G. UTILITIES

This section is intended to describe major existing utilities within the Study Area. These utilities include electric, gas, telephone service, water distribution, and sanitary sewage collection.

1. Electric:

Electric service within the Study Area is provided by the Niagara Mohawk Power Corporation (NMPC). NMPC has a network of 13.2 kilovolt (KV), 34.5 KV, and 115 KV transmission lines which currently supply ample electric power to all its customers (see Exhibit II-G-1). There are two 115 KV transmission lines which traverse the southern portion of the Study Area. These lines run from Menands to the 13.2 KV Wolf Road sub-station and continue in a northwesterly direction just north of the Village of Colonie boundary. A 34.5 KV distribution line parallels the two 115 KV lines from Menands until nearly reaching the Wolf Road sub-station. This line, called the Menands-Central Avenue line then turns 90 degrees to the northeast, is renamed the Newtonville-Patroon line, and parallels the Northway (I-87) along the eastern edge of the Study Area boundary. The 34.5 KV Latham-Newtonville line enters the Study Area just south of Northway Exit 6 and travels northward to the Latham substation located near the intersection of Wade Road and Route 7. This line then continues north and exits the Study Area.

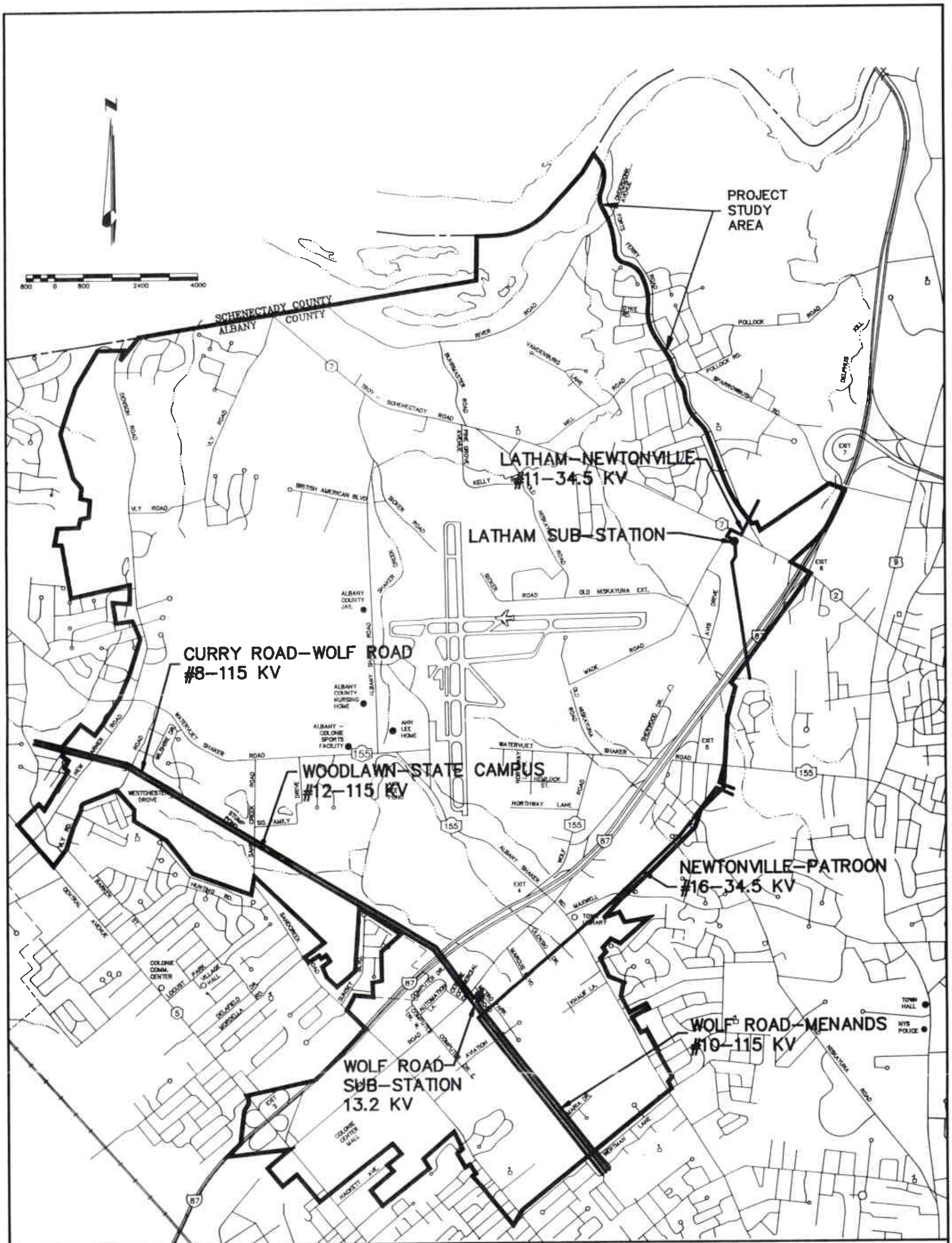
2. Gas:

The NMPC also provides natural gas service to the Study Area. The NMPC receives gas from a 16-inch Consolidated Gas line which enters the Study Area from the west, traversing the southern portion of the Study Area and terminating at the pressure regulating station located near the intersection of Wolf Road and Metro Park Drive. From this point, gas is distributed throughout the Town of Colonie as

well as the Study Area through a network of NMPC transmission and distribution lines which range in size from 8 to 16 inches as shown on Exhibit II-G-2. These lines are adequate to meet current residential and commercials needs in the Study Area. The 12-inch gas distribution line travels along Watervliet-Shaker Road (Route 155) in an east-west direction. From the regulating station on Wolf Road, a 16-inch NMPC line travels southeast to Aviation Road where it enters a tee. A 12-inch gas line continues southwest along Hackett Avenue to Central Avenue. At Central Avenue, the gas line is further reduced to an 8-inch line and travels northwest along Central Avenue past I-87. At the tee on Aviation Road, a 16-inch line continues in a northeasterly direction adjacent to I-87 near the eastern edge of the Study Area boundary until reaching a regulating station just south of Watervliet Shaker Road. A 12-inch line then continues north, crosses I-87 and continues past Route 7 near Forts Ferry Road where it exits the Study Area boundary.

3. Telephone:

Telephone service is provided by New York Telephone (NYT) for the Study Area. NYT currently owns a series of primary copper cable and fiber optic lines divided into three districts servicing the Study Area. They are known as the Latham, Guilderland, and Washington Avenue districts (see Exhibit II-G-3). The Latham District is located in the northern portion of the Study Area. This district includes both fiber-optic and cable lines which run from the Latham Central office, west along Route 7 and then south on Albany-Shaker Road to a remote terminal hut located on British-American Boulevard. In addition, from the intersection of Albany Shaker Road and Route 7, the underground cable line makes a transition to an overhead cable line which continues northwest along Route 7. There is also an existing cable line running adjacent to Wade Road to a terminal hut for the New York Army National Guard.



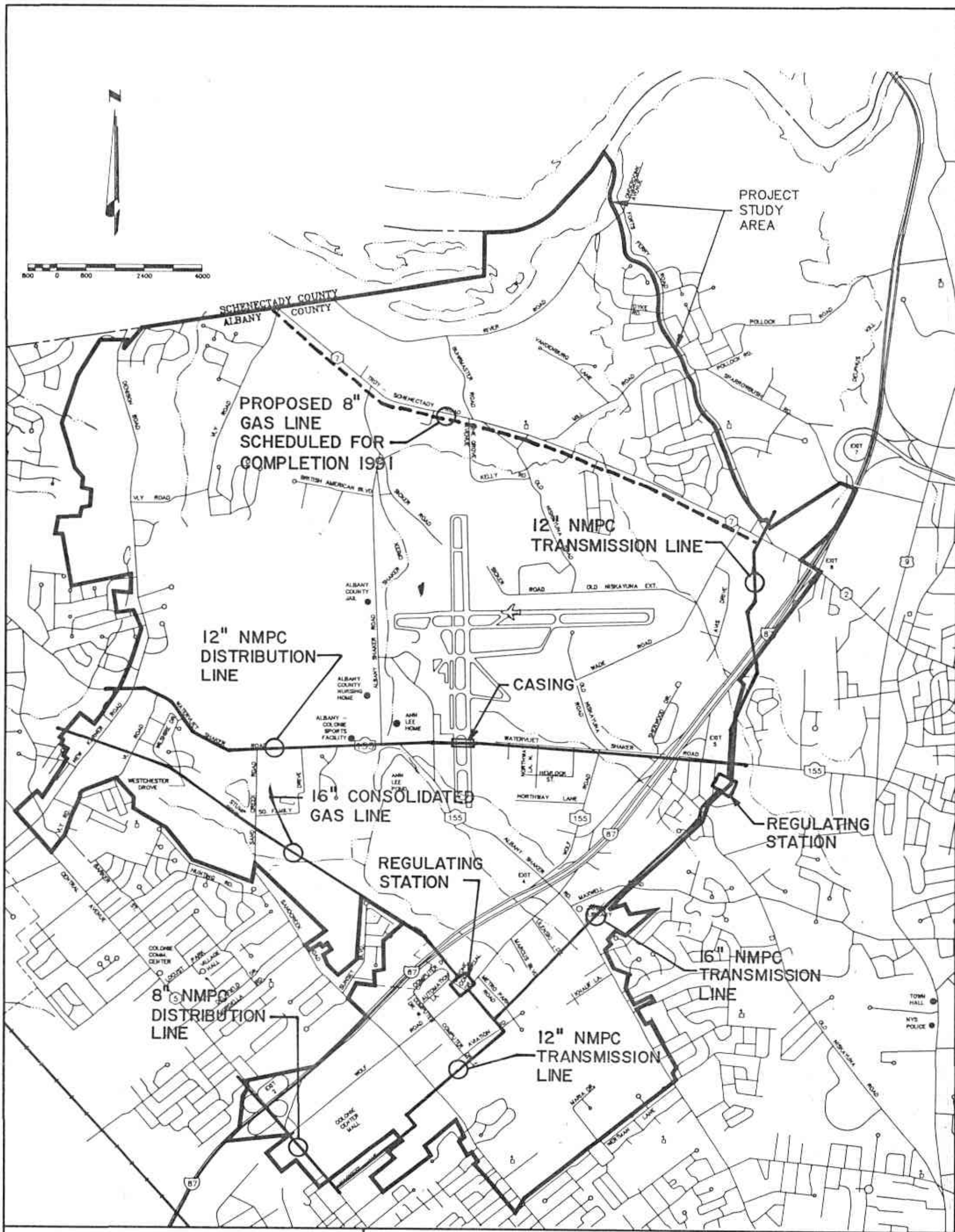
CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS & PLANNERS
3 WINNERS CIRCLE ALBANY, N.Y., 12205

EXISTING ELECTRICAL DISTRIBUTION SYSTEM

EXHIBIT NO.

II–G–1

AIRPORT AREA GENERIC ENVIRONMENTAL IMPACT STATEMENT



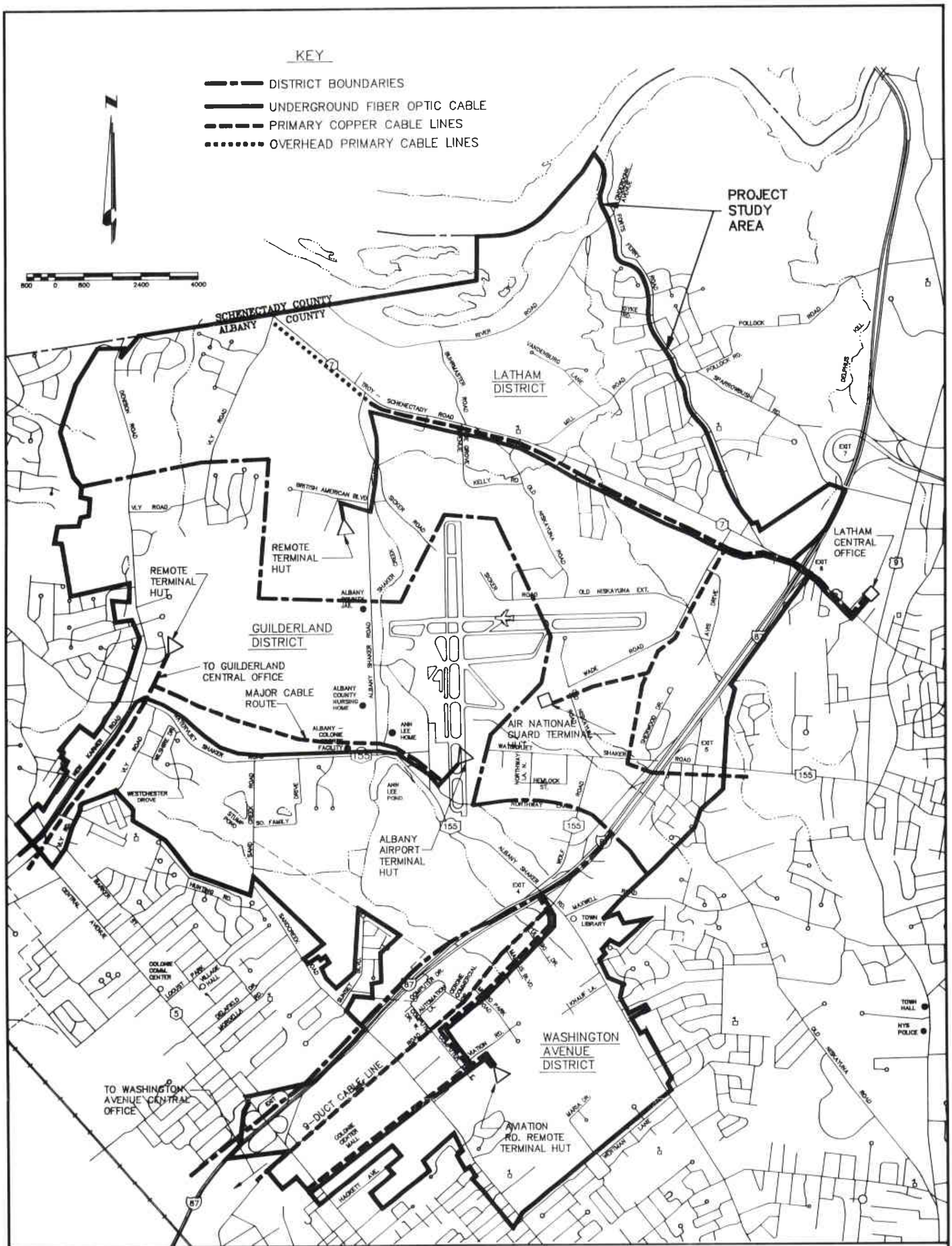
CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS & PLANNERS
3 WINNERS CIRCLE ALBANY, N.Y. 12205

NATURAL GAS TRANSMISSION AND DISTRIBUTION LINES

EXHIBIT NO.

II - G - 2

AIRPORT AREA GENERIC ENVIRONMENTAL IMPACT STATEMENT



CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS & PLANNERS
3 WINNERS CIRCLE ALBANY, N.Y., 12205

NEW YORK TELEPHONE PRIMARY CABLE LINES

EXHIBIT NO.

II – G – 3

AIRPORT AREA GENERIC ENVIRONMENTAL IMPACT STATEMENT

The Guilderland District provides service to the southern portion of the Study Area. This district includes a major copper cable route from the Guilderland central office north along New Karner Road and east along Watervliet Shaker Road to the airport terminal hut. In addition, there is a fiber-optic cable route paralleling the copper cable line until it reaches a terminal hut located east of New Karner Road.

The Washington Avenue district boundary includes a small portion of the Study Area. This district includes a major 9-duct cable transmission route which runs along Wolf Road. This district also includes a cable and fiber-optic line which travels in a northeasterly direction from Colonie Center to Albany Shaker Road. A terminal hut is also connected to these lines southeast of Aviation Road. Both cable and fiber-optic lines continue south to the Washington Avenue central office.

Together with all three districts, NYT is able to adequately service all residential, commercial, and industrial customers throughout the Study Area.

4. <u>Water</u>:

a. **Supply, Treatment and Filtration**

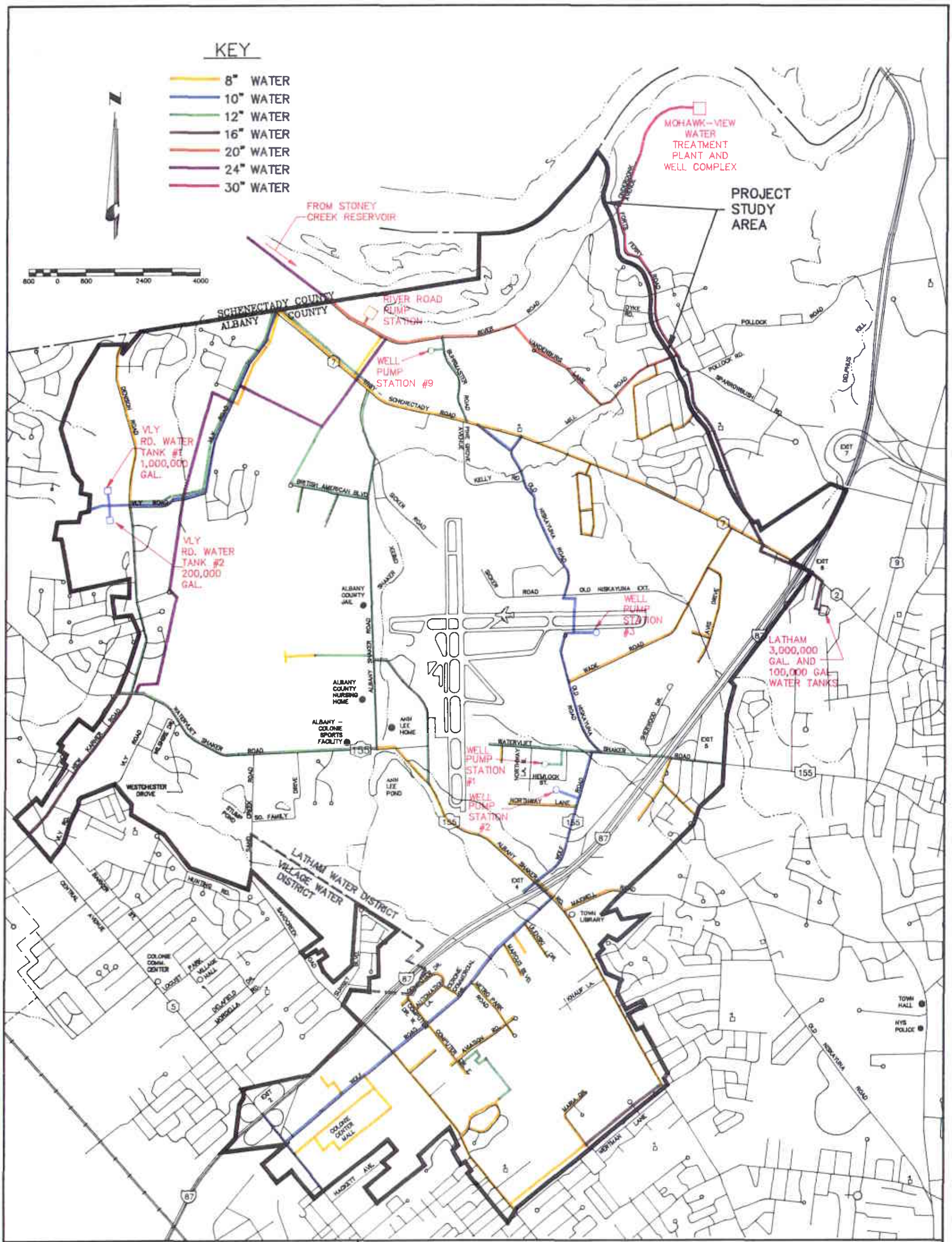
The Latham Water District (LWD) provides public water to the Study Area. A second water purveyor, the Village of Colonie, purchases water from the LWD and administers its distribution within the Village of Colonie. For the purpose of this FGEIS however, the issue of water supply will be discussed under one entity, the LWD. Exhibit II-G-4 outlines the existing supply and distribution facilities maintained and operated by the district for the Study Area.

The system draws raw water from three sources: 1) the Mohawk River; 2) the Stony Creek Reservoir; and, 3) the Mohawk-View Well Complex. The LWD is limited to the following quantities of raw water that can be drawn from these sources: 1) Mohawk River - 15 million gallons per day (MGD), 2) Stony Creek Reservoir - 6 MGD; and 3) Mohawk-View Well Complex - 5 MGD. All raw water is filtered and treated at the Mohawk-View Filtration Plant located on Onerdonk Avenue in the northern portion of the Town of Colonie, north of the Study Area. The plant currently produces an average of 10.5 MGD and has a design peak capacity of 22.5 MGD. In general, the Mohawk-View Filtration Plant presently has the capacity to supply the Study Area with sufficient potable water to meet current needs.

b. Pumping

There are two primary high-lift pumping stations located within the Town (see Exhibit II-G-4). The first pumping station is located adjacent to the Mohawk-View Filtration Plant on Onerdonk Avenue. It is designed to deliver treated water under high pressure through several transmission lines to distribution piping and storage facilities in the eastern portion of the Town of Colonie and the Study Area. The second pumping station is located at the site of the former River Road Filtration Plant in the northern part of the Study Area. This facility was constructed in 1989 as a high lift pumping station to deliver treated water to the western portions of the Town of Colonie and the remaining portions of the Study Area.

There are four well pumping stations located in the Study Area which supply ground water to the distribution network. All four currently produce a total of 2.75 MGD of well capacity. Well pump station #1 is located on Hemlock Street, well pump station #2 is located on Wolf Road, well pump station #3 is



CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS & PLANNERS
3 WINNERS CIRCLE ALBANY, N.Y., 12205

EXISTING WATER SYSTEM MAPPING OF TRANSMISSION & MAJOR DISTRIBUTION LINES (8" AND GREATER)

EXHIBIT NO.

II-G-4

AIRPORT AREA GENERIC ENVIRONMENTAL IMPACT STATEMENT

located just south of runway 10-28 (the east-west runway) at the Albany County Airport and well pump station #4 is located on Buhrmaster Road (see Exhibit II-G-4). As of November 1990, Wells #1 and #2 were abandoned by the LWD.

In addition to the treated water pump stations discussed above, there are two raw water pump stations which deliver untreated water to the Mohawk-View Filtration Plant. The first is the River Road Raw Water Pump Station which is located on River Road in the Town of Niskayuna. This pump station pumps water from the Stony Creek Reservoir to the Mohawk View Plant. The second raw water pump station is located at the Mohawk-View Filtration Plant and pumps water from the Mohawk River to the plant. This pump station is known as the Mohawk-View Low-Lift Pump Station.

c. **Storage**

Three of the LWD's storage tanks are located within the Study Area (see Exhibit II-G-4). Two are located proximate to each other on Vly Road in the northwestern portion of the Study Area. The smallest of these tanks is a standpipe with a 200,000 gallon capacity. The second storage tank, located 600 feet to the north, is also a standpipe but has a capacity of 1 million gallons. The third storage tank in the Study Area is the 3.4 MGD Denison Road Storage tank which was constructed in 1989 at a cost of $1 million.

In addition, to the storage tanks outlined above, there are two storage tanks, located just east of the Study Area and adjacent to Route 7, which also provide hydraulic benefit to the Study Area. These tanks, located on Utica Avenue, have capacities of 3 million and 100,000 gallons and assist in meeting the peak water demands of users in the eastern portion of the Study Area.

d. Transmission

There is presently an extensive network of major transmission lines which supply potable water to the Study Area. These are shown on Exhibit II-G-4.

A 24-inch main runs from the Stony Creek Reservoir, crosses the Mohawk River, then follows River Road to the water treatment plant. From the treatment plant a 24-inch line and an 8-inch line run south to Route 7, and a 20-inch line runs to the east. The 24-inch line is reduced to a 12-inch line and a 16-inch line which further distributes water throughout the Study Area. The 12-inch line on Route 7 turns south and travels down Vly Road where it is further reduced to a 10-inch line and feeds water to the existing 200,000 gallon and 1 million gallon standpipes located west of Vly Road. The 20-inch line continues east along River Road and then turns southeast to continue along Vandenberg Lane to Mill Road where it connects a 16-inch main that runs along Forts Ferry Road. A 30-inch main begins at the Mohawk-View Filtration Plant and follows Forts Ferry Road along the eastern edge of the Study Area. This line then reduces down to a 16-inch and 24-inch main at Sparrowbush Road. The 16-inch line then distributes water into a network of smaller lines which feed the Study Area. The 24-inch line travels down Sparrowbush Road and then runs south adjacent to the Northway and down Utica Avenue where it feeds the two standpipes (3 million gallon and 100,000 gallon capacities) located in Latham, just outside of the Study Area. From these standpipes, smaller-diameter lines distribute water to a network of lines serving users within the Study Area (see Exhibit II-G-4).

c. **Distribution**

The distribution system within the Study Area is comprised of a network of 8-inch, 10-inch, and 12-inch water mains located along the major thoroughfares of the Study Area as shown on Exhibit II-G-4. These mains supply existing residential developments as well as commercial and industrial users.

According to LWD personnel, there are no existing pressure or flow deficiencies within the District. As such, the LWD adequately supplies potable water to its existing customers.

5. Sanitary Sewer:

The Study Area is serviced by three primary sewer agencies: the Albany County Sewer District (ACSD), the Town of Colonie Pure Waters Department and the Village of Colonie. Approximately eight percent of the Study Area is located within the ACSD, while two percent of the Study Area is located in the Village. The remaining 90 percent of the lands within the Study Area are serviced by the Town of Colonie Pure Waters Department. The boundaries of the three sewer agencies and a layout of the sanitary collection system within the Study Area is found on Exhibit II-G-5.

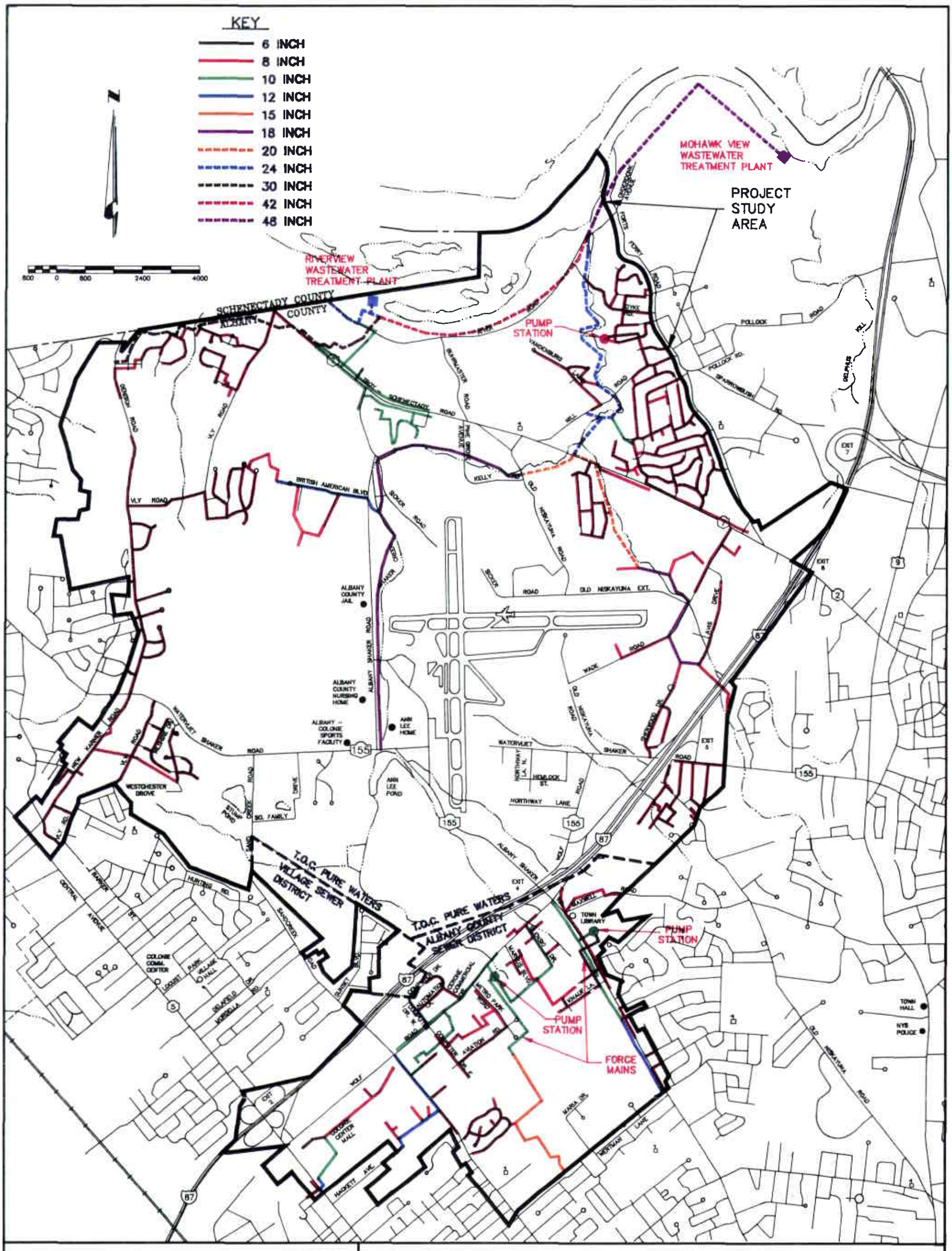
The Town of Colonie Pure Waters Department owns and maintains a network of existing sewer lines located within the Study Area ranging in size from 6 inches to 42 inches. An 18-inch sewer line extends north from Watervliet Shaker Road along Shaker Creek to Old Niskayuna Road. The 18-inch line collects wastewater from a network of 8-inch lines servicing the western portion of the Study Area and a 12-inch main at British American Boulevard. The 18-inch sewer line increases in size to a 20-inch main which continues along Shaker Creek between

old Niskayuna Road and Route 7. From this point the 20-inch main increases to a 24-inch main and then to a 42-inch main flowing northeast along Shaker Creek to the Mohawk-View Wastewater Treatment Plant which is located on Onerdonk Road, just outside the Study Area.

A 30-inch main services the northwest portion of the Study Area. The 30-inch line flows northeast from Denison Road to a 42-inch main along River Road. This line terminates at the Mohawk-View Wastewater Treatment Plant. All wastewater collected within the Town of Colonie Pure Waters Department Improvement Area is treated at the Mohawk-View Wastewater Treatment Plant. The plant currently processes an average of 2.85 MGD (60 percent capacity), but has an ultimate design capacity of 5 MGD. Officials of the Town of Colonie Pure Waters Department do not plan to make any improvements to the plant during the 15-year planning period as they have indicated that there is ample capacity within the existing sanitary sewer system to serve current wastewater needs.

The ACSD has a network of sewers in the southern portion of the Study Area (see Exhibit II-G-5). For discussion purposes, the description of this network is segmented into two groups.

One group of ACSD lines in the Study Area includes a series of 8, 10 and 12-inch lines which collect sewage from the Wolf and Sand Creek Road areas. With the exception of the Sand Creek Road corridor, these lines lead to a pump station located east of Wolf Road between Metro Park Road and Marcus Boulevard. Sewage from this facility is pumped through a 10-inch force main to a 15-inch gravity sewer which leads to the Patroons Creek trunk sewer. Sewage along Sand Creek is collected in a 12-inch line which eventually flows to the southwest and also discharges to the Patroon Creek trunk sewer.



CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS & PLANNERS
3 WINNERS CIRCLE ALBANY, N.Y. 12205

EXISTING SANITARY SEWER COLLECTION SYSTEM

EXHIBIT NO.

II – G – 5

AIRPORT AREA GENERIC

ENVIRONMENTAL IMPACT STATEMENT

The second group of ACSD sewer lines lies within the southern portion of the Study Area and serves users along Albany Shaker Road. A series of 8 and 10-inch sewer lines collect sewage from Maxwell and Albany Shaker Roads and discharges it to a pump station near the William K. Sanford Town Library. From this facility sewage is pumped southeastward via a force main along Albany Shaker Road to a 10-inch and 12-inch line respectively. This 12-inch line then discharges sewage to the Patroons Creek trunk sewer.

The intermunicipal agreement for the discharge of wastewater between the Town of Colonie and the ACSD allows the Town to contribute up to 13.7 percent of the ACSD's total receipt of sanitary sewage on a monthly basis. Currently, the ACSD North Wastewater Treatment Plant processes approximately 20 MGD, but has a design capacity of 35 MGD. Officials of the ACSD have stated that they do not plan to expand the existing North Wastewater Treatment Plant and that the plant is operating at approximately 60 percent capacity.

Village of Colonie Sewer facilities serve a portion of the Study Areas between Sand Creek Road, Sunset Boulevard, and the Village boundary. The Village of Colonie Sewer District has an intermunicipal agreement with the ACSD which permits the Village to discharge up to 2.6 MGD to the ACSD. According to Village personnel, the Village of Colonie currently discharges an average of only 1.14 MGD to the ACSD.

Impacts and Mitigation Measures:

1. **Electric:**

It has been estimated that the electrical demand for the Study Area during the 15-year planning period will be 168,903 kilovolt-amperes (KVA) per year, based on the Cumulative Growth Scenario. The increase in electrical demand in the

Study Area was presented to NMPC officials and they have indicated that existing and/or proposed facilities will be adequate to serve future needs.

To meet future demands for electricity, the NMPC is planning to construct a new 13.2 KV substation on Sand Creek Road approximately 1/2-mile south of Watervliet Shaker Road/Sand Creek Road Intersection and bring 115 KV transmission facilities to the Latham area. The costs for the construction of the above improvements will be borne by NMPC unless a relocation of existing facilities to a location outside a public R.O.W. or NMPC easement is requested. This may result in the need to acquire land or relocate existing overhead lines underground. In either case, costs are passed on to the entity requiring the relocation.

2. Natural Gas:

Officials of the NMPC Capital Region Gas Planning Unit have indicated that they do not foresee any difficulties with supplying natural gas to meet future demands within the Study Area under the Cumulative Growth Scenario. NMPC has stated that they will supply natural gas to future customers either by installing new mains where they currently do not exist or by upgrading the existing distribution system.

The future costs of supplying natural gas service to new developments in the Study Area will be borne by the NMPC. At no time during the 15-year planning period will the Town, Village or County be financially responsible for the extension of existing natural gas services unless a relocation of existing facilities is required by these municipalities.

3. Telephone:

Telephone service in the Study Area is currently provided by the NYT. Officials of NYT have indicated that NYT will meet the communication needs of its

customers during the 15-year planning period as required. The cost of any new construction will be borne solely by NYT with no costs attributable to the Town and Village of Colonie or Albany County.

4. Water:

a. Demand

The estimated additional water demand for the Study Area under the Cumulative Growth Scenario is 1,145,667 gallons per day (gpd) and is computed as follows:

Residential Growth = 4,068 people

Commercial Growth = 7,388,674 S.F. building space

Residential Demand

4,068 people x 100 gallons per day per capita (GPDC) =	406,800 GPD

Industrial/Commercial/Retail Demand

7,388,674 S.F. x 0.10 gal/S.F. building space =	738,867 GPD
Additional Average Daily Demand =	1,145,667 GPD

The LWD is currently supplying approximately 10.5 MGD to its residential/commercial users. Although the average water demand for this planning period is approximately 1,145,667 GPD, industry standards recommend that a peaking factor of 2.9 be used when computing future peak demands in accordance with Figure 1 - Ratio of Extreme Flow to Daily Average Flow of the Recommended Standards for Water Works, (Great Lakes-Upper Mississippi River Board of State Sanitary Engineers, 1978).

Given the above, peak demands are computed as follows:

Total Additional Average Daily Demand	=	1,145,667 GPD
1,145,667 GPD/100 GPDC	=	11,457 Design Capita
1,145,667 GPD x 2.9 peaking factor	=	3,322,434 GPD Additional Peak Demand

Since, according to LWD personnel, the treatment plant is designed to mitigate peak demands within the district, the peak demand rate calculated above will be added to the current demand and compared to the design peak capacity of the treatment plant. When comparing these values, it can be seen that the additional peak demand of development within the Study Area will not exceed the capacity of the treatment plant, but the cumulative impacts of development within entire district will require improvements to be made.

b. Supply, Treatment and Filtration

To meet the additional water demand for the Study Area, the LWD must apply to the NYSDEC for permission to draw additional raw water from the Mohawk River. A preliminary review of the expansion of the Mohawk-View Filtration Plant to 38 MGD is currently being evaluated. Construction of these improvements, however, will be undertaken over a 5 - 10-year period. Total improvement costs are estimated at $15 million. In addition to improvements at the treatment plant, the LWD proposes to make improvements to the existing intake structure in the Mohawk River, including the dredging of the intake channel. The estimated construction cost for these improvements is $400,000.

Officials of the LWD also plan to improve the district's supply by improving groundwater supply capabilities to 10-12 MGD if the groundwater is available. If sufficient groundwater is not available, LWD personnel have indicated that the potential may exist for the possibility of intermunicipal

emergency interconnections with neighboring communities. Whichever avenue for supply improvement is chosen, it is estimated that the maximum construction cost will be $2 million. Included in this estimate are the required engineering and inspection services, which typically add 20 percent to the total construction cost.

In reviewing the improvements outlined above, it may be seen that the estimated construction cost for supply, treatment, and filtration improvements is $17.4 million in 1990 dollars.

c. **Pumping**

Projected development within the Study Area will necessitate the following pumping improvements:

- modify and upgrade the existing Mohawk-View Low Lift Pump Station at an estimated construction cost of $120,000;
- modify and upgrade the existing Mohawk-View High Lift Pump Station, including an addition to the existing building, new pumps, electrical improvements, and instrumentation work at an estimated construction cost of $1.2 million;
- construct a new High Pressure Zone Pumping Station serving the Denison Road area above the elevation of 410 feet at an estimated construction cost of $360,000; and
- construct a new Airport West Booster Station on the existing Vly Road 24-inch main to provide better distribution in the Airport Area, Village of Colonie and areas to the west of the Study Area at an estimated construction cost of $540,000.

In summary, the total estimated cost of pumping improvements is $2.22 million in 1990 dollars. Included in this estimate are the required engineering and construction inspection services, which typically add 20 percent to the total construction cost.

d. Storage

Conversations with the LWD have indicated that a new 400,000 to 500,000-gallon storage tank will have to be constructed west of Denison Road to provide service to areas over elevation 410. The estimated cost, including engineering and construction inspection services at 20 percent of the total construction cost, is $720,000 in 1990 dollars.

e. Transmission

Due to projected development, LWD personnel have determined that the following improvements are required to service district users adequately in the Study Area:

- concurrent with the planned reconstruction of NYS Route 7 by the NYSDOT, construct a new 12-inch main along the north side of Route 7 from Wade Road to the Niskayuna Town line, estimated construction cost $2.4 million;

- install 400 LF of new 16-inch main to connect the existing 16-inch main on Forts Ferry Road with the new 12-main line on Route 7 described above, estimated construction cost $33,600;

- construct 4,400 LF of new 16-inch main to connect the Denison Road Storage Reservoir to the proposed storage tank to provide

service to areas above elevation 410 feet and an emergency connection for the west portion of Town, estimated construction cost is $369,600;

- construct 2,400 LF of new 12-inch main along Sand Creek Road from Watervliet Shaker Road to the Colonie Village line, estimated construction cost $167,040; and

- install 4,800 LF of new 24-inch transmission main from Mohawk-View Treatment Plant to the distribution system to allow additional finished water to enter the distribution system and avoid high discharge pressures, estimated construction cost is $518,400.

The total estimated cost of the above transmission improvements is $3,488,640 in 1990 dollars. Included in this estimate are the required engineering and construction inspection services which typically add 20 percent to the total construction cost.

f. Distribution

The following is a list of improvements which officials of the LWD has determined to be necessary to support projected growth in the Study Area under the Cumulative Growth Scenario:

- **Vly Road/Denison Road:** necessary interconnections with high pressure system (pumping station, storage tank, etc.) to primarily serve areas over elevation 410 and provide an emergency back-up supply for the Study Area. The cost is estimated as follows:

Approx. 4,200 L.F. of 12-inch Ductile Iron Pipe (D.I.P.) x $58.00/L.F. =	$243,600
Engineering/Const. Inspection (20%)	$ 48,720
	$292,320

- **Airport Area/Sicker Road:** construct a new 12-inch main to connect with an existing 12-inch main on Albany Shaker Road. The project is being financed by airport tenants and will not be included as a cost related to projected development in the Study Area. The cost is estimated as follows:

Approx. 4,150 L.F. of 12-inch D.I.P. x $58.00/L.F. =	$240,700
Engineering/Const. Inspection (20%)	$ 48,140
	$288,840

- **Mill Road:** connect an existing 20-inch main at Vandenburg Avenue with a new 20-inch main on Route 7. This improvement will require horizontal boring under Route 7. The cost is estimated as follows:

Approx. 2,000 L.F. of 20-inch D.I.P. x $85.00/L.F. =	$170,000
Rt. 7 bore: 100 L.F. of 20-inch D.I.P. x $400/L.F. (36-inch casing) =	$ 40,000
Subtotal	$210,000
Engineering/Const. Inspection (20%)	$ 42,100
	$252,000

- **Old Niskayuna Road:** replace existing 10-inch main under Old Niskayuna Road with a new 16-inch main from Route 7 to Watervliet Shaker Road. A horizontal boring under Airport runway 10-28 is required. The estimated cost of these improvements is calculated as follows:

Approx. 9,900 L.F. of 16-inch D.I.P. x $70.00/L.F. =	$693,000
Runway boring: 400 L.F. of 16-inch D.I.P. x $350/L.F. (30-inch casing) =	$140,000
Subtotal	$833,000
Engineering/Const. Inspection (20%)	$166,600
	$999,600

- **Old Wolf Road:** replace existing 10-inch main with a new 16-inch main on Old Niskayuna Road from Watervliet Shaker Road to Albany Shaker Road. This line would continue east on Albany Shaker Road to connect with the existing 10-inch main on Wolf Road. This cost is estimated as follows:

Approx. 5,000 L.F. of 16-inch D.I.P. x $70.00/L.F. =	$350,000
Engineering/Const. Inspection (20%)	$ 70,000
	$420,000

- **Rensselaer Avenue:** construct a new 8-inch main along Rensselaer Avenue to connect existing lines on Route 7 to Avis Drive. The estimated cost of improvements is as follows:

Approx. 2,000 L.F. of 8-inch D.I.P. x $42.00/L.F. =	$ 84,000
Engineering/Const. Inspection (20%)	$ 16,800
	$100,800

- **South Family Drive:** at present no water service is available in this area with the exception of 2-inch service for existing buildings. Therefore, a new 8-inch water line should be installed to connect existing water lines on Watervliet Shaker and Sand Creek Roads. The estimated improvement costs are as follows:

Approx. 3,120 L.F. of 8-inch D.I.P. x $42.00/L.F. =	$131,040
Engineering/Const. Inspection (20%)	$ 26,208
	$157,248

- **Sicker Road:** replace the existing 6 and 8-inch mains with a new 8-inch main from Albany Shaker Road to the end of Sicker Road. The estimated cost is as follows:

Approx. 3,050 L.F. of 8-inch D.I.P. x $42.00/L.F. =	$128,100
Engineering/Const. Inspection (20%)	$ 25,620
	$153,720

- **Wade Road:** replace existing 8-inch main with a new 16-inch main from Route 7 to Old Niskayuna Road. The estimated cost is as follows:

Approx. 6,550 L.F. of 16-inch D.I.P. x $70.00/L.F. =	$458,500
Engineering/Const. Inspection (20%)	$ 91,700
	$550,200

- **Airline Drive:** construct a new 12-inch main to interconnect with new or existing water lines on South Family Drive or Sand Creek Road. These improvements would provide better fire protection and system reliability to users in this area. The estimated cost is as follows:

Approx. 1,520 L.F. of 12-inch D.I.P. x $58.00/L.F. =	$ 88,160
Engineering/Const. Inspection (20%)	$ 17,632
	$105,792

The total estimated construction cost of all water distribution improvements required in the Study Area during the 15-year planning period is $3,320,520. This includes engineering and construction inspection servies and all hydrants, valves, surface restoration, etc., in 1990 dollars.

5. <u>Sanitary</u>:

The total additional wastewater flow generated within the Study Area under the Cumulative Growth Scenario is 1,145,667 GPD and is computed as follows:

Residential Growth = 4,068 people

Commercial Growth = 7,388,674 S.F. building space

<u>Residential Demand</u>

4,068 people x 100 gallons per day per capita (GPDC) = 406,800 GPD

<u>Industrial/Commercial/Retail Demand</u>

7,388,674 S.F. x 0.10 gal/S.F. building space = <u>738,867 GPD</u>

Additional Average Daily = 1,145,667 GPD

Although the average daily water demand for the planning period is approximately 1.146 MGD, industry standards recommend that a peaking factor of 2.9 be used when computing future peak demands in accordance with Figure 1 - Ratio of Extreme Flow to Daily Average Flow of the Recommended Standards for Sewage Works (Great Lakes-Upper Mississippi River Board of State Sanitary Engineers, 1978). As such, peak demands are computed as follows:

Total Additional Demand = 1,145,667 GPD

1,145,667 GPD/100 GPDC = 11,457 Design Capita

1,145,667 GPD x 2.9 peaking factor = <u>3,322,434 GPD</u>

<u>Additional Peak Demand</u>

The average demand value computed above represents peak demands for the entire Study Area. As discussed previously, however, three sewer agencies provide sewer service to the Study Area. For the comparison of existing systems capacities to proposed demand, the average demands of 1,145,667 must be broken down to reflect the actual flows being discharged to the system. This breakdown is calculated as follows:

<u>Albany County Sewer District (Incl. TAZ's 131, 138, 139, 140)</u>		
Residential Growth	= 1,002 people	
Commercial Growth	= 1,378,508 SF building space	
Average Daily Residential Demand	= 1,002 people x 100 GPD per capita	= 100,200 GPD
Average Daily Industrial/ Commercial/Retail Demand	= 1,378,508 SF x 0.10 GPD/SF	= 137,851 GPD
	Total Average Daily Demand	= 238,051 GPD
<u>Village of Colonie (TAZ 126)</u>		
Residential Growth	= 666 people	
Commercial Growth	= 0	
Average Daily Residential Demand	= 666 people x 100 GPD per capita	= 66,600 GPD
Average Daily Industrial/ Commercial/Retail Demand	= 0	
<u>Town of Colonie Pure Waters Department (all remaining TAZ's)</u>		
Residential Growth	= 2,400 people	
Commercial Growth	= 6,010,166 SF building space	
Average Daily Residential Demand	= 2,400 people x 100 GPD per capita	= 240,000 GPD
Average Daily Industrial/ Commercial/Retail Demand	= 6,010,166 SF x 0.10 GPD/SF	= 601,017 GPD
	Total Average Daily Demand	= 841,017 GPD

With respect to the Albany County Sewer District discharge, ACSD personnel have indicated that the additional 238,051 GPD to be consumed by development within the Study Area is not reported to alter this existing intermunicipal agreement between the Town and County or require improvement to facilities of the ACSD. Further, with respect to the Village, the additional 66,600 GPD will increase discharge to the ACSD to 1.21 MGD, well below the current discharge rate of 2.6 MGD.

With respect to the Town of Colonie Pure Waters Department, conversations with Pure Waters Department personnel have indicated that, while the additional flow is in keeping with the comprehensive sewer plan, all costs required to construct sanitary sewer facilities to a site must be borne by the developer.

In summary, it may be said that at no time are the costs of sanitary sewer improvements to be incurred by the Town, County or Village.

6. Utility Improvement Costs Apportionment:

Table II-G-1 summarizes the estimated costs of all utility improvements including engineering and construction inspection services. It is expected that no right-of-way or easement acquisition costs will be incurred to undertake the water system improvement costs summarized in Table II-G-1. While the exact routing of improvements is not presently known, it is anticipated that water improvements will be placed on municipally owned property or within existing highway right-of-way.

TABLE II-G-1

SUMMARY OF UNAPPORTIONED UTILITY COSTS

UTILITY	ESTIMATED UNAPPORTIONED CONSTRUCTION COST
ELECTRICAL	NONE
NATURAL GAS	NONE
TELEPHONE	NONE
WATER	$27,149,160
SANITARY SEWER	NONE

Since many of the utility improvement costs are either absorbed by the utility, such as in the case with the electric, natural gas and telephone companies, or passed on to developers on a project by project basis, such as in the

case with sanitary sewer, no costs for these improvements should be passed on to proposed development in the Study Area. Water improvement costs, however, must be absorbed by the LWD, a Town entity, or shared by agreement with another entity such as the Village of Colonie. As such, it is necessary to apportion some of these improvement costs to projected development within the Study Area. The cost of water supply improvements which clearly benefit the entire water district (i.e. supply, treatment, filtration, some pumping and some transmission improvements) will be apportioned to proposed development within the Study Area based upon that portion of the proposed increase in treatment capacity (15.5 MGD) which will be consumed by this new development. Costs will be apportioned to the Study Area based on the following factor:

$$\frac{\text{Peak Study Area Water Demand}}{\text{Prop. Peak Treatment Cap.-Exist. Peak Treatment Cap.}} = \text{Apportionment Factor}$$

$$\frac{3.322 \text{ MGD}}{38 \text{ MGD} - 22.5 \text{ MGD}} = 0.214$$

The costs of improvements which benefit areas of the LWD outside the Study Area as well as areas within the Study Area (i.e. storage, some transmission, distribution, and some pumping improvements) will be apportioned based on their estimated benefit to the Study Area. Benefit estimates were provided by LWD personnel based upon their experience and knowledge of the water distribution system. The apportioned value for all improvements and the justification for each is outlined below on Table II-G-2 and follows the outline of improvements discussed earlier in this section.

TABLE II-G-2
JUSTIFICATION OF APPORTIONMENT
VALUES FOR WATER IMPROVEMENTS

IMPROVEMENT	JUSTIFICATION
SUPPLY TREATMENT AND FILTRATION	- All supply, treatment and filtration improvement costs will be apportioned based upon the apportionment factor discussed above since each of these improvements benefit the entire LWD.
PUMPING	- Modifications to the Mohawk View Low Lift and High Lift Pump Stations will benefit the entire district and will, therefore, be apportioned using the apportionment factor. - The purpose of the new High Pressure Zone pumping Station is to service the area of Denison Road above elevation 410. Since this area is entirely within the Study Area boundary, 100 percent of the costs will be apportioned to the Study Area. - It has been estimated by LWD personnel that one-third of construction of the new Airport West Booster Pump Station will improve pressure within the Study Area. As such, 33 percent of the cost of this improvement will be apportioned to the Study Area.
STORAGE	- Since the purpose of the proposed 400,000 to 500,000 gallon Denison Road storage tank is to service the area of Denison Road over elevation 410, 100 percent of the cost will be apportioned to the Study Area.
TRANSMISSION	- 12-inch Route 7 main - 100 percent of the cost to be apportioned to the Study Area since the LWD has an independent large-diameter transmission main feeding the western portion of the district outside the Study Area which can meet the development needs of that area without installing the Route 7 main. - 16-inch Forts Ferry Road main - 100 percent of the cost to be apportioned to Study Area since the LWD maintains storage tanks in the Latham area to meet the demands of the eastern portion of the district outside the Study Area. - 16-inch Denison Road main - 100 percent of the cost to be apportioned to the Study Area since the purpose of the main is to deliver water to the proposed 400,000 to 500,000 gallon storage tank from the newly constructed 3.4 MG tank. - 12-inch Sand Creek Road main - 50 percent of the cost to be apportioned to Study Area based on LWD estimates. - 24-inch Mohawk View Treatment Plant Transmission main - costs to be apportioned using the apportionment factor discussed previously (0.214).

TABLE II-G-2 (CONT.)
JUSTIFICATION OF APPORTIONMENT
VALUES FOR WATER IMPROVEMENTS

IMPROVEMENT	JUSTIFICATION
DISTRIBUTION	- 12-inch Vly Road/Denison Road Main - 100 percent of the cost to be apportioned to the Study Area since this main is to serve areas over elevation 410, all of which lie within the Study Area. - 12-inch Airport Area/Sicker Road Main - 0 percent of the cost to be apportioned since the cost of this work is to be financed by current Airport tenants. - 20-inch Mill Road Main - 100 percent of the cost is to be apportioned to the Study Area based on LWD estimates. - 16-inch Old Niskayuna Road and Old Wolf Road Main Replacements - 100 percent of the cost of these improvements will be apportioned to the Study Area as the LWD has an existing 24-inch diameter main feeding the eastern and southern areas of the district outside the Study Area which could meet development needs in these areas without completing the 16-inch main replacements. - 8-inch Rensselaer Avenue, South Family Drive and Sicker Road Mains - 100 percent of the cost of these improvements will be apportioned to the Study Area since they are small in diameter improvements which provide service to areas that do not currently have service or which provide only localized hydraulic benefits. - 16-inch Wade Road Main - 100 percent of the cost is to be apportioned to the Study Area since the existing 6 and 8-inch mains will not be capable of meeting future demands in the vicinity of the Airport. - 12-inch Airline Drive Main - 100 percent of the cost is to be apportioned to the Study Area based upon LWD estimates.

Table II-G-3 summarizes the total cost of all water system improvements and their apportionment to the Study Area. As shown, the total cost of all required water system improvements which can be apportioned to the Study Area is $10,293,620.

7. Distribution of Costs:

To establish Development Mitigation Costs, the total cost of all utility improvements must be calculated based on cost per dwelling unit (D.U.) for residential development and cost per square foot for industrial/commercial/retail development. The calculation of these costs is based on the percentages of the total normal daily water demand consumed by each type of development as outlined below:

Residential Cost

$$\frac{406{,}800 \text{ GPD}}{1{,}145{,}667 \text{ GPD}} \times \$10{,}293{,}620 \div 1583 \text{ D.U.} = \$2{,}309/\text{D.U.}$$

Industrial/Commercial/Retail/Cost

$$\frac{738{,}867 \text{ GPD}}{1{,}145{,}667 \text{ GPD}} \times \$10{,}293{,}620 \div 7{,}388{,}674 \text{ S.F. building space} = \$0.90/\text{S.F.}$$

TABLE II-G-3
SUMMARY OF WATER IMPROVEMENT COSTS
APPORTIONMENT

WATER IMPROVEMENT	TOTAL CONSTRUCTION COST (1990 DOLLARS)	SHARED COST (EQUITY SHARING COST WITH LWD) (1990 DOLLARS)	TOTAL COST TO THE LWD (1990 DOLLARS)	APPORTIONMENT FACTOR	TOTAL COST TO BE APPORTIONED TO THIS STUDY AREA (1990 DOLLARS)
SUPPLY, TREATMENT AND FILTRATION	17,400,000	0	17,400,000	0.214	3,723,600
MOUNTAIN-VIEW LOW LIFT AND MAIN-LIFT PUMP STATION UPGRADING	1,320,000	0	1,320,000	0.214	282,480
HIGH PRESSURE ZONE (DENISON ROAD) PUMP STATION	360,000	0	360,000	1.0	360,000
AIRPORT WEST BOOSTER PUMP STATION	540,000	0	540,000	0.33	178,200
STORAGE	720,000	0	720,000	1.0	720,000
12" ROUTE 7 MAIN	2,400,000	1,000,000 (NYSDOT)	1,400,000	1.0	1,400,000
16" FORTS FERRY ROAD MAIN	33,600	0	33,600	1.0	33,600
16" DENISON ROAD MAIN	369,600	0	369,600	1.0	369,600
12" SAND CREEK ROAD MAIN	167,040	0	167,040	0.50	83,520
24" MOHAWK-VIEW TREATMENT PLANT TRANS. MAIN	518,400	0	518,400	0.214	110,940
12" VLY ROAD/DENNISON ROAD MAIN	292,320	0	292,320	1.0	292,320
12" AIRPORT AREA/SICKER RD. MAIN	288,840	288,840 (AIRPORT TENANTS)	0	N/A	N/A
20" MILL ROAD MAIN	252,000	0	252,000	1.0	252,000
16" OLD NISKAYUNA ROAD MAIN	999,600	0	999,600	1.0	999,600
16" OLD WOLF ROAD MAIN	420,000	0	420,000	1.0	420,000
8" RENSSELAER AVE. MAIN	100,800	0	100,800	1.0	100,800
8" SOUTH FAMILY DR. MAIN	157,248	0	157,248	1.0	157,248
8" SICKER ROAD MAIN	153,720	0	153,720	1.0	153,720
16" WADE ROAD MAIN	550,200	0	550,200	1.0	550,200
12" AIRLINE DRIVE MAIN	105,792	0	105,792	1.0	105,792
TOTAL	27,149,160	1,288,840	25,860,320		10,293,620