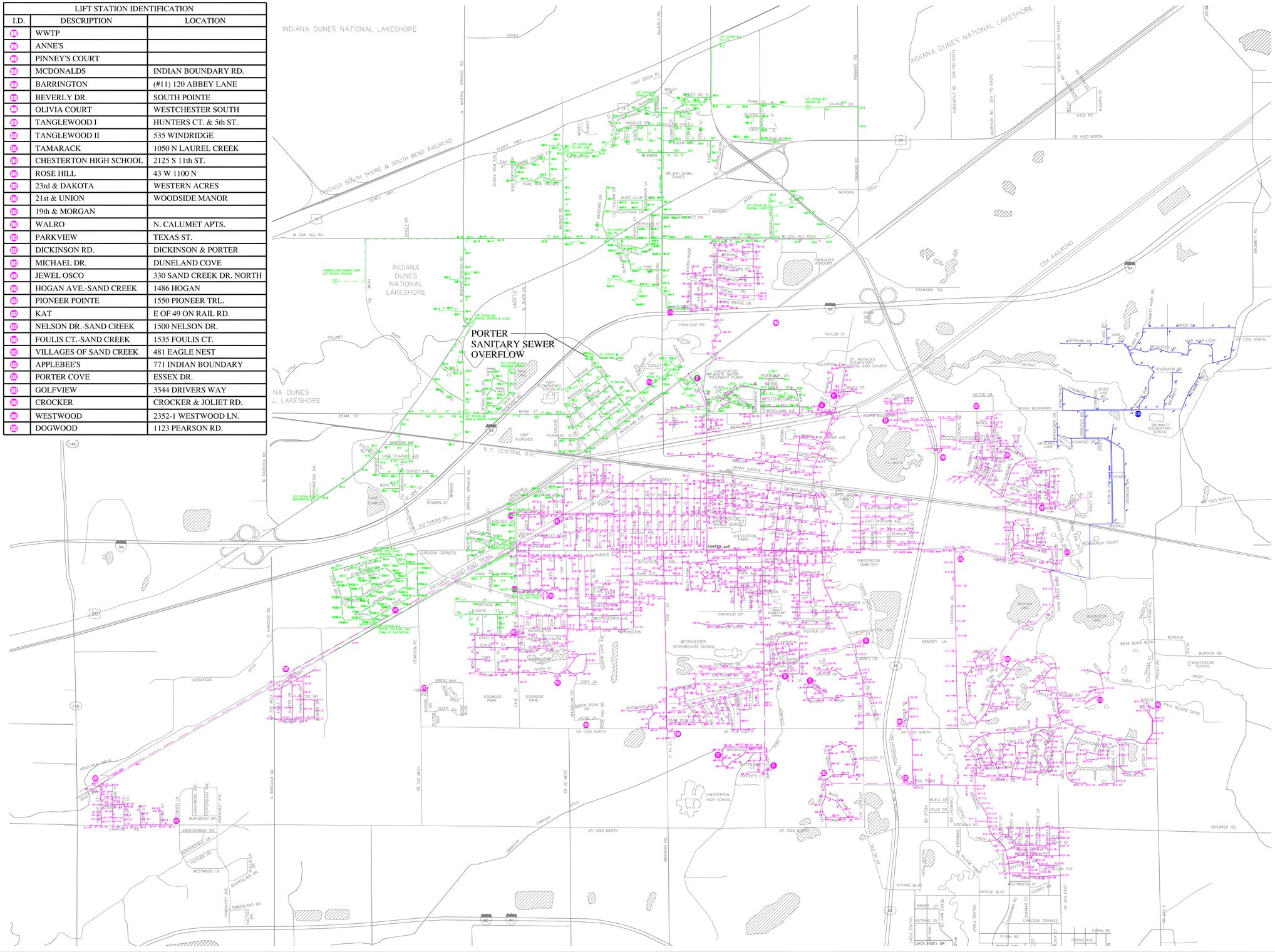
Chesterton also accepts and treats the sanitary sewage from the Indiana Boundary Conservancy District. Chesterton Utilities has an agreement with the district to treat up to 81,000 GPD. The district does not have a problem with wet weather I/I to the extent that it causes sanitary sewer overflows.

## 1.2 Sewer System Mapping

The sewer system maps that are currently in use are shown in **Figure 1.1**. The maps include both sanitary and combined sewers. The Town has not

included storm sewers on the overall sewer map to date but is working towards that goal. Storm sewer as-built plans are on file at the utility offices and the Town has hired a storm water engineer and formed a Storm Water Board to help manage the storm water systems within the Town. Rim and pipe invert data is available for most manholes and the Town is currently working to collect the data from all the manholes.

| LIFT STATION IDENTIFICATION | | |
|---|---|---|
| I.D. | DESCRIPTION | LOCATION |
| 1 | WWTP | |
| 2 | ANNE'S | |
| 3 | PINNEY'S COURT | |
| 4 | MCDONALDS | INDIAN BOUNDARY RD. |
| 5 | BARRINGTON | (#11) 120 ABBEY LANE |
| 6 | BEVERLY DR. | SOUTH POINTE |
| 7 | OLIVIA COURT | WESTCHESTER SOUTH |
| 8 | TANGLEWOOD I | HUNTERS CT. & 5th ST. |
| 9 | TANGLEWOOD II | 535 WINDRIDGE |
| 10 | TAMARACK | 1050 N LAUREL CREEK |
| 11 | CHESTERTON HIGH SCHOOL | 2125 S 11th ST. |
| 12 | ROSE HILL | 43 W 1100 N |
| 13 | 23rd & DAKOTA | WESTERN ACRES |
| 14 | 21st & UNION | WOODSIDE MANOR |
| 15 | 19th & MORGAN | |
| 16 | WALRO | N. CALUMET APTS. |
| 17 | PARKVIEW | TEXAS ST. |
| 18 | DICKINSON RD. | DICKINSON & PORTER |
| 19 | MICHAEL DR. | DUNELAND COVE |
| 20 | JEWEL OSCO | 330 SAND CREEK DR. NORTH |
| 21 | HOGAN AVE.-SAND CREEK | 1486 HOGAN |
| 22 | PIONEER POINTE | 1550 PIONEER TRL. |
| 23 | KAT | E OF 49 ON RAIL RD. |
| 24 | NELSON DR.-SAND CREEK | 1500 NELSON DR. |
| 25 | FOULIS CT.-SAND CREEK | 1535 FOULIS CT. |
| 26 | VILLAGES OF SAND CREEK | 481 EAGLE NEST |
| 27 | APPLEBEE'S | 771 INDIAN BOUNDARY |
| 28 | PORTER COVE | ESSEX DR. |
| 29 | GOLFVIEW | 3544 DRIVERS WAY |
| 30 | CROCKER | CROCKER & JOLIET RD. |
| 31 | WESTWOOD | 2352-1 WESTWOOD LN. |
| 32 | DOGWOOD | 1123 PEARSON RD. |




LEGEND

- PORTER SEWERS
- CHESTERTON SEWERS
- INDIAN BOUNDARY CONSERVANCY DISTRICT

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TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

TOWN OF CHESTERTON AND TOWN OF PORTER SEWER SYSTEM METER LOCATIONS

FIGURE

1.1

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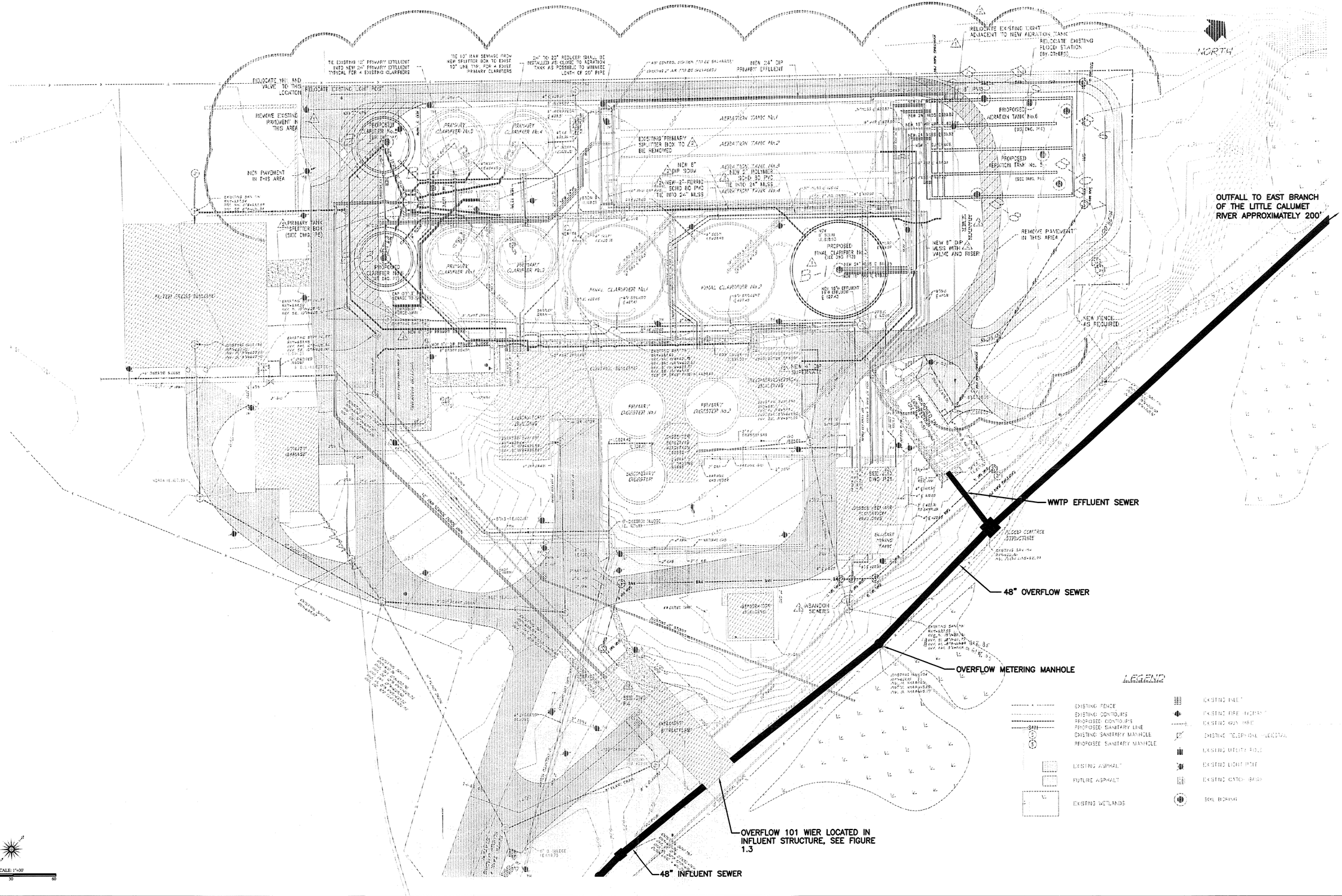


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TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

WASTE WATER TREATMENT PLANT SITE PLAN AND OVERFLOW 101 LOCATION

FIGURE 1.2

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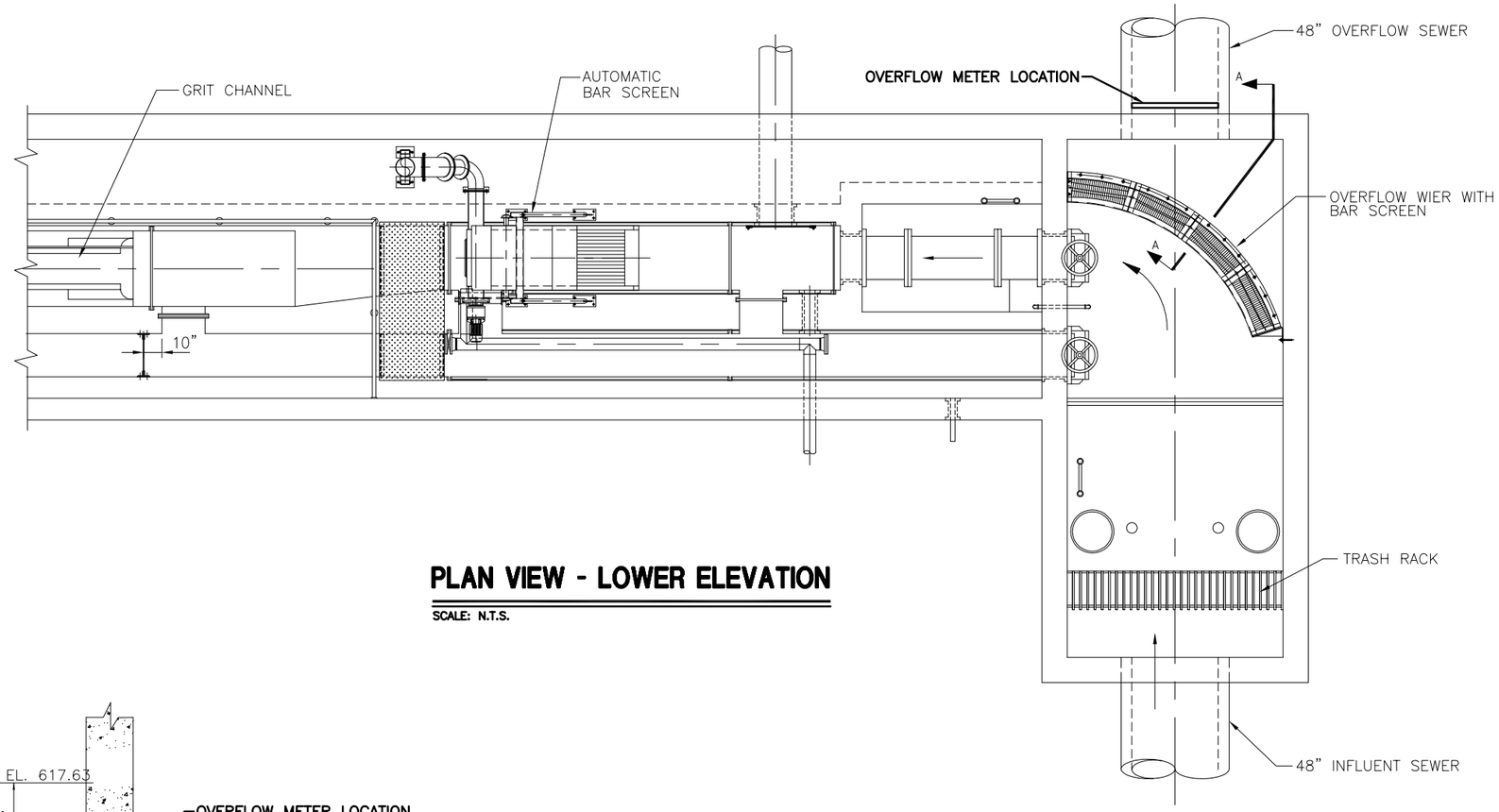


## PLAN VIEW - LOWER ELEVATION

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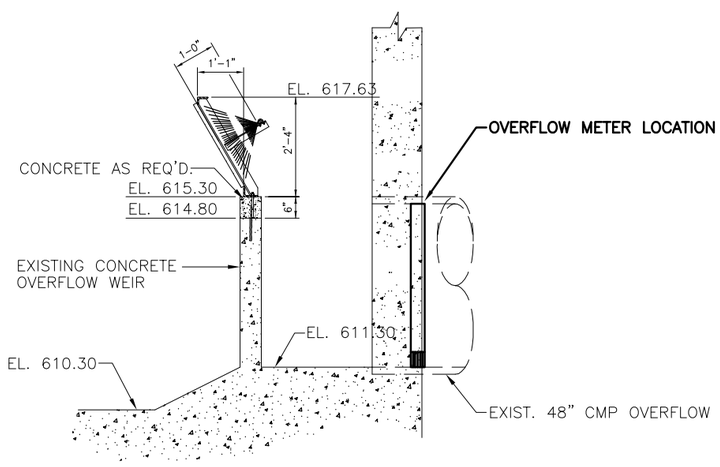


## SECTION "A-A"

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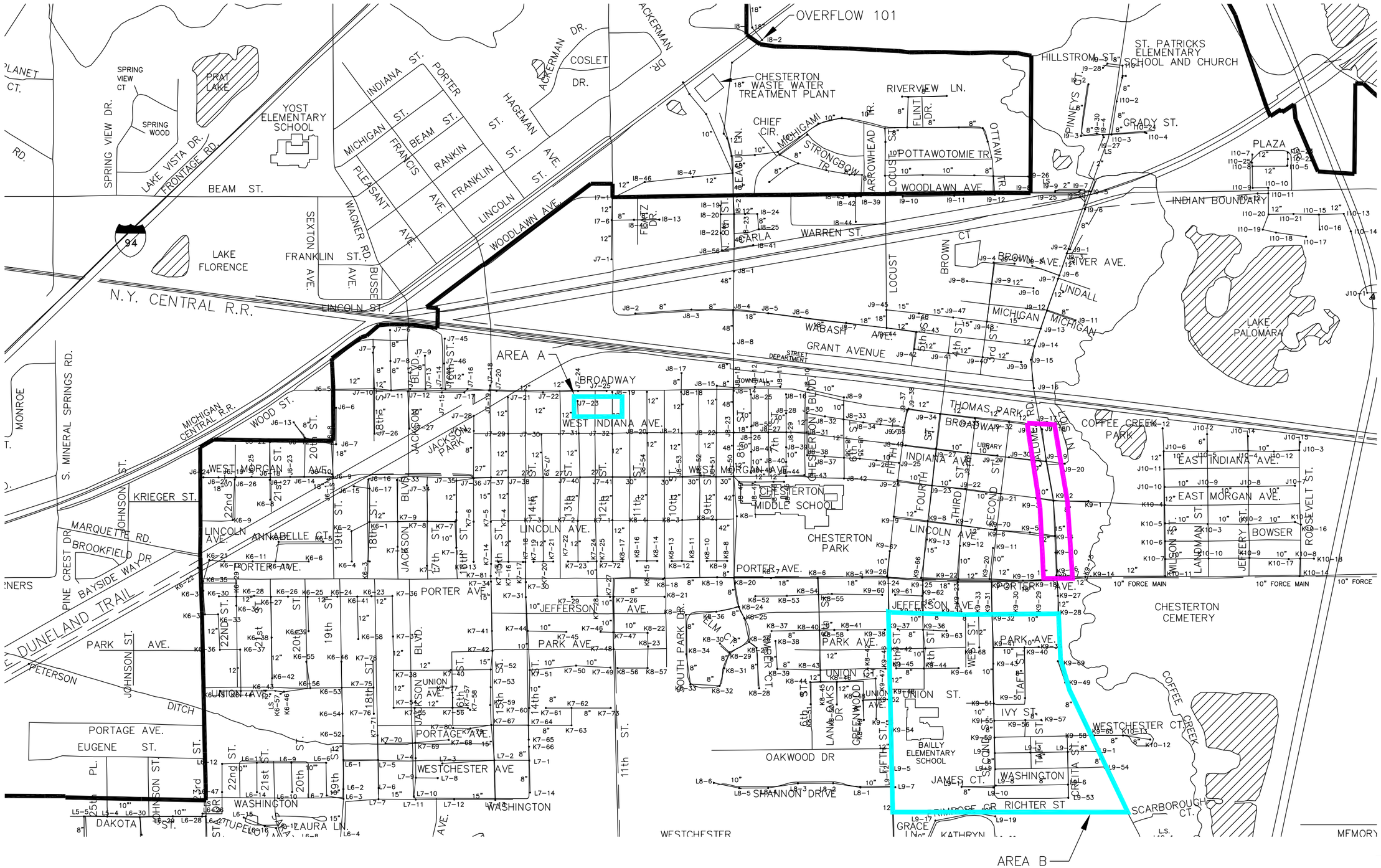
TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

WASTE WATER TREATMENT PLANT INFLUENT STRUCTURE - OVERFLOW WIER 101

FIGURE 1.3

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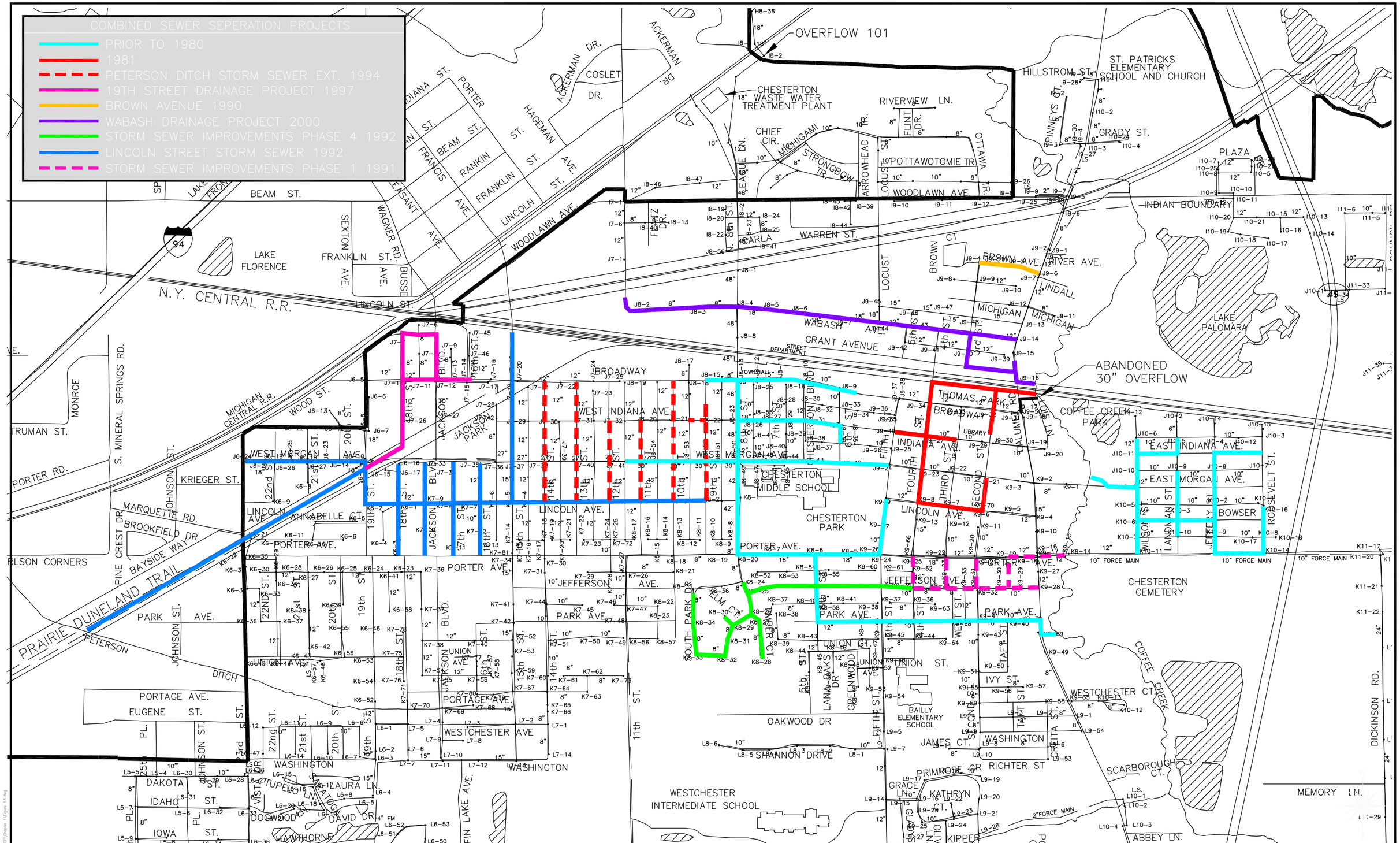
TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

COMBINED SEWER AREAS

FIGURE 1.4

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TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

SEWER SEPARATION PROJECTS

FIGURE 1.5

## 2.0 CSO HISTORICAL DATA REVIEW

In the summer of 2005 a metering program was initiated to collect data that could be utilized in the development of a hydrologic/hydraulic computer model. This section identifies the data collection strategy and the hydrologic/hydraulic computer model development.

### 2.1 Modeling Approach

Part of the alternatives analysis that is presented in Section 5 includes the IDEM guidance for treating the 1-year 1-hour storm and the 10-year 1-hour storm as defined as follows:

2.1.1 Provide for retention and treatment at the wastewater treatment plant, of combined sewage flows generated during storm events up to the 1-year, 1-hour storm.

2.1.2 Provide for primary treatment and disinfection of combined sewage flows generated during storm events larger than 1-year, 1-hour storm up to the 10-year, 1-hour storm.

2.1.3 Provide some primary treatment and disinfection of combined sewage flows generated during storm events above the 10-year, 1-hour storm.

2.1.4 Furthermore, IDEM has defined that the rainfall depths used in the analysis shall be as defined in Bulletin 71, *Rainfall Frequency Atlas of the Midwest,* and the rainfall shall be of uniform intensity and distribution over the entire service area for duration of exactly one hour. The 1-year 1-hour storm depth is 1.14 inches and the depth for the 10-year 1-hour storm is 1.98 inches as shown in **Table 2.1**.

Based on IDEM guidance the model will determine the flows generated by the 1-year 1-hour storm and the 10-year 1-hour storm.

### 2.2 Rain Fall Data

In past years, rainfall data was collected at the treatment plant with a rain gage. Data was collected from the rain gage daily and recorded as inches of rain. The rain data did not include intensity of the rainfall or the time the rain started or ended.

To determine the wet weather flows based on storm intensities the Town developed a flow monitoring program and put it into place on August 22, 2005 with the installation of a temporary tipping bucket rain gage at the WWTP. The rain gage was left in place until November 5, 2005. In May 2006 the Town purchased a tipping bucket rain gage and permanently

installed it at the WWTP and connected it to the WWTP monitoring system. Data that is collected by the rain gage is automatically downloaded to the plant monitoring system and stored in the data memory. The WWTP rain gage is located generally in the center of the sewer systems, which includes both the Chesterton and Porter areas. The gage is in an open area and is not obstructed by tall buildings or trees. The site is secure and data is easily retrievable.

## 2.3 Wet Weather Flow Modeling

As there is only one overflow within the Chesterton system located at the WWTP influent building, the computer model was developed to identify the flows at that point. To accomplish, this flow monitoring data was used from three monitoring points including Eighth and Carla Street (Meter 8), Franklin (Meter 4) and Marquardt (Meter 3). The wet weather flow modeling meters were located as shown on **Figure 2.1**.

### 2.3.1 Chesterton Flow Monitoring

The Town owns six (6) portable flow meters and has been monitoring flow in the collection system since the spring of 2006. **Figure 2.2** is a map of the collection system showing the location of the flow monitoring points that were used over the last four years and there tributary area. This information helped develop benchmark flows in various areas in the system to allow the town to check and monitor available capacity, particularly in areas of growth, changes in Infiltration and Inflow (I/I) over time and to verify the monthly flow data that is provided by the Town of Porter and Indian Boundary Conservancy District for billing purposes. The ongoing metering program will be included in the combined sewer overflow operational plan (CSOOP) for further reference.

For modeling purposes the Eighth and Carla Street (Meter 8) was utilized to determine the flows to the WWTP and CSO Overflow 101. Meter 8 is positioned as shown on **Figure 2.1** to monitor flows from a major portion of the Chesterton system. It also includes the Indian Boundary Conservancy District system and a number of collection areas of the Porter system.

### 2.3.2 Porter Flow Monitoring

The Town of Porter (Porter) owns and operates their sanitary sewer collection system but utilizes the Town of Chesterton's Wastewater Treatment plant for treatment. To transport the Porter sanitary wastewater to the WWTP they utilize 7 connection points

to the Chesterton sewers. The Porter sewer system is shown in **Figure 2.1.**

In 2007 Porter entered into an Agreed Order Case # 2007-16782-W with IDEM to eliminate sanitary sewer overflows (SSO). As part of that consent decree Porter completed a flow monitoring program that resulted in a report entitled "Sanitary Sewer Baseline Flow Analysis Summary" dated April 30, 2010. A copy of the report is included in **Appendix B.**

The flow analysis identified flows from each collection basin tributary to the Chesterton system for the 1 year 1 hour, 10 year 1 hour and the 50 year 18 hour storm events. Also the diurnal dry weather flows were identified and included in the report. Two of the 7 connection points were used in the determination of flows to CSO Overflow 101 including:

2.3.2.1 Marquardt (Meter 4)

The Meter 4 is positioned to monitor flows from the Porter sewer system in the area shown on **Figure 2.1**. Chesterton installed a meter in that same general area as shown, early in the flow monitoring period. However, an SSO in the Porter system was located in the collection system and the overflow amounts could not be determined. As part of the Porter consent decree, the Porter baseline report provided the flow data that was utilized in the computer model development. Porter maintains a meter in that area which is used for billing purposes. However, only totalized data is provided from the meter which is insufficient for modeling purposes.

2.3.2.2 Franklin (Meter 3)

The Meter 3 is positioned to monitor flows from the Porter sewer system in the area shown on **Figure 2.1**. The Franklin meter was also part of the Porter consent decree and flow from this collection area was part of the Porter baseline report providing flow data that was utilized in the computer model development.

## 2.4 Overflow 101 Monitoring

Overflow 101 is monitored using an area velocity meter in the outfall pipe to the river. The meter is located just downstream of the overflow weir in the 48" overflow pipe as shown in **Figure 1.3**.

The current meter was installed in early 2003 and reads velocity in both directions. This is important as the flow in the outfall pipe is affected by the water level in the East Branch of the Little Calumet River. As the river rises river water will flow back up the outfall pipe and a velocity and depth is recorded by the meter.

Data from the overflow meter is used to determine the volume of overflow during a CSO event for the MRO reporting.

## 2.5 WWTP Influent Monitoring

WWTP Influent is monitored with a meter located on the lift station force main located in the influent structure. The meter is monitored by the WWTP SCADA system and provides flow readings every 60 seconds and also totalizes the flow. This meter provides the average daily and peak daily flows reported on the MRO's and CSODMR.

## 2.6 Wet Weather Flow Modeling

As the Porter wet weather flows were modeled in the Base Line Study **(Appendix B)** those flows will be used and a model will not be developed as part of this report for Meter 3 and 4 areas.

This section provides a summary of the hydrologic/hydraulic modeling procedure used to predict the 1-year, 1-hour storm event and the 10-year, 1-hour storm event stormwater flows to the Chesterton Wastewater Treatment Plant. In particular, this section summarizes the hydraulic/hydrologic modeling and calibration for the area tributary to Meter 8. **Appendix C** includes a Technical Memorandum describing the methodology that was used to determine the 1-year 1-hour and the 10-year 1-hour design storms for the Meter 8 area. The analysis utilized rainfall and flow meter data in conjunction with the PCSWMM hydraulic/hydrologic model for flow simulation.

## 2.7 Model Flow and Volume Predictions

The storage volume required at the Chesterton wastewater treatment plant to store/treat the combined sewer inflow corresponding to the 1-yr 1-hr and the 10-yr 1-hr design storms are a combination of a number of flows. As discussed above, flows were modeled for meter areas 3, 4 and 8 feeding the WWTP as shown in **Figure 2.1**. The combination of these three flows, plus the diurnal flows, total the flows to the WWTP. If the total flow exceeds the 10 MGD peak capacity of the WWTP an overflow will occur unless storage is provided to contain the peak flow.

### 2.7.1 Dry Weather Diurnal Flows

Diurnal flows were determined from flow data collected by the WWTP influent meter. The diurnal flow was computed by averaging flows from dry periods between July 21 - 26, 2006, August 11 – 18, 2006 and October 28 – November 5, 2006. The average dry weather flow totaled 2.29 MGD. The current WWTP design capacity is 4.6 MGD so the diurnal flows were increased by a factor of 2.01. The diurnal curve for this period, with its average plotted on the curve, is shown in **Figure 2.3**. Increasing the diurnal flow to 4.6 MGD will allow growth in the community to the WWTP's current capacity without affecting the capacity of the wet weather treatment.

## 2.8 Predicted Wet Weather Flows to the WWTP

To determine the wet weather flow the Chesterton meter area 8, Porter metering areas 3, 4 and the diurnal flows were added together. To provide a safety factor the peaks of each area flow including the diurnal flow were shifted so that the peak flows coincide resulting in the maximum expected hydrograph (storm and sanitary combined) that the wastewater treatment plant would see for the design storm event. To size wet weather treatment process the peak flow capacity of the WWTP of 10 MGD was subtracted from the total wet weather flow.

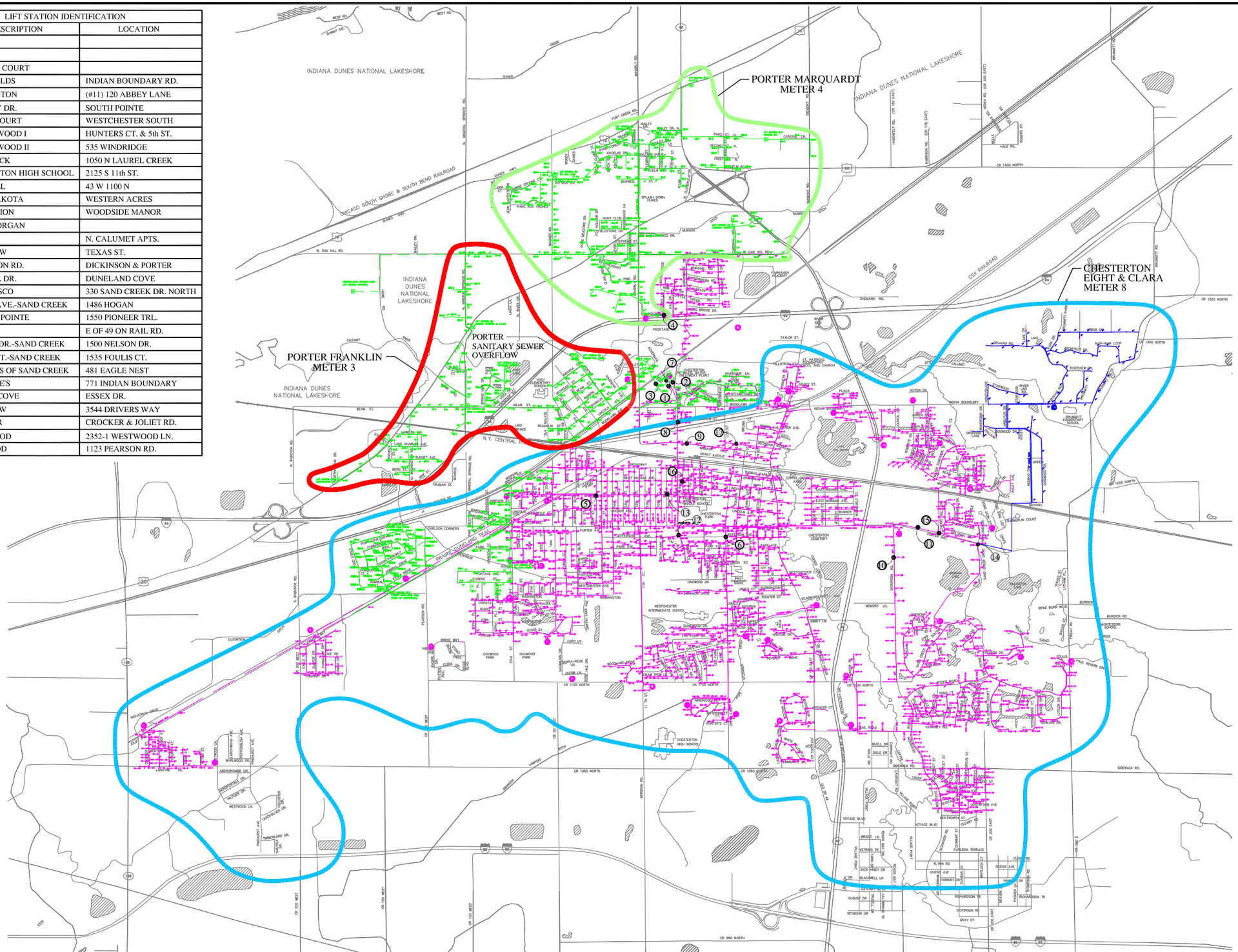
### 2.8.1 One Year One Hour Storm

**Table 2.2** and **Figure 2.4** illustrates the wet weather flow hydrograph model for the 1year 1 hour storm. The peak flow to the WWTP is 15.02 MGD and the wet weather volume over the 10 MGD peak capacity of the WWTP is 200,000 gallons.

### 2.8.2 Ten Year One Hour Storm

**Table 2.3** and **Figure 2.5** illustrates the wet weather flow hydrograph model for the 10 year 1 hour storm. The peak flow to the WWTP is 26 MGD and the wet weather volume over the above the 10 MGD peak capacity of the WWTP is 761,000 gallons.

| LIFT STATION IDENTIFICATION | | |
|---|---|---|
| I.D. | DESCRIPTION | LOCATION |
| 1 | WWTP | |
| 2 | ANNE'S | |
| 3 | PINNEY'S COURT | |
| 4 | MCDONALDS | INDIAN BOUNDARY RD. |
| 5 | BARRINGTON | (#11) 120 ABBEY LANE |
| 6 | BEVERLY DR. | SOUTH POINTE |
| 7 | OLIVIA COURT | WESTCHESTER SOUTH |
| 8 | TANGLEWOOD I | HUNTERS CT. & 5th ST. |
| 9 | TANGLEWOOD II | 535 WINDRIDGE |
| 10 | TAMARACK | 1050 N LAUREL CREEK |
| 11 | CHESTERTON HIGH SCHOOL | 2125 S 11th ST. |
| 12 | ROSE HILL | 43 W 1100 N |
| 13 | 23rd & DAKOTA | WESTERN ACRES |
| 14 | 21st & UNION | WOODSIDE MANOR |
| 15 | 19th & MORGAN | |
| 16 | WALRO | N. CALUMET APTS. |
| 17 | PARKVIEW | TEXAS ST. |
| 18 | DICKINSON RD. | DICKINSON & PORTER |
| 19 | MICHAEL DR. | DUNELAND COVE |
| 20 | JEWEL OSCO | 330 SAND CREEK DR. NORTH |
| 21 | HOGAN AVE.-SAND CREEK | 1486 HOGAN |
| 22 | PIONEER POINTE | 1550 PIONEER TRL. |
| 23 | KAT | E OF 49 ON RAIL RD. |
| 24 | NELSON DR.-SAND CREEK | 1500 NELSON DR. |
| 25 | FOULIS CT.-SAND CREEK | 1535 FOULIS CT. |
| 26 | VILLAGES OF SAND CREEK | 481 EAGLE NEST |
| 27 | APPLEBEE'S | 771 INDIAN BOUNDARY |
| 28 | PORTER COVE | ESSEX DR. |
| 29 | GOLFVIEW | 3544 DRIVERS WAY |
| 30 | CROCKER | CROCKER & JOLIET RD. |
| 31 | WESTWOOD | 2352-1 WESTWOOD LN. |
| 32 | DOGWOOD | 1123 PEARSON RD. |

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SCALE: 1"=3000'

0 1500 3000 6000

LEGEND

1. WWTP INFLUENT METER
2. CSO METER
3. PORTER PRINCIPAL METER
4. MARQUARDT AND PENNY METER
5. 16th AND MORGAN METER
6. 5th AND JEFFERSON METER
7. WWTP RAIN GAGE
8. 8th AND CARLA METER
9. WABASH METER
10. DICKINSON METER
11. PORTER AVE METER
12. SOUTH PARK METER
13. 9th AND MORGAN AVE
14. SAND CREEK DR AT PORTER AVE
15. PORTER AVE AT SAWGRASS
16. WEST INDIANA AVE AND 8TH ST
17. ALLEY NORTH OF WABASH & 5TH ST.

PORTER SEWERS
CHESTERTON SEWERS

DLZ

TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

WET WEATHER FLOW MODELING METER LOCATIONS

FIGURE 2.1

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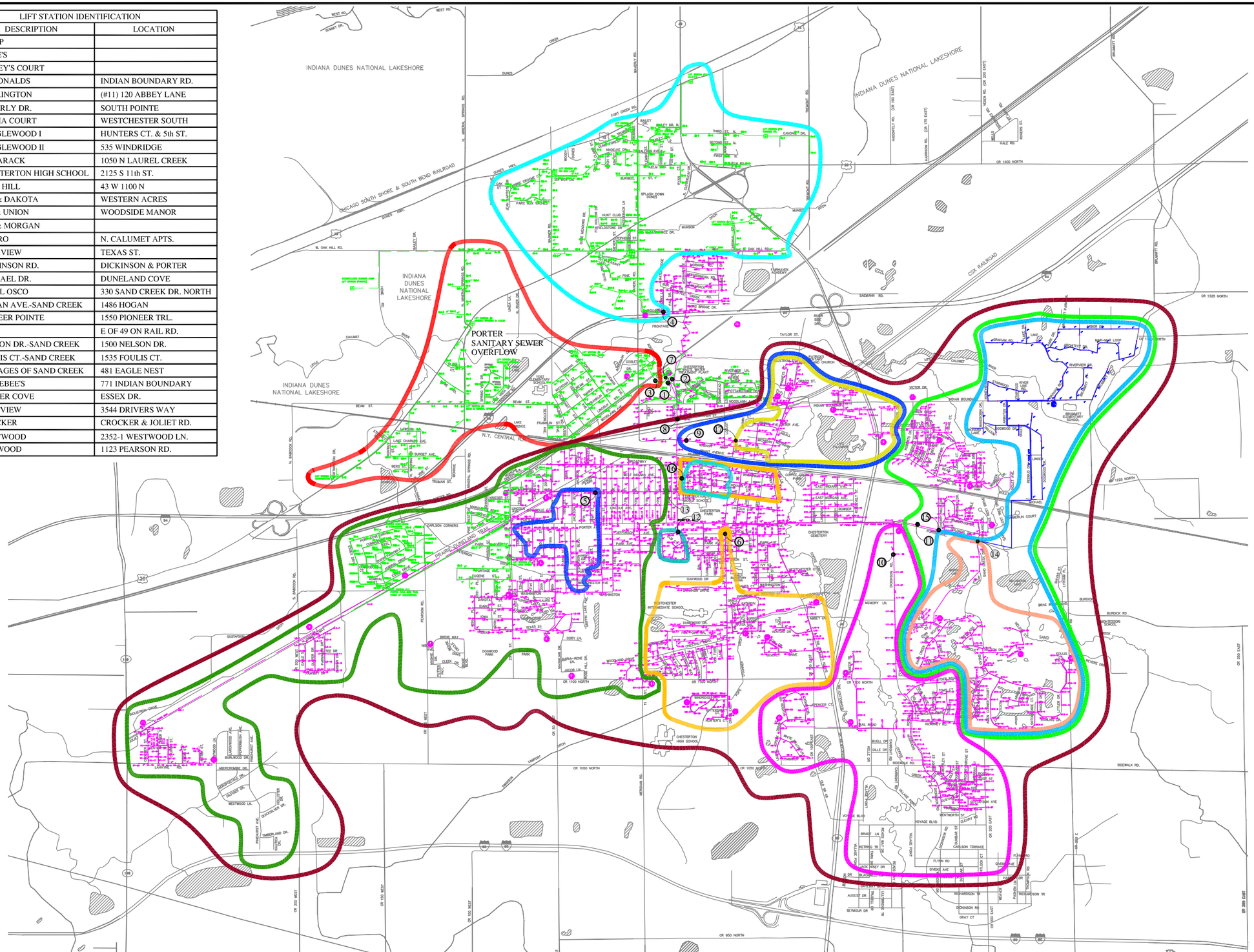
| LIFT STATION IDENTIFICATION | | |
|---|---|---|
| I.D. | DESCRIPTION | LOCATION |
| 1 | WWTP | |
| 2 | ANNE'S | |
| 3 | PINNEY'S COURT | |
| 4 | MCDONALDS | INDIAN BOUNDARY RD. |
| 5 | BARRINGTON | (#11) 120 ABBEY LANE |
| 6 | BEVERLY DR. | SOUTH POINTE |
| 7 | OLIVIA COURT | WESTCHESTER SOUTH |
| 8 | TANGLEWOOD I | HUNTERS CT. & 5th ST. |
| 9 | TANGLEWOOD II | 535 WINDRIDGE |
| 10 | TAMARACK | 1050 N LAUREL CREEK |
| 11 | CHESTERTON HIGH SCHOOL | 2125 S 11th ST. |
| 12 | ROSE HILL | 43 W 1100 N |
| 13 | 23rd & DAKOTA | WESTERN ACRES |
| 14 | 21st & UNION | WOODSIDE MANOR |
| 15 | 19th & MORGAN | |
| 16 | WALRO | N. CALUMET APTS. |
| 17 | PARKVIEW | TEXAS ST. |
| 18 | DICKINSON RD. | DICKINSON & PORTER |
| 19 | MICHAEL DR. | DUNELAND COVE |
| 20 | JEWEL OSCO | 330 SAND CREEK DR. NORTH |
| 21 | HOGAN AVE.-SAND CREEK | 1486 HOGAN |
| 22 | PIONEER POINTE | 1550 PIONEER TRL. |
| 23 | KAT | E OF 49 ON RAIL RD. |
| 24 | NELSON DR.-SAND CREEK | 1500 NELSON DR. |
| 25 | FOULIS CT.-SAND CREEK | 1535 FOULIS CT. |
| 26 | VILLAGES OF SAND CREEK | 481 EAGLE NEST |
| 27 | APPLEBEE'S | 771 INDIAN BOUNDARY |
| 28 | PORTER COVE | ESSEX DR. |
| 29 | GOLFVIEW | 3544 DRIVERS WAY |
| 30 | CROCKER | CROCKER & JOLIET RD. |
| 31 | WESTWOOD | 2352-1 WESTWOOD LN. |
| 32 | DOGWOOD | 1123 PEARSON RD. |




LEGEND

1. WWTP INFLUENT METER
2. CSO METER
3. PORTER PRINCIPAL METER
4. MARQUARDT AND PENNY METER
5. 16th AND MORGAN METER
6. 5th AND JEFFERSON METER
7. WWTP RAIN GAGE
8. 8th AND CARLA METER
9. WABASH METER
10. DICKINSON METER
11. PORTER AVE METER
12. SOUTH PARK METER
13. 9th AND MORGAN AVE
14. SAND CREEK DR AT PORTER AVE
15. PORTER AVE AT SAWGRASS
16. WEST INDIANA AVE AND 8TH ST
17. ALLEY NORTH OF WABASH & 5TH ST.

PORTER SEWERS
CHESTERTON SEWERS

DLZ

TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

TOWN OF CHESTERTON SEWER SYSTEM METER LOCATIONS

FIGURE 2.2

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## 3.0 CONSIDERATION OF SENSITIVE AREAS

It is the responsibility of the NPDES permit holder to identify all sensitive areas. The NPDES permit holder must assess exactly what is occurring along the waterways which flow through their jurisdictions and to which their CSOs discharge. The elimination, relocation or control of combined sewer discharges to sensitive areas is given a high priority in the Federal and State CSO policies.

### 3.1. Identification of Sensitive Areas

IDEM defines sensitive areas as "waters impacted by CSO discharges, which must be given the highest priority for CSO discharge elimination, relocation or control. Examples of sensitive areas include:

#### 3.1.1. Threatened or Endangered Species Habitat

The Indiana Department of Natural Resources, Division of Nature Preserves conducted an Indiana Natural Heritage Data Center database search for the Chesterton area on April 5, 2004.

The database includes endangered, threatened, and rare species, high quality natural communities and significant natural areas. The database reflects reporting from specific field studies conducted by independent research groups.

As threatened or endangered species are located, the findings are reported to the State and entered in the database specified by USGS Quadrangle Map township, range, and section numbers. The search indicated that the *Rana pipiens*, northern leopard frog, was documented from the Little Calumet River just northwest of Chesterton in 1993.

**Figure 3.1** illustrates the threatened, endangered, or rare species area.

#### 3.1.2. Primary Contact Recreational Areas

A water providing "full body contact recreation" means an area, both land and water, that is deemed important by local municipal, state, or federal governments for their recreational or educational value.

Typically, local municipal, state, or federal governments actively support or provide maintenance to these areas. These areas, which relate to activities where small amounts of water are likely to be

ingested, can be locally designated for such public activities as swimming and water skiing.

The Indiana Department of Natural Resources, Outdoor Recreation maintains the Indiana Recreation Facility Inventory. This inventory lists federal, state, county, municipal, and township-owned facilities with water bodies (lakes, ponds, or rivers) used for swimming, fishing, boating, or water skiing.

On April 5, 2004 the Recreation Facility Inventory listed the following water body locations:

| Water Body | Site | Address | City | Reason |
|---|---|---|---|---|
| Burns Ditch | Izaac Walton League – Miller Chapter | 1250 N. Crisman Road | Portage | Access |
| | Marquette Yacht Club | 1218 N. Crisman Road | Portage | Access |
| | Lefty's Coho Landing | 6161 Burns Waterway | Portage | Paved Access, Boat Rental |
| | Portage City Marina | | Portage | Paved Access |
| Little Calumet River | Hawthorn Park | 500 Ackerman Drive | Porter | Adjacent to waterbody |
| Lake Michigan | Indiana Dunes National Lakeshore | 1110 N. Mineral Springs Road | Porter | Beach, Fishing, Swimming, Access |
| | Port of Indiana State Fishing Site | Port of Indiana | Portage | Fishing along shore |
| | Ogden Dunes Beach Access Site | | Ogden Dunes | Beach, Fishing, Swimming |
| | Porter Beach | | Porter | Beach, Fishing |

**Figure 3.1** illustrates the primary contact recreational areas.

### 3.1.3. Drinking Water Source Waters

Surface drinking water intakes are considered a sensitive area for obvious human health factors. For purposes of completing the LTCP, a public surface water supply intake includes a point of intake used as a potable water source along surface waters downstream of the CSO discharge locations. The term is not intended to include ground water sources.

An IDEM database containing 72 public water supply intakes was reviewed. The database indicated several public water supply intakes exist along Lake Michigan within approximately 25 stream miles of the Chesterton CSO. It is approximately 8.5 stream miles from the Chesterton CSO discharge on the East Arm of Little Calumet River down Burns Ditch and ultimately to Lake Michigan. A radius of 16.5 miles was explored along Lake Michigan from the entrance of Burns Ditch, which resulted in the identification of the following intakes that could potentially be influenced by the Chesterton CSO:

| Public Water Supply ID | System Name | City | Intake |
|---|---|---|---|
| 5245015 | Indiana-American Water Co (Northwest Indiana Water Company) | Gary | Lake Michigan – Odgden Dunes |
| 5245015 | Indiana-American Water Co (Northwest Indiana Water Company) | Gary | Lake Michigan – Borman |
| 5245012 | East Chicago Water Works | East Chicago | Lake Michigan |
| 5245048 | Whiting Water Plant | Whiting | Lake Michigan |
| 5245020 | Hammond Water Works Department | Hammond | Lake Michigan |
| 5246020 | Michigan City Department of Water Works | Michigan City | Lake Michigan |

**Figure 3.2** illustrates the locations of the cities that have public water supply intakes within approximately 25 miles of the Chesterton CSO.

3.1.4. Outstanding State Resource Waters

The Indiana Administrative Code at 327 IAC 2-1-11(b) did not list the Little Calumet River, Burns Ditch, or Lake Michigan as exceptional use waters. However, in reviewing the Indiana Administrative Code at 327 IAC 2-1-2(3) and 327 IAC 2-1.5-19(b) the Indiana portion of the open waters of Lake Michigan and all waters incorporated in the Indiana Dunes National Lakeshore were defined to be outstanding waters. **Figure 3.1** illustrates the outstanding state resource waters.

3.2. Prioritize CSO Control Implementation

The IDEM requires communities to evaluate the CSOs and assign a priority for addressing each one, based upon existing uses and particularly sensitive areas.

The EPA's CSO Control Policy states, that for sensitive areas, the LTCP should:

3.2.1. Prohibit new or significantly increased overflow volumes into the sensitive areas;

3.2.2. Eliminate or relocate overflows that discharge to sensitive areas:

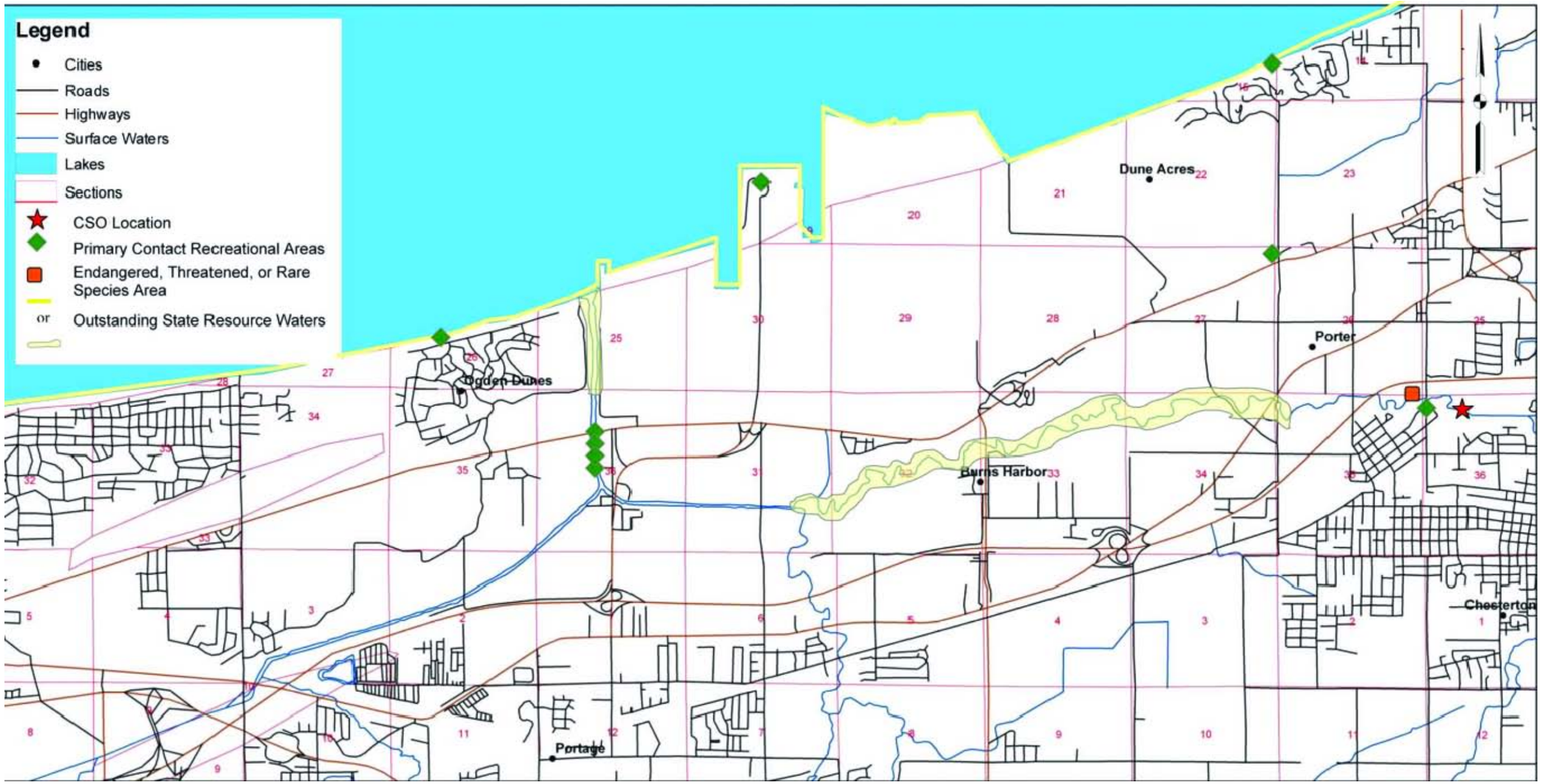
- Wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment, or;

- Where elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide the level of treatment for remaining overflows deemed necessary to meet Water Quality Standards for full protection of existing and designated uses;

- Where elimination or relocation has been proven not to be physically possible and economically achievable, permitting authorities should require, for each subsequent permit term, a reassessment based on new or improved techniques to eliminate or relocate, or on changed circumstances that influence economical feasibility.

> The implication is simply that even if it is not physically possible and economically achievable to eliminate or relocate overflows from sensitive areas when the LTCP is first approved, it does not relieve the community of the responsibility to continue to evaluate and assess the situation over time. As technologies or economic circumstances change with time, it may become clear that the existing CSO can be eliminated or relocated.

The intent of this element of the LTCP is to clearly demonstrate that consideration of sensitive areas has been accomplished through identifying the sensitive areas and determining the type of controls that are physically achievable. The evaluation of alternatives for the protection of the sensitive areas will be presented in **Chapter 5**.

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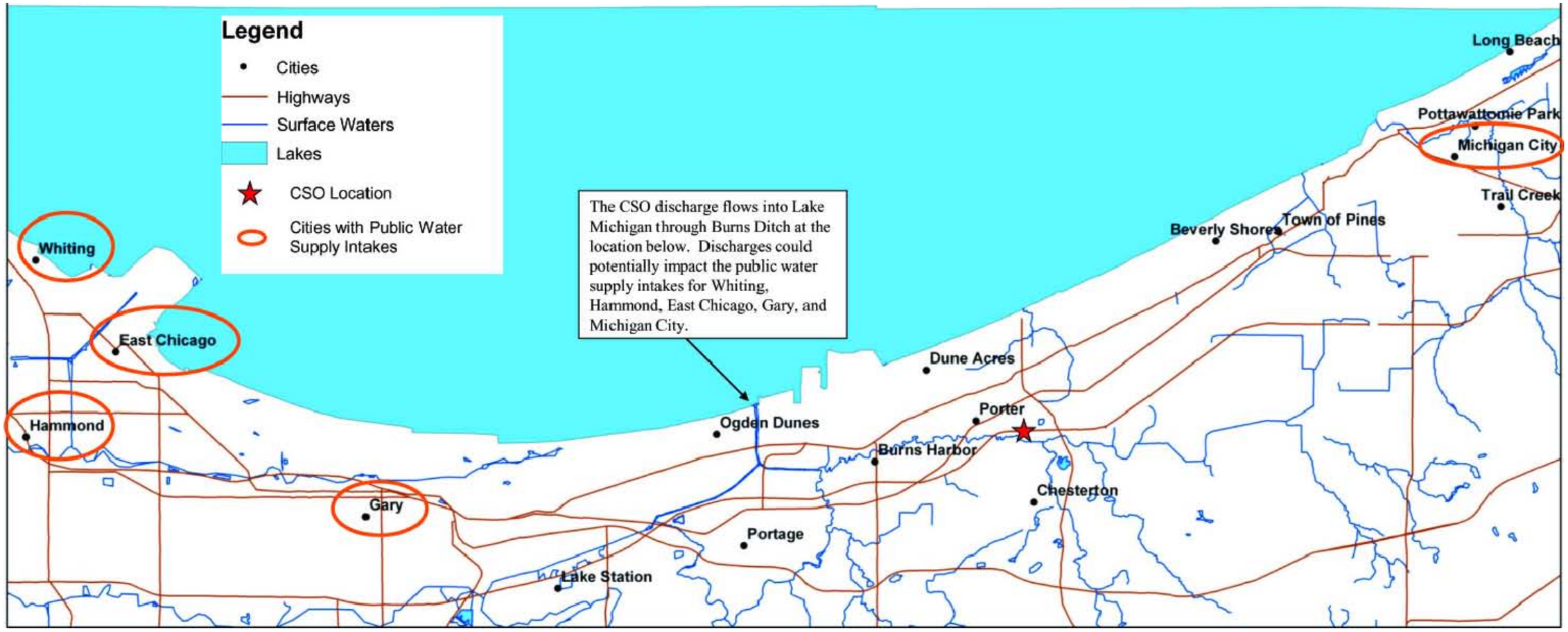
TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

SENSITIVE AREA LOCATIONS

FIGURE 3.1

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TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

CITIES WITH PUBLIC WATER SUPPLY INTAKES ALONG LAKE MICHIGAN WITHIN 25 MILES OF CHESTERTON CSO

FIGURE 3.2

# 4.0 MAXIMIZING TREATMENT AT THE WWTP

## 4.1 Wastewater Treatment Plant Capacity

The WWTP expansion was completed in September 2006, which increased the average daily flow from 2.7 MGD to 4.6 MGD. The peak flow capacity was expanded from 5.7 MGD to 10 MGD.

## 4.2 Hydraulic Stress Test

To verify the peak flow capacity a hydraulic stress test was completed on March 23, 2006. The stress test was preformed with the UV bulbs in place. Two tests were completed. The first test limited the flow to 10 MGD and the second allowed the flow to reach 11 MGD. In both instances the plant was able to pass the flow hydraulically. Water samples were taken for *E. coli*. No violation of the NPDES summer time limits occurred during the tests. Because the test flow was only sustained for approximately 10 minutes the performance of the clarifiers could not be analyzed.

Since the stress test was completed the WWTP has had a number of wet weather events and the operators were able to maximize the flow through the WWTP to 11 MGD. There are a number of factors that limit the flow through the WWTP as discussed below.

## 4.3 Flow Limiting Elements

Currently the WWTP staff limits the flow to peaks to 10 MGD to prevent the final clarifiers from bulking sludge. If sludge begins to bulk the flow is further reduced to allow the clarifiers to recover. The following elements limit the peak flow and should be addressed as part of the LTCP alternatives.

### 4.3.1 Final Clarifier Flow Split

It is difficult to maintain solids within the final clarifiers because of limited flow splitting abilities to prevent overloading a clarifier and causing sludge to bulk into the effluent.

### 4.3.2 Variable Speed Pumping

The lack of full range variable speed pumping at the influent lift station pulses the flow thru the plant causing solids in some clarifiers to bulk.

### 4.3.3 Headwork's Hydraulics

Another area that limits the flow capacity includes the plant head works. Operator attention is required to prevent the flow from overtopping the grit channel floor, which could potentially flood the lift station dry well. To prevent this, a valve next to the overflow weir and before the bar screen is partially closed to limit the flow to the amount of flow that the pumps are putting out. Over operating the valve will limit the flow to the plant increasing the amount of overflow or continue to flood the headworks, which is time consuming for the operators.

### 4.3.4 Ultra Violet (UV) Light Disinfection Structure

The other area that limits the flow is the UV disinfection structure in which the excessive high flows will float the light bulb units and cause the bulbs to break. Again procedures are being developed to maximize the flow and prevent flooding and UV bulb damage.

# 5.0 CSO CONTROL ALTERNATIVES

## 5.1 Historical CSO Reduction

The Town of Chesterton has been very proactive in the elimination of combined sewer overflow by the following actions:

### 5.1.1 Source Control

As discussed in Section 1.1.3 the Town of Chesterton during the last twenty years has been aggressive in the separation of the combined sewers in the older areas of the Town. These areas are shown in Figure 1.5 along with the approximate year each project was constructed. The separation was accomplished by the construction of new storm sewers and moving the storm inlets from the combined sewers to the storm sewers.

The separation of the combined sewers in the areas shown in Figure 1.5 has reduced the inflow significantly and has enabled the Town to eliminate an overflow at Calumet Road and Broadway that discharged to Coffee Creek.

Because of this separation the average flows to the WWTP have reduced between 100,000 to 400,000 GPD while the town has continued to experience growth.

Though the separation projects removed the storm inlets in the streets from the combined sewers they did not include the elimination of I/I from open joints, house laterals, roof down spouts or the disconnection of foundation drains. Because of this there are still wet weather (WW) peak flows in the separated sanitary sewer system.

#### 5.1.1.1 Calumet Street Separation

The Calumet Street Separation covers the area shown in **Figure 5.1**. The project is currently under construction and will be completed in 2012.

### 5.1.2 Collection System Controls

The Town has implemented a collection system control during the last WWTP expansion, which was completed in September 2006. The project included the raising of the overflow weir by 6 inches. This allowed the additional inline storage of WW flow by the 48” interceptor sewer and other connecting sewers depending on the hydraulic grade line of the WW flow. Also the plant expansion

increased the peak flow capacity of the WWTP from 5.7 MGD to 10 MGD. With the additional inline storage and increased plant capacity overflow amounts have been reduced.

## 5.2 Treatment Technologies

The treatment technologies that the Town of Chesterton has implemented include the following:

### 5.2.1 Overflow Weir 101 Bar Screen

Under the WWTP expansion project a bar screen was added on top of the overflow weir. The bar screen has 1 inch spacing to screen out floatable materials and other solids 1 inch and larger. The screen is detailed in **Figure 1.3.**

### 5.2.2 WWTP Trash Rack

The WWTP Trash Rack is located in the WWTP influent structure up stream of the overflow weir before flow is diverted into the bar screen and grit channel. The intent of the trash rack is to screen out any solids that are 4 inches and larger to protect the WWTP equipment. The trash rake also provides screening during an overflow event.

### 5.2.3 WWTP Expansion

As discussed earlier in **Section 4** the WWTP staff continues to maximize the treatment at the WWTP. The treatment plant peak capacity is key to the reduction of CSO occurrences.

### 5.2.4 CSO Metering

As discussed in **Section 2** Chesterton has embarked on an extensive metering program to identify bench marking of collection area and to develop a computer model to determine the 1 year 1 hour and 10 year one hour storm flows tributary to CSO 101.

## 5.3 LTCP Alternatives Approach

The WW treatment approach that the Town of Chesterton is taking with regard to the reduction of overflows is based on IDEM guidance (Policy - Water 016) for treating the 1-year 1-hour storm (1 year storm) and the 10-year 1-hour storm (10 year storm) as defined as follows:

5.3.1 Provide for retention and treatment at the wastewater treatment plant, of combined sewage flows generated during storm events up to the 1-year storm.

5.3.2 Provide for primary treatment and disinfection of combined sewage flows generated during storm events larger than 1-year storm up to the 10-year storm.

5.3.3 Provide some primary treatment and disinfection of combined sewage flows generated during storm events above the 10-year storm.

5.3.4 Furthermore, IDEM has defined that the rainfall depths used in the analysis shall be as defined in Bulletin 71, *Rainfall Frequency Atlas of the Midwest*, and the rainfall shall be of uniform intensity and distribution over the entire service area for duration of exactly one hour. The 1-year 1-hour storm depth is 1.14 inches and the depth for the 10-year 1-hour storm is 1.98 inches as shown in **Table 2.1**.

Based on the above IDEM guidance the computer model was developed as discussed in **Chapter 2** and **Appendix C**.

## 5.4 Alternative Development

### 5.4.1 Storage Tank Location Analysis

The WWTP property is shown in **Figure 5.2**. The tank locations that were considered are discussed below:

#### 5.4.1.1 Tank Location 1

There is a lot of land available to the east of the outfall sewer that could allow for gravity filling of the tank however this area was not considered for the following reasons:

- The area is low and susceptible to flooding
- There is a high probability that the area is a wetland
- Dewatering and special foundation requirements would add additional costs

#### 5.4.1.2 Tank Location 2

During the development of the 2004 LTCP the location that was being considered was adjacent to the little league baseball diamond and, though still on WWTP property, would impact the baseball facility. Representatives of the

State Park league expressed concern during public hearings at the time.

5.4.1.3 Tank Location 3

The third location that was considered is the area west of the sludge thickening building. This area has advantages over the other areas for the following reasons:

- Less impact on neighbors
- The site is out of the way for future WWTP expansion
- An additional tank could be installed adjacent to the proposed tank if required by future regulations
- The tank could be converted into a primary clarifier in a future plant expansion if WW flow reduction rendered the tank ineffective.

5.4.2 WW Storage Basin

Two alternatives were reviewed for the construction of the WW storage basin. One was for rectangular poured in place concrete construction and the second was circular pre-stressed concrete construction. In the review of both alternatives it was determined that the rectangular tank was the best alternative for the following reasons:

- The rectangular tank fit the site better with a smaller foot print.
- The location and foot print allows for future tank construction adjacent to the site.
- The tank cleaning system would be more efficient.

5.4.3 Full Treatment of the 1 Year Storm

Based on the results of the modeling discussed in Chapter 2, the 1 year storm will produce a peak flow of 14.7 MGD and 200,000 Gal above the WWTP capacity. The 10 year storm will produce a peak flow of 26 MGD. To process the flow, the sizing of the components would be based on **Figure 5.3**

5.4.3.1 Storage Tank

To store the 1 year storm the tank would have to store 200,000 Gal.

5.4.3.2 Primary Treatment

To provide primary treatment for the 10 year storm the alternative would include screening and grit removal. Primary clarification would also be provided by allowing settling in the storage tank. Flows from storms above the 1 hour storm would continue to be pumped to the storage tank and once full the tank would become a primary settling tank and excess flow would overflow out of the tank. Once the WW flows pass, the tank would be drained for full treatment through the WWTP. The primary solids would be flushed out of the tank with the tank cleaning system for removal in the primary tanks.

5.4.3.3 Disinfection

Because the flows above the 1 year storm would be discharged to the Little Calumet River after primary treatment, the flow would have to be disinfected prior to discharge. Three disinfection options were considered, as follows:

5.4.3.3.1 Ultraviolet Light Disinfection (UV)

During the last WWTP expansion the disinfection process was converted from gas chlorine to ultraviolet light disinfection to eliminate the potential hazards of gas chlorine and de-chlorination process.

During the evaluation of utilizing UV on the WW overflow it was determined that because the water would only receive primary treatment UV may not provide the disinfection levels necessary to meet the NPDES permit water quality standards. Because of this, UV was eliminated from further consideration.

5.4.3.3.2 Liquid Chlorination

Liquid chlorination would be a viable option to meet the NPDES disinfection limits however there are disadvantages:

- Requires de-chlorination
- The chemical has a limited shelf life and because the overflow would be infrequent the chemical could be ineffective and have to be disposed of and replaced before an overflow occurs.
- Startup would be required under the stressful operating conditions of a major storm to assure disinfection and de-chlorination is provided.

5.4.3.3.3 Gas Chlorination

Gas chlorination would also be a viable option to meet the NPDES disinfection limits however there are disadvantages as follows:

- Requires de-chlorination
- The WWTP eliminated gas chlorine in the last expansion so going back to a gas process was not recommended by the WWTP staff.
- Because the overflow would be infrequent, startup would be required under the stressful operating conditions of a major storm to assure disinfection and de-chlorination is provided.
- As the gas system would be utilized so infrequently, operating procedures could be difficult to remember by operators which could cause safety issues.

5.4.4 Full Treatment of the 10 Year Storm

During the development of the 1 year storage basin it became clear that by treating the full 10 year flow the disinfection process could be eliminated. The WW pumping, screening and grit removal would still remain the same size and have the same capacity. Storage and treating the 10 year storm would also further reduce the amount of overflow and the number of occurrences. Because of these reasons the Full Treatment of the 10 year storm was developed.

Based on the results of the modeling discussed in Chapter 2 the 1 year storm will produce a peak flow of 26 MGD and 1,200,000 Gal above the WWTP capacity. To process the flow the sizing of the components would be based on **Figure 5.3.**

5.4.4.1 Storage Tank

To store the 10 year storm the tank would have to store 1.2 MG.

5.4.5 WW Headworks Structure

The headworks structure includes the grit removal process, screening process and WW pump station. A layout of the headworks structure is shown in **Figures 5.4 - 5.6**.

Two alternatives for the headworks structure layout were considered. One is on the south side of the headworks diverting

flow before the existing trashrack. The other is on the north side of the headworks building. Both alternatives included basically the same layout.

It was determined that the north side was a better fit because the existing screening and grit process would be close to the same elevation which would provide easier constructability. The south side of the existing headworks is constructed shallower which would cause problems constructing the deeper WW grit and screening structure next to the shallow grit and screening processing area.

## 5.5 Recommended Alternative

Based on the analysis described in Paragraph 5.4 the recommended alternative includes a storage tank sized to store and treat the 10 year storm located on the west side of the WWTP site as shown in **Figure 5.7.**

### 5.5.1 WW Tank Location

Of the three locations considered in Paragraph 5.2.2.1 the area 3 was selected because of the advantages of placing the tank at that location.

### 5.5.2 WW Storage Tank

A schematic of the proposed WW Storage Basin is shown in **Figure 5.8** and **5.9**. The basin would be constructed partially in the ground with the top extending 5 feet above the ground. The basin will be covered to contain odors and prevent snow, leaves and other debris from falling into the tank.

As the Porter wet weather force main is in the vicinity of the basin it will be tapped, valved and connected to the basin as shown in **Figure 5.8**. This will allow the Porter WW flows to go directly into the basin without having to be repumped to the basin through the WW headworks, saving operating costs and WW headworks capacity. A control valve adjacent to the Porter Basin Weir will control whether or not flow is diverted into the tank. This will allow operator flexibility and avoid sending dry weather flow to the basin if that forcemain is used periodically for dry flows.

Wet Weather flows will enter the basin on the southwest corner of the tank. This will allow the flushing system to fill first to assure an efficient flush. Once the flushing basins are full, flow will overtop the flushing well wall and fill the basin. Once the storm

has passed and WWTP capacity is available, the tanks will be allowed to drain back into the headworks for full treatment through the WWTP. Drain flows will be controlled through the WWTP SCADA system and the tank control valve that will restrict the flow back to the WWTP based on the available WWTP excess capacity.

If a storm exceeds a 10 year storm and the tank is full the WW pump station will shut down and flow will be allowed to overflow to the Little Calumet River.

Once the tank is empty the flushing system will be initiated and each individual flushing gate will be opened in sequence to wash solids out of the tank and back to the headworks.

### 5.5.3 Headworks

The concept of the WW headworks is to allow the existing headworks process to work as intended until the WW flow exceeds the pump stations capacity of 10 MGD. At this point the flow will backup and overflow gates to the WW screens and flow will then flow through the screens, grit tank into the wet well and the WW pumps will pump the excess flow to the storage basin. Once the storage basin is full the WW pump station will shut down and any flow in excess of the 10 MGD flow to the WWTP will overflow to the Little Calumet River.

Operation flexibility is included in the layout of the WW headworks. This flexability includes:

- The grit and screening will be sized to treat 26 MGD based on the model predictions of the 10 year storm. The screening process includes two new screens and with the existing screen the combined firm capacity is 26 MGD with one unit out if service. This will allow the operators to take the existing screen and grit system off line and still provide flow to the WWTP.
- A channel will be constructed through the WW wet well which will allow flow to the existing wet well for pumping to the primary clarifiers. If the flow exceeds the 10 MGD capacity flow will backup and overflow the channel in the WW wet well and the WW Pumps will automatically pump the flow to the WW storage basin
- There will be an interconnect between the WW forcemain to the storage basin and the WWTP forcemain. This will allow

the operators the option to use the WW pumps to pump flow to the WWTP if the existing pump station is offline.

- WW Pump Station:
  The capacity of the WW Pump Station is to pump 26 MGD to the WW Storage Basin and the WWTP for treatment. The controls will be setup to automatically pump flow in excess of the WWTP Pumps to the WW Storage Basin without interaction by the operators. Final configuration and sizing of the WW Pumps and forcemain will be determined in the preliminary design. The schematic layout or the WW Pump Station is shown in **Figures 5.4 – 5.7**.

### 5.5.4 Consideration of Sensitive Areas

As discussed in **Section 3** there are sensitive areas downstream of CSO 101. It would not be cost effective to move the outfall to another location to bypass or avoid the sensitive areas. By implementing the recommendations identified in this section the Town of Chesterton will significantly reduce the overflow volume and overflow events to cause minimal impact on the sensitive areas.

### 5.5.5 Probable Project Cost Estimate

A detailed line item list of the components for the recommended project was developed. This list was developed based on similar projects that have been designed, bid and construction completed. Although the recommended project is far from being fully developed it will include many of the same components. In many cases, units were assigned to components based on the information known to date. However, in some cases allowances were assigned to cover the costs of the components. To each of the components a unit price was assigned. These unit prices were developed from recent project bids, Means Manuals, or equipment supplier's proposals. Costs were also adjusted to the Northwest Indiana construction environment using Engineering News Records cost analysis. Because the project is yet to be fully developed, a 20% contingency was added to cover unknowns such as special foundation requirements and dewatering. **Table 5.1** includes a summary of the probable project cost. The detailed cost break down is included in **Appendix D**.

## 5.6 Cost/Performance Considerations

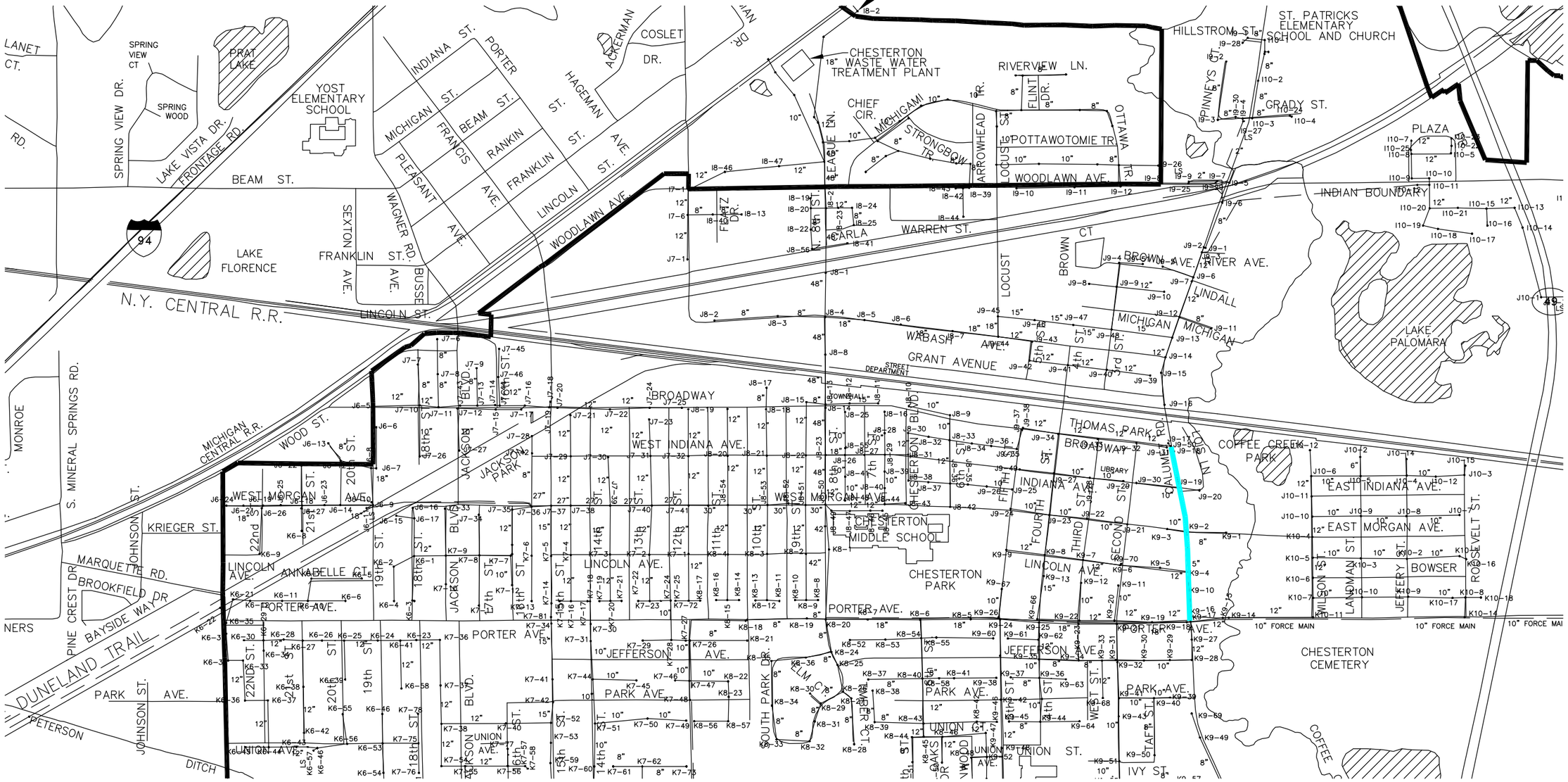
**Note: Cost/Performance Considerations will be added once the Accountant completes their analysis.**

5.7 Implementation Schedule for CSO Controls

**Note: Implementation Schedule for CSO Controls will be added once the Accountant completes their analysis.**

5.8 CSO Operation Plan Revisions

The CSO Operation Plan will be revised to include the recommendations of the LTCP after it is approved and once each project is complete.

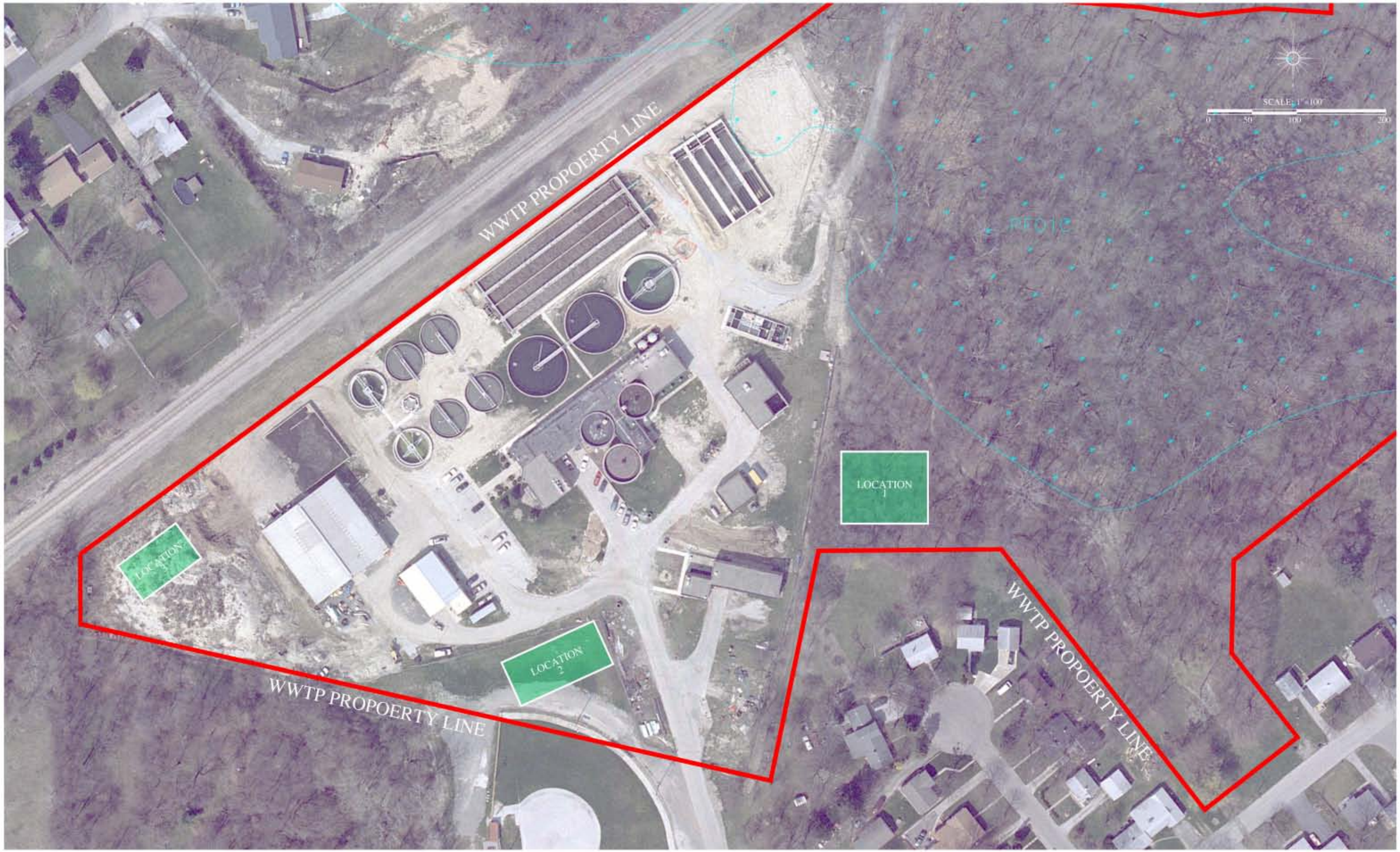



DLZ

TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

PROPOSED SEWER SEPARATION PROJECTS

FIGURE 5.1




DLZ

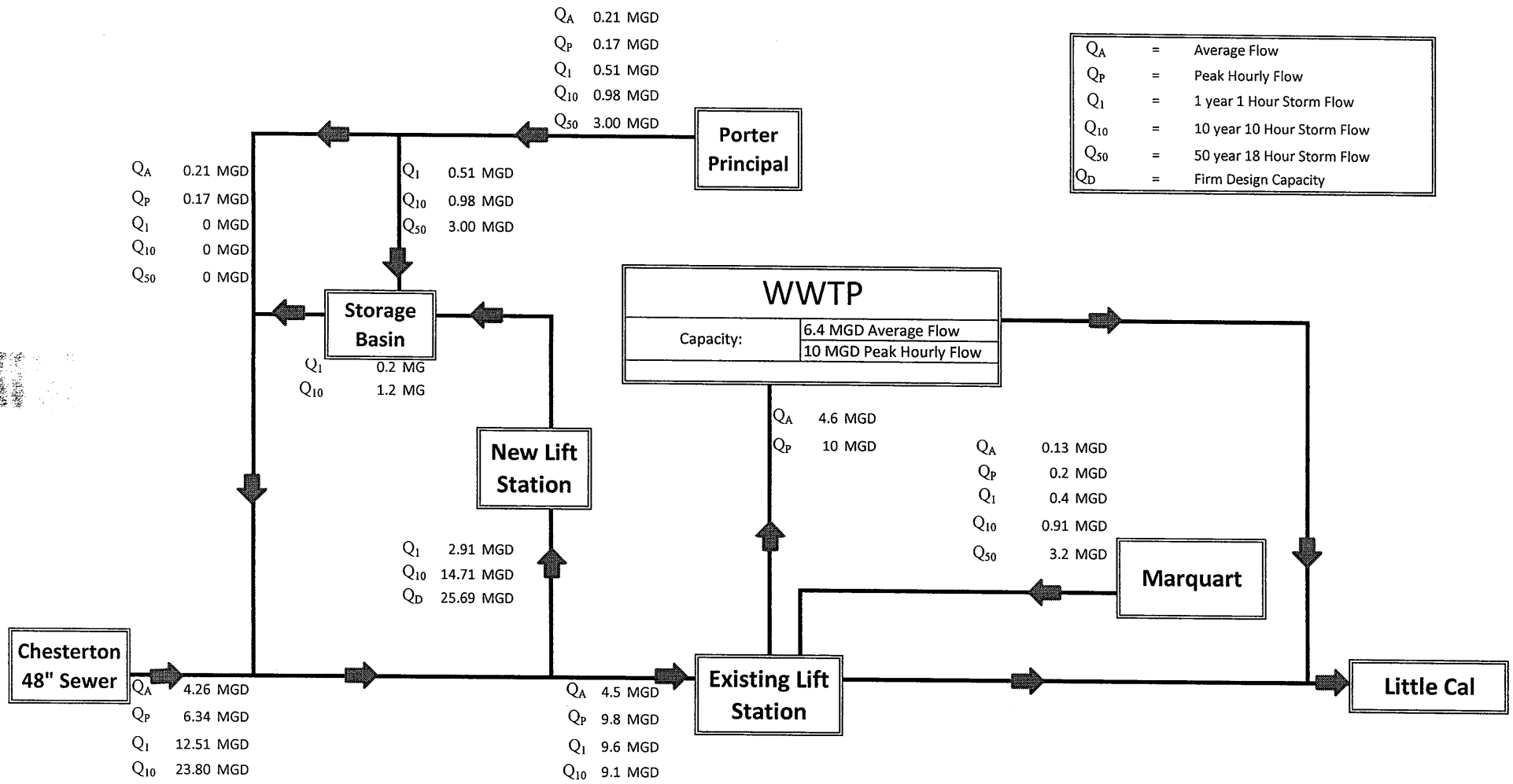
TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

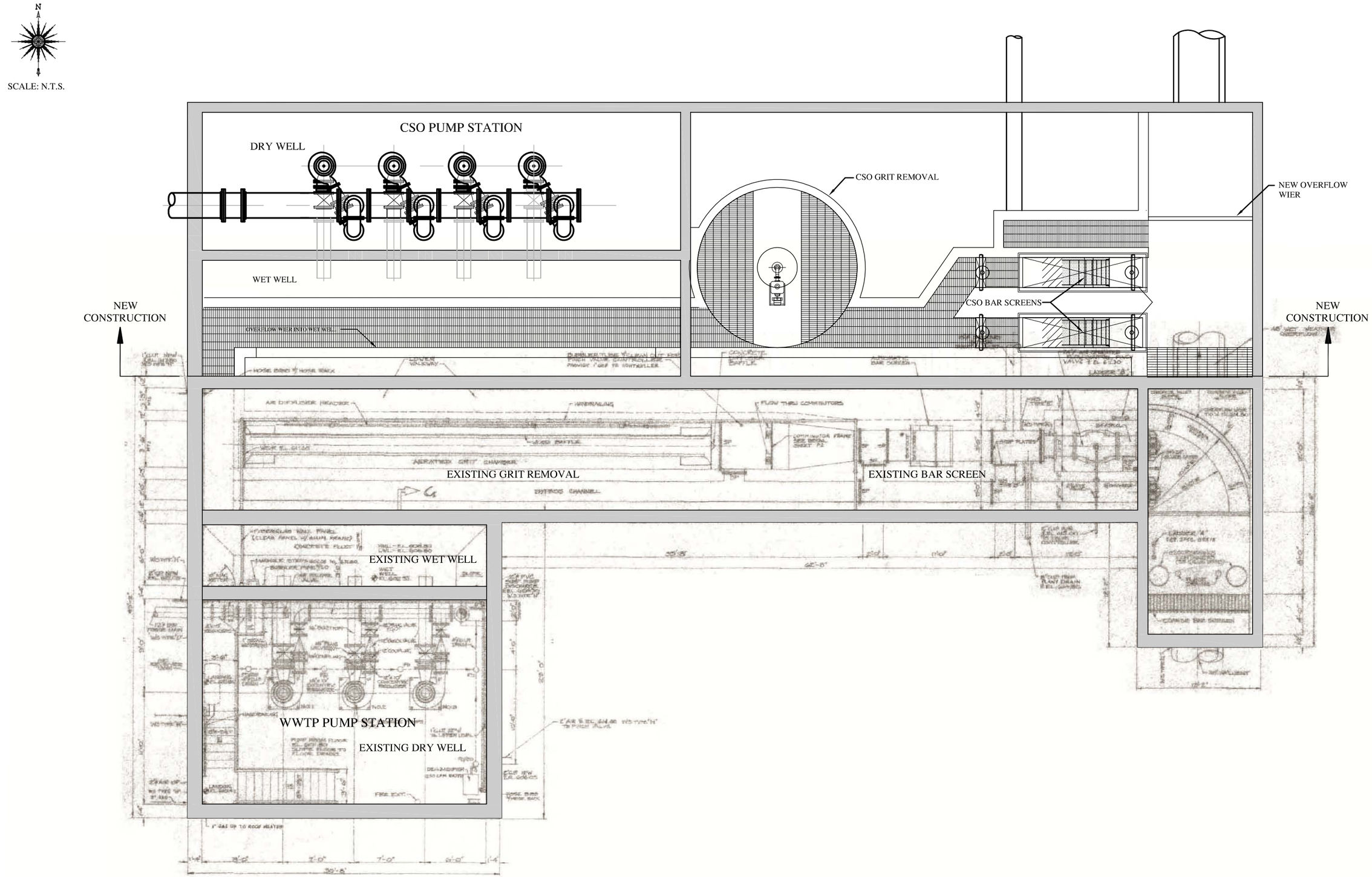
WASTE WATER TREATMENT PLANT PROPERTY TANK LOCATION ALTERNATIVES

FIGURE 5.2

Chesterton LTCP Flow Schematic March 10, 2011

Figure 5.3






DLZ

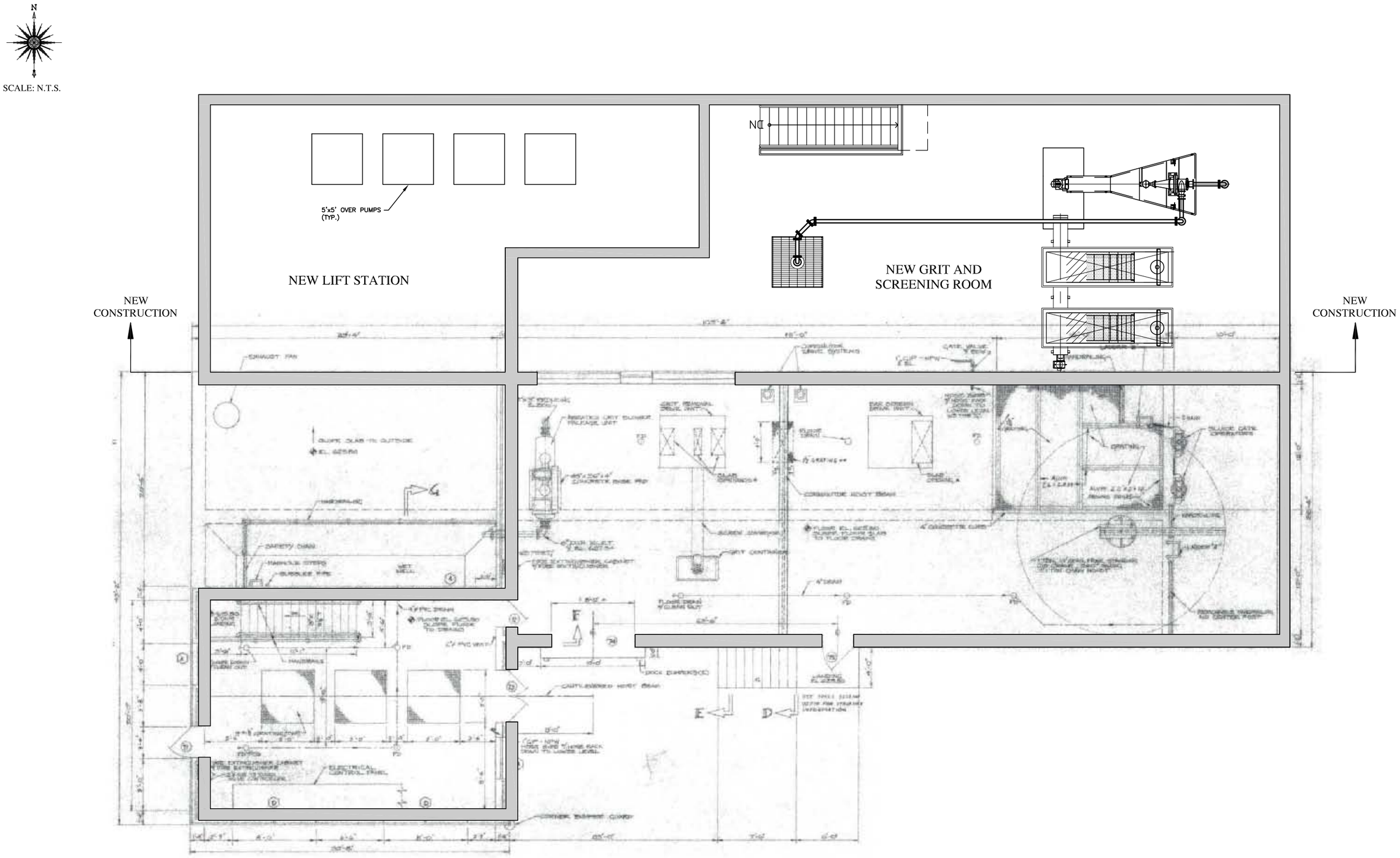
TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

LIFT STATION PLAN VIEW - ELEVATION 615.80

FIGURE

5.4

Date: Apr 14, 2011, 10:56am User ID: jjoy
File: M:\PROJ\10610\5964 Chesterton LTCP\LTCP\Chapter 5\Figure 5.4.dwg




DLZ

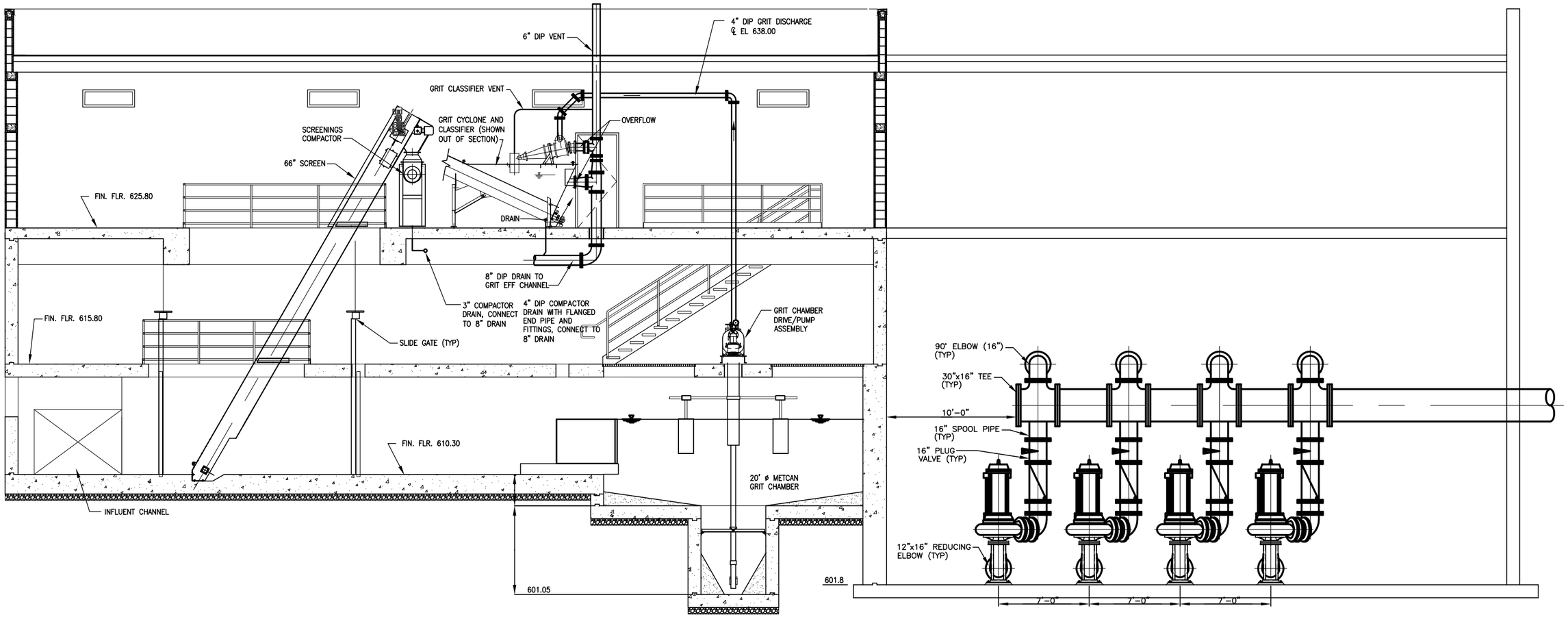
TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

LIFT STATION PLAN VIEW - ELEVATION 625.80

FIGURE

5.5

Date: Apr 14, 2011, 10:58am User ID: jjhy
File: M:\PROJ\1061\1664 Chesterton LTCP\LTCP\Chapter 5\Figure 5.5.dwg

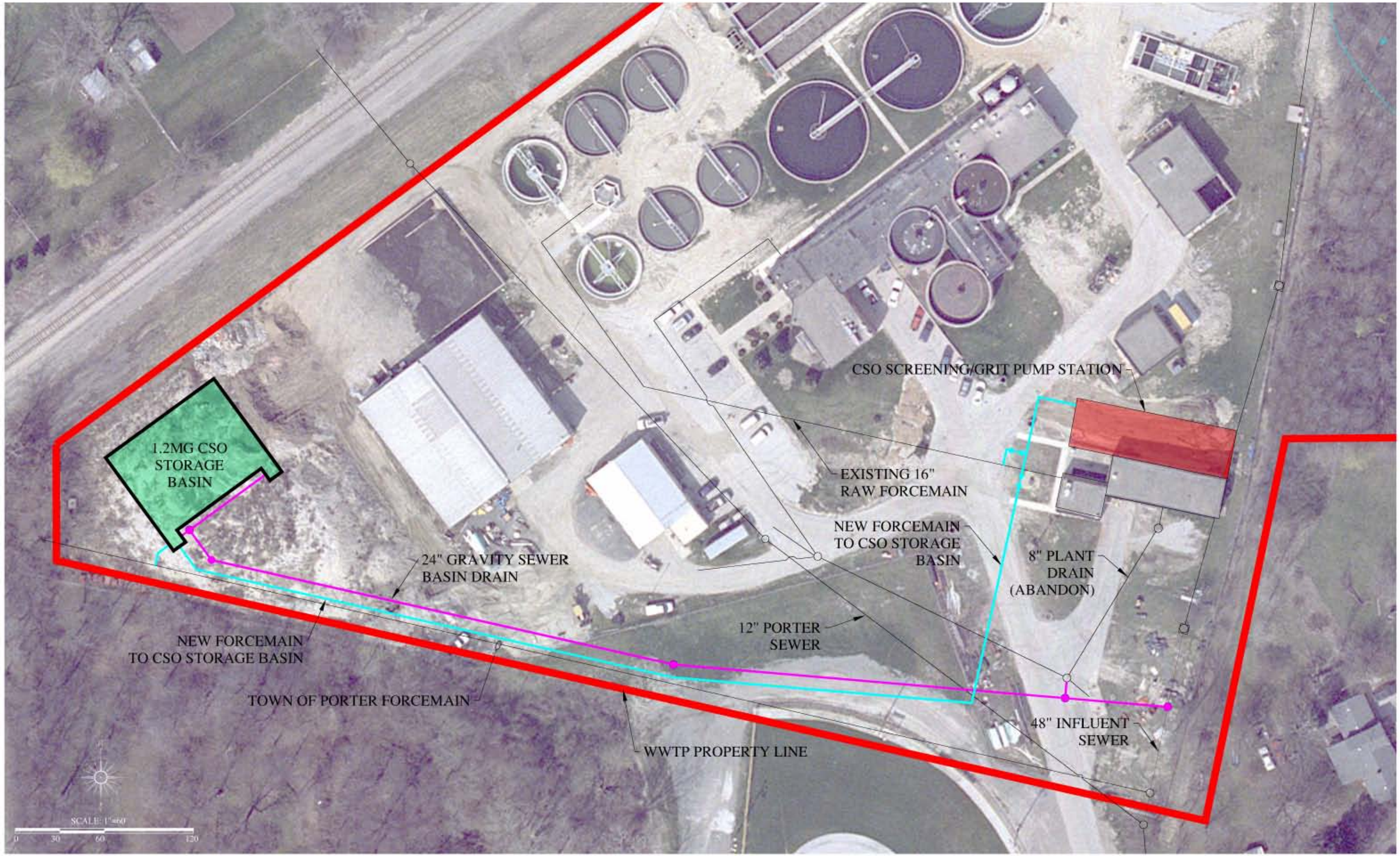



## SECTION

SCALE: 1/8" = 1'-0"

| | | |
|---|---|---|
| DLZ | TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN | FIGURE |
| | LIFT STATION PROFILE | 5.6 |

Date: Apr 14, 2011, 11:03am User ID: jjay
File: M:\PROJ\1061\1064 Chesterton LTCP\Chapter 5\Figure 5.6.dwg

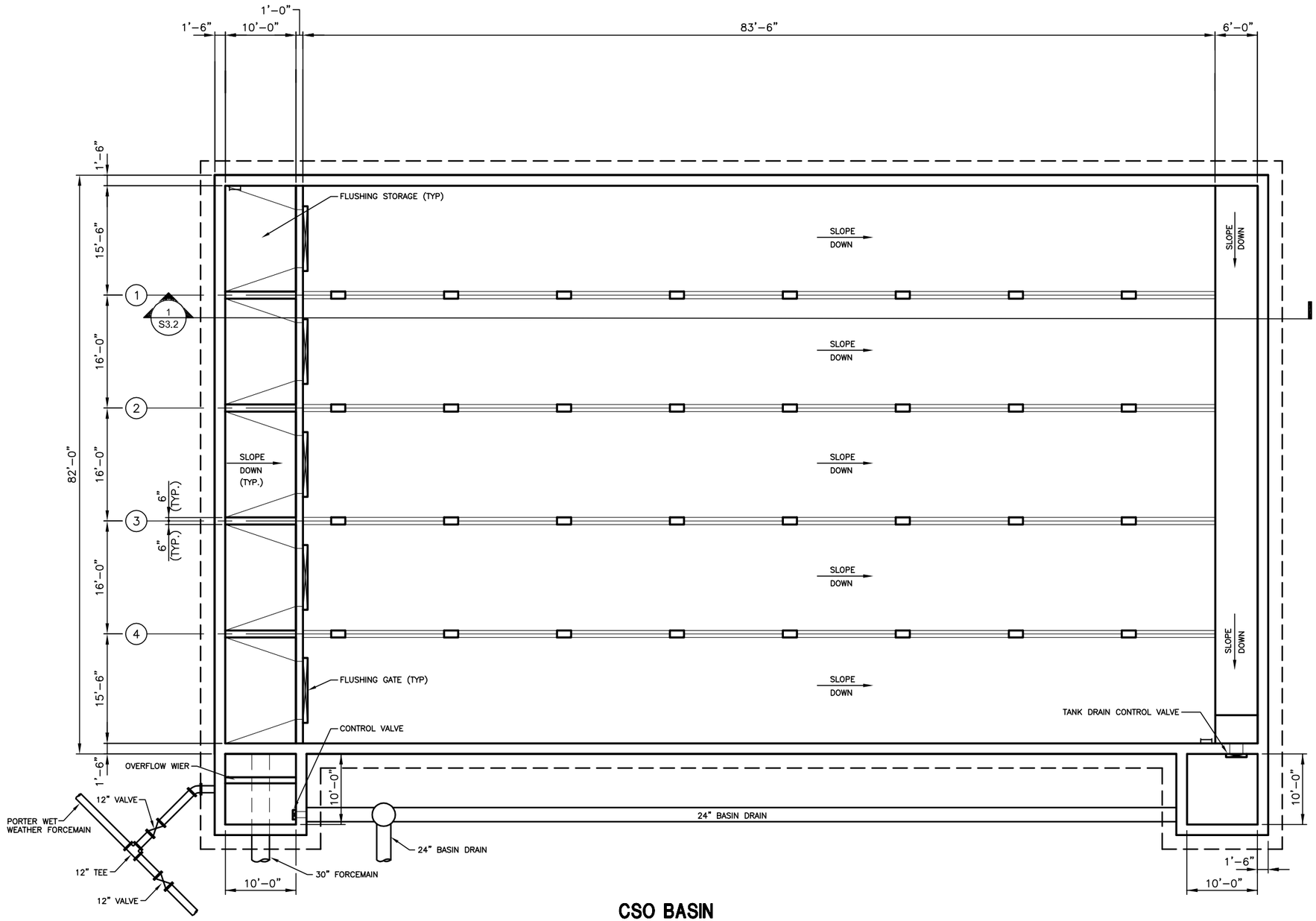



DLZ

TOWN OF CHESTERTON, INDIANA - WASTEWATER TREATMENT PLANT CSO LONG TERM CONTROL PLAN

ALTERNATIVE LOCATIONS FOR WET WEATHER TREATMENT AND/OR STORAGE - ALTERNATE 1

FIGURE
5.7




## CSO BASIN

SCALE: 1/16"=1'-0"

0 8' 16' 32'

Date: Apr 14, 2011, 11:11am User ID: JJBY
File: M:\PROJ\10611\5964 Chesterton LTCP\LTCP\Chapter 5\Figure 5.8.dwg

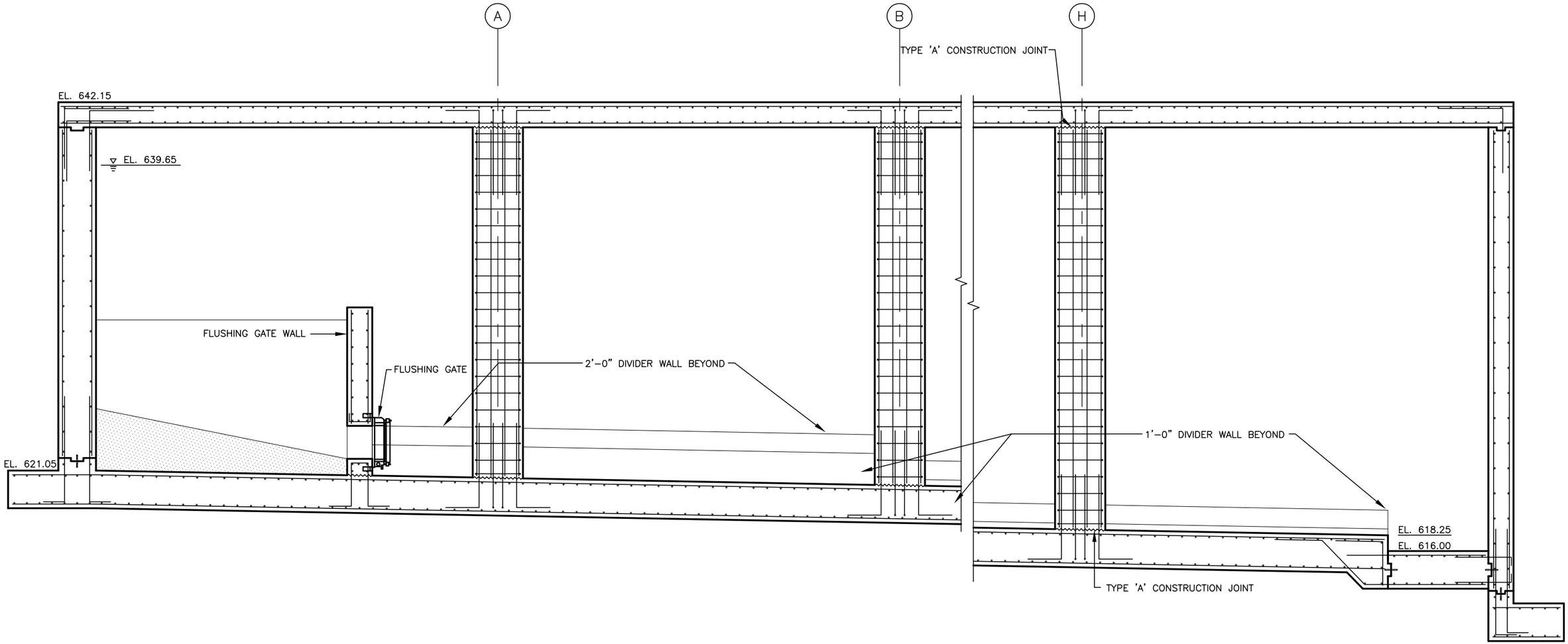
DLZ

TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

1.2 MILLION GALLON STORAGE BASIN

FIGURE

5.8




## CSO BASIN AND LIFT STATIONS SECTION

SCALE: 1/4"=1'-0"
0 2' 4' 8'

DLZ

TOWN OF CHESTERTON, INDIANA - COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN

1.2 MILLION GALLON STORAGE BASIN - ELEVATION

FIGURE
5.9

Date: Apr 14, 2011, 11:12am User ID: jjoy
File: M:\PROJ\1061\5964 Chesterton LTCP\Chapter 5\Figure 5.9.dwg

# Anticipated Project Costs for Chesterton, Indiana LTCP

## Headworks and Storage Tank

| | | | |
|---|---|---|---|
| **SUMMARY** | | | |
| DIV. 02 - EXISTING CONDITIONS | | | $0.00 |
| DIV. 03 - CONCRETE | | | $1,834,767.60 |
| DIV. 04 - MASONRY | | | $97,140.00 |
| DIV. 05 - METALS | | | $136,046.40 |
| DIV. 07 - THERMAL AND MOISTURE PROTECTION | | | $67,809.60 |
| DIV. 08 - OPENINGS | | | $63,060.00 |
| DIV. 09 - FINISHES | | | $46,980.00 |
| DIV. 10 - SPECIALTIES | | | $5,328.00 |
| DIV. 22 - PLUMBING | | | $43,266.00 |
| DIV. 23 - HEATING, VENTILATING, AND AIR CONDITIONING | | | $67,927.20 |
| DIV. 25 - INSTRUMENTATION & CONTROLS | | | $143,418.00 |
| DIV. 26 - ELECTRICAL | | | $541,200.00 |
| DIV. 31 - EARTHWORK | | | $1,198,740.00 |
| DIV. 32 - EXTERIOR IMPROVEMENTS | | | $236,550.00 |
| DIV. 33 - UTILITIES | | | $516,726.00 |
| DIV. 44 - POLLUTION CONTROL EQUIPMENT | | | $2,508,780.00 |
| Subtotal All Divisions | | | $7,507,738.80 |
| Construction Contingency | Add 20% | $ | 1,501,500.00 |
| **Total Construction (Year 2011):** | | **$** | **9,009,200.00** |
| Escalation to Construction Assume in **2015** (3 yrs @ 3%) | Add 9% | $ | 810,800.00 |
| Engineering Design | 10% | $ | 900,900.00 |
| Construction Inspection | 8% | $ | 720,700.00 |
| **Total Project Cost (Year 2015)** | | **$** | **11,441,600.00** |

# 6.0 PUBLIC PARTICIPATION

## 6.1 Advisory Committee

The Town of Chesterton has developed an advisory committee to serve as "liaisons among municipal officials, NPDES permitting agencies and the general public." The committee is made up of the following:

- Three Member Chesterton Utility Service Board
- Wastewater Treatment Plant Superintendent
- Utility Service Board Attorney

The overall goal of the committee is to help the decision-makers of the community select long-term controls which best achieve the environmental goals of the community in an economically responsible manner and to assist in the determination of sensitive areas.

## 6.2 Public Meetings

During the development of the LTCP, meetings were held for the education of the stock holders and to obtain feed back from the public, municipal and elected officials. The meetings included the following:

- Regularly scheduled 7:00 pm Utility Service Board Meeting, February 16, 2004.

- Regularly scheduled 7:00 pm Utility Service Board Meeting, March 15, 2004.

- Special 6:30 pm Utility Service Board Meeting, March 29, 2004.

- The LTCP was presented to the Utility Service Board during the April 19, 2004 meeting for approval and recommendation for submission to IDEM prior to the May 1, 2004 submission date.

- Regularly scheduled Utility Service Board Meeting, April 19, 2004.

- Regularly scheduled Utility Service Board Public Meeting – Discussed flow metering summary and conceptual alternatives review, February 20, 2007

- Regularly scheduled Utility Service Board Public Meeting – Discussed alternatives presentation, cost review and received public comment on 1.2 MGAL Storage Facility, March 19, 2007

- Regularly scheduled Utility Board Meeting – Discussed the State Judicial Agreement, September 17, 2007

- Regularly scheduled Utility Board Meeting – Discussed flow metering data, May 18, 2009

- Regularly scheduled Utility Service Board Meeting - DLZ presented the LTCP completion engineering proposal and received notice to proceed, August 16, 2010

- Regularly scheduled Utility Service Board Meeting - DLZ presented the LTCP completion schedule and Porter Flow monitoring results and alternatives, December 20, 2010

- Regularly scheduled Utility Service Board Meeting - DLZ presented the LTCP Modeling results for the 1 year 1 hour storm and the 10 year 1 hour storm and the alternatives approach, January 17, 2011

- Regularly scheduled Utility Service Board Meeting - DLZ presented the LTCP alternative sizing and approach, February 22, 2011

- Regularly scheduled Utility Service Board Meeting - DLZ presented the LTCP alternatives and anticipated costs, March 21, 2011

- Regularly scheduled Utility Service Board Meeting - DLZ presented the LTCP alternatives and anticipated costs and scheduled the Public Hearing for the May 16th Meeting, April 18, 2011

- Regularly scheduled Utility Service Board Meeting - DLZ conducted a Public Hearing presenting the LTCP and recommended approval for submission to IDEM, May 16, 2011

Newspaper articles of the public meetings and attendance sign-in sheets are included in Appendix E.

## 6.3 Public Education Material

The Town of Chesterton has implemented a public education program regarding CSO issues and occurrences. The education program includes the following:

### 6.3.1 CSO Signs

The Town of Chesterton has erected signs at the CSO outfall and has offered to erect signs at public access points along the Little Calumet River.

Posted at Chesterton wastewater treatment plant outfall 001 is a sign with the following wording:

WARNING
This is a combined sewer overflow (CSO).
Heavy rainfall may cause sewage to enter the stream.
For more information call
Chesterton Utility (219) 926-1032.

Wording for signage at public access points and residents includes the following language:

> Caution – Sewage or Wastewater pollution. Sewage or Wastewater may be in this water during and for several days after periods of rainfall or snowmelt. People who swim in, wade in, or ingest this water may get sick. For more information, please call the Town of Chesterton Utility, (219) 926-1032.

Signage has been offered to property owners along the banks of the East Branch of the Little Calumet River downstream of the CSO outfall. **Appendix A** includes a list of property owners that were offered signage. **Appendix A** also includes a copy of the letter that was sent to the property owners offering the signage.

There is no water drinking water suppliers with surface water intakes located within 10 miles downstream of the CSO as discussed in Chapter 3.

Below is a list of bridges that intersect with the Little Calumet River and public access points that were also offered signage:

- Waverly Road
- Wagner Road
- North Mineral Springs Road
- North Babcock Road
- State Road 149
- Samuelson Road

- State Road 249
- Crisman Road
- US 12
- Interstate 94
- US 20
- Howe Road

Parks and other public access points:

- Indiana Dunes National Lakeshore – Bailly Homestead, Chellberg Farm
- Indiana Dunes National Lakeshore – Indiana Dunes Environmental Learning Center
- Lefty's Coho Landing, Inc.
- Marquette Yacht Club

6.3.2 Notification Letters

The Town of Chesterton issued a notification letter in January and March 2004 and issues the notice every subsequent year in the Spring. The notification included the following language:

- The Town of Chesterton's Public Notification of CSO's

# Notice

The Town of Chesterton maintains a sanitary sewage collection system that still includes sewers combined with stormwater. Chesterton Wastewater Treatment Plant has experienced approximately 6-10 Combined Sewage Overflows (CSO's) per year during heavy rains or excessive snow melting. During CSO events, water quality downstream of the plant may be impaired within the east branch of the Little Calumet River, the Burns Harbor waterways and Lake Michigan beach areas along the south end of the lake.

Adverse health impacts may occur to persons entering these waterways to wade or swim during and immediately following CSO's. Special precautions should be taken to prevent accidental or intentional ingestion of this water. Bacterial levels will usually return to normal within 24 to 48 hours, at which time, normal recreational activities may resume.

Persons interested in direct notification of CSO events by mail, and or e-mail may provide contact information through a written request submitted to:

**Chesterton Utility Superintendent**
**300 League Lane**
**Porter, IN 46304**
Mr. Robert Lovell
Utility Superintendent
Town of Chesterton Utility

The Town of Chesterton Utility will issue a Public Notice in the local Chesterton Tribune, Post Tribune, and The Times. The Town also issued the notice to local radio stations and area organizations. A complete list of those receiving the notice is included in **Appendix A**.