Western New York Science & Technology Advanced Manufacturing Park (STAMP)

Sewer Service & Wastewater Treatment Facility Preliminary Report

Prepared for:

Genesee County Economic Development Center
99 MedTech Drive, Suite 106, Batavia, NY 14020

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DESIGN PROFESSIONALS

TABLE OF CONTENTS

PAGE

Executive Summary

The Science and Technology Advanced Manufacturing Park (STAMP) project in the Town of Alabama, in western Genesee County, New York is being planned. The project site consists of approximately 1,300 acres and is located along New York State Highway Route 77, approximately 5 miles north of the New York State Thruway. The purpose of the project is to develop a high technology manufacturing center, with a focus on renewable energy and to provide economic development opportunities within the region.

Currently, the majority of the STAMP project site consists of agricultural land and a few residential houses that do not contain municipal sanitary sewer service. The nearest municipal Wastewater Treatment Facilities (WWTF) are located in the Village of Oakfield and the Village of Corfu.

The purpose of this Sewer Service and Wastewater Treatment Facility Preliminary Report is to evaluate the necessary improvements required to provide sanitary sewer service to the STAMP project site. This evaluation considers several alternatives to provide sanitary service to the STAMP project. Upon development of conceptual sewer layouts and preliminary budgetary cost estimates, it was apparent that certain alternatives were the most practical and cost effective.

The analysis considers two build-out phases; an initial construction phase (Phase 1) and a full build-out scenario (Full Build-Out). The sewer demand for the initial phase is estimated to be 1,000,000 gallons per day (gpd). The initial construction of the site would include a Wastewater Treatment Facility and infrastructure to convey and treat this volume of flow. For the Full Build-Out scenario a sewer design demand of 3,000,000 gpd was evaluated. This phase will include upgrades to the Wastewater Treatment Facility (WWTF) and infrastructure previously constructed under the Phase 1 portion of the project, as well as new infrastructure to meet the anticipated demand.

Several alternatives were considered to provide a conveyance and treatment system that would meet the needs of the STAMP project. The alternatives consist of providing conveyance systems utilizing combinations of gravity sewers, pump stations, and force mains. Each alternative was evaluated using the two design capacities and incremental capacity upgrades over time. The following is a list summarizing the alternatives and capital costs:

Alternative	Alternative Description	1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
1	On-Site WWTF, Indian Falls Discharge	$20,993,000	$19,614,000	$40,607,000
2	On-Site WWTF, Tonawanda Discharge	$20,230,000	$19,614,000	$39,844,000
3	Indian Falls WWTF	$20,993,000	$19,614,000	$40,607,000
4	Village of Oakfield Existing WWTF	$24,099,000	$19,614,000	$43,713,000
5	On-Site WWTF, Oak Orchard Creek Discharge	$18,130,000	$19,614,000	$37,744,000

6	On-Site WWTF, Whitney Creek Discharge	$15,873,000	$19,614,000	$35,487,000

From this analysis, it appears that locating a WWTF on the STAMP project site would be the most economical and feasible approach for the following reasons:

- It eliminates the need for long sewer force mains filled with untreated sewage.
- It allows flexibility to upgrade the WWTF easily since it is incorporated into the overall site plan.
- It has the lowest estimated capital cost.
- It eliminates the need for offsite land acquisition.
- It allows easier permitting for the WWTF.

Of those alternatives that proposed a WWTF within the STAMP project site, Alternative 6: On-Site WWTF, Whitney Creek Discharge is the preferred alternative. This alternative would provide a WWTF on site, has the lowest capital cost, the shortest discharge route and is the preferred alternative with respect to permitting.

Any discharge from a WWTF would require a State Pollutant Discharge Elimination System (SPDES) permit from the New York State Department of Environmental Conservation (NYSDEC). A SPDES permit establishes stringent performance standards and operating conditions that are designed to protect the state's waters. The permit may incorporate water quality standards, sampling, analysis and reporting to the NYSDEC. Once a permit is issued, the owner or operator must comply with the specific conditions in the permit which may include chemical properties, temperature and other biological properties and will be monitored to assure compliance.

The sewer project would require permitting from involved agencies. Based on preliminary conversations with the NYSDEC, discharge to Whitney Creek would be feasible based on volume and constituent concentration levels for an Intermittent Stream. An Intermittent Stream classification, compared to a larger stream classification, requires more stringent controls. Typical constituent levels for an Intermittent Stream are as follows:

- 5-15 mg/L BOD level
- 10-20 mg/L Total Suspended Solids
- pH – 6.5 to 8.5
- Ammonia Limit – 1.2 – 8 mg/L
- Phosphorous Removal – 1.0 mg/L

The new WWTF would be required to meet these levels and other restrictions as required by the NYSDEC. Once a permit is issued, the discharge point would be continuously monitored for compliance. Downstream impacts would also need to be considered and would be part of the permitting process.

Introduction

The Science and Technology Advanced Manufacturing Park (STAMP) project in the Town of Alabama, in western Genesee County, New York is being planned. The project site consists of approximately 1,300 acres and is located along New York State Highway Route 77, approximately 5 miles north of the New York State Thruway. The purpose of the project is to develop a high technology manufacturing center, with a focus on renewable energy and to provide economic development opportunities within the region.

The purpose of this Sewer Service and Wastewater Treatment Facility Preliminary Report is to evaluate the necessary improvements required to provide sanitary sewer service to the STAMP project site.

Existing Treatment Conditions

Currently, the majority of the STAMP project site consists of agricultural land and a few residential houses that do not contain municipal sanitary sewer service. The nearest municipal Wastewater Treatment Facilities (WWTF) are located in the Village of Oakfield and the Village of Corfu.

The Village of Corfu WWTF is located in the northwestern quadrant of the Village of Corfu, approximately 9 miles south of the STAMP project site, along Route 77. The Corfu WWTF has a permitted treatment capacity of 135,000 gpd and discharges to Murder Creek. This facility currently operates at approximately 65,000 gpd. There is approximately 70,000 gpd of excess permitted capacity. However, upgrades at the WWTF are required to restore its original operating capacity to 135,000 gpd and allow the WWTF to accept flows beyond the 65,000 gpd generated by Village users. For this evaluation, it is assumed that the Corfu WWTF would not be a feasible or economical alternative due to the distance from the project site and the upgrades required at the facility. There is also a potential that the Town of Pembroke will use this additional capacity in the near future.

The Village of Oakfield WWTF is located in the northeastern quadrant of the Village of Oakfield, approximately 6.5 miles east of the STAMP project site. The Oakfield WWTF has a permitted treatment capacity of 500,000 gpd and discharges by a single outfall to Dry Brook, a tributary of Oak Orchard Creek. The facility currently operates at approximately 156,000 gpd. There is approximately 344,000 gpd of excess permitted capacity.

There are existing businesses to the south of the STAMP site utilizing relatively small individual treatment systems, including the Flying J. Travel Plaza, the TA Travel center, and the Pembroke Junior and Senior High School. As part of the Buffalo East Technology Park analysis, studies have been completed that would propose an expansion of the Village of Corfu WWTF or a new WWTF located along NYS Route 5, just east of the I-90 over pass. This facility would discharge to Murder Creek, similar to the Corfu WWTF.

Development Phases

This evaluation will consider several alternatives to provide sanitary service to the STAMP project. The analysis considers two build-out phases; an initial construction phase (Phase 1) and a full build-out scenario (Full Build-Out), consistent with the "Industry Requirements and Environmental, Health & Safety Review Report" prepared by CH2M Hill.

The evaluation will consider the installation of the sanitary sewer system along the main corridor of the project only (Crosby Road). Since the placement, final layout and future tenants are only conceptually developed at this time, future analysis will be required to determine the on-site collection system needs and requirements for each tenant within the Park.

Phase 1

Phase 1 will be the initial construction phase of the project. This phase may include several tenants and include approximately 1,000,000 square feet of building development. This development has the potential to employ approximately 1,282 employees. The sewer demand for the initial phase is estimated to be 1,000,000 gallons per day (gpd). The initial construction of the site would include a Wastewater Treatment Facility and infrastructure to convey and treat this volume of flow. This development is projected to occur over the next several years.

Full Build-Out

At Full Build-Out, approximately 6,130,000 square feet of building development will be required (an increase of 5,130,000 square feet from Phase 1). At Full-Build Out, approximately 9,330 employees are projected to occupy the site and the estimated sewer demand would be approximately 2,390,000 gpd.

For this phase, a sewer design demand of 3,000,000 gpd has been evaluated. This phase will include upgrades to the Wastewater Treatment Facility (WWTF) and infrastructure previously constructed under the Phase 1 portion of the project, as well as new infrastructure to meet the anticipated demand. A table summarizing the two phases is shown below.

Construction Phase	Assumed Building Development Area (SF)	Assumed Employees	Wastewater Demand (Gallons per Day)	Design Demand (Gallons per Day)
Phase 1	1,000,000	1,282	1,000,000	1,000,000
Full Build-Out	6,130,000	9,330	2,390,000	3,000,000

Alternatives Evaluation

Evaluation Approach

There is a wide range of flow demands possible at the STAMP project site over an extended period of time. Full development of the STAMP project site may take ten to twenty-five years, while the first phase of construction may take place in the next few years.

For these reasons, an incremental phased approach will likely be required for potential sewer collection and treatment alternatives. The sewer collection piping network would expand over time to accommodate new tenants or buildings. The pump station and WWTF would require capacity upgrades as required.

For the basis of this report, two (2) design capacities were used to compare the proposed alternatives. Each alternative was evaluated using the following capacities:

- 1,000,000 gallons per day (gpd) or 1.0 million gallons per day (MGD)
- 3,000,000 gallons per day (gpd) or 3.0 million gallons per day (MGD)

These design capacities allow for some additional growth in the Town of Alabama and surrounding areas. The Town of Alabama is projected to require 140 gallons per minute of sewer capacity in addition to the STAMP project. The design capacities chosen for analysis will accommodate this additional demand and the potential for future growth within the area.

The capital costs associated with improvements are presented within this evaluation. The capital costs for improvements to provide 1.0 MGD of service to the site represent the costs associated with the construction of the required initial facilities and infrastructure. The costs associated to provide 3.0 MGD represent the expansion costs associated with upgrading the system to that capacity.

Typical Wastewater Constituents

The following is a summary of some of the anticipated wastewater constituents and concentration levels associated with a project of this content and size:

Wastewater Constituent	Anticipated Level or Concentration	Typical Local Limit
pH	6.0-9.0	5.0-11.0
TSS	100-300 mg/l	300 mg/l
COD	< 300 mg/l	500 mg/l
BOD	< 300mg/l	400 mg/l

A full copy of the anticipated constituents table is located in Appendix C, consistent with the "Industry Requirements and Environmental, Health & Safety Review Report" by CH2M Hill. All proposed facilities would be designed accordingly to these anticipated limits.

The discharge of the treated water would require the appropriate permitting and approvals. The constituent levels in the discharged water (effluent) would be below the local requirements. The volume of water being discharged would therefore be the main concern.

Conveyance & Treatment Alternatives

Several alternatives were considered to provide a conveyance and treatment system that would meet the needs of the STAMP project. The alternatives consist of providing conveyance systems utilizing combinations of gravity sewers, pump stations, and force mains. Each alternative was evaluated using the two design capacities and incremental capacity upgrades over time.

Figures depicting conceptual layouts and Preliminary Budget Estimates are provided in Appendix A for each primary alternative.

Primary Alternatives

Several sanitary sewer alternatives were considered during the analysis. Upon development of conceptual sewer layouts and Preliminary Budgetary Estimates, it was apparent that certain alternatives were more practical and cost effective. These Primary Alternatives are outlined and explained below. An Overall Alternatives Map is shown in Figure 1 of Appendix A.

Most of the potential alternatives include a new WWTF that will treat 3,000,000 gpd and require approximately 5 to 10 acres of land. For those alternatives which propose a WWTF on the STAMP project site, this amount of land should be reserved and incorporated into the overall plan. For those alternatives that propose on offsite WWTF, this land would need to be acquired.

Any discharge from a WWTF would require a State Pollutant Discharge Elimination System (SPDES) permit from the New York State Department of Environmental Conservation (NYSDEC). A SPDES permit establishes stringent performance standards and operating conditions that are designed to protect the state's waters. The permit may incorporate water quality standards, sampling, analysis and reporting to the NYSDEC. Once a permit is issued, the owner or operator must comply with the specific conditions in the permit which may include chemical properties, temperature and other biological properties and will be monitored to assure compliance.

All of the alternatives will also include the construction of approximately 8,000 linear feet of gravity sewer main along Crosby Road. This improvement would serve as the sanitary sewer "backbone" for development within the STAMP project site. This sewer would collect sanitary discharge from future tenants within the site and convey the flow to either a new WWTF or pump station located on the site. Since the placement and layout of future tenants is only conceptually developed at this time, future analysis will be required to determine the on-site collection network needs and layout. The estimated cost for this sewer main is included in all alternatives.

Alternative 1: On-Site WWTF, Indian Falls Discharge

Alternative 1 is shown in Figure 2 of Appendix A. This alternative would consist of constructing an all new WWTF within the STAMP project site. The new WWTF would be constructed in phases, with the initial construction treating up to 1,000,000 gpd. The facility would be expandable up to the Full Build-Out demand of 3,000,000 gpd. The WWTF would be municipally owned and operated. An operations staff would need to be established. A WWTF located on site would eliminate concerns associated with a long sewer network filled with untreated sewage. It would also eliminate the need for land acquisition outside of the project boundaries and reduce permitting efforts.

Upon discharge from the WWTF, the treated water would be pumped to a discharge point utilizing a pump station and force main. The force main would be located along Route 77 to the south of the site and discharge into the Tonawanda Creek to the west of Indian Falls. Approximately 27,000 linear feet of sanitary force main would be required.

The majority of the sewer mains would be installed using open cut installation within public road rights of way. Some permanent easements may be required to avoid existing physical features. Directional drilling or other trenchless installation methods will likely be utilized for creek, wetland and road crossings.

The sewer project would require permitting from involved agencies. Downstream impacts would also need to be considered.

The estimated total capital costs associated with this alternative are as follows:

1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
$20,993,000	$19,614,000	$40,607,000

Alternative 2: On-Site WWTF, Tonawanda Discharge

Alternative 2 is shown in Figure 3 of Appendix A. This alternative would consist of constructing an all new WWTF within the STAMP project site. The new WWTF would be constructed in phases, with the initial construction treating up to 1,000,000 gpd. The facility would be expandable up to the Full Build-Out demand of 3,000,000 gpd. The WWTF would be municipally owned and operated. An operations staff would need to be established. A WWTF located on site would eliminate the concerns associated with a long sewer network filled with untreated sewage. It would also eliminate the need for land acquisition outside of the project boundaries for the WWTF, providing flexibility in sizing and construction. This alternative also provides a much shorter discharge route, reducing the costs associated with force mains and gravity sewers.

Upon discharge from the WWTF, the treated water would then be pumped utilizing a pump station and force main to the intersection of Crosby Road and Judge Road, then flow by gravity to the west along Judge Road and finally discharged into Tonawanda Creek. Approximately 10,000 linear feet of gravity sewer would be required from the project site to the discharge point.

The majority of the sewer mains would be installed using open cut installation within public road rights of way. Some permanent easements may be required to avoid existing physical features. Directional drilling or other trenchless installation methods will likely be utilized for creek, wetland and road crossings.

The sewer project would require permitting from involved agencies as well as approval and significant coordination with the Tonawanda Seneca Nation. Downstream impacts would also need to be considered.

The estimated total capital costs associated with this alternative are as follows:

1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
$20,230,000	$19,614,000	$39,844,000

Alternative 3: Indian Falls WWTF

Alternative 3 is shown in Figure 4 of Appendix A. This alternative would consist of constructing an all new WWTF to the west of the Hamlet of Indian Falls. The new WWTF would be constructed in phases, with the initial construction treating up to 1,000,000 gpd. The facility would be expandable up to the Full Build-Out demand of 3,000,000 gpd. The WWTF would be municipally owned and operated. An operations staff would need to be established. Significant coordination with the Town of Pembroke would be required.

The STAMP project site would have an onsite collection system network within the project boundaries that would discharge to a pump station located on site. The pump station would pump sewage east on Judge Road, and then south on NYS Route 77 to the new WWTF in Indian Falls. Approximately 27,000 linear feet of sanitary force main would be required from the project site to the discharge point.

The majority of the sewer mains would be installed using open cut installation within public road rights of way. Some permanent easements may be required to avoid existing physical features. Directional drilling or other trenchless installation methods will likely be utilized for creek, wetland and road crossings.

A potential Indian Falls WWTF could be located to the west of the Hamlet of Indian Falls, just southwest of the intersection of Waddington Street and NYS Route 77. As shown in the figure below, the facility would discharge to Tonawanda Creek. The two parcels shown total approximately 6.8 acres.

Potential Indian Falls WWTF Location

The sewer project would require permitting from involved agencies. Downstream impacts would also need to be considered. This WWTF location would require land acquisition and increase environmental permitting efforts. The facility would be located adjacent to a residential area which may present challenges for approval and public perception. There would be an extensive length of sewer required to transmit untreated sewage to the south along NYS Route 77. Long pipe runs of untreated sewage have more potential to become "septic" or stagnate in between pumping cycles, which could create odor issues or other problems within the system. This would also create issues and environmental concerns if breaks of leaks occur with the piping system.

This alternative does allow some flexibility for the possibility of future service for the Hamlet of Indian Falls and other areas in the Town of Pembroke. This alternative also creates some additional space within the STAMP site, as the WWTF would be located offsite.

The estimated total capital costs associated with this alternative are as follows:

1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
$20,993,000	$19,614,000	$40,607,000

Alternative 4: Village of Oakfield Existing WWTF

Alternative 4 is shown in Figure 5 of Appendix A. Treatment would take place at the existing WWTF in the Village of Oakfield. A pump station located on the STAMP site would convey sanitary flows to the Village of Oakfield via approximately 50,100 linear feet of sanitary force main along NYS Route 63.

The majority of the sewer mains would be installed using open cut installation within public road rights of way. Some permanent easements may be required to avoid existing physical features. Directional drilling or other trenchless installation methods will likely be utilized for creek, wetland and road crossings.

The existing WWTF in Oakfield discharges to Dry Brook, a tributary to Oak Orchard Creek. Dry Brook has less flow capacity than the Tonawanda Creek. The Oakfield WWTF has a permitted capacity of 500,000 gpd. Dry Brook may not have enough capacity to increase the discharge to 3,000,000 gpd as required by the STAMP development. Stricter treatment and discharge requirements would be necessary. Significant upgrades would be required to the existing plant to increase the capacity to the 3,000,000 gpd threshold. Substantial coordination would be required with the Village of Oakfield.

Of the four primary alternatives analyzed, this alternative requires the greatest length of force main sewer and therefore represents the most costly alternative. In addition, long pipe runs of untreated sewage have more potential to become "septic" or stagnate in between pumping cycles, which could create odor issues or other problems within the system. This would also create issues and environmental concerns if breaks of leaks occur with the piping system.

The estimated total capital costs associated with this alternative are as follows:

1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
$24,099,000	$19,614,000	$43,607,000

Alternative 5: On-Site WWTF, Oak Orchard Creek Discharge

Alternative 5 is shown in Figure 6 of Appendix A. This alternative would consist of a new WWTF located within the STAMP project limits. The new WWTF would be constructed in phases, with the initial construction treating up to 1,000,000 gpd. The facility would be expandable up to the Full Build-Out demand of 3,000,000 gpd. The WWTF would be municipally owned and operated. An operations staff would need to be established. A WWTF located on site would eliminate concerns associated with a long sewer network filled with untreated sewage. It would also eliminate the need for land acquisition outside of the project boundaries and reduce permitting efforts.

Upon discharge from the WWTF, the treated water would be pumped to a discharge point utilizing a pump station and force main. The force main would be located along Route 63 and discharge into the Oak Orchard Creek, approximately 14,500 linear feet to the north of the STAMP project site. This alternative also provides a much shorter discharge route, reducing the costs associated with force mains and gravity sewers.

The majority of the sewer mains would be installed using open cut installation within public road rights of way. Some permanent easements may be required to avoid existing physical features. Directional drilling or other trenchless installation methods will likely be utilized for creek, wetland and road crossings. Construction of sewers through the Oak Orchard Swamp and Iroquois National Wildlife Refuge could present design and permitting challenges. Force main construction methods would likely involve substantial directional drilling or boring to eliminate disturbances to the swamp area

The sewer project would require permitting from involved agencies. Downstream impacts would also need to be considered.

The estimated total capital costs associated with this alternative are as follows:

1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
$18,130,000	$19,614,000	$37,744,000

Alternative 6: On-Site WWTF, Whitney Creek Discharge

Alternative 6 is shown in Figure 7 of Appendix A. This alternative would consist of a new WWTF located within the STAMP project limits. The new WWTF would be constructed in phases, with the initial construction treating up to 1,000,000 gpd. The facility would be expandable up to the Full Build-Out demand of 3,000,000 gpd. The WWTF would be municipally owned and operated. An operations staff would need to be established. A WWTF located on site would eliminate concerns associated with a long sewer network filled with untreated sewage. It would also eliminate the need for land acquisition outside of the project boundaries and reduce permitting efforts.

Upon discharge from the WWTF, the treated water would be pumped to a discharge point utilizing a pump station and force main. The force main would be located along Crosby Road within the STAMP project site and discharge into Whitney Creek, approximately 7,100 linear feet to the south of the WWTF. This alternative provides the shortest discharge route of all options explored, reducing the costs associated with force mains and gravity sewers.

The sewer project would require permitting from involved agencies. Based on preliminary conversations with the NYSDEC, discharge to Whitney Creek would be feasible based on volume and constituent concentration levels for an Intermittent Stream. An Intermittent Stream classification, compared to a larger stream classification, requires more stringent controls. Typical constituent levels for an Intermittent Stream are as follows:

- 5-15 mg/L BOD level
- 10-20 mg/L Total Suspended Solids
- pH – 6.5 to 8.5
- Ammonia Limit – 1.2 – 8 mg/L
- Phosphorous Removal – 1.0 mg/L

The new WWTF would be required to meet these levels and other restrictions as required by the NYSDEC. Once a permit is issued, the discharge point would be continuously monitored for compliance. Downstream impacts would also need to be considered and would be part of the permitting process.

The sewer mains would be installed using open cut installation within the STAMP project site, eliminating the need to obtain easements. Directional drilling or other trenchless installation methods will likely be utilized for creek, wetland and road crossings.

The estimated total capital costs associated with this alternative are as follows:

1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
$15,873,000	$19,614,000	$35,487,000

Primary Alternatives Summary Comparison

The following is a list summarizing the alternatives and capital costs:

Alternative	Alternative Description	1.0 MGD	Expansion to 3.0 MGD	Total Capital Costs
1	On-Site WWTF, Indian Falls Discharge	$20,993,000	$19,614,000	$40,607,000
2	On-Site WWTF, Tonawanda Discharge	$20,230,000	$19,614,000	$39,844,000
3	Indian Falls WWTF	$20,993,000	$19,614,000	$40,607,000
4	Village of Oakfield Existing WWTF	$24,099,000	$19,614,000	$43,713,000
5	On-Site WWTF, Oak Orchard Creek Discharge	$18,130,000	$19,614,000	$37,744,000
6	On-Site WWTF, Whitney Creek Discharge	$15,873,000	$19,614,000	$35,487,000

Secondary Alternatives

Several other sanitary sewer treatment alternatives were considered during the analysis of the STAMP site. Upon development of conceptual sewer layouts and Preliminary Budgetary Estimates, it was apparent that servicing the STAMP site with these alternatives was not practical. These Secondary Alternatives are briefly explained below.

Existing Corfu WWTF

This alternative is shown in Figure 7 of Appendix B. This option would utilize the existing WWTF in Corfu, located to the south of the STAMP project site. The transmission sewer would be routed to the south, along NYS Route 77. This option would involve approximately 47,520 linear feet (9 miles) of sewer. Required upgrades to the existing Corfu WWTF and the distance from the project site do not make this option an economical or feasible solution.

WWTF within the Tonawanda Reservation

This alternative is shown in Figure 8 of Appendix B. A new WWTF would be constructed within the Tonawanda Reservation. Conveyance sewers would be routed from the STAMP site and west on NYS Route 63/Judge Road. Land, permits and easements would need to be acquired for the all

new facility and transmission sewers. Obtaining the necessary permits and approvals for this option could be very challenging.

Conclusions & Recommendations

The purpose of this Sewer Service and Wastewater Treatment Facility Preliminary Report is to evaluate the necessary improvements required to provide sanitary sewer service to the STAMP project site. The project site consists of approximately 1,300 acres and is located along New York State Highway Route 77, approximately 5 miles north of the New York State Thruway. The project requires a Phase 1 sewer capacity of 1,000,000 gallons per day and a Full Build-Out capacity of 3,000,000 gallons per day.

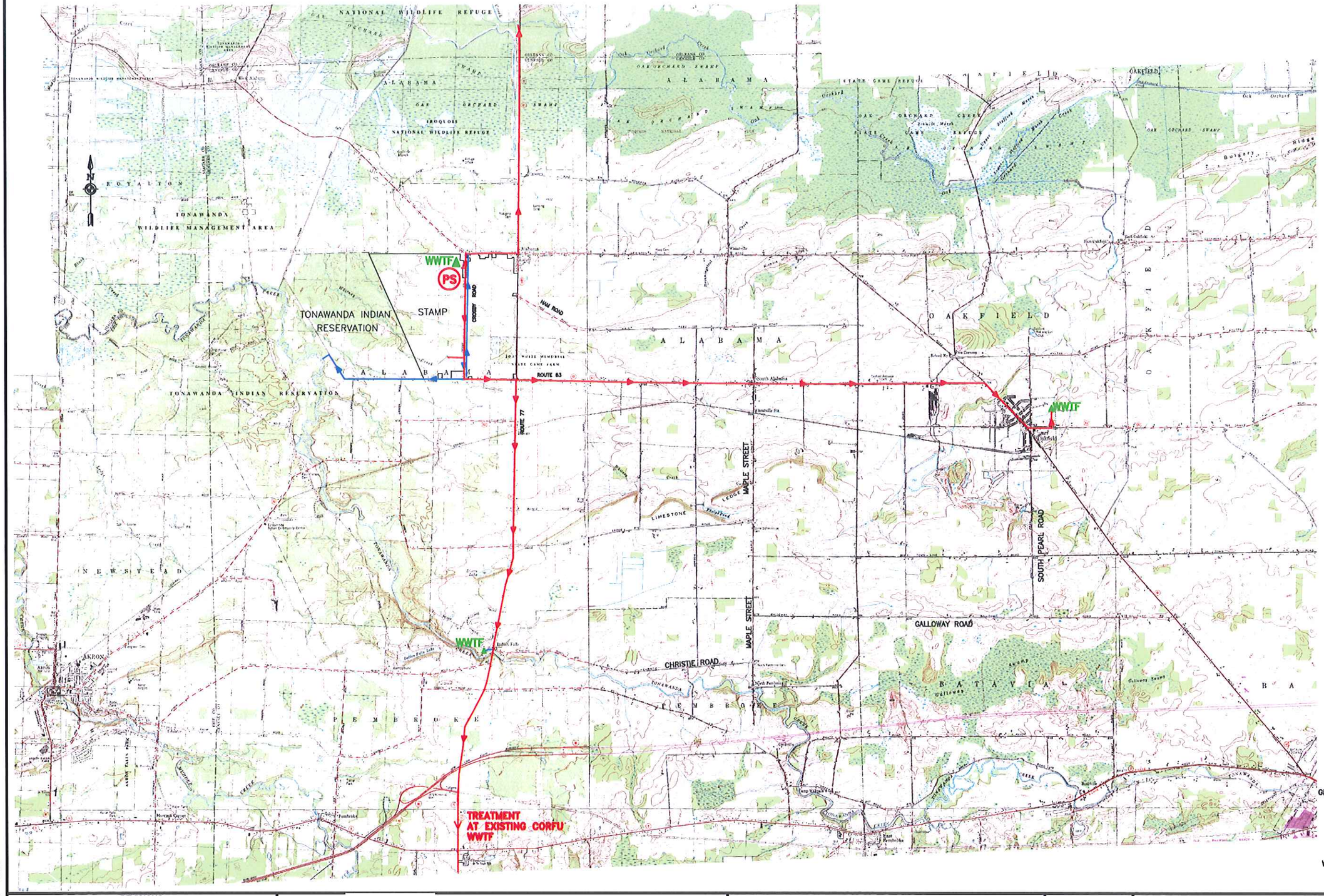
Several alternatives were considered in this evaluation to provide the most practical and cost effective approach to provide the STAMP site with a viable sanitary sewer conveyance and treatment system. From this analysis, it appears that locating a WWTF on the STAMP project site would be the most economical and feasible approach for the following reasons:

- It eliminates the need for long sewer force mains filled with untreated sewage.
- It allows flexibility to upgrade the WWTF easily since it is incorporated into the overall site plan.
- It has the lowest estimated capital cost.
- It eliminates the need for offsite land acquisition.
- It allows easier permitting for the WWTF.

Of those alternatives that proposed a WWTF within the STAMP project site, Alternative 6: On-Site WWTF, Whitney Creek Discharge is the preferred alternative. This alternative would provide a WWTF on site, has the lowest capital cost, the shortest discharge route and is the preferred alternative with respect to permitting. However, downstream impacts to Whitney Creek and the wetland network will need to be evaluated.

APPENDIX A – PRIMARY ALTERNATIVES

A-1: FIGURES
A-2: PRELIMINARY BUDGET ESTIMATES



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Referenced Drawings: None

REVISIONS				
NO.	DATE	BY	CHKED	DESCRIPTION

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GENESEE COUNTY ECONOMIC DEVELOPMENT CENTER

TOWN OF ALABAMA GENESEE COUNTY NEW YORK

DATE: 01/19/10
DRAWN: ARK
DESIGNED: ARK
CHECKED: TAC
SCALE: 1"=6000'

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

FIGURE 1

OVERALL SEWER ALTERNATIVES MAP

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DRAWING NUMBER S-001

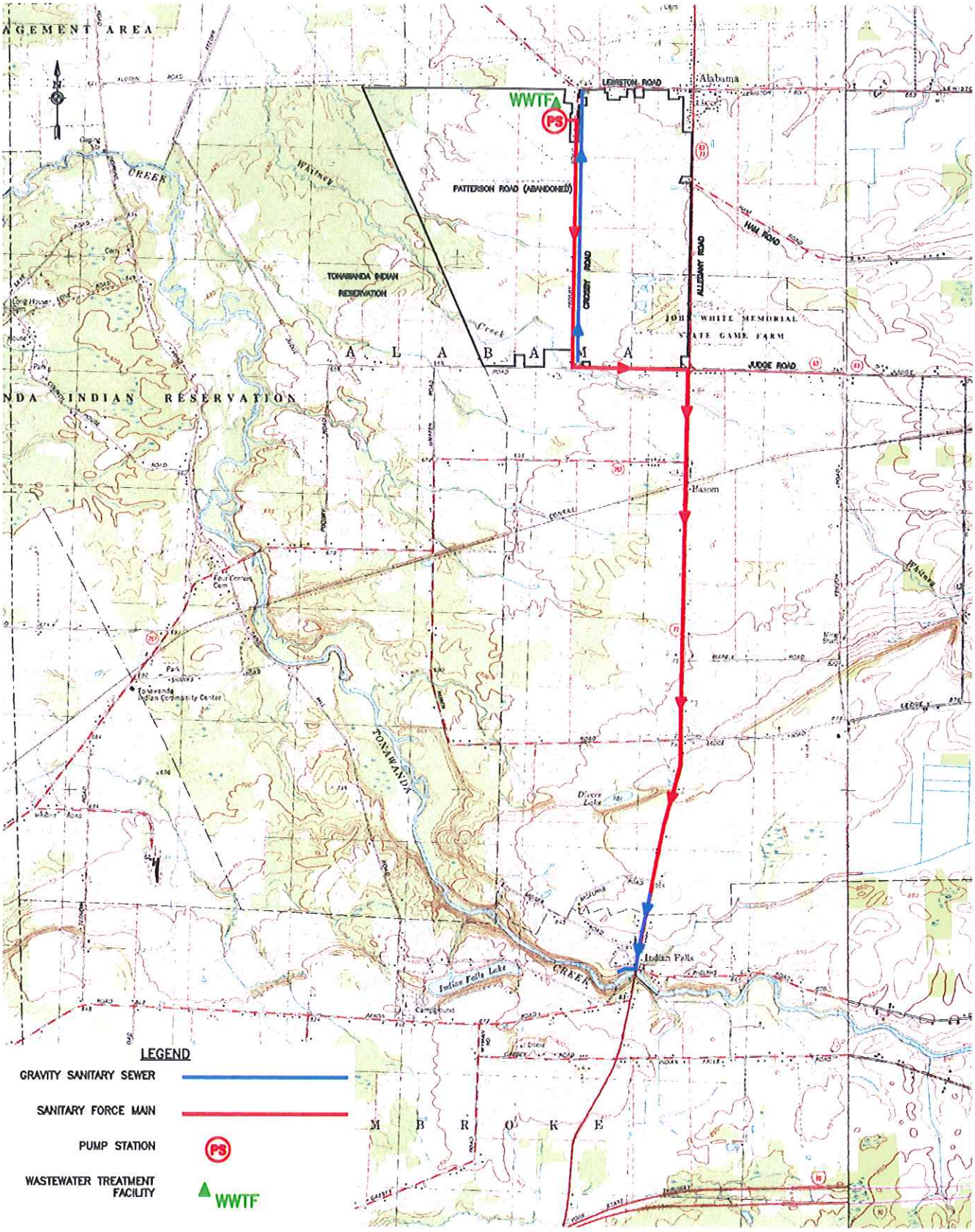

FIGURE #2

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TEL (800) 274-9000
FAX (585) 232-5836
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DATE:	01/08/10
DRAWN:	ARK
CHECKED:	TAC
SCALE:	1"=4000'
PROJ. #:	11790.00

ALTERNATIVE 1

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

TOWN OF ALABAMA, GENESEE COUNTY, NEW YORK

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FIGURE #3

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FAX (585) 232-5836
www.clarkpatterson.com

DATE:	01/08/10
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CHECKED:	TAC
SCALE:	1"=4000'
PROJ. #:	11790.00

ALTERNATIVE 2

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

TOWN OF ALABAMA, GENESEE COUNTY, NEW YORK

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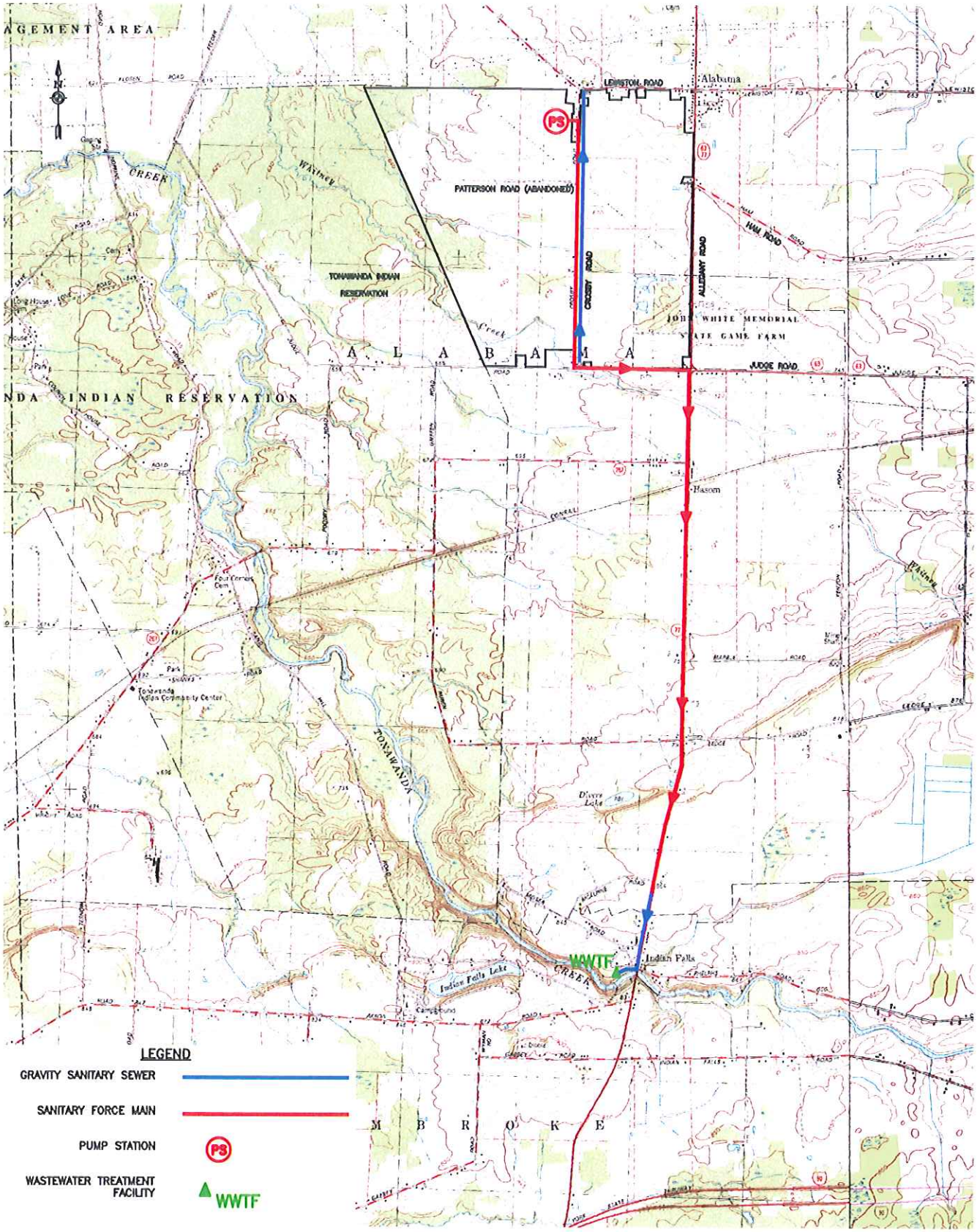

FIGURE #4

CLARK PATTERSON LEE
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ALTERNATIVE 3

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

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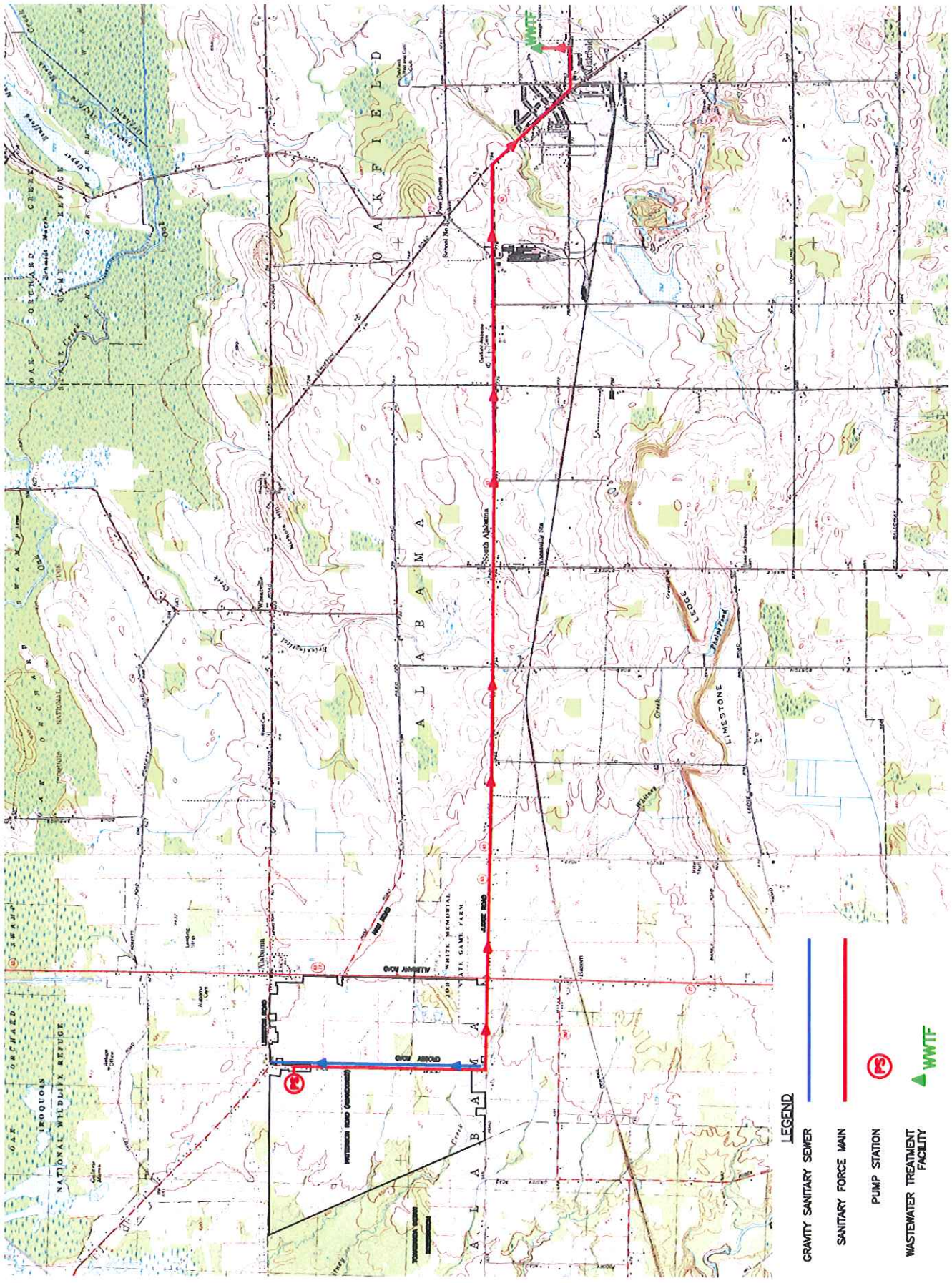

FIGURE #5

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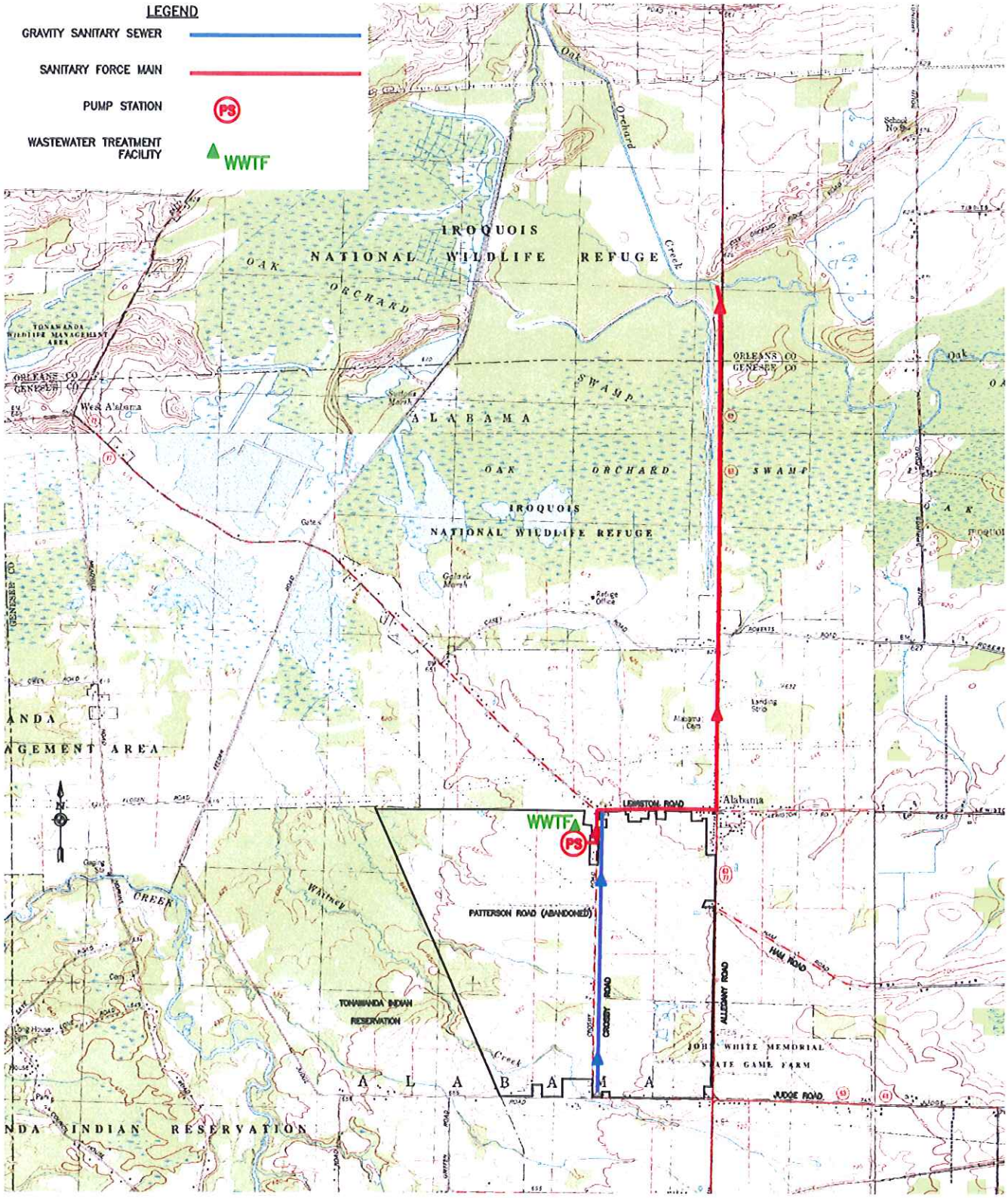

FIGURE #6

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ALTERNATIVE 5

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FIGURE #7

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ALTERNATIVE 6

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

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STAMP
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PRELIMINARY BUDGET ESTIMATE
DATE: 12/28/10

Alternative 1: On-Site WWTF, Indian Falls Discharge

Item	Description	1.0 MGD Design Flows				Expansion to 3.0 MGD				Total Capital Costs
		Quantity	Unit	Unit Price	Total	Quantity	Unit	Unit Price	Total	
1	Expandable Pump Station (3.0 MGD max. capacity)	1,000,000	Gal	$1.00	$ 1,000,000.00	2,000,000	Gal	$1.00	$ 2,000,000.00	$ 3,000,000.00
2A	30-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main	11,000	LF	$300.00	$ 3,300,000.00		LF	$300.00	$ -	$ 3,300,000.00
2B	36-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main		LF	$450.00	$ -		LF	$450.00	$ -	$ -
3A	18-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$100.00	$ -		LF	$100.00	$ -	$ -
3B	20-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$110.00	$ -		LF	$110.00	$ -	$ -
3C	24-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$125.00	$ -		LF	$125.00	$ -	$ -
3D	30-Inch Sanitary Sewer Force Main (PVC or HDPE)	27,000	LF	$135.00	$ 3,645,000.00		LF	$135.00	$ -	$ 3,645,000.00
4	New Wastewater Treatment Facility/Upgrade	1,000,000	Gal	$7.00	$ 7,000,000.00	2,000,000	Gal	$7.00	$ 14,000,000.00	$ 21,000,000.00
5	Rock Excavation	500	CY	$100.00	$ 50,000.00	100	CY	$100.00	$ 10,000.00	$ 60,000.00
	CONSTRUCTION SUBTOTAL				**$ 14,995,000.00**				**$ 14,010,000.00**	**$ 29,005,000.00**
	CONTINGENCY (15%)				$ 2,249,250.00				$ 2,101,500.00	$ 4,350,750.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 3,748,750.00				$ 3,502,500.00	$ 7,251,250.00
	TOTAL				$ 20,993,000.00				$ 19,614,000.00	$ 40,607,000.00
	TOTAL CAPITAL COST				**$ 20,993,000.00**				**$ 19,614,000.00**	**$ 40,607,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.

STAMP
SEWER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/28/10

Alternative 2: On-Site WWTF, Tonawanda Discharge

Item	Description	1.0 MGD Design Flows				Expansion to 3.0 MGD				Total Capital Costs
		Quantity	Unit	Unit Price	Total	Quantity	Unit	Unit Price	Total	
1	Expandable Pump Station (3.0 MGD max. capacity)	1,000,000	Gal	$1.00	$ 1,000,000.00	2,000,000	Gal	$1.00	$ 2,000,000.00	$ 3,000,000.00
2A	30-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main	18,000	LF	$300.00	$ 5,400,000.00		LF	$300.00	$ -	$ 5,400,000.00
2B	36-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main		LF	$450.00	$ -		LF	$450.00	$ -	$ -
3A	18-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$100.00	$ -		LF	$100.00	$ -	$ -
3B	20-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$110.00	$ -		LF	$110.00	$ -	$ -
3C	24-Inch Sanitary Sewer Force Main (PVC or HDPE)	8,000	LF	$125.00	$ 1,000,000.00		LF	$125.00	$ -	$ 1,000,000.00
3D	30-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$135.00	$ -		LF	$135.00	$ -	$ -
4	New Wastewater Treatment Facility/Upgrade	1,000,000	Gal	$7.00	$ 7,000,000.00	2,000,000	Gal	$7.00	$ 14,000,000.00	$ 21,000,000.00
5	Rock Excavation	500	CY	$100.00	$ 50,000.00	100	CY	$100.00	$ 10,000.00	$ 60,000.00
	CONSTRUCTION SUBTOTAL				**$ 14,450,000.00**				**$ 14,010,000.00**	**$ 28,460,000.00**
	CONTINGENCY (15%)				$ 2,167,500.00				$ 2,101,500.00	$ 4,269,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 3,612,500.00				$ 3,502,500.00	$ 7,115,000.00
	TOTAL				$ 20,230,000.00				$ 19,614,000.00	$ 39,844,000.00
	TOTAL CAPITAL COST				**$ 20,230,000.00**				**$ 19,614,000.00**	**$ 39,844,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.

STAMP
SEWER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/28/10

Alternative 3: Indian Falls WWTF

Item	Description	1.0 MGD Design Flows				Expansion to 3.0 MGD				Total Capital Costs
		Quantity	Unit	Unit Price	Total	Quantity	Unit	Unit Price	Total	
1	Expandable Pump Station (3.0 MGD max. capacity)	1,000,000	Gal	$1.00	$ 1,000,000.00	2,000,000	Gal	$1.00	$ 2,000,000.00	$ 3,000,000.00
2A	30-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main	11,000	LF	$300.00	$ 3,300,000.00		LF	$300.00	$ -	$ 3,300,000.00
2B	36-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main		LF	$450.00	$ -		LF	$450.00	$ -	$ -
3A	18-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$100.00	$ -		LF	$100.00	$ -	$ -
3B	20-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$110.00	$ -		LF	$110.00	$ -	$ -
3C	24-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$125.00	$ -		LF	$125.00	$ -	$ -
3D	30-Inch Sanitary Sewer Force Main (PVC or HDPE)	27,000	LF	$135.00	$ 3,645,000.00		LF	$135.00	$ -	$ 3,645,000.00
4	New Wastewater Treatment Facility/Upgrade	1,000,000	Gal	$7.00	$ 7,000,000.00	2,000,000	Gal	$7.00	$ 14,000,000.00	$ 21,000,000.00
5	Rock Excavation	500	CY	$100.00	$ 50,000.00	100	CY	$100.00	$ 10,000.00	$ 60,000.00
	CONSTRUCTION SUBTOTAL				**$ 14,995,000.00**				**$ 14,010,000.00**	**$ 29,005,000.00**
	CONTINGENCY (15%)				$ 2,249,250.00				$ 2,101,500.00	$ 4,350,750.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 3,748,750.00				$ 3,502,500.00	$ 7,251,250.00
	TOTAL				$ 20,993,000.00				$ 19,614,000.00	$ 40,607,000.00
	TOTAL CAPITAL COST				**$ 20,993,000.00**				**$ 19,614,000.00**	**$ 40,607,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.

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SEWER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
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Alternative 4: Village of Oakfield Existing WWTF

Item	Description	1.0 MGD Design Flows				Expansion to 3.0 MGD				Total Capital Costs
		Quantity	Unit	Unit Price	Total	Quantity	Unit	Unit Price	Total	
1	Expandable Pump Station (3.0 MGD max. capacity)	1,000,000	Gal	$1.00	$ 1,000,000.00	2,000,000	Gal	$1.00	$ 2,000,000.00	$ 3,000,000.00
2A	30-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main	8,000	LF	$300.00	$ 2,400,000.00		LF	$300.00	$ -	$ 2,400,000.00
2B	36-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main		LF	$450.00	$ -		LF	$450.00	$ -	$ -
3A	18-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$100.00	$ -		LF	$100.00	$ -	$ -
3B	20-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$110.00	$ -		LF	$110.00	$ -	$ -
3C	24-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$125.00	$ -		LF	$125.00	$ -	$ -
3D	30-Inch Sanitary Sewer Force Main (PVC or HDPE)	50,100	LF	$135.00	$ 6,763,500.00		LF	$135.00	$ -	$ 6,763,500.00
4	New Wastewater Treatment Facility/Upgrade	1,000,000	Gal	$7.00	$ 7,000,000.00	2,000,000	Gal	$7.00	$ 14,000,000.00	$ 21,000,000.00
5	Rock Excavation	500	CY	$100.00	$ 50,000.00	100	CY	$100.00	$ 10,000.00	$ 60,000.00
	CONSTRUCTION SUBTOTAL				**$ 17,213,500.00**				**$ 14,010,000.00**	**$ 31,223,500.00**
	CONTINGENCY (15%)				$ 2,582,025.00				$ 2,101,500.00	$ 4,683,525.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 4,303,375.00				$ 3,502,500.00	$ 7,805,875.00
	TOTAL				$ 24,098,900.00				$ 19,614,000.00	$ 43,712,900.00
	TOTAL CAPITAL COST				**$ 24,099,000.00**				**$ 19,614,000.00**	**$ 43,713,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.

STAMP
SEWER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/28/10

Alternative 5: On-Site WWTF, Oak Orchard Creek Discharge

Item	Description	1.0 MGD Design Flows				Expansion to 3.0 MGD				Total Capital Costs
		Quantity	Unit	Unit Price	Total	Quantity	Unit	Unit Price	Total	
1	Expandable Pump Station (3.0 MGD max. capacity)	1,000,000	Gal	$1.00	$ 1,000,000.00	2,000,000	Gal	$1.00	$ 2,000,000.00	$ 3,000,000.00
2A	30-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main	8,000	LF	$300.00	$ 2,400,000.00		LF	$300.00	$ -	$ 2,400,000.00
2B	36-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main		LF	$450.00	$ -		LF	$450.00	$ -	$ -
3A	18-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$100.00	$ -		LF	$100.00	$ -	$ -
3B	20-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$110.00	$ -		LF	$110.00	$ -	$ -
3C	24-Inch Sanitary Sewer Force Main (PVC or HDPE)	20,000	LF	$125.00	$ 2,500,000.00		LF	$125.00	$ -	$ 2,500,000.00
3D	30-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$135.00	$ -		LF	$135.00	$ -	$ -
4	New Wastewater Treatment Facility/Upgrade	1,000,000	Gal	$7.00	$ 7,000,000.00	2,000,000	Gal	$7.00	$ 14,000,000.00	$ 21,000,000.00
5	Rock Excavation	500	CY	$100.00	$ 50,000.00	100	CY	$100.00	$ 10,000.00	$ 60,000.00
	CONSTRUCTION SUBTOTAL				**$ 12,950,000.00**				**$ 14,010,000.00**	**$ 26,960,000.00**
	CONTINGENCY (15%)				$ 1,942,500.00				$ 2,101,500.00	$ 4,044,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 3,237,500.00				$ 3,502,500.00	$ 6,740,000.00
	TOTAL				$ 18,130,000.00				$ 19,614,000.00	$ 37,744,000.00
	TOTAL CAPITAL COST				**$ 18,130,000.00**				**$ 19,614,000.00**	**$ 37,744,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.

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PRELIMINARY BUDGET ESTIMATE
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Alternative 6: On-Site WWTF, Whitney Creek Discharge

Item	Description	1.0 MGD Design Flows				Expansion to 3.0 MGD				Total Capital Costs
		Quantity	Unit	Unit Price	Total	Quantity	Unit	Unit Price	Total	
1	Expandable Pump Station (3.0 MGD max. capacity)	1,000,000	Gal	$1.00	$ 1,000,000.00	2,000,000	Gal	$1.00	$ 2,000,000.00	$ 3,000,000.00
2A	30-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main	8,000	LF	$300.00	$ 2,400,000.00		LF	$300.00	$ -	$ 2,400,000.00
2B	36-Inch Diameter PVC SDR-35 Sanitary Sewer Gravity Main		LF	$450.00	$ -		LF	$450.00	$ -	$ -
3A	18-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$100.00	$ -		LF	$100.00	$ -	$ -
3B	20-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$110.00	$ -		LF	$110.00	$ -	$ -
3C	24-Inch Sanitary Sewer Force Main (PVC or HDPE)	7,100	LF	$125.00	$ 887,500.00		LF	$125.00	$ -	$ 887,500.00
3D	30-Inch Sanitary Sewer Force Main (PVC or HDPE)		LF	$135.00	$ -		LF	$135.00	$ -	$ -
4	New Wastewater Treatment Facility/Upgrade	1,000,000	Gal	$7.00	$ 7,000,000.00	2,000,000	Gal	$7.00	$ 14,000,000.00	$ 21,000,000.00
5	Rock Excavation	500	CY	$100.00	$ 50,000.00	100	CY	$100.00	$ 10,000.00	$ 60,000.00
	CONSTRUCTION SUBTOTAL				**$ 11,337,500.00**				**$ 14,010,000.00**	**$ 25,347,500.00**
	CONTINGENCY (15%)				$ 1,700,625.00				$ 2,101,500.00	$ 3,802,125.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 2,834,375.00				$ 3,502,500.00	$ 6,336,875.00
	TOTAL				$ 15,872,500.00				$ 19,614,000.00	$ 35,486,500.00
	TOTAL CAPITAL COST				**$ 15,873,000.00**				**$ 19,614,000.00**	**$ 35,487,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.

APPENDIX B – SECONDARY ALTERNATIVES

B-1: FIGURES

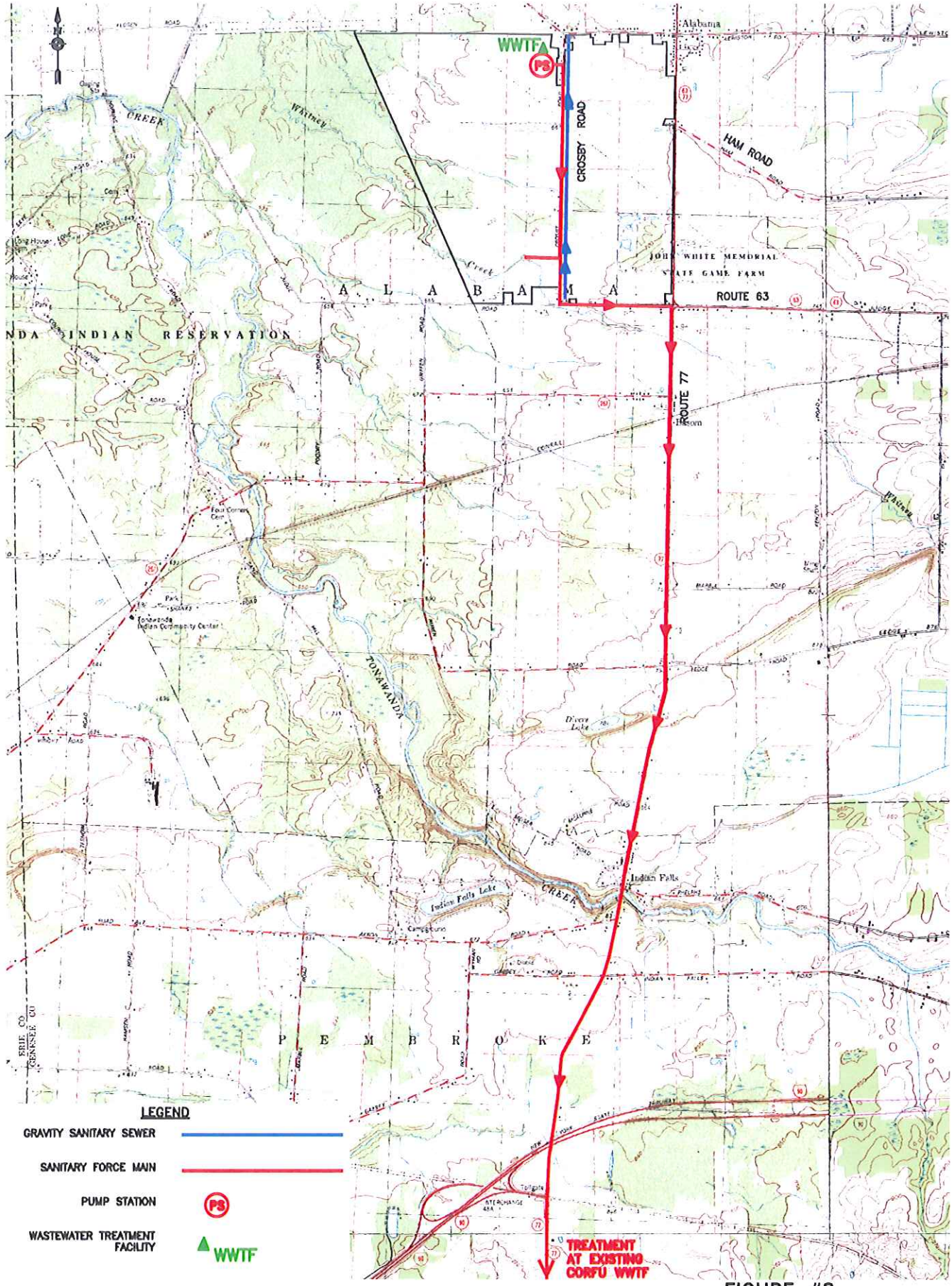

FIGURE #8

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SECONDARY ALTERNATIVE

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

TOWN OF ALABAMA, GENESEE COUNTY, NEW YORK

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FIGURE #9

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SECONDARY ALTERNATIVE

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

TOWN OF ALABAMA, GENESEE COUNTY, NEW YORK

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APPENDIX C – INDUSTRY REQUIREMENTS

All Information from the “Industry Requirements and Environmental, Health & Safety Review Report” prepared by CH2M Hill.

WASTEWATER

5.1 Wastewater Sources and Treatment

All of the industries considered in this report have the potential to generate wastewater from manufacturing process and process support systems. Wastewater generated on the various sites will be collected prior to treatment and will be treated to meet the applicable requirements of the Clean Water Act, as codified with Title 40 of the Code of Federal Regulations and local sewer use ordinances. Federal categorical pretreatment standards may apply to certain dischargers. For example, PV or semiconductor manufacturing can involve wastewater discharges subject to 40 CFR Part 469 – Electrical and Electronic Components Point Source Category. STAMP industries will discharge to a POTW and Pretreatment Standards for New Sources (PSNS) would typically apply. These standards include limits on pH and total toxic organics. Wastewater generated by these industries requires relatively conventional and commercially proven treatment technologies.

Table 5-1 provides a summary of the typical wastewater constituents and treatment technologies prevalent in the industries considered.

Table 5.1-1 – Typical Wastewater Constituents and Treatment Methods

Constituent	Treatment Method
Inorganic acids & bases	Acid/Base Neutralization
Fluorides	Precipitation, flocculation & filtration
Metals	Precipitation and/or filtration with ion exchange
Metals (low concentrations)	Ion exchange

5.2 Wastewater Characteristics

After treatment, wastewater will be discharged to the local municipal sanitary sewer in accordance with pretreatment standards, local effluent limits and permit conditions. Typical estimated wastewater constituent concentrations associated with each of the industrial manufacturing groups is summarized in Table 5.2-1 below.

Table 5.1-1 – Typical Wastewater Constituents

Primary Manufacturing Technology Exhibiting these Characteristics	Wastewater Constituent	Anticipated Level or Concentration at Monitored Point of Compliance	Typical Local Limit
All	pH	6.0 - 9.0	5.0 - 11.0
All	TSS	100 - 300 mg/l	300 mg/l
All	TDS	< 1500 mg/l	
All	Appearance	Clear, no color or odor	
All	COD	< 300 mg/l	500 mg/l
All	BOD	< 300 mg/l	400 mg/l
All	Temperature	< 80^{O}F (26.6^{O}C)	< 140^{O}F (<60^{O}C)
All	Total Toxic Organics	n/d	1.37
All	Oil & Grease	< 50 mg/l	< 100 mg/l
cSi	Nitrate	< 350 mg/l	n/e
All	Sulfate	< 150 mg/l	n/e
FPD/ Med Imagining	Phosphate	< 15 mg/l	n/e
All	Chloride	< 100 mg/l	n/e
All	Fluoride	< 15 mg/l	n/e
CIGS	Ammonia (as NH3)	< 285 mg/l	n/e
CIGS	TKN	< 250 mg/l	n/e
All	Antimony	n/d	10 mg/l
All	Arsenic	n/d	0.3 - 1.4 mg/l
All	Beryllium	n/d	0.3 mg/l
All	Cyanide (total)	n/d	0.3 - 1.5 mg/l
All	Chromium	n/d	2.0 - 5.0 mg/l
CIGS, CdTe	Cadmium	0.025 mg/l	0.04 - 0.3 mg/l
Nano	Copper	<1.0	1.0 - 4.0 mg/l
Nano	Lead	<0.3	0.5 - 1.1 mg/l
All	Nickel	n/d	0.8 - 2.0 mg/l
cSi	Silver	0.01 mg/l	0.02 - 0.40 mg/l
All	Zinc	n/d	0.5 - 5.0 mg/l
All	Selenium	n/d	2.5 mg/l
All	Mercury	n/d	0.001 - 0.008 mg/l

n/d = non-detect (below detection limits)

n/e = Local limit not typically established

5.3 Wastewater Generation Rate

The estimated maximum average daily wastewater generation rate from the proposed facilities is provided in Table 5.3-1 below. These estimated flow rates include all treated process wastewater, wastewater generated from utility systems (i.e., cooling tower blowdown) and sanitary wastewater and thus represents the estimated wastewater discharge rate delivered to the municipal sewer system.

Table 5.3-1 – Typical Wastewater Generation Rates

Manufacturing Technology	Maximum Gallons Per Day (gpd)	Production Capacity Basis (MW)
PV – Crystalline Silicon	460,000	170
PV – Amorphous Silicon	200,000	140
PV – CdTe	450,000	280
PV – CIGS	520,000	690
FPD/ Med Imaging	420,000	200,000 s.f. or ~15,000 sheets/mo
Nano	340,000	400,000 s.f. manufacturing area
Totals	2,390,000	

All Information from the "Industry Requirements and Environmental, Health & Safety Review Report" prepared by CH2M Hill.