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

Water Service Preliminary Report

Prepared for:

Genesee County Economic Development Center
99 Medtech Drive, Batavia, NY 14020

February 2011

Clark Patterson Lee
DESIGN PROFESSIONALS

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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.

The purpose of this Water Service Preliminary Report is to evaluate the necessary improvements required to provide water service to the STAMP project site.

The analysis considers two build-out phases; an initial construction phase (Phase 1) and a full build-out scenario (Full Build-Out) as summarized below:

Construction Phase	**Assumed Building Development Area (SF)**	**Assumed Employees**	**Water 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	2,990,000	3,000,000

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 (10) to twenty-five (25) years. The first phase of construction may take place in the next few years. For these reasons, a phased approach is required for potential water service alternatives.

Water resources and large diameter water mains are very limited in the vicinity of the project area. This results in a challenging and complex solution to providing an adequate water supply to the STAMP project site. Providing the high water demand to the site requires development of a network with multiple sources, rather than one or two simple high volume connections.

Several alternatives were considered to provide a water service system that would meet the needs of the STAMP project. The alternatives consist of providing a supply system including new water mains and connections to existing water mains in the surrounding area, as well as on-site storage tanks. The following is a summary of the alternatives considered:

Alternative	Alternative Description	Total Capital Cost	Initial Water Supply (gpd)	Water Storage (Gallons)
1	Route 77 Water Main, Pembroke Connection	$5,330,000	720,000	0
2	Water Storage Tank	$8,100,000	0	2,000,000
2A	Water Storage Tank Expansion	$7,800,000	0	2,000,000
3	Route 63 and South	$3,817,000	360,000	0

	Pearl Road Water Main			
4	Maple Street and Galloway Road Water Main	$3,605,000	360,000	0
5	Route 77 Water Main, North of Project Site	$2,200,000	100,000	0
6	Medina Connection	$5,629,000	360,000	0
7	Lyndonville WTF Expansion	$56,875,000	3,000,000	0

From this analysis, it appears that a phased network approach will be required to satisfy the large demands of the proposed STAMP site. The most practical sources of supply appear to be to the south and west of the site, in Pembroke and Oakfield and through Genesee County.

Phase 1 Project

Alternatives 1: Route 77 Water Main, Pembroke Connection and 3: Route 63 and South Pearl Road Water Main would be required to meet the demand of 1.0 MGD required for Phase 1 of the development. Alternative 2: Water Storage Tank would provide the required on-site storage for fire flow and peak demands. The estimated total capital costs associated with Phase 1 are shown below.

Phase 1		
Alternative	Alternative Description	Total Capital Cost
1	Route 77 Water Main, Pembroke Connection	$5,330,000
2	Water Storage Tank	$8,100,000
3	Route 63 and South Pearl Road Water	$3,817,000
	Total Capital Cost	**$17,247,000**

Phase 1A Project

The Town of Alabama and Village of Oakfield are planning water projects that are similar to Alternative 3. If these projects were completed in advance of the STAMP project and the proposed water main materials and sizes were upgraded, the total capital costs associated with Phase 1 could be reduced to $14,484,000 as summarized below.

Phase 1A		
Alternative	Alternative Description	Total Capital Cost
1	Route 77 Water Main, Pembroke Connection	$5,330,000
2	Water Storage Tank	$8,100,000
3A	Route 63 and South Pearl Road Water	$518,000
	Total Capital Cost	**$13,948,000**

Full Build-Out

In addition to the required alternatives constructed for Phase 1 of development, additional improvements would be required in order to service the Full Build-Out of the STAMP site. Alternative 4: Maple Street and Galloway Road Water Main would be required for Full Build-Out.

To provide the full 3.0 MGD to the STAMP site, significant upgrades will also be required in Genesee County, the Monroe County Water Authority and Erie County water systems. More extensive studies would be required to determine upgrades that would be needed. For the purpose of this report, rough costs have been estimated for these upgrades. The estimated total capital costs associated with Full Build-Out Expansion are shown below

Full Build-Out Expansion Costs		
Alternative	Alternative Description	Expansion Costs
4	Maple Street and Galloway Road Water Main	$3,605,000
2A	Water Storage Tank Expansion	$7,800,000
Upgrades of other Systems	Genesee County, Monroe County Water Authority Systems	$10,000,000
	Total Capital Cost	**$21,405,000**

To arrive at the Full Build-Out total capital costs, the Phase 1 costs must be added to the Full Build-Out Expansion Costs. The Full Build-Out total capital costs are summarized as follows:

	Phase 1	**Phase 1A**
Phase 1	$17,247,000	$13,948,000
Full Build-Out Expansion	$21,405,000	$21,405,000
Full Build-Out Total Capital Cost	**$38,652,000**	**$35,353,000**

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 Water Service Preliminary Report is to evaluate the necessary improvements required to provide water sewer service to the STAMP project site.

Existing Water Supply

Currently, the majority of the STAMP project site consists of agricultural land and a few residential houses that do not contain municipal water service or fire protection and are served by private wells. The nearest municipal water supply sources are located in the Village of Oakfield, approximately 30,000 linear feet (5.7 miles) to the east of the project site, and in the Town of Pembroke, approximately 25,000 linear feet (4.7 miles) to the south of the project site. The existing water service map is shown in Figure 1 in Appendix A.

The Town of Alabama, the Village of Oakfield, and the Town of Pembroke are planning water main projects in the vicinity of the project site. The planned municipal projects are shown in Figure 2 in Appendix A.

The Town of Alabama is proposing an 8-inch water main along Route 77, from the intersection of Lewiston Road south to the intersection of Route 63; a 12-inch water main along Route 63, from Route 77 to Maple Street; and a 12-inch water main along Route 63, from Maple Street east to the Village of Oakfield water system.

The Village of Oakfield is planning a replacement of an existing 8-inch transmission water main with a new 12-inch transmission water main along South Pearl Street, from Route 63 in the Village south to Galloway Road. They are also planning the replacement of their existing 150,000 gallon water storage tank with a 400,000 gallon tank near the intersection of Lewiston Road and Route 63. The tank project is expected to be constructed in 2011.

The Town of Pembroke is planning on installing a new 12-inch water main along Route 77, from the NYS Thruway north to Indian Falls Road and along Indian Falls Road from Route 77 to Maple Street.

The exact timing for the completion of the planned water main projects will be dependent upon the Towns and Village securing funding sources. The proposed projects may not be completed prior to development of the Phase 1 infrastructure for the STAMP project.

There are several small wells located within the project site and within the immediate surrounding area. Two soil borings were completed in August of 2008 at the STAMP site. Based upon the

observed silt content and the density of the material, it does not appear that the soil or bedrock in these locations exhibit aquifer characteristics. These wells may be used for small production domestic wells, intended for households or small businesses, but would not be able to support large manufacturing developments such as the STAMP project.

Development Phases

This evaluation will consider several alternatives to provide water 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. Portions of this report have been included in Appendix C.

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 estimated water service demand for the initial phase is estimated to be 1,000,000 gallons per day (gpd). 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 water service demand is approximately 2,990,000 gpd. For this phase, a water design demand of 3,000,000 gpd has been evaluated. A table summarizing the two phases is shown below.

Construction Phase	Assumed Building Development Area (SF)	Assumed Employees	Water 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	2,990,000	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 (10) to twenty-five (25) years. The first phase of construction may take place in the next few years. For these reasons, a phased approach is required for potential water service alternatives.

Water resources and large diameter water mains are very limited in the vicinity of the project area. This results in a challenging and complex solution to providing an adequate water supply to the STAMP project site. Providing the high water demand to the site requires development of a network with multiple sources, rather than one or two simple high volume connections.

Several alternatives were considered to provide a water service system that would meet the needs of the STAMP project. The alternatives consist of providing a supply system including new water mains and connections to existing water mains in the surrounding area, as well as on-site storage tanks.

The evaluation will consider the installation of the on-site water system along the main corridor of the project only (Crosby Road). Approximately 11,500 linear feet of new 16-inch water main would be constructed within the limits of the STAMP project site along Crosby Road and Judge Road. These improvements would establish the "backbone" for a new distribution system within the STAMP project site for future tenant use. 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 distribution network needs and layout.

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

Alternative 1: Route 77 Water Main, Pembroke Connection

Alternative 1: Route 77 Water Main, Pembroke Connection is shown in Figure 3 of Appendix A. This alternative would involve the following improvements:

- Approximately 24,500 linear feet of new 16-inch water main along Route 77 from the STAMP project site south to the NYS Thruway (I90). A connection would be made to an existing 12-inch ductile iron pipe water main, located 500 feet north of the NYS Thruway.

- Approximately 7,000 linear feet of new 12-inch water main along Route 77 from Route 5 to 500 feet north of the NYS Thruway. This water main would connect to the existing 16-inch water main on Route 5 and would be installed in parallel with the existing 12-inch water main on Route 77. The (2) 12-inch mains would provide similar capacity to a 16-inch water main.

Based on preliminary discussions with Erie County and Monroe County Water Authorities, the approximate available capacity at this connection point is approximately 500 gpm or 720,000 gpd. The supply of water at this connection point would most likely be available with little upgrades throughout the existing systems. An allowance has been included to upgrade the existing pump station located on Route 5. For demands above the 720,000 gpd, additional upgrades and improvements would be required.

The water lines constructed in this alternative could provide water service options to the Route 77 corridor, the Hamlet of Indian Falls, the Town of Alabama, and other future development.

The majority of the water main would be constructed within public road rights of way via open cut method. Directional Drilling method would be utilized to install the water main below Tonawanda Creek and other smaller tributary streams. Permitting and approval of construction under the Tonawanda Creek would require New York State Department of Environmental Conservation (NYSDEC) and Army Corps of Engineers approval. Approval would be required from the New York State Department of Transportation and the NYS Thruway Authority to install the water main within the right-of-way of Route 77 and under the NYS Thruway.

The estimated total capital cost associated with this alternative is **$5,330,000.** A full estimate has been included in Appendix A.

Alternative 2 and 2A: Water Storage Tank and Expansion

Alternative 2 (Water Storage Tank) is shown in Figure 4 of Appendix A. This alternative would consist of constructing a water storage tank within the STAMP project site. For the initial phase of the project, the size of the tank would be 2,000,000 gallons. This tank would need to be expandable to 4,000,000 gallons to accommodate the final Full Build-Out of the project.

It is anticipated that elevated storage tanks would be utilized. However the style of tank and dimensions would be determined at a later date.

This alternative would provide the STAMP project site with water storage for fire flow demand and assist in providing service during peak demand hours.

The estimated total capital cost associated with the first phase of this alternative is **$8,100,000.** The estimated total capital cost of the Full Build-Out expansion would be an additional **$7,800,000**. A full estimate has been included in Appendix A.

Alternative 3: Route 63 and South Pearl Road/Street Water Main

Alternative 3: Route 63 and South Pearl Road/Street Water Main is shown in Figure 5 of Appendix A. This alternative would consist of the following improvements:

- Approximately 15,000 linear feet of new 16-inch water main along Route 63 from the STAMP project site east to the intersection of Maple Street and Route 63.

- Approximately 15,000 linear feet of new 12-inch water main along Route 63 from Maple Street to the intersection of Lewiston Road and Route 63 within the Village of Oakfield. The new 12-inch water main would be connected to an existing 12-inch water main at this location.

- Approximately 9,500 linear feet of new 12-inch water main along South Pearl Street from Route 63 in the Village of Oakfield south to the intersection of Galloway Road and South Pearl Road.

Preliminary discussions with the Village of Oakfield, Town of Batavia and the Monroe County Water Authority have revealed that an additional 250 gpm or 360,000 gpd would most likely be available from these upgrades in this alternative. Significantly more water could not be transmitted through the Village of Oakfield water system. Demand in excess of 250 gpm would require additional upgrades throughout the Monroe County Water Authority system and the Batavia water system.

The Town of Alabama is proposing a 12-inch PVC water main along Route 63 from Lewiston Road in the Village of Oakfield to Route 77 in the Town of Alabama. These improvements may or may not be constructed prior to the STAMP infrastructure. If this project does occur before the STAMP project, then providing additional investment funds required to upgrade the 12-inch PVC water main to ductile iron pipe water main in this location should be considered along with an increase to 16-inch diameter from Maple Street Road to Route 77. Upgrading to a 16-inch ductile iron pipe between Maple Street Road and Route 77 will provide more capacity to the STAMP project when needed. Upgrading to ductile iron pipe will allow the option of dedicating the main to the Monroe County Water Authority in the future for operation and maintenance purposes.

The Village of Oakfield is planning the replacement of their existing 8-inch transmission water main with a new 12-inch transmission water main along South Pearl Street, from Route 63 in the Village south to Galloway Road. If the Village of Oakfield does not complete this improvement prior to construction of the STAMP infrastructure, then this improvement would be critical to include in the overall STAMP project. The existing 8-inch transmission water main does not have excess capacity and is in failing condition.

The estimated total capital cost associated with this alternative is **$3,817,000.** If the proposed projects by the Town of Alabama and the Village of Oakfield are completed prior to the STAMP development, then the associated capital costs with the Alternative 3A for upgrading the water main would be **$518,000**. A full estimate has been included in Appendix A.

The proposed connection to the Village of Oakfield would provide a small portion of the Full Build-Out capacity, but a significant portion of the required Phase 1 capacity, considering the limited water supply options in the area. Alternate 3A provides a good cost/benefit ratio for STAMP, while Alternate 3 does not. However, these water main projects are critical to the community surrounding STAMP and their perception and acceptance of the STAMP project.

Alternative 4: Maple Street and Galloway Road Water Main

Alternative 4: Maple Street and Galloway Road Water Main is shown in Figure 6 of Appendix A. This alternative would include the following improvements:

- Approximately 15,000 linear feet of new 16-inch water main along Maple Street from Route 63 south to Galloway Road.

- Approximately 3,000 linear feet of new 12-inch water main along Maple Street from Galloway Road south to Christie Road. A connection would be made to an existing 8-inch water main at the intersection of Christie Road and Maple Street.

- Approximately 18,000 linear feet of new 12-inch water main along Galloway Road from Maple Street east to South Pearl Road. A connection would be made to an existing 8-inch water main at the intersection of Galloway Road and South Pearl Road.

By completing this alternative, an additional approximately 250 gpm or 360,000 gpd would be available for the STAMP project. This alternative would provide a bypass of the Oakfield water system. This would allow for significant increases in capacity to STAMP as improvements are made within the Town of Batavia and Monroe County Water Authority systems. A Genesee County Phase II Water Supply project is in the planning phases. This project is roughly $20,000,000 and would involve additional Monroe County Water Authority system extensions in Genesee County and possible interconnection of system transmission lines. The Genesee County Phase II project is essential to developing a reliable and safe water supply to the area that is capable of expansion and growth.

The estimated total capital cost associated with this alternative, without upgrades in other systems, is **$3,605,000.** A full estimate has been included in Appendix A.

At least portions of the Genesee County Phase II project would need to be completed to provide capacity for Full Build-Out of the STAMP project. Additional evaluations would be required to determine the extent of the upgrades that would be necessary. The costs associated with these upgrades could be in excess of $10,000,000.

Alternative 5: Route 77 Water Main, North of Project Site

Alternative 5: Route 77 Water Main, North of Project Site is shown in Figure 7 of Appendix A. This alternative would consist of approximately 20,600 linear feet of new 16-inch water main along Route 77 north of the STAMP project site to the Genesee County and Niagara County boundary. The new 16-inch water main would connect to an existing 8-inch water main.

According to preliminary analyses, approximately 100,000 gpd to 200,000 gpd would be available from this source. This source may also require other system upgrades beyond the simple connection to provide this amount of water. Due to the large demands required from the STAMP development, this alternative would not support the initial phase of the project or provide a substantial contribution for the Full Build-Out.

The estimated total capital cost associated with this alternative is **$2,200,000.** A full estimate has been included in Appendix A.

Alternative 6: Medina Connection

Alternative 6: Medina Connection is shown in Figure 8 of Appendix A. This alternative would consist of approximately 55,000 linear feet of new 16-inch transmission water main along Route 63 north of the STAMP project site to Harrison Road, east on Harrison Road to Big Ford Road, north on Big Ford Road and north on Waterworks Road to the intersection of NYS Route 31A and Waterworks Road. The new 16-inch transmission water main would be connected to an existing 18-inch water main at this intersection. Construction of large diameter transmission mains through

the Village of Medina would not be practical due to the congestion of existing utilities and other existing physical features.

Based on recent projects completed in this area, it is believed that water supply from this connection would be limited and would be approximately 360,000 gpd. The water available at this connection is being used for other development, including a relatively new ethanol plant. Due to the large demands required from the STAMP development, this alternative may not support the initial phase of the project or provide a substantial contribution for the full build out.

The estimated total capital cost associated with this alternative is **$5,629,000.** A full estimate has been included in Appendix A.

Alternative 7: Lyndonville WTF Expansion

Alternative 7: Lyndonville WTF Expansion is shown in Figure 8 of Appendix A. This alternative would include expanding the existing Lyndonville WTF. The WTF is located along the shore of Lake Ontario in the Town of Yates, Orleans County, approximately 24 miles north of the STAMP project. It has a permitted capacity of approximately 400,000 gpd and currently operates at approximately 200,000 gpd.

This alternative would require substantial lengths of transmission water main in order to distribute the water to the STAMP project and nearby municipalities. Construction of large diameter transmission mains through the Village of Medina or Lyndonville would not be practical due to the congestion of existing utilities. Alternate routes would need to be explored. Bypass roads such as Waterworks Road and Bates Road may be practical.

This alternative could provide a new water source to Genesee and Orleans Counties. It would provide increased service to areas north of the STAMP project while providing an adequate and reliable source to the STAMP project. It would support increased demand at the STAMP site while allowing future development within the immediate area. Associated permits and easements would be required for the expanded facility and new distribution mains. The WTF would most likely remain municipally owned and operated. Additional operations and maintenance staff may be required.

This alternative represents the highest capital cost analyzed within this study. It would require a substantial initial cost to upgrade the WTF and install the distribution piping. While the significant investment and environmental permitting may not be ideal for Phase 1 of STAMP, this alternative may be a viable long term solution for the STAMP project and surrounding areas. For the purpose of this report, only approximate costs were calculated. Distribution routings, placement of the WTF and sizing would require further analysis.

The estimated total capital cost associated with this alternative is **$56,875,000.** A full estimate has been included in Appendix A.

Alternatives Summary

The following is a summary of the total capital cost for each of the alternatives:

Alternative	Alternative Description	Total Capital Cost	Initial Water Supply (gpd)	Water Storage (Gallons)
1	Route 77 Water Main, Pembroke Connection	$5,330,000	720,000	0
2	Water Storage Tank	$8,100,000	0	2,000,000
2A	Water Storage Tank Expansion	$7,800,000	0	2,000,000
3	Route 63 and South Pearl Road Water Main	$3,817,000	360,000	0
4	Maple Street and Galloway Road Water Main	$3,605,000	360,000	0
5	Route 77 Water Main, North of Project Site	$2,200,000	100,000	0
6	Medina Connection	$5,629,000	360,000	0
7	Lyndonville WTF Expansion	$56,875,000	3,000,000	0

Conclusions and Recommendations

The purpose of this Water Service Preliminary Report is to evaluate the necessary improvements required to provide water 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 water distribution system. From this analysis, it appears that a phased network approach will be required to satisfy the large demands of the proposed STAMP site. The most practical sources of supply appear to be to the south and west of the site, in Pembroke and Oakfield and through Genesee County.

Alternative 5: Route 77 Water Main, North of Project Site, Alternative 6: Medina Connection and Alternative 7: Lyndonville WTF Expansion do not appear to be practical or economical based on the water supply available, the needs of the STAMP site and the capital cost associated with these improvements.

Phase 1 Project

Approximately 1.0 MGD of water capacity is required for Phase 1 of the STAMP development. To meet this demand, several of the alternatives above would need to be completed. Alternatives 1: Route 77 Water Main, Pembroke Connection, 2: Water Storage Tank and 3: Route 63 and South Pearl Road Water Main would be required to meet Phase 1 demands. Figure 9 in Appendix B depicts the required Phase 1 improvements.

Alternatives 1: Route 77 Water Main, Pembroke Connection and 3: Route 63 and South Pearl Road Water Main would be required to construct a transmission distribution system that would service the STAMP project site. Alternative 1: Route 77 Water Main, Pembroke Connection would provide approximately 500 gpm or 720,000 gpd and Alternative 3: Route 63 and South Pearl Road Water Main would provide approximately 250 gpm or 360,000 gallons per day to the site for a total of 1.08 MGD, meeting the demand of 1.0 MGD required for Phase 1 of the development. Alternative 2: Water Storage Tank would provide the required on-site storage for fire flow and peak demands.

The estimated total capital cost associated with Phase 1 is **$17,247,000** and is summarized below. A full estimate has been included in Appendix B.

Phase 1		
Alternative	Alternative Description	Total Capital Cost
1	Route 77 Water Main, Pembroke Connection	$5,330,000
2	Water Storage Tank	$8,100,000
3	Route 63 and South Pearl Road Water	$3,817,000
	Total Capital Cost	**$17,247,000**

Phase 1A Project

If the proposed projects by the Town of Alabama and the Village of Oakfield were completed prior to the STAMP development, then the associated capital costs with the Phase 1A Project would be **$13,948,000** as summarized below. A full estimate has been included in Appendix B.

Phase 1A		
Alternative	Alternative Description	Total Capital Cost
1	Route 77 Water Main, Pembroke Connection	$5,330,000
2	Water Storage Tank	$8,100,000
3A	Route 63 and South Pearl Road Water	$518,000
	Total Capital Cost	**$13,948,000**

Full Build-Out Project

In addition to the required alternatives constructed for Phase 1 of development, additional improvements would be required in order to service the Full Build-Out of the STAMP site. Alternative 4: Maple Street and Galloway Road Water Main would be required for Full Build-Out and to provide an additional 500 gpm or 720,000 gpd of supply to the site without improvements in other water systems. Figure 10 of Appendix B depicts the required Full Build-Out improvements.

To provide the full 3.0 MGD to the STAMP site, significant upgrades will also be required in Genesee County, the Monroe County Water Authority and Erie County water systems. More extensive studies would be required to determine the upgrades that would be needed. For the purpose of this report, rough costs have been estimated for these upgrades.

The estimated total capital cost associated with upgrading the water service from 1.0 MGD to 3.0 MGD would be **$26,299,000** and is summarized below. A full estimate has been included in Appendix B.

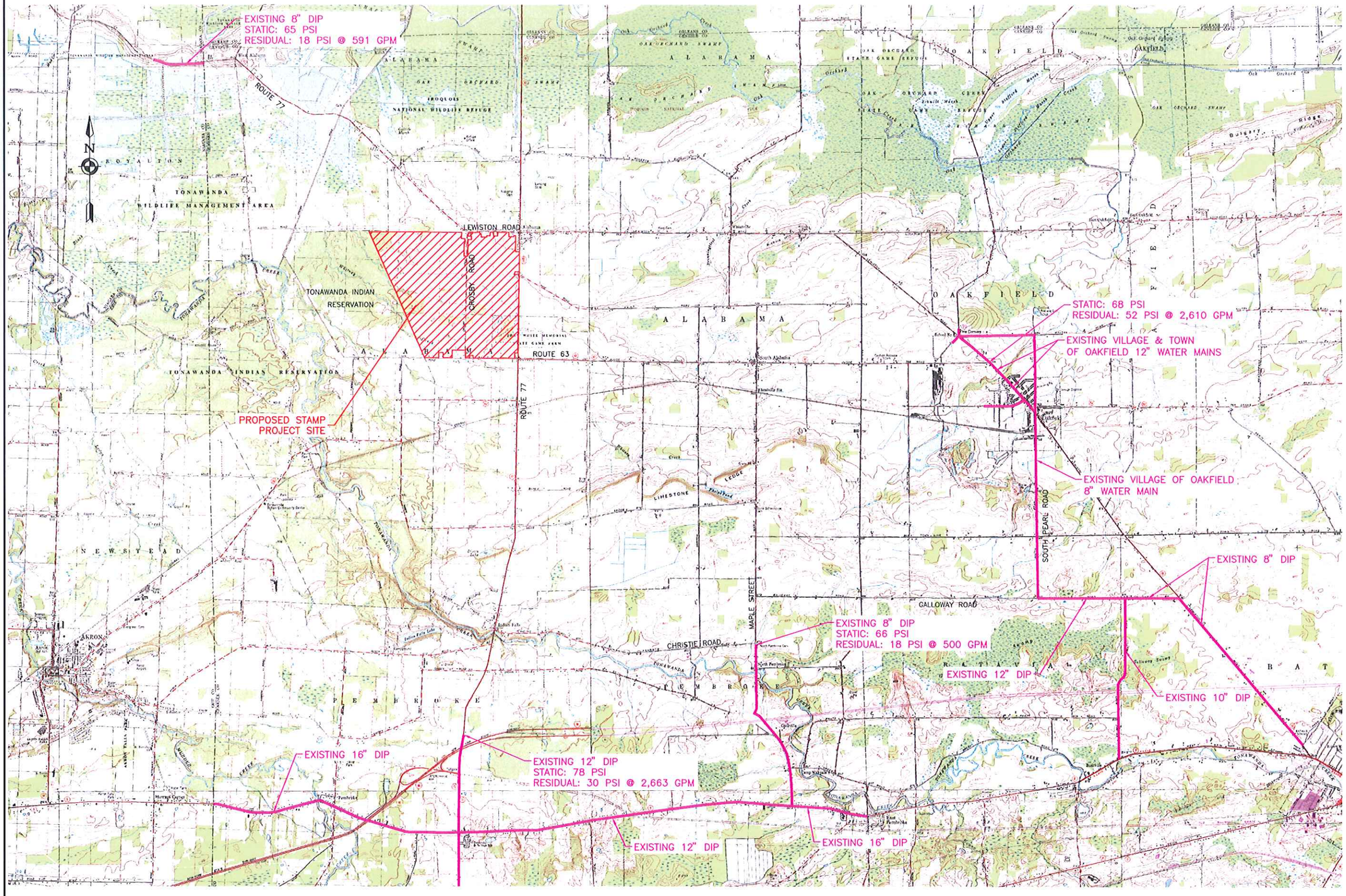
Full Build-Out Expansion Costs		
Alternative	Alternative Description	Expansion Costs
4	Maple Street and Galloway Road Water Main	$3,605,000
2A	Water Storage Tank Expansion	$7,800,000
Upgrades of other Systems	Genesee County, Monroe County Water Authority Systems	$10,000,000
	Total Capital Cost	**$21,405,000**

To arrive at the Full Build-Out total capital costs, the Phase 1 costs must be added to the Full Build-Out Expansion Costs. The Full Build-Out total capital costs are summarized as follows:

	Phase 1	**Phase 1A**
Phase 1	$17,247,000	$13,948,000
Full Build-Out Expansion	$21,405,000	$21,405,000
Full Build-Out Total Capital Cost	**$38,652,000**	**$35,353,000**

APPENDIX A – PRIMARY ALTERNATIVES

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



REVISIONS				
NO.	DATE	BY	CHKED	DESCRIPTION

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GENESEE COUNTY
ECONOMIC DEVELOPMENT CENTER

TOWN OF ALABAMA GENESEE COUNTY NEW YORK

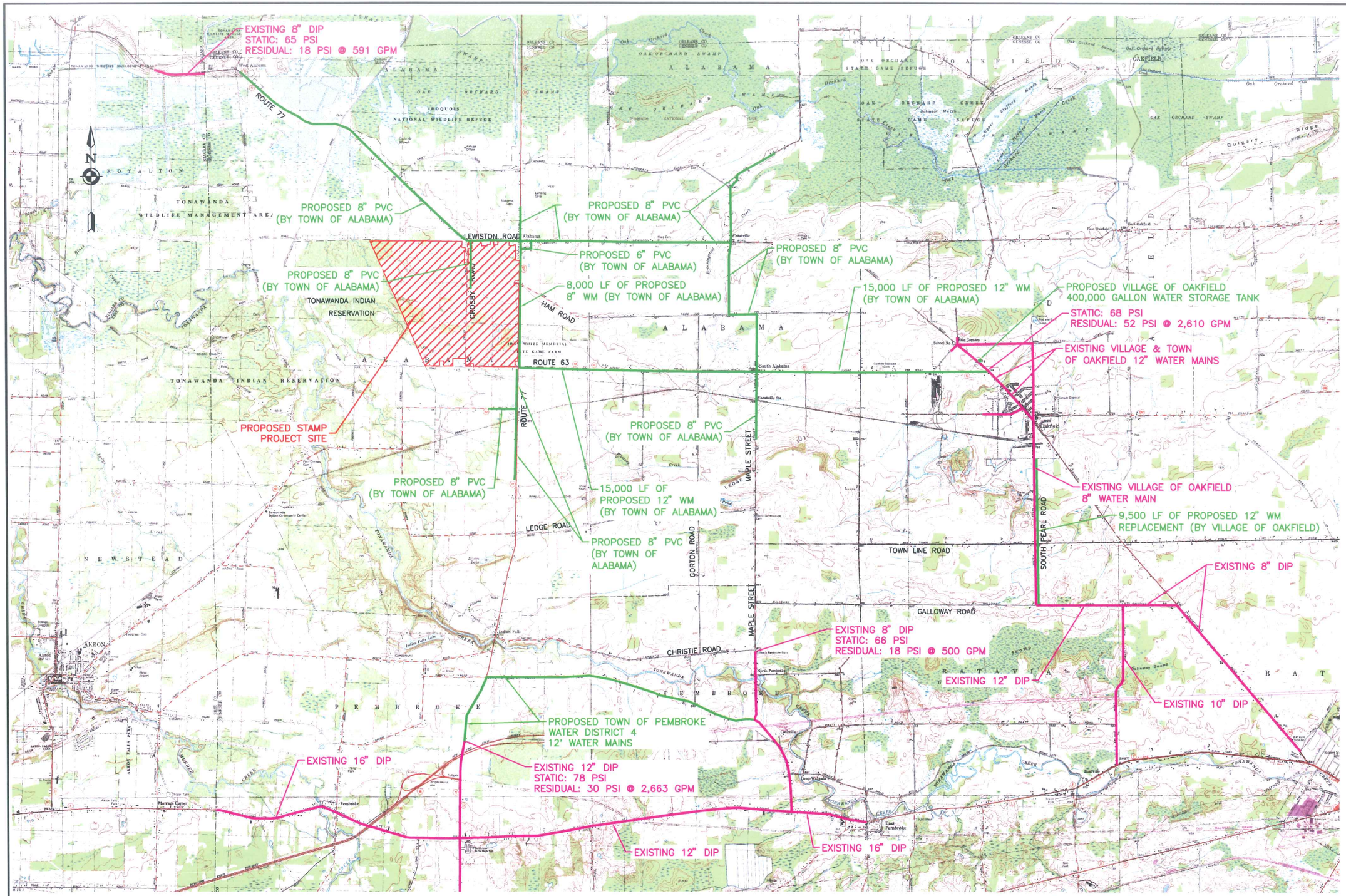
DATE:	01/19/10
DRAWN:	ARK
DESIGNED:	ARK
CHECKED:	TAC
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #1
EXISTING WATER SERVICE MAP

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-001



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GENESEE COUNTY ECONOMIC DEVELOPMENT CENTER

TOWN OF ALABAMA GENESEE COUNTY NEW YORK

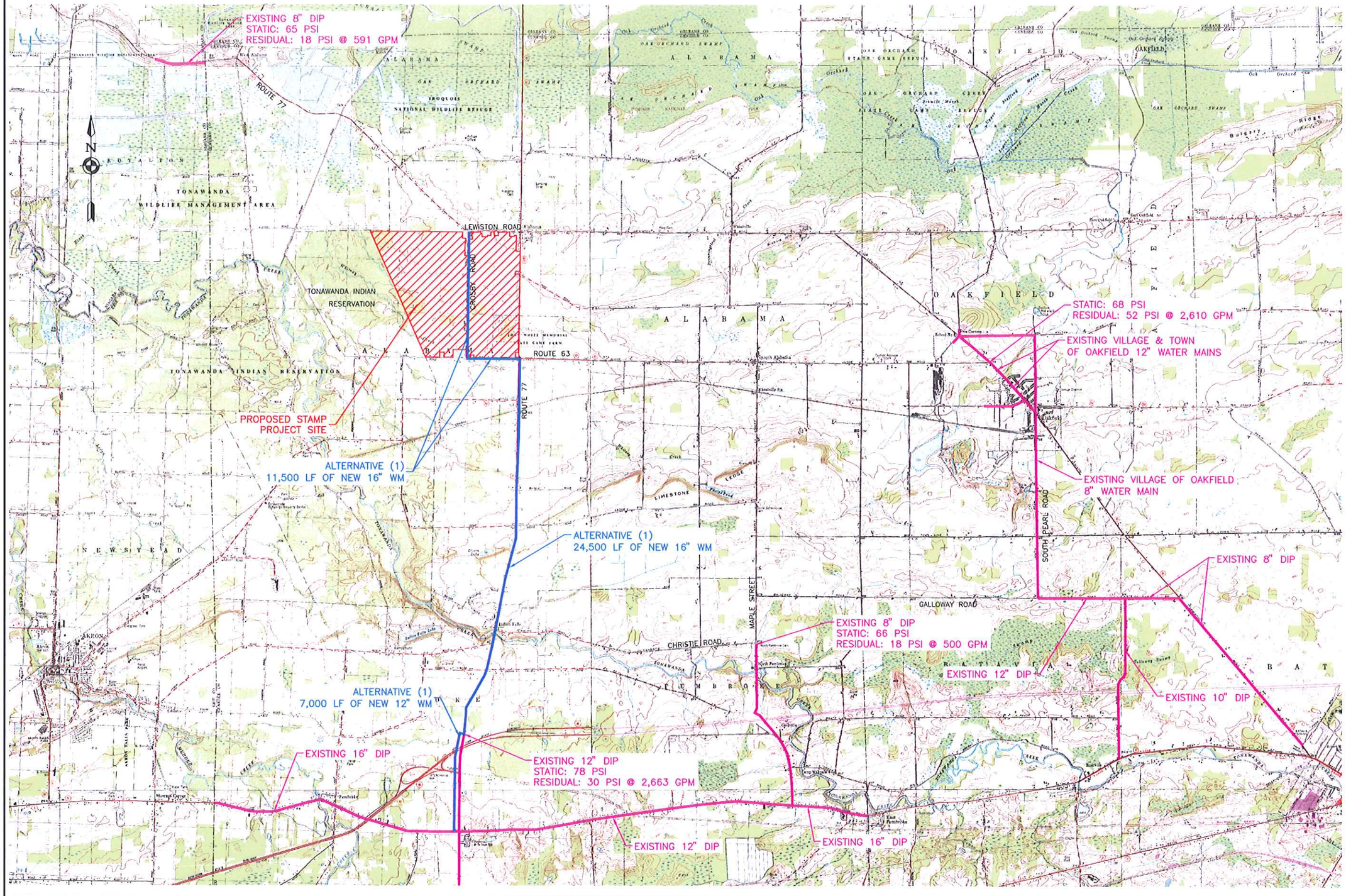
DATE:	01/19/10
DRAWN:	ARK
DESIGNED:	ARK
CHECKED:	TAC
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #2
PROPOSED MUNICIPAL WATER PROJECTS MAP

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-002



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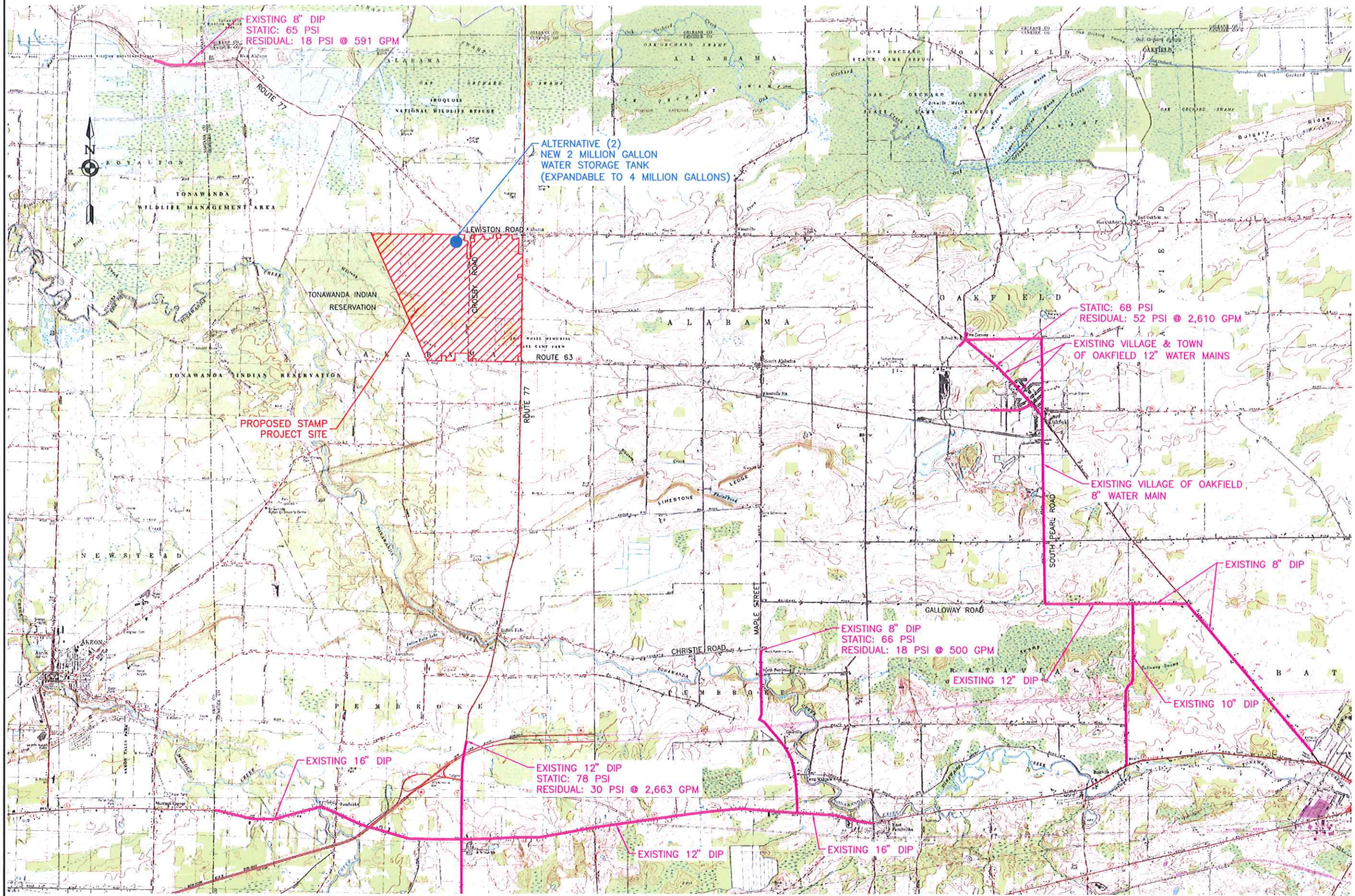
DATE:	01/19/10
DRAWN:	ARK
DESIGNED:	ARK
CHECKED:	TAC
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #3
ALTERNATIVE 1

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-003



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ECONOMIC DEVELOPMENT CENTER

TOWN OF ALABAMA GENESEE COUNTY NEW YORK

DATE:	01/19/10
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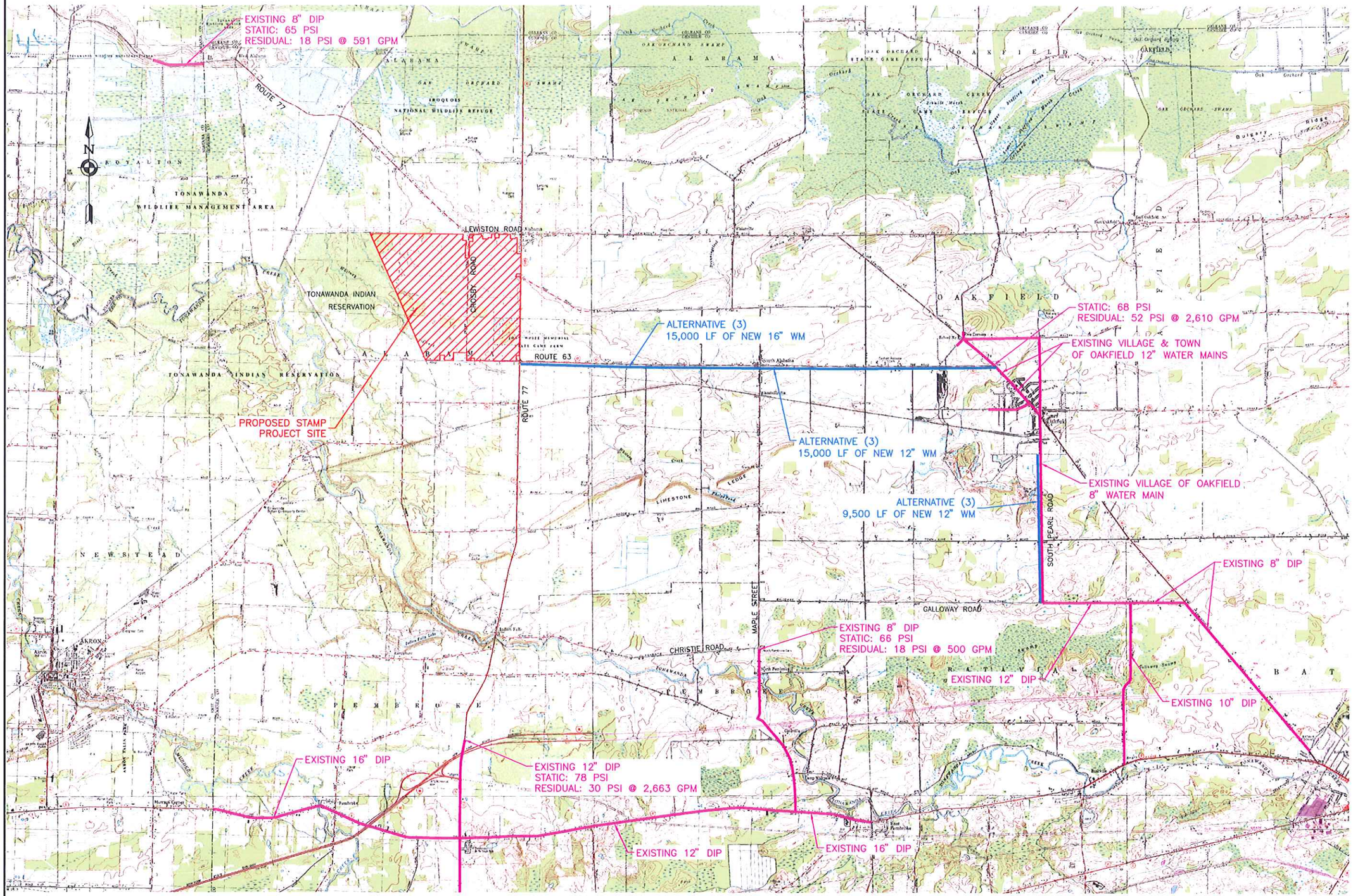
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)
FIGURE #4
ALTERNATIVE 2

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-004



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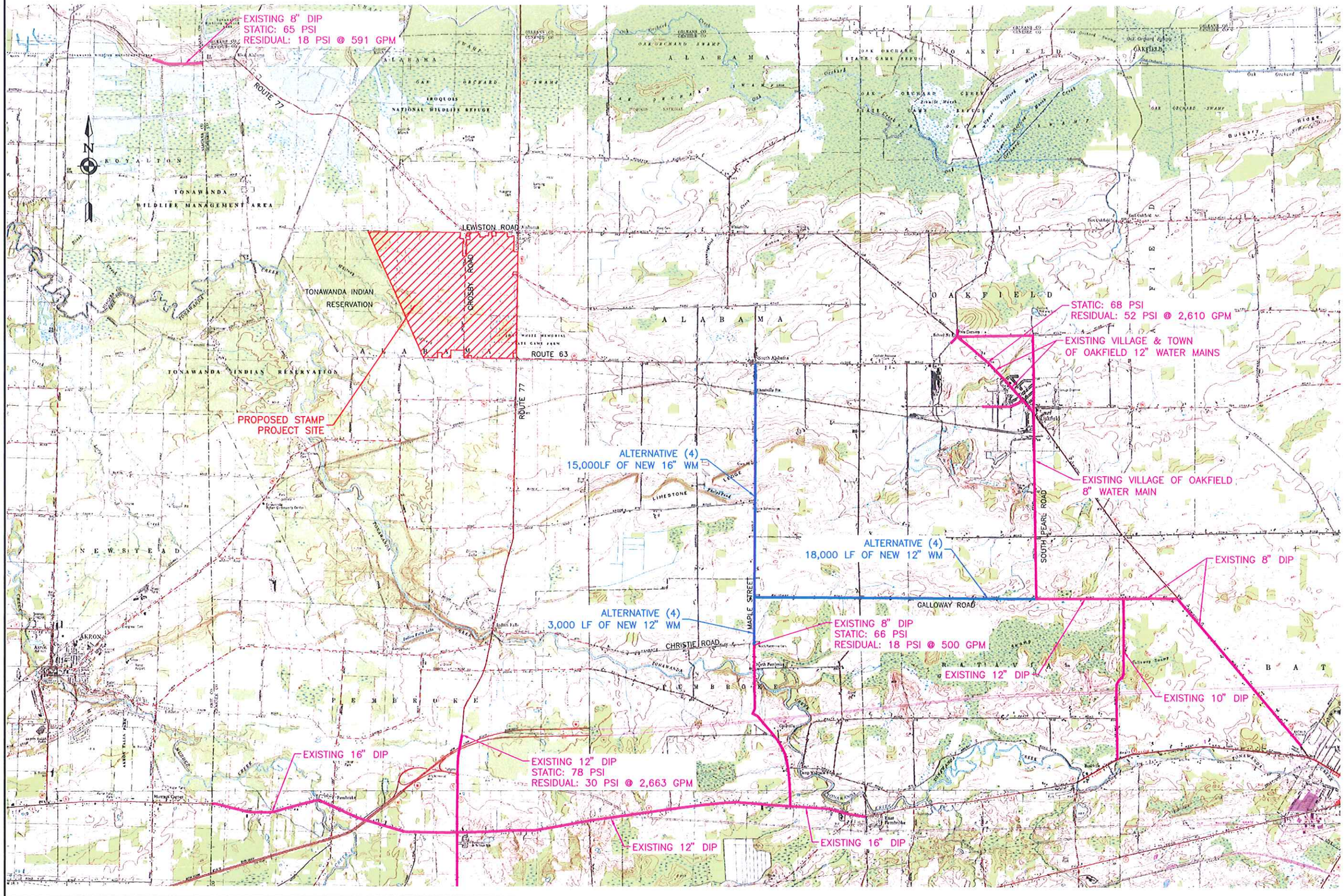
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #5
ALTERNATIVE 3

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-005



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TOWN OF ALABAMA GENESEE COUNTY NEW YORK

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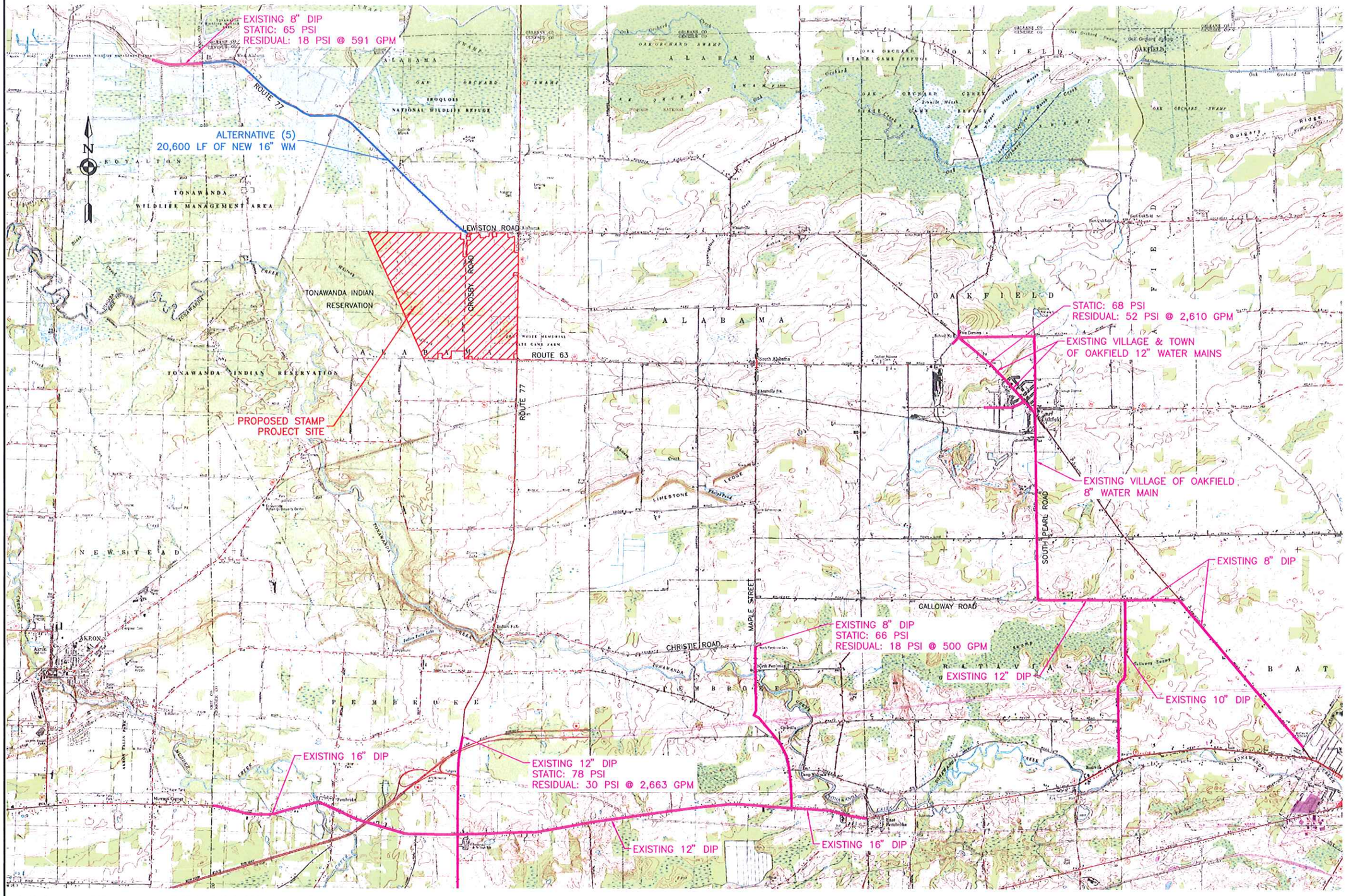
CHECKED:	TAC
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #6
ALTERNATIVE 4

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-006



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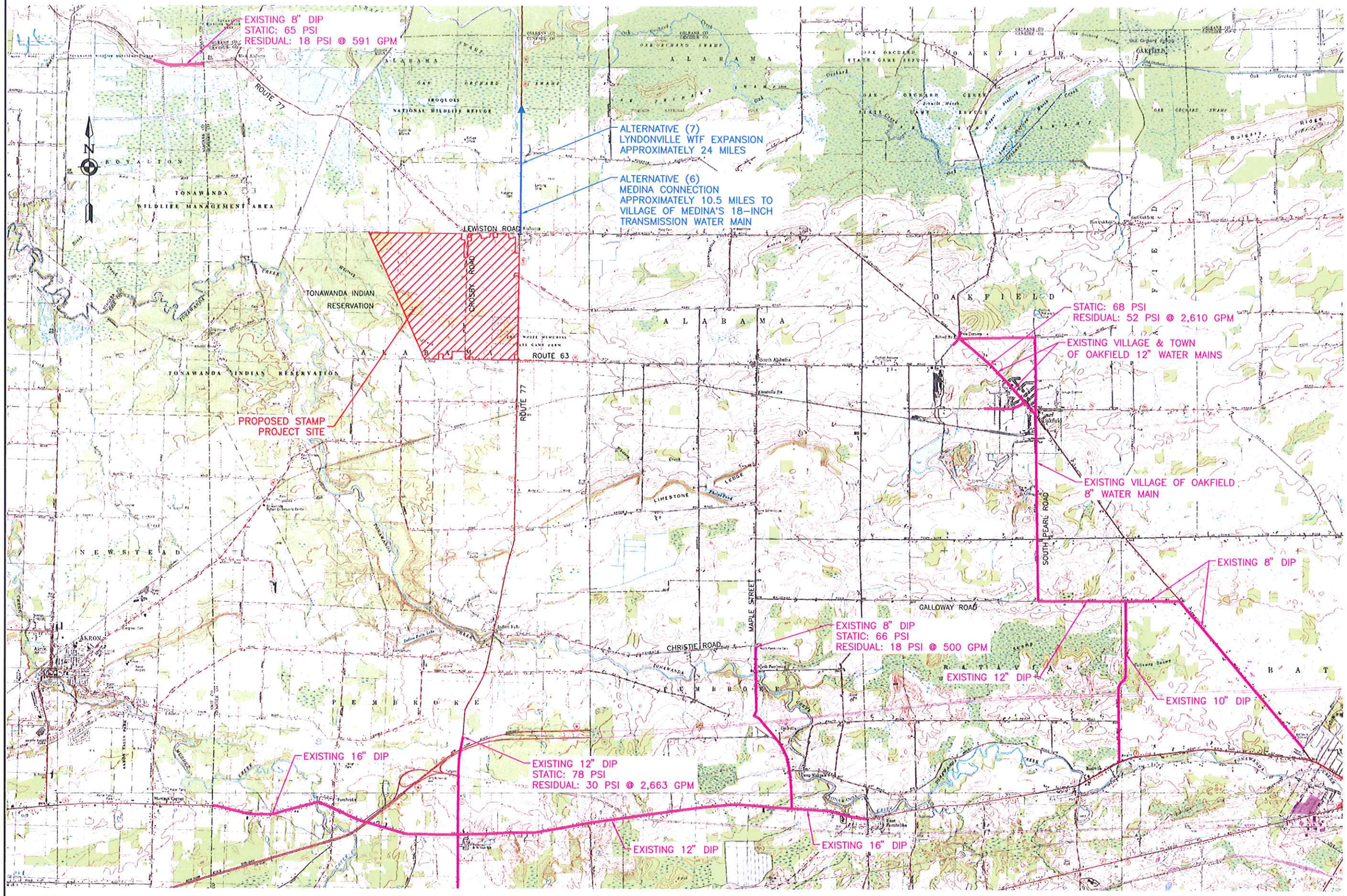
DATE:	01/19/10
DRAWN:	ARK
DESIGNED:	ARK
CHECKED:	TAC
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #7
ALTERNATIVE 5

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-007



REVISIONS				
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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 #8
ALTERNATIVES 6 & 7

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-008

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 1: Route 77 Water Main, Pembroke Connection

Item	Description	Quantity	Unit	Unit Price		Total
1	Furnish and Install 16" DIP Water Main	36,000	LF	$60.00	$	2,160,000.00
2	Furnish and Install 12" DIP Water Main	7,000	LF	$50.00	$	350,000.00
3	Gate Valves	15	EA	$2,800.00	$	42,000.00
4	Hydrants	95	EA	$3,500.00	$	332,500.00
5	Directional Drilling with 12" or 16" Water Main	1,400	LF	$225.00	$	315,000.00
6	Open Cut Road Crossings	500	LF	$50.00	$	25,000.00
7	Connection to Existing Water Main Complete	2	EA	$3,500.00	$	7,000.00
8	Rock Excavation	1,000	CY	$75.00	$	75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$	-
10	Route 5 Pump Station Upgrade	1	LS	$500,000.00	$	500,000.00
	CONSTRUCTION SUBTOTAL				**$**	**3,806,500.00**
	CONTINGENCY (15%)				$	570,975.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$	951,625.00
	TOTAL				$	5,329,100.00
	TOTAL CAPITAL COST				**$**	**5,330,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 2: Water Storage Tank

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	0	LF	$60.00	$ -
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	0	EA	$2,800.00	$ -
4	Hydrants	0	EA	$3,500.00	$ -
5	Directional Drilling with 12" or 16" Water Main	0	LF	$225.00	$ -
6	Open Cut Road Crossings	0	LF	$50.00	$ -
7	Connection to Existing Water Main Complete	0	EA	$3,500.00	$ -
8	Rock Excavation	0	CY	$75.00	$ -
9	Expandable Water Storage Tank	2,000,000	Gal	$3.00	$ 6,000,000.00
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 6,000,000.00**
	CONTINGENCY (15%)				$ 900,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (20%)				$ 1,200,000.00
	TOTAL				$ 8,100,000.00
	TOTAL CAPITAL COST				**$ 8,100,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 2A: Water Storage Tank Expansion

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	0	LF	$60.00	$ -
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	0	EA	$2,800.00	$ -
4	Hydrants	0	EA	$3,500.00	$ -
5	Directional Drilling with 12" or 16" Water Main	0	LF	$225.00	$ -
6	Open Cut Road Crossings	0	LF	$50.00	$ -
7	Connection to Existing Water Main Complete	0	EA	$3,500.00	$ -
8	Rock Excavation	0	CY	$75.00	$ -
9	Expandable Water Storage Tank	2,000,000	Gal	$3.00	$ 6,000,000.00
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 6,000,000.00**
	CONTINGENCY (15%)				$ 900,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (15%)				$ 900,000.00
	TOTAL				$ 7,800,000.00
	TOTAL CAPITAL COST				**$ 7,800,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 3: Route 63 & South Pearl Road/Street Water Main

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	15,000	LF	$60.00	$ 900,000.00
2	Furnish and Install 12" DIP Water Main	24,500	LF	$50.00	$ 1,225,000.00
3	Gate Valves	15	EA	$2,800.00	$ 42,000.00
4	Hydrants	80	EA	$3,500.00	$ 280,000.00
5	Directional Drilling with 12" or 16" Water Main	800	LF	$225.00	$ 180,000.00
6	Open Cut Road Crossings	200	LF	$50.00	$ 10,000.00
7	Connection to Existing Water Main Complete	4	EA	$3,500.00	$ 14,000.00
8	Rock Excavation	1,000	CY	$75.00	$ 75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 2,726,000.00**
	CONTINGENCY (15%)				$ 408,900.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 681,500.00
	TOTAL				$ 3,816,400.00
	TOTAL CAPITAL COST				**$ 3,817,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

Alternative 3A: Route 63 & South Pearl Road/Street Water Main (Alabama & Oakfield Projects Completed Prior)

Item	Description	Quantity	Unit	Unit Price	Total
1	16" DIP Water Main Upgrade*	15,000	LF	$20.00	$ 300,000.00
2	12" DIP Water Main Upgrade*	15,000	LF	$10.00	$ 150,000.00
	CONSTRUCTION SUBTOTAL				**$ 450,000.00**
	CONTINGENCY (10%)				$ 45,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (5%)				$ 22,500.00
	TOTAL				$ 517,500.00
	TOTAL CAPITAL COST				**$ 518,000.00**

*Cost for 16" DIP water main and 12" DIP water main is incremental cost difference between 12" PVC water main in Town of Alabama project.

1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 4: Maple Street and Galloway Road Water Main

Item	Description	Quantity	Unit	Unit Price		Total
1	Furnish and Install 16" DIP Water Main	15,000	LF	$60.00	$	900,000.00
2	Furnish and Install 12" DIP Water Main	21,000	LF	$50.00	$	1,050,000.00
3	Gate Valves	15	EA	$2,800.00	$	42,000.00
4	Hydrants	75	EA	$3,500.00	$	262,500.00
5	Directional Drilling with 12" or 16" Water Main	1,000	LF	$225.00	$	225,000.00
6	Open Cut Road Crossings	200	LF	$50.00	$	10,000.00
7	Connection to Existing Water Main Complete	3	EA	$3,500.00	$	10,500.00
8	Rock Excavation	1,000	CY	$75.00	$	75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$	-
10	Upgrades to other Systems	0	LS	$500,000.00	$	-
	CONSTRUCTION SUBTOTAL				**$**	**2,575,000.00**
	CONTINGENCY (15%)				$	386,250.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$	643,750.00
	TOTAL				$	3,605,000.00
	TOTAL CAPITAL COST				**$**	**3,605,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 5: Route 77 Water Main, North of Project Site

Item	Description	Quantity	Unit	Unit Price		Total
1	Furnish and Install 16" DIP Water Main	20,600	LF	$60.00	$	1,236,000.00
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$	-
3	Gate Valves	5	EA	$2,800.00	$	14,000.00
4	Hydrants	45	EA	$3,500.00	$	157,500.00
5	Directional Drilling with 12" or 16" Water Main	500	LF	$225.00	$	112,500.00
6	Open Cut Road Crossings	200	LF	$50.00	$	10,000.00
7	Connection to Existing Water Main Complete	1	EA	$3,500.00	$	3,500.00
8	Rock Excavation	500	CY	$75.00	$	37,500.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$	-
10	Upgrades to other Systems	0	LS	$500,000.00	$	-
	CONSTRUCTION SUBTOTAL				**$**	**1,571,000.00**
	CONTINGENCY (15%)				$	235,650.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$	392,750.00
	TOTAL				$	2,199,400.00
	TOTAL CAPITAL COST				**$**	**2,200,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

Alternative 6: Medina Connection

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	55,000	LF	$60.00	$ 3,300,000.00
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	15	EA	$2,800.00	$ 42,000.00
4	Hydrants	100	EA	$3,500.00	$ 350,000.00
5	Directional Drilling with 12" or 16" Water Main	1,000	LF	$225.00	$ 225,000.00
6	Open Cut Road Crossings	500	LF	$50.00	$ 25,000.00
7	Connection to Existing Water Main Complete	1	EA	$3,500.00	$ 3,500.00
8	Rock Excavation	1,000	CY	$75.00	$ 75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 4,020,500.00**
	CONTINGENCY (15%)				$ 603,075.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 1,005,125.00
	TOTAL				$ 5,628,700.00
	TOTAL CAPITAL COST				**$ 5,629,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

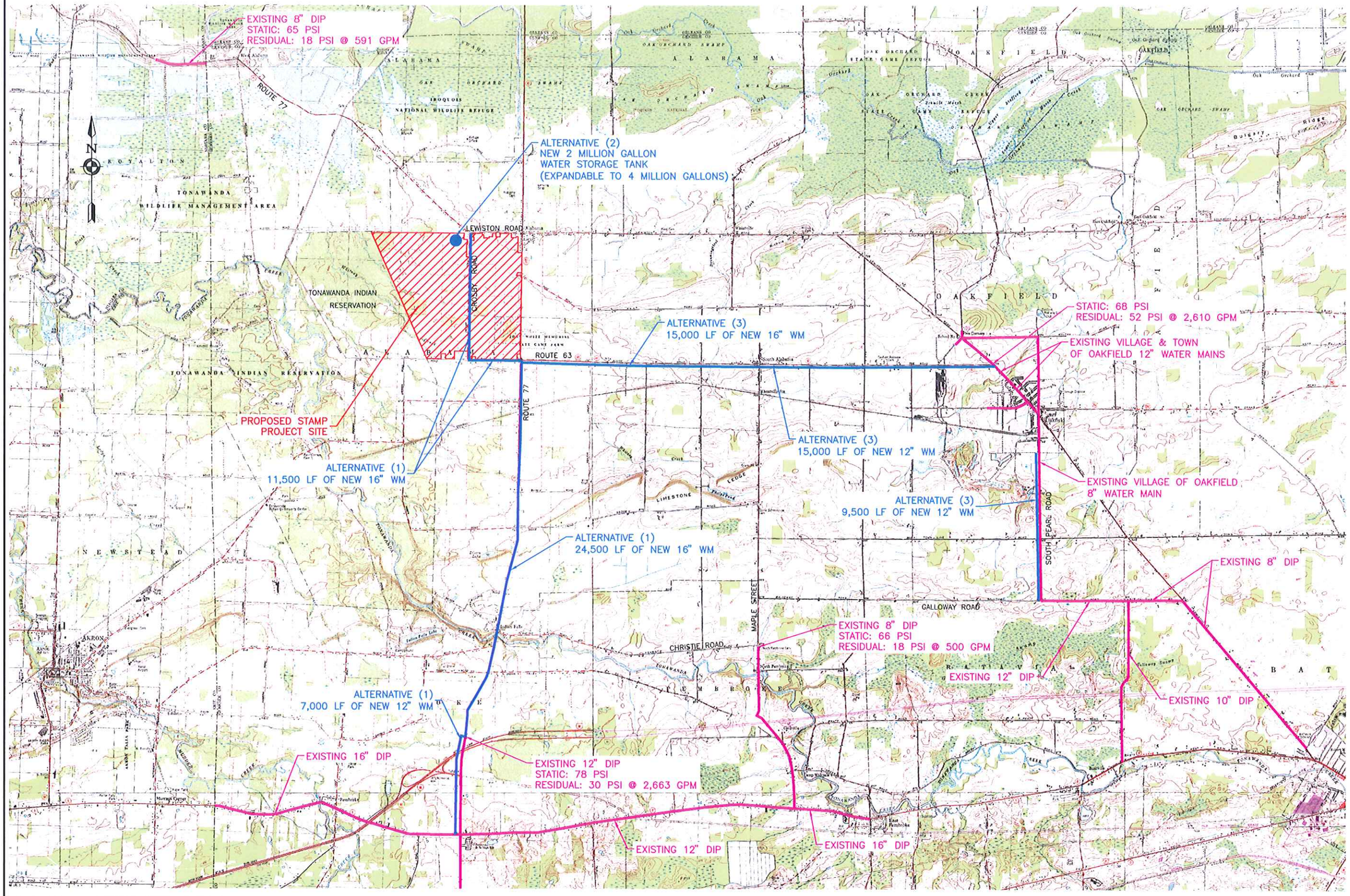
Alternative 7: Lyndonville WTF Expansion

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 24" DIP Water Main	125,000	LF	$85.00	$ 10,625,000.00
2	New WTF	3,000,000	Gal	$10.00	$ 30,000,000.00
	CONSTRUCTION SUBTOTAL				**$ 40,625,000.00**
	CONTINGENCY (15%)				$ 6,093,750.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 10,156,250.00
	TOTAL				$ 56,875,000.00
	TOTAL CAPITAL COST				**$ 56,875,000.00**

Notes:
1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.

APPENDIX B – RECOMMENDATIONS

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



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NO.	DATE	BY	CHKD	DESCRIPTION

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TOWN OF ALABAMA GENESEE COUNTY NEW YORK

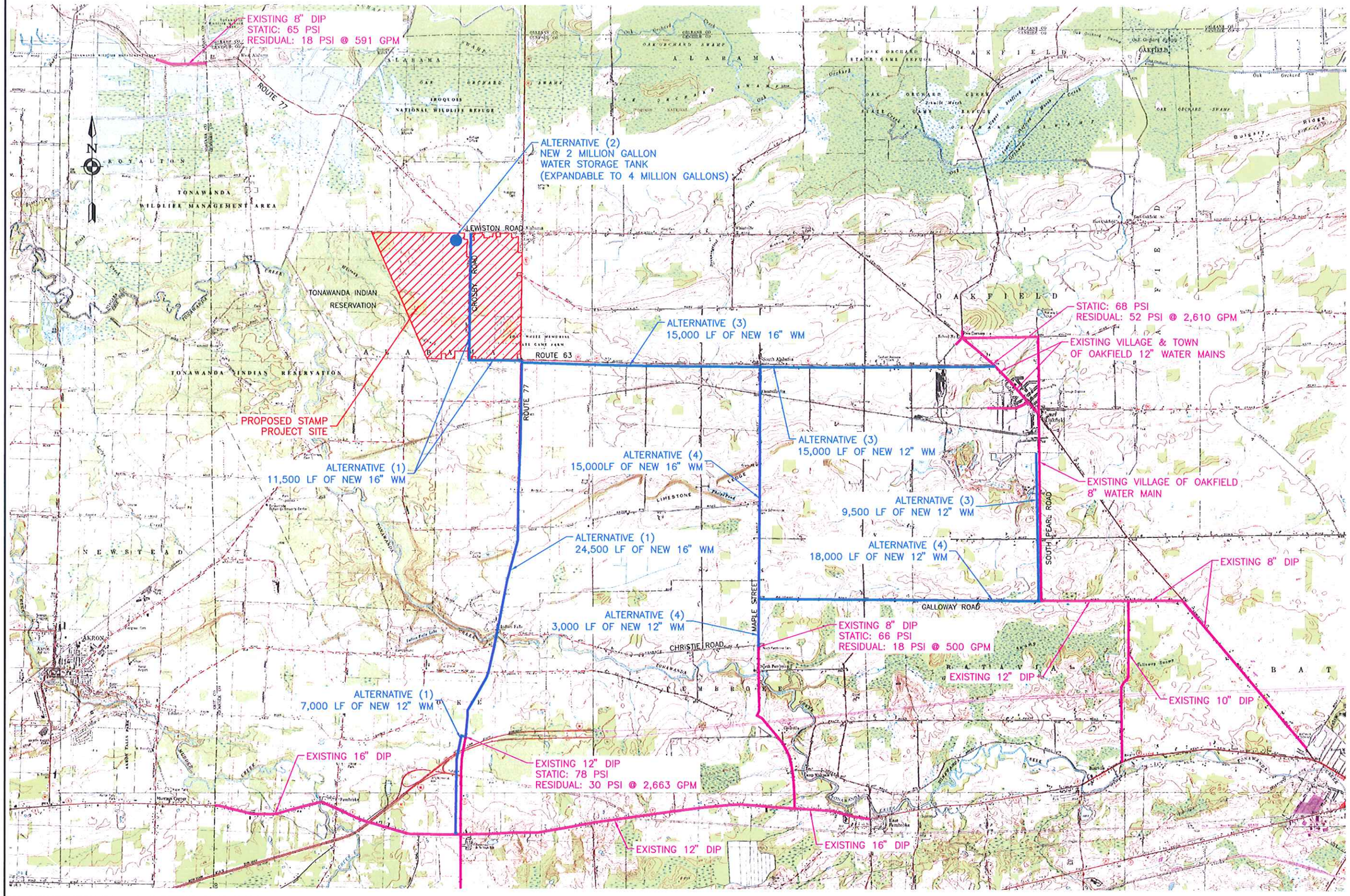
DATE:	01/19/10
DRAWN:	ARK
DESIGNED:	ARK
CHECKED:	TAC
SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #9
PHASE 1 REQUIREMENTS

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-009



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TOWN OF ALABAMA GENESEE COUNTY NEW YORK

DATE:	01/19/10
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SCALE:	1"=6000'

SCIENCE AND TECHNOLOGY
ADVANCED MANUFACTURING PARK (STAMP)

FIGURE #10
FULL BUILD-OUT REQUIREMENTS

PROJECT NUMBER
11790.00

DRAWING NUMBER
W-010

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

PHASE 1: 1.0 MGD

Alternative 1: Route 77 Water Main, Pembroke Connection

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	36,000	LF	$60.00	$ 2,160,000.00
2	Furnish and Install 12" DIP Water Main	7,000	LF	$50.00	$ 350,000.00
3	Gate Valves	15	EA	$2,800.00	$ 42,000.00
4	Hydrants	95	EA	$3,500.00	$ 332,500.00
5	Directional Drilling with 12" or 16" Water Main	1,400	LF	$225.00	$ 315,000.00
6	Open Cut Road Crossings	500	LF	$50.00	$ 25,000.00
7	Connection to Existing Water Main Complete	2	EA	$3,500.00	$ 7,000.00
8	Rock Excavation	1,000	CY	$75.00	$ 75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Route 5 Pump Station Upgrade	1	LS	$500,000.00	$ 500,000.00
	CONSTRUCTION SUBTOTAL				**$ 3,806,500.00**
	CONTINGENCY (15%)				$ 570,975.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 951,625.00
	TOTAL				$ 5,329,100.00
	TOTAL CAPITAL COST				**$ 5,330,000.00**

Alternative 2: Water Storage Tank

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	0	LF	$60.00	$ -
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	0	EA	$2,800.00	$ -
4	Hydrants	0	EA	$3,500.00	$ -
5	Directional Drilling with 12" or 16" Water Main	0	LF	$225.00	$ -
6	Open Cut Road Crossings	0	LF	$50.00	$ -
7	Connection to Existing Water Main Complete	0	EA	$3,500.00	$ -
8	Rock Excavation	0	CY	$75.00	$ -
9	Expandable Water Storage Tank	2,000,000	Gal	$3.00	$ 6,000,000.00
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 6,000,000.00**
	CONTINGENCY (15%)				$ 900,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (20%)				$ 1,200,000.00
	TOTAL				$ 8,100,000.00
	TOTAL CAPITAL COST				**$ 8,100,000.00**

Alternative 3: Route 63 & South Pearl Road/Street Water Main

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	15,000	LF	$60.00	$ 900,000.00
2	Furnish and Install 12" DIP Water Main	24,500	LF	$50.00	$ 1,225,000.00
3	Gate Valves	15	EA	$2,800.00	$ 42,000.00
4	Hydrants	80	EA	$3,500.00	$ 280,000.00
5	Directional Drilling with 12" or 16" Water Main	800	LF	$225.00	$ 180,000.00
6	Open Cut Road Crossings	200	LF	$50.00	$ 10,000.00
7	Connection to Existing Water Main Complete	4	EA	$3,500.00	$ 14,000.00
8	Rock Excavation	1,000	CY	$75.00	$ 75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 2,726,000.00**
	CONTINGENCY (15%)				$ 408,900.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 681,500.00
	TOTAL				$ 3,816,400.00
	TOTAL CAPITAL COST				**$ 3,817,000.00**

PHASE 1 TOTAL CAPITAL COST: $ 17,247,000.00

1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

PHASE 1A: 1.0 MGD

Alternative 1: Route 77 Water Main, Pembroke Connection

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	36,000	LF	$60.00	$ 2,160,000.00
2	Furnish and Install 12" DIP Water Main	7,000	LF	$50.00	$ 350,000.00
3	Gate Valves	15	EA	$2,800.00	$ 42,000.00
4	Hydrants	95	EA	$3,500.00	$ 332,500.00
5	Directional Drilling with 12" or 16" Water Main	1,400	LF	$225.00	$ 315,000.00
6	Open Cut Road Crossings	500	LF	$50.00	$ 25,000.00
7	Connection to Existing Water Main Complete	2	EA	$3,500.00	$ 7,000.00
8	Rock Excavation	1,000	CY	$75.00	$ 75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Route 5 Pump Station Upgrade	1	LS	$500,000.00	$ 500,000.00
	CONSTRUCTION SUBTOTAL				**$ 3,806,500.00**
	CONTINGENCY (15%)				$ 570,975.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 951,625.00
	TOTAL				$ 5,329,100.00
	TOTAL CAPITAL COST				**$ 5,330,000.00**

Alternative 2: Water Storage Tank

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	0	LF	$60.00	$ -
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	0	EA	$2,800.00	$ -
4	Hydrants	0	EA	$3,500.00	$ -
5	Directional Drilling with 12" or 16" Water Main	0	LF	$225.00	$ -
6	Open Cut Road Crossings	0	LF	$50.00	$ -
7	Connection to Existing Water Main Complete	0	EA	$3,500.00	$ -
8	Rock Excavation	0	CY	$75.00	$ -
9	Expandable Water Storage Tank	2,000,000	Gal	$3.00	$ 6,000,000.00
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 6,000,000.00**
	CONTINGENCY (15%)				$ 900,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (20%)				$ 1,200,000.00
	TOTAL				$ 8,100,000.00
	TOTAL CAPITAL COST				**$ 8,100,000.00**

Alternative 3A: Route 63 & South Pearl Road/Street Water Main (Alabama & Oakfield Projects Completed Prior)

Item	Description	Quantity	Unit	Unit Price	Total
1	16" DIP Water Main Upgrade*	15,000	LF	$20.00	$ 300,000.00
2	12" DIP Water Main Upgrade*	15,000	LF	$10.00	$ 150,000.00
	CONSTRUCTION SUBTOTAL				**$ 450,000.00**
	CONTINGENCY (10%)				$ 45,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (5%)				$ 22,500.00
	TOTAL				$ 517,500.00
	TOTAL CAPITAL COST				**$ 518,000.00**

PHASE 1 TOTAL CAPITAL COST: $ 13,948,000.00

*Cost for 16" Water Main is incremental cost difference between 12" PVC water main and a 16" DIP water main

1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

STAMP
WATER FEASIBILITY STUDY
PRELIMINARY BUDGET ESTIMATE
DATE: 12/29/10

FULL BUILD OUT EXPANSION: 3.0 MGD

Alternative 4: Maple Street and Galloway Road Water Main

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	15,000	LF	$60.00	$ 900,000.00
2	Furnish and Install 12" DIP Water Main	21,000	LF	$50.00	$ 1,050,000.00
3	Gate Valves	15	EA	$2,800.00	$ 42,000.00
4	Hydrants	75	EA	$3,500.00	$ 262,500.00
5	Directional Drilling with 12" or 16" Water Main	1,000	LF	$225.00	$ 225,000.00
6	Open Cut Road Crossings	200	LF	$50.00	$ 10,000.00
7	Connection to Existing Water Main Complete	3	EA	$3,500.00	$ 10,500.00
8	Rock Excavation	1,000	CY	$75.00	$ 75,000.00
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 2,575,000.00**
	CONTINGENCY (15%)				$ 386,250.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 643,750.00
	TOTAL				$ 3,605,000.00
	TOTAL CAPITAL COST				**$ 3,605,000.00**

Alternative 2A: Water Storage Tank Expansion

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	0	LF	$60.00	$ -
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	0	EA	$2,800.00	$ -
4	Hydrants	0	EA	$3,500.00	$ -
5	Directional Drilling with 12" or 16" Water Main	0	LF	$225.00	$ -
6	Open Cut Road Crossings	0	LF	$50.00	$ -
7	Connection to Existing Water Main Complete	0	EA	$3,500.00	$ -
8	Rock Excavation	0	CY	$75.00	$ -
9	Expandable Water Storage Tank	2,000,000	Gal	$3.00	$ 6,000,000.00
10	Upgrades to other Systems	0	LS	$500,000.00	$ -
	CONSTRUCTION SUBTOTAL				**$ 6,000,000.00**
	CONTINGENCY (15%)				$ 900,000.00
	LEGAL, ENGINEERING, ADMINISTRATION (15%)				$ 900,000.00
	TOTAL				$ 7,800,000.00
	TOTAL CAPITAL COST				**$ 7,800,000.00**

Additional Upgrades to Erie County, Monroe County and Genesee County Water Systems

Item	Description	Quantity	Unit	Unit Price	Total
1	Furnish and Install 16" DIP Water Main	0	LF	$60.00	$ -
2	Furnish and Install 12" DIP Water Main	0	LF	$50.00	$ -
3	Gate Valves	0	EA	$2,800.00	$ -
4	Hydrants	0	EA	$3,500.00	$ -
5	Directional Drilling with 12" or 16" Water Main	0	LF	$225.00	$ -
6	Open Cut Road Crossings	0	LF	$50.00	$ -
7	Connection to Existing Water Main Complete	0	EA	$3,500.00	$ -
8	Rock Excavation	0	CY	$75.00	$ -
9	Expandable Water Storage Tank	0	Gal	$3.00	$ -
10	Upgrades to other Systems	1	LS	$ 7,142,500.00	$ 7,142,500.00
	CONSTRUCTION SUBTOTAL				**$ 7,142,500.00**
	CONTINGENCY (15%)				$ 1,071,375.00
	LEGAL, ENGINEERING, ADMINISTRATION (25%)				$ 1,785,625.00
	TOTAL				$ 9,999,500.00
	TOTAL CAPITAL COST				**$ 10,000,000.00**

FULL BUILD OUT EXPANSION TOTAL CAPITAL COST: $ 21,405,000.00

1) It is assumed that Rock Excavation will be required. Sub-surface investigation will be needed to accurately estimate the total quantity.
2) Upgrades to other systems are assumed. Further analysis will be required to determine specific upgrades.
3) Carrier water main cost is not included in items 5 and 6. These items are additional costs to items 1 and 2.

APPENDIX C – INDUSTRY REQUIREMENTS

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

8. Other Utilities

8.1 Water

All of the prospective industries for the STAMP project require a relatively pure and consistent supply of water. Deionized water (DIW) or ultrapure water (UPW) is the primary cleaning liquid used in all of these facilities. Anticipated water treatment technologies used may include reverse osmosis (RO), filtration, ultraviolet (UV) sterilization, ozonation and ion-exchange.

Water reuse is also a typical consideration during facility design. Dilute process rinse waters can be recycled back through the UPW system or used as utility make-up water for cooling towers or scrubbers. Anticipated water demand for the proposed manufacturing facilities is provided in Table 8.1-1 below.

Manufacturing Technology	Maximum Gallons Per Day (gpd)	Production Capacity Basis (MW)
PV - Crystalline Silicon	650,000	170
PV - Amorphous Silicon	280,000	140
PV - CdTe	450,000	280
PV - CIGS	750,000	690
FPD/ Med Imaging	460,000	200,000 s.f. or ~15,000 sheets/mo
Nano	400,000	400,000 s.f. manufacturing area
Totals	2,990,000	

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