From:	Souraya Fathi
To:	Elizabeth Rorie
Subject:	FW: Town of Decatur - NPDES Engineering Report
Date:	Friday, August 22, 2014 12:58:55 PM
Attachments:	NPDES _Engineering _rpt_rev_1_2014_0822.pdf

Beth,

May you please take of this submittal. Thanks

From: Thomas, Paul [mailto:Paul.Thomas@stantec.com]
Sent: Friday, August 22, 2014 12:54 PM
To: Souraya Fathi
Cc: Bill James (mayorjames@decaturtn.net) (mayorjames@decaturtn.net); Jerry Harris; Sparkman, Jon
Subject: Town of Decatur - NPDES Engineering Report

Good afternoon Ms. Fathi. As discussed, I have attached the revised NPDES Engineering Report for the Town of Decatur. If you require a hard copy submittal in addition to this email, please let me know. Would you please respond to this email so that I can be sure that the resubmittal was received?

Please let me know if you have any questions or comments. Thanks and have a great weekend,

Paul Thomas, P.E.
Associate
Stantec
Phone: (423) 800-5350
Cell: (423) 322-2205
Fax: (423) 800-5351
Paul.Thomas@stantec.com

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Warehouse Row North
1110 Market Street, Suite 214A
Chattanooga TN 37402-2863
Phone: (423) 800-5350
Fax: (423) 800-5351

August 22, 2014 let_001_175618302_rev_1

Attention: Mr. Vojin Janjic
Manager Permit Section
Division of Water Pollution Control
Tennessee Department of Environment and Conservation
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243

Reference: Town of Decatur Sewer Treatment Plant (NPDES Permit No. TN0058521) Request for Expansion of Existing NPDES Discharge Capacity – Response to Comments

Dear Mr. Janjic,

The Town of Decatur desires to increase the capacity of their wastewater treatment plant. An application to increase the plant's discharge capacity was submitted to TDEC along with the supporting NPDES Engineering report dated May 7, 2014. The Town received the Notice of Incomplete Submittal from TDEC in a letter dated June 11, 2013.

On behalf of the Town of Decatur, Stantec is submitting the enclosed revised application and NPDES Engineering Report that addresses TDEC's comments. The items addressed are summarized below:

1. *Consideration of a non-discharging alternatives (e.g. land application, reuse) for the additional 0.34 MGD rather than the total 0.68 MGD proposed flow;*

   The alternatives for non-discharge alternatives have been revised to include "splitting" the flow. Regardless of flow scenario, the non-discharge alternatives continue to not be the preferred alternative. See Section 4.1.3 for the detailed description and analysis of the alternative.

2. *Additional treatment technologies capable of maintaining the current permitted loadings;*

   Two tertiary treatment technologies have been evaluated. Those technologies are the implementation of a lagoon system and implementation of a membrane system. Both technologies allow flexibility in treatment operations and can achieve a high quality effluent; however neither of the treatment technologies are practical for the Town. See Section 4.3.2 for a detailed description and analysis of the tertiary alternatives.

3. *The applicant's basis for determining the selected alternative will have minimum environmental impacts;*

   This statement was based on the relatively large receiving stream compared to the relatively small wastewater treatment plant discharge. The section has been revised to state that the expansion (selected) alternative is the best alternative for the Town to support potential growth. See Revised Section 5.3.3.

August 22, 2014

Mr. Vojin Janjic
Page 2 of 2

Reference: Town of Decatur Sewer Treatment Plant (NPDES Permit No. TN0058521) Request for Expansion of Existing NPDES Discharge Capacity – Response to Comments

4. *Engineering design calculations demonstrating the selected design will be capable of achieving secondary treatment standards, including 85% removal, at current levels of influent concentrations for BOD5 and TSS; and*

   Engineering calculations are included in Appendix E. The model includes improved aeration systems as well as more tank volume for the aerification and clarification to improve treatment capacity.

5. *Consideration of I/I removal as an alternative.*

   An evaluation of I/I is included as an alternative in Section 4.3.3. The Town is continuing to address I/I in there sewerage collection system. I/I reduction improvement is an ongoing process and the Town has an immediate need to expand their treatment capacity to position themselves for prospective industrial growth.

In your previous letter to the Town, the Division recognizes that growth for the Town of Decatur is expected to be approximately 300 individuals translating into an additional 30,000 gpd. A primary focus of this expansion is to be able to attract new industry. The Decatur/Meigs County community is uniquely positioned to attract new industry. The State of Tennessee has invested significant funds for the development of Enterprise South Industrial Park with improved roadways and connectivity to area roads. The Decatur/Meigs County industrial park is located just 35 miles north along State Route 58 from the Volkswagen facility. With the recent announcement of the expansion of that facility, additional suppliers will continue to relocate to the southeast Tennessee region. The community would like to have sufficient capacity at the wastewater plant to attract this new industry.

If you have any questions or need additional information, please let us know. The Town of Decatur appreciates your consideration in this matter.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Paul Thomas, PE
Paul.Thomas@stantec.com

Attachment: NPDES Engineering Report

c: Mayor Bill James, Town of Decatur

NPDES Engineering Report

Town of Decatur
Wastewater Treatment Plant
(TN0058521)

Prepared for:

Town Of Decatur

May 7, 2014

August 22, 2014 (Revision)

Stantec Consulting Services Inc.
Design with community in mind
www.stantec.com

Table of Contents

Section **Page No.**

List of Tables

List of Figures

List of Appendixes

NPDES Engineering Report

Town of Decatur
Wastewater Treatment Plant
(TN0058521)

1.0 Introduction

The Town of Decatur has owned and operated its sanitary sewer system since 1980. The system is comprised of a gravity collection system, pump stations, and a wastewater treatment plant. The treatment plant was originally designed to treat 0.17 million gallons per day (MGD) on an average day, with a peak hydraulic capacity of 0.34 MGD. The original facility consisted of an influent pumping station, an equalization basin, (2) aeration basins, (2) clarifiers, a chlorine contact chamber, and an effluent pumping station. The plant's effluent was pumped via force main to River Mile 514.8 of the Tennessee River. The plant utilized aerobic digestion to process solids and used sand drying beds to dewater sludge for disposal.

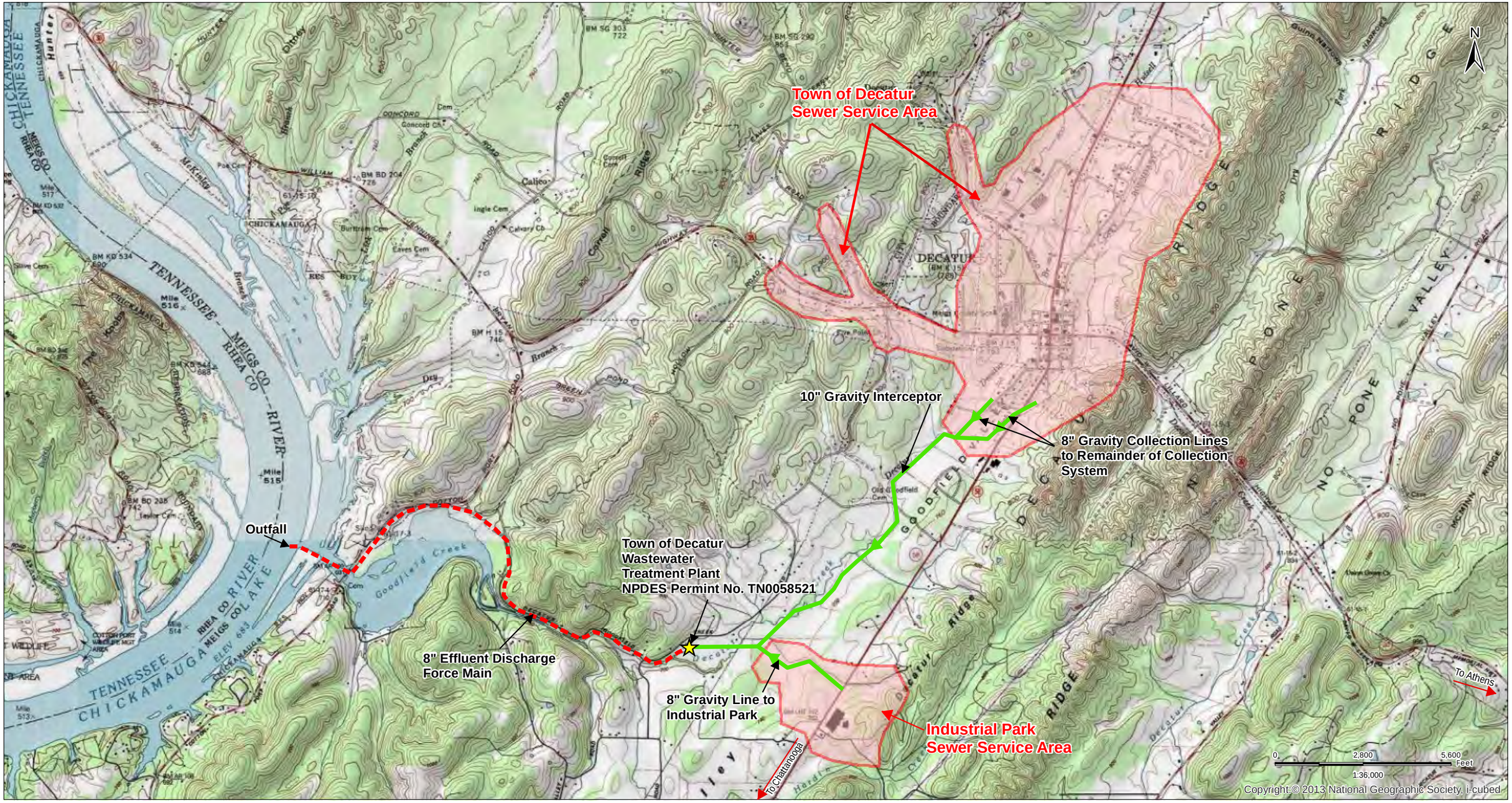
The plant was expanded in 1993 and the plant's design capacity was increased from 0.17 MGD to 0.34 MGD. The upgrade converted the existing equalization basin to an aerobic digester, added a third clarifier, added a new chlorine contact chamber, added a blower building, and expanded the sand drying bed system. As a result of this upgrade, the peak hydraulic capacity of the plant was increased to 0.90 MGD.

The Town currently desires to expand the plant to address the needs of existing residential, commercial, and industrial customers and to obtain some excess treatment capacity to facilitate growth. The proposed improvements will increase clarification and aeration at the existing plant.

2.0 Service Area and Flow Projections

The wastewater treatment plant is located along Decatur Creek south of the Town of Decatur. The sewer collection system primarily includes areas within the municipal boundary as well as the existing industrial park. See Figure 1. Future service areas of the Town would generally be limited by municipal boundary and potential industrial users.

The Center for Business and Economic Research (CBER) shows the 2010 population of Meigs County and Decatur, Tennessee to be 11,753 and 1,598, respectively. The CBER projects the populations of both the County and the Town of Decatur to be increasing over the next 20 year period. This area is considered to be the center of the commercial and retail shopping area for the County. If the current commercial/retail trend continues, this area could grow beyond that which was projected by the CBER.



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Revised: 2014-04-30 By: mgreene

April 2014
Project No.

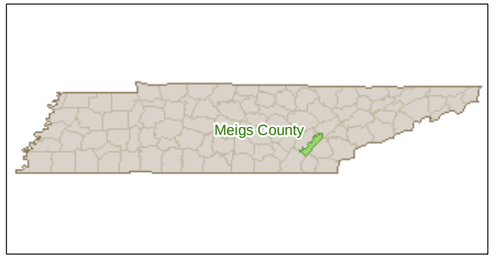
Stantec

Notes

1. Base features: 2013 National Geographic Society, i-cubed

Legend

- Wastewater Treatment Plant
- 8" Gravity Lines
- 10" Gravity Interceptor
- 8" Effluent Discharge Pipe
- Sewer Service Area



Client/Project

Client: Town of Decatur, Tennessee
Project: Proposed Wastewater Treatment Plant Expansion

Figure No.
1

Title
Service Area and Location Map

It is assumed that as the population of Decatur and the surrounding areas increase, so will the corresponding sewer service area. This growth will comprise of residential, commercial and industrial customers.

Table 1 shows the historical and projected population for Meigs County and the Town of Decatur.

Table 1. Population Trends

Year	Meigs County [1]	Compounded Annual Growth Rate	Decatur [2]	Compounded Annual Growth Rate
2010	11,753		1,598	
2015	12,151	0.67%	1,681	1.02%
2020	12,462	0.51%	1,734	0.62%
2025	12,682	0.35%	1,770	0.41%
2030	12,794	0.18%	1,790	0.22%
2035	12,770	-0.04	1,796	0.07%
2040	12,655	-0.18	1,797	0.01%

1. University of Tennessee, Center for Business Economic Research (CBER) Population Projections for Tennessee and Counties by Gender, Race, and Age Group, 2015 – 2064
2. University of Tennessee, Center for Business Economic Research (CBER) Population Projections for Tennessee Places (cber.bus.utk.edu/data/plcpj12.htm)

Average daily plant effluent flows for 2011, 2012, and 2013 were 0.32, 0.29, and 0.40 million gallons per day (MGD) respectively. While 2012 was a drier year by comparison, the recent range of average daily flows exhibits that the system flows are increasing.

It is assumed that as the population of Decatur and the surrounding areas increase, so will the corresponding sewer service area. The growth of the service area will support additional residential flows in addition to commercial and industrial flows. It is also assumed that the percentage of connected customers within the service area will continue to increase with time in the form of existing homes and new development. As shown in Table 1, the population for both the County and the Town of Decatur are expected to increase by more than 10% in the next 15 years. For the purpose of this study, we will assume that the average daily plant flows will increase by 30% in the next 15 years due to industrial growth. This growth percentage should account for new connections within the existing service area and the expansion of the service area itself. Using the average daily flow of 0.40 MGD from 2013, the projected daily flow is expected to increase to 0.52 MGD by 2030.

3.0 Antidegradation

Water Quality Criteria within the Rules of the Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control (1200-4-3) include standards to fully protect existing uses of all surface waters of the State. Applications for the issuance or renewal of an NPDES discharge into waters of the State require the provision of an Antidegradation Statement and Alternatives Analysis indicating that no feasible or practical alternative exists regarding the permitted discharge of pollutants. This document addresses that requirement.

The Antidegradation Statement provides a method for determining if a surface receiving water has the assimilative capacity to receive additional pollutant loadings while maintaining the established water quality criteria for the waterbody. An analysis of alternatives is required in the Statement that demonstrates that "reasonable alternatives to degradation are not feasible". The analysis of alternatives includes a discussion of feasibility, social and economic impacts, and the environmental consequences of each alternative. Appendix A contains the EPA Economic Guidance worksheets used to evaluate the alternatives economic impact to the project area.

In this report, alternatives are divided into Zero-Discharge (ZD), Flow Transfer (FT) and Other alternatives (O). Zero-discharge alternatives do not discharge pollutants to surface waters of the state. "Flow transfer" alternatives transport wastewater to existing permitted wastewater treatment facilities. "Other" alternatives include alternatives that discharge water to the surface waters.

The description and comparison of alternatives is focused on providing additional capacity for the Town of Decatur and adjacent or nearby unincorporated areas of the existing sewer collection system. This additional capacity is needed to provide additional capacity to the Town's existing and future residential, commercial and industrial users.

4.0 Description of Alternatives

A number of alternatives were considered prior to the selection of the proposed improvements project. Among these were various zero discharge options including spray irrigation and drip irrigation of treated effluent, connecting to a neighboring WWTP, and expanding the existing plant. Each of these alternatives is further described as follows.

4.1 Zero Discharge Alternatives

The term zero discharge is used to define a process that does not discharge treated effluent directly to a surface body of water. In this case, the two zero discharge alternatives that will be considered are spray irrigation of treated effluent and drip irrigation.

4.1.1 Spray Irrigation (ZD-1)

Some land application systems use spray irrigation to distribute treated effluent over vegetated areas. The effluent requires pretreatment consisting of BOD removal and disinfection prior to spraying. Effluent requirements for large scale spray irrigations systems are typically 50 to 70 mg/l for BOD5 and TSS and 300 MPN/100 ml or less for fecal coliform. These pretreatment reductions are typically performed using aeration equipment and chlorine disinfection.

Spray irrigation of treated effluent is typically applied at a rate of 1 to 2 inches per week. A minimum area of 250 acres is required for each 1.0 MGD of flow. Additional land area for equalization of peak flows and setback from development must also be provided. A 0.68 MGD facility would require approximately 200 acres of irrigation fields, equalization basins, pretreatment equipment and setback requirements. The performance of the spray irrigation system is dependent upon the percolation of the native soils and the nitrogen uptake ability of the vegetation and soils. Percolate from the system is tested to monitor performance of the system.

Pretreatment and effluent distribution costs are assumed to be approximately 60% of traditional wastewater treatment costs, or approximately $3.00 per gallon, assuming the cost of a traditional WWTP plant is approximately $5.00 per gallon of discharge capacity. Land costs are highly variable depending on land use alternatives and zoning but it is assumed that $5,000 per acre would be an acceptable amount for this study. The preliminary opinion of capital cost for the land required to support a 0.68 MGD spray irrigation facility would therefore be $3,040,000.

4.1.2 Drip Irrigation (ZD-2)

A second type of land application uses drip irrigation. Drip irrigation also requires pretreatment and partial disinfection as described previously for spray irrigation. In drip irrigation, the effluent is distributed to drip fields. The buried piping slowly discharges effluent through a perforated piping system which is then infiltrated into the soil. This technology is typically not utilized for municipal applications.

Pretreatment and effluent distribution costs are assumed to be slightly less than the spray irrigation costs mentioned previously. For this study, it is assumed that drip irrigation costs are approximately 40% of normal wastewater treatment costs, or approximately $2.00 per gallon. Land area required will similarly be assumed to be 200 acres, again at $5,000 per acre for this study. The preliminary opinion of capital cost for the land required to support a 0.68 MGD spray irrigation facility would therefore be $2,360,000.

4.1.3 Partial Land Application (ZD-3)

A third Zero Discharge option is to land apply only the "new" portion of the effluent as opposed to the entire amount of discharge being requested. This option would not increase the amount of effluent that was discharged to the receiving stream and therefore maintain the existing permitted loadings to the receiving stream.

For this alternative it is assumed that half (0.34 MGD) of the flow would be discharged traditionally and half (0.34 MGD) would be land applied. Based on the previous opinions of capital cost for both the spray irrigation and the drip irrigation, the capital cost of this alternative would be $1,520,000 and $1,180,000 respectively.

4.2 Flow Transfer Alternatives

Additional alternatives for the Town of Decatur to support additional sanitary sewer customers would be to connect the existing sanitary sewer collection system to a neighboring WWTP. The two nearest plants are Athens to the east and Dayton to the west. Both of these plants are approximately 15 miles from Decatur's plant.

4.2.1 Athens Utilities Board Wastewater Treatment Plant (FT-1)

The Athens Utilities Board (AUB) North Mouse Creek WWTP (NPDES Permit TN0067539) has a design capacity of 1.2 MGD and discharges treated effluent to North Mouse Creek. It is unknown if the North Mouse Creek plant could accommodate an additional 0.68 MGD from Decatur without an expansion to meet the needs of this new service area. Further, the North Mouse Creek receiving stream is a much smaller receiving stream than the Tennessee River and will likely have a lower assimilative capacity and require more stringent treatment. However, for the purpose of this analysis it is assumed that the North Mouse Creek plant can support the connection.

The route of the connection is unknown but it is assumed that it would track along existing roads utilizing right-of-way where possible. Therefore, it is assumed that 14.2 miles (75,000 feet) of a combination of force main and gravity lines would be required. It is assumed that a cost $100 per lineal foot of force main and gravity lines would be appropriate. It is also assumed that a pump station would be required every 5 miles (for a total of three pump stations) at approximately $500,000 per million gallons of pumping capacity, or $345,000 per pump station. Taking these assumptions into account provides a preliminary opinion of probable cost of approximately $8,535,000.

4.2.2 City of Dayton, Tennessee Wastewater Treatment Plant (FT-2)

The City of Dayton currently owns and operates a WWTP that is permitted to discharge 2.67 MGD to the Tennessee River. The City of Dayton has not included this (Town of Decatur's) service area and flows as part of the planning and permitting of Dayton's facility. As such, the Town of Dayton would likely have to pursue an expansion of their plant to accommodate this additional flow. Since Dayton also discharges to the Tennessee River, this expansion would have the same impact at Dayton's facility as an expansion of the Decatur facility plus the additional conveyance costs. For the purposes of this report, it is assumed that the City of Dayton's WWTP can support this additional flow.

The route distance from Decatur to Dayton is approximately 14.7 miles, or approximately 77,600 feet. Similar to the scenario described above, it is assumed that a combination of gravity lines, force mains and pump stations will be required to convey flow from Decatur's existing wastewater treatment plant to Dayton's wastewater treatment plant. Assuming a pump station is required at 5 mile intervals, a total of three pump stations would be required at an estimated cost of $345,000 each. A river crossing of the Tennessee River would be required. The crossing would either be by directional drilling or attachment to the State Route (SR) 30 bridge across the Tennessee River. The width of the Tennessee River at this portion is approximately 1,600 lineal feet. It is assumed that a crossing could be completed at $700 per foot, or $1,120,000. The total opinion of probable cost for this alternative is approximately $9,915,000.

4.3 Other Alternatives

4.3.1 Expansion of the Existing Facility (O-1)

Other alternatives available to the Town to appropriately treat and discharge sanitary sewer is to expand the plant. Decatur's existing WWTP has a permitted capacity of 0.34 MGD and could be expanded to approximately twice that capacity with the addition of aeration volume and clarification volume. The proposed expansion will allow the Town to efficiently treat more sewage as they continue to work towards reducing the increased I/I. This alternative continues to utilize the existing infrastructure to treat wastewater.

Traditional WWTP plant construction is approximately $5.00 per gallon of discharge capacity. It is assumed that this unit rate can also be used to estimate expansion of the existing wastewater treatment plant. The monthly effluent limits for BOD and TSS for this expansion are assumed to continue to be 30 mg/l. Further, these limits are consistent with current other similar sewer treatment plant discharges to the Tennessee River in the area, most notably the City of Dayton's Wastewater Treatment Plant (NPDES Permit TN0020478). An increase of approximately 0.34 MGD would therefore be approximately $1,750,000. A detailed opinion of probable cost was included in the Preliminary Engineering Report, prepared by Arcadis, which is included as Appendix B of this report. This report estimated the cost to be $1,785,000. Because that value is specific to this construction project, it will be used in further evaluations as part of this analysis.

4.3.2 Additional Treatment Technologies

Additional treatment technologies capable of maintaining the current permitted loadings with an increase in discharge capacity were also considered. Some of these tertiary alternatives included the addition of a maturation lagoon system and a membrane system.

The existing plant property is surrounded by farm land. The area, as previously mentioned, is expected to have shallow rock which would increase the cost required to construct a pond. It should also be noted that much of the property adjacent to the plant is in the flood plain which would again make permitting and construction difficult.

The installation of a membrane system would be expensive from a capital cost standpoint as well as from a maintenance perspective. It is expected that the installation of membranes would require the plant to increase staff and staff training to operate the more sophisticated plant.

Both of these tertiary alternatives were considered to not be reasonable alternatives for geological, geographical, operability, and economical reasons. For that reason, the addition of tertiary treatment will not be considered further.

4.3.3 Removal of Collection System Infiltration and Inflow

The primary purpose of this expansion is to provide a treatment plant capacity that is able to treat average influent flows and provide excess capacity that could be available for prospective industry. The average plant flows currently exceed the permitted flow capacity of 0.34 MGD by approximately 0.06 MGD.

Reducing I/I in the Town's system is beneficial. However, I/I reduction is an expensive and time consuming process with unpredictable and often less than satisfactory results. Additionally repairing faulty service laterals to the sewer collection system is even more problematic in that almost the entire service lateral is located on private property. Even if the Town was successful in eliminating half of their I/I, or 100,000 gallons per day average, then the Town would still not have additional capacity at the wastewater plant to market to potential industry.

The Town is continuing to locate and address I/I. The Town currently has a back log of video from previous inspection projects which they are reviewing and budgeting to address. The Town is actively employing various techniques to isolate sources and repair them as time allows.

Infiltration and Inflow is a major concern of the Town however it is not considered to be a reasonable alternative to meet the community's needs and therefore will not be evaluated further.

4.3.4 No Action Alternative (O-2)

The No Action Alternative is the continued operation of the existing wastewater treatment plant. The plant has a design capacity of 0.34 MGD. In recent years, the flow received at the plant has averaged 0.41 MGD. The Decatur/Meigs County community desires to attract additional industry to the area. Not having additional capacity at the plant is a burden to attracting new industry. The No Action Alternative does not address increasing the plant's capacity or to meet the community's needs.

5.0 Evaluation of Alternatives

5.1 Feasibility

The Antidegradation Statement of TDEC states that "reasonable alternatives shall be part of the application process and shall include a discussion of feasibility of all potential alternatives." Before an evaluation of the social and economic feasibility can be performed, the alternative must first be evaluated for technical feasibility.

Alternatives ZD-1, ZD-2, and ZD-3 are not considered to be technically feasible because the area adjacent to the plant is known to have relatively shallow rock and poorly draining soils. These characteristics do not support the possibility of spray irrigation or drip irrigation systems. The effluent would quickly saturate the thin soil layer reducing the ability for vegetation to facilitate in nutrient uptake. Further, The Town of Decatur is presently considering the addition of a new water plant to support their growing potable water needs. The existing water treatment plant utilizes wells and a spring as the raw water source prior to filtering and is located just north of Decatur. Expanding the existing plant would require improvements in the distribution system to transport the water from the north to the south. The Town desires a new water treatment plant located in the southern part of the distribution system utilizing wells or springs as the raw water source. The Town has recently contracted with Bradfield Environmental Services, Inc. to prepare a Hydro-Geologic Investigation (dated March 3, 2014) as an initial step to locating conducive sources of ground water. The report identified potential locations for test wells and ultimately a new water treatment facility. The Hydrogeologic Report identified the area at the confluence of Goodfield Creek and Decatur Creek to be the most ideal for a suitable future water source. This ideal area is in the immediate vicinity of the Town's wastewater plant.

For these reasons, the zero discharge alternatives are not technically feasible and will not be evaluated further.

Alternatives FT-1, FT-2, O-1, and O-2 are technically feasible and will therefore be evaluated further.

5.2 Socioeconomic Evaluation

The expansion of the wastewater treatment plant will benefit the residents of the Town of Decatur and Meigs County in that it will support residential, commercial and industrial growth. That growth will result in an increase tax base which will support infrastructure improvement in the form of roads, schools, and public recreation. Increase industrial growth can help provide employment opportunities to Meigs County residents. Meigs County unemployment rates tend to be higher than the Tennessee average. In January 2014, the state unemployment rate was 7.2%, Meigs County's unemployment rate was 9.3%.

As part of this project, the Town of Decatur has secured or will secure approximately $1,250,000 in combined funding from the Community Development Block Grant (CDBG) program ($300,000), Appalachian Regional Commission (ARC) program ($500,000). Rural development has stated that the Town may receive approximately $450,000 in grant with and an approximately $550,000 low interest loan.

The Town received the CDBG and ARC grants for improvements specifically at the wastewater plant. It is our understanding that these funds could not be used for other improvements (i.e. flow transfer to other wastewater treatment plants).

As of January 2014, the annual median household income (MHI) for the Meigs County area is $42,300 (source: Southeast Tennessee Development District). The MHI is used in the analysis to assess the financial impacts of the various alternatives to the community.

Environmental Protection Agency (EPA) Economic Guidance worksheets were used to determine socioeconomic effects of each alternative. These forms can be found in Appendix A. Note that Alternative O-2 will not be evaluated with EPA forms because there is no cost associated with that alternative.

5.2.1 Athens Utilities Board Wastewater Treatment Plant (FT-1)

Connecting to the Athens Utilities Board North Mouse Creek WWTP would require approximately $8,535,000 in infrastructure to convey the wastewater from Decatur to Athens. In this alternative, the Town of Decatur would enter into an agreement with the Athens Utilities Board for the treatment of the Town's wastewater. The Town's existing and future sewer customers would absorb the annual debt service.

Also under this scenario the Town would responsible for operations and maintenance of the conveyance system and would be required to pay the neighboring utility for treatment. This could be costly over time.

Worksheet B, included in Appendix A shows the "Calculation of Total Annualized Project Costs" shows that the annual debt service would be $8,535,000. The annual cost of wastewater per household is $910.40 which is 2.2% of the MHI. This indicates the alternative has a large economic impact.

5.2.2 City of Dayton Wastewater Treatment Plant (FT-2)

Connecting to the City of Dayton's WWTP would require approximately $9,915,000 in infrastructure to convey the wastewater from Decatur to Dayton. In this alternative, the Town of Decatur would enter into an agreement with the City of Dayton for the treatment of the Town's wastewater. The Town's existing and future sewer customers would absorb the annual debt service.

Worksheet B, included in Appendix A shows the "Calculation of Total Annualized Project Costs" shows that the annual debt service would be $9,915,000. The annual cost of wastewater per household is $999.28 which is 2.4% of the MHI. This indicates the alternative has a large economic impact.

5.2.3 Expansion of Existing Facility (O-1)

The opinion of probable cost for the expansion of the wastewater treatment plant is $1,750,000. The expansion of the plant would occur at the current plant site within the existing footprint. The expansion of the plant includes funding from CDBG, ARC, and Rural Development. These grants will total approximately $1,250,000 of the project cost. The expansion of the existing plant allows the Town to continue to utilize existing infrastructure that the Town has previously invested in. Other alternatives would abandon the plant and Town's previous investment. This would negatively affect the Town's financial statements.

The annual debt service for this alternative is $1,785,000 (See Worksheet B in Appendix A). The annual cost for wastewater treatment and disposal per household is $395.64 which is 0.9% of the MHI. This indicates this alternative has a low economic impact.

5.2.4 No Action (O-2)

Without an expansion of the existing facility, recruitment of new industry is curtailed. Further, residential and commercial developments will be limited. This alternative will result in a continued lag in local employment reduced future growth and is considered to be socio-economically unacceptable.

5.3 Environmental Consequences

5.3.1 Athens Utilities Board Wastewater Treatment Plant (FT-1)

The AUB North Mouse Creek WWTP discharges flow from the facility to North Mouse Creek in McMinn County. An expansion of their facility would ultimately be required to treat additional flow from Decatur. The creek is much smaller than the Tennessee River. Additional loadings would be more impactful to the smaller receiving stream of North Mouse Creek compared to the larger receiving stream of the Tennessee River. This is alternative is disadvantageous.

Other environmental considerations include the operation and maintenance of an extended conveyance system. These systems could potentially experience failures such as line breaks or blockages and power outages at the pump stations. These failures would result in untreated sewage entering the nearby waterways. This alternative could therefore further intermittently degrade water quality on smaller streams and conveyances located along the pipeline route.

5.3.2 City of Dayton Wastewater Treatment Plant (FT-2)

The City of Dayton does not have sufficient capacity to receive the additional flow from the Town of Decatur. An expansion of their facility would ultimately be required to treat the additional flow from Decatur. The City of Dayton currently discharges (Tennessee River Mile 504) into the Tennessee River only 11 miles downstream from the Town of Decatur's outfall (Tennessee River Mile 514.8). An increase in loadings would either occur at the City of Dayton's outfall or the Town of Decatur's outfall. From the perspective of additional loadings to the Tennessee River, there is not an environmental advantage or disadvantage to this alternative.

Other environmental considerations include the operation and maintenance of an extended conveyance system. These systems could potentially experience failures such as line breaks or blockages and power outages at the pump stations. These failures would result in untreated sewage entering the nearby waterways. This alternative could therefore further intermittently degrade water quality on smaller streams and conveyances located along the pipeline route.

5.3.3 Expansion of Existing Facility (O-1)

The best alternative for the Town of Decatur is to expand the plant. The plant will continue to use existing infrastructure. The expansion will include additional aeration and clarification to expand the facility and is expected to occur within the existing facilities' current footprint.

The Tennessee Department of Transportation (TDOT) is constructing the connector road from the Volkswagen facility to State Route 58. Once this connector road is complete, potential automotive suppliers desiring to locate in the region will have a direct connection to the facility. The recent announcement by Volkswagen to expand the production at their facility will provide the Decatur/Meigs County community even more opportunities to attract new industry.

5.3.4 No Action (O-2)

The existing wastewater treatment plant continues to experience and average daily flow of 0.40 MGD in a plant with a design capacity of 0.34 MGD. Much of the excess flow is excess I/I flowing into the collection system. Even with reduced I/I, the Town still has limited excess capacity to provide future residential, commercial and industrial customers. Without this excess capacity, growth in the area will be limited to residential customers that will rely on small on-site septic systems sewerage disposal. These disposal systems could potentially be problematic due to septic tank failures. Having a centralized wastewater treatment plant would result in less degradation of water quality.

5.4 Alternatives Evaluation Summary

Table 2 summarizes the alternatives available to the Town of Decatur. Comparisons of cost, technical feasibility, socio-economic acceptability and environmental impact of the alternatives are summarized. A scale of 1 to 5 is used to assess the degree of potential environmental consequences with 5 being the most severe consequences and 1 indicating little to no impact to local environmental conditions and/or water quality.

Alternatives ZD-1, ZD-2, and ZD-3 are not technically feasible due to poor local soil conditions and potentially severe environmental consequences.

The flow transfer alternatives FT-1 and FT-2 would be a burden to the receiving communities. Neither community has performed any prior planning to receive flow from Decatur. Receiving this flow would be a burden on their existing infrastructure. Further, both alternatives include a relatively long pipeline infrastructure whose failure would have negative environmental consequences.

The no-action alternative (O-2) is not socioeconomically acceptable to the community in that it does nothing to provide the additional capacity at the existing treatment plant to facilitate industrial growth which will improve the employment opportunities in the community.

Alternative O-1, Expansion of Existing Facility is technically feasible, socioeconomically acceptable, has the lowest environmental impact and lowest construction cost. Alternative O-1 is the preferred alternative.

Table 2. Summary of Alternatives

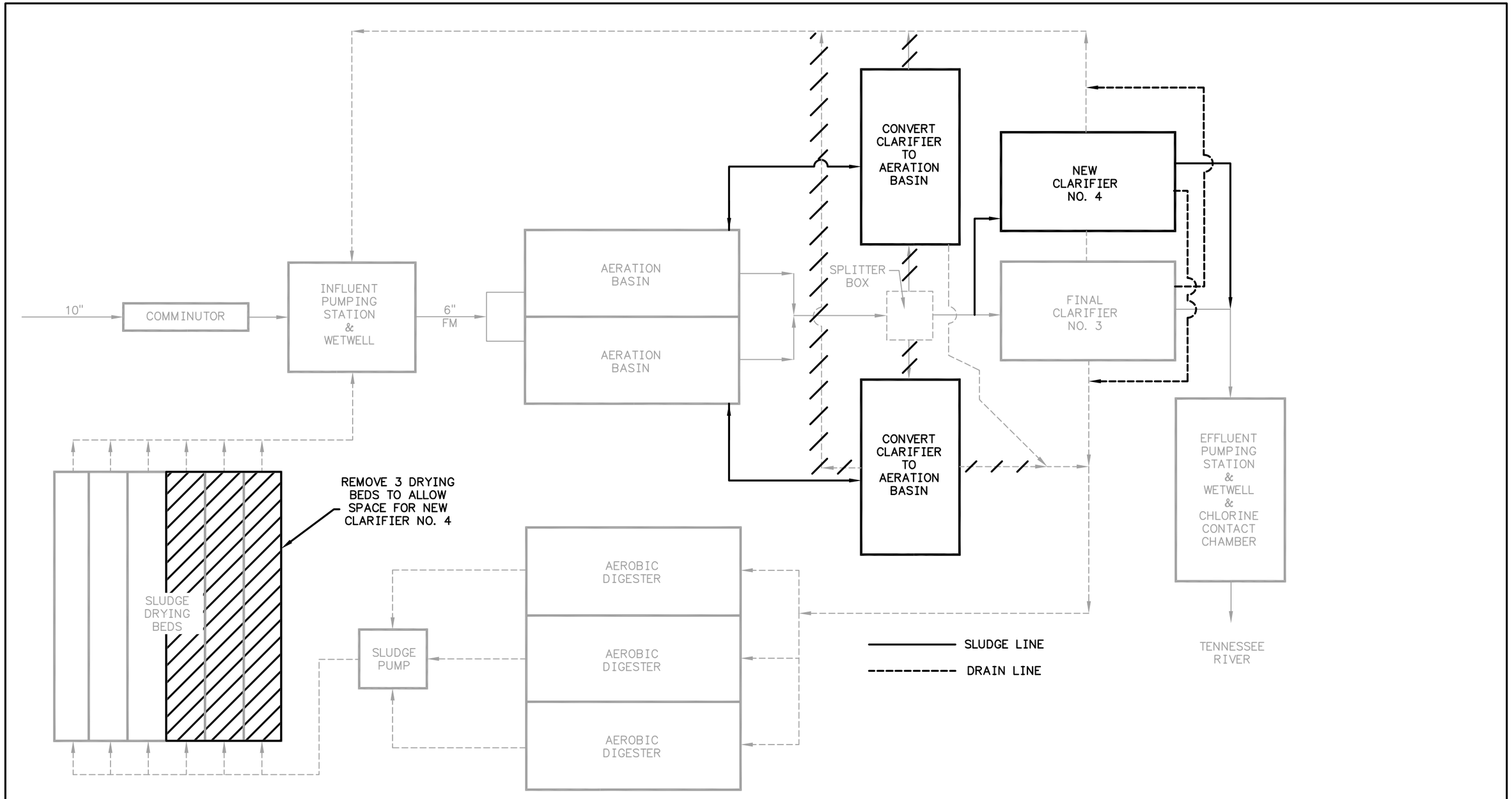
Alternative	Construction Cost	Technically Feasible?	Socially & Economically Acceptable?	Environmental Impact Rating (1 to 5)*
ZD-1, Spray Irrigation	$3,040,000	No	N/A	5
ZD-2, Drip Irrigation	$2,360,000	No	N/A	5
ZD-3, Partial Land Application	$1,520,000 /$1,180,000	No	N/A	5
FT-1, Connect to AUB's WWTP	$8,535,000	Yes	No	2
FT-2, Connect to Dayton's WWTP	$9,915,000	Yes	No	2
O-1,Plant Expansion	$1,785,000	Yes	Yes	1
O-2, No Action	N/A	N/A	No	3

* A rating of 1 indicates low or no environmental impact, 5 indicates high impact

6.0 Proposed Wastewater Treatment Facility

For a summary of the preliminary expansion approach, please refer to the Preliminary Engineering Report, prepared by ARCADIS, and dated February 2013, which is included in Appendix B. An Environmental Report of the preferred alternative was prepared by Stantec is included in Appendix C.

This project will increase the plant's ability to treat average daily flows, and will not change the plants existing peak hydraulic capacity. The plants peak hydraulic capacity will be improved as part of a future improvement project. A flow schematic which summarizes the primary improvements that will be completed as part of this project is included in Figure 2. A copy of NPDES permit application Form 2-A is included in Appendix D.



MAY 2014
175618302

Legend

Notes

Stantec

601 Grassmere Park Road, Suite 22
Nashville, Tennessee 37211
www.stantec.com

Client/Project
TENNESSEE VALLEY AUTHORITY
PROJECT

Drawing No.
FIGURE 2

Title
DECATUR WWTP
FLOW SCHEMATIC WITH
2014 IMPROVEMENTS

6.1 Proposed Timeline

The Town of Decatur has acquired funding in the form of grants from the Community Development Block Grant (CDBG), Appalachian Regional Commission (ARC) and Rural Development. The Town will also apply for a loan from Rural Development. Preliminary design for the expansion has begun and detailed design will begin upon approval of the permit expansion request that is being submitted in conjunction with this document.

It is assumed that a draft permit will be granted in August 2014. Detailed design will begin following receipt of the draft permit and is estimated to take approximately 90 days. Note that the revised Form 2A includes the required 3 samples for the array of effluent testing.

The construction plans and specifications will be submitted to the Tennessee Department of Environment and Conservation. It is assumed that the TDEC review will take approximately 6 weeks. Following the receipt of approved plans, the project will be publicly bid, which will take approximately two months. After awarding the project to the lowest responsive bidder, construction will follow and it is expected to last approximately 6 months. A simplified design verification spreadsheet is included in Appendix E.

Appendix A

Environmental Protection Agency Economic Guidance Worksheets A-D

Worksheet A
The Town of Decatur

Pollution Control Project Summary Information

Current Capacity of the Pollution Control System (MGD)	0.34 MGD
Design Capacity of the Pollution Control System (MGD)	0.68 MGD
Current Excess Capacity (%)	0%
Expected Excess Capacity after Completion of Project (%)	66%
Projected Groundbreaking Date	
Projected Date of Completion	3/15/2015

Please describe the pollution control project being proposed below

The proposed plant would double the Average Daily treatment capacity of the existing facility. The peak hydraulic capacity would not be changed as part of this project. A second (future) phase, primarily consisting of effluent / influent pumping improvements would be implemented to increase hydraulic capacity of 1.7 MGD, giving the plant a peaking factor of 2.5

Please describe the other pollution control options considered, explaining why each option was rejected.

Please refer to the NPDES Engineering Report for a detailed explanation of alternatives considered. The alternatives considered are briefly summarized below.

1) Spray and Drip Irrigation discharged alternatives were considered. Both were rejected because the soils in the area drain poorly and when coupled with a relatively shallow bedrock make land application systems likely to result in surface runoff.

2) Flow transfer to neighboring plants was also considered. This option was determined to be both uneconomical and socio-politically unacceptable.

Worksheet B
Alternative FT-1, Transfer to Athen's North Mouse Creek Plant
Calculation of Total Annualized Project Costs

A. Capital Costs

Capital Cost of Project	$8,535,000	
Other One-Time Costs of Project (please list, if any):		
	$0	
	$0	
	$0	
Total Capital Costs (sum column)	$8,535,000	(1)
Portion of Capital Costs to be Paid with Grant Monies	$0	(2)*
Capital Costs to be Financed [(1) - (2)]	$8,535,000	(3)
Type of Financing (e.g., G.O. bond, revenue bond, bank loan)	Bank Loan	
Interest Rate for Financing	3.25%	(i)
Time Period of Financing (in years)	38	(n)
Annualization Factor = $i/((1+i)^n - 1) + I$ (or see Appendix B)	0.046	(4)
Annualized Capital Cost [(3) × (4)]	$392,610	(5)

*At this time there are no grants available to support a flow transfer project.

B. Operating and Maintenance Costs
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement; list below).

Annual Operation and Maintenance (O&M) cost assumed	$50,000	
to be similar to existing WWTP O&M cost.	0	
	0	
	0	
	$0	
Total Annual O & M Costs (sum column)	$50,000	(6)

C. Total Annual Cost of Pollution Control Project

Total Annual Cost of Pollution Control Project [(5) + (6)]	$442,610	(7)

Worksheet C
Alternative FT-1, Flow Transfer to Athen's North Mouse Creek Plant
Calculation of Total Annual Pollution Control Costs per Household

A. Current Pollution Control Costs

Total Annual Cost of Existing Pollution Control	$207,682	(1)
Amount of Existing Costs Paid by Households	$145,377	(2)
Percent of Existing Costs Paid by Households	70%	(3)
Number of Households *	500	(4)
Annual Cost Per Household [(2)/(4)]	$290.75	(5)

* Do not use number of hook-ups.

B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

✓	a) Yes [fill in percent from (3)]	70%	(6a)
	b) No, they will pay	0%	(6b)
	c) No, they will pay based on flow		

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B]	$442,610	(7)
Proportion of Costs Paid by Households [(6a) or (6b)]	70%	(8)
Amount to be Paid by Households [(7) × (8)]	$309,827	(9)
Annual Cost per Household [(9)/(4)]	$619.65	(10)

C. Total Annual Pollution Control Cost per Household

Total Annual Cost of Pollution Control Project per Household [(5) + (10)]	$910.41	(11)

Worksheet D
Alternative FT-1, Transfer to Athen's North Mouse Creek Plant
Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income*}} \times 100$$

A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost per Household [Worksheet C, (11)]	$910.40 (1)
Median Household Income	$42,300.00 (2)
Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100)	2.2% (3)

B. Evaluation of the Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

Little Impact	**Mid-Range Impact**	**Large Impact**
Less than 1.0%	1.0%-2.0%	Greater than 2.0%
Indication of no substantial economic impacts	Proceed to Secondary Test	

Worksheet B
Alternative FT-2, Flow Transfer to Dayton's WWTP
Calculation of Total Annualized Project Costs

A. Capital Costs

Capital Cost of Project	$9,915,000	
Other One-Time Costs of Project (please list, if any):		
	$0	
	$0	
	$0	
Total Capital Costs (sum column)	$9,915,000	(1)
Portion of Capital Costs to be Paid with Grant Monies	$0	(2)
Capital Costs to be Financed [(1) - (2)]	$9,915,000	(3)
Type of Financing (e.g., G.O. bond, revenue bond, bank loan)	Bank Loan	
Interest Rate for Financing	3.25%	(i)
Time Period of Financing (in years)	38	(n)
Annualization Factor = $i/((1+i)^n - 1) + I$ (or see Appendix B)	0.046	(4)
Annualized Capital Cost [(3) × (4)]	$456,090	(5)

*At this time there are no grants available to support a flow transfer project.

B. Operating and Maintenance Costs
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement; list below).

Annual Operation and Maintenance (O&M) cost assumed	$50,000	
to be similar to existing WWTP O&M cost.	$0	
	$0	
	$0	
	$0	
Total Annual O & M Costs (sum column)	$50,000	(6)

C. Total Annual Cost of Pollution Control Project

Total Annual Cost of Pollution Control Project [(5) + (6)]	$506,090	(7)

Worksheet C
Alternative FT-2, Flow Transfer to Dayton's WWTP
Calculation of Total Annual Pollution Control Costs per Household

A. Current Pollution Control Costs

Total Annual Cost of Existing Pollution Control	$207,682	(1)
Amount of Existing Costs Paid by Households	$145,377	(2)
Percent of Existing Costs Paid by Households	70%	(3)
Number of Households *	500	(4)
Annual Cost Per Household [(2)/(4)]	$290.75	(5)

* Do not use number of hook-ups.

B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

a) Yes [fill in percent from (3)]	70%	(6a)
b) No, they will pay	0%	(6b)
c) No, they will pay based on flow		

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B]	$506,090	(7)
Proportion of Costs Paid by Households [(6a) or (6b)]	70%	(8)
Amount to be Paid by Households [(7) × (8)]	$354,263	(9)
Annual Cost per Household [(9)/(4)]	$708.53	(10)

C. Total Annual Pollution Control Cost per Household

Total Annual Cost of Pollution Control Project per Household [(5) + (10)]	$999.28	(11)

Worksheet D
Alternative FT-2, Flow Transfer to Dayton's WWTP
Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income*}} \times 100$$

A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost per Household [Worksheet C, (11)]	$999.28 (1)
Median Household Income	$42,300.00 (2)
Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100)	2.4% (3)

B. Evaluation of the Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

Little Impact	**Mid-Range Impact**	**Large Impact**
Less than 1.0%	1.0%-2.0%	Greater than 2.0%
Indication of no substantial economic impacts	Proceed to Secondary Test	

Worksheet B
Alternative O-1, Expansion of the Existing Facility
Calculation of Total Annualized Project Costs

A. Capital Costs

Capital Cost of Project	$1,785,000	
Other One-Time Costs of Project (please list, if any):		
	$0	
	$0	
	$0	
Total Capital Costs (sum column)	$1,785,000	(1)
Portion of Capital Costs to be Paid with Grant Monies	$1,243,250	(2)*
Capital Costs to be Financed [(1) - (2)]	$541,750	(3)
Type of Financing (e.g., G.O. bond, revenue bond, bank loan)	Bank Loan	
Interest Rate for Financing	3.25%	(i)
Time Period of Financing (in years)	38	(n)
Annualization Factor = $i/((1+i)^n - 1) + I$ (or see Appendix B)	0.046	(4)
Annualized Capital Cost [(3) × (4)]	$24,921	(5)

*$500,000 ARC Grant, $300,000 Rural Development Grant, 45% RD Grant, 55% RD loan.

B. Operating and Maintenance Costs
Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement; list below).

Annual Operation and Maintenance (O&M) cost of	$50,000	
existing plant.	$0	
	$0	
	$0	
	$0	
Total Annual O & M Costs (sum column)	$50,000	(6)

C. Total Annual Cost of Pollution Control Project

Total Annual Cost of Pollution Control Project [(5) + (6)]	$74,921	(7)

Worksheet C
Alternative O-1, Expansion of the Existing Facility
Calculation of Total Annual Pollution Control Costs per Household

A. Current Pollution Control Costs

Total Annual Cost of Existing Pollution Control	$207,682	(1)
Amount of Existing Costs Paid by Households	$145,377	(2)
Percent of Existing Costs Paid by Households	70%	(3)
Number of Households *	500	(4)
Annual Cost Per Household [(2)/(4)]	$290.75	(5)

* Do not use number of hook-ups.

B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

✓ a) Yes [fill in percent from (3)]	70%	(6a)
b) No, they will pay	0%	(6b)
c) No, they will pay based on flow		

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B]	$74,921	(7)
Proportion of Costs Paid by Households [(6a) or (6b)]	70%	(8)
Amount to be Paid by Households [(7) × (8)]	$52,444	(9)
Annual Cost per Household [(9)/(4)]	$104.89	(10)

C. Total Annual Pollution Control Cost per Household

Total Annual Cost of Pollution Control Project per Household [(5) + (10)]	$395.64	(11)

Worksheet D
Alternative O-1, Expansion of the Existing Facility
Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income*}} \times 100$$

A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost per Household [Worksheet C, (11)]	$395.64 (1)
Median Household Income	$42,300.00 (2)
Municipal Preliminary Screener (Calculate: [(1)/(2)] x 100)	0.9% (3)

B. Evaluation of the Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

Little Impact	**Mid-Range Impact**	**Large Impact**
Less than 1.0%	1.0%-2.0%	Greater than 2.0%
Indication of no substantial economic impacts	Proceed to Secondary Test	

Appendix B

Engineering Report,
Prepared by Arcadis

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Imagine the result

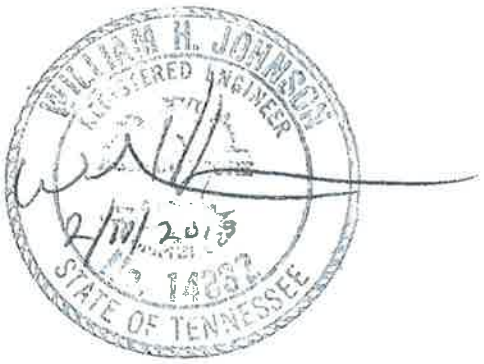
Town of Decatur, Tennessee

Preliminary Engineering Report

Wastewater Treatment Plant Upgrade

February 2013

ARCADIS



William H. Johnson, PE
Vice President

Preliminary Engineering Report

Wastewater Treatment Plant Upgrade

Prepared for:
Town of Decatur

Prepared by:
ARCADIS
1210 Premier Drive
Suite 200
Chattanooga
Tennessee 37421
Tel 423.756.7193
Fax 423.756.7197

Our Ref.:
66030330.0001. CDWMO

Date:
February 2013

ARCADIS

Table of Contents

ARCADIS

Preliminary Engineering Report

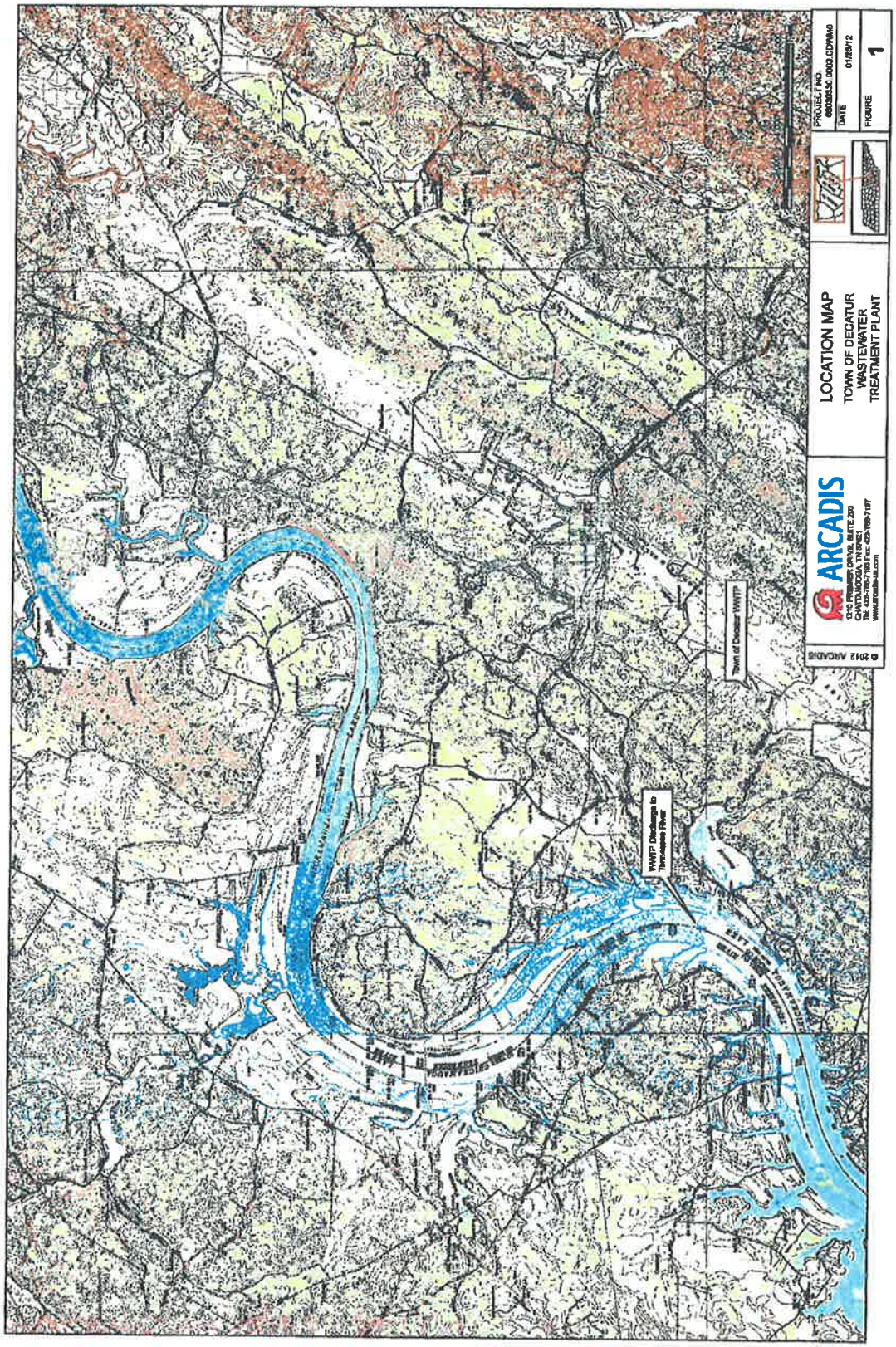
Wastewater Treatment Plant Upgrade

1. Background

The Town of Decatur is located in Meigs County, Tennessee, and was incorporated in 1905. Decatur is situated at the western base of No Pone Ridge, an elongated ridge with characteristics of the Appalachian Ridge-and-Valley Province and is centered near the junction of State Route (SR) 30, and SR-58. The population of Decatur as of the 2010 census was 1,598. A site location map is provided as Figure 1.

Currently, the Town of Decatur's wastewater treatment plant (WWTP) has a design capacity of 0.34 million gallons per day (MGD). The plant needs to be upgraded to an average 0.7 MGD facility. The purpose of this preliminary report is to present engineering and financial data relative to the upgrade of the existing wastewater treatment facility to an average 0.7 MGD facility.

The Town's wastewater treatment facility exceeded the permitted plant capacity for 227 of 730 days from 2011 through 2012. The collection system is experiencing high infiltration/inflow (I/I). At this time, the Town is addressing I/I issues in the Five Point and Meadowview sewer drainage areas. However, reducing I/I flows to the plant will not reduce base flows received. In order to become compliant with Tennessee Department of Environment and Conservation (TDEC) regulations, the facility must be upgraded to a higher capacity of 0.7 MGD.


LOCATION MAP
TOWN OF DECATUR
WASTEWATER
TREATMENT PLANT
ARCADIS
PROJECT NO
60035530.0003.CDWMO
DATE
01/25/12
FIGURE
1
WWTP Discharge to Tennessee River
Town of Decatur WWTP

2. Existing Sewer Infrastructure

The Town of Decatur currently has 542 residential sewer customers served by a system of gravity collection sewers and force mains. The Town currently has five pumping stations and 8-inch through 10-inch gravity collection lines and a 0.34-MGD wastewater treatment plant. The WWTP process train consists of an influent pump station, aeration, clarification and chlorine disinfection before effluent discharge is pumped to the Tennessee River (Mile 514.8). Activated sludge is aerobically digested, dried in drying beds on site, and then hauled to the landfill for disposal.

The wastewater treatment plant discharges to the Tennessee River just upstream of the confluence of Goodfield Creek (Tennessee River Mile 514.9±). This segment of the Tennessee River between Goodfield Creek and Watts Bar Dam has been designated as "High Quality Waters" by TDEC.

The Town of Decatur has been experiencing difficulties treating the amount of wastewater received at its plant. Figure 2 depicts the influent flow at the wastewater treatment plant as well as a 30-day moving average of the daily flow for 2009, 2010, 2011 and 2012. The 0.34-MGD flow that the WWTP is currently permitted to treat and discharge and rainfall data collected are also shown in Figure 2.

The green line on Figure 2 represents the permitted capacity of the WWTP. The blue line represents the average daily flow into the WWTP, which can be as much as four times greater than the permitted average daily flow. This is excessive flow into the plant over the permitted capacity.

The only time the wastewater treatment plant operated below permitted capacity was during summer months with higher temperatures and decreased rainfall when the system was not adversely impacted by I/I. The 30-day moving average, indicated by the red line on the graph, shows the influent into the plant exceeded the permitted capacity for 227 of 730 days in 2011 and 2012. The 75-percent of permitted flow is represented by the purple line in Figure 2. During the same period, the 30-day average flow was over 75 percent of the design capacity of the plant 70 percent of the time.

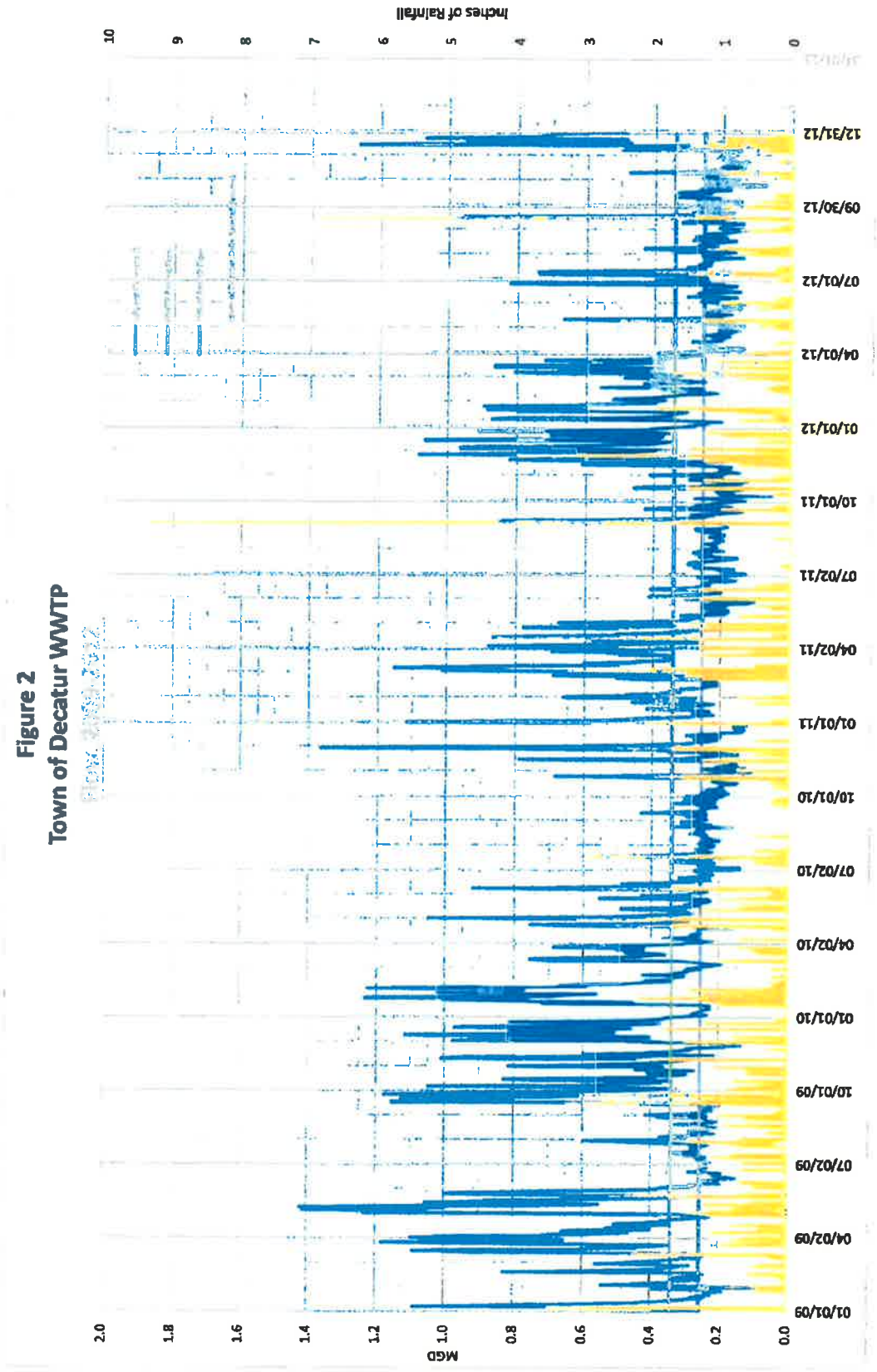


Figure 2
Town of Decatur WWTP

3. Proposed Improvements

The Town of Decatur is addressing I/I issues with their sewer system. At this time, the Town has an on-going program to reduce I/I specifically within the Five Point basin and Meadowview basin collection systems. However, even after I/I issues are addressed to adequately treat wastewater in accordance with the National Pollutant Discharge Elimination System (NPDES) permit, the wastewater treatment plant will still need to be expanded.

The construction of an upgrade at the wastewater treatment plant, which will allow treatment of an average daily flow of approximately 0.7 MGD, will help the Town meet its goals. ARCADIS recommends the Town upgrade their existing treatment facility to be able to treat an average daily flow of 0.7 MGD. The following items are required for this upgrade:

1. New influent pumps.

   The new pumps will be submersible type capable of pumping 2.5 times the average daily flow. The pumps will be non-clog pumps. Solids from the plant influent will be removed by the new bar screen.

2. New bar screen.

   The new bar screen will be an automatic, above ground, stainless steel package. It will have minimum 1/4 inch openings. The bar screen will replace the need for the existing grinder. Solids from the screen will be deposited at ground level into a bin for removal off site.

3. New aeration system.

   The new aeration system will be sized for the increased flow. It will include new blowers, air distribution system, diffusers and controls. It will deliver at a minimum 3,430 pound per day actual oxygen required (AOR).

4. Aeration basin modification.

   The existing aeration basins will be enlarged. The existing aeration basins will be enlarged by removal of the walls between the existing basins and the old clarifiers. Additional volume will also be added by increasing the wall height around the basins.

5. New secondary clarifier.

   A new clarifier will be needed for increased flow and to replace those now used for the modified aeration basins. The proposed new clarifier will be a circular type with concrete walls with a center feed and rim take-off. Approximate diameter of the clarifier will be 60 feet. The newest rectangular clarifier will remain in service.

6. New chlorine contact chamber.

   An additional new concrete chlorine contact chamber will be built to assure a minimum of 30-minute chlorine contact time at the new design flows.

7. Site piping.

   Addition site piping will be required to tie all of the new equipment into the process.

8. Miscellaneous metals.

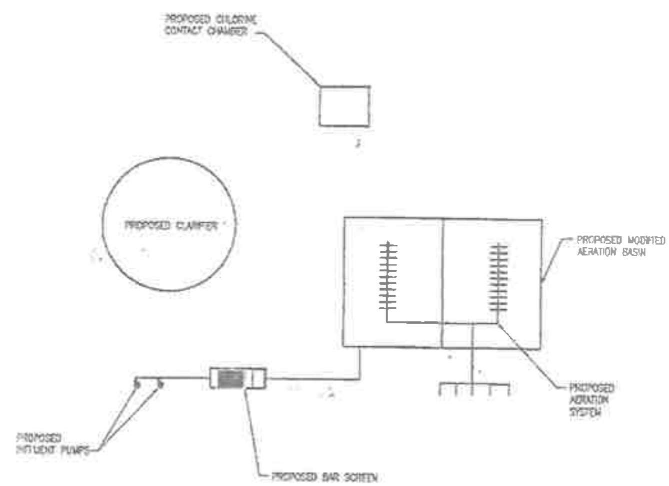
   Several items will be needed for the operation of the new basin such as a slitter box for the influent flow to the aeration basins, new guardrails, new basin effluent weirs, etc.

9. Electrical system upgrades.

   Addition power requirements will be needed for the new equipment. Also changes to the electrical system will be required for moving the existing on-site generators.

Figure 3 shows a general layout for the proposed upgrades to the existing facility.

Prior to initiating any plant upgrades, the Town needs to obtain a higher discharge flow limit from the State.



ARCADIS

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Chattanooga, TN 37421
Tel 423-756-7193 Fax 423-756-7197
www.arcadis-us.com

CITY OF DECATUR
WASTEWATER TREATMENT PLANT
MEIGS COUNTY, TENNESSEE

GENERAL LAYOUT
OF PROPOSED IMPROVEMENTS

PROJECT MANAGER	BILL JOHNSON
DEPARTMENT MANAGER	WAYNE CRUBBS
LEAD DESIGN PROF.	BILL JOHNSON
CHECKED BY	BILL JOHNSON
TASK/PHASE NUMBER	0001
DRAWN BY	JERRY CAMP
PROJECT NUMBER	66030330
DRAWING NUMBER	FIGURE 3

4. Project Financing

The Town of Decatur recognizes that the treatment capacity of the existing plant must be increased. The future capacity of the facility needs to be 0.7 MGD. Our opinion of total project cost for expansion is $1,785,000. Table 1 summarizes our opinion of probable project costs to complete this upgrade.

Table 1. Opinion of Probable Construction Costs – Town of Decatur Wastewater Treatment Plant Expansion

Item Description	Estimated Cost
1. Influent pumps	$40,000
2. Mechanical bar screen	250,000
3. Aeration system	325,000
4. Aeration basin modifications	75,000
5. 60-foot-diameter clarifier	337,000
6. Chlorine contact chamber	27,000
7. Site piping	150,000
8. Miscellaneous metals	22,000
9. Electrical and controls	98,000
Total Estimated Construction Costs	**$1,324,000**
Basic Engineering Design and Services During Construction	$109,000
Resident Project Representation (9 months)	$105,000
Surveying	$10,000
Permitting	$50,000
Legal and Administration	$25,000
Project Contingency (10%)	$162,000
Total Estimated Project Cost	**$1,785,000**

The estimated total project cost is $1,785,000. The Town of Decatur is planning to secure $300,000 from CDBG, $500,000 from ARC and the remaining balance of $985,000 will come from a Rural Development grant/loan and other funding If the Town of Decatur receives the CDBG funds to construct the proposed project, the rate structure or financial condition of the Town of Decatur would not be affected.

Appendix C

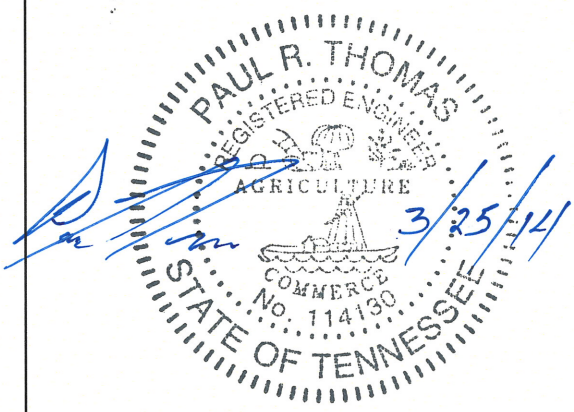
Environmental Report,
Prepared by Stantec

Stantec

Environmental Report

Wastewater Treatment Plant Improvements

Town of Decatur, Tennessee



Prepared for:
Town of Decatur
Decatur, Tennessee

March 25, 2014

Design with community in mind

Environmental Report
Wastewater Treatment Plant Improvements
Town of Decatur, Tennessee

Table of Contents

Section **Page No.**

Table of Contents
(Continued)

List of Appendices

Environmental Report
Wastewater Treatment Plant Improvements

Town of Decatur, Tennessee

1.0 Introduction

This Environmental Report is intended to summarize all applicable environmental reviews and evaluations related to the Decatur Wastewater Treatment Plant (WWTP) improvements project. This project is intended to serve the Town of Decatur, Tennessee. For project details and analysis, refer to the Preliminary Engineering Report (PER) prepared by Arcadis, February 2013. The PER describes the potential issues associated with the existing plant and reinforces the need for improvements.

The Town of Decatur currently has approximately 500 residential and commercial customers served by a system of gravity collection sewers and force mains. The Town currently has five pumping stations, 8-inch through 10-inch gravity collection lines and a 0.34-MGD (million gallons per day) capacity wastewater treatment plant. The proposed improvements in this expansion project will allow for treatment of an average daily flow of approximately 0.7 MGD.

1.1 Purpose and Need

The Town's wastewater treatment facility exceeded the permitted plant capacity for 227 of 730 days from 2011 through 2012. The collection system is experiencing high infiltration/inflow (I/I).The Town has addressed I/I issues in the Five Point and Meadowview sewer drainage areas. The Town is continuing to implement measures to reduce inflow and infiltration of water into their sewer system. However, even with these continued improvements, influent flows to their wastewater treatment plant will likely not be sufficiently reduced for the Town to consistently meet their permitted discharge limits set by TDEC. As such, the Town desires to expand their wastewater treatment plant to improve the treatment of the wastewater as well as allow for capacity to attract new industry.

2.0 Affected Environment/Environmental Consequences

2.1 Floodplains

2.1.1 Affected Environment

The proposed WWTP improvements are located at the existing WWTP. The project location was mapped using the Federal Emergency Management Agency, Flood

Insurance Rate Maps (FIRMs) and was found to be located outside of the floodway. FIRM panel 230 of 325, Map number 47121C0230F FEMA for delineation of the 100-year floodplain at the project site which is included in Appendix A.

2.1.2 Environmental Consequences

No environmental impacts are anticipated.

2.1.3 Mitigation

No mitigation measures are required.

2.2 Waters of the United States

2.2.1 Affected Environment

The U.S. Army Corps of Engineers (USACE) has regulatory responsibilities pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344). Under Section 10, the USACE regulates any work in, or affecting, navigable waters of the U.S. Under Section 404, the USACE regulates the discharge of dredged and/or fill material into waters of the U.S., including wetlands. Since the improvements are currently proposed within the existing facility footprint, the project would not involve work in waters of the US (streams and/or wetlands). Therefore, a Department of the Army (DA) permit would not be required. A copy of the clearance letter from the USACE is included in Appendix B.

2.2.2 Environmental Consequences

No environmental impacts are anticipated.

2.2.3 Mitigation

No mitigation measures are required.

2.3 Land Use/Important Farmland/Formally Classified Lands

2.3.1 Affected Environment

The project site will be constructed at the current WWTP and will therefore not affect any existing farm or classified lands.

2.3.2 Environmental Consequences

No environmental impacts are anticipated.

2.3.3 Mitigation

No mitigation measures are required.

2.4 Historic and Cultural Resources

2.4.1 Affected Environment

Investigations of the site have yielded no indications of the presence of historic or cultural resources. The Tennessee State Historic Preservation Office (SHPO) has reviewed the project and indicated that it has no objections to the Town proceeding with the project. A copy of the December 27, 2013 letter from Patrick McIntyre of the SHPO to Clay Copeland of Rural Development is included in Appendix C.

2.4.2 Environmental Consequences

No environmental impacts are anticipated.

2.4.3 Mitigation

No mitigation measures are required.

2.5 Biological Resources

2.5.1 Affected Environment

A review of the project site yielded no indications of the presence of any federally listed threatened or endangered species on this site or habitat suitable for such biological species in the project area. All construction will occur within the maintained WWTP property. A copy of the clearance letter from U.S. Fish and Wildlife Services is included in Appendix D.

2.5.2 Environmental Consequences

No environmental impacts are anticipated.

2.5.3 Mitigation

No mitigation measures are anticipated.

2.6 Socio-Economic / Environmental Justice Issues

2.6.1 Affected Environment

The project will positively affect all socio-economic levels within the Town of Decatur. The WWTP improvements will promote public health, economic development and environmental protection, which will benefit all citizens of the city. Further, during the construction period, it may generate temporary jobs available from the contractor and the general economic benefits that result from public works projects.

2.6.2 Environmental Consequences

No environmental impacts are anticipated.

2.6.3 Mitigation

No mitigation measures are anticipated.

2.7 Miscellaneous Issues

2.7.1 Air Quality

Because the construction of the WWTP upgrade involves trenching and excavation, the presence of construction-related dust is likely for this project. The contractor will be required to minimize dust by keeping paved roads clean and dirt or gravel roads watered down. Dusty conditions should be temporary and isolated only to the immediate vicinity of the excavation.

2.7.2 General Access and Mobility

Transportation and traffic along the project area may be minimally and sporadically affected by construction vehicle traffic. It is not anticipated that any roads will be either closed or even temporarily blocked, but if so, the contractor will be required to place warning signs and have flag personnel on either side of any obstruction in order to avoid accidents and minimize the disruption of general access and mobility.

2.7.3 Noise

Noise levels in the immediate vicinity of the WWTP Upgrade will likely increase during construction. However, any higher noise levels will be isolated to this area and should only be an inconvenience for short durations. The contractor must maintain equipment to meet all Occupational Safety and Health Administration (OSHA) regulations.

3.0 Summary of Mitigation

The improvements involved in this project must be performed to minimize adverse environmental effects using the following measures:

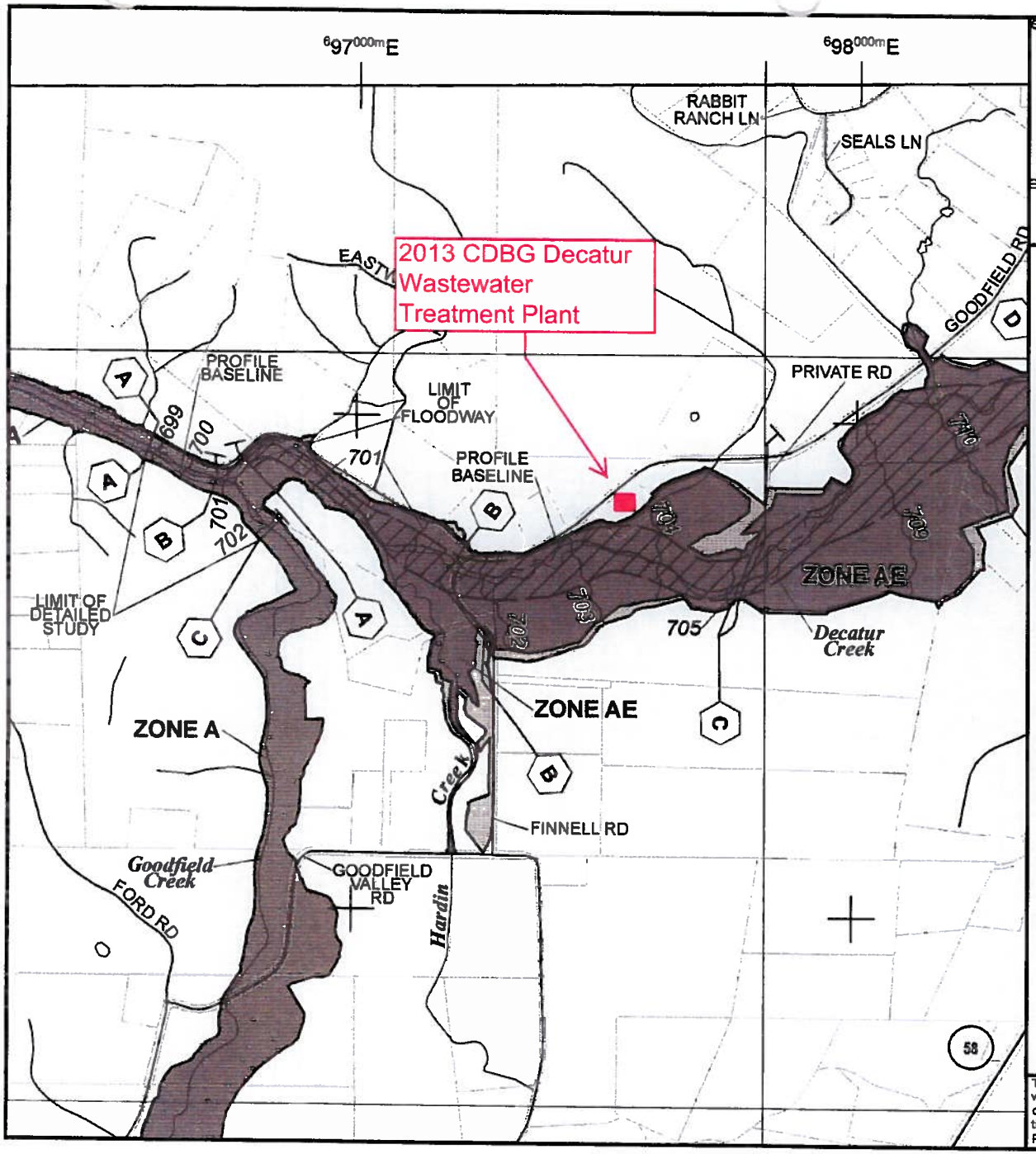
- All construction will be constructed above the 100-year flood level.
- All plans and specifications for the WWTP Upgrade, including required soil erosion and sedimentation control plans, will be submitted to TDEC for review and approval prior to construction.
- The contractor will be required to minimize dust by keeping paved roads clean and dirt or gravel roads watered down.

- The contractor will be required to place warning signs and have flag personnel on either side of any such obstruction in order to avoid accidents and minimize the disruption of general access and mobility.

The contractor must maintain equipment to meet all OSHA standards in order to minimize excessive noise at the site during construction.

Appendix A

Flood Insurance Rate Map



e Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

0 500 1,000 1,500 2,000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0230F

FIRM

FLOOD INSURANCE RATE MAP

MEIGS COUNTY, TENNESSEE

AND INCORPORATED AREAS

PANEL 230 OF 325

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MEIGS COUNTY	470133	0230	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
47121C0230F

EFFECTIVE DATE
SEPTEMBER 17, 2010

Federal Emergency Management Agency

This is an offi al copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix B

U.S. Army Corps of Engineers Clearance Letter

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
3701 BELL ROAD
NASHVILLE, TENNESSEE 37214

REPLY TO
ATTENTION OF:

December 3, 2013

Regulatory Branch

SUBJECT: Reference No. LRN-2013-01274; Proposed 2013 CDBG Wastewater Treatment Plant Expansion Project, new influent pumps, bar screen, aeration system, and many more various items, Town of Decatur, Tennessee

Mr. Richie Johnson
Regional Planner
Southeast Tennessee Development District
P.O. Box 4757
Chattanooga, Tennessee 37405-0757

Dear Mr. Johnson:

This is in regard to your recent request for information on the proposed 2013 CDBG Wastewater Treatment Plant Expansion Project, new influent pumps, bar screen, aeration system, and many more various items, Town of Decatur, Tennessee.

The U.S. Army Corps of Engineers (USACE) has regulatory responsibilities pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344). Under Section 10, the USACE regulates any work in, or affecting, navigable waters of the U.S. Under Section 404, the USACE regulates the discharge of dredged and/or fill material into waters of the U.S., including wetlands.

A review of the information provided indicates an activity that would not involve work in waters of the US (streams and/or wetlands). Therefore, a Department of the Army (DA) permit would not be required.

However, we understand the project proposal may not have specific design plans at this time, and this inquiry is an initial review to obtain grant funds. We appreciate your awareness of our regulatory program. If you have any questions regarding this matter, please contact me at the above address or telephone (615) 369-7500.

Sincerely,

Lisa Morris

Lisa Morris
Project Manager
Operations Division

Appendix C

Tennessee State Historic Preservation Office Review Letter (SHPO)

JAN - 3 2014

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON ROAD
NASHVILLE, TENNESSEE 37214
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

December 27, 2013

Mr. Clay Copeland
RD
Post Office Box 4941
Chattanooga, Tennessee, 37405

RE: RD, WWTP IMPROVEMENTS, DECATUR, MEIGS COUNTY

Dear Mr. Copeland:

In response to your request, received on Thursday, December 26, 2013, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

After considering the documents you submitted, we determine that THERE ARE NO NATIONAL REGISTER OF HISTORIC PLACES LISTED OR ELIGIBLE PROPERTIES AFFECTED BY THIS UNDERTAKING. We have made this determination either because: the undertaking will not alter any characteristics of an identified eligible or listed Historic Property that qualify the property for listing in the National Register, the undertaking will not alter an eligible Historic Property's location, setting or use, the specific location, scope and/or nature of the undertaking precluded affect to Historic Properties, the size and nature of the undertaking's area of potential effects precluded affect to Historic Properties, or, no National Register listed or eligible Historic Properties exist within the undertaking's area of potential effects. Therefore, we have no objections to your proceeding with your undertaking.

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. If you are applying for federal funds, license or permit, you should submit this letter as evidence of consultation under Section 106 to the appropriate federal agency, which, in turn, should contact us as required by 36 CFR 800. If you represent a federal agency, you should submit a formal determination of eligibility and effect to us for comment. You may find additional information concerning the Section 106 process and the Tennessee SHPO's documentation requirements at http://www.tennessee.gov/environment/hist/federal/sect106.shtm. You may direct questions or comments to Joe Garrison (615) 532-1550-103. This office appreciates your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jyg

Appendix D

U.S. Fish and Wildlife Service Clearance Letter

Chattanooga Area Regional Council of Governments
Southeast Tennessee Development District

SETDD

No significant impacts to wetlands are anticipated from this proposal. No federally listed endangered or threatened species, or habitat suitable for such species, are known to exist in the project area.

Mary E Jennings 12-5-13
Field Supervisor Date
U.S. Fish and Wildlife Service
Cookeville, TN 38501

November 14, 2013

Ms. Mary E. Jennings
U.S. Fish and Wildlife Service
446 Neal St.
Cookeville, TN 38501

RE: 2013 CDBG Wastewater Treatment Plant Expansion Project, Town of Decatur, Tennessee

Meigs
-84.8223
35.4925

Dear Ms. Jennings:

I am working on an environmental assessment for a project that will be using Community Development Block Grant (CDBG) funds and I need your agency's comments regarding the project's possible impact on endangered species, critical habitats and wetlands.

The Town of Decatur is requesting $300,000 in CDBG funds to assist with upgrades at their Wastewater Treatment Plant. Decatur has a program to reduce I&I issues within the Five Points basin and Meadowview basin collection systems. However, even after I&I issues are addressed to adequately treat wastewater in accordance with the National Pollutant Discharge Elimination System (NPDES) permit, the wastewater treatment plant will still need to be expanded. This project encompasses nine improvements, in order to expand the capacity of the wastewater treatment plant. These improvements include the installation of: new influent pumps, a new bar screen, a new aeration system, a aeration basin modification, a new secondary clarifier, a new chlorine contact chamber, site piping, the installation of various metal upgrades to plant equipment, and an electrical system upgrade. As a part of the project, the new submersible, anti-clog pumps will be capable of pumping 2.5 times the daily flow. The new aeration system will be sized for the increased flow, and the existing aeration basins will be enlarged.

Attached for your review are a U.S.G.S. topographic map of the general area and an aerial map.

If you need further information, please contact me at 423.424.4265 or rjohnson@sedev.org.

Thank you for your time,

Richie Johnson

Richie Johnson
Regional Planner, SETDD

P. O. Box 4757 • 1000 Riverfront Parkway • Chattanooga, TN 37405-0757
Phone (423) 266-5781 • Fax (423) 267-7705 • www.developmentdistrict.com

Appendix D

NPDES Permit
Application, Form 2A

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

FORM 2A NPDES

NPDES FORM 2A APPLICATION OVERVIEW

APPLICATION OVERVIEW

Form 2A has been developed in a modular format and consists of a "Basic Application Information" packet and a "Supplemental Application Information" packet. The Basic Application Information packet is divided into two parts. All applicants must complete Parts A and C. Applicants with a design flow greater than or equal to 0.1 mgd must also complete Part B. Some applicants must also complete the Supplemental Application Information packet. The following items explain which parts of Form 2A you must complete.

BASIC APPLICATION INFORMATION:

A. **Basic Application Information for all Applicants.** All applicants must complete questions A.1 through A.8. A treatment works that discharges effluent to surface waters of the United States must also answer questions A.9 through A.12.

B. **Additional Application Information for Applicants with a Design Flow ≥ 0.1 mgd.** All treatment works that have design flows greater than or equal to 0.1 million gallons per day must complete questions B.1 through B.6.

C. **Certification.** All applicants must complete Part C (Certification).

SUPPLEMENTAL APPLICATION INFORMATION:

D. **Expanded Effluent Testing Data.** A treatment works that discharges effluent to surface waters of the United States and meets one or more of the following criteria must complete Part D (Expanded Effluent Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to provide the information.

E. **Toxicity Testing Data.** A treatment works that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to submit results of toxicity testing.

F. **Industrial User Discharges and RCRA/CERCLA Wastes.** A treatment works that accepts process wastewater from any significant industrial users (SIUs) or receives RCRA or CERCLA wastes must complete Part F (Industrial User Discharges and RCRA/CERCLA Wastes). SIUs are defined as:

1. All industrial users subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations (CFR) 403.6 and 40 CFR Chapter I, Subchapter N (see instructions); and
2. Any other industrial user that:
   a. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions); or
   b. Contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the treatment plant; or
   c. Is designated as an SIU by the control authority.

G. **Combined Sewer Systems.** A treatment works that has a combined sewer system must complete Part G (Combined Sewer Systems).

ALL APPLICANTS MUST COMPLETE PART C (CERTIFICATION)

Form Approved 1/14/99
OMB Number 2040-0086

BASIC APPLICATION INFORMATION

PART A. BASIC APPLICATION INFORMATION FOR ALL APPLICANTS:

All treatment works must complete questions A.1 through A.8 of this Basic Application Information packet.

A.1. Facility Information.

Facility name: DECATUR WASTEWATER TREATMENT PLANT (TOWN OF DECATUR)

Mailing Address: PO BOX 188
DECATUR, TN 37322

Contact person: GOLDMAN SMITH, JR

Title: WWTP MANAGER

Telephone number: (423) 435-8612

Facility Address (not P.O. Box): GOODFIELD ROAD, DECATUR, TN 37322

A.2. Applicant Information. If the applicant is different from the above, provide the following:

Applicant name:

Mailing Address:

Contact person:

Title:

Telephone number:

Is the applicant the owner or operator (or both) of the treatment works?

✓ owner ✓ operator

Indicate whether correspondence regarding this permit should be directed to the facility or the applicant.

✓ facility _____ applicant

A.3. Existing Environmental Permits. Provide the permit number of any existing environmental permits that have been issued to the treatment works (include state-issued permits).

NPDES TN0058521 PSD

UIC Other

RCRA Other

A.4. Collection System Information. Provide information on municipalities and areas served by the facility. Provide the name and population of each entity and, if known, provide information on the type of collection system (combined vs. separate) and its ownership (municipal, private, etc.).

Name	Population Served	Type of Collection System	Ownership
TOWN OF DECATUR	500	GRAVITY AND FORCE	TOWN OF DECATUR
AND SURROUNDING		MAIN	
AREAS			

Total population served 500

A.5. Indian Country.

a. Is the treatment works located in Indian Country?

_____ Yes ✓ No

b. Does the treatment works discharge to a receiving water that is either in Indian Country or that is upstream from (and eventually flows through) Indian Country?

_____ Yes ✓ No

A.6. Flow. Indicate the design flow rate of the treatment plant (i.e., the wastewater flow rate that the plant was built to handle). Also provide the average daily flow rate and maximum daily flow rate for each of the last three years. Each year's data must be based on a 12-month time period with the 12th month of "this year" occurring no more than three months prior to this application submittal.

a. Design flow rate 0.34 mgd

	Two Years Ago	Last Year	This Year	
b. Annual average daily flow rate	0.33	0.37	0.40	mgd
c. Maximum daily flow rate	0.75	0.75	0.99	mgd

A.7. Collection System. Indicate the type(s) of collection system(s) used by the treatment plant. Check all that apply. Also estimate the percent contribution (by miles) of each.

✓	Separate sanitary sewer	100.00 %
_____	Combined storm and sanitary sewer	_____ %

A.8. Discharges and Other Disposal Methods.

a. Does the treatment works discharge effluent to waters of the U.S.? ✓ Yes _____ No

If yes, list how many of each of the following types of discharge points the treatment works uses:

i. Discharges of treated effluent 1

ii. Discharges of untreated or partially treated effluent 0

iii. Combined sewer overflow points 0

iv. Constructed emergency overflows (prior to the headworks) 0

v. Other N/A _____

b. Does the treatment works discharge effluent to basins, ponds, or other surface impoundments that do not have outlets for discharge to waters of the U.S.? _____ Yes ✓ No

If yes, provide the following for each surface impoundment:

Location: _____

Annual average daily volume discharged to surface impoundment(s) _____ mgd

Is discharge _____ continuous or _____ intermittent?

c. Does the treatment works land-apply treated wastewater? _____ Yes ✓ No

If yes, provide the following for each land application site:

Location: _____

Number of acres: _____

Annual average daily volume applied to site: _____ Mgd

Is land application _____ continuous or _____ intermittent?

d. Does the treatment works discharge or transport treated or untreated wastewater to another treatment works? _____ Yes ✓ No

If yes, describe the mean(s) by which the wastewater from the treatment works is discharged or transported to the other treatment works (e.g., tank truck, pipe).

_____

If transport is by a party other than the applicant, provide:

Transporter name: _____

Mailing Address: _____

_____

Contact person: _____

Title: _____

Telephone number: _____

For each treatment works that receives this discharge, provide the following:

Name: _____

Mailing Address: _____

_____

Contact person: _____

Title: _____

Telephone number: _____

If known, provide the NPDES permit number of the treatment works that receives this discharge. _____

Provide the average daily flow rate from the treatment works into the receiving facility. _____ mgd

e. Does the treatment works discharge or dispose of its wastewater in a manner not included in A.8.a through A.8.d above (e.g., underground percolation, well injection)? _____ Yes ✓ No

If yes, provide the following for each disposal method:

Description of method (including location and size of site(s) if applicable):

_____

Annual daily volume disposed of by this method: _____

Is disposal through this method _____ continuous or _____ intermittent?

WASTEWATER DISCHARGES:

If you answered "yes" to question A.8.a, complete questions A.9 through A.12 **once for each outfall** (including bypass points) through which effluent is discharged. Do not include information on combined sewer overflows in this section. **If you answered "no" to question A.8.a**, go to Part B, "Additional Application Information for Applicants with a Design Flow Greater than or Equal to 0.1 mgd."

A.9. Description of Outfall.

a. Outfall number 001

b. Location
DECATUR, TN (City or town, if applicable) — 37322 (Zip Code)
MEIGS (County) — TN (State)
35 30' 01" (Latitude) — 84 51' 36" (Longitude)

c. Distance from shore (if applicable) _____ ft.

d. Depth below surface (if applicable) 5.00 ft.

e. Average daily flow rate 0.41 mgd

f. Does this outfall have either an intermittent or a periodic discharge? _____ Yes ✓ No (go to A.9.g.)

If yes, provide the following information:

Number of times per year discharge occurs: _____

Average duration of each discharge: _____

Average flow per discharge: _____ mgd

Months in which discharge occurs: _____

g. Is outfall equipped with a diffuser? _____ Yes ✓ No

A.10. Description of Receiving Waters.

a. Name of receiving water TENNESSEE RIVER

b. Name of watershed (if known) MEIGS AND RHEA COUNTY

United States Soil Conservation Service 14-digit watershed code (if known): _____

c. Name of State Management/River Basin (if known): _____

United States Geological Survey 8-digit hydrologic cataloging unit code (if known): _____

d. Critical low flow of receiving stream (if applicable):
acute _____ cfs chronic _____ cfs

e. Total hardness of receiving stream at critical low flow (if applicable): _____ mg/l of $CaCO_3$

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

A.11. Description of Treatment.

a. What levels of treatment are provided? Check all that apply.

✓ Primary ✓ Secondary

____ Advanced ____ Other. Describe: ____

b. Indicate the following removal rates (as applicable):

Design BOD_5 removal or Design $CBOD_5$ removal	85.00 %
Design SS removal	85.00 %
Design P removal	____ %
Design N removal	____ %
Other ____	____ %

c. What type of disinfection is used for the effluent from this outfall? If disinfection varies by season, please describe.

____

If disinfection is by chlorination, is dechlorination used for this outfall? ____ Yes ✓ No

d. Does the treatment plant have post aeration? ____ Yes ✓ No

A.12. Effluent Testing Information. All Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than four and one-half years apart.

Outfall number: 001

June 1, 2011 - May 31, 2014
Summer: June 21 - September 21; Winter: December 21 - March 20

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	6.20	s.u.			
pH (Maximum)	7.70	s.u.			
Flow Rate	0.99	mgd	0.36	mgd	1,094.00
Temperature (Winter)	17.40	c	14.30	c	270.00
Temperature (Summer)	28.00	c	25.10	c	279.00

* For pH please report a minimum and a maximum daily value

POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML / MDL
		Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.								
BIOCHEMICAL OXYGEN	BOD-5	63.80	mg/L	10.59	mg/L	471.00	SMS210	5 mg/L
DEMAND (Report one)	CBOD-5							
FECAL COLIFORM		960.00	col/100mL	42.61	col/100mL	468.00	IDEX	count 100 mg/L
TOTAL SUSPENDED SOLIDS (TSS)		61.00	mg/L	10.90	mg/L	471.00	25400	1.0 mg/L

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

BASIC APPLICATION INFORMATION

PART B. ADDITIONAL APPLICATION INFORMATION FOR APPLICANTS WITH A DESIGN FLOW GREATER THAN OR EQUAL TO 0.1 MGD (100,000 gallons per day).

All applicants with a design flow rate ≥ 0.1 mgd must answer questions B.1 through B.6. All others go to Part C (Certification).

B.1. Inflow and Infiltration. Estimate the average number of gallons per day that flow into the treatment works from inflow and/or infiltration.

200,000.00 gpd

Briefly explain any steps underway or planned to minimize inflow and infiltration.

We are in the process of rehabilitating manholes and will continue to camera lines, smoke test, and repair as needed.

B.2. Topographic Map. Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. (You may submit more than one map if one map does not show the entire area.)

a. The area surrounding the treatment plant, including all unit processes.

b. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.

c. Each well where wastewater from the treatment plant is injected underground.

d. Wells, springs, other surface water bodies, and drinking water wells that are: 1) within 1/4 mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.

e. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.

f. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, and/or disposed.

B.3. Process Flow Diagram or Schematic. Provide a diagram showing the processes of the treatment plant, including all bypass piping and all backup power sources or redundancy in the system. Also provide a water balance showing all treatment units, including disinfection (e.g, chlorination and dechlorination). The water balance must show daily average flow rates at influent and discharge points and approximate daily flow rates between treatment units. Include a brief narrative description of the diagram.

B.4. Operation/Maintenance Performed by Contractor(s).

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor? ✓ Yes ____ No

If yes, list the name, address, telephone number, and status of each contractor and describe the contractor's responsibilities (attach additional pages if necessary).

Name: Byrd's Electric Motor Sales | NDM Service Associates (423-240-5758)

Mailing Address: 2191 Water Level Highway, Cleveland, TN 37311 | 1763 Walker Valley Road, NW Cleveland, TN 37312

Telephone Number: (423) 472-2166

Responsibilities of Contractor: Rebuilds pumps and motors | Electrical Work

B.5. Scheduled Improvements and Schedules of Implementation. Provide information on any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses to question B.5 for each. (If none, go to question B.6.)

a. List the outfall number (assigned in question A.9) for each outfall that is covered by this implementation schedule.

001

b. Indicate whether the planned improvements or implementation schedule are required by local, State, or Federal agencies.

✓ Yes ____ No

c If the answer to B.5.b is "Yes," briefly describe, including new maximum daily inflow rate (if applicable).

The aeration volume will be expanded and a clarifer will be added. New ADF - 0.68 MGD

d. Provide dates imposed by any compliance schedule or any actual dates of completion for the implementation steps listed below, as applicable. For improvements planned independently of local, State, or Federal agencies, indicate planned or actual completion dates, as applicable. Indicate dates as accurately as possible.

Implementation Stage	Schedule MM / DD / YYYY	Actual Completion MM / DD / YYYY
– Begin construction	3 / 15 / 2015	___/___/_____
– End construction	9 / 15 / 2015	___/___/_____
– Begin discharge	9 / 15 / 2015	___/___/_____
– Attain operational level	9 / 15 / 2015	___/___/_____

e. Have appropriate permits/clearances concerning other Federal/State requirements been obtained? ✓ Yes ___ No

Describe briefly: Environmental clearances have been provided by appropriate organizations.

B.6. EFFLUENT TESTING DATA (GREATER THAN O.1 MGD ONLY).

Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall Number: 001

Effluent Flow this period: (June 1, 2011 - May 31, 2014) Average = 0.35 Maximum = 0.99

POLLUTANT	MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML / MDL
	Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.							
AMMONIA (as N)	19.90	mg/L	6.70	mg/L	3.00	4500-NH3B	.05 mg/L
CHLORINE (TOTAL RESIDUAL, TRC)	3.87	mg/L	1.00	mg/L	781.00	4500-CLG	.05 mg/l
DISSOLVED OXYGEN	8.90	mg/L	5.63	mg/L	780.00	4500-OG	.05 mg/l
TOTAL KJELDAHL NITROGEN (TKN)	25.30	mg/L	12.29	mg/L	19.00	4500-NH3	1 mg/l
NITRATE PLUS NITRITE NITROGEN	18.90	mg/L	10.20	mg/L	3.00	4500-NO3-E	1 mg/L
OIL and GREASE	6.30	mg/L	4.80	mg/L	3.00	1664A	4 mg/L
PHOSPHORUS (Total)	3.43	mg/L	1.70	mg/L	10.00	4500-PE	.01 mg/L
TOTAL DISSOLVED SOLIDS (TDS)	456.00	mg/L	403.00	mg/L	3.00	2540C	10 mg/L
OTHER							

END OF PART B.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

BASIC APPLICATION INFORMATION

PART C. CERTIFICATION

All applicants must complete the Certification Section. Refer to instructions to determine who is an officer for the purposes of this certification. All applicants must complete all applicable sections of Form 2A, as explained in the Application Overview. Indicate below which parts of Form 2A you have completed and are submitting. By signing this certification statement, applicants confirm that they have reviewed Form 2A and have completed all sections that apply to the facility for which this application is submitted.

Indicate which parts of Form 2A you have completed and are submitting:

✓ Basic Application Information packet

Supplemental Application Information packet:

✓ Part D (Expanded Effluent Testing Data)

✓ Part E (Toxicity Testing: Biomonitoring Data)

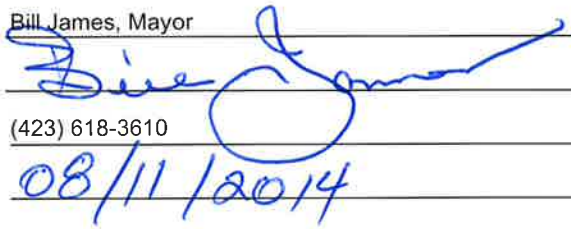
✓ Part F (Industrial User Discharges and RCRA/CERCLA Wastes)

____ Part G (Combined Sewer Systems)

ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and official title: Bill James, Mayor

Signature: 

Telephone number: (423) 618-3610

Date signed: 08/11/2014

Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

SEND COMPLETED FORMS TO:

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART D. EXPANDED EFFLUENT TESTING DATA

Refer to the directions on the cover page to determine whether this section applies to the treatment works.

Effluent Testing: 1.0 mgd and Pretreatment Treatment Works. If the treatment works has a design flow greater than or equal to 1.0 mgd or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information and any other information required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analyses conducted using 40 CFR Part 136 methods. In addition, these data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS, AND HARDNESS.											
ANTIMONY	<.01	mg/L	.083	lbs/day	<.01	mg/L	0.029	lbs/day	3	200.7	0.01
ARSENIC	<.01	mg/L	.083	lbs/day	<.01	mg/L	0.029	lbs/day	3	200.7	0.01
BERYLLIUM	<.01	mg/L	.083	lbs/dat	<.01	mg/L	0.029	lbs/day	3	200.7	0.01
CADMIUM	<.01	mg/L	.083	lbs/day	<.01	mg/L	0.029	lbs/day	6	200.7	0.01
CHROMIUM	<.01	mg/L	.083	lbs/day	<.01	mg/L	0.029	lbs/day	6	200.7	0.01
COPPER	.03	mg/L	.247	lbs/day	0.018	mg/L	0.052	lbs/day	6	200.7	0.01
LEAD	<0.01	mg/L	.083	lbs/day	<.01	mg/L	.029	lbs/day	6	200.7	0.01
MERCURY	<.0002	mg/L	0.001	lbs/day	<0.0002	mg/L	0.0006	lbs/day	6	245.1	0.0002
NICKEL	<.01	mg/L	.083	lbs/day	<.01	mg/L	.029	lbs/day	6	200.7	0.01
SELENIUM	<.01	mg/L	.083	lbs/day	<.01	mg/L	.029	lbs/day	3	200.7	0.01
SILVER	0.01	mg/L	.083	lbs/day	.006	mg/L	0.017	lbs/day	6	200.7	0.01
THALLIUM	<.01	mg/L	.083	lbs/day	<0.01	mg/L	.029	lbs/day	3	200.7	0.01
ZINC	.1	mg/L	0.826	lbs/day	.057	mg/L	0.166	lbs/day	6	200.7	0.01
CYANIDE	<.02	mg/L	0.165	lbs/day	<0.02	mg/L	0.058	lbs/day	6	200.7	0.02
TOTAL PHENOLIC COMPOUNDS	0.09	mg/L	0.743	lbs/day	0.036	mg/L	0.105	lbs/day	7	200.7	0.05
HARDNESS (AS $CaCO_3$)	256	mg/L	2114	lbs/day	245	mg/L	715	lbs/day	3	2340B	0.01
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer.											

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
VOLATILE ORGANIC COMPOUNDS.											
ACROLEIN	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
ACRYLONITRILE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
BENZENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
BROMOFORM	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
CARBON TETRACHLORIDE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
CLOROBENZENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
CHLORODIBROMO-METHANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
CHLOROETHANE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
2-CHLORO-ETHYLVINYL ETHER	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
CHLOROFORM	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
DICHLOROBROMO-METHANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
1,1-DICHLOROETHANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
1,2-DICHLOROETHANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
TRANS-1,2-DICHLORO-ETHYLENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
1,1-DICHLOROETHYLENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
1,2-DICHLOROPROPANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
1,3-DICHLORO-PROPYLENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
ETHYLBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
METHYL BROMIDE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
METHYL CHLORIDE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
METHYLENE CHLORIDE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8260B	10
1,1,2,2-TETRACHLORO-ETHANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
TETRACHLORO-ETHYLENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5
TOLUENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8260B	5

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: _____ (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
1,1,1-TRICHLOROETHANE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8250B	5
1,1,2-TRICHLOROETHANE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8250B	10
TRICHLORETHYLENE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8250B	5
VINYL CHLORIDE	<5	ug/L	.041	lbs/day	<5	ug/L	0.014	lbs/day	3	624/8250B	5
Use this space (or a separate sheet) to provide information on other volatile organic compounds requested by the permit writer.											
ACID-EXTRACTABLE COMPOUNDS											
P-CHLORO-M-CRESOL	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	825/8270C	50
2-CHLOROPHENOL	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	825/8270C	10
2,4-DICHLOROPHENOL	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	825/8270C	10
2,4-DIMETHYLPHENOL	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	825/8270C	10
4,6-DINITRO-O-CRESOL	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	825/8270C	50
2,4-DINITROPHENOL	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	825/8270C	50
2-NITROPHENOL	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	825/8270C	50
4-NITROPHENOL	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	825/8270C	50
PENTACHLOROPHENOL	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	825/8270C	10
PHENOL	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	825/8270C	10
2,4,6-TRICHLOROPHENOL	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	825/8270C	10
Use this space (or a separate sheet) to provide information on other acid-extractable compounds requested by the permit writer.											
BASE-NEUTRAL COMPOUNDS.											
ACENAPHTHENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8250B	10
ACENAPHTHYLENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8250B	10
ANTHRACENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8250B	10
BENZIDINE	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	624/8250B	50
BENZO(A)ANTHRACENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8250B	10
BENZO(A)PYRENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	624/8250B	10

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: _____ (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
3,4 BENZO-FLUORANTHENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
BENZO(GHI)PERYLENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
BENZO(K)FLUORANTHENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
BIS (2-CHLOROETHOXY) METHANE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
BIS (2-CHLOROETHYL)-ETHER	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
BIS (2-CHLOROISO-PROPYL) ETHER	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
BIS (2-ETHYLHEXYL) PHTHALATE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
4-BROMOPHENYL PHENYL ETHER	<50	ug/L	.413	lbs/day	<50	ug/L	0.146	lbs/day	3	625/8270C	50
BUTYL BENZYL PHTHALATE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
2-CHLORONAPHTHALENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
4-CHLORPHENYL PHENYL ETHER	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
CHRYSENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
DI-N-BUTYL PHTHALATE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
DI-N-OCTYL PHTHALATE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
DIBENZO(A,H) ANTHRACENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
1,2-DICHLOROBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
1,3-DICHLOROBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
1,4-DICHLOROBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
3,3-DICHLOROBENZIDINE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
DIETHYL PHTHALATE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
DIMETHYL PHTHALATE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
2,4-DINITROTOLUENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
2,6-DINITROTOLUENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
1,2-DIPHENYLHYDRAZINE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10

FACILITY NAME AND PERMIT NUMBER:
DECATUR WASTEWATER TREATMENT PLANT TN0058521

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: _____ (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/ MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
FLUORANTHENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
FLUORENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
HEXACHLOROBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
HEXACHLOROBUTADIENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
HEXACHLOROCYCLO-PENTADIENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
HEXACHLOROETHANE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
INDENO(1,2,3-CD)PYRENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
ISOPHORONE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
NAPHTHALENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
NITROBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625,870.00	10
N-NITROSODI-N-PROPYLAMINE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
N-NITROSODI- METHYLAMINE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
N-NITROSODI-PHENYLAMINE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
PHENANTHRENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
PYRENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10
1,2,4-TRICHLOROBENZENE	<10	ug/L	.083	lbs/day	<10	ug/L	0.029	lbs/day	3	625/8270C	10

Use this space (or a separate sheet) to provide information on other base-neutral compounds requested by the permit writer.

Use this space (or a separate sheet) to provide information on other pollutants (e.g., pesticides) requested by the permit writer.

END OF PART D.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

SUPPLEMENTAL APPLICATION INFORMATION

PART E. TOXICITY TESTING DATA

POTWs meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points: 1) POTWs with a design flow rate greater than or equal to 1.0 mgd; 2) POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403); or 3) POTWs required by the permitting authority to submit data for these parameters.

- At a minimum, these results must include quarterly testing for a 12-month period within the past 1 year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute and/or chronic toxicity, depending on the range of receiving water dilution. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- In addition, submit the results of any other whole effluent toxicity tests from the past four and one-half years. If a whole effluent toxicity test conducted during the past four and one-half years revealed toxicity, provide any information on the cause of the toxicity or any results of a toxicity reduction evaluation, if one was conducted.
- If you have already submitted any of the information requested in Part E, you need not submit it again. Rather, provide the information requested in question E.4 for previously submitted information. If EPA methods were not used, report the reasons for using alternate methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E.

If no biomonitoring data is required, do not complete Part E. Refer to the Application Overview for directions on which other sections of the form to complete.

E.1. Required Tests.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years.

____chronic ____acute

E.2. Individual Test Data. Complete the following chart for each whole effluent toxicity test conducted in the last four and one-half years. Allow one column per test (where each species constitutes a test). Copy this page if more than three tests are being reported.

	Test number:_____	Test number:_____	Test number:_____
a. Test information.			
Test species & test method number			
Age at initiation of test			
Outfall number			
Dates sample collected			
Date test started			
Duration			
b. Give toxicity test methods followed.			
Manual title			
Edition number and year of publication			
Page number(s)			
c. Give the sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used.			
24-Hour composite			
Grab			
d. Indicate where the sample was taken in relation to disinfection. (Check all that apply for each)			
Before disinfection			
After disinfection			
After dechlorination			

	Test number:_____	Test number:_____	Test number:_____
e. Describe the point in the treatment process at which the sample was collected.			
Sample was collected:			
f. For each test, include whether the test was intended to assess chronic toxicity, acute toxicity, or both.			
Chronic toxicity			
Acute toxicity			
g. Provide the type of test performed.			
Static			
Static-renewal			
Flow-through			
h. Source of dilution water. If laboratory water, specify type; if receiving water, specify source.			
Laboratory water			
Receiving water			
i. Type of dilution water. It salt water, specify "natural" or type of artificial sea salts or brine used.			
Fresh water			
Salt water			
j. Give the percentage effluent used for all concentrations in the test series.			
k. Parameters measured during the test. (State whether parameter meets test method specifications)			
pH			
Salinity			
Temperature			
Ammonia			
Dissolved oxygen			
l. Test Results.			
Acute:			
Percent survival in 100% effluent	%	%	%
LC_{50}			
95% C.I.	%	%	%
Control percent survival	%	%	%
Other (describe)			

Chronic:			
NOEC	%	%	%
IC_{25}	%	%	%
Control percent survival	%	%	%
Other (describe)			
m. Quality Control/Quality Assurance.			
Is reference toxicant data available?			
Was reference toxicant test within acceptable bounds?			
What date was reference toxicant test run (MM/DD/YYYY)?			
Other (describe)			

E.3. Toxicity Reduction Evaluation. Is the treatment works involved in a Toxicity Reduction Evaluation?

____Yes____No If yes, describe: _____

_____

_____

E.4. Summary of Submitted Biomonitoring Test Information. If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date submitted: _____ (MM/DD/YYYY)

Summary of results: (see instructions)

_____

_____

END OF PART E.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is it subject to, an approved pretreatment program?

✓ Yes ___ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. 1.00

b. Number of CIUs. 2.00

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: Storm Copper Components

Mailing Address: 240 Industrial Drive, PO Box 99, Decatur, TN 37322

F.4. Industrial Processes. Describe all of the industrial processes that affect or contribute to the SIU's discharge.

Manufactuers copper connectors and cable/harness assemblies and tin elecroplating of connectors.

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): Copper connectors

Raw material(s): Copper

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

270.00 gpd (___ continuous or ✓ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

5,500.00 gpd (___ continuous or ✓ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ✓ Yes ___ No

b. Categorical pretreatment standards ✓ Yes ___ No

If subject to categorical pretreatment standards, which category and subcategory?

40CFR433 "Metal Finishing Point Source"

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes ✓ No If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe? ____Yes ✓ No (go to F.12.)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ✓ No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

F.15. Waste Treatment.

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule.

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

SUPPLEMENTAL APPLICATION INFORMATION

PART G. COMBINED SEWER SYSTEMS

If the treatment works has a combined sewer system, complete Part G.

G.1. System Map. Provide a map indicating the following: (may be included with Basic Application Information)

a. All CSO discharge points.

b. Sensitive use areas potentially affected by CSOs (e.g., beaches, drinking water supplies, shellfish beds, sensitive aquatic ecosystems, and outstanding natural resource waters).

c. Waters that support threatened and endangered species potentially affected by CSOs.

G.2. System Diagram. Provide a diagram, either in the map provided in G.1. or on a separate drawing, of the combined sewer collection system that includes the following information:

a. Locations of major sewer trunk lines, both combined and separate sanitary.

b. Locations of points where separate sanitary sewers feed into the combined sewer system.

c. Locations of in-line and off-line storage structures.

d. Locations of flow-regulating devices.

e. Locations of pump stations.

CSO OUTFALLS:

Complete questions G.3 through G.6 once for each CSO discharge point.

G.3. Description of Outfall.

a. Outfall number _____

b. Location

_____
(City or town, if applicable) (Zip Code)

_____
(County) (State)

_____
(Latitude) (Longitude)

c. Distance from shore (if applicable) _____ ft.

d. Depth below surface (if applicable) _____ ft.

e. Which of the following were monitored during the last year for this CSO?

____Rainfall ____CSO pollutant concentrations ____CSO frequency

____CSO flow volume ____Receiving water quality

f. How many storm events were monitored during the last year? _____

G.4. CSO Events.

a. Give the number of CSO events in the last year.

_____ events (___ actual or ___ approx.)

b. Give the average duration per CSO event.

_____ hours (____ actual or ____ approx.)

c. Give the average volume per CSO event.

_____ million gallons (_____ actual or _____ approx.)

d. Give the minimum rainfall that caused a CSO event in the last year.

_____ inches of rainfall

G.5. Description of Receiving Waters.

a. Name of receiving water: _____

b. Name of watershed/river/stream system: _____

United States Soil Conservation Service 14-digit watershed code (if known): _____

c. Name of State Management/River Basin: _____

United States Geological Survey 8-digit hydrologic cataloging unit code (if known): _____

G.6. CSO Operations.

Describe any known water quality impacts on the receiving water caused by this CSO (e.g., permanent or intermittent beach closings, permanent or intermittent shell fish bed closings, fish kills, fish advisories, other recreational loss, or violation of any applicable State water quality standard).

_____

_____

END OF PART G.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.

Appendix E

Simplified Design Verification Spreadsheet

DECATUR, TN
WASTEWATER TREATMENT PLANT DESIGN VERIFICATION CALCULATIONS
UPDATED JUNE 27, 2014

INPUT DATA

TOTAL AERATION BASIN VOLUME, MGAL	0.25	Adequacy of volume is verified below.
TOTAL CLARIFIER AREA, FT2	3120	Adequacy of clarifier area is verified below.
INFLUENT CHARACTERISTICS, AVERAGE		
FLOW, MGAL/D	0.68	
BOD5, MG/L	100	
INFLUENT FLOW PEAKING FACTORS (RATIO TO AVG)		
PEAK MONTH	1.75	
PEAK DAY	2.5	Allowance - Requires I/I Reduction
PEAK HOUR	3	Allowance - Requires I/I Reduction
INFLUENT LOAD PEAKING FACTORS, EXCEPT ALKALINITY (RATIO TO AVG)		
PEAK MONTH	1.35	Typical Municipal Value is 1.3. Must Verify for Decatur.
PEAK DAY	2	
PEAK HOUR	3	

FLOW AND LOAD MULTIPLIERS FOR IN PLANT RECYCLES (ALLOWANCE)

	FLOW	BOD LOAD
AVERAGE	1.05	1.05
PEAK MONTH	1.05	1.05
PEAK DAY	1.05	1.05
PEAK HOUR	1.05	1.05

IS THERE A PRIMARY CLARIFIER? (ENTER 1 FOR YES, 2 FOR NO)	2	
PRIMARY CLARIFIER REMOVALS (SET TO ZERO IF NO PRIMARY), FRACTION		
BOD	0	
DESIGN PEAK MONTH MINIMUM MIXED LIQUOR TEMP, C	13	
DESIGN PEAK MONTH MCRT, DAYS	10	
DESIGN SLUDGE YIELD (LB TSS / LB BODR)	1.00	
CLARIFIER DESIGN PARAMETERS		
SELECT SSP (1=SVI, 2=DSVI, 3=SSVI3.5)	1	
VALUE OF SELECTED SSP (SEE VALUES FOR OTHERS IN TABLE), mL/g	175	
MAXIMUM CLARIFIER UNDERFLOW RATE (q_R, MUST BE ≤ $q_{R,crit}$) GPD/FT2	500	Note: $q_{R,crit}$ = 518 gpd/ft2
Choose Data Set to be Used for Stirred Zone Settling Velocity Correlation Parameters (See Table Below):		
If SVI is specified, choose between Data Sets 1 and 2	1	
If DSVI is specified, choose between Data Sets 3 and 4	3	
If SSVI is specified, choose between Data Sets 5, 6, and 7	5	

Note: With design for nitrification, essentially all soluble BOD will be removed.

MCRT FOR NITRIFICATION GUIDANCE	
INPUT EFFLUENT NH4-N, MG/L	1
INPUT SAFETY FACTOR	2
NITRIFICATION MCRT, DAYS	10.4

BASIS:
MU = (0.47*EXP(0.098*(T-15))*(N/(1+N))
MCRT = SAFETY FACTOR * 1/MU
NO DO, PH, OR OTHER INHIBITION

Data Set	Description	Parameters Per IAWQ STR6 Nomenclature α	β	δ	γ
1	SVI, Daigger and Roper, 1995	6.495	0	0.001586	0.1646
2	SVI, Ozinsky and Ekama, 1995 (Pitman SVI Family)	8.531	0.00165	0.00091	0.20036
3	DSVI, Daigger and Roper, 1995	7.599	0	0.002555	0.103
4	DSVI, Ozinsky and Ekama, 1995 (UCT DSVI Family)	10.060	0.00297	0.00095	0.29721
5	SSVI, Daigger and Roper, 1995	7.973	0	0.00405	0.0583
6	SSVI, Ozinsky and Ekama, 1995 (UCT SSVI Family)	11.599	0.00636	0.00218	0.16756
7	SSVI, Ozinsky and Ekama, 1995 (Pitman SSVI - GK Set)	14.889	0.00808	0.00264	0.22632

FLOW, LOAD, AND CONCENTRATION TABLE

	FLOW MGAL/D	BOD5 MG/L	BOD5 LB/D
PLANT INFLUENT			
AVERAGE	0.68	100	567
PEAK MONTH FLOW AND LOAD	1.19	77	766
PEAK DAY FLOW AND LOAD	1.70	80	1134
PEAK HOUR FLOW AND LOAD	2.04	100	1701
PLANT INFLUENT PLUS RECYCLES			
AVERAGE	0.71	100	595
PEAK MONTH FLOW AND LOAD	1.25	77	804
PEAK DAY FLOW AND LOAD	1.79	80	1191
PEAK HOUR FLOW AND LOAD	2.14	100	1786
SECONDARY INFLUENT W/O RECYCLES*			
AVERAGE	0.68	100	567
PEAK MONTH FLOW AND LOAD	1.19	77	766
PEAK DAY FLOW AND LOAD	1.70	80	1134
PEAK HOUR FLOW AND LOAD	2.04	100	1701
SECONDARY INFLUENT WITH RECYCLES*			
AVERAGE	0.71	100	595
PEAK MONTH FLOW AND LOAD	1.25	77	804
PEAK DAY FLOW AND LOAD	1.79	80	1191
PEAK HOUR FLOW AND LOAD	2.14	100	1786

* IF NO PRIMARY, PLANT INFLUENT AND SECONDARY INFLUENT ARE THE SAME.

AERATION BASIN MIXED LIQUOR SOLIDS CONCENTRATIONS

	AVG	PK. MO.		
SECONDARY INFLUENT BOD LOAD WITH RECYCLE, LB/D	595	804		
SLUDGE PRODUCTION, LB/D	595	804	BASED ON SLUDGE YIELD =	1.00 LB TSS / LB BOD
MLSS INVENTORY, LBS	5955	8039	BASED ON MCRT =	10 DAYS
MLSS CONCENTRATION, MG/L	2856	3856	BASED ON AERATION BASIN VOL =	0.25 MGAL

Note: The calculated MLSS concentrations are acceptable, therefore basin volume is adequate. Acceptable clarifier solids flux based on peak month MLSS is verified below.

CLARIFIER ANALYSIS

RECAP OF KEY DESIGN PARAMETERS FROM ABOVE

SSP Used (1=SVI, 2=DSVI, 3=SSVI3.5)	1	
SSP Value, mL/g	175	
Peak Month Flow, Mgal/d (See Note to Right)	1.25	197 m3/h
Peak Day Flow, Mgal/d	1.79	281 m3/h
Peak Hour Flow, Mgal/d	2.14	338 m3/h
Underflow Rate @ Peak Day, gpd/ft2	500	0.849 m/h
Underflow Rate @ Peak Hour, gpd/ft2	500	0.849 m/h
MLSS @ Peak Month and Peak Day Flow, g/L	3.856	
SSP Used (1=SVI, 2=DSVI, 3=SSVI3.5)	1	
SSP Value, mL/g	175	
Total Reactor Volume, Mgal	0.250	946 m3
Total Clarifier Area, ft2	3120	290 m2

Note: 1 Mgal/d = 157.7 m3/h
1 Mgal = 3785 m3

1 m/h = 589 gpd/ft2
1 kg/m2.h = 4.91 lb/d.ft2

Chosen Data Set for SSP Correlations this Analysis (1 through 7): 1

	Values for Chosen Data Set			α	β	δ	γ
1	SVI, Daigger and Roper, 1995			6.495	0.00000	0.001586	0.16460

Note: Equation for Stirred Zone Settling Velocity (IAWQ Nomenclature): $V_{ZS} = \alpha^*\exp(-\beta^*SSP-(\gamma+\delta^*SSP)X)$
Where SSP = Sludge Settleability Parameter (SVI, DSVI, or SSVI)

Calculate Critical and Actual Underflow Rates and X_{CRIT} Based on Selected Correlation Parameters

$q_{r,crit} = \alpha * \exp(-\beta^*SSP-2)$	0.879	m/h
$q_{r,crit}$ =	518	gpd/ft2
$X_{crit} = 2/(\gamma+\delta^*SSP)$	4.523	g/L
Maximum Underflow Rate as Input Above, But Limited to $q_{R,crit}$	0.8489	m/h
	500	gpd/ft2

Clarifier State Point Analysis

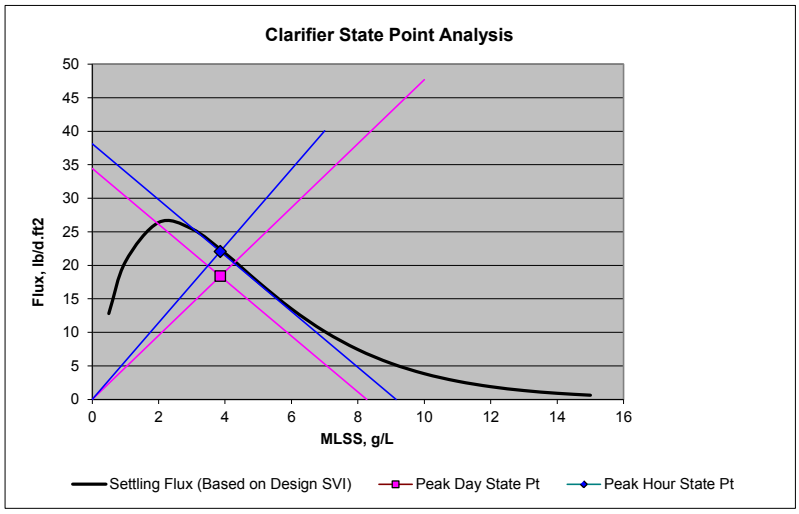
	Peak Day	Peak Hour	
Clarifier Overflow Rates Based on Design Flows and Clarifier Areas	0.9712	1.1655	m/h
	572	686	gpd/ft2
Underflow Rate	0.8489	0.8489	m/h
	500	500	gpd/ft2
Total RAS Flow	1.560	1.560	Mgal/d
Total Flux Applied = $X_F(q_R + q_A)$	7.02	7.77	kg/m2.h
	34.46	38.13	lb/d.ft2
Underflow Concentration = Total Applied Flux / q_R	8.3	9.1	g/L

The equation of the solids flux due to settling line is:
$j_S = X\alpha^*e^{(-\beta^*SSP-(\gamma+\delta^*SSP)X)}$

MLSS, g/L	Settle Flux, lb/d.ft2
0.5	12.808
1	20.536
2	26.395
3	25.444
4	21.802
5	17.514
6	13.506
7	10.127
8	7.438
9	5.377
10	3.840
11	2.714
12	1.903
13	1.325
14	0.917
15	0.631

Underflow and Overflow Rate Lines

	X, g/L	Solids Flux, lb/d.ft2
Peak Day Flow		
Overflow Rate Line	0.000	0.000
	10.000	47.688
Underflow Rate Line	0.000	34.457
	8.267	0.000
Peak Hour Flow		
Overflow Rate Line	0.000	0.000
	7.000	40.058
Underflow Rate Line	0.000	38.134
	9.149	0.000
Pivot Points		
Peak Day Flow	3.86	18.387
Peak Hour Flow	3.86	22.064



Note: Settling Flux Curve Based on
SVI = 175 mL/g

Note: Successful operation is indicated when the pivot point and the descending leg of the underflow line are below the settling flux curve.