STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

PETITION OF MONTVILLE POWER LLC FOR A DECLARATORY RULING TO APPROVE THE RETROFIT AND OPERATION OF A 40 MW BIOMASS-FUELED GENERATION UNIT AT MONTVILLE STATION IN UNCASVILLE, CONNECTICUT

MONTVILLE POWER LLC
PETITION FOR DECLARATORY RULING

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PETITION FOR DECLARATORY RULING

I. INTRODUCTION

A. Statutory Authority

Pursuant to § 16-50k of the Connecticut General Statutes ("C.G.S.") and §§ 16-50j-38 to 16-50j-40 of the Regulations of Connecticut State Agencies ("R.C.S.A."), Montville Power LLC ("Montville Power"), hereby submits to the Connecticut Siting Council (the "Council") this Petition for a Declaratory Ruling ("Petition") approving Montville Power's proposal to retrofit Montville Station (the "Station") Unit 5 to enable the unit to use clean wood biomass to produce up to 40 MW of renewable energy (the "Project"). The Project is eligible to be approved by declaratory ruling because it is an electric generating facility that will be located at a site where an electric generating facility existed prior to July 1, 2004. C.G.S. § 16-50k(a).

B. Project Overview

Originally placed in service in the 1950s, Unit 5 is an 82 MW steam generation unit presently fueled by natural gas and No. 6 oil. Montville Power proposes to retrofit Unit 5 to use clean wood biomass to produce up to 40 MW of renewable energy. In addition, the Project will be designed to maintain Unit 5's ability to operate on liquid fuel or natural gas at its full 82 MW capacity, when needed, in order to continue to provide power during peak periods. In addition, Unit 5's liquid fuel will be switched form No. 6 fuel oil to ultra-low sulfur distillate fuel oil ("ULSD fuel"). The Project will utilize a stoker technology with a vibrating grate feed system that will allow the biomass to be evenly combusted with increased efficiency and lower ash discharge. To control emissions, retrofitted Unit 5 will be equipped with enhanced pollution control systems, and will be among the cleanest biomass-fueled projects in the country.

Montville Power plans to procure the biomass fuel supply to power Unit 5 from local Connecticut sources, including foresters. The Station's location on the estuarine portion of the Thames River also affords Montville Power the option to transport sustainable biomass by barge from the northern states in the event that Connecticut's indigenous supply becomes depleted. The biomass fuel source will consist exclusively of untreated wood, clean urban wood wastes and forest residues, all of which qualify as sustainable biomass under Connecticut law as further discussed in Section II below.

Due to its location, configuration, fuel source and anticipated emission reductions, the Project will not have substantial adverse environmental effects.

C. Applicant Information

Montville Power is a wholly-owned subsidiary of NRG Energy, Inc. ("NRG"). NRG is a competitive power generation company with an approximately 25,000 MW portfolio distinguished by its range in geography, fuel source and dispatch level. Headquartered in Princeton, New Jersey, NRG owns and operates a diverse portfolio of power-generating facilities in the Northeast and throughout the United States. NRG and its subsidiaries own and operate almost 2,000 MW of generation capacity within Connecticut. NRG is a Member of the New England Power Pool.

II. DESCRIPTION OF THE PROJECT

A. Site Description

Montville Power has owned and operated the Station since purchasing it from The Connecticut Light & Power Company ("CL&P") in December 1999. Located in Uncasville, Connecticut, six miles north of New London, Connecticut, on the Thames River, the Station has a nominal, aggregate generating capacity of 500 MW, and currently consists of four units: two steam boilers, Units 5 and 6, and two diesel-fired internal combustion turbines, Units 10 and 11. Unit 5 currently has a nominal rating of 82 MW. (A Site Location Map is included as Attachment A to this Petition.) Montville Power owns approximately 50 acres comprising the Station site, of which the Project will utilize no more than 20%.

As part of the Project, Montville Power will construct a fuel storage shed capable of storing enough wood to fuel Unit 5 for 14 days. The fuel storage shed also will be equipped with automated stacking and a reclaim process integrated into the unit's fuel

management system. As stated above, once retrofitted as a biomass unit, Unit 5 will remain able to operate up to 82 MW of capacity, using natural gas or ULSD fuel. The Station is connected to the Algonquin Gas Transmission ("Algonquin") pipeline by a pipeline spur, owned by Yankee Gas Services Company ("Yankee Gas"), and, in order to accommodate Unit 5's full load capacity, one of the existing fuel oil storage tanks will be converted to suitable storage for ULSD fuel. (A General Arrangement Plan illustrating the general layout of the existing Station and the retrofit of Unit 5 is included as Attachment B to this Petition.)

B. Station Redevelopment

1. Retrofit of Existing Unit 5

Upon completion of the Project, Unit 5 is expected to run as a biomass-fueled, base load resource for the majority of the year. The Project consists of retrofitting Unit 5 to be fueled by biomass to produce up to 40 MW, or to be fueled by either natural gas or ULSD fuel to retain the ability to provide up to 82 MW for a limited period of time. The operational flexibility of the retrofitted Unit 5 – its ability to operate at a nominal rating of 40 MW when fueled by biomass, while retaining the ability to operate up to 82 MW on either natural gas or ULSD fuel – will provide both economic and system reliability benefits to the state of Connecticut.

Converting Unit 5 to a base load, biomass-fueled generator will increase its operating efficiency and will produce cleaner energy, as compared with many of the oil-fired, steam units currently in operation in Connecticut. When the Project is completed, Unit 5 will be equipped with regenerative selective catalytic reduction ("RSCR")

technology to reduce nitrous oxide ("NOx" emissions, and with an oxidation catalyst to reduce carbon monoxide ("CO") and volatile organic compound ("VOC") emissions, which will reduce the Station's overall NOx rates up to 75% at Unit 5's full load, as compared to current allowable rates for the Station. (A more detailed description of the emissions profile for the Station following completion of the Project is provided in Section IV of this Petition.) Unit 5's base load, biomass-fueled operations also will enhance its operational flexibility by allowing Unit 5 to respond more quickly to the needs of the system on high energy demand days. In other words, because Unit 5 will be operating as a base load resource, the unit will effectively provide spinning reserve capacity at times of system peak – with the added benefit that, as a biomass-fueled generator, Unit 5 will provide much cleaner spinning reserve capacity than would be provided by a ULSD fuel or natural gas-fired unit.

Furthermore, because Unit 5 is expected to operate as a base load resource when fueled by biomass, completion of the Project will help to moderate the market price of energy and of renewable energy credits ("RECs"). Simply put, Unit 5 will provide more flexible, lower cost, lower emitting, Class 1 renewable energy with the ability to provide additional power on demand. When Unit 5 operates on biomass fuel, which should be the majority of the hours in the year, it will generate approximately 40 MWs of RECs to contribute towards the state's renewable portfolio requirements, which are escalating at a rate of one percent per year over the next several years. As a result, Connecticut's consumers will benefit from lower cost power, even as the state moves closer to meeting its renewable energy goals.

2. New Fuel

For base load operations, retrofitted Unit 5 primarily will use biomass fuel obtained from three source streams:

(1) *untreated, recycled wood from manufacturing residues,* which includes sawdust, shavings, and unused wood from wood manufacturing and milling businesses (*e.g.* saw mills or flooring mills);

(2) *urban wood wastes*, which includes land-clearing debris from home and business development, residential yard wastes from arborists and landscaping activities and untreated, recycled pallets; and

(3) *forest residues*, which includes logging residues, land-clearing debris from timber stand improvements and commercial development removals. Forest residues are typically whole tree chips and un-merchantable byproducts of normal timbering practices, including trunks, limbs, stumps, leaves and tree tops. Un-merchantable biomass products are traditionally left on the forest floor while high-value saw timber is sold to lumber markets.

Each of these sources is an unadulterated, qualifying sustainable biomass fuels within the meaning of C.G.S. § 16-1(a)(45). Montville Power will not accept painted, stained, pressure-treated or engineered material or any other construction or demolition waste for use as a biomass fuel for Unit 5. All biomass fuel is expected to be processed by the supplier, prior to delivery to the Station. Montville Power will specify to its suppliers that it will only accept wood chips that are no greater than two inches in size. Although Montville Power will install a wood hogger to provide limited processing

capability on site, the wood hogger will be used solely to process the limited amount of pre-processed biomass that may be larger than specified.

In addition, the Project scope includes new biomass fuel handling equipment and the retrofit of an existing fuel oil tank with storage capacity for a minimum of 50,000 gallons of ULSD fuel, which equates to enough ULSD fuel to operate Unit 5 continuously, at full output, for approximately eight hours. The Station is connected to the Algonquin pipeline by a pipeline spur owned by Yankee Gas, with sufficient capacity for plant operations.

3. Electrical Interconnection

The existing interconnection for Unit 5 will not require any modifications to accommodate the Project. Unit 5 will continue to be electrically connected to the Station's 138 kV substation, which is shared with the Station's Unit 6.

4. Site Aesthetics

The Station has been operated as electrical generation station for over 90 years, and is a fixture in the surrounding community. Visual impacts of the Project will be limited to the construction of covered fuel receiving and storage facilities. The fuel receiving facility will be located near the entrance to the Station on Lathrop Road and will receive fuel delivery vehicles, which will then convey the biomass a distance of approximately 300 yards to the nearby fuel storage facility. As designed, the storage facility will be approximately 90 feet tall. Montville Power will landscape around the wood yard receiving area to minimize its visual effects. Grass will be planted on areas

not subject to vehicle or foot traffic, and walkways and driveways will be comprised of crushed stone, asphalt or concrete.

5. Sound Attenuation

The Station is bounded by the Thames River on one side and by an upward-sloping topography of forested land on the other. This location will minimize the impact of sound emissions of Unit 5. In addition, retrofitted Unit 5 will feature high-performance silencers and noise-attenuating enclosures for the fuel processing equipment, as well as installation of acoustical barriers around the fuel unloading and handling equipment, noise emissions are expected to comply with the standards established by the state of Connecticut. A complete Noise Level Evaluation (the "Noise Study") evidencing this conclusion was conducted by Shaw Group and is discussed in detail below in Section IV. (A copy of the Noise Study is included as Attachment C to this Petition.)

6. Traffic Impacts

A complete study of the impact that construction and operation of the Project will have on local traffic (the "Traffic Study") was conducted by Shaw Environmental. Based on an analysis of the expected traffic levels during the 12-month construction period, the Project will result in very minimal impacts on roadway operations. Montville Power estimates that approximately 100 craft employees will work on the Project, of which 80 will work on the site during the heaviest work days. Existing traffic volumes along Lathrop Road and Depot Road are very light and the additional construction traffic will have only minimal and temporary impact on roadway operations. All drivers of

construction vehicles will be warned to stay off of the local residential streets. The Project's permanent impact on traffic is expected to increase slightly with the addition of 40 fuel truck deliveries each day. Despite the additional fuel deliveries, the Project will have no appreciable effect on local traffic volumes or delays. (A copy of the Traffic s included as Attachment D to this Petition.)

C. **Construction Plan**

NRG Construction LLC, NRG's development, engineering, procurement and ction subsidiary, will directly manage and execute the construction activities for ect. (A Construction Schedule is included as Attachment E to this Petition.) onstruction activities associated with the Project include the following:

- installation of new maintenance warehouse/garage;
- installation of new waste water transfer pump house interconnection to city sewer;
- demolition of existing maintenance garage and waste water treatment facility;
- site mobilization for construction activities;
- civil work including foundations for the new wood yard material handling equipment, electro-static precipitators, regenerative select catalytic and booster fan;
- installation of biomass material handling equipment;

- installation of emission controls equipment including dust collector and electrostatic precipitator ("ESP") for particulate controls, oxidation catalyst and RSCR for NOx, CO and VOC emissions control;
- removal of lower furnace bottom and installation of new stoker grate firing system including fuel metering system and distribution air systems;
- installation of new ash material handling systems;
- construction of a new electrical distribution system for power supply to the new equipment;
- retrofit of the No. 6 oil supply system day tank to hold ULSD fuel; and
- retrofit of Unit 5 to install low NOx burners on the boiler.

Landscaping around the wood yard receiving area also is planned in order to minimize visual effects of the operation. Grass will be planted on areas not subject to vehicle or foot traffic and walkways and driveways will be of crushed stone, asphalt or concrete. Erosion and sedimentation control procedures will be implemented to preclude any run-off into the Thames River.

III. NEED FOR THE PROJECT

In 1998, the state legislature adopted a state-wide requirement for the procurement of renewable energy, C.G.S § 16-245a, and established Connecticut's renewable portfolio standards ("RPS"). Revised several times since then, Connecticut's current RPS require that, by 2020, 20% of energy sold in the state must be produced by "Class I" renewable resources (as defined by C.G.S. § 16-245a). On March 25, 2009, NRG filed with the DPUC a Petition for a Declaratory Ruling with respect to

qualification of the Project as a Class I renewable energy source pursuant to C.G.S § 6-1(a)(26). A determination on the petition is expected soon, and Montville Power will provide a copy of such determination to the Council as soon as it is received.

Opinions differ regarding the amount of available renewable generation in NEPOOL. However, there is agreement that existing resources are only sufficient through 2010 and the absence of additional capacity may cause a shortfall in RECs, requiring Connecticut electrical delivery companies to procure RECs at the penalty rate of $55 per megawatt hour. The Project is uniquely situated to take advantage of existing infrastructure to satisfy a portion of the growing renewable requirements without constructing additional capacity in Connecticut. The modification of existing, in-state equipment allows Connecticut to benefit directly from the reinvestment in an aging facility by improving its emissions profile, while also ensuring that Connecticut customers' REC costs inure to the benefit of the Connecticut economy, by supporting local fuel supply and generation.

IV. ENVIRONMENTAL IMPACTS

A. Air Emissions

The Project is designed to meet all applicable state and federal air quality requirements, as well as the expected terms of the Air Permit to be issued by DEP under R.C.S.A. § 22a-174-3a. Overall, the Project is designed to fall within the allowable stack concentrations of hazardous air pollutants as allowed by R.C.S.A. § 22a-174-29, as well as to meet Best Available Control Technology standards for sulfur dioxide ("SO_2"), NOx, CO, VOC, PM_{10}, and $PM_{2.5}$. As designed, the Project also will meet Lowest Available

Control Technology for NOx. Unit 5 will use good combustion practices when fueled by biomass, and will use ULSD fuel and natural gas up to 82 MW for the control of SO_2. The Project will be equipped with a catalytic oxidation system for the control of CO and some VOC emissions, and equipped with a new ESP for the control of PM_{10}, and $PM_{2.5}$. In addition, Unit 5 will be equipped with RSCR technology for the control of NOx.

Because the nameplate capacity of Unit 5 is greater than 25 MW, the Project also is subject to the requirements of the Federal Acid Rain Program (40 C.F.R. § 72). The Station has an Acid Rain permit issued by DEP for its existing units including Unit 5. No modification to the Acid Rain Permit is needed. Additionally, the Station has a Title V Operating Permit (Permit No. 107-0043-TV) issued by DEP on November 15, 2007. Under R.C.S.A. § 22a-174-33(f)(4), Montville Power is required to submit a request to revise the Title V Permit within 12 months of the commencement of biomass operations.

Based on the foregoing, the air emissions will meet all applicable state and federal requirements and will not have a substantial adverse environmental effect on Connecticut's air resources.

B. Natural Diversity

As defined in the DEP data base, the Station, and, therefore the Project, is not located within an area defined as requiring a review of the Natural Diversity Database ("NDD") to determine the presence of endangered or threatened species. However, Montville Power will submit a NDDB review form to DEP to solicit a response that either (1) confirms that this review is not needed, or (2) provides information regarding species of concern. Montville Power will provide a copy of such review form to the

Council upon filing, and will provide a copy of DEP's response to the Council upon receipt.

C. Coastal Zone Consistency Review

The Station is located with the Coastal Zone as identified by DEP. A Coastal Consistency Review form will be filed with DEP's Office of Long Island Sound Programs with copies to the Town of Montville, DEP's Air Bureau and the Council. No impact on the Coastal Zone is expected from the Project.

D. Subsurface Environmental Conditions

Phase I and Phase II studies of the Station's site, which were conducted by CL&P in 1999, indicated historic site contamination, including oil, solvent and coal ash deposits, from industrial activities that occurred prior to Montville Power's ownership of the Station. As a condition of Montville Power's 1999 purchase of the Station from CL&P, with the concurrence of DEP, Montville Power accepted responsibility for compliance with the requirements of the Connecticut Transfer Act, C.G.S. § 22a-134 (the "Transfer Act"). Pursuant to the Transfer Act, Montville Power must remediate and/or implement controls to address the site pollution. Montville Power has conducted extensive studies since it assumed ownership of the Station and has been working with a Licensed Environmental Professional from Shaw E&I, and with DEP, to remediate the contamination issues at the Station. The locations chosen for several of the facilities comprising the Project are within areas identified for remediation. Accordingly, remediation will be completed prior to or in conjunction with the completion of the Project.

E. Water Resources

1. Cooling Water Diversion

Montville Power holds water well registrations (Registration Nos. 4000-094-PWR-RI and 4000-095-PWR-RI) and diversions to divert 354.4 million gallons per day ("mgd") of water from the Connecticut River for once-through cooling and other uses associated with the production of electricity. Since there will be no changes to the existing once-through cooling, no changes to Montville Power's diversion registration will be needed. Moreover, no construction activities at the shoreline will be associated with obtaining this water, because the water intake infrastructure is currently in place via existing intake structures, tunnel and pump systems to the existing power plant.

2. Water Discharges

Montville Power holds a current National Pollutant Discharge Elimination System ("NPDES') water discharge permit issued by the DEP (Permit No. CT0003115). This NPDES permit authorizes discharge of 354.4 mgd of once-through cooling water from the existing Station units. Since the cooling water needs for the Project will not change as a result of changing the fuel source, Montville Power will not seek a permit modification for this discharge.

However, the existing NPDES permit also encompasses the operation of a waste water treatment facility ("WWTF") for processing the low volume industrial waters used at the Station. Changing to biomass fuel will change inputs to the WWTF. Due to very low use of the WWTF and to the improvement of publicly-owned treatment facilities ("POTW") in the Town of Montville associated with the Project, all the low volume

waste discharges will be routed to the local POTW. Initial engineering discussions with the Town of Montville have been initiated. If the plan to re-route discharged water to the POTW is approved by the Town, a new, pre-treatment discharge permit will be obtained from DEP and Montville Power's existing NPDES permit will be modified to remove the WWTF discharge.

3. Site Storm Water Runoff

Montville Power holds a registration under the General Permit for the Discharge of Stormwater Associated with Industrial Activities. The Project will alter the potential inputs to the storm water discharge and a modification to the registration will be submitted to DEP by Montville Power, once an evaluation of such changes is completed and confirmed. Furthermore, if necessary to accommodate the Project, Montville Power will submit a registration under the General Permit for the Discharge of Stormwater Associated with Construction Activities.

F. Sound

The Noise Study conducted by Shaw Group assessed the potential noise impact of the Project. (A copy of the Noise Study is included with this Petition as Attachment C.) According to the Noise Study, the acoustical design of Unit 5 and all related equipment will yield full compliance with the performance standards established by the Connecticut DEP. Noise emissions between industrial Zone Class C sites and residential Zone Class A sites are limited to 61dba in the daytime and 51 dba at night. Modeling results show mitigated noise levels to be in compliance with daytime noise emissions limits. Evening noise levels are marginal, with only slight exceedances of state criteria along adjacent

properties, under worst case scenario conditions. However, the point at which such exceedances were measured is at the southern end of the Station's property line, more than 500 feet from the nearest residential homes, which are separated from the Station site by woods. Moreover, the measured exceedances are so slight that they fall within the ± 2 dba margin of error.

Noise attenuation controls planned for the Project include:

- enclosure of 48" feeder conveyor from truck dumper to fuel shed;
- enclosure of fuel hogger (processing) equipment;
- silencers for filters on hogger and truck dumpers; and
- berm or sound barrier around truck unloading facilities

Additionally, enclosure of the 30" conveyor from fuel storage to the boiler house may be required if observed noise levels during operations continue to exceed state limits.

As stated above, the results of the Noise Study indicate that, given the proposed acoustical design of the Project, noise emissions are expected to comply with the standards established by the state of Connecticut.

V. STATE AND MUNICIPAL CONSULTATIONS

NRG has been in contact with a number of state and local officials as part of NRG's coordinated effort to inform and involve stakeholders in Montville Power's plan to improve the Station by adding renewable biomass generation capability. Specifically, NRG has discussed the Project with:

- Council staff;

- DPUC Chairman Donald Downes, DPUC Commissioners Kevin DelGobbo, Jack Betkowski and Tony Palermino and DPUC staff;
- DEP staff (Gary Rose, Ric Pirolli, Ernie Bouffard and Jim Grillo);
- Town of Montville Mayor Joseph Jaskiewicz;
- Town of Montville Police officials (regarding the Traffic Study) – Police Lieutenant Bunnell and Resident State Trooper Collins; and
- the Montville legislative delegation – Senator Edith Prague, Representative Betsy Ritter, Representative Kevin Ryan and Representative Tom Reynolds.

Conversations with all of these stakeholders regarding the Project were positive. All stakeholders recognize the benefits of developing new, environmentally-beneficial, renewable generation at the current Station site. Project-specific issues raised by these stakeholders and addressed with them by NRG (and in this Petition) included (1) environmental and public policy benefits of adding a renewable energy component to the Station; (2) staffing levels or increasing employment at the Station; and (3) maintaining a facility on the tax roll and increasing as additional equipment is added. Going forward, stakeholders' issues will be addressed in the overall Project plan.

The Traffic Study results have been presented to the Mayor and police officials. NRG also will present the results of the Noise Study to the Town of Montville in the near future. NRG has held several meetings with the Mayor and is presently working with the Mayor to schedule meetings with key department heads, community meetings, plant tours

and informational sessions. NRG will notify the Council of these events and invites the Council to participate.

VI. CONCLUSION

Based on the foregoing and the attached exhibits, Montville Power respectfully requests that the Council approve the Project by Declaratory Ruling as allowed under C.G.S. § 16-50k. The Project will provide much needed renewable energy, electric generation capacity and reliability in Connecticut and it will do so without substantial adverse environmental effects.

Finally, in accordance with R.C.S.A. § 16-50j-39, the names addresses and telephone numbers of the persons to whom correspondence or communications in regard to this Petition are to be directed are:

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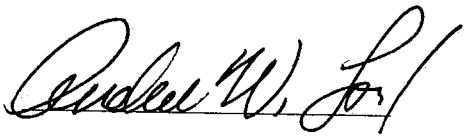
Respectfully submitted,
MONTVILLE POWER LLC



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ATTACHMENTS

A. Site Location Map

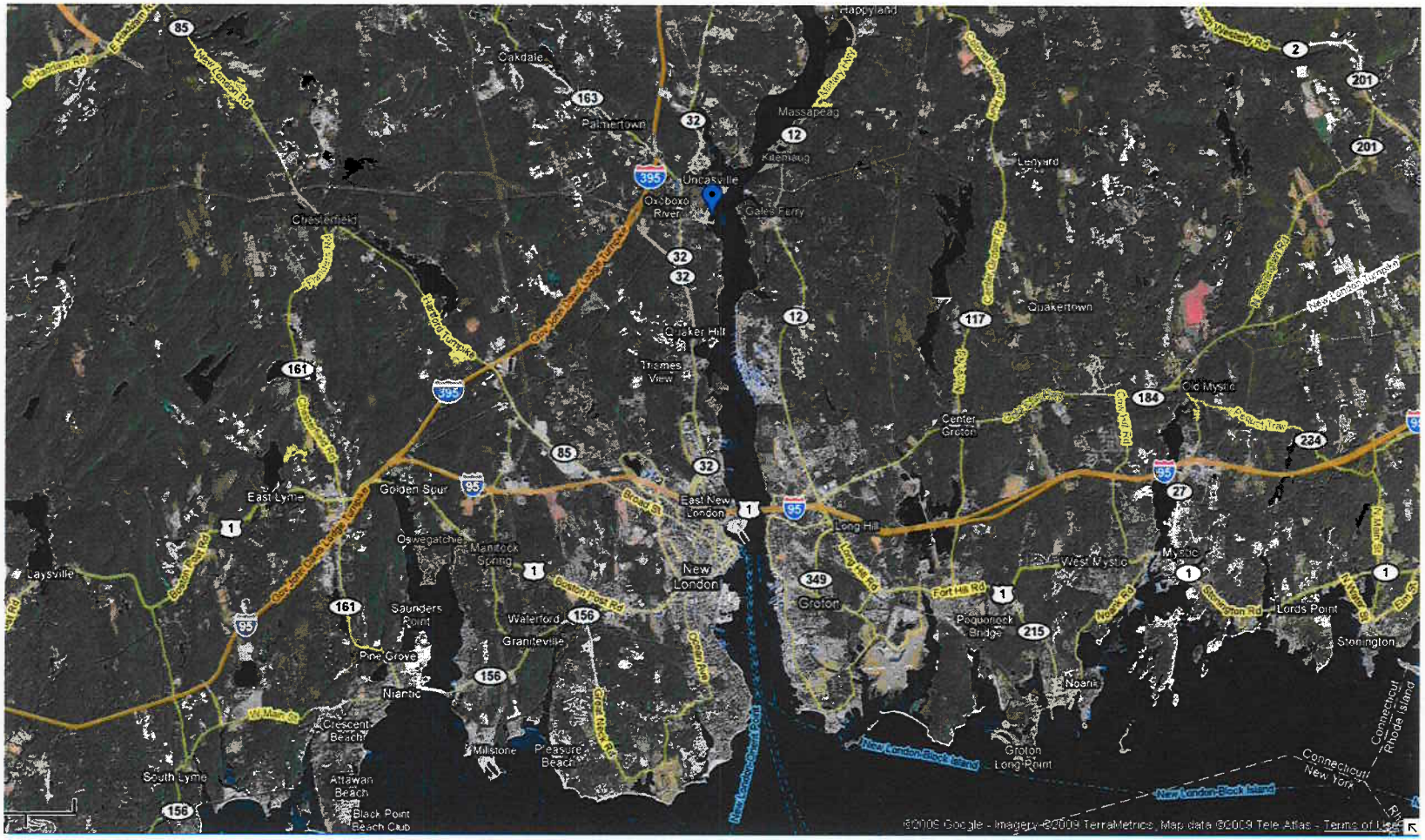
B. General Arrangement Plan

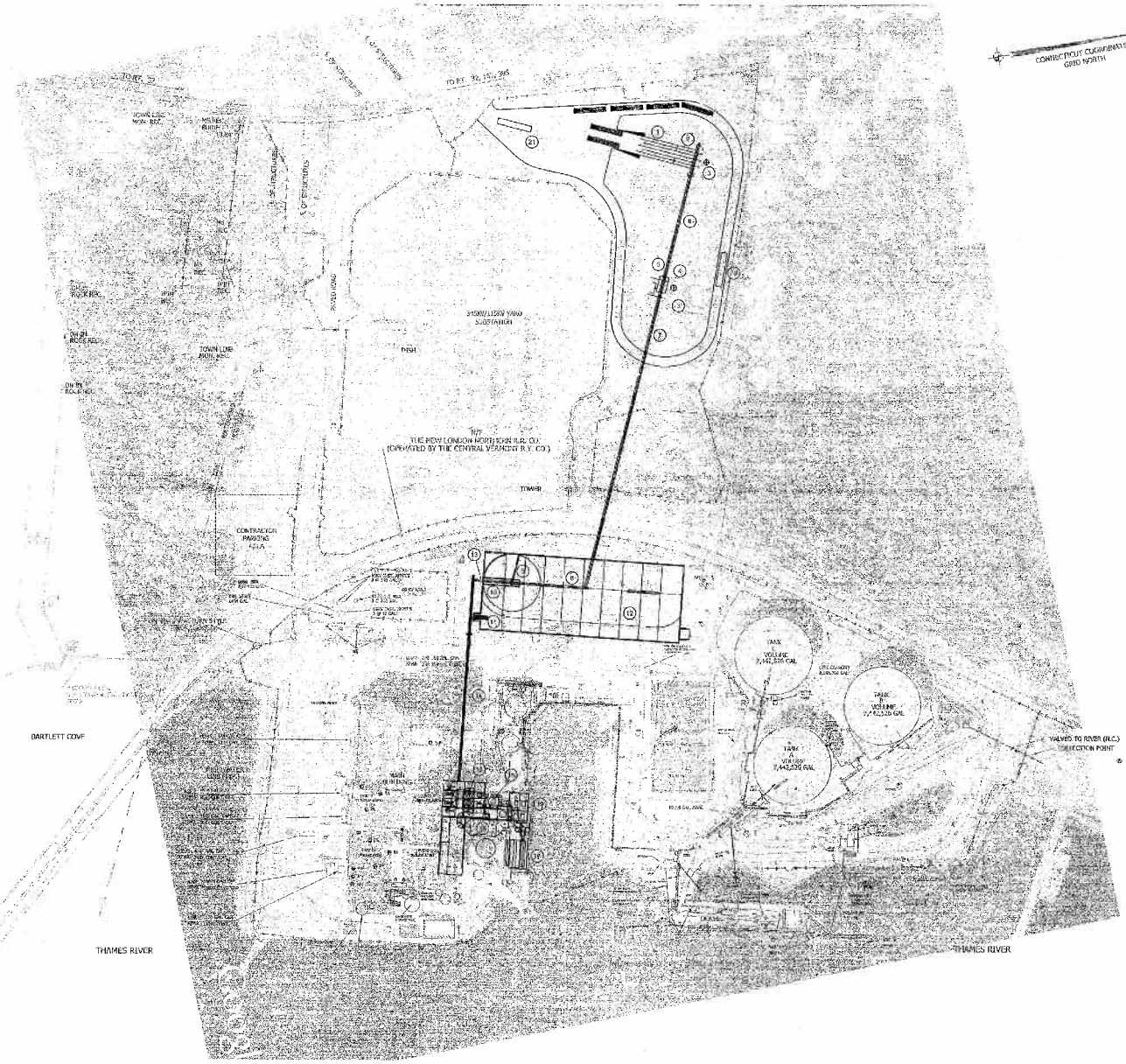
C. Noise Study

D. Traffic Study

E. Construction Schedule

Attachment A





LEGEND

1. TRUCK DUMPERS
2. RECEIVING HOPPERS
3. DUST COLLECTOR
4. DISC SCREEN
5. FUEL HOG
6. BELT CONVEYOR #1
7. BELT CONVEYOR #2
8. REVERSING SHUTTLE CONVEYOR
9. ROTARY SCREW RECLAIMER
10. LIVE STORAGE PILE
11. AUXILIARY RECLAIMER
12. INACTIVE STORAGE PILE
13. BOILER FEED BELT CONVEYOR #1
14. BOILER FEED BELT CONVEYOR #2
15. MECHANICAL DUST COLLECTOR
16. ELECTROSTATIC PRECIPITATOR
17. ID FAN
18. UNIT 5 STACK
19. FLY ASH SILO
20. INCOMING TRUCK SCALE
21. OUTGOING TRUCK SCALE

GENERAL NOTES

1. A PORTION OF THIS DRAWING WAS TAKEN AND MODIFIED FROM A WOLF MATERIAL HANDLING SYTEMS DRAWING
2. A PORTION OF THIS DRAWING WAS TAKEN AND MODIFIED FROM A RILEY POWER INC. DRAWING

PRELIMINARY
AS OF 4/9/2009
NOT FOR CONSTRUCTION

NRG

ZACHRY

NRG ENERGY
MONTVILLE NO. 5 BIOMASS CONVERSION
SITE TOPOGRAPHIC LAYOUT

D0136685-SRWM00001 02 A

Noise Assessment
Unit #5 Biomass Conversion Project
NRG Montville Power LLC

Prepared for
Montville Power LLC
74 Lathrop Road
Montville, Connecticut 06382

Prepared by
Shaw Environmental, Inc.
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June 2009

MONTVILLE POWER LLC

Noise Assessment of Unit 5 Biomass Conversion

June 2009

Introduction

Montville Station (Montville) is located in Montville, CT. Montville operates two steam-electric generating units, Units 5 and 6, as required to supply electricity to the ISO New England system. Unit 5 has a rated capacity of 88 MW. Unit 6 has a rated capacity of 417 MW. Both units burn either oil or natural gas.

This report addresses ambient sound levels and noise issues at Montville in support of a project to add biomass (woodchips) as a primary fuel to Unit 5.

New Equipment

Wood chips will be conveyed to the site in trucks, which will enter the plant from Lathrop Road. Trucks will back into a dumper, and will discharge their loads onto a 48-inch-wide receiving conveyor. The dumper will be equipped with an air blower and filter for dust control.

The conveyor will transport the wood chips to a hogging machine to ensure they are ground to an appropriate maximum size, before another 48-inch-wide wide conveyor transports the chips across the railway line to a Processed Fuel Storage Building on the north side of Unit 5. The hogger will also be equipped with an air blower and filter for dust control.

The aforementioned new plant items will be run only in the daytime.

Fuel will be conveyed continuously from the storage building to Unit 5 along a 30-inch-wide conveyor when Unit 5 is utilizing biomass.

Additional plant equipment considered during this assessment was a Combustion Air (CA) Fan, an electrostatic precipitator, an Induced Draft (ID) fan, and fan filters at metering bins. We also included an approximation for the RSCR fan unit and ducting; the overfire air fan is assumed to draw air from within the building. Appendix C includes a list of inputs into the model.

Unit 5 will use the existing boiler and turbine-generator, which are both located indoors, and no further noise assessments are necessary for this equipment.

Regulations

The Connecticut Department of Environmental Protection (CTDEP) has Regulations for the Control of Noise, Section 22a-69, the relevant parts of which may be summarized as follows:

- Land use classified into zones; A is residential, B is commercial, C is industrial;
- A general prohibition of "excessive noise" beyond zone boundaries;
- The noise emission limit from Zone Class C to Zone Class A is 61 dBA in the daytime, 51 dBA at night (10pm to 7am);
- The limits are reduced by 5 dBA if tones are present;

- There is an allowance of 5 dBA if sources of noise were present between 1 Jan 1960 and 15 Jun 1978 (the date of the Regulations), and an allowance of 10 dBA if the sources existed before 1960. Montville was in operation prior to 1960.

The town of Montville, in which the plant is sited, has no local noise ordinance. Receptors to the south of the plant, particularly the residents along Lower Bartlett Road, are located within the jurisdiction of the Town of Waterford. Waterford does have a noise ordinance, which is less detailed than the CTDEP regulations, but uses the same criterion of Zone Class C to Zone Class A emissions as the State, which is 61 dBA in the daytime and 51 dBA at night.

Ambient Noise

Sound level measurements were undertaken without any generating units running on Monday April 13, 2009 during the daytime and into the following night. These measurements were obtained at locations around the station boundary shown in Figure 1 and described in Table 1, below.

Table 1 Location Description for Ambient Measurements June 2008

Location	Description (see also Figure 1)
1	Bottom of Lower Bartlett Road, below last house on this road, with a clear line of sight to the power station
2	Opposite #31 Lower Bartlett Road, on the power station side of the road
3	The most southerly boundary on Lathrop Road, outside the boundary fence near houses
4	At the main site entrance on Lathrop Road
5	The northern end of the boundary on Lathrop Road, outside the boundary fence opposite houses
6	The north boundary fence in a clearing on a hill within the site, behind trees
7	The most northwest boundary fence within the site, overlooked by a large house
8	At the southern boundary within the site and among trees, with a direct view of the plant
9	On the bridge of the railway track with a direct view of the plant

The measurements were undertaken using Rion model NA-29E integrating octave band sound level meters (serial numbers 10790058 and 10810374), with the microphones at 1.5 m above ground level. These instruments meet the American National Standards Institute (ANSI) and the International Electrotechnical Commission (IEC) requirements for Type 1 accuracy and have calibration traceable to National Institute of Standards Technology (NIST). The meters were also field calibrated (B&K 4230 no. 782537) before and after each set of measurements. The measurements were conducted in compliance with Sec. 22a-69-4, *Measurement Procedures of the Connecticut Regulations for the Control of Noise*.

The environmental sound level data consisted of A-weighted statistical samples, which provided the simultaneous measurement of L_{eq}, the equivalent continuous level, and L_{10}, L_{50} and L_{90}, which are the levels exceeded for 10%, 50% and 90% of the time. The L_{90} value is used to estimate the background sound level because it is least affected by short-term variations in sound. The measurements were for periods of 15 minutes in the daytime and 5 minutes at night. Octave band frequency measurements were also obtained.

This ambient data is presented in Appendix A (Tables A1 and A2). The west side of the site, especially at positions along Lathrop Road, was subjected to a strong hum (a tonal component) at times from the electric switchyard. The switchyard is owned by Northeast Utilities (NU), not NRG, and hence does not originate from NRG's power plant. However, since the presence of this tone complicates the study, we have "corrected out" this hum at 120 Hz from the octave band data of Table A2 in order to arrive at corrected background levels without the hum.

A summary of the L_{90} ambient values, after this hum correction has been applied at locations 3 and 4 on Lathrop Road, is given in Table 2, below.

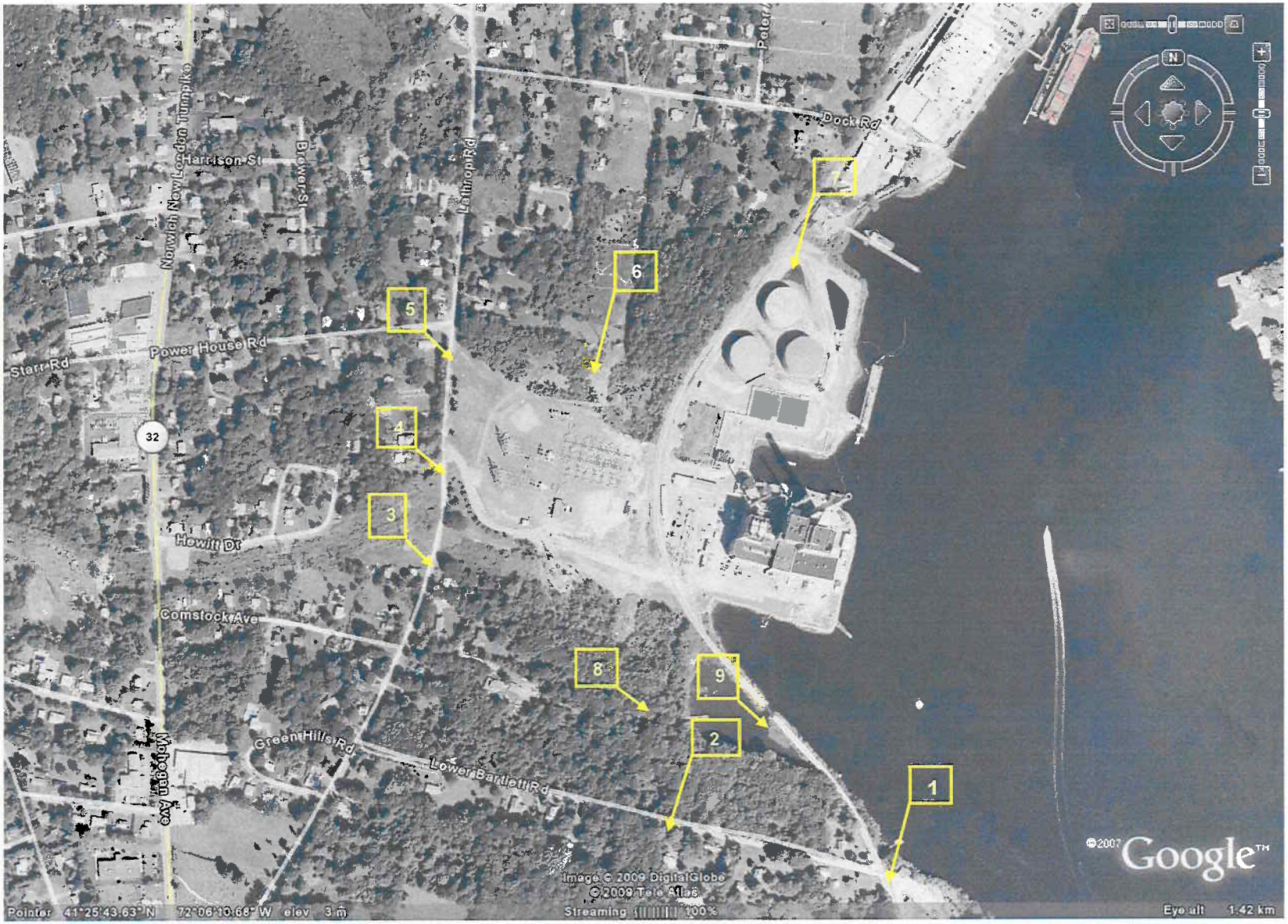
Table 2 Ambient Noise Levels Summary L_{90} dBA

Location	Ambient L_{90}
Daytime	
1 Lwr Bartett (lwr)	42.9
2 #31LwrBartlett	43.1
3 Lathrop (south)	43.8 *
4 Entrance	42.9 *
5 Lathrop (north)	43.4
6 Mid north bdry	43.6
7 Far N corner	43.0
8 S boundary	42.7
9 Railway bridge	44.9
Night-time	
1 Lwr Bartett (lwr)	39.6
2 31Lwr Bartlett (31)	39.5
4 Entrance	47.3 *
5 Lathrop (north)	40.8 *
* hum corrected	

Overall, the ambient daytime noise level was determined to be approximately 43 dBA, reducing to 40 dBA at night. Hum from the switchyard does add considerably to levels along Lathrop Road at times (by about 6 dBA), but this switchyard is not part of the Power Plant.

On the south side of the plant, measured ambient levels have included residual transformer noise at locations 1, 2, 8 and 9 which was clearly audible at these sites, and is likely to remain as a significant contributor to the total noise level on the south side when Units 5 and 6 are running.

Fig 1 Measurement Positions



Operational Plant Noise

Noise readings with Unit 5 and also with Units 5 and 6 running together, had been taken in June 2008 for the earlier study. These results are included in Appendix B and are summarized in Table 3, below. (The level of noise from the plant itself is independent of day or night.) It has been concluded that the plant meets the Connecticut Regulations boundary conditions by day and night.

Table 3 Plant Noise Levels June 2008 L_{90} dBA

Location	Unit 5	Unit 5,6
1 Lwr Bartett (lwr)		
2 #31LwrBartlett	44	47
3 Lathrop (south)	44	47
4 Entrance	49	47
5 Lathrop (north)	45	47
6 Mid north bdry	47	50
7 Far N corner	50	51
8 S boundary	47	50
9 Railway bridge	-	58

Computer Modeling

Our SoundPlan computer modeling program has been used to predict noise levels resulting from the installation of biomass equipment to feed wood chips to Unit 5. The likely sound power levels of Units 5 and 6 had been determined from the previous measurements taken last year, and these values were used as the basis for the model for Unit 5, and Units 5 and 6 together, under present conditions.

We understand that Unit 6 runs very infrequently and, even when it does run at night, it operates under minimum load. Hence the consideration of Units 5 and 6 together does represent a worst case that occurs on only a few days (or nights) in the year.

There are differences between the plots for predicted and measured values because the measured noise is also affected by extraneous sounds from the switchyard along Lathrop Road in particular (locations 3, 4 and 5) and the shipyard and steam generation plant to the north (location 7). The model over-predicts by about 3 dBA at locations 8 and 9, because the existing plant buildings screen the noise to a greater extent than we have been able to model at present.

The noise contours produced by the model should not be regarded as plots of precise levels, but rather as indications of how the sound levels increase at the Plant boundaries with the introduction of the biomass equipment, and how and where they reduce with subsequent mitigation (broadly treated as a reduction of 15 dB in some plant items at this stage of design – see later discussion).

The SoundPlan figures represent a downwind situation in all cases, and hence present a slightly pessimistic overall picture, compared with what will likely be experienced most times in practice, with a bias of about + 2dB at the boundary lines.

Ten cases have been considered:

Unit 5

1) Unit 5 running alone, before conversion (Figure 2). This is the current situation. Predicted levels on the south side of the computer model shown are slightly pessimistic for most circumstances because they represent approximations in the sound power, and downwind conditions. The plant's output sound levels are very directional, and in practice, more sound tends to be generated to the north and west, than to the south. The large brick building, currently used for administrative offices, presents a noise barrier to much of the sound emanating westwards.

2) Unit 5 with biomass running alone in the daytime (Figure 3). The following assumptions have been made for the present model, which may be modified when more defined details of plant items become available:

   - CA and ID fans, 84 dBA sound pressure level, from data supplied by Babcock Power;
   - Electrostatic precipitator, 84 dBA sound power level (sound power is a measure of the total sound generated in all directions), from Shaw file data;
   - Truck dumper (down), 100 dBA sound power level, from Zachary Engineering Corporation and using SoundPlan library for hydraulic lift spectrums;
   - Truck Dumper (idle), 90 dBA sound power level, from Zachary Engineering Corp.;
   - Filters at Dumpers and at hogger, 114 dBA sound power level, from Zachary Engineering Corp. and spectrum from measured 100 HP fan;
   - Hogger, 111 dBA sound power level, from quoted level of 85 dBA at 25 ft., from Zachary Engineering Corp.
   - Conveyors, 90 dBA per meter sound power, from UE&C coal handling manual;
   - Unit 5, with an overall sound power level of 103 dBA, and Unit 6 with 118 dBA, from previous field measurements.

3) Unit 5 running with biomass at night (Figure 4), without the unloading operations and wood hogging, but assuming the transfer conveyor from the storage shed would be running;

4) Daytime Unit 5 biomass case, but with 15 dB noise reduction applied to the 48-inch wide conveyor, hogger, and filter fan silencers for hogger and dumpers (Figure 5). This is a generalized assumption of mitigation without specific details on noise reduction methods, since more detailed vendor and design information will, in time, dictate the method of noise reduction. For example:

   - If the conveyor is quieter than predicted from coal handling, it may only be necessary to treat sections of it, rather than all, by enclosure. (There is every indication that the conveyor is quieter than for coal handling because the wood chip conveyors will run at half the speed of coal conveyors. Also, with a 6-inch idler, the rpm on the equipment will be quite low and thus will have less noise, and the conveyor will be covered on top and sides to confine dust and noise further.)
   - Treatment of the hogger by enclosure will depend on design details of this machine, and how the feed inlet (through which much noise is likely to escape) can be treated. At present, either enclosures or barriers, or a combination of both, are envisioned for this machine (see later);
   - Silencers for the filters on the hogger and dumpers are available that reduce the noise by 15 dBA if this is necessary;
   - Six-inch lagging applied to RSCR booster fan and ducts to reduce output by 7 dBA.

5) Night-time Unit 5 biomass situation (Figure 6), with mitigation of RSCR fan and ducting, and an assumed reduction of 10 dBA on the transfer conveyor to allow for the "quieter than coal" conveying condition and partial enclosure (as described above).

Units 5 and 6

6) Unit 6 added to the current situation before Unit 5 is converted to biomass (Figure 7);

7) Unit 6 added to the daytime Unit 5 biomass case (Figure 8);

8) Unit 6 added to the night-time Unit 5 biomass case (Figure 9);

9) Unit 6 added to the daytime Unit 5 biomass case with 15 dB mitigation applied (Figure 10), as described for (4);

10) Unit 6 added to the night-time Unit 5 biomass case (Figure 11) with mitigation of RSCR fan and ducting.

The computer model results are summarized in Table 4, below. The model over-predicts the current situation by up to 2 dBA at locations 8 and 9, because the existing buildings further screen the sound directed southwards, and downwind effects contribute to the increase.

Table 4 Summary of Predicted Noise Levels, L_{eq} (dBA)

Figure	Unit 5 condition	Period	Locations in computer generated images								
			1	2	3	4	5	6	7	8*	9*
Unit 5 alone											
Fig. 2	Current	Day/night	46	41	41	37	34	38	32	49	52
Fig. 3	Biomass	Day	50	43	60	65	68	71	52	57	58
Fig. 4	unmitigated	Night	49	42	52	52	44	46	48	54	57
Fig. 5	Biomass	Day	47	38	50	54	59	61	46	51	54
Fig. 6	Mitigated	Night	47	38	47	48	39	42	45	50	53
Unit 5 plus Unit 6 running in current condition*											
Fig. 7	Current	Day/night	51	41	45	41	44	49	38	53	56
Fig. 8	Biomass	Day	54	43	60	65	68	73	56	58	60
Fig. 9	unmitigated	Night	52	43	52	52	45	46	50	56	58
Fig. 10	Biomass	Day	51	41	51	54	59	61	47	54	58
Fig. 11	Mitigated	Night	51	41	48	49	41	43	46	53	58

*Locations 8 and 9, although technically on plant boundaries are nowhere near residential property, the closest being on the other side of Lower Bartlett Road, about 150 meters away.

** These are worst case: it is unusual for Unit 6 to run at all, and at night it would run on reduced load.

Noise Control

The results show that, if the Unit 5 Biomass plant were operated without noise reduction applied to the components, then the State daytime criterion of 61 dBA would be exceeded at some locations around the property line of the Plant.

For daytime conditions, it is believed that the main contributors already described above will have to be reduced by a minimum of 15 dBA to avoid daytime exceedances of the 61 dBA criterion.

At night, the situation would be marginal even without mitigation applied because so much of the noise-producing equipment does not operate. Table 4 above and Figure 4 show that the 51 dBA criterion is barely exceeded at locations 3 and 4, and refinement of the model, once more detail of the proposed plant becomes available is likely to result in a further decrease in predicted noise. Indeed, although the 30-inch transfer conveyor could have been the highest contributor to the new plant noise at night, recent information indicates lower noise levels will be emitted by this conveyor. Since the conveyor will run at half the speed of coal conveyors and will be enclosed on its top and sides, the noise level is likely to be at least 10 dBA less than the "unmitigated" condition assumed in Figure 4. We have allowed for this in our mitigated condition for night-time operation of Unit 5 alone, and thus Table 4 and Figure 6 demonstrate the plant can achieve noise levels at night which do not exceed the 51 dBA criterion.

The model also introduces about a 2 dB increase at the boundaries to allow for a downwind situation, which may over-estimate the noise for most occasions.

Vehicles

The noise from vehicles delivering wood chips on the west side of the Plant has not been considered in this study. In order to avoid complaints of excessive noise from idling engines and from reverse warning alarms, a barrier may be required between the vehicles and the fence line on Lathrop Road. The barrier should be high enough to shield residents from the tall exhaust stacks on the tractor trailers.

Additionally, a berm, or berm and barrier combination, is likely to be required on the north and east sides of the dumper zone to restrict line of sight to the houses along Lathrop Road and to the northwest near Location 6. For better shielding of this noise, line of sight plus 1 meter should be allowed for the barrier wall height.

Wood Hogger

Noise reduction of the wood hogger is achieved in part by enclosing the machine in sound resisting material, internally lined with sound absorptive material. However, this only achieves noise reduction for sound radiated by the body of the machine; significant noise will be emitted through the feed intake of the machine. It is necessary to protect dwellings to the west along Lathrop Road, to the south close to Location 3, and to the north close to Location 6. A three-sided barrier is envisioned, that provides at least line of sight plus 1 meter to these dwellings. Calculations indicate that such a barrier would achieve at least the required 15 dBA reduction in total noise from the inlet, if it was constructed within a distance of 2 meters from the edge of the hopper. Alternatively, the barrier could be a combination of berm and barrier for the last few meters of height.

The barrier is penetrated by the conveyor on the west side, and this would, if left untreated, allow sound to be directed toward residents along Lathrop Road. In order to mitigate this effect, the conveyor should feed through the barrier through a sound-reducing tunnel, lined internally with sound absorptive material, and about 3 meters long (but depending on the construction, shape and sound absorption applied).

48-Inch Conveyor

In the absence of other information, we have made use of published data for coal conveyors in our computer model and have concluded that 15 dB noise reduction would be required. At present, it is envisioned that the conveyor will have to be enclosed to achieve this noise reduction. We are presently advised that the conveyor is quieter than for coal handling because the wood chip conveyors will run at half the speed of coal conveyors. Also, with a 6-inch idler, the rpm on the equipment will be quite low and thus will have less noise, and the conveyor will be covered on top and sides to confine dust and noise further. The 15 dB assumption for mitigation therefore seems reasonable in the light of this information.

30-Inch Conveyor

We have similarly used coal industry data for this conveyor. We have already discussed the benefit of reducing the noise from this conveyor, as it dominates the night-time total levels from the new plant. We are similarly advised that the new woodchip conveyor would be quieter for the reasons described above and we have allowed for a conservative 10 dB noise reduction in the mitigated level, which brings the total noise levels at the important boundaries and receptors to 51 dBA or less.

Conclusions and Recommendations

On-site noise measurements have shown that the ambient daytime noise in the absence of Units 5 and 6 is 43 dBA in the daytime and 40 dBA at night. There is tonal hum from the switchyard which is especially noticeable along Lathrop Road, but this switchyard is not part of the Power Plant.

Measurements have shown that Units 5 and 6 currently run without exceeding the State criteria of 61 dBA in the daytime and 51 dBA at night.

Noise modeling of the proposed biomass conversion of Unit 5 indicates that, without mitigation to the new plant, the daytime criterion would be exceeded along Lathrop Road in particular, where there are dwellings. This applies to Unit 5 running alone, or in conjunction with Unit 6. Recommendations have been made for controlling the noise as follows:

- Enclosure of part or all of the 48-inch feeder conveyor (the proposed quieter conveyor system will have top and side covers to control dust and thus further control noise);
- Enclosure of the 30-inch transfer conveyor (for which the same comments apply as for the 48" conveyor);
- Treatment of the hogger by enclosure and the hogger feed inlet. At present, either enclosures or barriers, or a combination of both, are envisioned for this machine;
- Silencers for the filters on the hogger and dumpers are available that reduce the noise by 15 dBA if this is necessary;
- Six-inch lagging applied to RSCR booster fan and ducts to reduce output by 7 dBA;
- A berm, or berm and barrier combination, is likely to be required on the north and east sides of the vehicle dumper zone to restrict line of sight to the houses along Lathrop Road and to the northwest near Location 6;
- A barrier may be required between the delivery vehicles and the fence line on Lathrop Road.

At night, it is believed that the new plant can be operated without exceedances of the 51 dBA State criterion.

Once all noise controls have been applied to the plant, the following noise levels are predicted (Table 5).

Table 5 Summary of Final Noise Levels, L_{eq} (dBA)

Figure	Unit 5 condition	Period	Locations in computer generated images								
			1	2	3	4	5	6	7	8*	9*
Unit 5 alone											
Fig. 5	Biomass Mitigated	Day	47	38	50	54	59	61	46	51	54
Fig. 6		Night	47	38	47	48	39	42	45	50	53
Unit 5 plus Unit 6 running in current condition**											
Fig. 10	Biomass Mitigated	Day	51	41	51		54	59	61	47	54	58
Fig. 11		Night	51	41	48		49	41	43	46	53	58

*Locations 8 and 9, although technically on plant boundaries, are nowhere near residential property, the closest being on the other side of Lower Bartlett Road, about 150 meters away.

** These are worst case: it is unusual for Unit 6 to run at all, and at night it would run on reduced load.

Figure 2

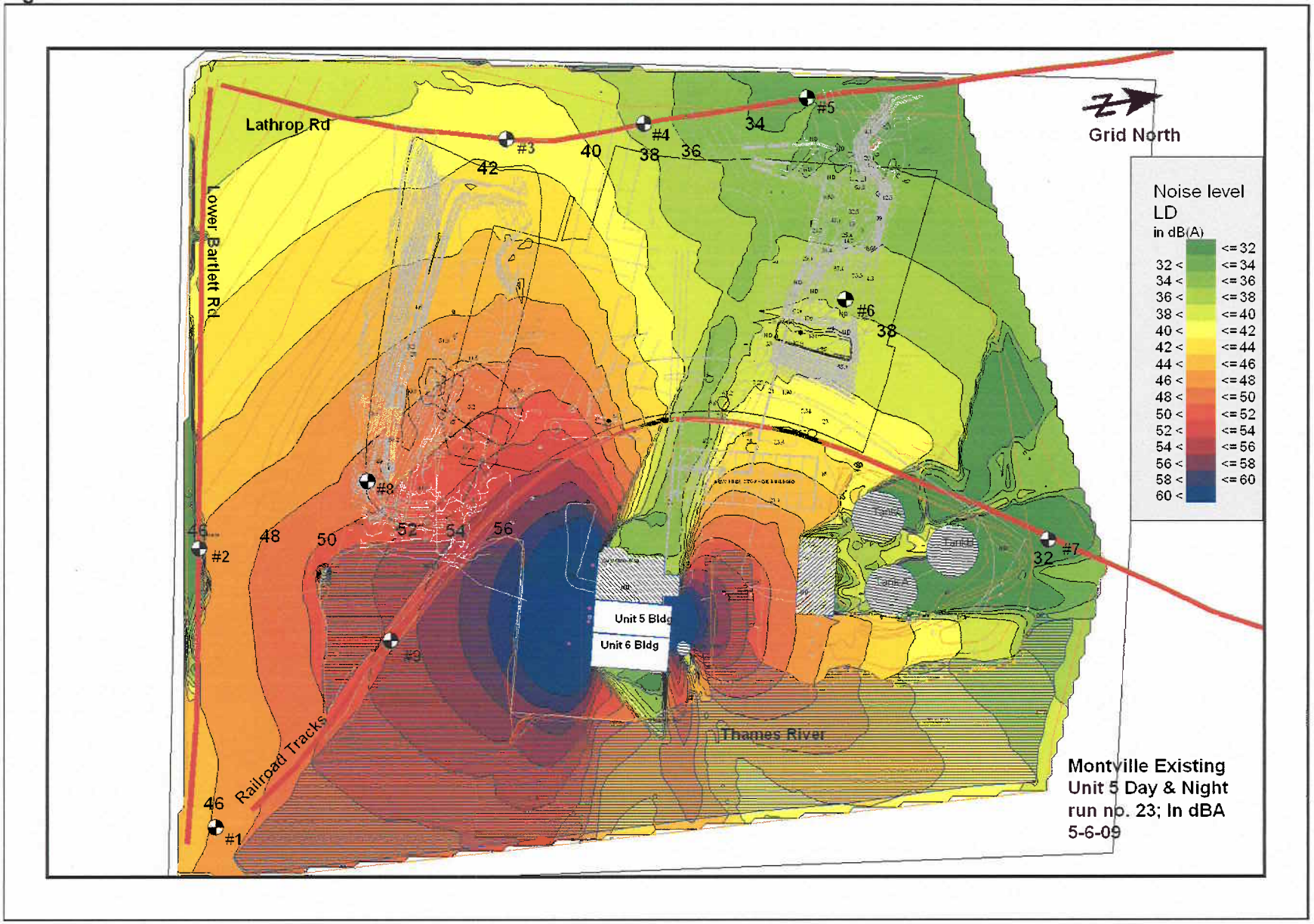

Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Unit 5 Bldg
Unit 6 Bldg
Grid North
Noise level
LD
in dB(A)
<= 32
32 < <= 34
34 < <= 36
36 < <= 38
38 < <= 40
40 < <= 42
42 < <= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
#1
#2
#3
#4
#5
#6
#7
#8
#9
Montville Existing
Unit 5 Day & Night
run no. 23; In dBA
5-6-09

Figure 3

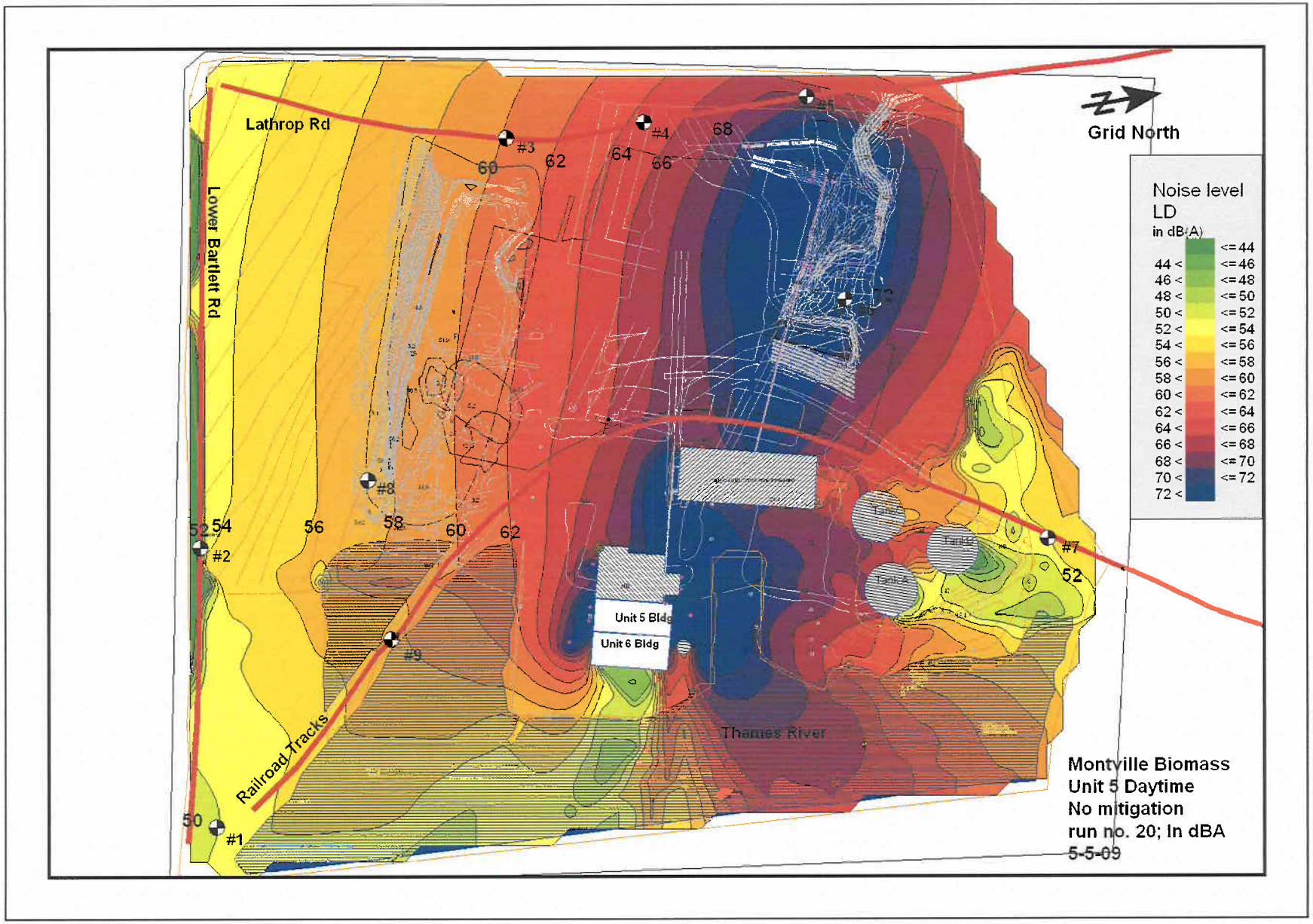

Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Unit 5 Bldg
Unit 6 Bldg
Grid North
Noise level
LD
in dB(A)
<= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
72 <
#1
#2
#3
#4
#5
#7
#8
#9
50
52
54
56
58
60
62
64
66
68
Montville Biomass
Unit 5 Daytime
No mitigation
run no. 20; In dBA
5-5-09

Figure 4

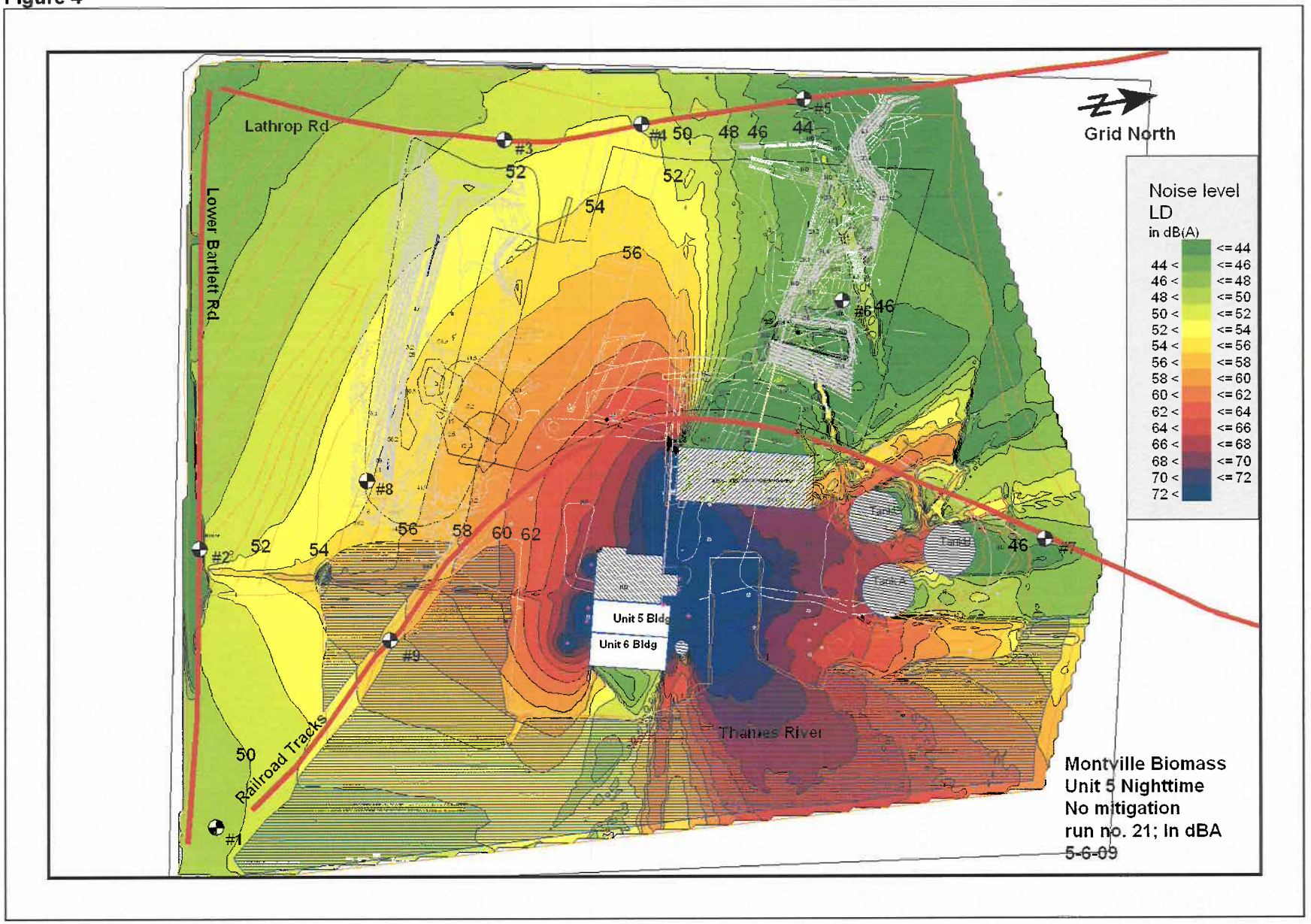
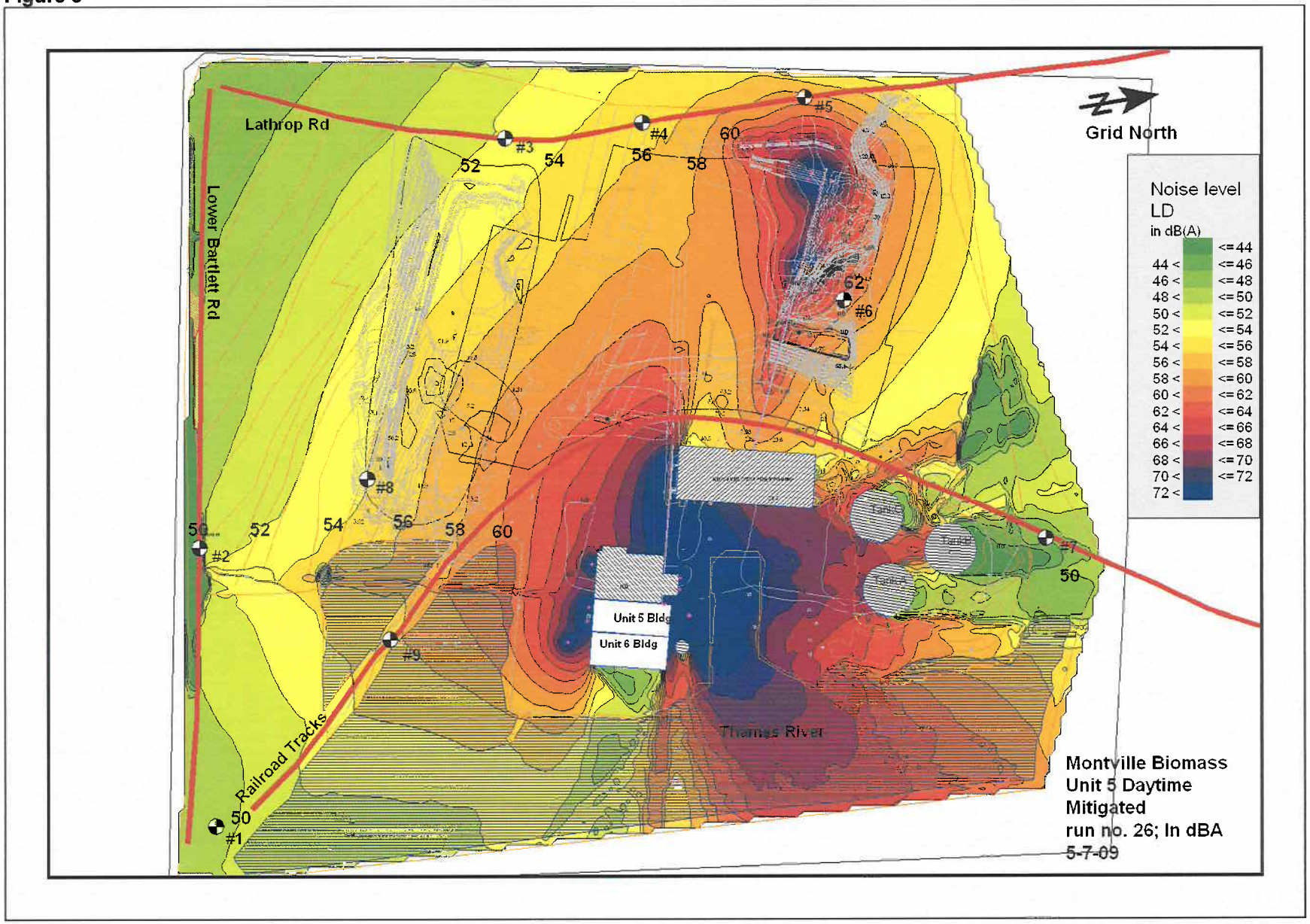

Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Grid North
Noise level
LD
in dB(A)
<= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 < <= 72
Unit 5 Bldg
Unit 6 Bldg
Tank C
Tank B
Tank A
#1
#2
#3
#4
#5
#6
#7
#8
#9
Montville Biomass
Unit 5 Nighttime
No mitigation
run no. 21; In dBA
5-6-09

Figure 5


Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thomas River
Unit 5 Bldg
Unit 6 Bldg
Grid North
Noise level
LD
in dB(A)
<=44
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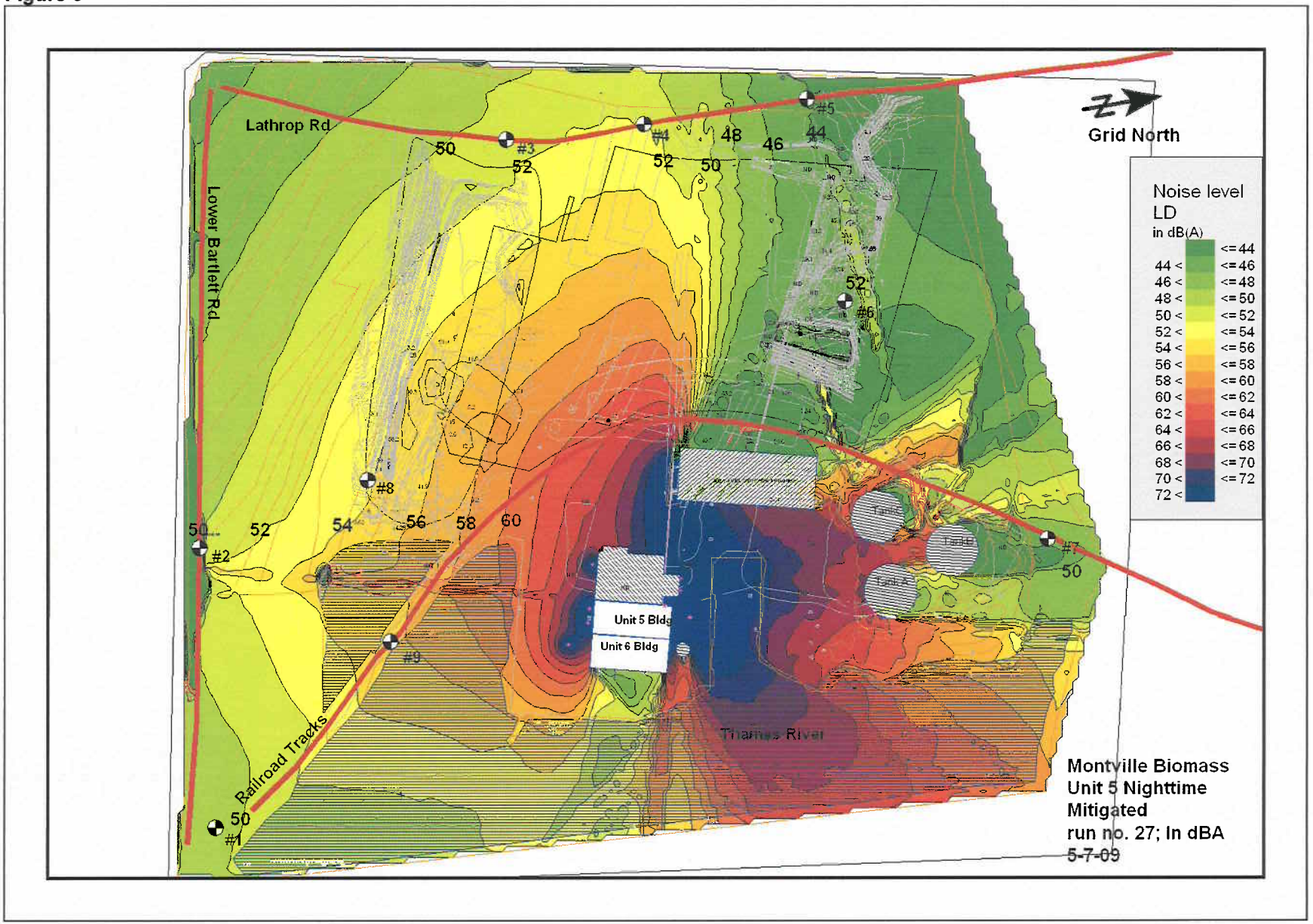
46 < <=48
48 < <=50
50 < <=52
52 < <=54
54 < <=56
56 < <=58
58 < <=60
60 < <=62
62 < <=64
64 < <=66
66 < <=68
68 < <=70
70 < <=72
#1
#2
#3
#4
#5
#6
#7
#8
#9
50
52
54
56
58
60
62
Montville Biomass
Unit 5 Daytime
Mitigated
run no. 26; In dBA
5-7-09

Figure 6


Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Unit 5 Bldg
Unit 6 Bldg
Grid North
Noise level
LD
in dB(A)
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44 < <=46
46 < <=48
48 < <=50
50 < <=52
52 < <=54
54 < <=56
56 < <=58
58 < <=60
60 < <=62
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64 < <=66
66 < <=68
68 < <=70
70 < <=72
#1
#2
#3
#4
#5
#6
#7
#8
#9
Montville Biomass
Unit 5 Nighttime
Mitigated
run no. 27; In dBA
5-7-09

Figure 7

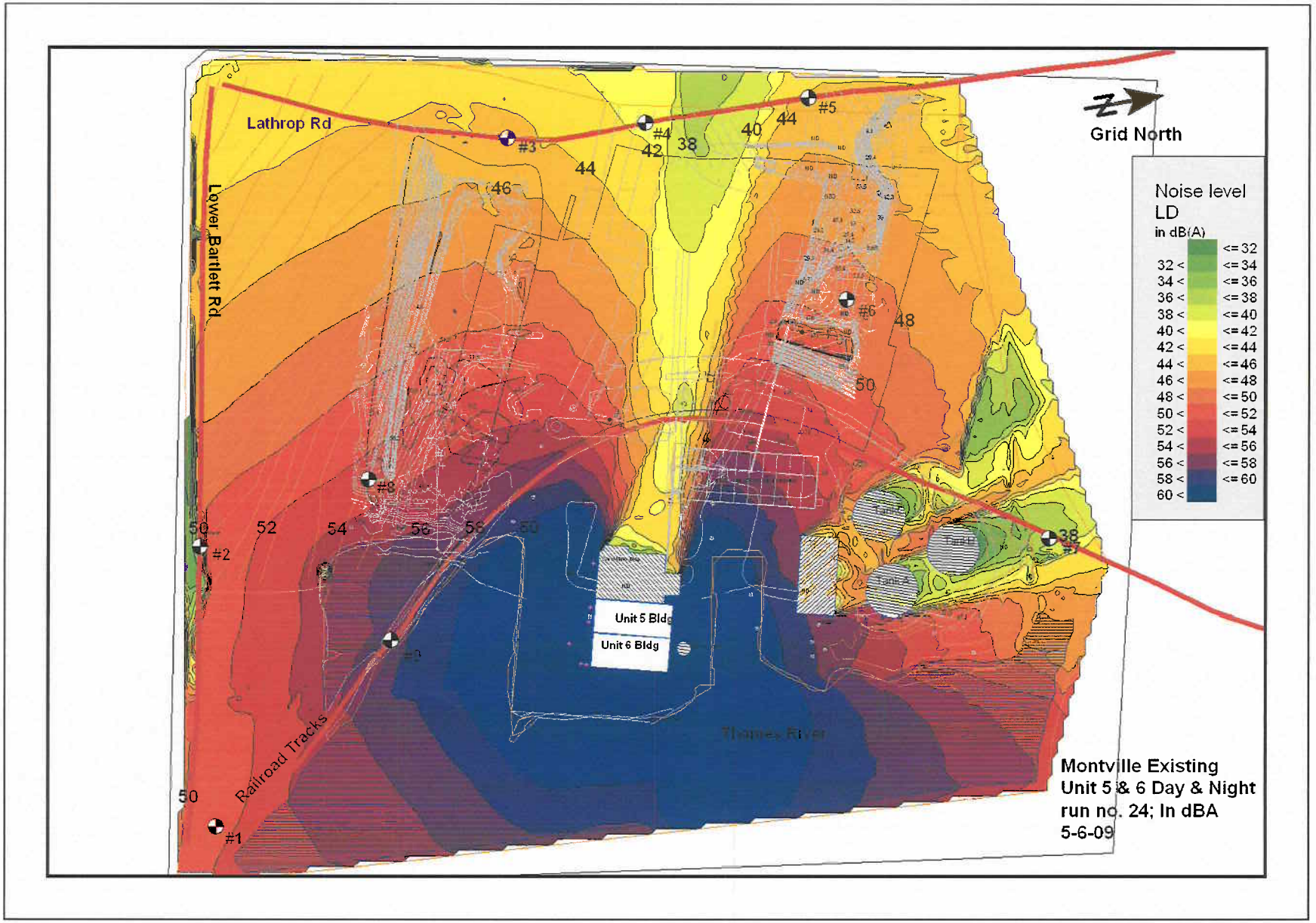
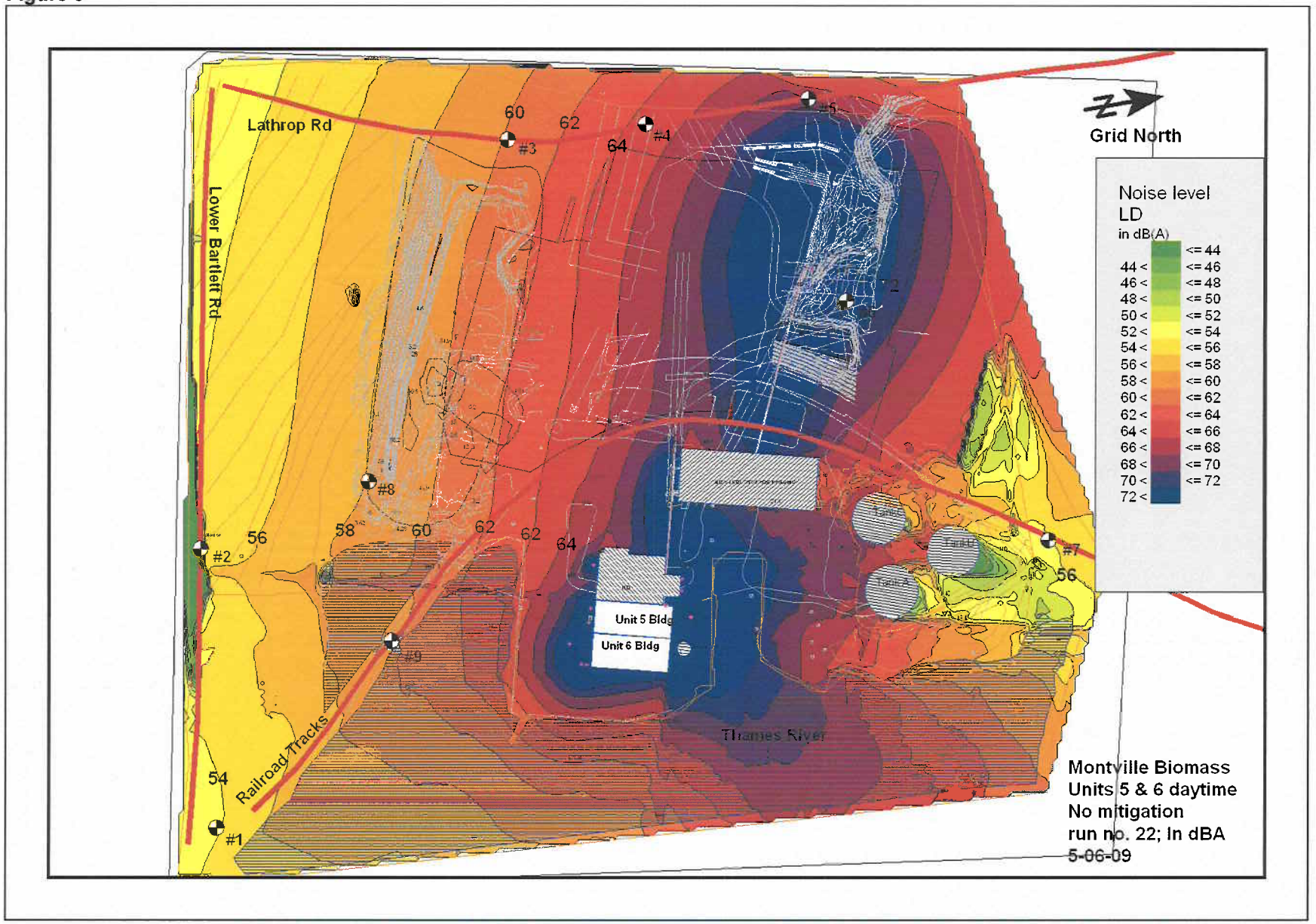

Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Grid North
Noise level
LD
in dB(A)
<= 32
32 < <= 34
34 < <= 36
36 < <= 38
38 < <= 40
40 < <= 42
42 < <= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 <
Unit 5 Bldg
Unit 6 Bldg
Tank C
Tank B
Tank A
#1
#2
#3
#4
#5
#6
#7
#8
Montville Existing
Unit 5 & 6 Day & Night
run no. 24; In dBA
5-6-09

Figure 8


Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Unit 5 Bldg
Unit 6 Bldg
Grid North
Noise level
LD
in dB(A)
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44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 < <= 72
Montville Biomass
Units 5 & 6 daytime
No mitigation
run no. 22; In dBA
5-06-09

Figure 9

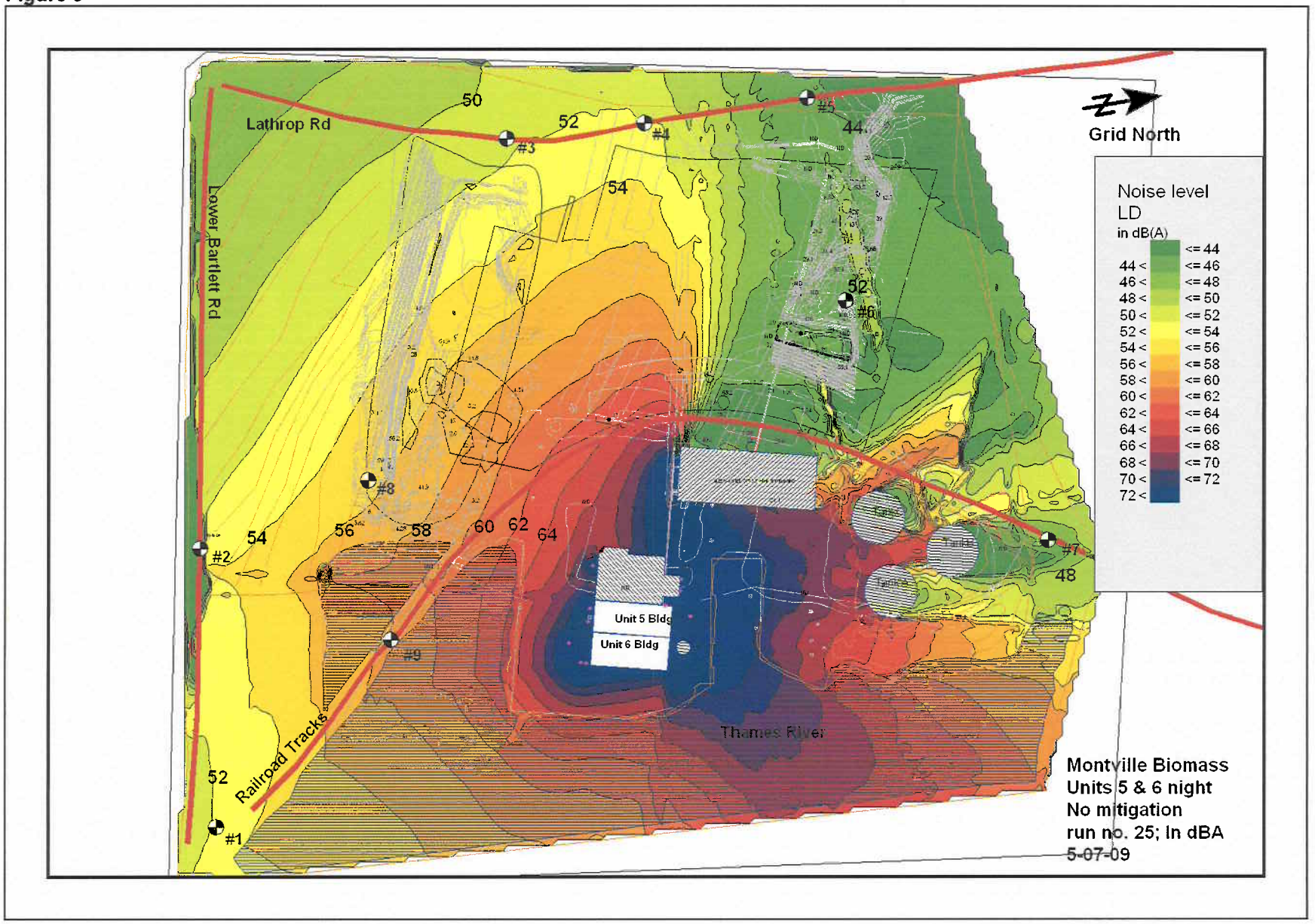

Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Unit 5 Bldg
Unit 6 Bldg
Grid North
Noise level
LD
in dB(A)
<= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 < <= 72
#1
#2
#3
#4
#5
#6
#7
#8
#9
50
52
54
56
58
60
62
64
44
48
Montville Biomass
Units 5 & 6 night
No mitigation
run no. 25; In dBA
5-07-09

Figure 10

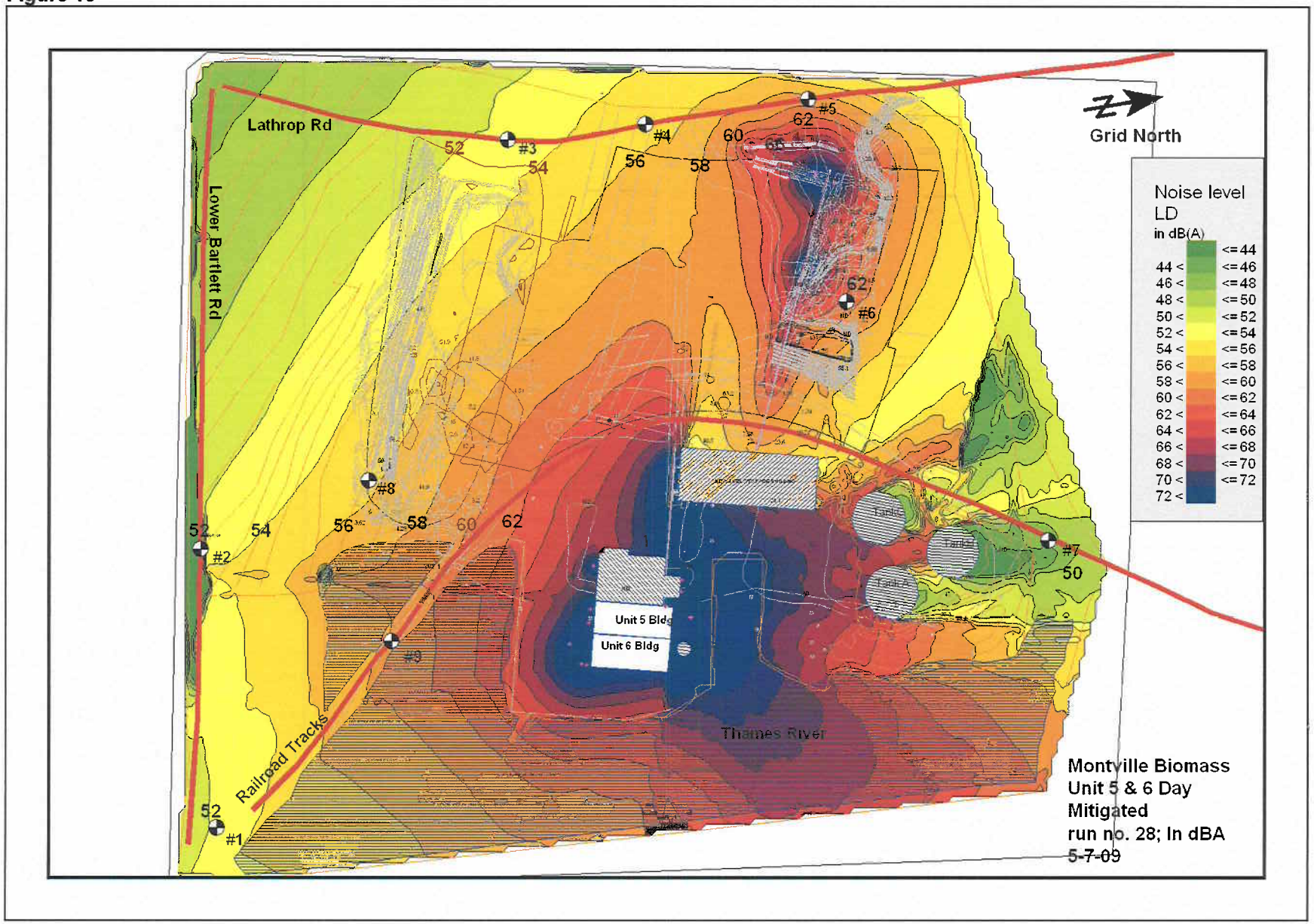
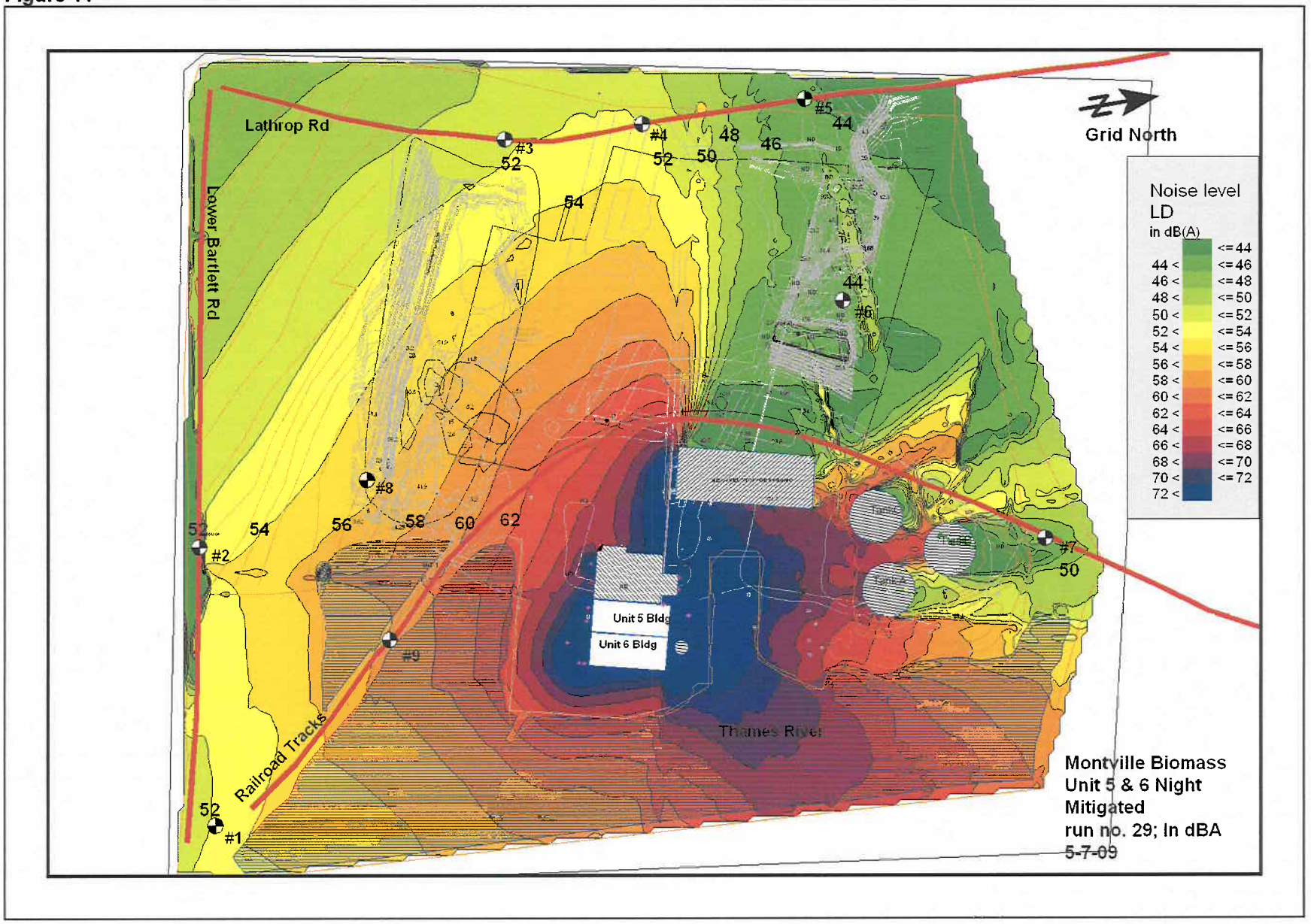

Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Grid North
Noise level
LD
in dB(A)
<= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 < <= 72
Unit 5 Bldg
Unit 6 Bldg
Tank 1
Tank 2
Tank 3
#1
#2
#3
#4
#5
#6
#7
#8
#9
Montville Biomass
Unit 5 & 6 Day
Mitigated
run no. 28; In dBA
5-7-09

Figure 11


Lathrop Rd
Lower Bartlett Rd
Railroad Tracks
Thames River
Unit 5 Bldg
Unit 6 Bldg
Tank A
Tank B
Tank C
Grid North
#1
#2
#3
#4
#5
#6
#7
#8
#9
Noise level
LD
in dB(A)
<= 44
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 < <= 72
Montville Biomass
Unit 5 & 6 Night
Mitigated
run no. 29; In dBA
5-7-09

APPENDIX A

AMBIENT NOISE MEASUREMENTS

Appendix A - Ambient Noise Measurements

Table A1 **Daytime and Night-time Ambient Noise Measurements for the Montville Station April 13th /14th 2009**

Location	Time	Sound levels dBA				Notes
		Leq	L10	L50	L90	
1 Lwr Bartett	12.20	44.8	46.4	44.4	42.9	Plant (xfmrs?) clearly heard, wind, birds
2 #31LwrBartlett	11.40	48.7	47.7	44.2	43.1	Wind chimes, xfmrs?, birds, far train
3 Lathrop (south)	15.15	61.8	63.9	50.4	48.2	Strong hum, many vehicles
4 Entrance	14.50	59.8	57.2	50.8	49.0	Strong hum, some traffic
5 Lathrop (north)	14.30	59.8	59.9	46.2	43.4	Slight hum, traffic
6 Mid north bdry	14.10	46.1	48.2	44.9	43.6	Slight transmission hum, birds, traffic
7 Far N corner	13.40	45.4	47.4	44.7	43.0	Nearby plant clear, shipyard activity
8 S boundary	16.30	44.0	45.0	43.9	42.7	Buzz from xfmrs? clearly audible
9 Railway bridge	16.05	46.3	48.1	45.8	44.9	Buzz from xfmrs? clearly audible
	Night of 14th					
1 Lwr Bartett	00.00	41.0	42.3	40.7	39.6	
2 31Lwr Bartlett	00.15	41.1	42.7	40.7	39.5	
4 Entrance	00.40	55.7	55.7	55.6	55.6	Strong hum
5 Lathrop (north)	01.00	46.2	46.7	46.1	45.6	Slight hum

Table A2 **Daytime and Night-time Ambient Octave Band Levels L_{90} A-weighted dB April 13th /14th 2009**

Freq:	31.5	63	125	250	500	1k	2k	4k	8k
Daytime A-wtd dB									
1 Lwr Bartett	17	30	36	35	38	35	25	21	16
2 #31LwrBartlett	17	27	33	35	39	36	30	24	17
3 Lathrop (south)	15	27	32	35	38	37	29	19	14
4 Entrance	15	31	47	37	36	35	28	24	17
5 Lathrop (north)	17	28	37	34	36	37	30	24	18
6 Mid north bdry	17	28	37	35	37	36	25	19	15
7 Far N corner	15	27	32	35	38	37	29	19	14
8 S boundary	15	28	33	35	40	37	27	18	13
9 Railway bridge	15	29	35	36	41	37	27	18	13

Night-time A-wtd dB									
1 Lwr Bartett	13	26	32	32	35	33	21	14	12
2 31Lwr Bartlett	10	23	34	29	36	32	20	14	12
4 Entrance	16	38	55	40	39	37	29	24	18
5 Lathrop (north)	13	28	44	31	35	37	28	17	13

APPENDIX B

SUMMARY OF NOISE READINGS

Appendix B

Table B1 Summary of Noise Readings for Continuous Plant Operation

5 Jun 08 – Unit 5 only		**Leq dBA**	**L90 dBA**	**Notes**
Daytime conditions: Wind from North 5 mph, occasional gusts to 10 mph ; 75-80% RH; temperature from 65 in morning, rising to 69 during day, then falling to 65 evening time.				
Location				
Lower Bartlett Rd (2)	1530	45.6	44.1	Plant clearly audible
Lathrop south (3)	1530	54.0	44.4	Plant scarcely audible, some hum
Entrance (4)	1545	49.0*	48.7*	Strong hum
Lathrop north (5)	1610	54.3	44.6	Plane/ traffic/ some hum and plant
Mid north bndry (6)	1620	48.5	47.4	Distant traffic, some hum and plant
Far N corner (7)	1700	52.0	50.3	Distant coal plant, boatyard + plant
S Boundary (8)	1330	48	47	Plant strongly audible
		* after hum correction		
10 Jun 08 – Units 5+6				
Early morning conditions: Wind from East, less than 2mph; 70 F; later in day wind rising to 5 mph E, 90 F				
Lower Bartlett Rd (2)	0115	48.5	47.4	Plant clearly audible
Lathrop south (3)	0300	48.9	47.3	Plant audible slightly, also hum
4 in Fig 1 (entrance)	0315	49.1	47.3	Plant audible, distant traffic, plus hum
Lathrop north (5)	0330	48.9	47.0	Plant audible slightly, also hum
Mid north bndry (6)	1300	51.0	50.3	Distant traffic, some hum and plant
Far N corner (7)	0730	53.9	51.5	Distant coal plant, boatyard + plant
S Boundary (8)	0630	51.5	50.0	Plant strongly audible
Upper Bartlett Rd	0340	48.2	43.6	Distant traffic and nearby main road

APPENDIX C

INPUT SOUND LEVELS ASSUMED FOR SOUNDPLAN MODEL

Appendix C

Table C1 Input Sound Levels Assumed for SoundPlan Model

Montville Biomass Noise Control												
3 Jun-09	Run	31										Assumptions Applied
Equipment Noise Inputs												Regular ground absorption, except water
												Downwind conditions, 3 m per sec
												5% ventilation on all building walls
												Inside to Outside - 3dBA
												Used Soundplan wall directivity, 3 dB
												Grey area not running at night.
frequency Hz:	31.5	63	125	250	500	1k	2k	4k	8k	A	Notes	Comments
Sound source												
CA Fan, SPL	90.0	90.0	86.0	84.0	84.0	77.0	72.0	63.0	58.0	83.8	from Babcock power	Added 25 dB area factor for point source Lw
RSCR Booster Fan & Ducts, Lw	111.8	109.8	112.8	106.8	105.8	101.8	94.8	88.8	80.8	107.0	From EEI guide.	Unmitigated levels. Used 7 dBA mitigation for insul.
48" wide receiving conveyor, Lw	96.0	94.0	94.0	90.0	88.0	84.0	81.0	78.0	76.0	90.2	from UE&C coal handling pg D-8	Line source, Lw per meter; mitigation assumes 15 dB less (new conveyor condition)
30" wide transfer conveyor, Lw	96.0	94.0	94.0	90.0	88.0	84.0	81.0	78.0	76.0	90.2	from UE&C coal handling pg D-8	Line source, Lw per meter; mitigation assumes 10 dB less (new conveyor condition)
Electrostatic Precipitator, Lw	96.0	92.0	89.0	80.0	80.0	81.0	75.0	68.0	61.0	84.2	From Tilbury Job	Point source, added 23 dB for area factor; 7 x 15 x 3 meters
Filters at Dumpers, Lw	111.0	114.0	109.0	104.0	101.7	106.0	110.9	104.9	95.9	114.1	from Zachary Engr Corp	Spectrum from Air blower and 100 HP fan from Brayton pt

Montville Biomass Noise Control												
3 Jun-09	**Run**	31										**Assumptions Applied**
Filters at Hogger, Lw	111.0	114.0	109.0	104.0	101.7	106.0	110.9	104.9	95.9	114.1	from Zachary Engr Corp	Spectrum from Air blower and 100 HP fan from Brayton pt
Filters at Metering Bins. Lw	111.0	114.0	109.0	104.0	101.7	106.0	110.9	104.9	95.9	114.1	from Zachary Engr Corp	Spectrum from 25 HP fan from Brayton pt
ID fan, SPL	104.0	104.0	93.0	90.0	77.0	63.0	49.0	41.0	35.0	84.4	from Babcock power	Added 26 dB area factor for point source Lw
Truck Dumper, (Down), Lw	106.0	93.2	93.1	92.6	93.2	93.0	92.8	93.0	93.1	100.0	From Zachary Engr Corp	Used SoundPlan system library for hydraulic lift and added 8 dB area factor for point source Lw
Truck Dumper, (idling), Lw	96.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	83.0	90.0	From Zachary Engr Corp	Assumed Idling truckLw was 10 dBA less than during dumping.
Hogger, Lw	77.5	77.5	87.5	94.5	100.5	103.5	104.5	104.5	102.5	110.6	From Zachary Engr Corp	Spectrum from Soundplan system library and total Lw based on 85 dBA at 25 ft.
Transformers-Aux; Lw	98.8	98.8	100.8	95.8	95.8	89.8	84.8	79.8	72.8	96.2		Std transformers-in house data
Transformers-main; Lw	102.1	108.1	110.1	105.1	105.1	99.1	94.1	89.1	82.1	105.5		Std transformers-in house data
Unit 5 bldg, Lw	117.1	113.1	112.1	103.1	100.1	95.1	93.1	90.1	83.1	102.9		Lws based on Graham Custard's field measurements at the job site
Unit 6 bldg, Lw	132.0	129.0	124.0	118.0	114.0	111.0	112.0	109.0	103.0	118.7		Lws based on Graham Custard's field measurements at the job site

Traffic Report

NRG Montville Power Biomass Project
Montville, Connecticut

Shaw Environmental, Inc.
May 22, 2009

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PROJECT DESCRIPTION

This traffic study has been prepared by Shaw Environmental, Inc. (Shaw) for NRG Montville Power. The Montville Power generating station (Montville) is located in Montville, CT, east of Lathrop Road, approximately 0.25 miles east of State Route 32, just south of Power House Road, and west of the Thames River (Figure VM-1). Montville plans to convert an existing steam boiler to be capable of firing biomass (woodchips), in addition to its existing fuel capabilities.

The Biomass project includes construction of material handling facilities, emission controls and other modifications. Located just north of the substation, the civil site plan (Figure C-1 on pg 6) shows a truck loop road with weigh scales, truck dumpers, receiving hoppers, fuel hog, disc screens, dust collector, and belt conveyors. The biomass (wood chips) will be conveyed to an area just east of the rail spur. At this location the biomass is directed to the rotary screw reclaimer, live storage pile, auxillairy reclaimer, inactive storage pile, and the boiler feed conveyor. The biomass is then conveyed to Unit #5 for combustion. Mechanical dust collectors and a Regenerative Selective Catalyst Reactor will be added to the back end of the boiler.

EXISTING ROAD CONDITIONS

Lathrop Road – The posted speed limit on Lathrop Road is 25 mph. The road is asphalt paved and is generally 24 feet wide, with 2-ft wide gravel and grass shoulders. There is a single yellow centerline. The pavement is in fair condition, and some joint and crack seal repairs have occurred. In the section between Route 32 and the NRG Site Entrance, Lathrop Road is posted "No Thru Traffic Residents Only". For this study, no vehicles will be assigned to the segment of Lathrop Road between Route 32 and the NRG Site driveway.

NRG Site Entrance – The road is asphalt paved and varies in width from 24 to 28 feet. A stop sign is located on the NRG Site Drive at Lathrop Road, however the white stop line is faded.

Power House Road – This local residential street connects Route 32 with Lathrop Road. The posted speed limit is 25 mph. Power House Road is asphalt paved and is approximately 20 feet wide with no shoulders. There is no yellow centerline, and the pavement is in fair condition. The road has a steep profile grade, and has several large trees with low canopies.

Route 32 (Norwich New London Turnpike) – The section of Route 32 from Lathrop Road to Route 163 is posted 40 mph. The road is asphalt paved and is approximately 24 feet wide, with 3 to 6 ft wide paved shoulders. There is a double yellow centerline and the pavement is in very good condition. There is a yellow flashing beacon at Power House Road, a traffic signal at Maple Avenue Extension, and a traffic signal at Route 163. The Rte 163/Rte 32 signal is fully actuated, with variable signal timing.

Route 163 – Palmertown Road - The posted speed limit on Route 163 west of Route 32 is 30 mph. The road is asphalt paved and is generally 24 feet wide with 1-2 foot wide paved shoulders. There is a double yellow centerline, and the pavement is in very good condition.

Depot Road - The posted speed limit on Depot Road east of Route 32 is 25 mph. The road is asphalt paved and is approximately 24 feet wide with no shoulders. There is a single yellow centerline and the pavement is in fair condition, and some crack sealing is evident. Metal w-beam guardrail follows most of the north shoulder. Three structures are located within 5 feet of the road way edge.

I-395 Southbound off ramp at Route 163 – This off ramp meets at a tee-intersection with Route 163. The ramp widens to provide one left-, and one right-turn lane. The ramp is stop sign controlled, and the white stop line is in good condition. The pavement on both roads is in very good condition.

I-395 Northbound off ramp at Route 163 – This off ramp meets at a tee-intersection with Route 163. The ramp widens to provide one left-, and one right-turn lane. The ramp is signal controlled, and the signal cycle varies from 32 to 45 seconds. The pavement markings and white stop lines are in good condition. The pavement on both roads is in very good condition.

TRIP GENERATION (During Construction)

This section estimates the "temporary" traffic related to the additional construction traffic entering and exiting the project site. The plant construction period is estimated to be 21 months, beginning in Early 2010 and ending in Fall 2011. The projected commercial operation date (COD) is November 2011.

The NRG Design Engineer has prepared a "Manpower Loading Estimate" that describes by construction phase the following topics:

- The demolition of various structures, and facilities
- The excavation and construction of new buildings and facilities
- The on-site equipment and manpower needs during construction
- The estimated heavy vehicles arriving at the site that will import and export soil, haul away construction debris, and deliver new materials and equipment.

According to the "Manpower Loading Estimate," the heaviest period for construction traffic will occur in the second quarter of 2011, and the following craft employees are projected.

Table 1- Manpower Loading Estimate (During construction)

(A) Quarter, Year	(B) Dayshift Employees	(C) Evening Shift Employees	(C) Total Employees
Q1 2010	10	0	10
Q2 2010	20	0	20
Q3 2010	50	0	50
Q4 2010	50	0	50
Q1 2011	80	0	80
Q2 2011	80	20	100
Q3 2011	40	0	40

During construction, numerous trades and crafts will be required. The peak quarter (Q2 2011) will have approximately 80 craft employees working the dayshift, and 20 employees working the evening shift. Also, in this quarter about 18 tons of material will be delivered daily, and using a 6 ton truck capacity, then 3 trucks per day will enter the site.

Using the above manpower loading chart, we have developed the "Trip Generation Table – Traffic During Construction".

Table 2
Trip Generation Table – Montville Station
Traffic During Construction (Vehicle Trips)

QTY	Trip	Daily Trips (in+out)	AM Peak Hour 7:15 to 8:15 AM			PM Peak Hour 4:00 to 5:00 PM		
			In	Out	Total	In	Out	Total
18	18 ton delivery at 6 tons/truck= 3 trucks in/3 trucks out Dayshift 7AM to 4PM Construction Traffic Truck Trips	6	1	0	1	0	1	1
80	Employees Dayshift 7AM to 4PM: Construction Craft Employee Auto Trips	240	40	0	40	0	80	80
20	Employees Evening Shift 4PM to 12Mid Construction Craft Employee Auto Trips	40	0	0	0	20	0	20
	TOTAL		**41**	**0**	**41**	**20**	**81**	**101**

It is important to note that the above "site trips" are during construction only. This trip generation table includes a number of conservative trip generation assumptions:

- The typical daytime construction work shift is Monday to Friday 7 AM to 4 PM.
- The construction traffic (generator) will arrive prior to the start of the 7:00 dayshift. The peak hour of the adjacent street traffic is 7:15 AM to 8:15 AM. We conservatively assume that half of the Contractors will arrive on-site prior to 7:15 AM, and half will arrive after 7:15 AM.
- The PM peak hour for the construction traffic (generator) is 4:00 to 5:00 PM, and generally coincides with the PM peak hour of the adjacent street traffic.
- The vehicle occupancy will be 1.0 for all drivers, craft labor, engineers, and inspectors. No employees will carpool.
- For material deliveries, 3 trucks/day will enter, and 3 trucks/day will exit the site. We assume that 15% (rounded up to one truck) will enter during the AM peak hour.
- For material deliveries, 3 trucks/day will enter, and 3 trucks/day will exit the site. We assume that 15% (rounded up to one truck) will exit during the PM peak hour.
- Half of the day workers (40) will exit the site for their lunch break and then return at 1 pm. The vehicle occupancy is 1.0. Daily trips by craft labor are estimated to be 80+40+40+80 = 240 daily trips.
- It is conservatively assumed that all craft site trips entering and exiting the study area are new trips, and that these site trips are not captured or diverted from trips that may already occur on the adjacent street system (i.e. No trips are intercepted or diverted).

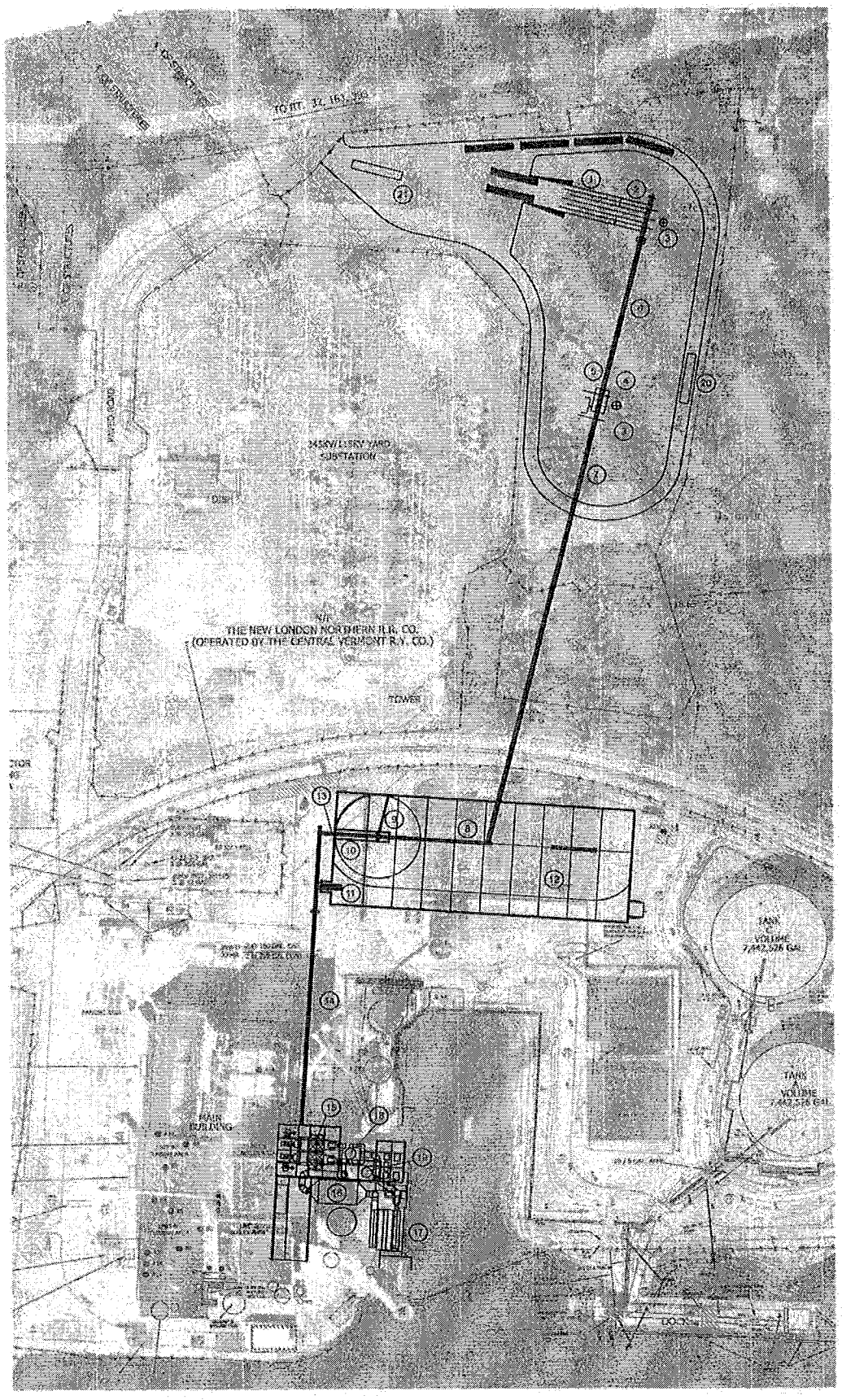


Figure C-1 Civil Site Plan

TRIP GENERATION (During Operation)

This section estimates the "site trips" related to operating the NRG Montville facility. After project completion in 2011, during biomass operations we expect the following vehicle trips.

Table 3
Trip Generation Table
Project Completed - Traffic During Biomass Operations (Vehicle Trips)

Employee	Daily Trips (in+out)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Trucker (woodchips)	40+40	6	6	12	6	6	12

The above trip generation table includes the following assumptions:

- The typical daytime work shift is Monday to Friday 8 AM to 5 PM.
- For woodchip deliveries, 40 trucks/day will enter the site. We assume that 15% (6 trucks) will enter during the AM peak hour.
- We assume that 15% x 40 = 6 trucks will exit during the PM peak hour.
- NRG proposes to reassign current employees to operate and maintain the biomass conveyors and the facility.

The woodchip truck and trailer length is approximately 69-70 feet. The truck is 8'-6" wide and 13'-0" high. The empty weight of a truck and 2 axle trailer is around 34,000 lbs. They carry a payload of 46,000 lbs of woodchips, and the maximum gross vehicle weight (GVW) is 80,000 lbs. The State of Connecticut maximum GVW is 80,000 lbs for a 4-, 5- or 6- axle semi-trailer. (See details in Appendix F)

TRIP DISTRIBUTION AND ASSIGNMENT

Since the segment of Lathrop Road, between Route 32 and the NRG Plant Entrance is posted "No Thru Traffic - Residents Only", no vehicles will be distributed and assigned to this road segment.

Trip Distribution:
The trip distribution is shown on Figure VM-1. All vehicles leaving the NRG plant will be assigned to travel north on Lathrop Road, west on Depot Road to Route 163, and northwest to the I-395 interchange. This is the shortest route to/from I-395 and Exit #79.

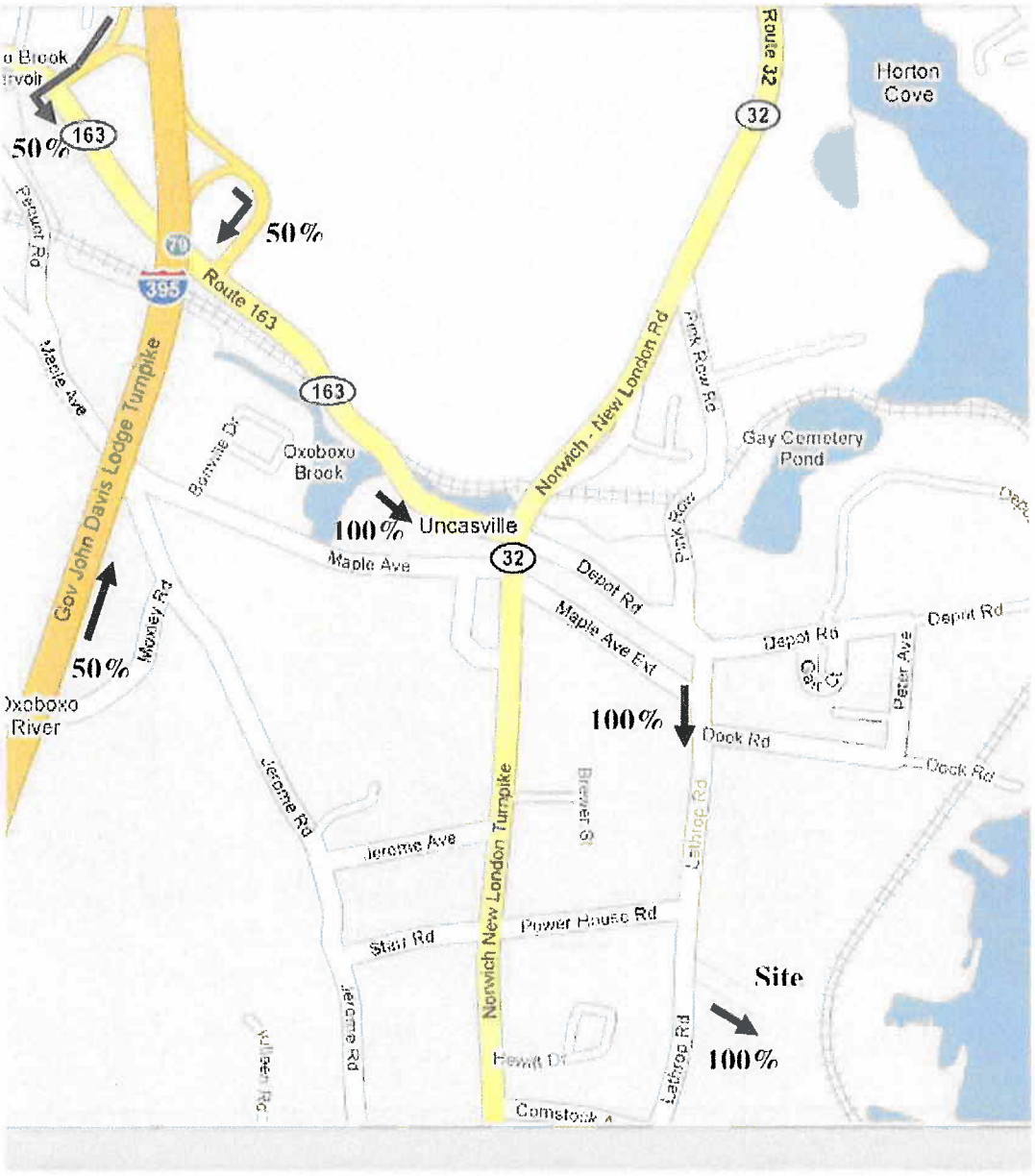


FIGURE VM-1
Vicinity Map &
Trip Distribution

LEVEL OF SERVICE (LOS) ANALYSIS

Levels of Service Defined:

The Highway Capacity Manual (HCM) is published by the National Science Foundation's Transportation Research Board (TRB). The HCM's analyses are based on determining the capacity of a facility compared to the demand to use the facility. Capacity is determined by such factors as the number of lanes, the type of control (signal or stop sign), the length of a signal cycle, and the amount of green time provided for each movement. The traffic demand on the facility is based on either traffic data collected or a projection of traffic anticipated to use the facility due to anticipated developments. These traffic volumes are adjusted for many factors including the types of vehicles in the traffic stream, the grade of the roadway, and the characteristics of the traffic flow during peak times.

The methodology, in its simplest form, compares the demand to the capacity and identifies the operational conditions as a level of service. Level of service is a letter designation assigned to a specified range of traffic delay values. Delay as calculated using the methodologies of the HCM is the average amount of time required to complete a movement through the intersection. Weighted averages of the movement delays are also reported for each approach to the intersection, and for all intersection approaches.

Table 4 shows the level of service assignments and their associated range of delays in seconds, for both unsignalized (stop controlled) and signalized intersections. The level of service designations and the number of seconds of delay associated with unsignalized intersections varies from signalized intersections because driver perception differs. Longer delays are accepted at signalized intersections since the driving task is simplified through the assignment of the right of way by the traffic signal.

The HCM also calculates queue lengths for movements at the intersection. These queue lengths report the number of vehicles stored while waiting to make each particular movement.

Table 4 - Level of Service Defined

LOS	Unsignalized Intersection		Signalized Intersection	
	Control Delay Per Vehicle (sec)	Expected Delay to Minor Street Traffic	Control Delay Per Vehicle (sec)	Expected Delay At Intersection
A	0 -10	little or no delay	0 – 10	very low delay
B	10-15	short traffic delays	10 – 20	short traffic delays
C	15-25	average traffic delays	20 – 35	Average delays, fair progression, number of vehicles stopping is significant though many pass without stopping
D	25 – 35	long traffic delays	35 – 55	Longer delays, poor progression, influence of congestion becomes more noticeable
E	35 – 50	very long traffic delays	55 – 80	High delays, long cycles, limit of acceptable delay
F	50+	extreme delays	80+	over-saturated, arrivals exceed capacity

Source: Highway Capacity Manual - Special Report 209, TRB, National Research Council, Washington, D.C. 2000.

One great benefit of the HCM is that it provides a standard analysis method for each facility type regardless of where the facility is located.

EXISTING LEVEL OF SERVICE

The study area includes the following intersections:

1. Route 163 at I-395 SB Ramp
2. Route 163 at I-395 NB Ramp
3. Route 163 at Route 32
4. Lathrop Road at Route 163
5. Lathrop Road at NRG Montville Site Entrance

AM and PM peak hour manual traffic counts were conducted from April 6, 2009 through April 8, 2009. The two-hour AM, and two-hour PM counts, with 15-minute summaries are shown in Appendix E.

Route 163 at I-395 SB Ramp: The AM/PM peak hour volume is 854/803 vph at this location. The AM peak hour occurred from 7:15 to 8:15 AM and the PM peak hour occurred from 4:15 to 5:15 PM. The existing AM/PM level of service is LOS C/B. The vehicle delay and LOS calculations are shown in Appendix B.

Route 163 at I-395 NB Ramp: The AM/PM peak hour volume is 750/847 vph at this location. The AM peak hour occurred from 7:15 to 8:15 AM and the PM peak hour occurred from 4:30 to 5:30 PM. The existing AM/PM level of service is LOS A/A. The vehicle delay and LOS calculations are shown in Appendix B.

Route 163 at Route 32: The AM/PM peak hour volume is 1190/1496 vph at this location. The AM peak hour occurred from 7:15 to 8:15 AM and the PM peak hour occurred from 4:00 to 5:00 PM. The existing AM/PM level of service is LOS B/B. The vehicle delay and LOS calculations are shown in Appendix B.

Lathrop Road at Route 163 (Depot Road and Pink Row): The AM/PM peak hour volume is 100/145 vph at this location. The AM peak hour occurred from 7:15 to 8:15 AM and the PM peak hour occurred from 5:00 to 6:00 PM. The existing AM/PM level of service is LOS A/A. The vehicle delay and LOS calculations are shown in Appendix B.

Lathrop Road at NRG Montville Site Entrance: The AM/PM peak hour volume is 36/78 vph at this location. The AM peak hour occurred from 7:15 to 8:15 AM and the PM peak hour occurred from 5:00 to 6:00 PM. The existing AM/PM level of service is LOS A/A. The vehicle delay and LOS calculations are shown in Appendix B.

NO BUILD LEVEL OF SERVICE

Based on discussion with the Town of Montville Public Works Department, Mr. Don Bourdeau, there are no roadway or signal improvements planned for Rte 163, Depot Road or Lathrop Road. We have contacted the Connecticut Department of Transportation (ConnDOT) and the Traffic Forecasting Section (Mr. Mike Connors) suggested that we apply a 1% per year annual traffic growth rate to account for normal traffic growth.

Traffic volumes were projected that should exist in the year 2011, without construction of the NRG project. The existing 2009 volumes were increased by a 1% per year annual growth rate. This No Build condition is used as the baseline to understand what the future LOS would be in 2011 without the proposed NRG project (Table 7.2). The HCS+ level of service worksheets are shown in Appendix B.

FUTURE LEVEL OF SERVICE DURING CONSTRUCTION (Qtr 1 2010 to Qtr 3 2011)

The "During construction" traffic shown in Trip Generation Table 2 was added to the "2011 No Build" traffic volumes, and the LOS calculations were performed. Table 5 shows the LOS summary.

Route 163 at I-395 SB Ramp: The AM/PM peak hour volume will increase by 21/51 vph at this location. The AM/PM level of service during construction is projected to be LOS C/B.

Route 163 at I-395 NB Ramp: The AM/PM peak hour volume will increase by 41/101 vph at this location. The AM/PM level of service during construction is projected to be LOS A/A.

Route 163 at Route 32: The AM/PM peak hour volume will increase by 41/101 vph at this location. The AM/PM level of service during construction is projected to be LOS B/B.

Lathrop Road at Depot Road and Pink Row: The AM/PM peak hour volume will increase by 41/101 vph at this location. The AM/PM level of service during construction is projected to be LOS A/A.

Lathrop Road at NRG Montville Site Entrance: The AM/PM peak hour volume will increase by 41/101 vph at this location. The AM/PM level of service during construction is projected to be LOS A/A.

FUTURE LEVEL OF SERVICE AFTER PROJECT COMPLETION

The permanent traffic shown in the Trip Generation Table 3 was added to the 2011 No Build traffic volumes, and the LOS calculations were performed. Table 5 shows the LOS summary.

Route 163 at I-395 SB Ramp: The AM/PM peak hour volume will increase by 3/3 vph at this location. The AM/PM level of service during construction is projected to be LOS C/B.

Route 163 at I-395 NB Ramp: The AM/PM peak hour volume will increase by 6/6 vph at this location. The AM/PM level of service during construction is projected to be LOS A/A.

Route 163 at Route 32: The AM/PM peak hour volume will increase by 6/6 vph at this location. The AM/PM level of service during construction is projected to be LOS B/B.

Lathrop Road at Depot Road and Pink Row: The AM/PM peak hour volume will increase by 6/6 vph at this location. The AM/PM level of service during construction is projected to be LOS A/A.

Lathrop Road at NRG Montville Site Entrance: The AM/PM peak hour volume will increase by 6/6 vph at this location. The AM/PM level of service during construction is projected to be LOS A/A.

TABLE 5
LOS SUMMARY TABLE

Level of Service 2009 Existing, 2011 No Build, 2011 During Construction and 2011 Project Complete Conditions																
	AM Peak Hour								PM Peak Hour							
	2009 Exist		2011 No-Build		2011 During Construction		2011 Project Complete		2009 Exist		2011 No-Build		2011 During Construction		2011 Project Complete	
Intersection	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Route 163 at I-395 SB Ramp	C	18.5	C	19.1	C	21.9	C	19.8	B	13.1	B	13.3	B	13.9	B	13.4
Route 163 at I-395 NB Ramp (signal)	A	6.1	A	6.2	A	7.0	A	6.2	A	8.2	A	8.2	A	8.2	A	8.3
Route 163 Depot Rd at Route 32 (signal)	B	12.6	B	12.8	B	12.8	B	12.8	B	17.1	B	18.5	B	18.7	B	18.5
Lathrop Rd Depot Rd Pink Row	A	7.4	A	7.4	A	7.3	A	7.5	A	7.5	A	7.5	A	8.2	A	7.8
Lathrop Rd at NRG Site Entrance	A	8.6	A	8.6	A	8.9	A	9.4	A	8.7	A	8.7	A	9.0	A	8.9

ACCIDENT DATA

The Connecticut Department of Transportation (ConnDOT) uses historical accident data as an important component in its ongoing evaluation of Connecticut's public highways, streets and roads. Accident data plays an integral part in ConnDOT's responsibilities for maintaining the state highway system, and is a key factor in the decision making process for roadway improvements and modifications.

Shaw contacted ConnDOT (Mr. Angelo Asaro and Mr. Craig Mandell) and requested and received accident data for the most recent 3-year period (July 1, 2005 to June 30, 2008) for the following locations:

TABLE 6 ACCIDENT SUMMARY TABLE

Intersection	Total Acc.	Fatal	Inj A	Inj B	Inj C	PDO	Day/ night	Wet/ dry	Cars,Vans, Truck ST	Truck DT, Combin.
I-395 SB Ramp near Rte 163	4	0	1	0	2	1	3/1	1/3	4	0
I-395 NB Ramp near Rte 163	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Rte 32 near Rte 163	15	0	0	1	0	14	12/3	2/13	14	1
Rte 163 near Rte 32	6	0	0	1	0	5	4/2	1/5	6	0
Depot Rd at Pink Row at Lathrop Rd	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lathrop Rd at Site Entry	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lathrop Rd near Dock Rd	1	0	0	0	0	1	0/1	0/1	0	1
Rte 32 near Powerhouse Rd	6	0	0	0	2	4	5/1	0/6	6	0
Total	32	0	1	2	4	25	24/8	4/28	30	2

Footnotes:

ND = No ConnDOT accident data provided.
Inj A = Incapacitating Injury
Inj B = Non-incapacitating Injury
Inj C = Possible Injury
PDO = Property damage only
Truck ST = Truck Single Unit Single Tires
Truck DT, Combin. = Truck Dual Tires, truck trailer combination

The above data is shown in Appendix D. The ConnDOT Accident Records and Statistics Section of the Office of Inventory and Forecasting is responsible for the codification, maintenance and compilation of motor vehicle traffic accident data. Each police department investigates and documents the reportable motor vehicle accidents, and forwards a copy of the police accident report to ConnDOT. A reportable motor vehicle accident is defined as one in which any person is killed or injured, or in which damage to the property of any one individual is in excess of one thousand dollars.

At the above locations, the contributing factors to each accident were:

- 9 by following too close,
- 8 by failure to grant right of way,
- 3 by an improper passing maneuver,
- 3 by speeding or too fast for conditions
- 3 by lost control,
- 2 by mechanical failure
- 1 by driving wrong way on ramp
- 1 by driver being inattentive,
- 1 by using the wrong turn signal, and
- 1 by unknown or conflicting stories.

Most accidents occurred during the day (24 of 32), and most accidents occurred on a dry road surface (28 of 32).

At the above locations, the types of accidents were:

- Zero fatality type accidents
- 1 Injury Type A accidents (Incapacitating)
- 2 Injury Type B accidents (non-incapacitating)
- 4 injury Type C accidents (possible injury)
- 25 Property damage only accidents

There were 2 accidents involving a truck (with dual tires or trailer combination).

- A truck was on Lathrop Road near Dock Road turning right and struck a fire hydrant. This was a single vehicle, property damage only type accident.
- A truck heading north on Rte 32 passed a NB car on the right side, and had a sideswipe accident. Two vehicles were involved, and was a property damage only type accident.

Shaw requested that ConnDOT provide us with the "*Suggested List of Surveillance Study Sites" (SLOSSS).* The SLOSSS list provides locations that experienced abnormally high accident rates for the corresponding 3-year period. The objective in developing *SLOSSS* is to define those locations which have the greatest promise of accident reduction and thus to give a broad measure of overall needs of highway safety improvements. Unfortunately, Mr. Craig Mandell (ConnDOT) stated that due to an ongoing State Court case, ConnDOT cannot provide us with a copy of the SLOSSS list.

RECOMMENDATIONS

Roadway Operations During Construction (Qtr 1 2010 to Qtr 3 2011):
The construction-related traffic will arrive on-site just prior to the start of the 7:00 AM dayshift. The peak hour of adjacent street traffic is 7:15 to 8:15 AM. To be conservative, we have assigned half of these AM construction worker trips to occur in the 7:15 to 8:15 AM peak hour window. The construction traffic will depart after 4:00 PM, which coincides with the PM peak hour of adjacent street traffic. The existing traffic volumes are very light along Lathrop Road. The contractor traffic can be easily accommodated on the existing road network. The additional construction traffic will have a minimal and temporary impact on intersection delays and operations. The AM and PM intersection delays will increase, but the level of service (LOS) at the 5 intersections will remain unchanged. All locations will operate at LOS C (or better) levels. No capacity-related improvements are required.

Roadway Operations after Project Completion:
The Biomass project will generate 6 inbound and 6 outbound truck trips during the AM and PM peak hours. The completed project will generate fewer trips than the "During Construction" scenario. The AM and PM intersection delays will increase slightly as compared to 2009 Existing conditions, but the level of service (LOS) at the 5 intersections will remain unchanged. No capacity-related improvements are required.

Turning Geometry:
The Biomass woodchip trucks will be conducting left- and right-turn moves at 4 of the study area intersections. The minimum turning template for the woodchip semi-trailer (WB-62) is shown in Appendix G. The minimum turn radius of the inside tire for the woodchip semi-trailer is 45 feet.

TABLE 7: Turn Radius Table

Location	Movement	Measured Radius* (inside tire)	Acceptable?
Route 163 at I-395 SB Ramp	WB to NB right turn	90 ft	Yes
Route 163 at I-395 NB Ramp (signal)	WB to NB right turn	90 ft	Yes
Route 163 at Route 32 (signal)	EB thru, and WB thru	Straight movement	Yes
Depot Road at Pink Row at Lathrop Road	EB to SB right turn	110 ft	Yes
Lathrop Road at NRG Site Entrance	WB to NB right turn	60 ft	Yes

* See Appendix G for aerial photo and measured radius at each intersection.

We have measured the actual curb (fillet) radius for the above intersections. All curb (fillet) radii exceed 45 feet and are acceptable, and the swept path of the wood chip truck tires will stay on the pavement surface.

Parking:
It is expected that the contractor vehicles and equipment will be located on the NRG property about 100 yards east of Lathrop Road in the temporary staging and parking area. No NRG or Contractor vehicles will be parking along Lathrop Road. All visitors will be directed to park at the Visitor parking lot, inside the property fence.

Pavement markings:
During our site visit we noted the following roadway pavement marking issues.

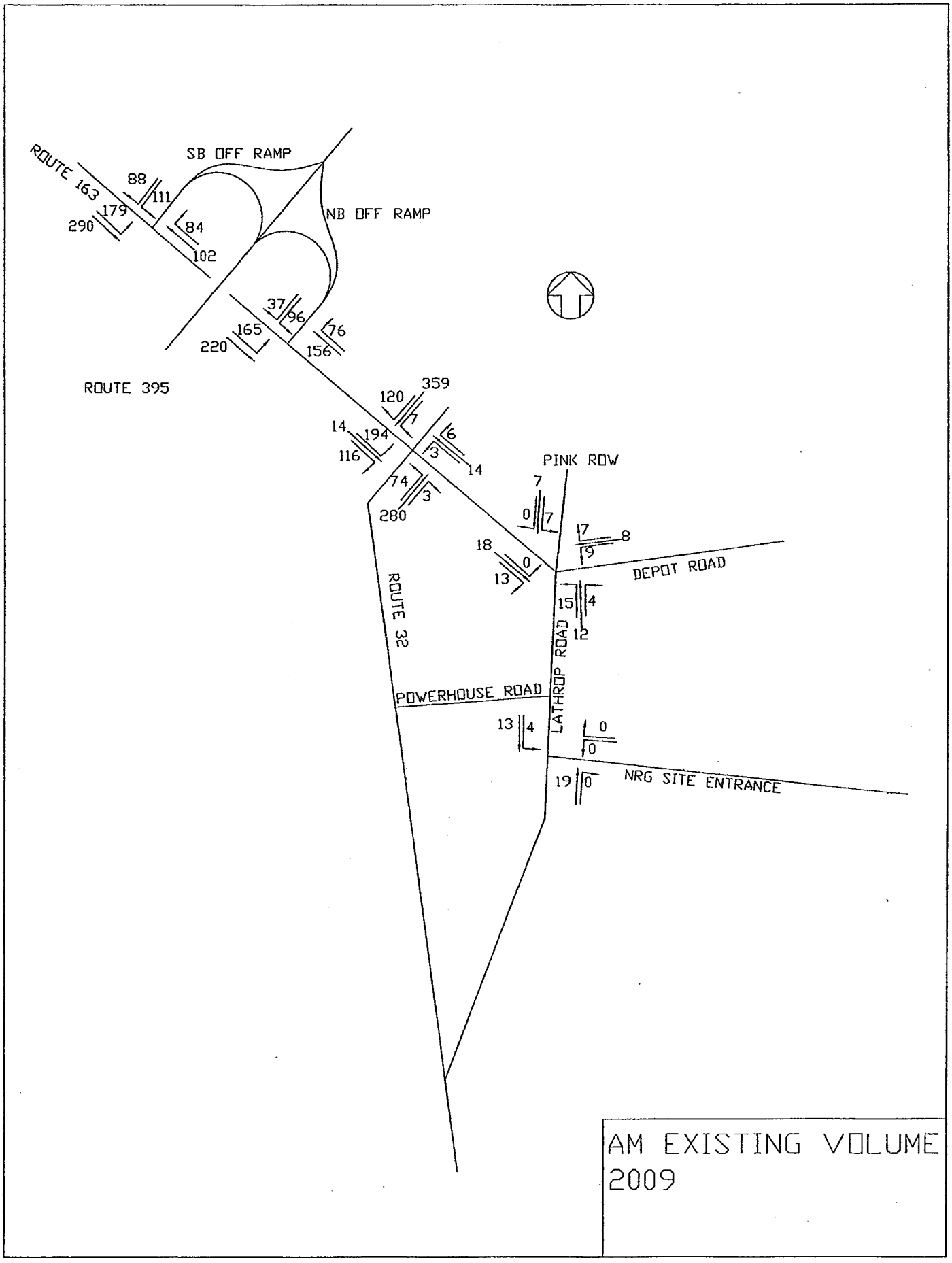
A white stop line should be re-applied at the following locations:
- NRG Site Drive at Lathrop Road (WB approach)
- Lathrop Road at Depot Road (NB and EB approaches)

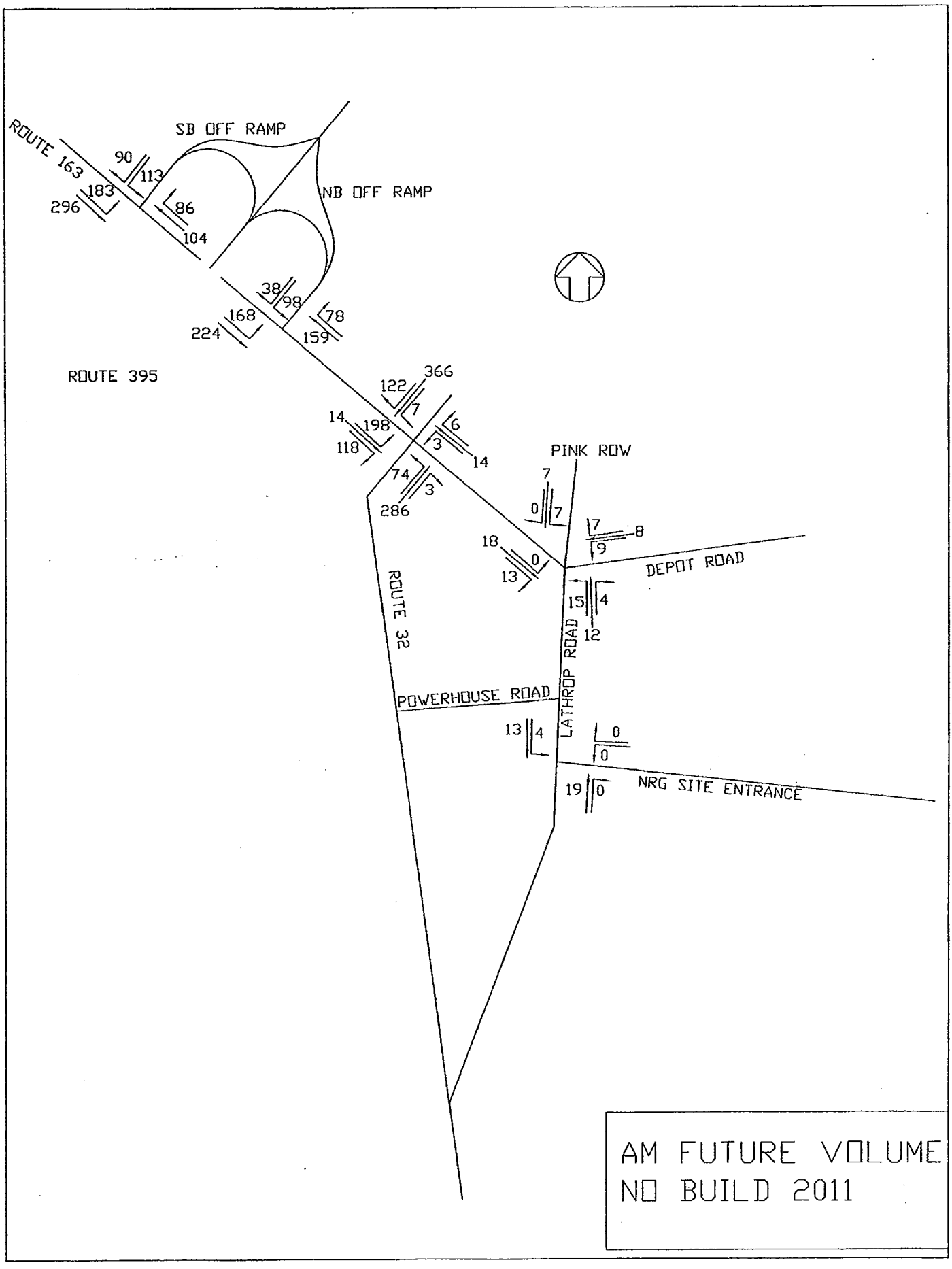
A yellow centerline should be re-applied on:
- Route 163 from Route 32 to Lathrop Road (1,200 ft)
- Lathrop Road from Route 163 to Route 32 (4,500 ft).

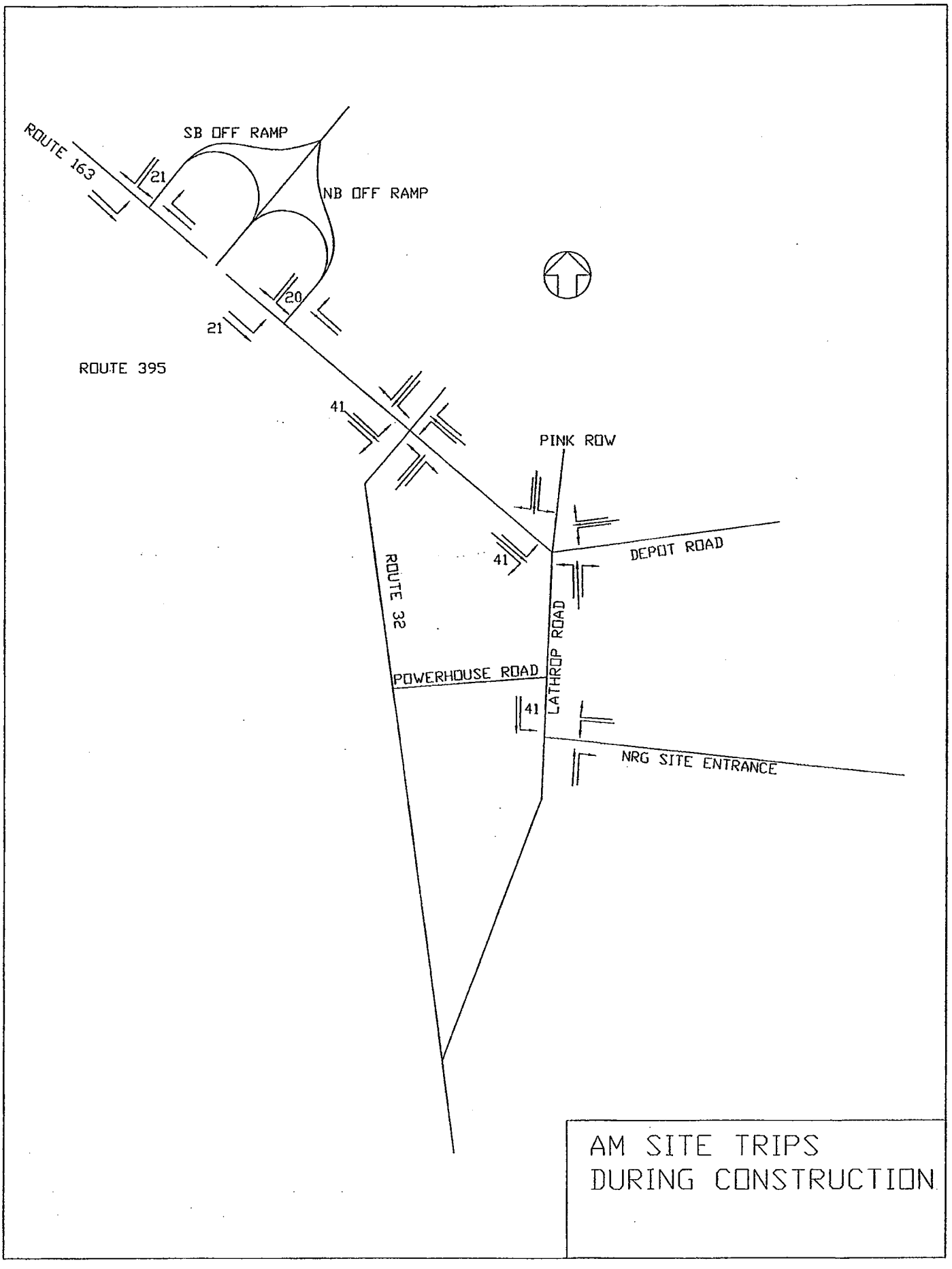
Re-applying the above pavement markings are routine maintenance tasks, typically scheduled every 2 or 3 years, and the markings are not required for conditional approval of this project.

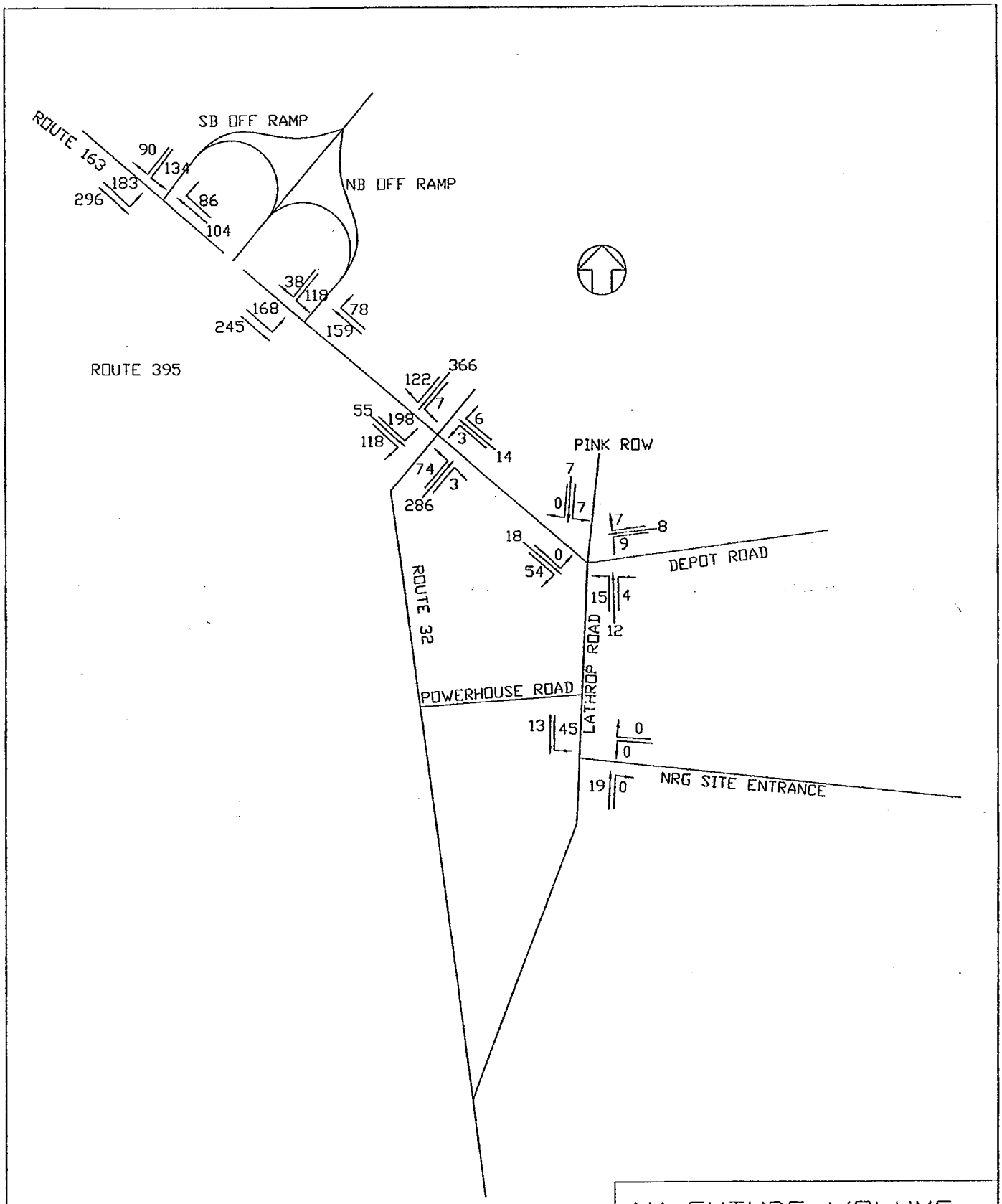
APPENDIX A

TRAFFIC FLOW MAPS

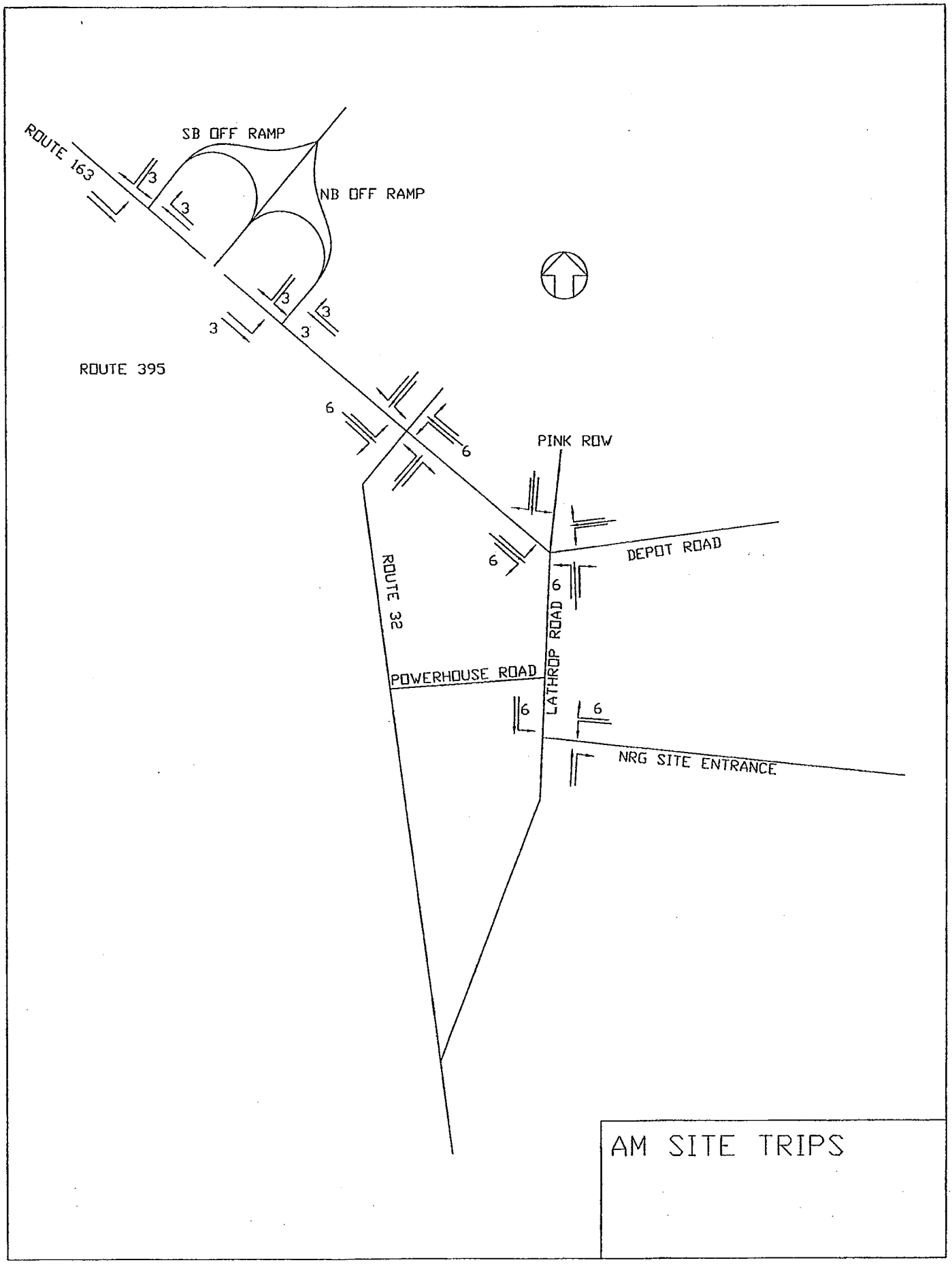

ROUTE 163
SB OFF RAMP
NB OFF RAMP
88
111
179
290
84
102
37
96
165
220
76
156
ROUTE 395
120
359
14
194
116
6
3
14
74
3
280
PINK ROW
7
0
7
17
8
9
18
0
13
DEPOT ROAD
ROUTE 32
15
4
12
LATHROP ROAD
POWERHOUSE ROAD
13
4
0
0
19
0
NRG SITE ENTRANCE
AM EXISTING VOLUME
2009

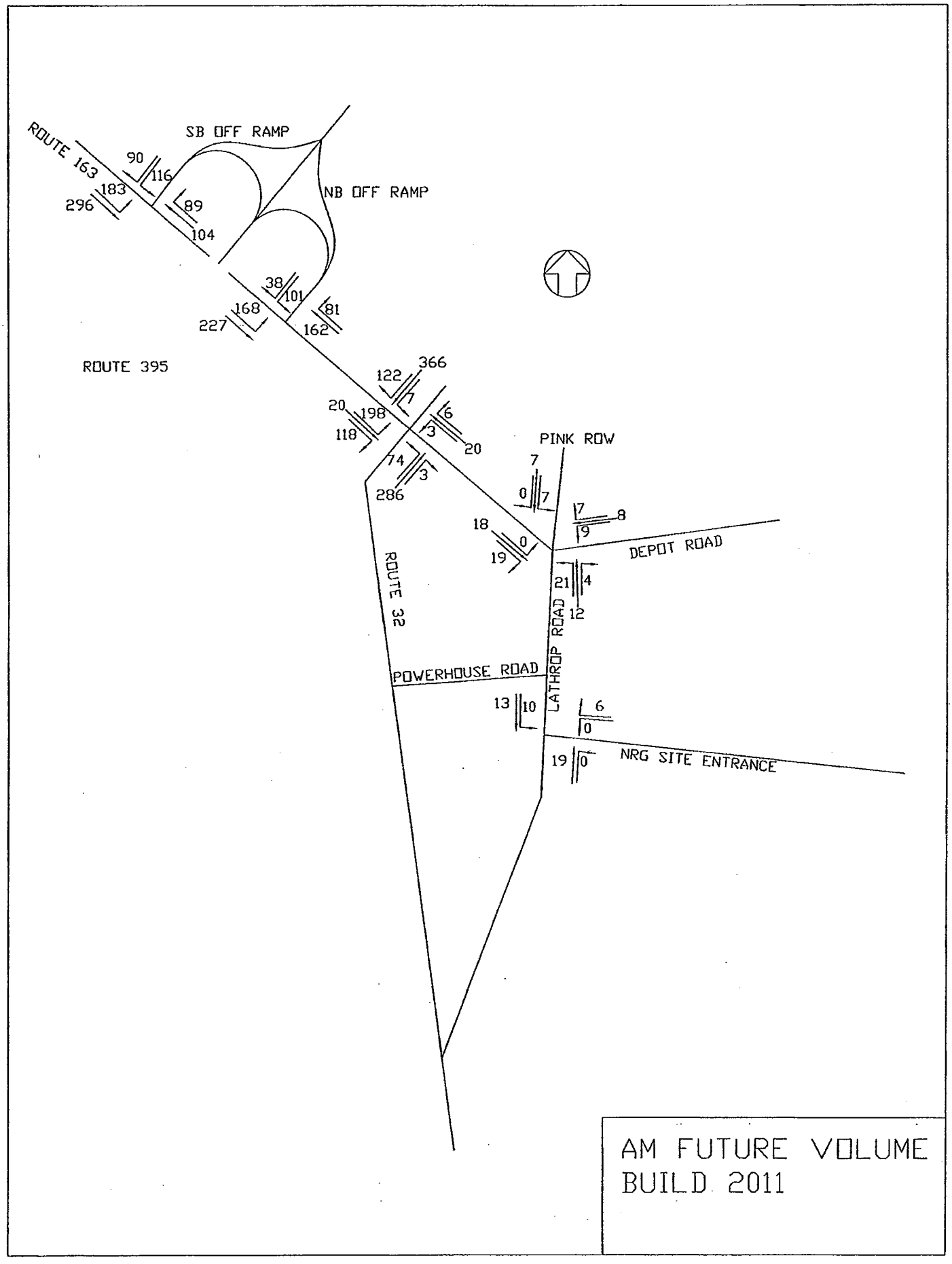

ROUTE 163
SB OFF RAMP
NB OFF RAMP
90
113
183
296
86
104
38
98
168
224
78
159
ROUTE 395
366
122
7
14
198
118
6
3
14
74
3
286
PINK ROW
7
0
7
7
8
9
18
0
13
DEPOT ROAD
ROUTE 32
15
4
12
LATHROP ROAD
POWERHOUSE ROAD
13
4
0
0
19
0
NRG SITE ENTRANCE
AM FUTURE VOLUME
NO BUILD 2011

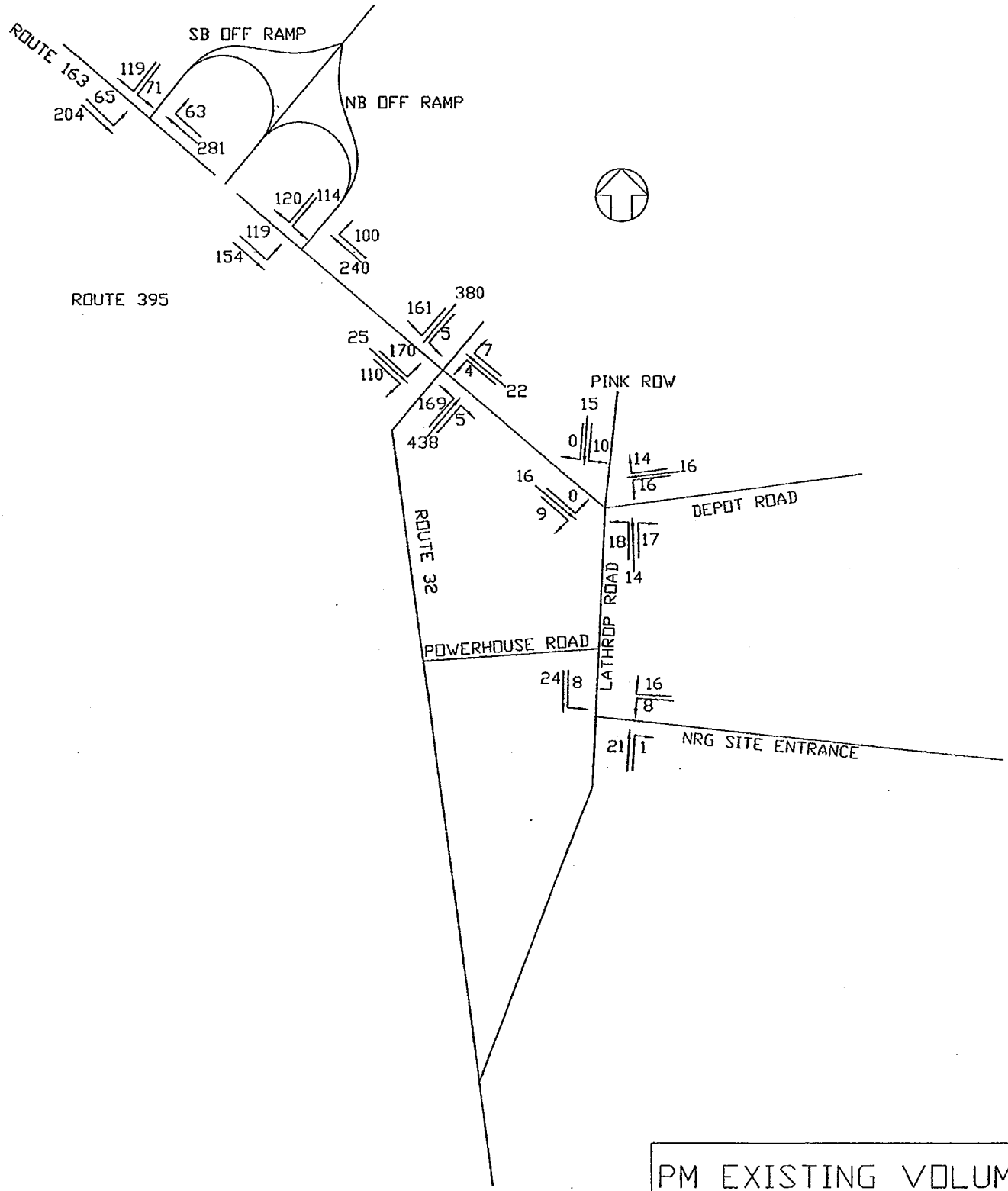

ROUTE 163
SB OFF RAMP
21
NB OFF RAMP
20
21
ROUTE 395
41
PINK ROW
41
DEPOT ROAD
ROUTE 32
LATHROP ROAD
POWERHOUSE ROAD
41
NRG SITE ENTRANCE
AM SITE TRIPS
DURING CONSTRUCTION



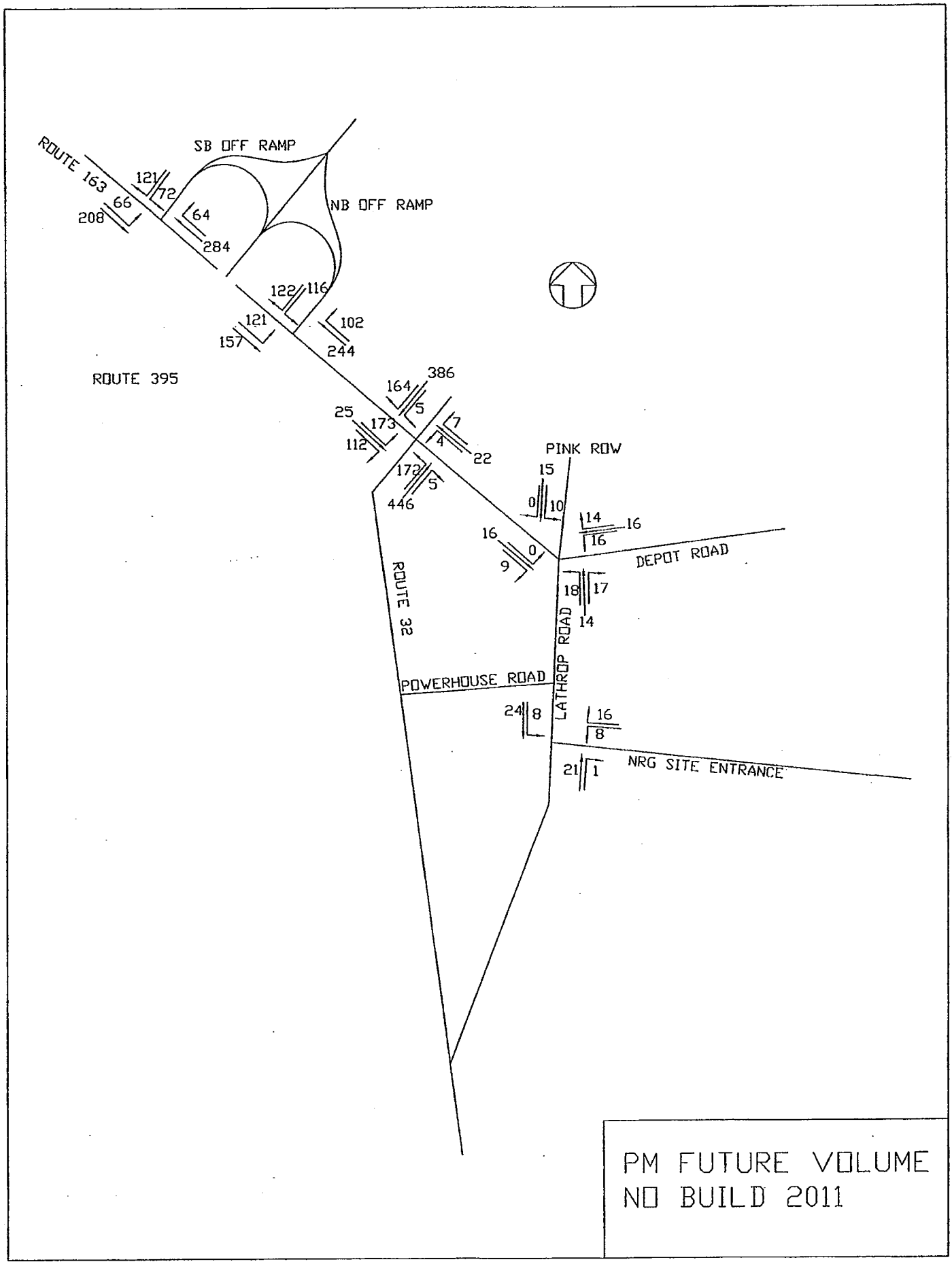
AM FUTURE VOLUME
DURING CONSTRUCTION
2011


ROUTE 163
SB OFF RAMP
NB OFF RAMP
3
3
3
3
3
3
ROUTE 395
6
6
PINK ROW
6
DEPOT ROAD
ROUTE 32
6
LATHROP ROAD
POWERHOUSE ROAD
6
6
NRG SITE ENTRANCE
AM SITE TRIPS


ROUTE 163
SB OFF RAMP
NB OFF RAMP
90
116
183
296
89
104
38
101
168
227
81
162
ROUTE 395
122
366
20
198
118
6
3
20
74
3
286
PINK ROW
7
0
7
7
8
9
18
0
19
DEPOT ROAD
ROUTE 32
21
4
12
LATHROP ROAD
POWERHOUSE ROAD
13
10
6
0
19
0
NRG SITE ENTRANCE
AM FUTURE VOLUME
BUILD 2011



PM EXISTING VOLUME
2009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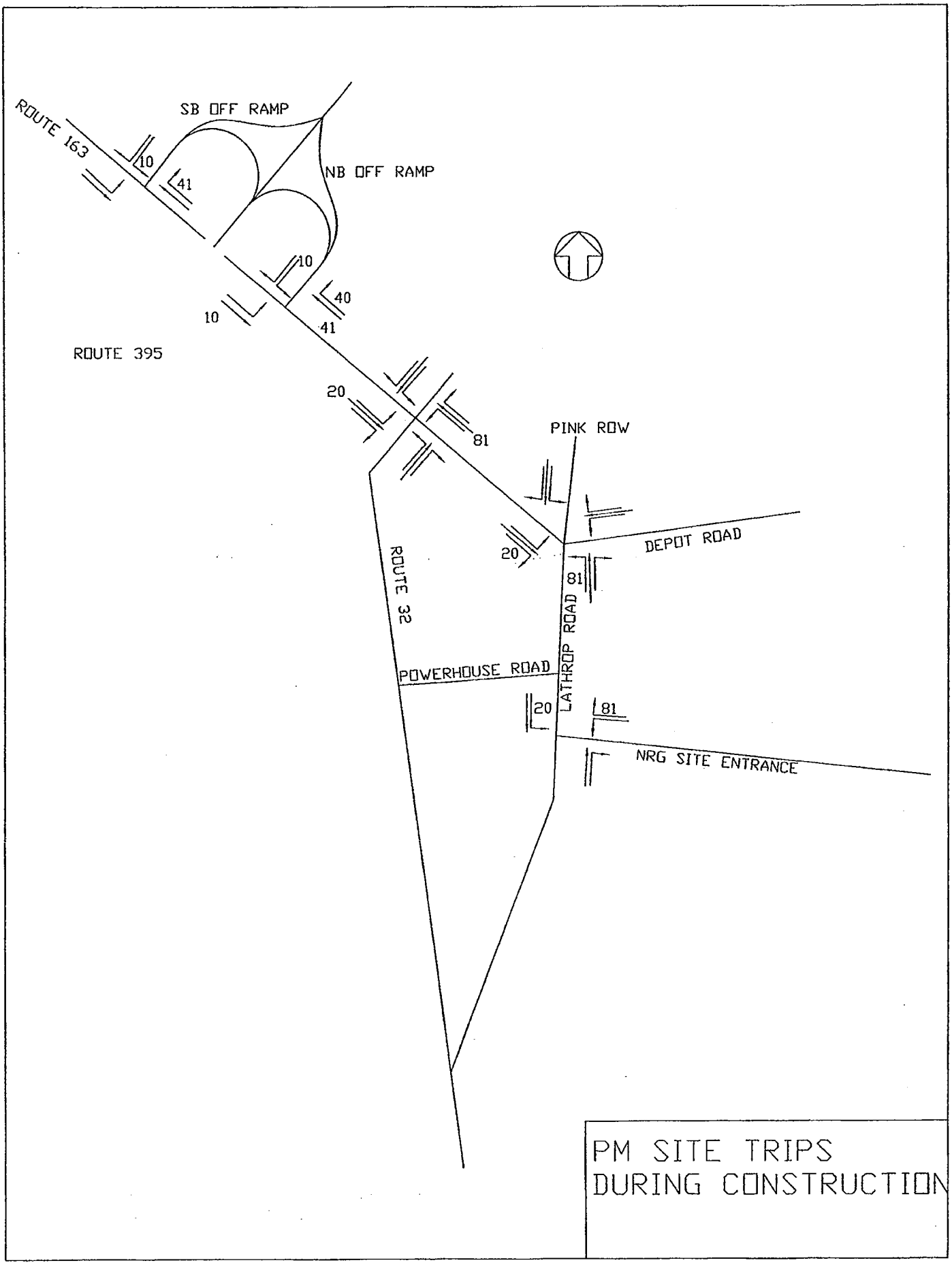
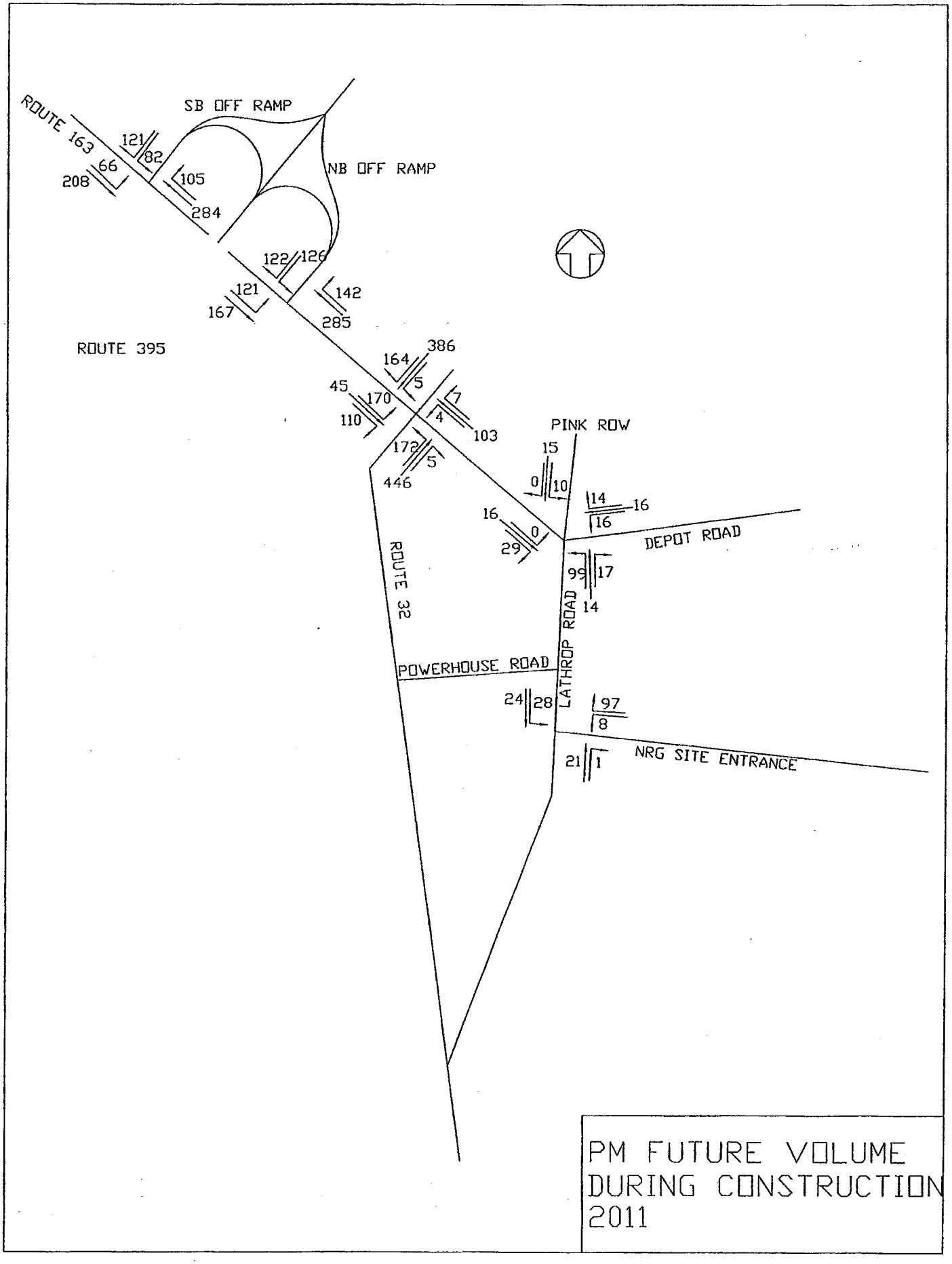
SB OFF RAMP
NB OFF RAMP
121
72
66
208
64
284
122
116
121
157
102
244
ROUTE 395
386
164
5
25
173
112
7
4
22
172
5
446
PINK ROW
15
0
10
14
16
16
0
9
DEPOT ROAD
18
17
14
ROUTE 32
LATHROP ROAD
POWERHOUSE ROAD
24
8
16
8
21
1
NRG SITE ENTRANCE
PM FUTURE VOLUME
NO BUILD 2011


ROUTE 163
SB OFF RAMP
NB OFF RAMP
10
41
10
40
10
41
ROUTE 395
20
81
PINK ROW
DEPOT ROAD
20
81
ROUTE 32
LATHROP ROAD
POWERHOUSE ROAD
20
81
NRG SITE ENTRANCE
PM SITE TRIPS
DURING CONSTRUCTION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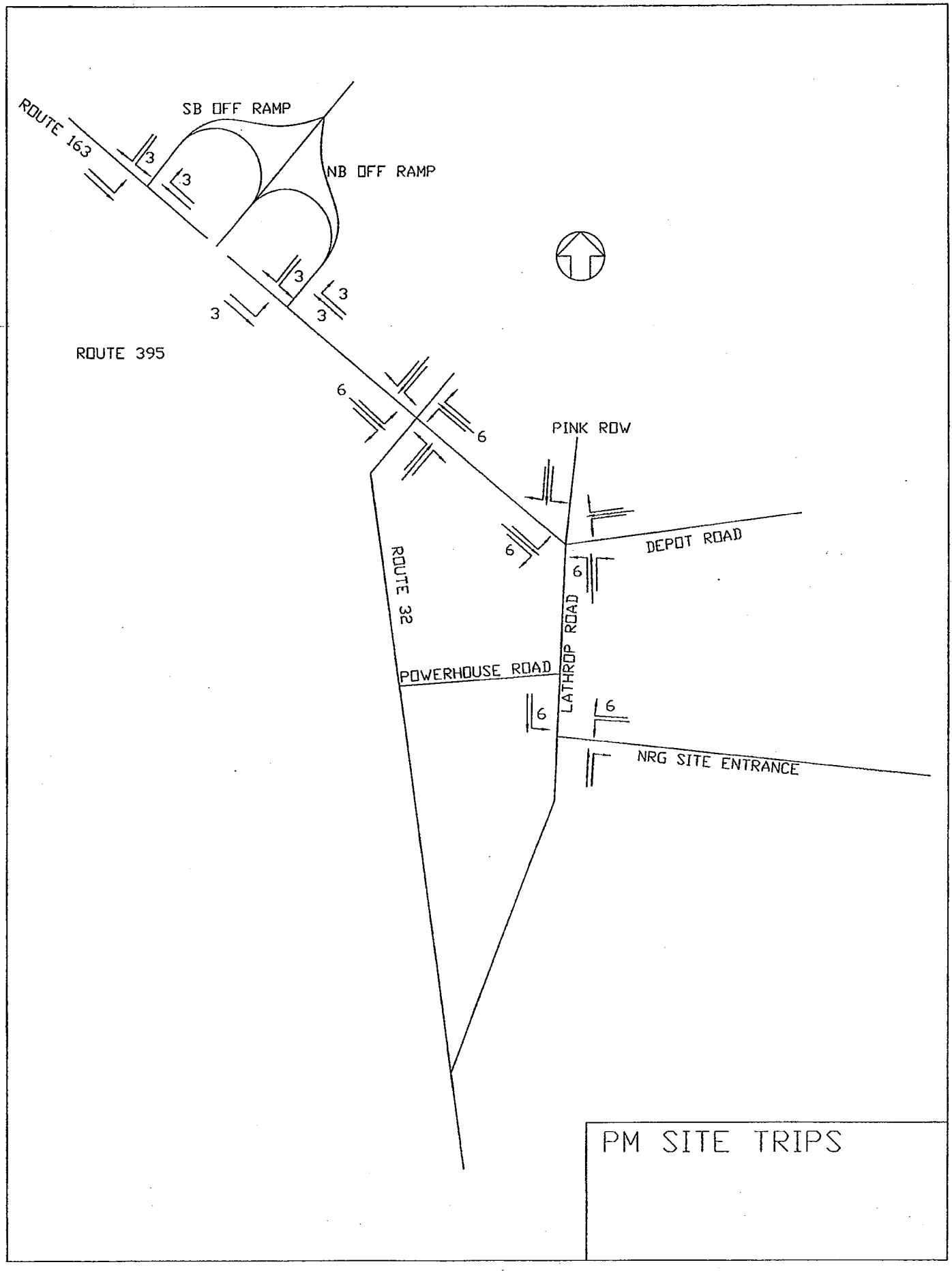
SB OFF RAMP
NB OFF RAMP
121
82
66
208
105
284
122
126
121
167
142
285
ROUTE 395
164
386
5
45
170
110
7
4
103
172
5
446
PINK ROW
15
0
10
14
16
16
16
0
29
DEPOT ROAD
99
17
14
ROUTE 32
LATHROP ROAD
POWERHOUSE ROAD
24
28
97
8
21
1
NRG SITE ENTRANCE
PM FUTURE VOLUME
DURING CONSTRUCTION
2011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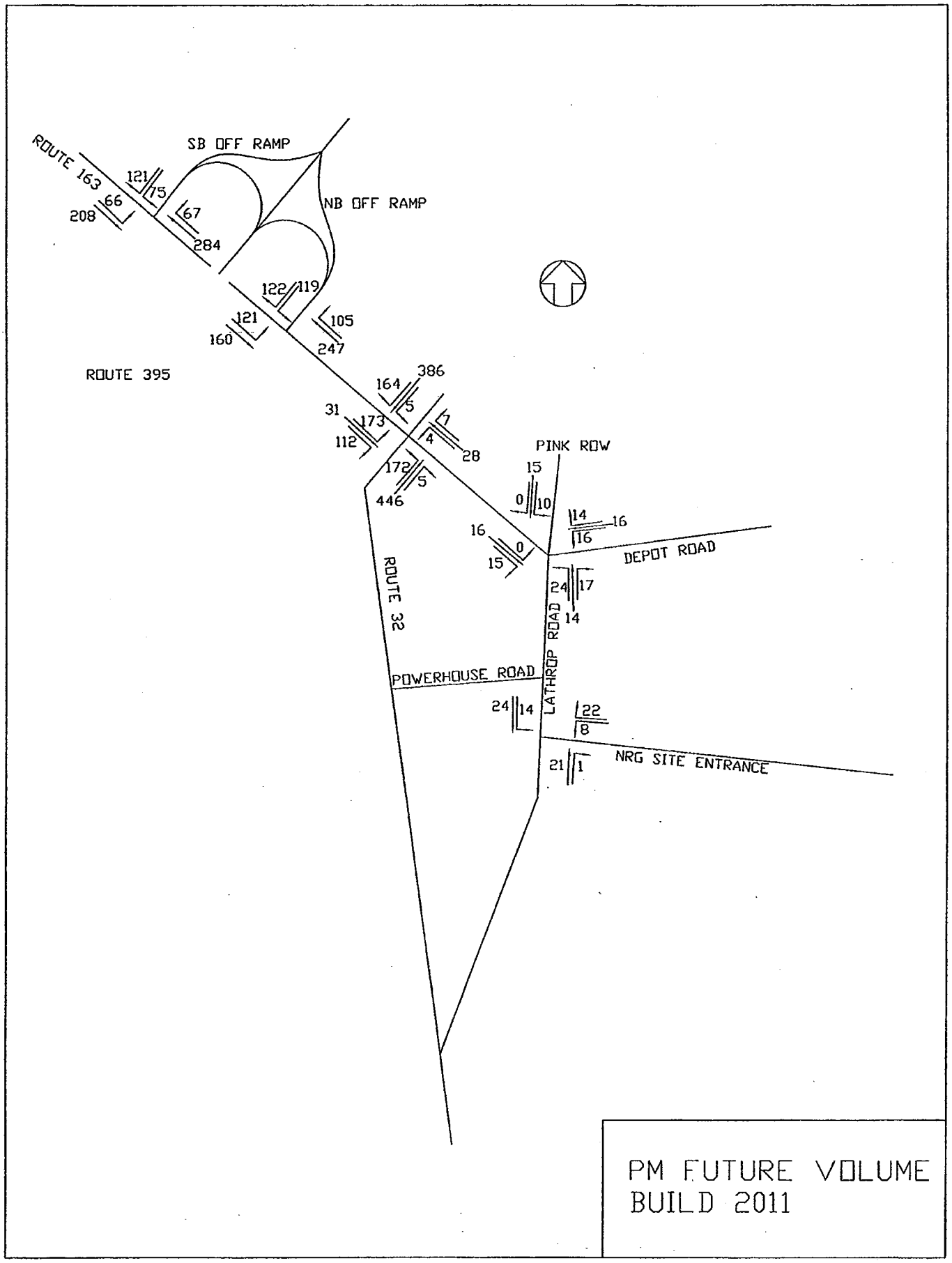
SB OFF RAMP
NB OFF RAMP
3
3
3
3
3
3
ROUTE 395
6
6
PINK ROW
6
DEPOT ROAD
6
ROUTE 32
LATHROP ROAD
POWERHOUSE ROAD
6
6
NRG SITE ENTRANCE
PM SITE TRIPS


ROUTE 163
SB OFF RAMP
NB OFF RAMP
121
15
66
208
67
284
122
119
121
160
105
247
ROUTE 395
164
386
5
31
173
112
4
7
28
172
5
446
PINK ROW
15
0
10
14
16
16
16
0
15
DEPOT ROAD
ROUTE 32
24
17
14
LATHROP ROAD
POWERHOUSE ROAD
24
14
22
8
21
1
NRG SITE ENTRANCE
PM FUTURE VOLUME
BUILD 2011

APPENDIX B

Level of Service Calculations
HCS+ Software for Intersections

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM Exist
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2009
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	179	290			102	84
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	188	305			107	88
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				111		88
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				116		92
Percent Heavy Vehicles				4		4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	188					116		92
C(m) (vph)	1366					290		890
v/c	0.14					0.40		0.10
95% queue length	0.48					1.96		0.35
Control Delay	8.1					25.6		9.5
LOS	A					D		A
Approach Delay							18.5	
Approach LOS							C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM No Build 2011
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	183	296			104	86
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	192	311			109	90
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				113		90
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				118		94
Percent Heavy Vehicles				4		4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	192					118		94
C(m) (vph)	1361					283		887
v/c	0.14					0.42		0.11
95% queue length	0.49					2.09		0.36
Control Delay	8.1					26.7		9.5
LOS	A					D		A
Approach Delay							19.1	
Approach LOS							C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM During Construction
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	183	296			104	86
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	192	311			109	90
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				134		90
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				141		94
Percent Heavy Vehicles				4		4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	192					141		94
C(m) (vph)	1361					283		887
v/c	0.14					0.50		0.11
95% queue length	0.49					2.86		0.36
Control Delay	8.1					30.2		9.5
LOS	A					D		A
Approach Delay							21.9	
Approach LOS							C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: Shaw Group
Date Performed: 5/22/2009
Analysis Time Period: AM Build 2011
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Rte 163
North/South Street: Route 395 SB Ramp
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	183	296			104	89
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	192	311			109	93
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				116		90
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				122		94
Percent Heavy Vehicles				5		4
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	192					122		94
C(m) (vph)	1358					280		884
v/c	0.14					0.44		0.11
95% queue length	0.49					2.25		0.36
Control Delay	8.1					27.7		9.6
LOS	A					D		A
Approach Delay							19.8	
Approach LOS							C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/6/2009
Analysis Time Period: PM Exist
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2009
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	65	204			281	63
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	68	214			295	66
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				71		119
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				74		125
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	68					74		125
C(m) (vph)	1187					389		706
v/c	0.06					0.19		0.18
95% queue length	0.18					0.70		0.64
Control Delay	8.2					16.4		11.2
LOS	A					C		B
Approach Delay							13.1	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/6/2009
Analysis Time Period: PM No Build 2011
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	66	208			284	64
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	69	218			298	67
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				72		121
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				75		127
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	69					75		127
C(m) (vph)	1183					384		703
v/c	0.06					0.20		0.18
95% queue length	0.19					0.72		0.66
Control Delay	8.2					16.6		11.2
LOS	A					C		B
Approach Delay							13.3	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/6/2009
Analysis Time Period: PM During Construction
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	66	208			284	105
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	69	218			298	110
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				82		121
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				86		127
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	69					86		127
C(m) (vph)	1140					372		684
v/c	0.06					0.23		0.19
95% queue length	0.19					0.90		0.68
Control Delay	8.4					17.6		11.5
LOS	A					C		B
Approach Delay							13.9	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/6/2009
Analysis Time Period: PM Build 2011
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Route 163
North/South Street: Route 395 S Ramps
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	66	208			284	67
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	69	218			298	70
Percent Heavy Vehicles	4	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				75		121
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				78		127
Percent Heavy Vehicles				6		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage				/		/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	69					78		127
C(m) (vph)	1180					382		702
v/c	0.06					0.20		0.18
95% queue length	0.19					0.77		0.66
Control Delay	8.2					16.8		11.3
LOS	A					C		B
Approach Delay							13.4	
Approach LOS							B	

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/8/2009
Period: AM Exist
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2009
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	165	220			156	76				96		37
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left	A		
Thru	A				Thru			
Right	A				Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	33.9					6.1		
Yellow	3.0					3.0		
All Red	1.0					1.0		

Cycle Length: 48.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	994	1408	0.43	0.71	3.3	A	3.3	A
Westbound								
TR	1245	1763	0.21	0.71	2.5	A	2.5	A
Northbound								
Southbound								
L	218	1719	0.49	0.13	21.2	C		
							20.7	C
R	195	1538	0.21	0.13	19.3	B		

Intersection Delay = 6.1 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst: Keith Malloy
Agency: The Shaw Group
Date: 4/8/2009
Period: AM No Build 2011
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	168	224			159	78				98		38
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left				
Thru	A				Thru				
Right					Right				
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru				
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	33.9					6.1			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 48.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	989	1401	0.44	0.71	3.3	A	3.3	A
Westbound								
TR	1245	1763	0.21	0.71	2.5	A	2.5	A
Northbound								
Southbound								
L	218	1719	0.50	0.13	21.3	C		
							20.8	C
R	195	1538	0.22	0.13	19.4	B		

Intersection Delay = 6.2 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/8/2009
Period: AM During Construction
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	168	245			159	78				118		38
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left				
	Thru	A					Thru				
	Right						Right				
	Peds						Peds				
WB	Left					SB	Left	A			
	Thru	A					Thru				
	Right	A					Right	A			
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		33.9						6.1			
Yellow		3.0						3.0			
All Red		1.0						1.0			

Cycle Length: 48.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	992	1404	0.46	0.71	3.4	A	3.4	A
Westbound								
TR	1245	1763	0.21	0.71	2.5	A	2.5	A
Northbound								
Southbound								
L	216	1703	0.61	0.13	24.6	C		
							23.4	C
R	194	1524	0.22	0.13	19.4	B		

Intersection Delay = 7.0 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/8/2009
Period: AM Build 2011
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	168	227			162	81				101		38
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left				
Thru	A				Thru				
Right					Right				
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru				
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	33.9					6.1			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 48.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	988	1399	0.44	0.71	3.3	A	3.3	A
Westbound								
TR	1244	1762	0.22	0.71	2.5	A	2.5	A
Northbound								
Southbound								
L	218	1719	0.51	0.13	21.7	C		
							21.0	C
R	195	1538	0.22	0.13	19.4	B		

Intersection Delay = 6.2 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/6/2009
Period: PM Exist
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2009
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	119	154			240	100				114		120
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left	A		
Thru	A				Thru			
Right	A				Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	33.1					8.9		
Yellow	3.0					3.0		
All Red	1.0					1.0		

Cycle Length: 50.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	877	1325	0.36	0.66	4.0	A	4.0	A
Westbound								
TR	1196	1806	0.33	0.66	3.8	A	3.8	A
Northbound								
Southbound								
L	312	1752	0.42	0.18	19.2	B		
							19.5	B
R	279	1568	0.49	0.18	19.9	B		

Intersection Delay = 8.2 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/6/2009
Period: PM No Build 2011
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	121	157			244	102				116		122
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left				
Thru	A				Thru				
Right					Right				
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru				
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	33.1					8.9			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 50.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	874	1320	0.36	0.66	4.0	A	4.0	A
Westbound								
TR	1172	1771	0.34	0.66	3.9	A	3.9	A
Northbound								
Southbound								
L	318	1787	0.42	0.18	19.1	B		
							19.5	B
R	285	1599	0.49	0.18	19.8	B		

Intersection Delay = 8.2 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/6/2009
Period: PM During Construction
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	121	167			285	142				126		122
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left	A		
Thru	A				Thru			
Right	A				Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	33.1					8.9		
Yellow	3.0					3.0		
All Red	1.0					1.0		

Cycle Length: 50.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	843	1273	0.39	0.66	4.2	A	4.2	A
Westbound								
TR	1166	1762	0.42	0.66	4.2	A	4.2	A
Northbound								
Southbound								
L	318	1787	0.46	0.18	19.4	B		
							19.6	B
R	285	1599	0.49	0.18	19.8	B		

Intersection Delay = 8.2 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst: Keith Malloy
Agency: The Shaw Group
Date: 4/6/2009
Period: PM Build 2011
Project ID: Route 395 N Ramps/Route 163
E/W St: Route 163

Inter.: 2
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 395 N Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	1	0	1
LGConfig		LT			TR					L		R
Volume	121	160			247	105				119		122
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol						0						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left				
Thru	A				Thru				
Right					Right				
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru				
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	33.1					8.9			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 50.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	873	1319	0.37	0.66	4.0	A	4.0	A
Westbound								
TR	1172	1770	0.35	0.66	3.9	A	3.9	A
Northbound								
Southbound								
L	318	1787	0.43	0.18	19.2	B		
							19.5	B
R	285	1599	0.49	0.18	19.8	B		

Intersection Delay = 8.3 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: AM Exist
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2009
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	194	14	116	3	14	6	74	280	3	7	359	120
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	23.7					28.3			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	551	1394	0.38	0.40	13.4	B		
TR	643	1629	0.22	0.40	12.2	B	12.9	B
Westbound								
LTR	682	1727	0.04	0.40	11.2	B	11.2	B
Northbound								
LT	745	1579	0.52	0.47	11.7	B	11.7	B
R	754	1599	0.00	0.47	8.4	A		
Southbound								
LTR	853	1809	0.62	0.47	13.2	B	13.2	B

Intersection Delay = 12.6 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: AM No Build 2011
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	198	14	118	3	14	6	74	286	3	7	366	122
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	23.7					28.3		
Yellow	3.0					3.0		
All Red	1.0					1.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	551	1394	0.39	0.40	13.4	B		
TR	643	1629	0.22	0.40	12.2	B	13.0	B
Westbound								
LTR	682	1726	0.04	0.40	11.2	B	11.2	B
Northbound								
LT	744	1578	0.53	0.47	11.8	B	11.8	B
R	754	1599	0.00	0.47	8.4	A		
Southbound								
LTR	853	1808	0.63	0.47	13.5	B	13.5	B

Intersection Delay = 12.8 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: AM During Construction
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	198	55	118	3	14	6	74	286	3	7	366	122
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	23.7					28.3		
Yellow	3.0					3.0		
All Red	1.0					1.0		

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	545	1380	0.39	0.40	13.5	B		
TR	661	1673	0.28	0.40	12.6	B	13.1	B
Westbound								
LTR	674	1706	0.04	0.40	11.2	B	11.2	B
Northbound								
LT	744	1578	0.53	0.47	11.8	B	11.8	B
R	754	1599	0.00	0.47	8.4	A		
Southbound								
LTR	853	1808	0.63	0.47	13.5	B	13.5	B

Intersection Delay = 12.8 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: AM Build 2011
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	198	20	118	3	20	6	74	286	3	7	366	122
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	23.7					28.3			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	547	1385	0.39	0.40	13.5	B		
TR	648	1640	0.23	0.40	12.3	B	13.0	B
Westbound								
LTR	690	1747	0.05	0.40	11.2	B	11.2	B
Northbound								
LT	744	1578	0.53	0.47	11.8	B	11.8	B
R	754	1599	0.00	0.47	8.4	A		
Southbound								
LTR	853	1808	0.63	0.47	13.5	B	13.5	B

Intersection Delay = 12.8 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: PM Exist
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2009
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	170	25	110	4	22	7	169	438	5	5	380	161
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	18.9					41.1			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 68.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	379	1364	0.51	0.28	21.8	C		
TR	454	1634	0.34	0.28	20.0+	C	21.0	C
Westbound								
LTR	434	1562	0.09	0.28	18.3	B	18.3	B
Northbound								
LT	795	1316	0.87	0.60	22.5	C	22.3	C
R	966	1599	0.01	0.60	5.3	A		
Southbound								
LTR	1086	1797	0.57	0.60	8.9	A	8.9	A

Intersection Delay = 17.1 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst: Keith Malloy
Agency: The Shaw Group
Date: 4/7/2009
Period: PM No Build 2011
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	173	25	112	4	22	7	172	446	5	5	386	164
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	18.9						41.1			
Yellow	3.0						3.0			
All Red	1.0						1.0			

Cycle Length: 68.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	379	1364	0.52	0.28	22.0	C		
TR	454	1634	0.34	0.28	20.0+	C	21.1	C
Westbound								
LTR	434	1561	0.09	0.28	18.3	B	18.3	B
Northbound								
LT	789	1306	0.89	0.60	25.7	C	25.6	C
R	966	1599	0.01	0.60	5.3	A		
Southbound								
LTR	1086	1797	0.58	0.60	9.0	A	9.0	A

Intersection Delay = 18.5 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: PM During Contruction
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2009
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	170	45	110	4	103	7	172	446	5	5	386	164
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru	A					Thru	A			
	Right	A					Right	A			
	Peds						Peds				
WB	Left	A				SB	Left	A			
	Thru	A					Thru	A			
	Right	A					Right	A			
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		18.9						41.1			
Yellow		3.0						3.0			
All Red		1.0						1.0			

Cycle Length: 68.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	347	1247	0.56	0.28	23.0	C		
TR	458	1648	0.38	0.28	20.4	C	21.7	C
Westbound								
LTR	447	1610	0.29	0.28	19.6	B	19.6	B
Northbound								
LT	789	1306	0.89	0.60	25.7	C	25.6	C
R	966	1599	0.01	0.60	5.3	A		
Southbound								
LTR	1086	1797	0.58	0.60	9.0	A	9.0	A

Intersection Delay = 18.7 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst:
Agency: The Shaw Group
Date: 4/7/2009
Period: PM Build 2011
Project ID: Route 163/Route 32 Intersection
E/W St: Route 163

Inter.: 3
Area Type: All other areas
Jurisd:
Year :
N/S St: Route 32

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	0	1	0	0	1	1	0	1	0
LGConfig	L	TR			LTR			LT	R		LTR	
Volume	173	31	112	4	28	7	172	446	5	5	386	164
Lane Width	12.0	12.0			12.0			12.0	12.0		12.0	
RTOR Vol			0			0			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	18.9					41.1			
Yellow	3.0					3.0			
All Red	1.0					1.0			

Cycle Length: 68.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	377	1356	0.52	0.28	22.1	C		
TR	457	1644	0.35	0.28	20.1	C	21.2	C
Westbound								
LTR	437	1574	0.10	0.28	18.4	B	18.4	B
Northbound								
LT	789	1306	0.89	0.60	25.7	C	25.6	C
R	966	1599	0.01	0.60	5.3	A		
Southbound								
LTR	1086	1797	0.58	0.60	9.0	A	9.0	A

Intersection Delay = 18.5 (sec/veh) Intersection LOS = B

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/8/2009
Analysis Time Period: AM Exist
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2009
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	18	13	9	8	7	15	12	4	7	7	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.92		0.92		0.92		0.92	
Flow Rate	33		24		33		14	
% Heavy Veh	10		33		19		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	33		24		33		14	
Left-Turn	0		9		16		7	
Right-Turn	14		7		4		0	
Prop. Left-Turns	0.0		0.4		0.5		0.5	
Prop. Right-Turns	0.4		0.3		0.1		0.0	
Prop. Heavy Vehicle	0.1		0.3		0.2		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	-0.1	0.5	0.3	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	33		24		33		14	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.03		0.02		0.03		0.01	
hd, final value	3.95		4.50		4.39		4.16	
x, final value	0.04		0.03		0.04		0.02	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	1.9		2.5		2.4		2.2	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	33		24		33		14	
Service Time	1.9		2.5		2.4		2.2	
Utilization, x	0.04		0.03		0.04		0.02	
Dep. headway, hd	3.95		4.50		4.39		4.16	
Capacity	283		274		283		264	
Delay	7.10		7.64		7.57		7.23	
LOS	A		A		A		A	
Approach:								
Delay	7.10		7.64		7.57		7.23	
LOS	A		A		A		A	
Intersection Delay	7.39		Intersection LOS		A			

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/8/2009
Analysis Time Period: AM No Build 2011
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	18	13	9	8	7	15	12	4	7	7	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.92		0.92		0.92		0.92	
Flow Rate	33		24		33		14	
% Heavy Veh	10		33		19		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	33		24		33		14	
Left-Turn	0		9		16		7	
Right-Turn	14		7		4		0	
Prop. Left-Turns	0.0		0.4		0.5		0.5	
Prop. Right-Turns	0.4		0.3		0.1		0.0	
Prop. Heavy Vehicle	0.1		0.3		0.2		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	-0.1	0.5	0.3	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	33		24		33		14	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.03		0.02		0.03		0.01	
hd, final value	3.95		4.50		4.39		4.16	
x, final value	0.04		0.03		0.04		0.02	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	1.9		2.5		2.4		2.2	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	33		24		33		14	
Service Time	1.9		2.5		2.4		2.2	
Utilization, x	0.04		0.03		0.04		0.02	
Dep. headway, hd	3.95		4.50		4.39		4.16	
Capacity	283		274		283		264	
Delay	7.10		7.64		7.57		7.23	
LOS	A		A		A		A	
Approach:								
Delay	7.10		7.64		7.57		7.23	
LOS	A		A		A		A	
Intersection Delay	7.39		Intersection LOS		A			

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/8/2009
Analysis Time Period: AM During Construction
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	18	54	9	8	7	15	12	4	7	7	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.92		0.92		0.92		0.92	
Flow Rate	77		24		33		14	
% Heavy Veh	6		33		19		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	77		24		33		14	
Left-Turn	0		9		16		7	
Right-Turn	58		7		4		0	
Prop. Left-Turns	0.0		0.4		0.5		0.5	
Prop. Right-Turns	0.8		0.3		0.1		0.0	
Prop. Heavy Vehicle	0.1		0.3		0.2		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	-0.3	0.5	0.3	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	77		24		33		14	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.07		0.02		0.03		0.01	
hd, final value	3.69		4.54		4.47		4.25	
x, final value	0.08		0.03		0.04		0.02	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	1.7		2.5		2.5		2.2	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	77		24		33		14	
Service Time	1.7		2.5		2.5		2.2	
Utilization, x	0.08		0.03		0.04		0.02	
Dep. headway, hd	3.69		4.54		4.47		4.25	
Capacity	327		274		283		264	
Delay	7.00		7.68		7.66		7.32	
LOS	A		A		A		A	
Approach:								
Delay	7.00		7.68		7.66		7.32	
LOS	A		A		A		A	
Intersection Delay	7.29		Intersection LOS		A			

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/8/2009
Analysis Time Period: AM Build 2011
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	18	19	9	8	7	21	12	4	7	7	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.92		0.92		0.92		0.92	
Flow Rate	39		24		39		14	
% Heavy Veh	16		33		24		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	39		24		39		14	
Left-Turn	0		9		22		7	
Right-Turn	20		7		4		0	
Prop. Left-Turns	0.0		0.4		0.6		0.5	
Prop. Right-Turns	0.5		0.3		0.1		0.0	
Prop. Heavy Vehicle	0.2		0.3		0.2		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	-0.0	0.5	0.5	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	39		24		39		14	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.03		0.02		0.03		0.01	
hd, final value	4.02		4.52		4.52		4.18	
x, final value	0.04		0.03		0.05		0.02	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.0		2.5		2.5		2.2	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	39		24		39		14	
Service Time	2.0		2.5		2.5		2.2	
Utilization, x	0.04		0.03		0.05		0.02	
Dep. headway, hd	4.02		4.52		4.52		4.18	
Capacity	289		274		289		264	
Delay	7.20		7.67		7.75		7.25	
LOS	A		A		A		A	
Approach:								
Delay	7.20		7.67		7.75		7.25	
LOS	A		A		A		A	
Intersection Delay 7.49			Intersection LOS A					

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/7/2009
Analysis Time Period: PM exist
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2009
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	16	9	16	16	14	18	14	17	10	15	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.70		0.70		0.70		0.70	
Flow Rate	34		64		69		35	
% Heavy Veh	20		11		4		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	34		64		69		35	
Left-Turn	0		22		25		14	
Right-Turn	12		20		24		0	
Prop. Left-Turns	0.0		0.3		0.4		0.4	
Prop. Right-Turns	0.4		0.3		0.3		0.0	
Prop. Heavy Vehicle	0.2		0.1		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	0.1	0.1	-0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	34		64		69		35	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.03		0.06		0.06		0.03	
hd, final value	4.32		4.23		4.09		4.27	
x, final value	0.04		0.08		0.08		0.04	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.3		2.2		2.1		2.3	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	34		64		69		35	
Service Time	2.3		2.2		2.1		2.3	
Utilization, x	0.04		0.08		0.08		0.04	
Dep. headway, hd	4.32		4.23		4.09		4.27	
Capacity	284		314		319		285	
Delay	7.51		7.58		7.44		7.46	
LOS	A		A		A		A	
Approach:								
Delay	7.51		7.58		7.44		7.46	
LOS	A		A		A		A	
Intersection Delay	7.50		Intersection LOS		A			

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/7/2009
Analysis Time Period: PM No Build 2011
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	16	9	16	16	14	18	14	17	10	15	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.70		0.70		0.70		0.70	
Flow Rate	34		64		69		35	
% Heavy Veh	20		11		4		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	34		64		69		35	
Left-Turn	0		22		25		14	
Right-Turn	12		20		24		0	
Prop. Left-Turns	0.0		0.3		0.4		0.4	
Prop. Right-Turns	0.4		0.3		0.3		0.0	
Prop. Heavy Vehicle	0.2		0.1		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	0.1	0.1	-0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	34		64		69		35	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.03		0.06		0.06		0.03	
hd, final value	4.32		4.23		4.09		4.27	
x, final value	0.04		0.08		0.08		0.04	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.3		2.2		2.1		2.3	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	34		64		69		35	
Service Time	2.3		2.2		2.1		2.3	
Utilization, x	0.04		0.08		0.08		0.04	
Dep. headway, hd	4.32		4.23		4.09		4.27	
Capacity	284		314		319		285	
Delay	7.51		7.58		7.44		7.46	
LOS	A		A		A		A	
Approach:								
Delay	7.51		7.58		7.44		7.46	
LOS	A		A		A		A	
Intersection Delay	7.50		Intersection LOS		A			

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/7/2009
Analysis Time Period: PM During Construction
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	16	29	16	16	14	99	14	17	10	15	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.70		0.70		0.70		0.70	
Flow Rate	63		64		185		35	
% Heavy Veh	13		11		3		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	63		64		185		35	
Left-Turn	0		22		141		14	
Right-Turn	41		20		24		0	
Prop. Left-Turns	0.0		0.3		0.8		0.4	
Prop. Right-Turns	0.7		0.3		0.1		0.0	
Prop. Heavy Vehicle	0.1		0.1		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj	-0.6	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7
hadj, computed	-0.2	0.1	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	63		64		185		35	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.06		0.06		0.16		0.03	
hd, final value	4.32		4.55		4.36		4.48	
x, final value	0.08		0.08		0.22		0.04	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.3		2.6		2.4		2.5	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	63		64		185		35	
Service Time	2.3		2.6		2.4		2.5	
Utilization, x	0.08		0.08		0.22		0.04	
Dep. headway, hd	4.32		4.55		4.36		4.48	
Capacity	313		314		435		285	
Delay	7.67		7.95		8.62		7.69	
LOS	A		A		A		A	
Approach:								
Delay	7.67		7.95		8.62		7.69	
LOS	A		A		A		A	
Intersection Delay	8.23		Intersection LOS		A			

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/7/2009
Analysis Time Period: PM Build 2011
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Depot Road
North/South Street: Pink Row/Lathrop Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	16	15	16	16	14	24	14	17	10	15	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.70		0.70		0.70		0.70	
Flow Rate	43		64		78		35	
% Heavy Veh	52		11		15		0	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	43		64		78		35	
Left-Turn	0		22		34		14	
Right-Turn	21		20		24		0	
Prop. Left-Turns	0.0		0.3		0.4		0.4	
Prop. Right-Turns	0.5		0.3		0.3		0.0	
Prop. Heavy Vehicle	0.5		0.1		0.1		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	

hRT-adj		-0.6		-0.6		-0.6		-0.6
hHV-adj		1.7		1.7		1.7		1.7
hadj, computed	0.6		0.1		0.2		0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	43		64		78		35	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.04		0.06		0.07		0.03	
hd, final value	4.82		4.28		4.35		4.32	
x, final value	0.06		0.08		0.09		0.04	
Move-up time, m		2.0		2.0		2.0		2.0
Service Time	2.8		2.3		2.4		2.3	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	43		64		78		35	
Service Time	2.8		2.3		2.4		2.3	
Utilization, x	0.06		0.08		0.09		0.04	
Dep. headway, hd	4.82		4.28		4.35		4.32	
Capacity	293		314		328		285	
Delay	8.12		7.63		7.80		7.51	
LOS	A		A		A		A	
Approach:								
Delay		8.12		7.63		7.80		7.51
LOS		A		A		A		A
Intersection Delay	7.77		Intersection LOS		A			

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM Exist
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2009
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		19	1	4	13	
Peak-Hour Factor, PHF		0.84	0.84	0.84	0.84	
Hourly Flow Rate, HFR		22	1	4	15	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	1		1			
Peak Hour Factor, PHF	0.84		0.84			
Hourly Flow Rate, HFR	1		1			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		4	1		1			
C(m) (vph)		1605	968		1061			
v/c		0.00	0.00		0.00			
95% queue length		0.01	0.00		0.00			
Control Delay		7.2	8.7		8.4			
LOS		A	A		A			
Approach Delay				8.6				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM No Build 2011
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		19	1	4	13	
Peak-Hour Factor, PHF		0.84	0.84	0.84	0.84	
Hourly Flow Rate, HFR		22	1	4	15	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	1		1			
Peak Hour Factor, PHF	0.84		0.84			
Hourly Flow Rate, HFR	1		1			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		4	1		1			
C(m) (vph)		1605	968		1061			
v/c		0.00	0.00		0.00			
95% queue length		0.01	0.00		0.00			
Control Delay		7.2	8.7		8.4			
LOS		A	A		A			
Approach Delay				8.6				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM During Construction
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		19	1	45	13	
Peak-Hour Factor, PHF		0.84	0.84	0.84	0.84	
Hourly Flow Rate, HFR		22	1	53	15	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	1		1			
Peak Hour Factor, PHF	0.84		0.84			
Hourly Flow Rate, HFR	1		1			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		53	1		1			
C(m) (vph)		1592	826		1061			
v/c		0.03	0.00		0.00			
95% queue length		0.10	0.00		0.00			
Control Delay		7.3	9.4		8.4			
LOS		A	A		A			
Approach Delay			8.9					
Approach LOS			A					

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: AM Build 2011
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		19	0	10	13	
Peak-Hour Factor, PHF		0.84	0.84	0.84	0.84	
Hourly Flow Rate, HFR		22	0	11	15	
Percent Heavy Vehicles		--	--	60	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1 0		0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0		6			
Peak Hour Factor, PHF	0.84		0.84			
Hourly Flow Rate, HFR	0		7			
Percent Heavy Vehicles	0		100			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		11	0		7			
C(m) (vph)		1287	945		831			
v/c		0.01	0.00		0.01			
95% queue length		0.03	0.00		0.03			
Control Delay		7.8	8.8		9.4			
LOS		A	A		A			
Approach Delay				9.4				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: PM Exist
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2009
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		21	1	8	24	
Peak-Hour Factor, PHF		0.70	0.70	0.70	0.70	
Hourly Flow Rate, HFR		30	1	11	34	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	8		16			
Peak Hour Factor, PHF	0.70		0.70			
Hourly Flow Rate, HFR	11		22			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		11	11		22			
C(m) (vph)		1595	914		1050			
v/c		0.01	0.01		0.02			
95% queue length		0.02	0.04		0.06			
Control Delay		7.3	9.0		8.5			
LOS		A	A		A			
Approach Delay				8.7				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: Keith Malloy
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: PM No Build 2011
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		21	1	8	24	
Peak-Hour Factor, PHF		0.70	0.70	0.70	0.70	
Hourly Flow Rate, HFR		30	1	11	34	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	8		16			
Peak Hour Factor, PHF	0.70		0.70			
Hourly Flow Rate, HFR	11		22			
Percent Heavy Vehicles	0		0			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		11	11		22			
C(m) (vph)		1595	914		1050			
v/c		0.01	0.01		0.02			
95% queue length		0.02	0.04		0.06			
Control Delay		7.3	9.0		8.5			
LOS		A	A		A			
Approach Delay			8.7					
Approach LOS			A					

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: PM During Construction
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		21	1	28	24	
Peak-Hour Factor, PHF		0.70	0.70	0.70	0.70	
Hourly Flow Rate, HFR		30	1	40	34	
Percent Heavy Vehicles		--	--	0	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	8		97			
Peak Hour Factor, PHF	0.70		0.70			
Hourly Flow Rate, HFR	11		138			
Percent Heavy Vehicles	0		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		40	11		138			
C(m) (vph)		1595	832		1044			
v/c		0.03	0.01		0.13			
95% queue length		0.08	0.04		0.46			
Control Delay		7.3	9.4		9.0			
LOS		A	A		A			
Approach Delay				9.0				
Approach LOS				A				

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: The Shaw Group
Date Performed: 4/22/2009
Analysis Time Period: PM Build 2011
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year:
Project ID:
East/West Street: Site Entrance
North/South Street: Lathrop Rd
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		21	1	14	24	
Peak-Hour Factor, PHF		0.70	0.70	0.70	0.70	
Hourly Flow Rate, HFR		30	1	20	34	
Percent Heavy Vehicles		--	--	43	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1 0		0 1		
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	8		22			
Peak Hour Factor, PHF	0.70		0.70			
Hourly Flow Rate, HFR	11		31			
Percent Heavy Vehicles	0		30			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	1		1			
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT	L		R			
v (vph)		20	11		31			
C(m) (vph)		1353	886		970			
v/c		0.01	0.01		0.03			
95% queue length		0.05	0.04		0.10			
Control Delay		7.7	9.1		8.8			
LOS		A	A		A			
Approach Delay			8.9					
Approach LOS			A					

APPENDIX C
Photographs

Site Name: Uncasville, CT

Site Location: **Route 163**

Photographer
Peter Rancourt

Date
4/8/09

Direction
SB

Comments
Side street is Hidden Acres Road

Good Pavement Condition

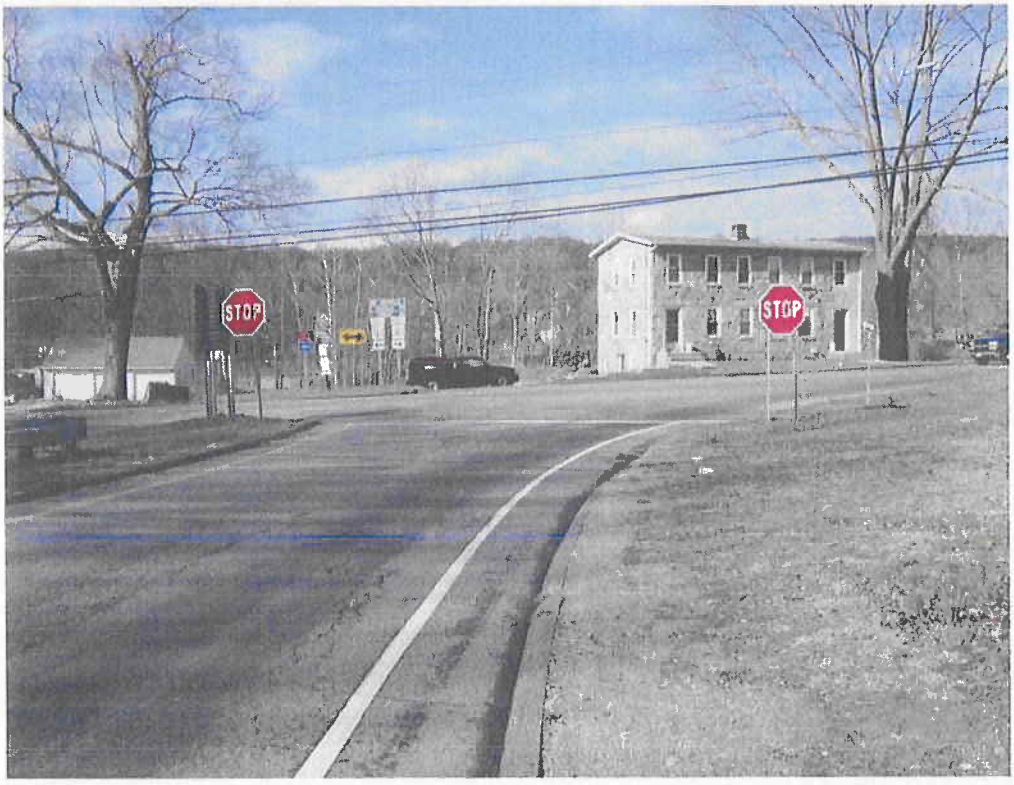
Photographer
Peter Rancourt

Date
4/8/09

Direction
SB

Comments
I – 395 S Exit Ramp

Good Pavement Condition



Site Name: Uncasville, CT

Site Location: Route 163 and I-395 NB Ramps

Photographer Peter Rancourt

Date 4/8/09

Direction NB

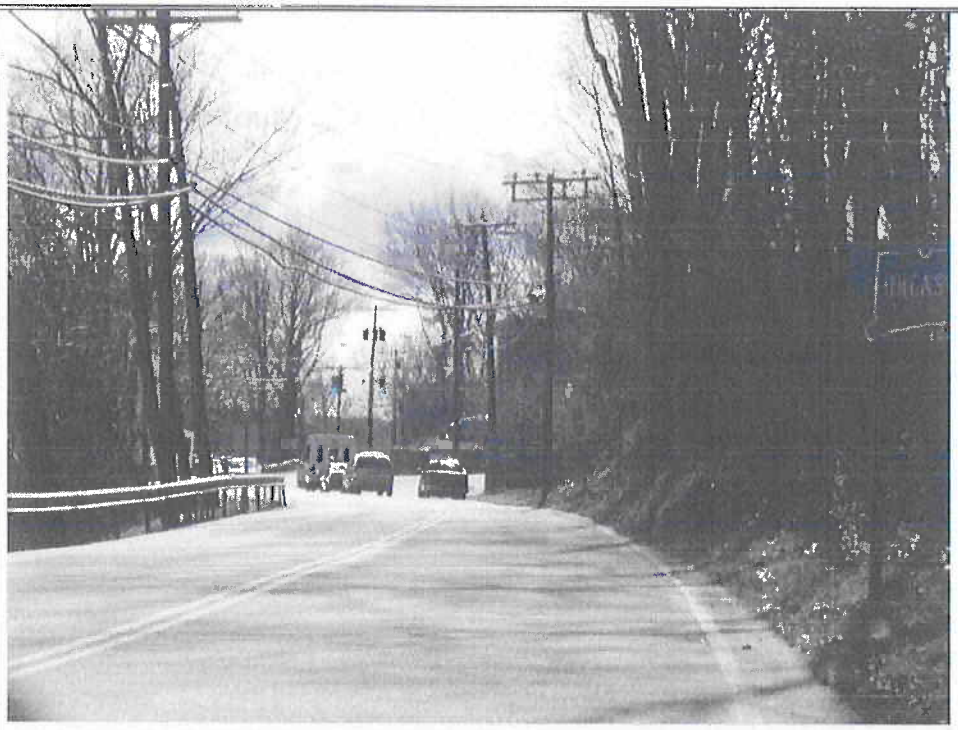
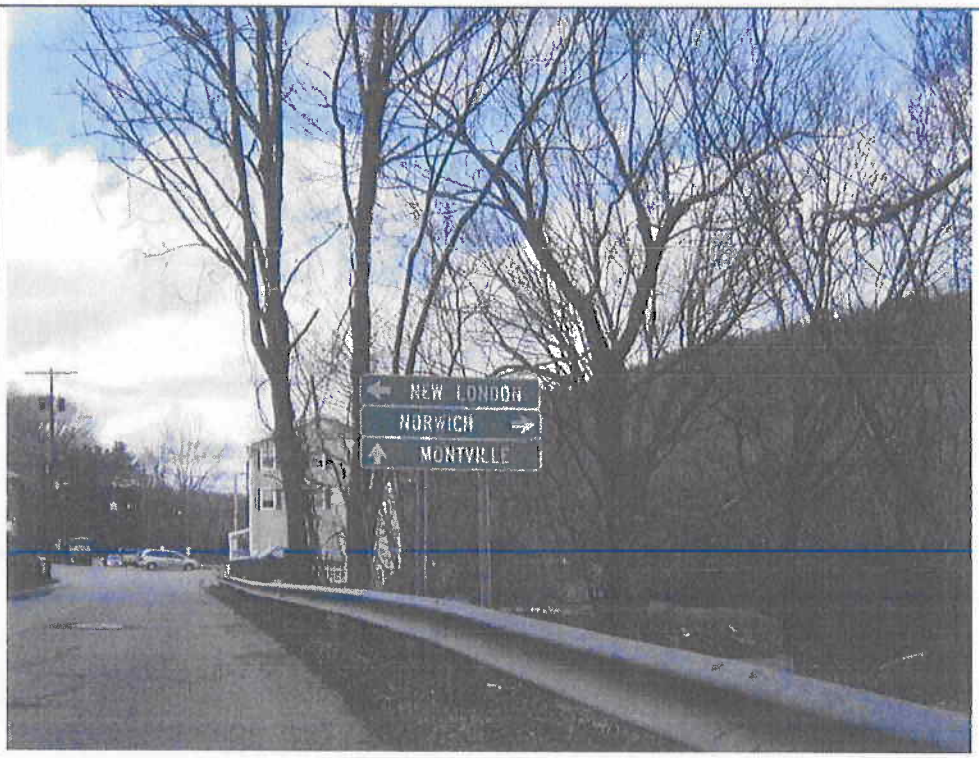
Comments Good pavement condition

Photographer Peter Rancourt

Date 4/8/09

Direction NB Ramps

Comments Good pavement condition

Site Name: Uncasville, CT	Site Location: **Route 163**
Photographer Peter Rancourt **Date** 4/8/09 **Direction** SB **Comments** Approaching Route 32	
Photographer Peter Rancourt **Date** 4/8/09 **Direction** NB **Comments** Approaching Route 32	

Site Name: Uncasville, CT

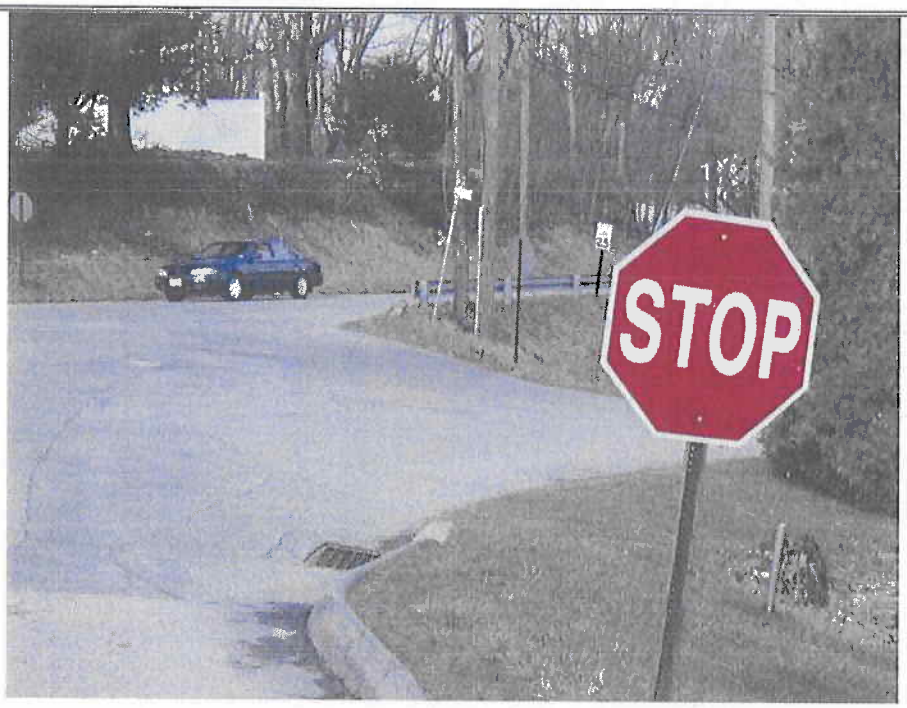
Site Location: **Depot Road**

Photographer
Peter Rancourt

Date
4/8/09

Direction
SB

Comments
Pink Row and Lathrop Rd Intersection

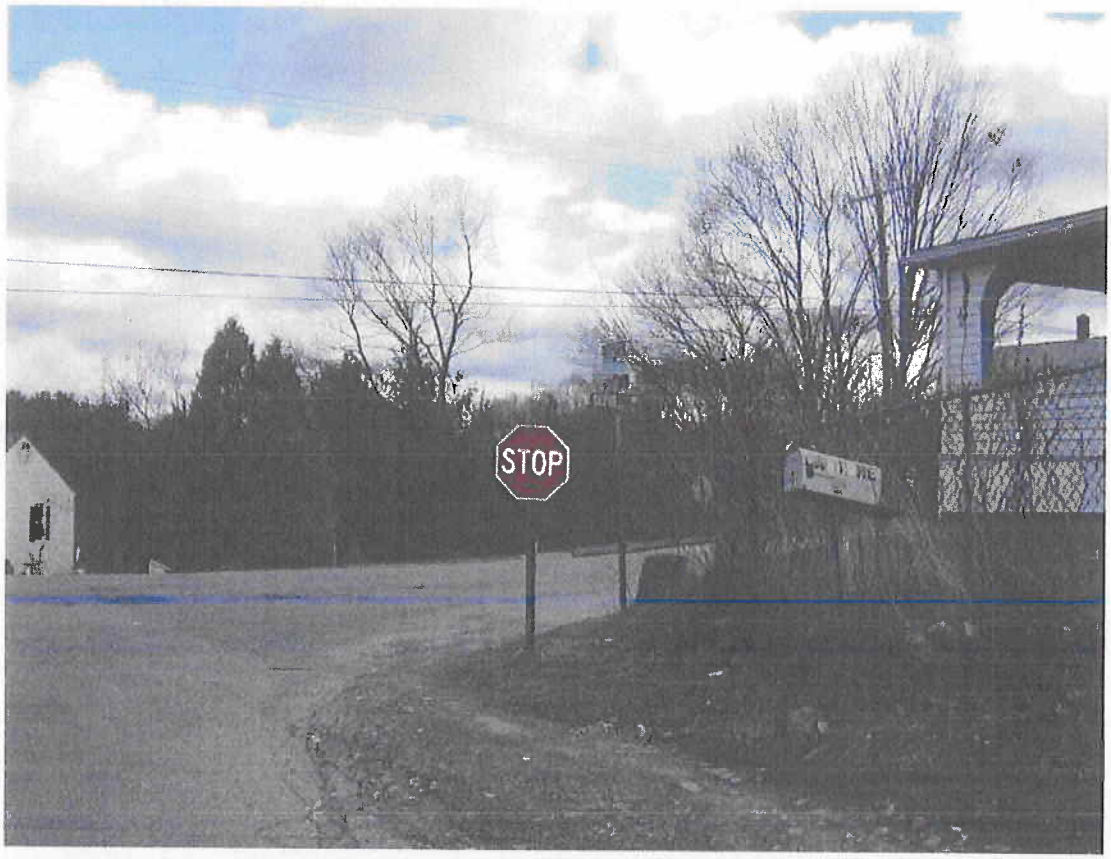


Photographer
Peter Rancourt

Date
4/8/09

Direction
SB

Comments
On Lathrop Rd, Depot Rd on the right



Site Name: Uncasville, CT	Site Location: **Lathrop Rd**
Photographer Peter Rancourt **Date** 4/8/09 **Direction** NB **Comments** Side Street is Maple Ave Ext NRG site can be seen on left	
Photographer Peter Rancourt **Date** 4/8/09 **Direction** SB **Comments** No thru traffic residents only sign	

Site Name:
Uncasville, CT

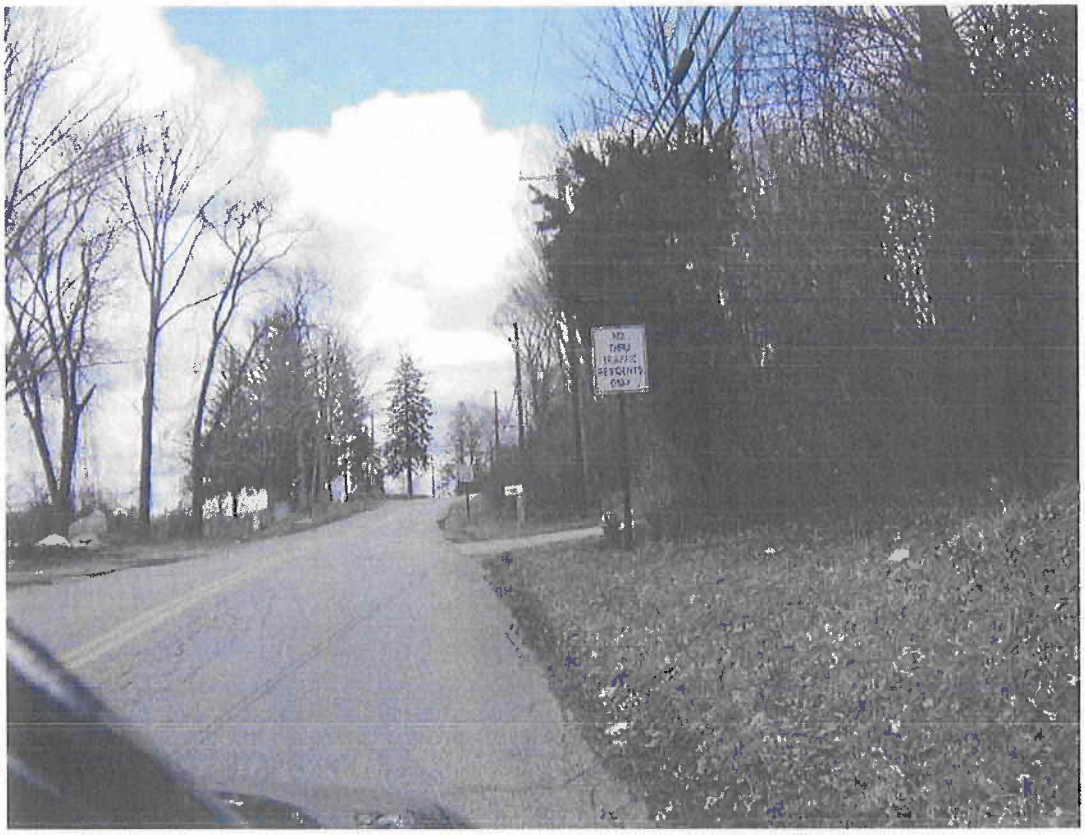
Site Location: Lathrop RD

Photographer
Peter Rancourt

Date
4/8/09

Direction
NB

Comments
No thru traffic residents only sign

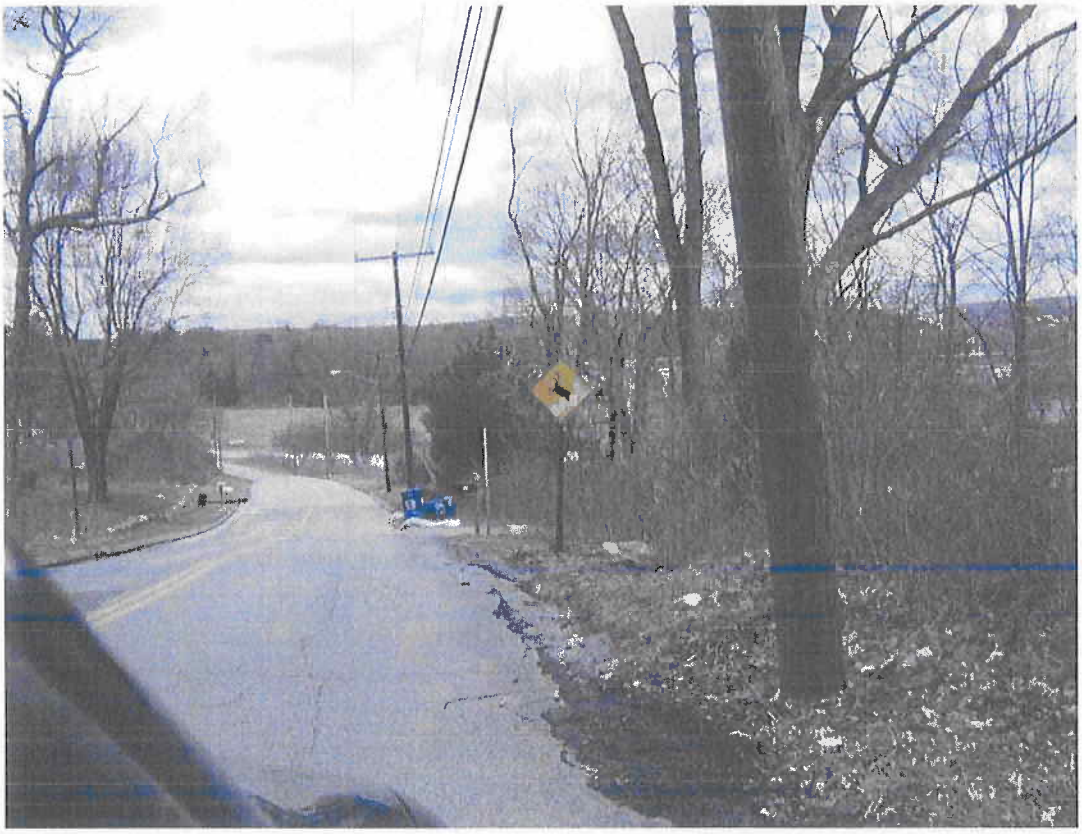


Photographer
Peter Rancourt

Date
4/8/09

Direction
NB

Comments
Approaching Site on right



Site Name: Uncasville, CT

Site Location: Lathrop Rd

Photographer
Peter Rancourt

Date
4/8/09

Direction
NB

Comments
Site Entrance

Site Name: Uncasville, CT	Site Location: Route 32
Photographer Peter Rancourt **Date** 4/8/09 **Direction** NB **Comments**	
Photographer Peter Rancourt **Date** 4/8/09 **Direction** NB **Comments** Approaching Route 163	

Site Name:
Uncasville, CT

Site Location: Route 32

Photographer
Peter
Rancourt

Date
4/8/09

Direction
SB

Comments

Site Name:
Uncasville, CT

Site Location: Powerhouse Rd

Photographer
Peter
Rancourt

Date
4/8/09

Direction
EB

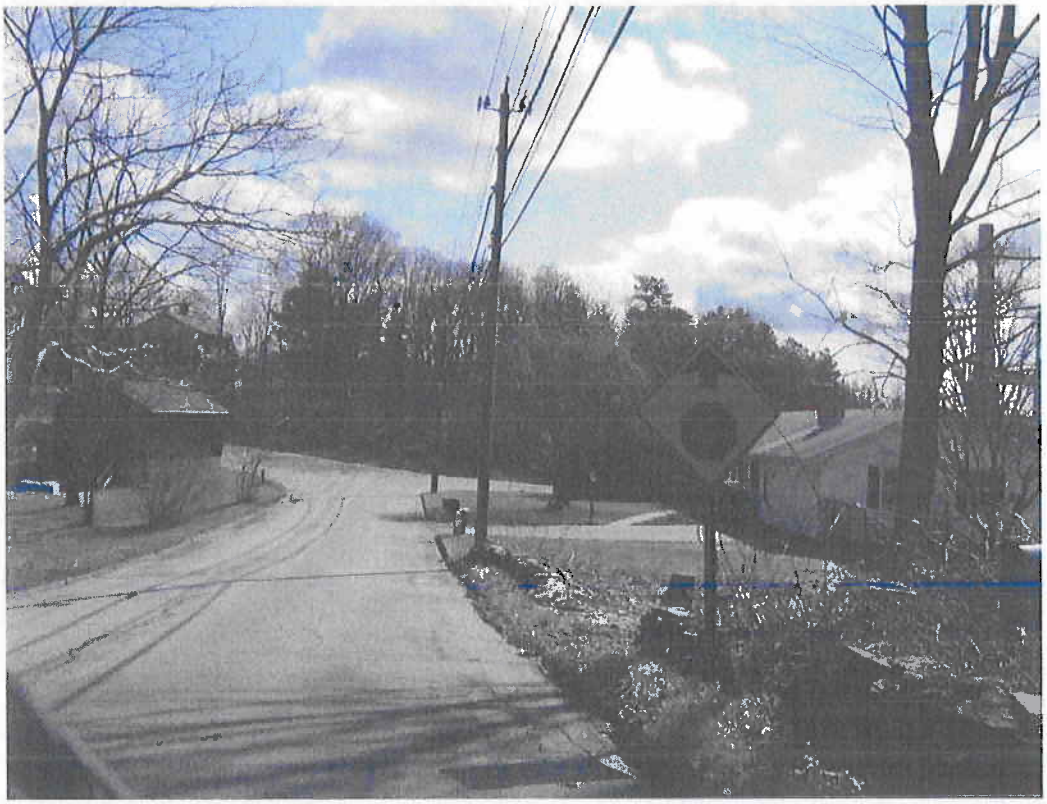
Comments

Photographer
Peter
Rancourt

Date
4/8/09

Direction
EB

Comments



APPENDIX D
CDOT Accident Experience Report

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone:

April 22, 2009

RESPONSE TO DATA REQUEST

TO: Mr. Jim Barrack, P.E.
Lead Civil Engineer
Shaw Environmental & Infrastructure Group
100 Technology Center Drive
Stoughton MA 02072

Re: Response to your request of April 21, 2009.

Enclosed is the Accident Data that you requested.

COMMENTS:

Direct questions to: Craig Mandell

Telephone number: (860) 594-2097

for Sebastian P. Puglisi
Trans. Supervising Planner
Systems Information
Bureau of Policy & Planning

Shaw Environmental & Infrastructure, Inc.
100 Technology Center Drive
Stoughton, MA 02072
617-589-2761
Fax: 617-589-2160

Fax

To:	**Mr. Angelo Asaro,** **Transportation Asst Planning Director**	Facsimile No. **860-594-2056**	
Location:	ConnDOT Division of Systems Information PO Box 317546 Newington CT 06131	# of Sheets: 1 of 2	
From:	James Barrack, P.E.	Telephone No. (617) 589-2761	Date:April 21, 2009

RE: **Request for Accident Experience Report.**

Mr. Asaro:

We are requesting an "Accident Experience Report" for the latest 3-year time period, for the following six (6) intersections located in Montville, CT.

1. I-395 Exit 79 SB off ramp at Rte 163 (unsig)
2. I-395 Exit 79 NB off ramp at Rte 163 (signal)
3. Rte 163 at Rte 32 at Depot Rd (signal)
4. Lathrop Rd at Depot Rd at Pink Row (unsig, non-State owned)
5. Lathrop Rd at NRG Plant Entrance (unsig, non-State owned)
6. Power House Rd at Rte 32 (unsig)

A map is attached on page 2.

Also, can you provide me with the average accident rates for signalized and unsignalized intersections (Statewide rates are fine).

This will be supporting data for a "Traffic Impact Study" for the NRG Power plant proposed conversion to wood chip fuel source. The trip generation is 6 new inbound/ 6 new outbound vehicle trips per peak hour.

Thank you. The information can be faxed, emailed, or mailed directly to me

Jim Barrack, P.E.
Lead Civil Engineer
Shaw Environmental & Infrastructure Group
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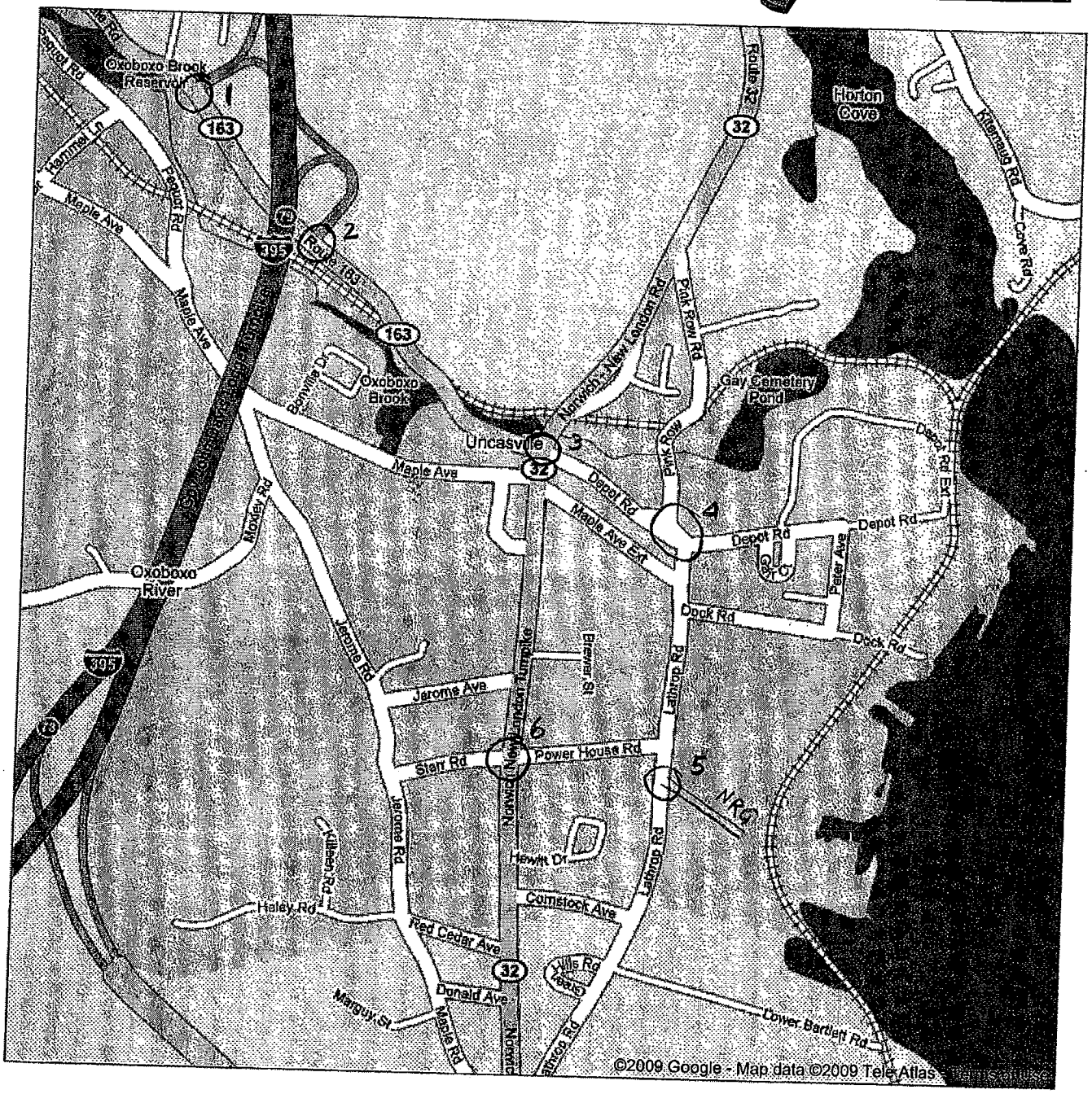
Google Maps



TRANSMISSION VERIFICATION REPORT

TIME : 04/21/2009 14:00

DATE,TIME	04/21 13:57
FAX NO./NAME	918605942056
DURATION	00:02:11
PAGE(S)	02
RESULT	OK
MODE	STANDARD ECM

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Division of Systems Information

Standard Accident Experience Abbreviations

Table Title - Special Features (RDWY. FACT.)

Abbreviation	Definition
PENTRTD M B	Median Barrier Penetration
CNST ACT,DEV	Construction Activity or Device
AT PVT DRIVE	At a Private Drive
AT COMM DRVE	At a Commercial Drive
OPN MED DVDR	At an Opening in Median Divider
AT RR XING	At a Railroad Crossing

Table Title - Light Condition (LIGHT COND)

Abbreviation	Definition
DAYLT	Daylight
DARK/WO	Darkness, No Highway Illumination
DARK/W	Darkness, With Highway Illumination

Table Title - Road Surface Condition (SURF COND)

Abbreviation	Definition
SAND	Loose Sand
UNKN	Unknown

Table Title – Weather Condition (WEATH)

Abbreviation	Definition
UNKN	Unknown

Table Title - Type of Collision (COLLISION TYPE)

Abbreviation	Definition
ANGLE	Angle (involving no turns)
FIXED OBJ	Fixed Object
MOVING OBJ	Moving Object
SIDESWP-SM	Sideswipe (same direction)
SIDESWP-OP	Sideswipe (opposite direction)
TURN-SAME	Turning Movement (same direction)
HD-ON TRN	Turning Movement (opposite direction)
TURN-INTS	Turning Movement (intersecting paths)
NON-COLL	Miscellaneous - Non-Collision

Table Title - Pedestrian Maneuver

Abbreviation	Definition
EMERG PERS (NOT REL TO MTR VEH ACC)	Emergency Personnel (not related to a motor vehicle accident)

Table Title - Injury Severity (INJURIES)

Abbreviation	Definition
K	Fatal Injury
A	Incapacitating Injury (i.e., severe lacerations, broken or distorted limbs, skull or chest injuries, abdominal injuries, unconsciousness at or when taken from the accident scene, unable to leave the accident scene without assistance)
B	Nonincapacitating Evident Injury (i.e., lump on head, abrasions, bruises, minor lacerations)
C	Possible Injury (i.e., momentary unconsciousness, claim of injuries not evident, limping, complaint of pain, nausea, hysteria)

Table Title - Roadway Type (RAMP TYPE)

Abbreviation	Definition
ON	On-Ramp
OFF	Off-Ramp
SERV	Service Area or Rest Area
CON	Connector
CDRD	Collector-Distributor Roadway
HOV	High-Occupancy Vehicle Lane
TRWT	Truck Weighing Station

Table Title - Contributing Factors

Abbreviation	Definition
DRVR ENTERED DIVD HWY IN WRONG DIRECTION	Driver entered a divided highway in wrong direction
DRVR UNABLE TO COPE W/COND, DRVR LOST CONT	Driver unable to cope with conditions, driver lost control
VEH TURNING DISPLAYING WRONG DIR SIGNAL	Vehicle turning displaying wrong directional signal

Table Title - Vehicle Direction

Abbreviation	Definition
NB	Northbound
SB	Southbound
EB	Eastbound
WB	Westbound
UK	Unknown

Table Title - Object Location

Abbreviation	Definition
OFF RD AHEAD	Off road and shoulder ahead
SHLDR RIGHT	On shoulder - near side (right)
SHLDR LEFT	On shoulder - far side (left)
OFF RD RIGHT	Off road & shoulder - near side (right)
OFF RD LEFT	Off road & shoulder - far side (left)

Table Title - Vehicle Type

Abbreviation	Definition
COMM BUS	Commercial Bus
SCHL BUS	School Bus
TRUCK ST	Truck (single unit-single tires)
TRUCK DT	Truck (single unit-dual tires)
MTRCYCLE	Motorcycle
EMRGNCY	Emergency Vehicle
TR TRAIL	Tractor-trailer (1 trailer)
CNSTRTN	Construction or farm equipment
SNOWMOBL	Snowmobile, Go-Kart, ATV's, etc.
NON CONT	Non-contact vehicle
TANDEM	Tractor-trailer (2 trailers)
VAN	Passenger Van
AUTO PAS	Passenger Car
TRK-COMB	Truck-trailer combination (not tractor)
CAR-COMB	Car-trailer combination
VEHICLE	Unknown vehicle
PDSTRIAN	Pedestrian

Table Title - Vehicle Maneuver

Abbreviation	Definition
VEH CHANGING FROM ENT. RAMP TO LEFT LANE	Vehicle changing from entrance ramp to left lane
VEH MANEUV TO EXIT FR PRKNG SP(NOT ANGLE)	Vehicle maneuvering to exit from parking space (other than angle parking)

Table Title - Object Involved

Abbreviation	Definition
CONST BARR	Construction Barricade or Barrels
CATCH BASN	Catch basin or manhole cover
CLVRT HEDR	Culvert Endwall (header)
FRGN OBJ	Foreign object on pavement
ILLUM POLE	Illumination Pole
UTLTY POLE	Utility Pole
BRDGE RAIL	Bridge parapet wall or rail (on bridge)
HGHWY SIGN	Highway Sign
OH SGN SPT	Overhead sign support
U.P.CEILING	Underpass Ceiling
VEH OFF RD	Vehicle (off road and shoulder)
R.R.APURTN	Railroad appurtenance or tracks
IMPCT DEVC	Impact Attenuator
CHANNELIZTN	Channelization
FIRE HYD	Fire Hydrant
JERSEY BARR.	New Jersey Barrier
TR-CNTRL DEV	Traffic Control Device

2004 - 2006

TABLE III

GROUP NAMES

1. Identification
2. Total Number of Sections

4. Number of Accidents (Sections)
5. Rate - Sections - Accidents Per Million Vehicle Miles
6. Rate - Sections - Accidents Per Mile
7. Required Minimum - Accidents Per Mile
8. Total Number of Spots

10. Number of Accidents (Spots)
11. Rate - Spots - Accidents Per Million Vehicles Entering
12. Rate - Spots - Accidents Per Spot
13. Required Minimum - Accident Per Spot

COMPARITIVE ACCIDENT STATISTICS BY ROADWAY GROUP AND INTERSECTION TYPES
DESCRIPTION OF ROW HEADING ABBREVIATIONS FOR TABLE III - PAGE 1

RNOR	= R NORMAL STREETS	W/O INTERSECTION
UNOR	= U NORMAL STREETS	W/O INTERSECTION
RNORS	= R NORMAL STREETS	AT CT HWY
UNORS	= U NORMAL STREETS	AT CT HWY
RNORT	= R NORMAL STREETS	AT TOWN RD
UNORT	= U NORMAL STREETS	AT TOWN RD
RNORTS	= R NORMAL STREETS	AT TOWN RD WITH SIGNAL
UNORTS	= U NORMAL STREETS	AT TOWN RD WITH SIGNAL
R4UN	= R 4 LANE UNDIVIDED	W/O INTERSECTION
U4UN	= U 4 LANE UNDIVIDED	W/O INTERSECTION
R4UNS	= R 4 LANE UNDIVIDED	AT CT HWY
U4UNS	= U 4 LANE UNDIVIDED	AT CT HWY
R4UNT	= R 4 LANE UNDIVIDED	AT TOWN RD
U4UNT	= U 4 LANE UNDIVIDED	AT TOWN RD
R4UNTS	= R 4 LANE UNDIVIDED	AT TOWN RD WITH SIGNAL
U4UNTS	= U 4 LANE UNDIVIDED	AT TOWN RD WITH SIGNAL
R4DU	= R 4 LANE DIVIDED UNLIMITED	W/O INTERSECTION
U4DU	= U 4 LANE DIVIDED UNLIMITED	W/O INTERSECTION
R4DUS	= R 4 LANE DIVIDED UNLIMITED	AT CT HWY
U4DUS	= U 4 LANE DIVIDED UNLIMITED	AT CT HWY
R4DUT	= R 4 LANE DIVIDED UNLIMITED	AT TOWN RD
U4DUT	= U 4 LANE DIVIDED UNLIMITED	AT TOWN RD
R4DUTS	= R 4 LANE DIVIDED UNLIMITED	AT TOWN RD WITH SIGNAL
U4DUTS	= U 4 LANE DIVIDED UNLIMITED	AT TOWN RD WITH SIGNAL
RFRT	= R FRONTAGE OR SERVICE	W/O INTERSECTION
UFRT	= U FRONTAGE OR SERVICE	W/O INTERSECTION
RFRTS	= R FRONTAGE OR SERVICE	AT CT HWY
UFRTS	= U FRONTAGE OR SERVICE	AT CT HWY
RFRTT	= R FRONTAGE OR SERVICE	AT TOWN RD
UFRTT	= U FRONTAGE OR SERVICE	AT TOWN RD
RFRTTS	= R FRONTAGE OR SERVICE	AT TOWN RD WITH SIGNAL
UFRTTS	= U FRONTAGE OR SERVICE	AT TOWN RD WITH SIGNAL
RCIR	= R TRAFFIC CIRCLE	W/O INTERSECTION
UCIR	= U TRAFFIC CIRCLE	W/O INTERSECTION
RCIRS	= R TRAFFIC CIRCLE	AT CT HWY
UCIRS	= U TRAFFIC CIRCLE	AT CY HWY
RCIRT	= R TRAFFIC CIRCLE	AT TOWN RD
UCIRT	= U TRAFFIC CIRCLE	AT TOWN RD
RCIRTS	= R TRAFFIC CIRCLE	AT TOWN RD WITH SIGNAL
UCIRTS	= U TRAFFIC CIRCLE	AT TOWN RD WITH SIGNAL
REXPB	= R EXPRESSWAY	BETWEEN INTERCHANGES
UEXPB	= U EXPRESSWAY	BETWEEN INTERCHANGES
REXPI	= R EXPRESSWAY	AT INTERCHANGE
UEXPI	= U EXPRESSWAY	AT INTERCHANGE
RRMP	= R RAMPS	BETWEEN INTERSECTIONS
URMP	= U RAMPS	BETWEEN INTERSECTIONS
RRMPS	= R RAMPS	AT CT HWY
URMPS	= U RAMPS	

COMPARITIVE ACCIDENT STATISTICS BY ROADWAY GROUP AND INTERSECTION TYPES
DESCRIPTION OF ROW HEADING ABBREVIATIONS FOR TABLE III - PAGE 2

RRMPT	= R RAMPS	AT TOWN RD
URMPT	= U RAMPS	AT TOWN RD
RRMPTS	= R RAMPS	AT TOWN RD WITH SIGNAL
URMPTS	= U RAMPS	AT TOWN RD WITH SIGNAL
RVAR	= R VARIOUS RDS	W/O INTERSECTION
UVAR	= U VARIOUS RDS	W/O INTERSECTION
RVARS	= R VARIOUS RDS	AT CT HWY
UVARS	= U VARIOUS RDS	AT CT HWY
RVART	= R VARIOUS RDS	AT TOWN RD
UVART	= U VARIOUS RDS	AT TOWN RD
RVARTS	= R VARIOUS RDS	AT TOWN RD WITH SIGNAL
UVARTS	= U VARIOUS RDS	AT TOWN RD WITH SIGNAL
RTUR	= R TURNING ROADWAY	W/O INTERSECTION
UTUR	= U TURNING ROADWAY	W/O INTERSECTION
RTURS	= R TURNING ROADWAY	AT CT HWY
UTURS	= U TURNING ROADWAY	AT CT HWY
RTURT	= R TURNING ROADWAY	AT TOWN RD
UTURT	= U TURNING ROADWAY	AT TOWN RD
RTURTS	= R TURNING ROADWAY	AT TOWN RD WITH SIGNAL
UTURTS	= U TURNING ROADWAY	AT TOWN RD WITH SIGNAL

R = RURAL
U = URBAN

TABLE 3

COMPARATIVE ACCIDENT STATISTICS BY ROADWAY GROUP AND INTERSECTION TYPES

	SECTIONS					SPOTS				
IDENT	TOTAL NUMBER	NUMBER ACCIDENTS	ACC/ MVM	ACC/ MI	REQ MIN ACC/ MI	TOTAL NUMBER	NUMBER ACCIDENTS	ACC/ MV	ACC/ SPOT	REQ MIN ACC/ SPOT
RNOR	2353	8279	1.429	6.9	.0	817	493	.102	.6	.0
UNOR	4252	27710	2.263	23.0	.0	5044	10931	.181	2.2	.0
RNORS	0	0	.000	.0	.0	586	1361	.499	2.3	.0
UNORS	0	0	.000	.0	.0	1374	10074	.710	7.3	.0
RNORT	0	0	.000	.0	.0	2565	2465	.175	1.0	.0
UNORT	0	0	.000	.0	.0	6834	15703	.217	2.3	.0
RNORTS	0	0	.000	.0	.0	54	283	.305	5.2	.0
UNORTS	0	0	.000	.0	.0	1086	12694	.552	11.7	.0
R4UN	3	16	1.872	31.0	.0	4	30	.536	7.5	.0
U4UN	429	7570	4.031	88.5	.0	961	5592	.271	5.8	.0
R4UNS	0	0	.000	.0	.0	4	31	1.044	7.7	.0
U4UNS	0	0	.000	.0	.0	303	4394	.771	14.5	.0
R4UNT	0	0	.000	.0	.0	3	4	.080	1.3	.0
U4UNT	0	0	.000	.0	.0	613	3011	.235	4.9	.0
R4UNTS	0	0	.000	.0	.0	1	5	.178	5.0	.0
U4UNTS	0	0	.000	.0	.0	489	8268	.559	16.9	.0
R4DU	8	24	1.020	10.9	.0	16	41	.213	2.6	.0
U4DU	192	1907	1.679	44.5	.0	488	1388	.130	2.8	.0
R4DUS	0	0	.000	.0	.0	17	73	.414	4.3	.0
U4DUS	0	0	.000	.0	.0	232	2681	.499	11.6	.0
R4DUT	0	0	.000	.0	.0	7	48	.515	6.9	.0
U4DUT	0	0	.000	.0	.0	269	1401	.241	5.2	.0
R4DUTS	0	0	.000	.0	.0	0	0	.000	.0	.0
U4DUTS	0	0	.000	.0	.0	165	2974	.570	18.0	.0
RFRT	0	0	.000	.0	.0	0	0	.000	.0	.0
UFRT	0	0	.000	.0	.0	0	0	.000	.0	.0
RFRTS	0	0	.000	.0	.0	0	0	.000	.0	.0
UFRTS	0	0	.000	.0	.0	0	0	.000	.0	.0
RFRTT	0	0	.000	.0	.0	0	0	.000	.0	.0
UFRTT	0	0	.000	.0	.0	0	0	.000	.0	.0
RFRTTS	0	0	.000	.0	.0	0	0	.000	.0	.0
UFRTTS	0	0	.000	.0	.0	0	0	.000	.0	.0
RCIR	0	0	.000	.0	.0	5	33	1.012	6.6	.0
UCIR	3	42	6.315	89.4	.0	7	55	.815	7.9	.0

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sugg list of surveill. site

TABLE 3

COMPARATIVE ACCIDENT STATISTICS BY ROADWAY GROUP AND INTERSECTION TYPES

	SECTIONS					SPOTS				
IDENT	TOTAL NUMBER	NUMBER ACCIDENTS	ACC/ MVM	ACC/ MI	REQ MIN ACC/ MI	TOTAL NUMBER	NUMBER ACCIDENTS	ACC/ MV	ACC/ SPOT	REQ MIN ACC/ SPOT
RCIRS	0	0	.000	.0	.0	0	0	.000	.0	.0
UCIRS	0	0	.000	.0	.0	0	0	.000	.0	.0
RCIRT	0	0	.000	0	.0	0	0	.000	.0	.0
UCIRT	0	0	.000	.0	.0	0	0	.000	.0	.0
RCIRTS	0	0	.000	.0	.0	0	0	.000	.0	.0
UCIRTS	0	0	.000	.0	.0	0	0	.000	.0	.0
REXPB	34	1281	.595	20.9	.0	0	0	.000	.0	.0
UEXPB	281	13012	.705	50.7	.0	17	100	.071	5.9	.0
REXPI	35	1380	1.496	57.1	.0	1	0	.000	.0	.0
UEXPI	418	47993	2.232	170.3	.0	7	26	.098	3.7	.0
RRMP	0	0	.000	.0	.0	0	0	.000	.0	.0
URMP	0	0	.000	.0	.0	0	0	.000	.0	.0
RRMPS	0	0	.000	.0	.0	0	0	.000	.0	.0
URMPS	0	0	.000	.0	.0	0	0	.000	.0	.0
RRMPT	0	0	.000	.0	.0	0	0	.000	.0	.0
URMPT	0	0	.000	.0	.0	0	0	.000	.0	.0
RRMPTS	0	0	.000	.0	.0	0	0	.000	.0	.0
URMPTS	0	0	.000	.0	.0	0	0	.000	.0	.0
RVAR	7	29	1.726	12.0	.0	0	0	.000	.0	.0
UVAR	60	591	3.485	44.0	.0	28	14	.065	.5	.0
RVARS	0	0	.000	0	.0	163	376	.126	2.3	.0
UVARS	7	275	3.087	65.9	.0	53	173	.529	3.3	.0
RVART	0	0	.000	.0	.0	257	1981	.654	7.7	.0
UVART	0	0	.000	.0	.0	3	2	.138	.7	.0
RVARTS	0	0	.000	.0	.0	35	185	.341	5.3	.0
UVARTS	0	0	.000	0	.0	0	0	.000	.0	.0
RTUR	0	0	.000	.0	.0	37	1094	1.020	29.6	.0
UTUR	0	0	.000	.0	.0	0	0	.000	.0	.0
RTURS	0	0	.000	.0	.0	0	0	.000	.0	.0
UTURS	0	0	.000	.0	.0	0	0	.000	.0	.0
RTURT	0	0	.000	.0	.0	0	0	.000	.0	.0
UTURT	0	0	.000	.0	.0	0	0	.000	.0	.0
RTURTS	0	0	.000	.0	.0	0	0	.000	.0	.0
UTURTS	0	0	.000	.0	.0	0	0	.000	.0	.0

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY AND PLANNING
DIVISION OF SYSTEMS INFORMATION

ACCIDENT DATA CONTENT

Data in the enclosed report reflects that which was contained in the Department of Transportation's accident file on the date that this report was generated and represents accidents occurring during the period July 1, 2005 through June 30, 2008.

REPORTING LEVEL

Investigating police authorities have been required to file an accident report within five days of the completion of such investigation for any accident that resulted in death, injury or a prescribed dollar amount of damage to the property of any one individual. The prescribed dollar amounts and their effective periods are as follows: $1,000, from October 1, 1988 to present; $600, from October 1, 1984 to September 30, 1988; and $400, from January 1, 1974 to September 30, 1984.

Effective with accidents occurring on October 1, 1990 and thereafter, (in accordance with Public Act 90-143) the requirement of involved operators to complete an Operator Accident Report was rescinded by the State Legislature. Also, investigating police authorities are required to file accident reports with the Department of Transportation instead of the Department of Motor Vehicles as formerly required.

Effective with accidents occurring on January 1, 1995 and thereafter, investigating police authorities are required to report accidents with a revised accident report form which differs significantly from the form used to report accidents prior to 1995. Data recorded from this form is then converted to the pre-1995 format for the production of various reports. Since some information is lost in the conversion process, the data in the enclosed report may not necessarily reflect the data recorded from the police accident report form.

DIFFERENCES IN CODING CRITERIA CONCERNING LOCAL ROAD PROPERTY DAMAGE ONLY ACCIDENTS

Property damage only accidents which occurred on locally maintained roadways before August 1, 1990, from January 1, 1992 to March 31, 1992 and **from January 1, 2007 to the present** were coded for inclusion in the Department of Transportation's accident file. Property damage only accidents which occurred on locally maintained roadways from August 1, 1990 to December 31, 1991 and from April 1, 1992 to December 31, 2006 were not coded for inclusion in the accident file. Data users should be aware of the differences in the accident coding criteria among the various time periods.

LIMITATIONS

The Department of Transportation devotes considerable resources to the analysis of each accident received and to the codification of the location of each accident. Each accident entered into the Department's computerized system is reviewed for accuracy and completeness. Quality control routines are included in the system that validate the data and generate reports containing exceptional data for review. The user of the data contained in the enclosed report should be aware of certain limitations.

All accidents which actually occurred within the area covered by the report:

- May not have been received by the Department of Transportation;
- May not have contained sufficient information to have been located in the physical area covered by this report; or
- May not have been appropriately located by the Department of Transportation during codification, data entry, file maintenance or data retrieval activities.

Accidents contained within the enclosed report may not have actually occurred within the physical area covered by the report, but have been placed there due to, either, insufficient or misleading information contained in the accident report or to misallocation of the accident during codification, data entry, file maintenance or data retrieval activities.

Contributing Factors

The contributing factors indicated on the accident experience and/or accident summary have been determined by the Department of Transportation's Accident Records Section and are used by the Department in its ongoing engineering evaluation of Connecticut's roads and highways. Each contributing factor has been determined subjectively and is not meant to assign legal responsibility.

STATE OF CONNECTICUT ACCIDENT SUMMARY

ROUTE NUMBER 00320 FROM 005.56 MILES TO 005.60 MILES

MONTH	2005	2006	2007	2008	TOTAL	PERCENT
MAR			1		1	6.666
MAY			1	1	2	13.333
JUN		2		1	3	20.000
JUL		1			1	6.666
AUG	1	1			2	13.333
OCT	1		1		2	13.333
NOV		2			2	13.333
DEC	2				2	13.333
TOTAL	4	6	3	2	15	100.000

COLLISION TYPE	2005	2006	2007	2008	TOTAL	PERCENT
HD-ON TRN		1	1		2	13.333
SIDESWP-SM		3		1	4	26.666
REAR END	3	2	2	1	8	53.333
TURN-SAME	1				1	6.666

WEATHER	2005	2006	2007	2008	TOTAL	PERCENT
CLEAR	3	6	3	1	13	86.666
RAIN	1			1	2	13.333

ROAD COND	2005	2006	2007	2008	TOTAL	PERCENT
DRY	3	6	3	1	13	86.666
WET	1			1	2	13.333

LIGHT COND	2005	2006	2007	2008	TOTAL	PERCENT
DAYLT	3	5	2	2	12	80.000
DARK/W	1	1	1		3	20.000

STATE OF CONNECTICUT ACCIDENT SUMMARY

ROUTE NUMBER 00320 FROM 005.56 MILES TO 005.60 MILES

HOUR BEGINS	SUN	MON	TUE	WED	THUR	FRI	SAT	TOTAL	PERCENT
09 A.M.	1	0	0	0	0	0	0	1	6.666
10 A.M.	1	0	0	0	0	0	0	1	6.666
11 A.M.	0	0	0	0	0	1	0	1	6.666
NOON	0	1	0	0	0	0	0	1	6.666
02 P.M.	0	0	0	2	0	1	0	3	20.000
03 P.M.	0	0	0	0	0	1	0	1	6.666
04 P.M.	0	0	0	0	0	2	1	3	20.000
06 P.M.	0	1	0	0	0	0	0	1	6.666
07 P.M.	0	0	0	1	0	0	0	1	6.666
09 P.M.	0	1	0	0	0	0	0	1	6.666
10 P.M.	0	0	0	0	0	0	1	1	6.666
TOTAL	2	3	0	3	0	5	2	15	100.000

VEHICLE TYPE	2005	2006	2007	2008	TOTAL	PERCENT
AUTO PAS	6	9	6	4	25	80.645
TRK-COMB		1			1	3.225
TRUCK ST	1	2			3	9.677
VAN	2				2	6.451

INTERSECTING FEATURES	2005	2006	2007	2008	TOTAL	PERCENT
AT COMM DRVE			1		1	6.666
NONE	2	1		1	4	26.666
UNKNOWN	2	5	2	1	10	66.666

STATE OF CONNECTICUT ACCIDENT SUMMARY

ROUTE NUMBER 00320 FROM 005.56 MILES TO 005.60 MILES

ACCIDENT CONTRIBUTING FACTOR	2005	2006	2007	2008	TOTAL	PERCENT
NO ACTION, UNKNOWN OR CONFLICTING STORIES	1				1	6.666
DRIVER FAILED TO GRANT RIGHT OF WAY			1		1	6.666
VEHICLE HAD MECHANICAL FAILURE		1	1		2	13.333
DRIVING TOO FAST FOR CONDITIONS	1	1			2	13.333
DRIVER FOLLOWING TOO CLOSE	1	2	1	1	5	33.333
IMPROPER PASSING MANEUVER		2		1	3	20.000
VEH TURNING DISPLAYING WRONG DIR SIGNAL	1				1	6.666

STATE OF CONNECTICUT ACCIDENT SUMMARY

ROUTE NUMBER 00320 FROM 005.56 MILES TO 005.60 MILES

OFFENDING VEHICLE DIRECTION	2005	2006	2007	2008	TOTAL	PERCENT
NORTH	1	5	1	1	8	53.333
SOUTH	3	1	2	1	7	46.666

DIRECTIONS OF ALL VEHICLES	2005	2006	2007	2008	TOTAL	PERCENT
NORTH	3	9	3	2	17	54.838
SOUTH	6	3	3	2	14	45.161

INJURIES	2005	2006	2007	2008	TOTAL	PERCENT
TOTAL B-INJURIES			1		1	100.000
TOTAL			1		1	100.000

ACCIDENTS BY SEVERITY	2005	2006	2007	2008	TOTAL	PERCENT
B-INJ			1		1	6.666
PROPERTY DAMAGE ONLY	4	6	2	2	14	93.333
TOTAL	4	6	3	2	15	100.000

OBJECT INVOLVED

	2005	2006	2007	2008	TOTAL	OBJECT LOCATION OFFRD AHEAD	IN RDWY	SHLDR RIGHT	SHLDR LEFT	OFFRD RIGHT	OFFRD LEFT	IN MEDIAN	GORE AREA	OVER RDWY	UNKNWN
TOTAL															

@FIN

CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE

TOWN OF MONTVILLE ROAD NUMBER 00990 LOCATION 000.00 999.99
PREPARED 04 22 09 PERIOD FROM 07 01 05 TO 06 30 08

MILEAGE	ALPHA	DESCRIPTION OF ACC. LOCATION	RDWY.	FACT.	CASE #	DAY	MON	DA	TH	TE	YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
	ON	0099 AT		0042					0000							0000						0000
	ON LATHROP RD	AT DOCK RD																				
	000.10 AT DOCK RD				105972	MON	FEB	12	07	2159	DARK/W	DRY	CLEAR	FIXED OBJ								
	DRIVER FAILED TO GRANT RIGHT OF WAY		ON A BRIDGE																			
	NB TRK-COMB		VEH TURNING RIGHT FROM PROPER LANE																			
	STRUCK FIRE HYD		OFF RD RIGHT																			

TOWN OF MONTVILLE — CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE
PREPARED 04 22 09 — ROUTE NUMBER 395 — LOCATION 006.33 006.33
PERIOD FROM 07 01 05 TO 06 30 08

MILEAGE	ALPHA	DESCRIPTION OF ACC.	LOCATION	RDWY. FACT.	CASE #	DAY	MON	DA	TH	TE	YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
006.33	0.4 MI S OF EXIT 79 SB	DRVR UNABLE TO COPE W/COND, DRVR LOST CONT SB AUTO PAS STRUCK BEAM RAIL	NONE	VEHICLE GOING STRAIGHT ON MEDIAN	123956	FRI	MAY	19	06	1531	DAYLT	DRY	CLEAR	FIXED OBJ							
006.33	AT EXIT 79	DRVR UNABLE TO COPE W/COND, DRVR LOST CONT SB AUTO PAS STRUCK TREE	OFF RAMP	VEHICLE GOING STRAIGHT GORE AREA	136786	TUE	JUL	11	06	1650	DAYLT	DRY	CLEAR	FIXED OBJ	-	1	-	-			1
006.33	0.4 MI S OF EXIT 79	DRIVER FOLLOWING TOO CLOSE SB AUTO PAS SKIDDED SB AUTO PAS	NONE	SLOWING FOR STOPPED VEHICLE STOPPED FOR SURFACE OR VISIBILITY CONDITION	153612	WED	OCT	11	06	1555	DAYLT	UNKN	RAIN	REAR END	-	-	-	1			1

CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE

TOWN OF MONTVILLE ROUTE NUMBER 395 LOCATION 006.73 006.73
PREPARED 04 22 09 PERIOD FROM 07 01 05 TO 06 30 08

MILEAGE	ALPHA	DESCRIPTION OF ACC. LOCATION	RDWY. FACT.	CASE #	MON DA DAY TH	TE	YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
006.73		ON RT 95 SB OFF RAMP 008	NONE	131766	SAT JUN 10	06		2215	DARK/W	DRY	CLEAR	HEAD-ON					OFF	
		DRVR ENTERED DIVD HWY IN WRONG DIRECTION																
		NB AUTO PAS	VEHICLE GOING STRAIGHT															
		SB AUTO PAS	VEHICLE GOING STRAIGHT												-	-	- 1	1

CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE

TOWN OF MONTVILLE ROUTE NUMBER 32 LOCATION 005.56 005.60
PREPARED 04 22 09 PERIOD FROM 07 01 05 TO 06 30 08

MILEAGE	ALPHA	DESCRIPTION OF ACC.	LOCATION	RDWY. FACT.	CASE #	DAY	MON	DA	TH	TE	YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
005.57		50 FT S OF DEPOT RD		NONE	133578	FRI	MAY	09	08	1604	DAYLT	WET	RAIN	SIDESWP-SM							
		IMPROPER PASSING MANEUVER																			
		NB AUTO PAS																			
		NB AUTO PAS		VEH PASSING SAME DIRECTION ON RIGHT VEH. CHANGING FROM LEFT TO RIGHT LANE																	
005.58		AT RTE 163		UNKNOWN	125798	FRI	MAR	09	07	1108	DAYLT	DRY	CLEAR	HD-ON TRN							
		DRIVER FAILED TO GRANT RIGHT OF WAY																			
		SB AUTO PAS																			
		NB AUTO PAS		VEH TURNING LEFT FROM PROPER LANE VEHICLE GOING STRAIGHT																	
005.58		INT RT 163		UNKNOWN	131519	WED	JUN	14	06	1412	DAYLT	DRY	CLEAR	SIDESWP-SM							
		IMPROPER PASSING MANEUVER																			
		NB AUTO PAS																			
		NB TRUCK ST		VEH PASSING SAME DIRECTION ON RIGHT VEHICLE GOING STRAIGHT																	
005.58		AT RTE 163 OAKDALE RD		UNKNOWN	134702	SUN	JUL	02	06	0944	DAYLT	DRY	CLEAR	HD-ON TRN							
		VEHICLE HAD MECHANICAL FAILURE																			
		NB AUTO PAS																			
		SB AUTO PAS	STOPPED FOR	VEH TURNING LEFT FROM PROPER LANE TRAFFIC SIGNALS																	
005.58		100 FT NORTH OF RTE 163		AT COMM DRVE	138166	FRI	MAY	04	07	1616	DAYLT	DRY	CLEAR	REAR END							
		DRIVER FOLLOWING TOO CLOSE																			
		NB AUTO PAS		VEHICLE GOING STRAIGHT																	
		NB AUTO PAS	STOPPED FOR	VEH.TURNING LEFT FROM PROPER LANE													-	-	1	-	1	1
005.58		AT RTE 163		UNKNOWN	144912	FRI	JUN	20	08	1435	DAYLT	DRY	CLEAR	REAR END							
		DRIVER FOLLOWING TOO CLOSE																			
		SB AUTO PAS		VEHICLE GOING STRAIGHT																	
		SB AUTO PAS	STOPPED FOR	TRAFFIC SIGNALS																	
005.58		INT RT 163		UNKNOWN	145904	WED	JUN	28	06	1923	DAYLT	DRY	CLEAR	SIDESWP-SM							
		DRIVING TOO FAST FOR CONDITIONS																			
		NB AUTO PAS	SKIDDED	SLOWING FOR STOPPED VEHICLE																	
		NB AUTO PAS	STOPPED FOR	TURN LEFT																	
005.58		INT RT 163		UNKNOWN	146087	SUN	AUG	14	05	1006	DAYLT	DRY	CLEAR	TURN-SAME							
		VEH TURNING DISPLAYING WRONG DIR SIGNAL																			
		SB AUTO PAS		VEH TURNING RIGHT FROM PROPER LANE																	
		SB AUTO PAS		VEHICLE GOING STRAIGHT																	

TOWN OF MONTVILLE — CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE
PREPARED 04 22 09 — ROUTE NUMBER 32 — LOCATION 005.56 005.60
PERIOD FROM 07 01 05 TO 06 30 08

MILEAGE	ALPHA DESCRIPTION OF ACC. LOCATION	RDWY. FACT.	CASE #	MON DA DAY TH TE YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K A B C	RAMP TYPE	TOT INJ
005.58	INT RT 163	UNKNOWN	161766	FRI NOV 03 06	1504	DAYLT	DRY	CLEAR	SIDESWP-SM			
	IMPROPER PASSING MANEUVER											
	NB TRK-COMB	VEH PASSING SAME DIRECTION ON RIGHT										
	NB AUTO PAS	STOPPED FOR TURN LEFT										
005.58	AT RTE 163	UNKNOWN	162182	SAT NOV 04 06	2240	DARK/W	DRY	CLEAR	REAR END			
	DRIVER FOLLOWING TOO CLOSE											
	NB AUTO PAS	VEHICLE GOING STRAIGHT										
	NB AUTO PAS	STOPPED FOR TURN LEFT										
005.58	INT RT 163	UNKNOWN	170466	MON DEC 19 05	2105	DARK/W	DRY	CLEAR	REAR END			
	NO ACTION, UNKNOWN OR CONFLICTING STORIES											
	SB VAN	VEHICLE GOING STRAIGHT										
	SB TRUCK ST	VEHICLE GOING STRAIGHT										
005.58	INT RT 163	UNKNOWN	181645	MON OCT 08 07	1855	DARK/W	DRY	CLEAR	REAR END			
	VEHICLE HAD MECHANICAL FAILURE											
	SB AUTO PAS	VEHICLE GOING STRAIGHT										
	SB AUTO PAS	STOPPED FOR TRAFFIC SIGNALS										
005.59	.1 MI N OF RTE 163	NONE	149009	MON AUG 21 06	1202	DAYLT	DRY	CLEAR	REAR END			
	DRIVER FOLLOWING TOO CLOSE											
	SB AUTO PAS	VEHICLE GOING STRAIGHT										
	SB TRUCK ST	STOPPED FOR TRAFFIC										
005.59	50 FT N OF RT 163	NONE	173484	WED DEC 21 05	1427	DAYLT	DRY	CLEAR	REAR END			
	DRIVER FOLLOWING TOO CLOSE											
	NB VAN	SKIDDED SLOWING FOR STOPPED VEHICLE										
	NB AUTO PAS	STOPPED FOR SCHOOL BUS										
	NB AUTO PAS	STOPPED FOR STOPPED VEHICLE										
005.60	100 FT N OF RT 163	NONE	159112	SAT OCT 22 05	1610	DAYLT	WET	RAIN	REAR END			
	DRIVING TOO FAST FOR CONDITIONS											
	SB AUTO PAS	SKIDDED SLOWING FOR STOPPED VEHICLE										
	SB AUTO PAS	STOPPED FOR STOPPED VEHICLE										

CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE

TOWN OF MONTVILLE ROUTE NUMBER 163 LOCATION 000.00 000.00
PREPARED 04 22 09 PERIOD FROM 07 01 05 TO 06 30 08

MILEAGE	ALPHA	DESCRIPTION OF ACC. LOCATION	RDWY. FACT.	CASE #	DAY	MON	DA	TH	TE	YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
000.00		AT DEPOT RD		UNKNOWN																	
		DRIVER FAILED TO GRANT RIGHT OF WAY		100591	THU	JAN	10	08	21	10		DARK/W	DRY	CLEAR	HD-ON TRN						
		SB AUTO PAS																			
		NB AUTO PAS	VEH TURNING LEFT FROM PROPER LANE																		
			VEHICLE GOING STRAIGHT																		
000.00		AT RTE 32		UNKNOWN																	
		DRIVER INATTENTIVE		119047	THU	FEB	15	07	16	41		DAYLT	UNKN	CLEAR	SIDESWP-OP						
		NB VEHICLE																			
		SB AUTO PAS	VEHICLE ENGAGED IN HIGHWAY MAINTENANCE																		
			STOPPED FOR TRAFFIC SIGNALS																		
000.00		INT OF DEPOT RD		UNKNOWN																	
		DRIVER FAILED TO GRANT RIGHT OF WAY		147186	SUN	AUG	14	05	15	12		DAYLT	DRY	CLEAR	FIXED OBJ						
		NB NON CONT																			
		SB TRUCK ST	VEH TURNING LEFT FROM PROPER LANE																		
		STRUCK BEAM RAIL	AVOIDING VEH TURNING LEFT FROM PROPER LANE OFF RD RIGHT																		
000.00		INT OF RT 32		UNKNOWN																	
		DRIVER FOLLOWING TOO CLOSE		153822	THU	JUL	26	07	07	30		DAYLT	DRY	CLEAR	REAR END						
		NB AUTO PAS	SKIDDED SLOWING FOR STOPPED VEHICLE																		
		NB VAN	STOPPED FOR TRAFFIC SIGN																		
000.00		AT DEPOT RD		UNKNOWN																	
		DRIVER FAILED TO GRANT RIGHT OF WAY		157348	MON	OCT	02	06	16	28		DAYLT	DRY	CLEAR	HD-ON TRN						
		NB AUTO PAS	VEH TURNING LEFT FROM PROPER LANE																		
		SB AUTO PAS	VEHICLE GOING STRAIGHT																		
000.00		AT RT 32		UNKNOWN																	
		DRIVER FOLLOWING TOO CLOSE		201653	WED	DEC	26	07	21	58		DARK/WO	WET	RAIN	REAR END						
		SB AUTO PAS	VEHICLE GOING STRAIGHT																		
		SB AUTO PAS	STOPPED FOR TRAFFIC SIGNALS													-	-	1	-		1
																-	-	1	-		1

(b)

TOWN OF MONTVILLE
PREPARED 04 22 09

CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE
ROUTE NUMBER 395
PERIOD FROM 07 01 05 TO 06 30 08
LOCATION 006.33 006.33

MILEAGE	ALPHA	DESCRIPTION OF ACC. LOCATION	RDWY. FACT.	CASE #	DAY	MON	DA	TH	TE	YR	HOUR	LIGHT COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
006.33	0.4	MI S OF EXIT 79 SB	NONE	123956	FRI	MAY	19	06			1531	DAYLT	DRY	CLEAR	FIXED OBJ						
DRVR UNABLE TO COPE W/COND, DRVR LOST CONT																					
SB AUTO PAS			VEHICLE GOING STRAIGHT																		
STRUCK BEAM RAIL		ON MEDIAN																			
006.33	AT	EXIT 79	OFF RAMP	136786	TUE	JUL	11	06			1650	DAYLT	DRY	CLEAR	FIXED OBJ						
DRVR UNABLE TO COPE W/COND, DRVR LOST CONT																					
SB AUTO PAS			VEHICLE GOING STRAIGHT																		
STRUCK TREE		GORE AREA														-	1	-	-		1
006.33	0.4	MI S OF EXIT 79	NONE	153612	WED	OCT	11	06			1555	DAYLT	UNKN	RAIN	REAR END						
DRIVER FOLLOWING TOO CLOSE																					
SB AUTO PAS	SKIDDED	SLOWING FOR STOPPED VEHICLE																			
SB AUTO PAS		STOPPED FOR SURFACE OR VISIBILITY CONDITION																			
																-	-	-	1		1

TOWN OF MONTVILLE CONNECTICUT DEPARTMENT OF TRANSPORTATION ACCIDENT EXPERIENCE
PREPARED 04 22 09 ROUTE NUMBER 395 LOCATION 006.73 006.73
PERIOD FROM 07 01 05 TO 06 30 08

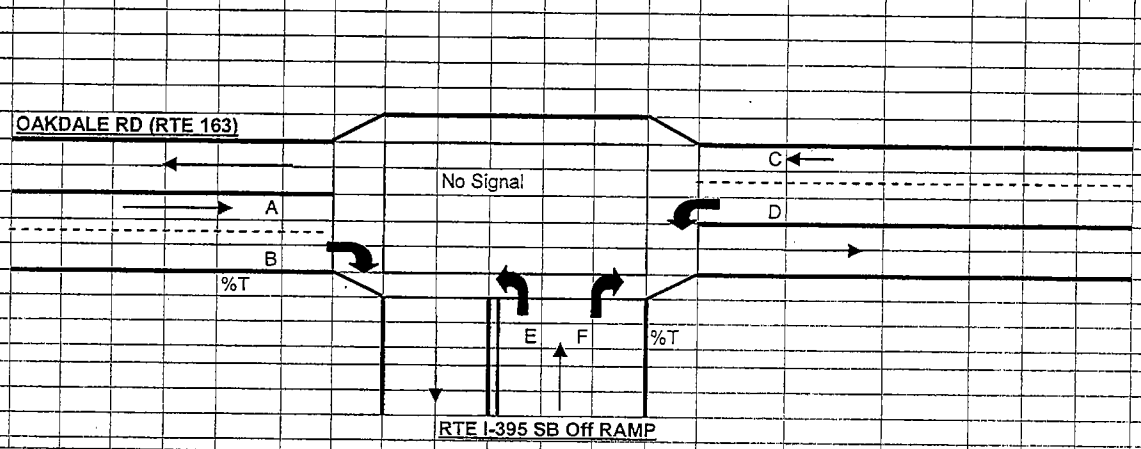
MILEAGE	ALPHA	DESCRIPTION OF ACC. LOCATION	RDWY. FACT.	CASE #	DAY	MON	DA	TH	TE	YR	HOUR	LIGHT. COND	SURF COND	WEATH	COLLISION TYPE	INJURIES K	A	B	C	RAMP TYPE	TOT INJ
006.73	ON RT 95 SB OFF RAMP 008		NONE	131766	SAT	JUN	10	06	2215	DARK/W	DRY	CLEAR	HEAD-ON					OFF	
	DRVR ENTERED DIVD HWY IN WRONG DIRECTION																				
	NB AUTO PAS		VEHICLE GOING STRAIGHT																		
	SB AUTO PAS		VEHICLE GOING STRAIGHT																		
																-	-	-	1		1

APPENDIX E
Manual Traffic Counts

SHAW E&I

COUNT LOCATION: Oakland Road(Rte 163) / Rte I-395 SB OFF Ramp

COUNT DATE: 4/6/2009



15 MINUTE COUNTS

COUNT DATE: 4/6/2009

PERIOD FROM	TO	A	B	#T's	%T	PED	C	Left D	#T's	%T	PED	E	F	#T's	%T	PED
7:00 AM	7:15 AM	33	16	4	8%		42	31	3	4%		9	24	2	6%	
7:15 AM	7:30 AM	40	22	3	5%		76	45	6	5%		25	30	3	5%	
7:30 AM	7:45 AM	23	19	2	5%		77	59	3	2%		25	28	3	6%	
7:45 AM	8:00 AM	21	31	2	4%		62	28	4	4%		36	21	1	2%	
8:00 AM	8:15 AM	18	12	2	7%		75	47	7	6%		25	9	1	3%	
8:15 AM	8:30 AM	24	17	2	5%		61	25	1	1%		25	19	3	7%	
8:30 AM	8:45 AM	29	16	5	11%		62	26	4	5%		20	22	3	7%	
8:45 AM	9:00 AM	27	15	5	12%		59	23	6	7%		32	23	4	7%	
		102	84		5%		290	179		4%		111	88		4%	

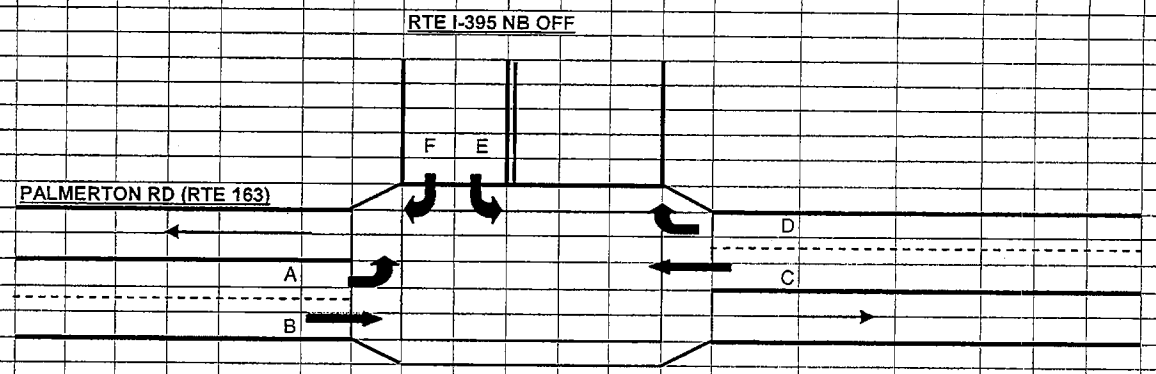
PERIOD FROM	TO	A	B	#T's	%T	PED	C	Left D	#T's	%T	PED	E	F	#T's	%T	PED
4:00 PM	4:15 PM	65	19	8	10%		57	23	3	4%		22	23	4	9%	
4:15 PM	4:30 PM	62	15	4	5%		45	24	4	6%		18	36	3	6%	
4:30 PM	4:45 PM	83	10	2	2%		59	11	4	6%		20	28	2	4%	
4:45 PM	5:00 PM	68	13	1	1%		45	17	1	2%		15	23	2	5%	
5:00 PM	5:15 PM	68	25	2	2%		55	13	3	4%		18	32	2	4%	
5:15 PM	5:30 PM	71	16	1	1%		37	10	3	6%		22	17	3	8%	
5:30 PM	5:45 PM	69	16	2	2%		44	17	1	2%		18	26	1	2%	
5:45 PM	6:00 PM	55	16		0%		32	14	4	9%		24	36	1	2%	
		281	63		3%		204	65		4%		71	119		5%	

PERIOD FR	TO	Peak VEH			peak Hour
7:00 PM	8:00 PM	823	36	4%	
7:15 PM	8:15 PM	854	37	4%	Yes
7:30 PM	8:30 PM	787	31	4%	
7:45 PM	8:45 PM	731	35	5%	
8:00 PM	9:00 PM	711	43	6%	

PERIOD FR	TO	Peak VEH	#T's	%T	peak Hour
4:00 PM	5:00 PM	801	38	5%	
4:15 PM	5:15 PM	803	30	4%	Yes
4:30 PM	5:30 PM	776	26	3%	
4:45 PM	5:45 PM	755	22	3%	
5:00 PM	6:00 PM	751	23	3%	

SHAW E&I

COUNT LOCATION: **Palmerton Road (Rte 163) / I-395 NB OFF Ramp**



15 MINUTE COUNTS

COUNT DATE: **4/7/2009**

PERIOD FROM	TO	EB A	EB B	EB #T's	EB %T	EB PED	WB C	WB D	WB #T's	WB %T	WB PED	NB E	NB F	NB #T's	NB %T	NB PED
7:00 AM	7:15 AM	29	26	2	4%		40	12	3	6%		11	12	4	17%	
7:15 AM	7:30 AM	44	55	5	5%		42	17	1	2%		24	12	2	6%	
7:30 AM	7:45 AM	34	64	4	4%		41	23	3	5%		38	11	1	2%	
7:45 AM	8:00 AM	40	59	5	5%		45	17	3	5%		17	2	1	5%	
8:00 AM	8:15 AM	47	42	2	2%		28	19	1	2%		17	12	2	7%	
8:15 AM	8:30 AM	22	58	1	1%		28	14	2	5%		12	10	2	9%	
8:30 AM	8:45 AM	24	62	1	1%		37	12	4	8%		8	12	2	10%	
8:45 AM	9:00 AM	30	57	6	7%		33	16	2	4%		13	13	1	4%	
		165	220		4%		156	76		3%		96	37		5%	

PERIOD	TOT FR	TOT TO	Peak VEH	Peak #T's	Peak %T	Hour
	7:00 PM	8:00 PM	715	34	5%	
	7:15 PM	8:15 PM	750	30	4%	Yes
	7:30 PM	8:30 PM	700	27	4%	
	7:45 PM	8:45 PM	644	26	4%	
	8:00 PM	9:00 PM	626	26	4%	

COUNT DATE: **4/6/2009**

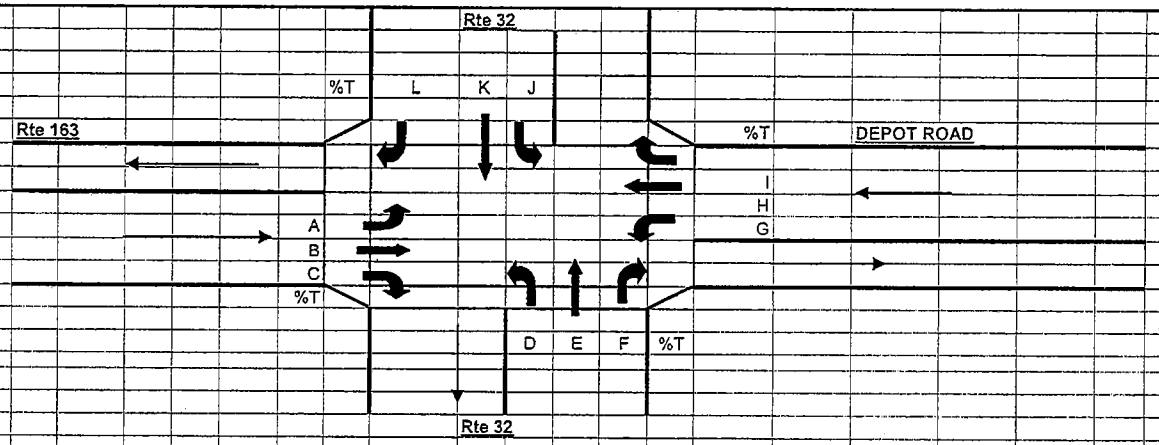
PERIOD FROM	TO	EB A	EB B	EB #T's	EB %T	EB PED	WB C	WB D	WB #T's	WB %T	WB PED	NB E	NB F	NB #T's	NB %T	NB PED
4:00 PM	4:15 PM	31	42	1	1%		49	22	4	6%		29	32	1	2%	
4:15 PM	4:30 PM	33	31	6	9%		54	21	3	4%		25	38	3	5%	
4:30 PM	4:45 PM	40	52	5	5%		65	29	2	2%		26	31	1	2%	
4:45 PM	5:00 PM	28	27	1	2%		39	25	4	6%		37	27	0	0%	
5:00 PM	5:15 PM	31	33	4	6%		66	22	3	3%		20	31	1	2%	
5:15 PM	5:30 PM	20	42	3	5%		70	24	1	1%		31	31	1	2%	
5:30 PM	5:45 PM	20	48	1	1%		59	23	3	4%		37	22	1	2%	
5:45 PM	6:00 PM	17	34	4	8%		41	18	1	2%		30	37	0	0%	
		119	154		5%		240	100		3%		114	120		1%	

PERIOD	TOT FR	TOT TO	Peak VEH	Peak #T's	Peak %T	Hour
	4:00 PM	5:00 PM	833	31	4%	
	4:15 PM	5:15 PM	831	33	4%	
	4:30 PM	5:30 PM	847	26	3%	Yes
	4:45 PM	5:45 PM	813	23	3%	
	5:00 PM	6:00 PM	807	23	3%	

SHAW E&I

COUNT LOCATION: Rte 163 / Rte 32 Traffic Light

COUNT DATE:



15 MINUTE COUNTS

COUNT DATE: 4/7/2009

PERIOD FROM	TO	EB A	B	C	#T's	%T	PED	WB D	E	F	#T's	%T	PED	NB G	H	I	#T's	%T	PED	J	K	L	#T's	%T	PED
7:00 AM	7:15 AM	19	3	7	1	3%		16	57	0	3	4%		3	4	0	1	14%		0	49	27	2	3%	
7:15 AM	7:30 AM	61	5	22	2	2%		12	80	2	0	0%		0	6	1	0	6%		3	81	37	3	2%	
7:30 AM	7:45 AM	57	3	33	1	1%		17	81	0	2	2%		1	1	1	0	0%		0	112	33	2	1%	
7:45 AM	8:00 AM	37	1	33	1	1%		28	60	0	1	1%		1	4	0	0	0%		1	92	37	1	1%	
8:00 AM	8:15 AM	39	5	28	0	0%		17	59	1	2	3%		1	3	4	1	13%		3	74	13	1	1%	
8:15 AM	8:30 AM	50	5	24	0	0%		14	71	0	1	1%		3	7	2	1	8%		0	87	19	1	1%	
8:30 AM	8:45 AM	34	2	33	2	3%		18	66	0	1	1%		0	2	0	0	0%		1	86	35	4	3%	
8:45 AM	9:00 AM	22	0	40	1	2%		17	63	1	2	2%		3	1	0	0	0%		0	80	26	2	2%	
		194	14	116		1%		74	280	3		1%		3	14	6		4%		7	359	120		1%	

PERIOD FROM	TO	EB A	B	C	#T's	%T	PED	WB D	E	F	#T's	%T	PED	NB G	H	I	#T's	%T	PED	J	K	L	#T's	%T	PED
4:00 PM	4:15 PM	37	7	29	2	3%		26	91	2	1	1%		0	11	3	3	21%		2	87	30	0	0%	
4:15 PM	4:30 PM	38	6	24	1	1%		38	123	2	1	1%		0	5	3	1	13%		4	115	45	3	2%	
4:30 PM	4:45 PM	46	3	33	2	2%		64	109	1	0	0%		0	7	1	3	38%		0	81	44	0	0%	
4:45 PM	5:00 PM	47	7	26	0	0%		33	110	0	0	0%		1	7	1	1	11%		0	101	34	0	0%	
5:00 PM	5:15 PM	39	9	27	2	3%	2%	34	96	2	1	1%	4	3	3	2	0	0%		1	83	38	0	0%	1
5:15 PM	5:30 PM	30	6	33	1	1%		37	100	0	0	0%		1	14	0	0	0%		0	90	45	0	0%	
5:30 PM	5:45 PM	38	7	21	1	2%		51	94	5	0	0%	3	1	6	1	1	13%		1	80	33	0	0%	
5:45 PM	6:00 PM	32	3	35	1	1%		31	96	0	2	2%		3	7	1	0	0%		0	57	34	0	0%	1
		170	25	110		2%		169	438	5		0%		4	22	7		15%		5	380	161		1%	

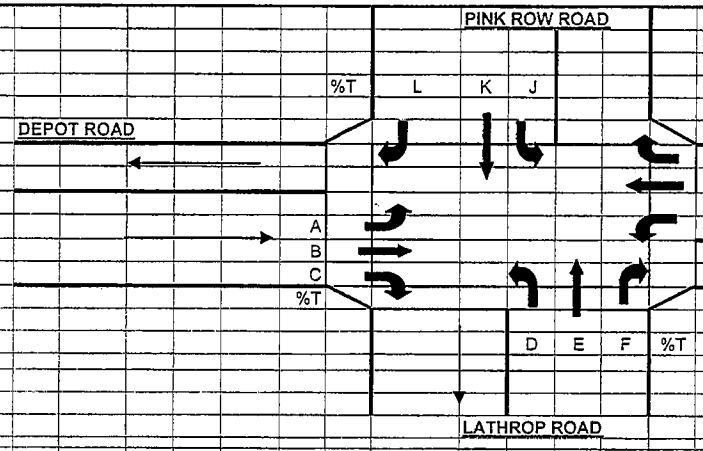
PERIOD FR	TO	TOT VEH	#T's	%T	Peak Hour
7:00 PM	8:00 PM	1128	20	2%	
7:15 PM	8:15 PM	1190	17	1%	Yes
7:30 PM	8:30 PM	1162	15	1%	
7:45 PM	8:45 PM	1100	17	2%	
8:00 PM	9:00 PM	1059	19	2%	

PERIOD FR	TO	TOT VEH	#T's	%T	Peak Hour
4:00 PM	5:00 PM	1484	18	1%	
4:15 PM	5:15 PM	1496	15	1%	yes
4:30 PM	5:30 PM	1449	10	1%	
4:45 PM	5:45 PM	1398	7	1%	
5:00 PM	6:00 PM	1330	9	1%	

SHAW E&I

COUNT LOCATION: Depot Road/Lathrop Road/Pink Row Road

COUNT DATE: 4/8/2009



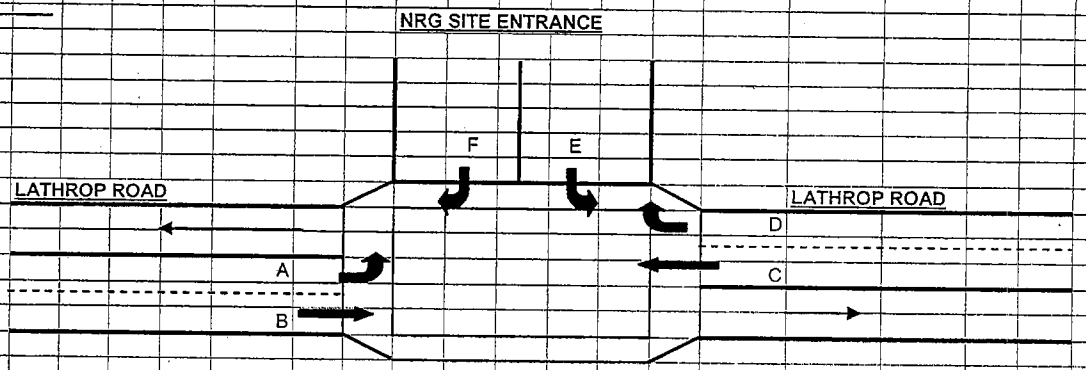
15 MINUTE COUNTS

COUNT DATE: 4/8/2009

PERIOD		EB																						PERIOD		TOT			Peak
FROM	TO	A	B	C	#T's	%T	PED	D	E	F	#T's	%T	PED	G	H	I	#T's	%T	PED	J	K	L	#T's	%T	PED	FR	TO	VEH	#T's	%T	Hour
7:00 AM	7:15 AM	0	3	2	4	80%		4	3	0	2	29%		0	1	2	3	100%		2	4	0	0	0%							
7:15 AM	7:30 AM	0	7	3	1	10%		5	5	2	2	17%		3	2	4	1	11%		3	1	0	0	0%							
7:30 AM	7:45 AM	0	1	4	1	20%		3	3	1	3	43%		3	2	3	3	38%		0	2	0	0	0%							
7:45 AM	8:00 AM	0	5	2	0	0%		2	2	0	1	25%		2	2	0	3	75%		1	0	0	0	0%		7:00 PM	8:00 PM	94	24	26%	
8:00 AM	8:15 AM	0	5	4	1	11%		5	2	1	0	0%		1	2	0	1	33%		3	4	0	0	0%		7:15 PM	8:15 PM	100	17	17%	Yes
8:15 AM	8:30 AM	0	4	1	1	20%		5	2	2	1	11%		0	2	2	2	50%		1	1	1	1	33%		7:30 PM	8:30 PM	86	18	21%	
8:30 AM	8:45 AM	0	3	2	1	20%		2	3	0	1	20%		3	4	3	2	20%		2	3	0	0	0%		7:45 PM	8:45 PM	89	15	17%	
8:45 AM	9:00 AM	0	0	3	0	0%		3	2	0	1	20%		0	3	0	2	67%		3	3	0	0	0%		8:00 PM	9:00 PM	90	14	16%	
		0	18	13		10%		15	12	4		19%		9	8	7		33%		7	7	0		0%							

PERIOD		EB																						PERIOD		TOT			Peak
FROM	TO	A	B	C	#T's	%T	PED	D	E	F	#T's	%T	PED	G	H	I	#T's	%T	PED	J	K	L	#T's	%T	PED	FR	TO	VEH	#T's	%T	Hour
4:00 PM	4:15 PM	0	5	6		0%		4	8	3	1	7%		2	8	4	0	0%		1	3	0	0	0%							
4:15 PM	4:30 PM	0	4	3	2	29%		5	4	3	1	8%		2	2	4	2	25%		3	4	0	1	14%							
4:30 PM	4:45 PM	0	1	4		0%		1	5	2		0%		2	8	1	2	18%		3	2	0	0	0%							
4:45 PM	5:00 PM	0	1	4	1	20%		3	3	2	1	13%		2	5	4	3	27%		1	5	0	0	0%		4:00 PM	5:00 PM	137	14	10%	
5:00 PM	5:15 PM	0	6	3	2	22%		2	3	3	1	13%		5	1	5	1	9%		3	5	0	0	0%		4:15 PM	5:15 PM	129	17	13%	
5:15 PM	5:30 PM	0	3	2	1	20%		6	5	2	0	0%		3	16	6	2	13%		4	3	0	0	0%		4:30 PM	5:30 PM	137	14	10%	
5:30 PM	5:45 PM	0	5	3	1	13%		1	3	7	0	0%		4	5	2	1	8%		1	5	0	0	0%		4:45 PM	5:45 PM	144	14	10%	
5:45 PM	6:00 PM	0	2	1	1	33%		7	3	5	1	7%		4	4	1	1	11%		2	2	0	0	0%		5:00 PM	6:00 PM	145	12	8%	yes
		0	16	9		20%		18	14	17		4%		16	16	14		11%		10	15	0		0%							

SHAW E&I



COUNT LOCATION: **Lathrop Road / NRG Site Entrance**

15 MINUTE COUNTS

COUNT DATE: **4/8/2009**

PERIOD FROM	TO	SB A	SB B	SB #T's	SB %T	SB PED	NB C	NB D	NB #T's	NB %T	NB PED	EB E	EB F	EB #T's	EB %T	EB PED
7:00 AM	7:15 AM	1	3	0	0%		4	1	0	0%		0	0	0	0%	
7:15 AM	7:30 AM	0	1	0	0%		7	0	0	0%		0	0	0	0%	
7:30 AM	7:45 AM	2	6	0	0%		5	0	0	0%		0	0	0	0%	
7:45 AM	8:00 AM	1	2	0	0%		2	0	0	0%		0	0	0	0%	
8:00 AM	8:15 AM	1	4	0	0%		5	0	0	0%		0	0	0	0%	
8:15 AM	8:30 AM	0	3	0	0%		1	0	0	0%		1	0	0	0%	
8:30 AM	8:45 AM	3	5	0	0%		1	0	0	0%		0	0	0	0%	
8:45 AM	9:00 AM	2	2	0	0%		1	0	1	100%		0	0	0	0%	
		4	13		0%		19	0		0%		0	0		0%	

PERIOD FR	PERIOD TO	TOT VEH	Peak #T's	Peak %T	Peak Hour
7:00 PM	8:00 PM	35	0	0%	
7:15 PM	8:15 PM	36	0	0%	Yes
7:30 PM	8:30 PM	33	0	0%	
7:45 PM	8:45 PM	29	0	0%	
8:00 PM	9:00 PM	29	1	3%	

COUNT DATE: **4/7/2009**

PERIOD FROM	TO	SB A	SB B	SB #T's	SB %T	SB PED	NB C	NB D	NB #T's	NB %T	NB PED	EB E	EB F	EB #T's	EB %T	EB PED
4:00 PM	4:15 PM	0	5	0	0%		0	0	0	0%		0	0	0	0%	
4:15 PM	4:30 PM	1	6	0	0%		5	0	0	0%		0	1	0	0%	
4:30 PM	4:45 PM	1	4	0	0%		2	0	0	0%		0	0	0	0%	
4:45 PM	5:00 PM	2	6	0	0%		1	0	0	0%		0	1	0	0%	
5:00 PM	5:15 PM	1	4	0	0%		6	0	0	0%		0	0	0	0%	
5:15 PM	5:30 PM	2	5	0	0%		6	1	0	0%		5	10	0	0%	
5:30 PM	5:45 PM	3	7	0	0%		3	0	0	0%		2	2	0	0%	
5:45 PM	6:00 PM	2	8	0	0%		6	0	0	0%		1	4	0	0%	
		8	24		0%		21	1		0%		8	16		0%	

PERIOD FR	PERIOD TO	TOT VEH	Peak #T's	Peak %T	Peak Hour
4:00 PM	5:00 PM	35	0	0%	
4:15 PM	5:15 PM	41	0	0%	
4:30 PM	5:30 PM	57	0	0%	
4:45 PM	5:45 PM	67	0	0%	
5:00 PM	6:00 PM	78	0	0%	Yes

APPENDIX F
ConnDOT Maximum Vehicle Loads

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
2800 BERLIN TURNPIKE, P. O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546

Telephone (860) 594-2880
Fax (860) 594-2949

Connecticut DOT Web Page *www.ct.gov/dot* **On-line Permits** *www.cvisn.ct.gov*

Connecticut Bridge Formula

L = DISTANCE IN FEET BETWEEN THE EXTREMES OF ANY GROUP OF TWO OR MORE CONSECUTIVE AXLES.
N = NUMBER OF AXLES IN ANY GROUP UNDER CONSIDERATION.
W = MAXIMUM WEIGHT IN POUNDS CARRIED ON ANY GROUP OF TWO OR MORE AXLES COMPUTED TO THE NEAREST 500 POUNDS.

DISTANCE IN FEET BETWEEN THE EXTREMES OF ANY GROUP OF 2 OR MORE CONSECUTIVE AXLES	MAXIMUM LOAD IN POUNDS CARRIED ON ANY GROUP OF 2 OR MORE CONSECUTIVE AXLES.					
	2 AXLES	3 AXLES	4 AXLES	5 AXLES	6 AXLES	7 AXLES
4	36,000					
5	36,000					
6	36,000					
7	36,000					
8	36,000	42,000				
9	39,000	42,500				
10	40,000	43,500				
11		44,000				
12		45,000	50,000			
13		45,500	50,500			
14		46,500	51,500			
15		47,000	52,000			
16		48,000	52,500	58,000		
17		48,500	53,500	58,500		
18		49,500	54,000	59,000		
19		50,000	54,500	60,000		
20		51,000	55,500	60,500	66,000	
21		51,500	56,000	61,000	66,500	
22		52,500	56,500	61,500	67,000	
23		53,000	57,500	62,500	68,000	
24		54,000	58,000	63,000	68,500	74,000
25		54,500	58,500	64,500	69,000	74,500
26		55,500	59,500	65,000	69,500	75,000
27		56,000	60,000	65,000	70,000	75,500
28		57,000	60,500	65,500	71,000	76,500
29		57,500	61,500	66,000	71,500	77,000
30		58,500	62,000	66,500	72,000	77,500
31		59,000	62,500	67,500	72,500	78,000
32		60,000	63,500	68,000	73,000	78,500
33			64,000	68,500	74,000	79,000
34			64,500	69,000	74,500	80,000
35			65,500	70,000	75,000	
36			66,000	70,500	75,500	
37			66,500	71,000	76,000	
38			67,500	72,000	77,000	
39			68,000	72,500	77,500	
40			68,500	73,000	78,000	
41			69,500	73,500	78,500	
42			70,000	74,000	79,000	
43			70,500	75,000	80,000	
44			71,500	75,500		
45			72,000	76,000		
46			72,500	76,500		
47			73,500	77,500		
48			74,000	78,000		
49			74,500	78,500		
50			75,500	79,000		
51			76,000	80,000		
52			76,500			
53			77,500			
54			78,000			
55			78,500			
56			79,500			
57			80,000			

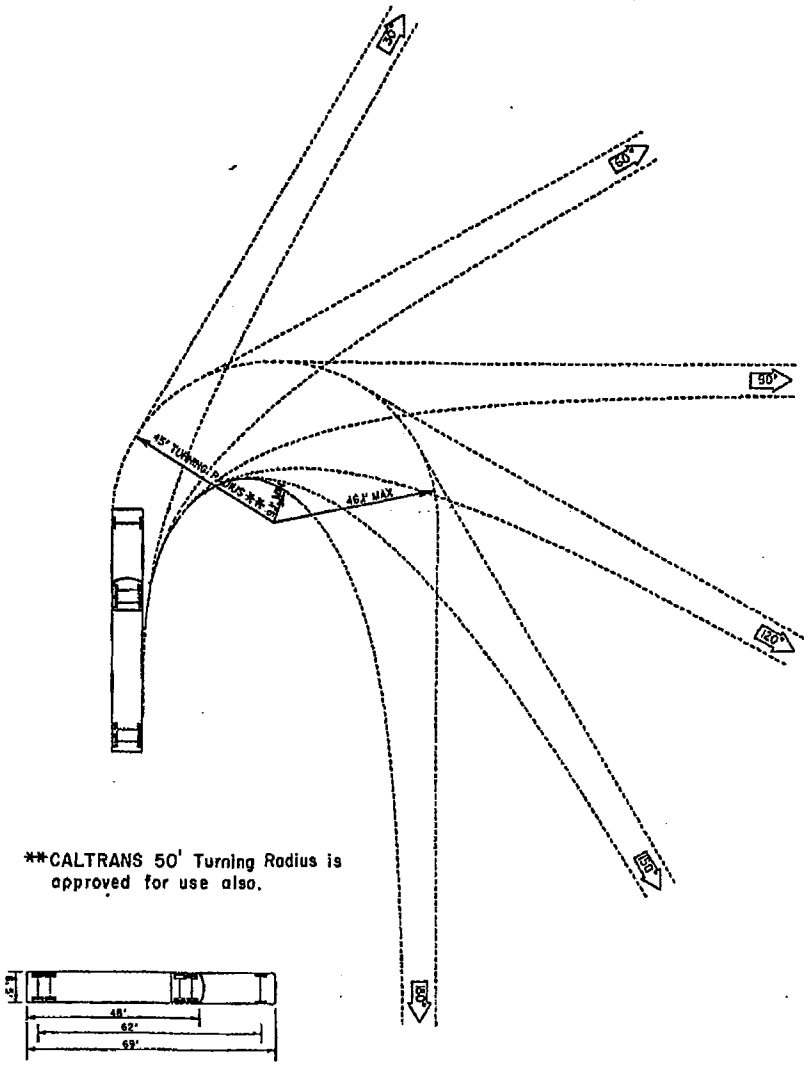
APPENDIX G
Minimum Turning Radius (WB-62) Semi-trailer Truck with Aerial Photos

Design Vehicle Type	Passenger Car	Single Unit Truck	Single Unit Bus	Articulated Bus	Semi-trailer Intermediate	Semi-trailer Combination Large	Semi-trailer Full Trailer Combination	Interstate Semi-Trailer	Interstate Semi-Trailer	Triple Semi-Trailer	Turnpike Double Semi-Trailer	Motor Home	Passenger Car with Travel Trailer	Passenger Car with Boat and Trailer	Motor Home and Boat Trailer
Symbol	P	SU	BUS	A-BUS	WB-40	WB-50	WB-60	WB-62*	WB-67**	WB-96	WB-114	MH	P/T	P/B	MH/B
Minimum design turning radius (ft)	24	42	42	38	40	45	45	45	45	50	60	40	24	24	50
Minimum inside radius (ft)	13.8	27.8	24.4	14.0	18.9	19.2	22.2	9.1	00	20.7	17	26.0	2.0	6.5	35

* Design vehicle with 48' trailer as adopted in 1982 STAA (Surface Transportation Assistance Act)
** Design vehicle with 53' trailer as grandfathered in 1982 STAA (Surface Transportation Assistance Act)

Table II-2. Minimum turning radii of design vehicles.

THIS TURNING TEMPLATE SHOWS THE TURNING PATHS OF THE AASHTO DESIGN VEHICLES. THE PATHS SHOWN ARE FOR THE LEFT FRONT OVERHANG AND THE OUTSIDE REAR WHEEL. THE LEFT FRONT WHEEL FOLLOWS THE CIRCULAR CURVE, HOWEVER, ITS PATH IS NOT SHOWN.



**CALTRANS 50' Turning Radius is approved for use also.

0 10 20 30 40 50
SCALE IN FEET

*Design vehicle with 48' trailer as adopted in 1982 Surface Transportation Assistance Act (STAA)

Source: Texas State Department of Highways and Public Transportation

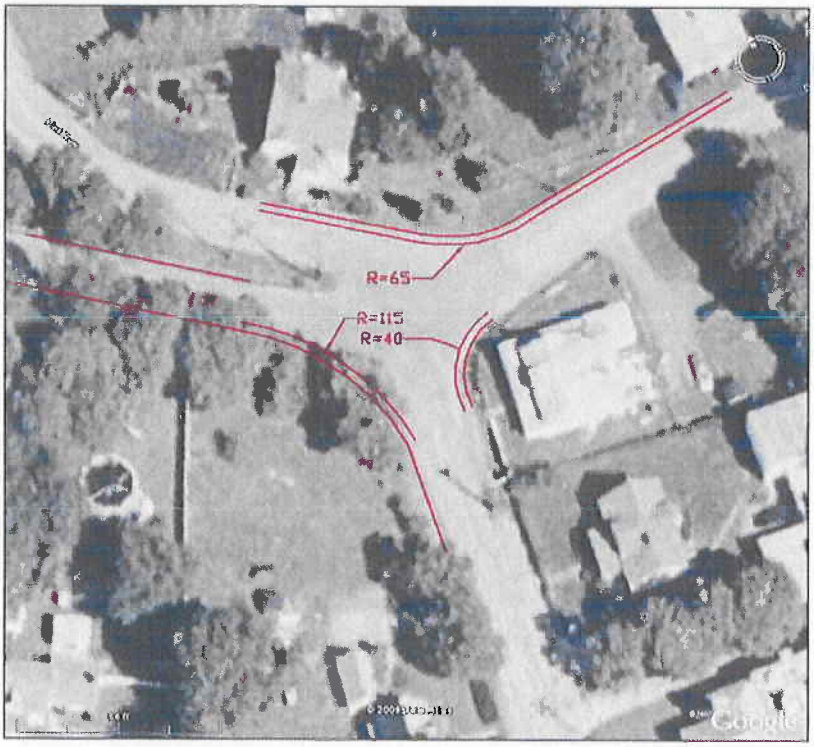
Figure II-8. Minimum turning path for WB-62 (Interstate Semitrailer)*

I-395 SB at Rte 163

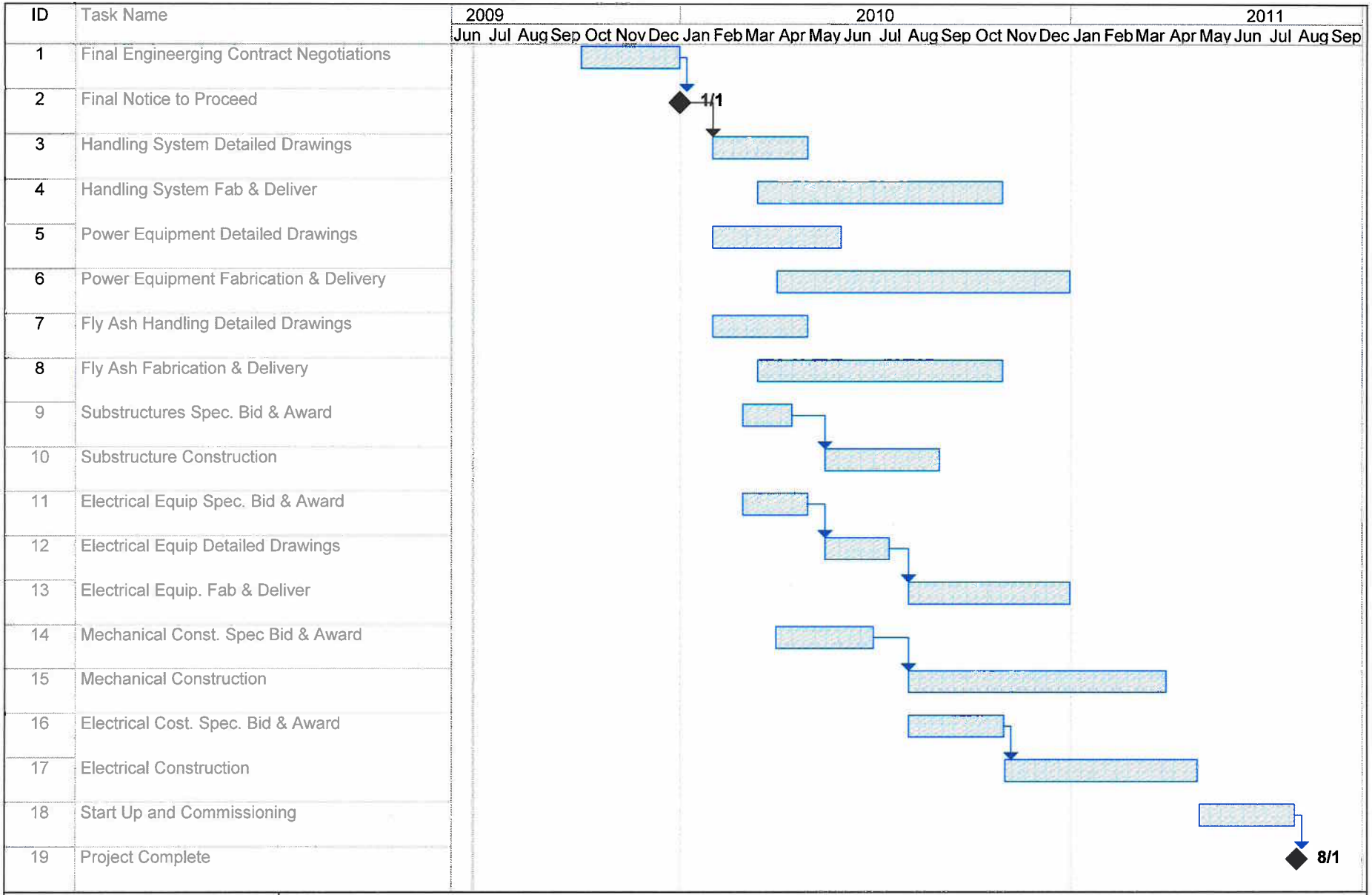
I-395 NB at Rte 163 (signal)

Route 163 at Route 32 (signal)

Lathrop Road at NRG Site Entrance



Depot Road at Pink Row at Lathrop Road



Project: Montville Construction
Date: Sun 6/21/09

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline