ARCADIS Design & Consultancy for natural and built assets

Northrop Grumman Systems Corporation

RW-21 PROJECT AREA COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

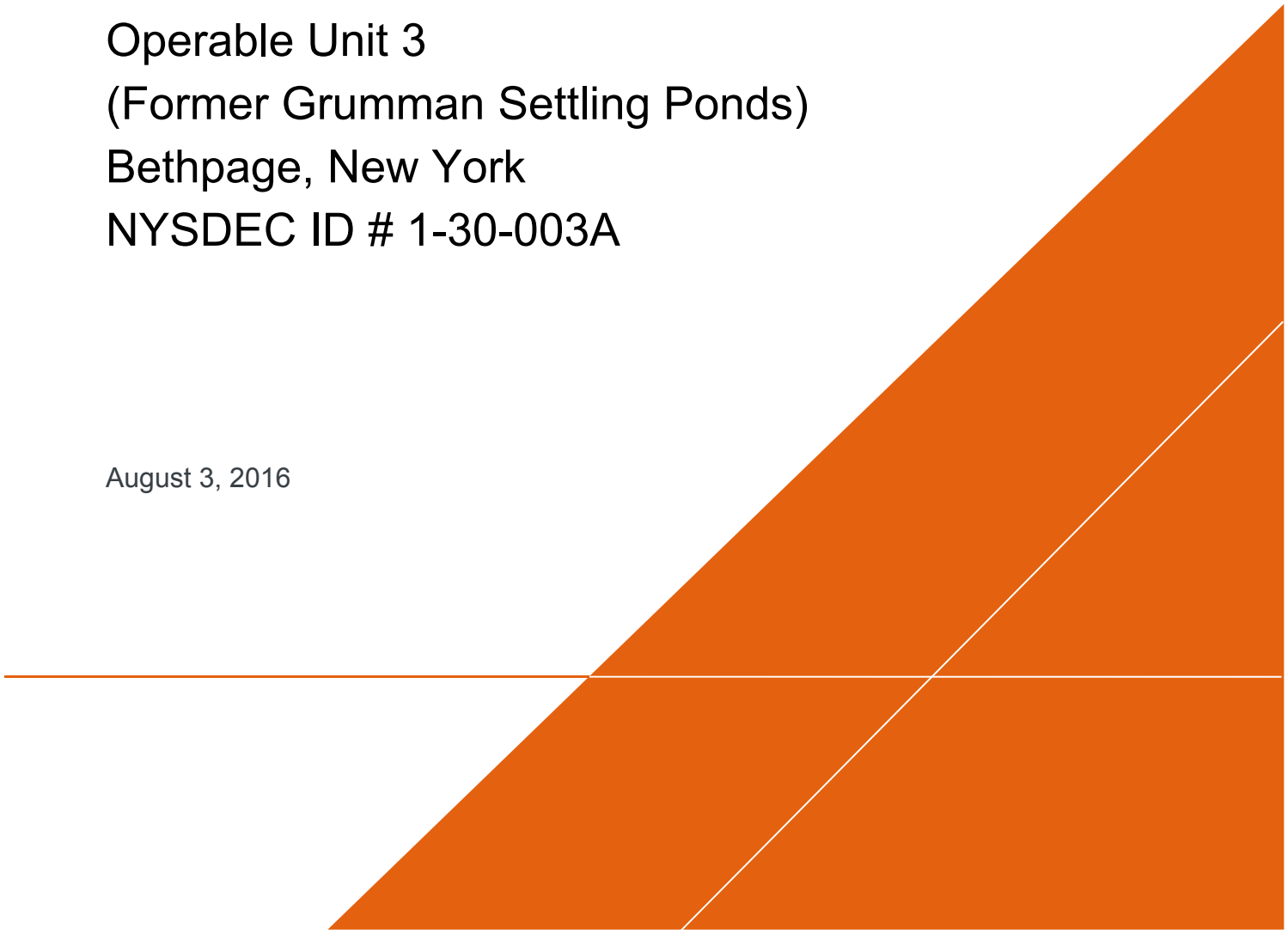
Operable Unit 3

(Former Grumman Settling Ponds)

Bethpage, New York

NYSDEC ID # 1-30-003A

August 3, 2016



RW-21 PROJECT AREA COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York
NYSDEC ID # 1-30-003A

Christopher Engler, PE 069748
Principal Engineer

Carlo San Giovanni
Project Manager

Michael F. Wolfert
Project Director

Prepared for:

Northrop Grumman Systems Corporation

Prepared by:

Arcadis of New York, Inc.
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610

Our Ref.:

NY001496.2715.PM0F8

Date:

August 3, 2016

CONTENTS

APPENDICES

Traffic Control Plans

Community Air Monitoring Plan (CAMP)

Example Noise Attenuation Barries

1 INTRODUCTION

This Community and Environmental Response Plan (CERP) has been prepared by Arcadis, on behalf of Northrop Grumman, as required by the New York State Department of Environmental Conservation (NYSDEC). This CERP will be implemented at each work area (Site(s)) associated with the RW-21 remedial action. This CERP is consistent with the requirements of Section 5.1(f) of "DER-10 / Technical Guidance for Site Investigation and Remediation" (NYSDEC 2010) and has been prepared to provide measures to protect the community and environment during the RW-21 Project Area remedial action.

1.1 CERP Organization

This CERP is organized as follows:

- **Section 1: Introduction** – Describes the purpose of the CERP and provides project specific contact information
- **Section 2: Public Protection Measures** – Describes the temporary measures to be used to protect the public.
- **Section 3: Community Air Monitoring Plan** – Describes the provisions of the Community Air Monitoring Plan, specifically measures to control the generation of vapors or odors.
- **Section 4: Noise Reduction Plan** – Describes the measures to control noise.
- **Section 5: Vibration Monitoring** – Describes the measures to control vibration.
- **Section 6: Pre and Post-Construction Survey Program** – Describes the documentation of site conditions prior to and at the conclusion of construction activities.
- **Section 7: Site Security Plan** – Describes the measures to secure the site from trespassers.
- **Section 8: Storm water and Erosion Control Plan** – Describes the measures to control storm water and erosion.
- **Section 9: Waste Management** – Describes the measures to manage waste storage, treatment, and disposal.
- **Section 10: Traffic Management Plan** – Describes measures to control traffic during the remedial action.

1.2 Northrop Grumman and Regulatory Agency Contact Information

The Northrop Grumman and regulatory agency contact information for the RW-21 Area Remedial Action is presented below:

Edward Hannon
Northrop Grumman Systems Corporation Project Manager
(516) 575-2333
E-mail: edward.hannon@ngc.com

Steven Scharf, P.E.
NYSDEC Project Manager
(518) 402-7860 Ext 3
E-mail: steven.scharf@dec.ny.gov

Steve Karpinski
NYSDOH Public Health Specialist
(518) 402-7860
E-Mail: steven.karpinski@health.ny.gov

1.2 Document Repositories

This CERP and other project related reports and documents are available for review at the following document repository:

Bethpage Public Library
49 Powell Avenue
Bethpage, New York 11714
(516) 931-3907

2 PUBLIC PROTECTION MEASURES

In accordance with CERP requirements, the use of controls to ensure the protection of the community and environment will be implemented by contractors performing remedial action on the Sites. Due to the proximity of the Sites to residential areas and road traffic, temporary controls will be installed and maintained to address the short-term impacts to public access and modified traffic flow in the vicinity of the Sites. Temporary fencing will provide clear notice to the public of the areas under active construction, with signs indicating warnings and detours to ensure continued safe access by the community to public space. Excavations that remain open overnight will be securely covered with steel road plates to ensure continued access to driveways, alleys, sidewalks and roadways.

Advanced notification of road closures for the remedial actions will be provided to emergency response agencies, including the Nassau County Police Department and Bethpage Fire Department, such that their response time would not be adversely affected. The posted speed limit will remain at 30 miles-per-hour (mph), which is appropriate for the residential traffic adjacent to the Sites. The affected roadways are not anticipated to receive heavy volumes of rush-hour traffic. In the event that work times must extend beyond permitted times, notification to the appropriate emergency agencies will be provided. Permitted work may occur at the RW-21 location between 7am to 7pm and at the RW-20 and RW-22 locations between 7am to 5pm, Monday through Friday, excluding holidays.

The safe use of public roadways will be facilitated by implementing Site-Specific Traffic Control Plans (TCPs) to provide a layout of signs and traffic control devices that when combined offer protection to the community during the work. The TCP approach is outlined in Section 10 and presented in **Appendix A**.

2.1 Warning Signs

Traffic control devices, which meet New York State Department of Transportation (DOT) and Manual on Uniform Traffic Control Device (MUTCD) standards, will be installed to notify roadway traffic and pedestrians of construction activities at the Site(s). Warning signs will be erected at the adjacent intersections that remain open to free flowing residential traffic, or approximately 500 feet in advance of a Site perimeter, whichever is closer to the Site(s). Sidewalk closure signs will be erected approximately 100 feet in advance of channelizing cones and safety fencing which demarcate a Site and re-direct pedestrian traffic. Traffic cones will be arranged such that oncoming traffic is directed away from Site equipment and vehicles. Identical traffic control will be configured with signs facing the opposite direction of traffic and be installed prior to beginning work. Additional warning signs will include, at a minimum, warnings of lane and parking reductions as well as new right-of-ways at affected intersections.

2.2 Parking Limitations

Staging of equipment and vehicles will be contained within the existing parking areas and delineated intersections identified in the TCP. The required work permits have been secured from the Town of Oyster Bay (TOB) to redirect parking adjacent to the Sites. Notices of the impending work will be mailed to the surrounding community in advance of mobilization. Drums or traffic cones will be installed along the perimeter of the Sites to indicate that these areas are no longer accessible to the public but access to driveways, residences, or public areas will not be impeded.

2.3 Site Fencing

Site perimeter security will be maintained using high-visibility orange construction fence to alert traffic and pedestrians of restricted areas and to prevent unauthorized entry to the Sites. Modified fencing consisting of metal chain-link sections anchored with sandbags will be installed as deemed necessary for public protection during advanced phases of remedial action. Site fencing will be inspected regularly and maintained to provide ongoing protection for the environment and community.

3 COMMUNITY AIR MONITORING PLAN (CAMP)

The use of work practices and engineering controls to ensure the protection of the community and environment will be implemented by contractors performing remedial action in accordance with New York State Department of Health (NYSDOH) and CERP requirements. A Community Air Monitoring Plan (CAMP) has been prepared and adopted for this project to protect the community from airborne contaminant releases related to the Sites. This CAMP helps to ensure that work activities do not spread contamination off-site through the air. Real-time readings (15-minute averages) for volatile organic compounds (VOCs) and particulates (i.e., dust) will be obtained when certain activities such as drilling, construction involving earthwork or other intrusive activities, and soil and groundwater handling are in progress at the Sites. The CAMP methods and procedures as well as corrective action response levels are presented in **Appendix B**.

3.1 Vapor/Odor Management Plan

Consistent with the procedures specified in the CAMP and the requirements of the CERP, air monitoring will be implemented to monitor, prevent and control the generation of vapors and odors during remedial activities. Monitoring frequency will be determined based on whether the activity is considered intrusive or non-intrusive and if the materials being handled possess contamination. Based on existing soil data obtained from drilling and sampling vertical profile borings (VPBs), the soils in shallow trenching and vault excavations would not constitute a source of VOCs or other contamination. Due to the anticipated depth to groundwater at the Sites of approximately 50 feet or more, groundwater will not be encountered in shallow excavations which are not anticipated to exceed 10 feet in depth. The deeper subsurface soils and groundwater approaching the well screen depth are expected to be contaminated when encountered during drilling, but will only be exposed to the air for short periods during the process of containerizing into poly lined and covered roll-off containers. This work practice will mitigate the potential generation of vapors or odors and escape beyond the perimeter of Sites.

Continuous downwind monitoring for VOCs will be carried out during intrusive activities including soil excavation and handling, test pitting, drilling, demolition, and construction involving earthwork. Periodic monitoring of VOCs at the upwind perimeter of the Sites will also be performed. Periodic downwind and upwind monitoring of VOCs will also be conducted during non-intrusive activities that have the potential to generate emissions. A photo-ionization detector (PID) will monitor vapors and have the capacity to provide audible alerts; the threshold response level will be set relative to the background VOC level established for the given Sites.

Although unlikely, reaching the response levels specified in the CAMP will trigger mitigation actions for vapors or odors, including increased monitoring, corrective actions to abate emissions, and/or work shutdown of the of the Site operation emitting the odors or vapors. Reliance on this CAMP does not preclude simple, common sense measures to keep potential VOCs and emissions at a minimum within Sites (e.g., containerizing soil, tarping, hose wetting using potable water, etc.). Additionally, engineering controls to redirect the flow of vehicle exhaust will be used as needed to control the migration of vapors into active public areas. Adjustments to the CAMP, work practices and engineering controls will be made to accurately reflect the Sites' emissions over varying wind patterns through the work shift.

3.2 Dust Control

Dust control measures will be implemented to monitor, prevent, and control the generation of dust and particulate emissions during intrusive remedial activities. Continuous downwind particulate monitoring will be conducted during work that may generate emissions (i.e., soil excavation and handling, saw cutting, test pitting, drilling, or construction involving earthwork). Background data of initial and periodic dust/particulate measurements will be conducted at the upwind perimeter to the Sites.

Reaching the response levels specific in the CAMP will trigger mitigation of dust or other emissions, including increased monitoring, corrective actions, and/or work shutdown of the of the Site operation creating the emissions. Reliance on this CAMP does not preclude simple, common sense dust suppression techniques (e.g., tarping, hose wetting using potable water, etc.) to keep potential emissions at a minimum around Sites. Upon backfilling with select native material, the residual excess material will be placed on and covered by poly liners prior to disposal to prevent a means for dust dispersal. Vehicles

will be inspected for accumulation of soils which may cause dusty conditions when departing from the Sites and accumulated soil will be removed from vehicles via dry brush or hose wetting using potable water, as necessary.

4 NOISE REDUCTION PLAN

Noise attenuating devices will be used to mitigate sources of elevated noise from the Sites. Work hours will be limited to the periods of time allotted in the TOB permits. Based upon noise exposure assessments from previous VPB drilling and well installation, the primary source of elevated noise exposure is expected to be from the drill rig engine. Noise dosimeters will be used to determine noise exposure to contractors and site personnel during brief periods of elevated noise and to determine if hearing protection is required. Although existing data shows exposure to noise in the immediate drill rig area to be well below the OSHA TWA threshold of 85 dB required for hearing protection, workers and support personnel in the immediate area of the rig engine will be wearing hearing protection as a requirement of the HASP. In the unlikely event that noise levels reach the threshold level of 75dB OSHA TWA at the Site perimeters, noise will be reduced by throttling the equipment down, and during periods of low demand maintain low rotations-per-minute (RPM). As a measure of additional sound attenuation, temporary barriers will be used to enclose and thereby reduce noise from the rig engine. Examples of the proposed noise attenuation barriers are presented in **Appendix C**.

5 VIBRATION MONITORING

The majority of remedial activities conducted at the Sites are not anticipated to create detectable vibrations. The activities that have the potential to cause mild vibrations are limited to pipeline and vault installation. An evaluation of any sensitive structures occupying the immediate Site area will be conducted before and after backfilling and compaction activities to ensure integrity of existing features. If structural concerns are identified during the evaluation, or structures appear impacted from periods of mild vibration created as a direct result from remedial activities, work will be temporarily halted and the need for vibration monitoring will be reevaluated and a vibration monitoring plan developed if warranted.

In the unlikely event that vibration monitoring is warranted, monitoring will be conducted using an Instantel Minimate Plus or equivalent seismic vibration instrument to detect any vibrations produced and ensure remedial activities remain within acceptable limits and do not impact any structures.

6 PRE AND POST-CONSTRUCTION SURVEY PROGRAM

A land survey has been conducted and land records have been collected and reviewed prior to the selection of Sites. In advance of and upon completion of the work, pre and post-construction conditions of each of the Site areas and adjacent public areas will be noted through detailed photo documentation, so that restoration may be conducted in the event of damages caused during remedial action. Site restoration will include restoration of easements and rights-of-way, repair/patch/touch-up of marred and damaged surfaces, reinstallation of concrete curb and sidewalk, and asphalt repair/repaving, as required. Existing vegetative surfaces will be replaced to mitigate soil erosion and restore to pre-construction conditions.

7 SITE SECURITY PLAN

The security of the Sites will be maintained in accordance with CERP requirements and sufficient protection from trespassers gaining entry through perimeter security into the construction areas will be provided.

7.1 Perimeter Security

Perimeter fencing will be constructed of rigid materials that offer additional security from trespassers to the Sites. Orange construction fencing or metal chain-link sections will be installed to create channelizing zones where varying levels of vehicular and pedestrian traffic approach perimeters of the Sites. Regular inspection of the perimeter will be conducted to determine the need for repairs or modifications to ensure continued protection of the Sites.

7.2 Equipment Security

The storage of equipment on the Sites during remedial action will be limited to the machinery and materials which cannot be readily demobilized at the end of each shift. Lockable features will be present on all site equipment to prevent the tampering or disabling of any vehicles, waste containers, or tool storage boxes. Polyvinyl farm tanks for non-potable water and 'mud tubs' for drilling will be staged on the Sites and have secured covers over their openings to prevent tampering or accidental release.

7.3 Overnight Security

Delineation of the perimeter of each Site with fencing and barriers will provide sufficient means of overnight security. Perimeter fencing will be inspected and secured at the end of the shift to prevent unauthorized access. Site entrances will be secured prior to Site departure. Site work may not extend beyond the permitted hours issued by the TOB without prior notification and approval.

8 EROSION AND STORM WATER CONTROL PLAN

The intrusive activities to be conducted as part of the remedial action will be conducted to minimize soil disturbance and mitigate impacts to storm water systems to comply with the NYSDEC best practices recommendations. The amount of land disturbance is not anticipated to require a Storm Water Pollution Prevention Plan (SWPPP). The impermeable paved surfaces will be maintained at Sites and in the immediate vicinity to minimize erosion and impacts to storm water features. Based on the available data from VPBs from previous investigations, the soil type most handled during this remedial action will be clean, shallow soils that are disturbed during pipe laying and vault excavation.

8.1 Implementation of Erosion Control Methods

Piping and vault installation activities will be sequenced so that a minimal amount of equipment and materials is maintained to complete the remedial action. To stage the remainder of materials and equipment, space will be allocated at the Northrop Grumman Building 14 facility, located approximately 2.5 miles away from the Sites. Excavation activities will consist of 2-feet wide shallow trenches measuring

5-feet to 7-feet deep and 10-feet by 18-feet wide by 10-feet deep pits. The shallow trenches will be excavated in sequential sections of up to 250 feet and will be promptly backfilled with the native soil, compacted and receive gravel to mitigate erosion before advancing to the next section. Steel road plates will be secured over temporarily open excavations between progressing sections in the sequence of pipeline construction and will remain in place overnight to protect from weather and erosion.

It is anticipated that the well vault installation will immediately follow completion of well drilling. The vault excavations will be promptly backfilled with native soil, compacted and receive gravel to mitigate erosion.

Excess excavated soil will be safely stockpiled adjacent to excavations on poly sheeting and covered with weighted weatherproof sheeting for either backfilling or imminent containerization for eventual off-site disposal at a Northrop Grumman approved facility. Silt fencing and hay-bales will be installed to provide the necessary protection of recharge basins and storm water utilities where the potential for soil dispersal may occur.

8.2 Storm Water Runoff Control

The impermeable paved surfaces of the Sites will be maintained intact to permit storm water to runoff to receiving inlets. Storm water inlets will be covered with semi-permeable filtering devices to permit the flow of water through the filter media. Curbs will not be obstructed by soil stockpiles or other materials that would impede the flow of storm water runoff.

Clean non-potable water for drilling and dust control will be stored on Sites in polyvinyl farm tanks with secured openings to prevent tampering or accidental release. Soil stockpiles protected with weighted sheeting will consist of uncontaminated material only, which does not pose a risk to sensitive environmental features in the unlikely event of soil dispersal from the Sites. Soil will be managed in accordance with Section 9 of this CERP. Soil or groundwater with detectable levels of contamination will not be exposed to weather or other means of potential dispersal to uncontaminated areas of the Site or off-site areas.

9 WASTE MANAGEMENT

All waste generated by Northrop Grumman during remedial actions will be collected, containerized, and transported daily to Building 14 of the Northrop Grumman Bethpage, NY facility. Waste will be temporarily stored in the dedicated remedial waste storage area before being characterized (as required by the disposal facility) and disposed off-site at a Northrop Grumman-approved facility.

Management of solid and liquid wastes during transportation will be in accordance with NYSDOT requirements, such that all waste transporting vehicles are currently certified in the state of New York.

9.1 Soil Management and Treatment

Soil excavated from shallow intrusive activities has previously been identified in VPBs to be free of contamination, and the majority of this clean material is intended for backfilling excavations. Backfilling of excavations and compaction will be conducted prior to mobilizing to adjacent construction areas; any residual excavated material will be containerized and transported to and stored at the Northrop Grumman facility for waste profiling as required by the disposal facility. Soil designated for disposal will be handled

to prevent dispersal to other areas during transfer to containers and transporting to the Northrop Grumman facility where materials will be temporarily stored pending analysis prior to disposal.

All well drilling cuttings and drilling fluid will be promptly containerized into poly lined and covered roll off containers and Baker type tanks to prevent contact with paved surfaces and generation of VOCs or odors, which could migrate from the Site.

To further mitigate the potential for dispersal to off Site areas, vehicles will be inspected for soil accumulation prior to departing the Sites and receive a dry brushing or potable water hosing, as necessary.

9.2 Construction Dewatering and Treatment

Excavations will be dewatered as needed to remove accumulated storm water runoff prior to resuming remedial action. Liquid generated from dewatering will be containerized and transported by tanker truck to the Northrop Grumman temporary waste storage area, before being characterized (as required by the disposal facility) and disposed off-Site at a Northrop Grumman approved facility.

Groundwater intrusion in excavations is not anticipated to occur; however, any accumulated volume inside the excavation will also be collected and profiled before disposal or alternatively introduced to nearby filtered storm water inlets.

9.3 Wastewater Management and Treatment

Wastewater will be generated as a result of using drilling fluids and conducting well development on the Sites. The drilling fluids will be contained within separate closed-top, leak-proof roll-off containers to prevent escape to storm water systems and sensitive environmental receptors. Wastewater-bearing containers temporarily stored on Site will be transported by truck to the temporary storage area at the Northrop Grumman property before being characterized and disposed off-Site at an approved facility.

Groundwater generated from well development will be containerized in closed-top leak-proof poly tanks located on Sites and subsequently transported in tanker trucks for treatment and disposal. Groundwater that accumulates in trenches or vault excavations, which is determined to be free of contamination, will be released into the nearby storm water system at a rate not to exceed 200 gallon per minute.

A decontamination area consisting of steam powered washing equipment will be setup at the Northrop Grumman Bethpage, NY facility to service vehicles and equipment in between recovery well installations. All wastewater and waste materials derived from use of the decontamination area will be containerized on the Northrop Grumman facility and disposed at an approved facility following waste characterization.

10TRAFFIC MANAGEMENT PLAN

The logistics of controlling site vehicle traffic to support the phases of remedial action have been established in the TCPs (**Appendix A**), which describe the measures undertaken to manage obstructions to sidewalk and roadway traffic.

Temporary traffic controls outlined in the TCPs will be installed in separate phases during remedial action to mitigate traffic disruptions during well installation and trenching. Information gathered during the pre-

construction survey (Section 6) indicates the vicinity of Sites with Remedial Wells RW-20, RW-21 and RW-22 are free of low-clearance obstructions that could prevent the flow of truck traffic. The Sites and surrounding residential roadways are not anticipated to receive significant increase in rush-hour traffic and can accommodate the mild increase in truck traffic to the Sites. Phases of the remedial action involving pipe installation and vault construction will be sequenced such that impacts to traffic due to material deliveries or waste pickups will be minimized. The truck route for the Northrop Grumman facility to the Sites will be limited to major public roads.

Contractors will be required to coordinate delivery of construction materials from the Northrop Grumman facility (Northrop Grumman Building 14, Aerospace Blvd, Bethpage, NY) to the Sites throughout the permitted working times. The Contractors will take possession of materials staged at Building 14 and assume responsibility for the proper handling and transportation of the materials to the Sites over public roadways. When necessary, Site vehicles will queue in a manner that preserves the safe passage of traffic, and will be assisted by a flag man when necessary to maintain safe distances between Site traffic and through traffic.

APPENDIX A

Traffic Control Plans

Traffic Control Plan/Site Traffic Awareness and Response Plan
Revision 8, 10/15/2015

1.0 General

Plan type	TCP
Project Name:	Northrop Grumman System Corporation
Project Number:	NY001496.2515
Developer Name:	Xuan Xu
Duration of Project (in hours or days):	30 days
Time Restrictions (Y/N, if Y descibe below):	Y
Roadway Work Zone Start Point	See Work Description
Roadway Work Zone End Point	See Work Description
Posted Speed Limit (roadway)	30 mph
Number of Lanes (each direction)	1

Comments:
Duration of work (30 days) is approximate and may vary pending progress on each borehole. General work hours are from 7:00am to 5:00pm. Work day may be extended beyond 5:00pm as necessary to complete activities, but will be limited to the extent reasonable possible.

2.0 Work Description

Provide a brief description of scope of work:
ARCADIS will be drilling and sampling groundwater and soil at locations on rights-of-ways within the Town of Oyster Bay New York (Town). Temporary borings will be drilled and permanent wells will be installed. Equipment used at each location will include a drill rig, support trucks, a water truck, portable water containers, a pump rig, and a pump. The drill rig will be secured at the location, within the work zone, until the work is complete and will not be moved offsite overnight. Construction fence and yellow flashing lights will be used around the work zone overnight. Vertical profile borings (VPBs) VP-13, VP-14, VP-15 and VP-16 will be installed. Following the completion of each VPB, a permanent monitoring well will be installed in the VPB borehole.

At VP-13 the work zone will begin approximately 20 feet west of the intersection of Broadway and Wilson Lane. The work zone will extend approximately 100 feet west along the northern curb of Broadway, directly in front of the 73 Broadway and 33 Wilson Ln. The work zone will occupy the existing grass right-of-way on the south side of 73 Broadway and 33 Wilson Ln, and 9 feet, measured from the existing curb, of the existing roadway.

At VP-14 the work zone will begin approximately 90 feet east of the intersection of North Herman Avenue and Sophia Street. The work zone will extend approximately 60 feet east along the southern curb of Sophia Street. The work zone will end approximately 170 feet east of the intersection of North Herman Avenue and Sophia Street. The work zone will extend 50 ft south of the southern curb on Sophia Street into the grass area. The work zone will occupy the grass area on the powerline easement and will not interefere with traffic on Sophia Street.

At VP-15 the work zone will be located within the powerline easement area west of Broadway. The work zone will occupy the grass area between the overhead powerline and trees on southern side of Authur Ave. The work zone will begin approxmiately 30 feet west of the western curb of Broadway and extend approximately 80 feet west. All equpment and trucks must be staged in the grass area. No trucks or equipment shall be starged within the public roadway.

At VP-16 the work zone will be located within the powerline easement area east of Broadway. The work zone will begin approximately 370 feet east of Broadway and extend approximately 80 feet east along the northern side of the access road within the easement. Work zone will be on the grass area and will not interfere with traffic on the access road.

Due to the complexity of underground utilities at these locations 5ft hand clear will be performed to

3.0 Type and Duration

Work locations on this project will be: Long term work (>8 hours per location)

Roadway work will be performed: On shoulder and sidewalk

Special traffic conditions may include (select most prevalent): Construction equipment

4.0 Traffic Control Layout, Number of Devices Required and Phasing

The following traffic control configuration in the Field Guide to RWZ Safety applies:

Section 6.5 Shoulder Work with Minor Encroachment (DOT Facts-301m)

The following pedestrian requirements in the Field Guide to RWZ Safety applies:

Section 8.1 Sidewalk Detour or Diversion (DOT Facts-301x)

All ARCADIS vehicles in a RWZ will, at a minimum, have a functioning high intensity strobe or rotating orange light. All ARCADIS employees in the RWZ will wear, at a minimum, a retroreflective high visibility vest meeting Class II or III requirements and other PPE required by JSA or HASP. Don't leave vehicle doors open. Do not park within 25 ft of the rear or front of parked large vehicles/construction equipment.

Select the traffic control devices to be used and enter number each required:

Check all that apply:	*Wording or Pictogram*	*Number:*
☑ Warning signs	Road Work Ahead	See attached layout
☑ Warning signs	End Road Work	See attached layout
☐ Warning signs		
☐ Stop/Slow paddle		
☐ Red flag		
☐ Drums		
☐ Channelizer cone (42 inch height, 10 lb base)		
☐ Channelizer cone (42 inch height, 30 lb base)		
☑ Traffic cones (≥ 18 inches tall)		20
☐ Barricade ☐ Type I ☐ Type II		
☐ Flags for cones		
☐ Lights (for night work)		
☑ Plastic fencing (rolls)		12
☑ Caution tape (rolls)		12
☑ Other (specify):		
	Type III Barricade (One Rail)	2 per work zone
	Solar Warning Lights	1 per barricade
	Sidewalk Closed	See attached layout

TCP Phasing:

1) Deploy warning signs at first approach, if required

2) Deploy subsequent approach warning signs, if required

3) Deploy channeling devices, if required, starting with first approach

4) Deploy "End Road Work" signs, if required

5) Position vehicle as shield to the extent practical

6) Commence work, SSO or designated contractor to maintain devices

7) Remove devices in reverse order

5.0 Approvals

Plan Developer: Xuan Xu

HASP Reviewer Carlo San Giovanni

Engineering Judgment Review By: Justin Maderia

Traffic Control Plan/Site Traffic Awareness and Response Plan
Revision 8, 10/15/2015

1.0 General

Plan type	TCP
Project Name:	Northrop Grumman System Corporation
Project Number:	NY001496.2515
Developer Name:	Xuan Xu
Duration of Project (in hours or days):	60 days
Time Restrictions (Y/N, if Y descibe below):	Y
Roadway Work Zone Start Point	See Work Description
Roadway Work Zone End Point	See Work Description
Posted Speed Limit (roadway)	30 mph
Number of Lanes (each direction)	1

Comments:
Duration of work (60 days) is approximate and may vary pending progress on each borehole. General work hours are from 7:00am to 5:00pm. Work day may be extended beyond 5:00pm as necessary to complete activities, but will be limited to the extent reasonable possible.

2.0 Work Description

Provide a brief description of scope of work:
ARCADIS will be drilling and sampling soil at locations on rights-of-ways within the Town of Oyster Bay New York (Town). A single permanent remedial well will be installed. Equipment used at each location will include a drill rig, support trucks, a water truck, portable water containers, a pump rig, and a pump. The drill rig will be secured at the location, within the work zone, until the work is complete and will not be moved offsite overnight. Construction fence and yellow flashing lights will be used around the work zone overnight. Test boring RW-20 will be installed. Following the completion of the test boring, the remedial well will be installed in the test boring location.

At RW-20, William Street will be closed between the intersection with Broadway and 115ft east of the intersection with Broadway (shown in the attached figure). The work zone will begin at the intersection of Broadway and William Street. On William Street the work zone will extend approximately 115 feet east of the intersection with Broadway. On Broadway the work zone will extend approximately 100 feet north and 40 feet south of the intersection with William Street. The actual size of the work zone may vary depending on the final location of the boring. The work zone will occupy the existing pavement and the existing grass right-of-way.

Due to the complexity of underground utilities at these locations, 5ft hand clear will be performed to determine final drilling location. Once the remedial wells are installed, a separate crew will develop and sample the wells.

3.0 Type and Duration

Work locations on this project will be: Long term work (>8 hours per location)

Roadway work will be performed: Road and sidewalk closure

Special traffic conditions may include (select most prevalent): Construction equipment

4.0 Traffic Control Layout, Number of Devices Required and Phasing

The following traffic control configuration in the Field Guide to RWZ Safety applies:

Section 6.13 Atypical Traffic Control (DOT Facts-301u)

All ARCADIS vehicles in a RWZ will, at a minimum, have a functioning high intensity strobe or rotating orange light. All ARCADIS employees in the RWZ will wear, at a minimum, a retroreflective high visibility vest meeting Class II or III requirements and other PPE required by JSA or HASP. Don't leave vehicle doors open. Do not park within 25 ft of the rear or front of parked large vehicles/construction equipment.

Select the traffic control devices to be used and enter number each required:

Check all that apply:	*Wording or Pictogram*	*Number:*
☑ Warning signs	Road Closure Signs	See attached layout
☑ Warning signs	Side Walk Closed	See attached layout
☐ Warning signs		See attached layout
☐ Stop/Slow paddle		
☐ Red flag		
☐ Drums		
☐ Channelizer cone (42 inch height, 10 lb base)		
☐ Channelizer cone (42 inch height, 30 lb base)		
☑ Traffic cones (≥ 18 inches tall)		7
☐ Barricade ☐ Type I ☐ Type II		
☐ Flags for cones		
☐ Lights (for night work)		
☑ Plastic fencing (rolls)		10
☑ Caution tape (rolls)		10
☑ Other (specify):		
	Type III Barricade (On Rail)	See attached layout
	Solar Warning Lights	1 per barricade

TCP Phasing:

1) Deploy warning signs at first approach, if required

2) Deploy subsequent approach warning signs, if required

3) Deploy channeling devices, if required, starting with first approach

4) Deploy "End Road Work" signs, if required

5) Position vehicle as shield to the extent practical

6) Commence work, SSO or designated contractor to maintain devices

7) Remove devices in reverse order

5.0 Approvals

Plan Developer: Xuan Xu

HASP Reviewer: Carlo San Giovanni

Engineering Judgment Review By: Justin Maderia

Traffic Control Plan/Site Traffic Awareness and Response Plan
Revision 8, 10/15/2015

1.0 General

Plan type	TCP
Project Name:	Northrop Grumman System Corporation
Project Number:	NY001496.2415
Developer Name:	Xuan Xu
Duration of Project (in hours or days):	60 days
Time Restrictions (Y/N, if Y descibe below):	Y
Roadway Work Zone Start Point	See Work Description
Roadway Work Zone End Point	See Work Description
Posted Speed Limit (roadway)	30 mph
Number of Lanes (each direction)	1

Comments:
Duration of work (60 days) is approximate and may vary pending progress on each borehole. General work hours are from 7:00am to 5:00pm. Work day may be extended beyond 5:00pm as necessary to complete activities, but will be limited to the extent reasonable possible.

2.0 Work Description

Provide a brief description of scope of work:
ARCADIS will be drilling and sampling soil at locations on rights-of-ways within the Town of Oyster Bay New York (Town). Test borings will be drilled and permanent recovery wells will be installed. Equipment used at each location will include a drill rig, support trucks, a water truck, portable water containers, a pump rig, and a pump. The drill rig will be secured at the location, within the work zone, until the work is complete and will not be moved offsite overnight. Construction fence and yellow flashing lights will be used around the work zone overnight. Test boring RW-21 will be installed. Following the completion of each test boring, a recovery well will be installed in the test boring location.

At RW-21 the southern portion of the municipal parking lot will be closed for the duration of the work (shown in attached figure).

Due to the complexity of underground utilities at these locations, 5ft hand clear will be performed to determine final drilling location. Once the recovery wells are installed, a separate crew will develop and sample the wells.

3.0 Type and Duration

Work locations on this project will be: Long term work (>8 hours per location)

Roadway work will be performed: Road and sidewalk closure

Special traffic conditions may include (select most prevalent): Construction equipment

4.0 Traffic Control Layout, Number of Devices Required and Phasing

The following traffic control configuration in the Field Guide to RWZ Safety applies:

Section 6.13 Atypical Traffic Control (DOT Facts-301u)

All ARCADIS vehicles in a RWZ will, at a minimum, have a functioning high intensity strobe or rotating orange light. All ARCADIS employees in the RWZ will wear, at a minimum, a retroreflective high visibility vest meeting Class II or III requirements and other PPE required by JSA or HASP. Don't leave vehicle doors open. Do not park within 25 ft of the rear or front of parked large vehicles/construction equipment.

Select the traffic control devices to be used and enter number each required:

Check all that apply:	*Wording or Pictogram*	*Number:*
☑ Warning signs	Road Work Ahead	See attached layout
☑ Warning signs	End Road Work	See attached layout
☑ Warning signs	Road Closed Ahead	See attached layout
☐ Stop/Slow paddle		
☐ Red flag		
☐ Drums		
☐ Channelizer cone (42 inch height, 10 lb base)		
☐ Channelizer cone (42 inch height, 30 lb base)		
☑ Traffic cones (≥ 18 inches tall)		20
☐ Barricade ☐ Type I ☐ Type II		
☐ Flags for cones		
☐ Lights (for night work)		
☑ Plastic fencing (rolls)		10
☑ Caution tape (rolls)		10
☑ Other (specify):		
	Type III Barricade (One Rail)	See attached layout
	Solar Warning Lights	1 per barricade
	Sidewalk Closed	See attached layout

TCP Phasing:

1) Deploy warning signs at first approach, if required

2) Deploy subsequent approach warning signs, if required

3) Deploy channeling devices, if required, starting with first approach

4) Deploy "End Road Work" signs, if required

5) Position vehicle as shield to the extent practical

6) Commence work, SSO or designated contractor to maintain devices

7) Remove devices in reverse order

5.0 Approvals

Plan Developer: Xuan Xu

HASP Reviewer Carlo San Giovanni

Engineering Judgment Review By: Justin Maderia

Traffic Control Plan/Site Traffic Awareness and Response Plan
Revision 8, 10/15/2015

1.0 General

Plan type	TCP
Project Name:	Northrop Grumman System Corporation
Project Number:	NY001496.2515
Developer Name:	Xuan Xu
Duration of Project (in hours or days):	60 days
Time Restrictions (Y/N, if Y descibe below):	Y
Roadway Work Zone Start Point	See Work Description
Roadway Work Zone End Point	See Work Description
Posted Speed Limit (roadway)	NA
Number of Lanes (each direction)	1

Comments:
Duration of work (60 days) is approximate and may vary pending progress on each borehole. General work hours are from 7:00am to 5:00pm. Work day may be extended beyond 5:00pm as necessary to complete activities, but will be limited to the extent reasonable possible.

2.0 Work Description

Provide a brief description of scope of work:
ARCADIS will be installating remedial well RW-22 on rights-of-ways within the Town of Oyster Bay New York (Town). Equipment used at each location will include a drill rig, support trucks, a water truck, portable water containers, a pump rig, and a pump. The drill rig will be secured at the location, within the work zone, until the work is complete and will not be moved offsite overnight. Construction fence and yellow flashing lights will be used around the work zone overnight.

At RW-22, the work zone will be located within the powerline easement area east of Broadway. The work zone will begin approximately 80 feet east of Broadway and extend approximately 100 feet east along the northern side of the access road within the easement. Work zone will be on the grass area and will not interfere with traffic on the access road.

Due to the complexity of underground utilities at these locations, 5ft hand clear will be performed to determine final drilling location. Once the recovery well is installed, a separate crew will develop and sample the wells.

3.0 Type and Duration

Work locations on this project will be: Long term work (>8 hours per location)

Roadway work will be performed: Greenway

Special traffic conditions may include (select most prevalent): Construction equipment

4.0 Traffic Control Layout, Number of Devices Required and Phasing

The following traffic control configuration in the Field Guide to RWZ Safety applies:
Section 6.13 Atypical Traffic Control (DOT Facts-301u)

The following pedestrian requirements in the Field Guide to RWZ Safety applies:

All ARCADIS vehicles in a RWZ will, at a minimum, have a functioning high intensity strobe or rotating orange light. All ARCADIS employees in the RWZ will wear, at a minimum, a retroreflective high visibility vest meeting Class II or III requirements and other PPE required by JSA or HASP. Don't leave vehicle doors open. Do not park within 25 ft of the rear or front of parked large vehicles/construction equipment.

Select the traffic control devices to be used and enter number each required:

Check all that apply:	*Wording or Pictogram*	*Number:*
☑ Warning signs	Road Work Ahead	See attached layout
☑ Warning signs	End Road Work	See attached layout
☐ Warning signs		See attached layout
☐ Stop/Slow paddle		
☐ Red flag		
☐ Drums		
☐ Channelizer cone (42 inch height, 10 lb base)		
☐ Channelizer cone (42 inch height, 30 lb base)		
☑ Traffic cones (≥ 18 inches tall)		20
☐ Barricade ☐ Type I ☐ Type II		
☐ Flags for cones		
☐ Lights (for night work)		
☑ Plastic fencing (rolls)		as needed
☑ Caution tape (rolls)		as needed
☑ Other (specify):		
	Solar Warning Lights	as needed

TCP Phasing:

1) Deploy warning signs at first approach, if required

2) Deploy subsequent approach warning signs, if required

3) Deploy channeling devices, if required, starting with first approach

4) Deploy "End Road Work" signs, if required

5) Position vehicle as shield to the extent practical

6) Commence work, SSO or designated contractor to maintain devices

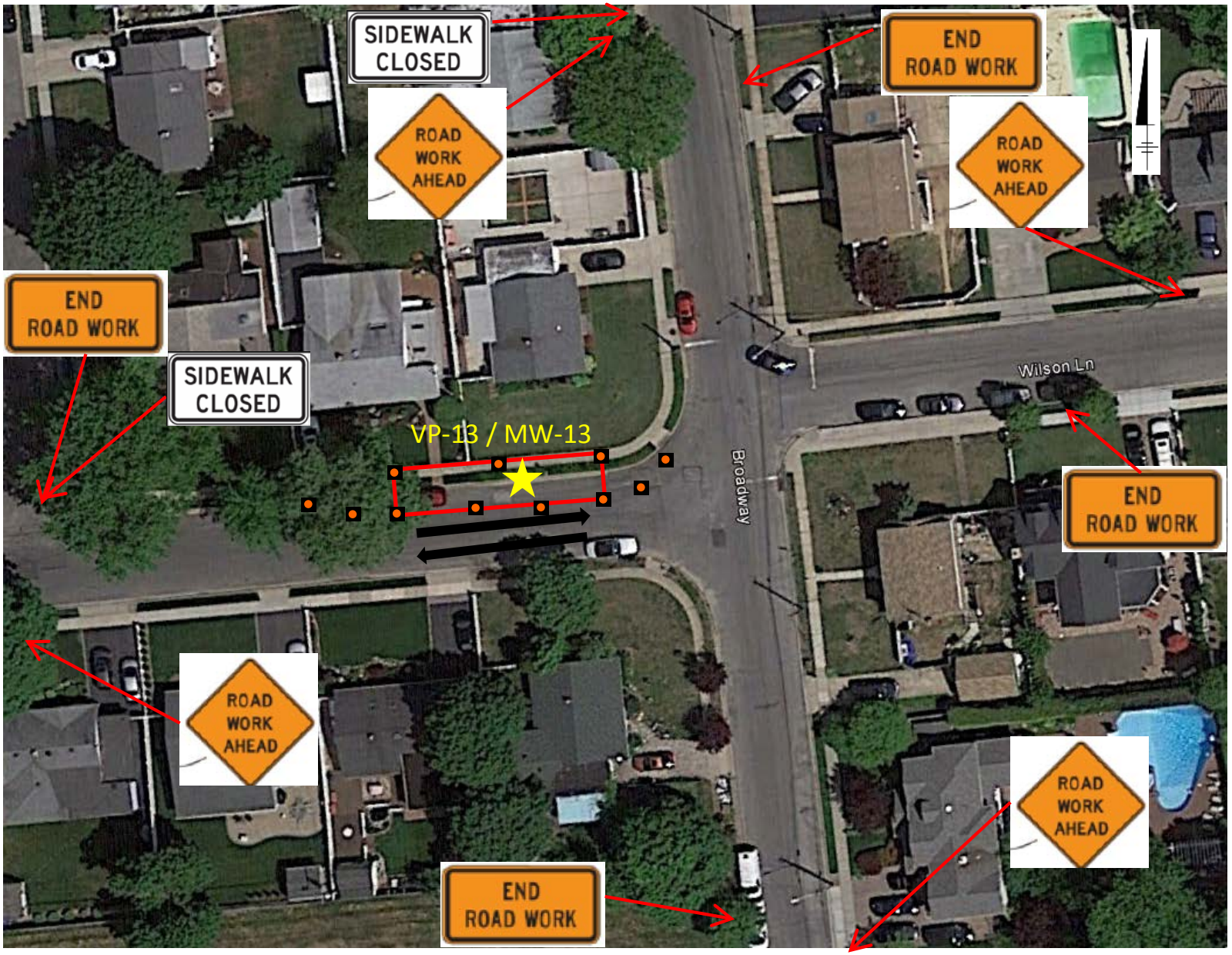
7) Remove devices in reverse order

5.0 Approvals

Plan Developer: Xuan Xu

HASP Reviewer Carlo San Giovanni

Engineering Judgment Review By: Justin Maderia



Approximate extend of work zone. Extend approximately 9ft from curb onto Wilson Ln.

Channelizer Cones. Cone spacing on road side is 25ft or less apart

Traffic direction. Two-lane, two-way traffic will be maintained on Wilson Ln at all times.

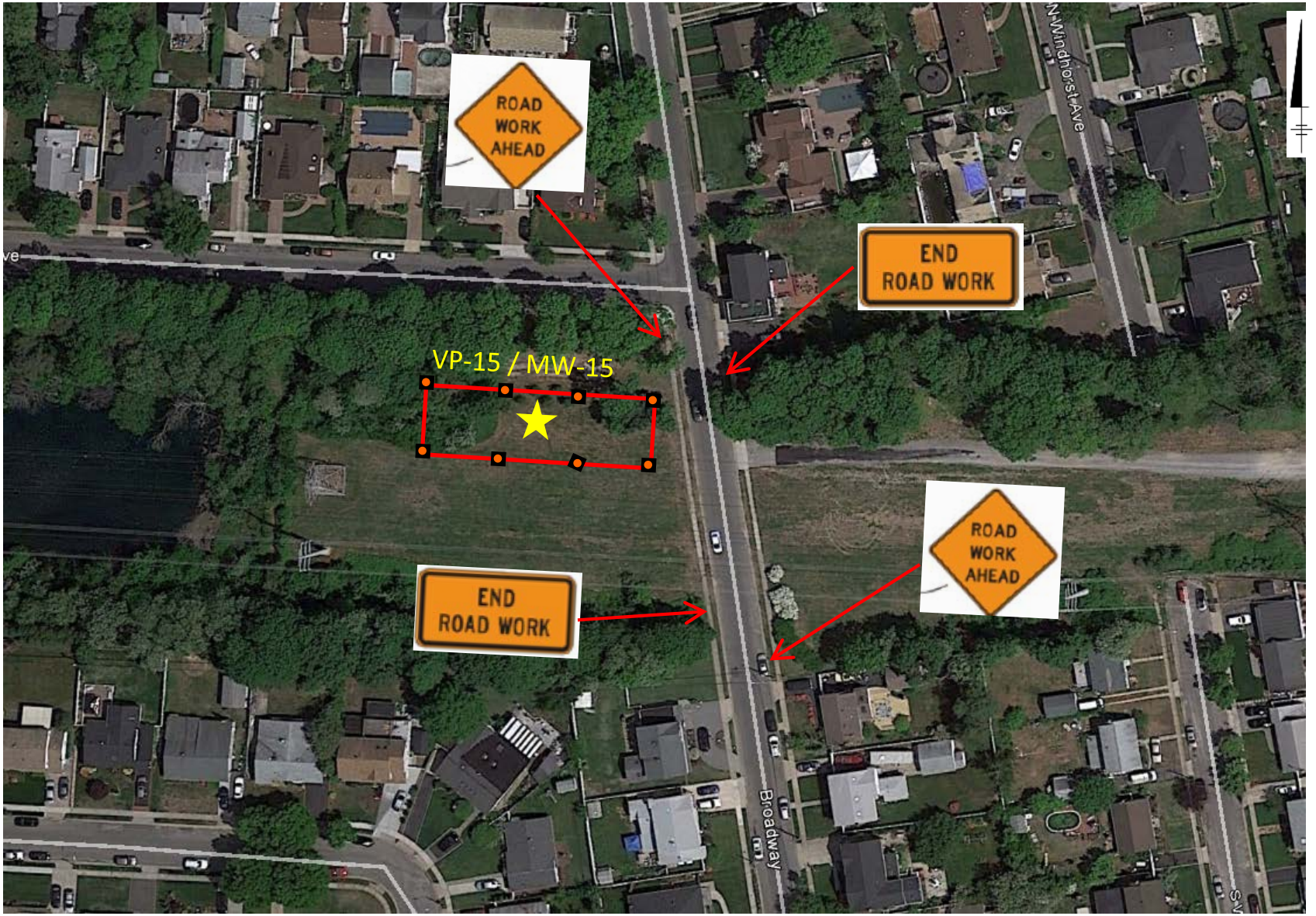
SIDEWALK CLOSED

"SIDEWALK CLOSED" will be placed at proceeding crosswalk.

Approximate extend of work zone. Extend approximately 5ft from curb onto Sophia St.

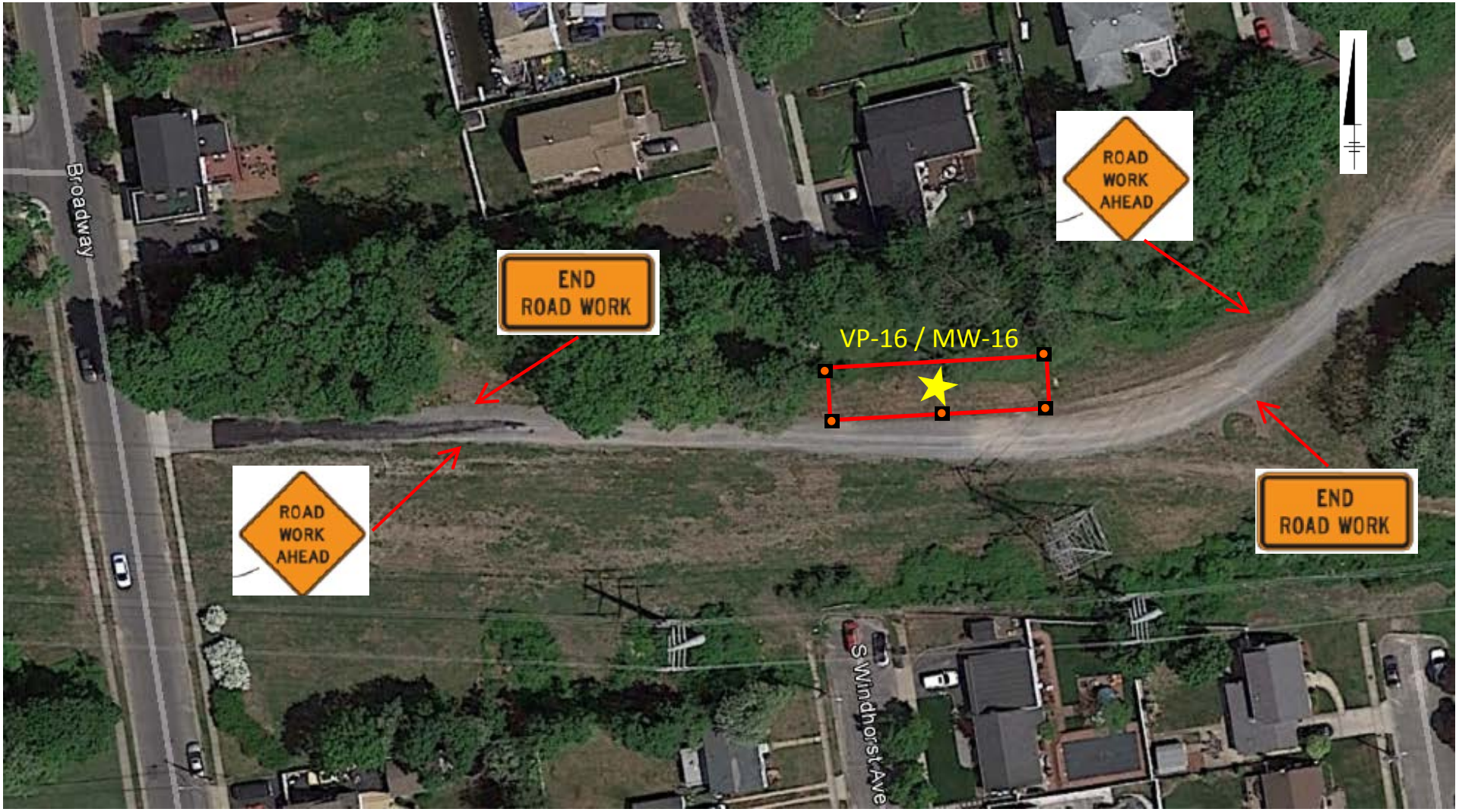
Channelizer Cones. Cone spacing on road side is 25ft or less apart

Traffic direction. Two-lane, two-way traffic will be maintained on Sophia St at all times.



Approximate extend of work zone

Channelizer Cones. Cone spacing on road side is 25ft or less apart

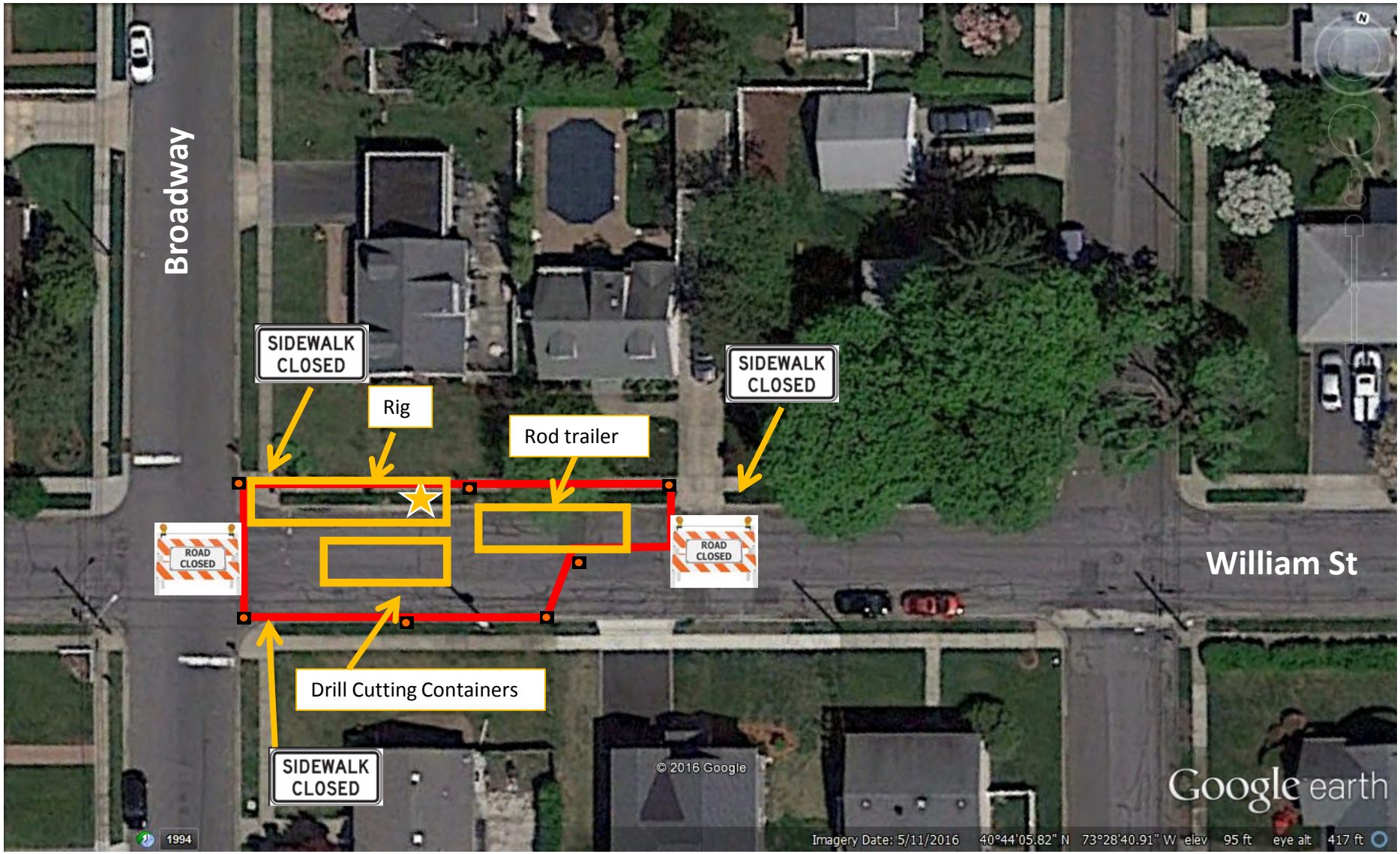


Approximate extend of work zone

Channelizer Cones. Cone spacing on road side is 25ft or less apart

Traffic direction. Two-lane, two-way traffic will be maintained on access road at all times

RW-20 Layout of Traffic Control Signs



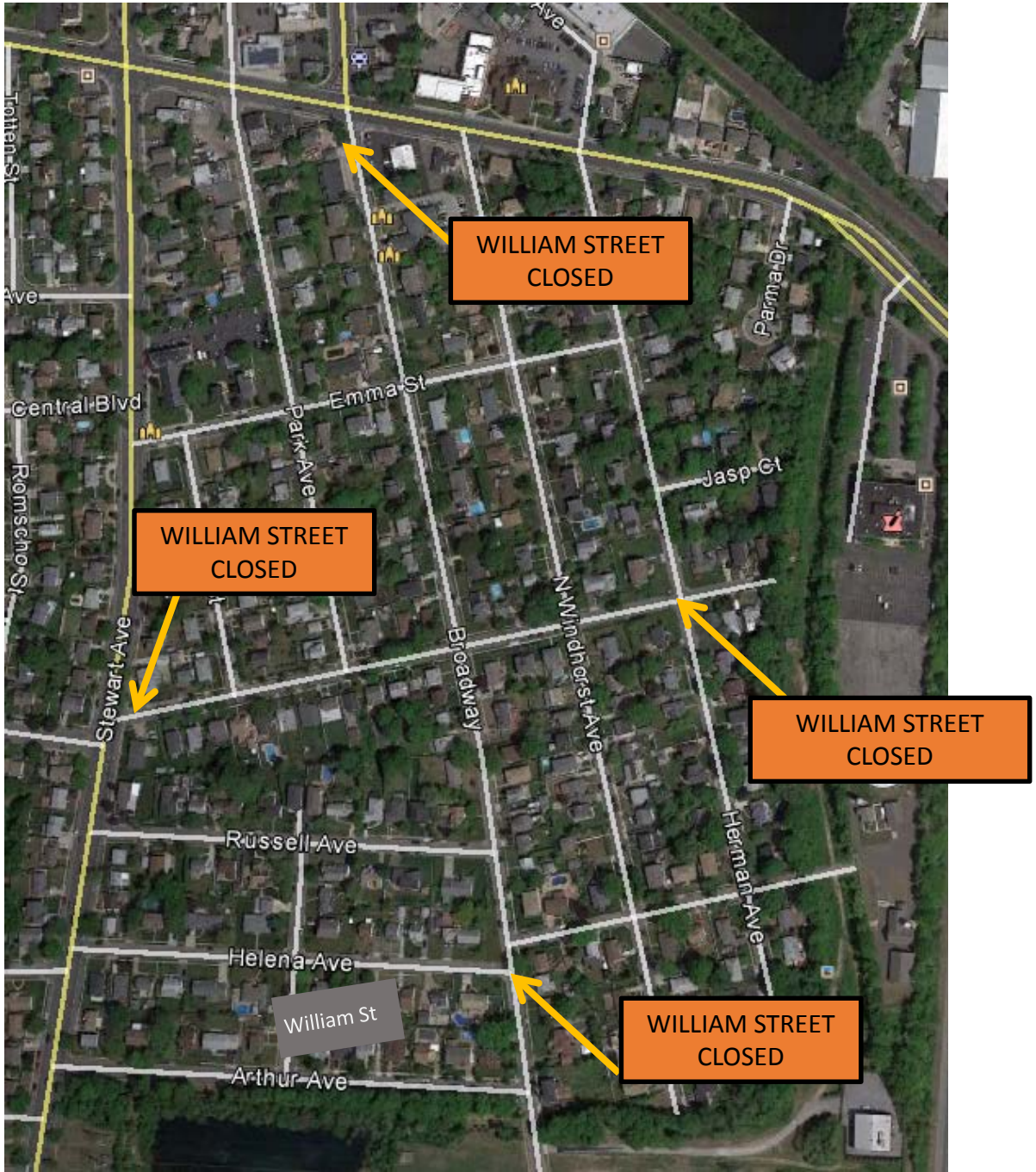
Approximate location of proposed remedial well RW-20

Approximate extend of Work zone

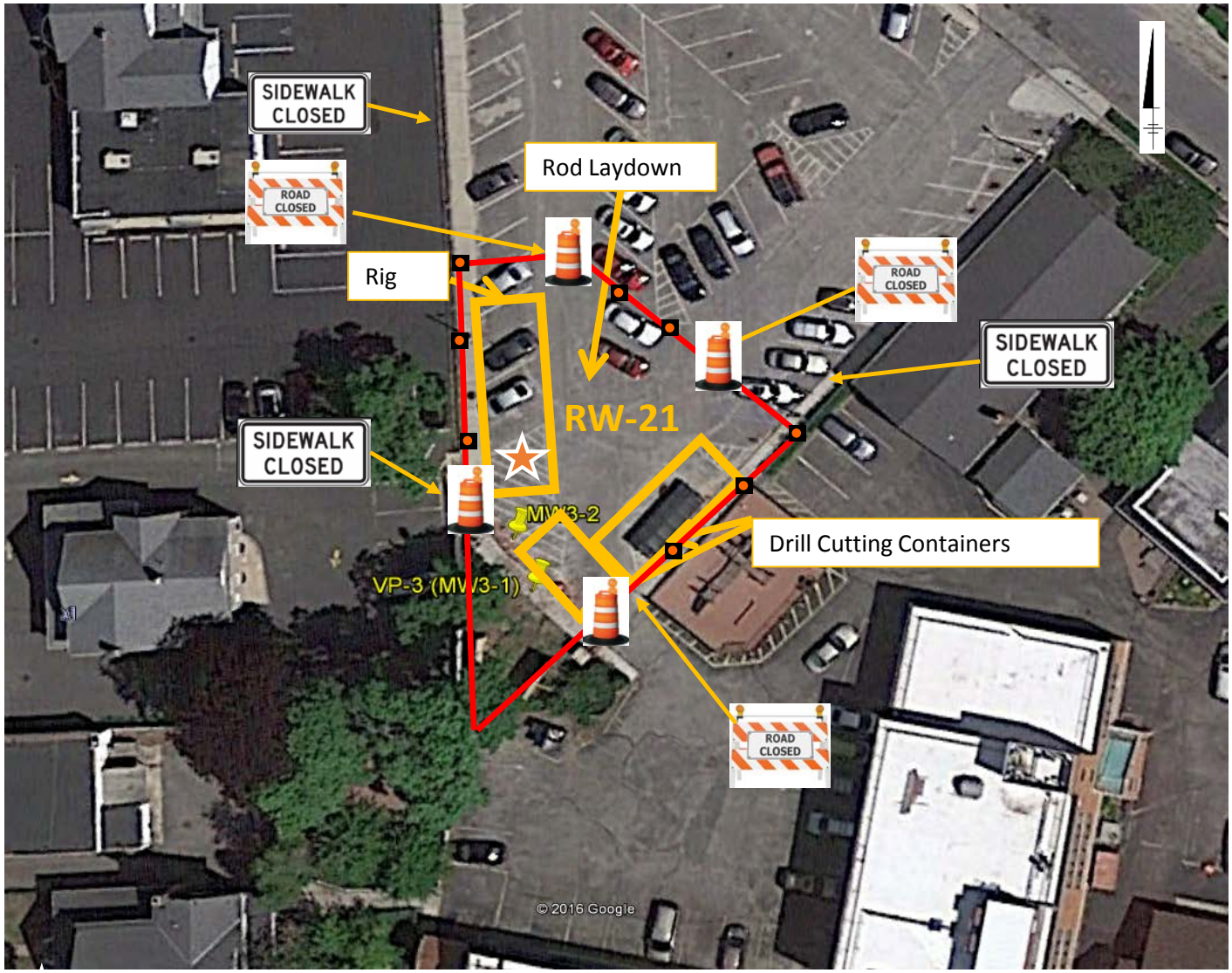
Channelizer Cones with safety fencing. Cone spacing on road side is 25ft or less apart.

RW-20 Road Closure Signs

RW-20 Road Closure Signs (cont.)



RW-21 Layout of Traffic Control Signs



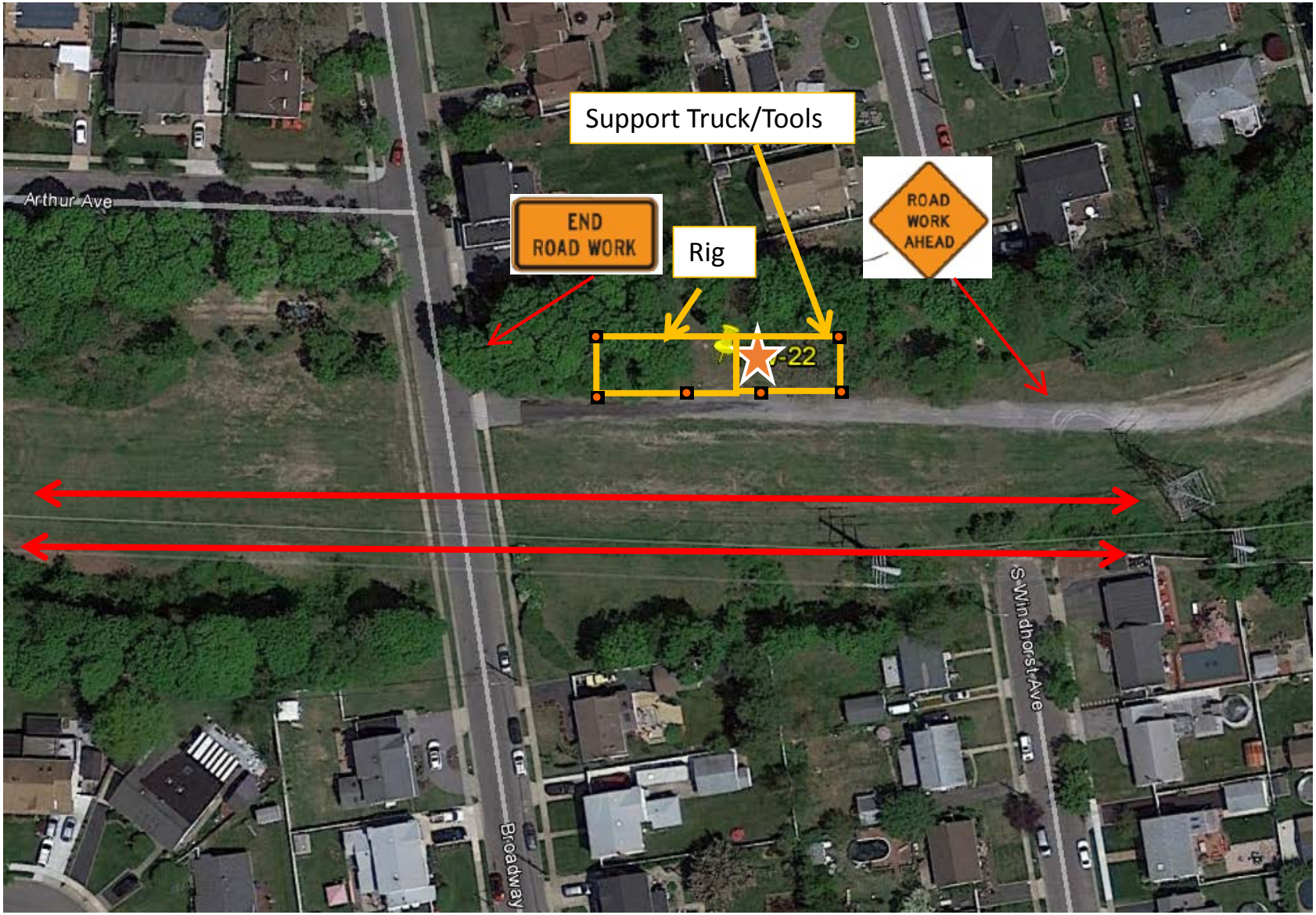
Approximate location of proposed remedial well RW-21

Approximate extend of Work zone

Channelizer Cones with safety fencing. Cone spacing on road side is 25ft or less apart.

Traffic drum with solar barricade flashing light

RW-22 Layout of Traffic Control Signs

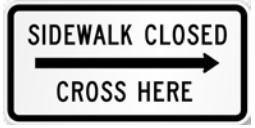


Approximate extend of work zone

Channelizer Cones. Cone spacing on road side is 25ft or less apart


ROAD
CLOSED
AHEAD


SIDEWALK
CLOSED


SIDEWALK CLOSED
CROSS HERE


BE
PREPARED
TO STOP


ROAD
CLOSED

APPENDIX B

Community Air Monitoring Plan (CAMP)

ARCADIS

David Stern
Task Manager

Carlo San Giovanni
Project Manager

Michael F. Wolfert
Project Director

Appendix A
Attachment A-2
Community Air Monitoring Plan
Northrop Grumman Systems Corporation
Bethpage, New York.
NYSDEC Site # 1-30-003A
Revised: March 8, 2006

Prepared for:
Northrop Grumman Systems Corporation

Prepared by:
ARCADIS G&M, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610

Our Ref.:
NY001348.0706.00002

Date:
8 March 2006

Former Grumman Settling Ponds (Operable Unit 3 – Bethpage Community Park), Bethpage, NY

NYSDEC Site #1-30-003A
Revised March 8, 2006

1. Introduction

In accordance with New York State Department of Health (NYSDOH) requirements, this Community Air Monitoring Plan (CAMP) has been prepared for use during certain investigative and remedial field activities associated with the Northrop Grumman Corporation (NGC), Bethpage Facility (Site). This CAMP serves to present the methods and procedures to conduct real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at each designated work area when certain activities are in progress. This CAMP is not intended for use in establishing action levels for worker respiratory protection; action levels are described in the Northrop Grumman Corporation Health and Safety Plan (HASP) (ARCADIS G&M, Inc. 2004). The intent of this CAMP is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers that are not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities that are related to the Site. The response levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, this CAMP helps to confirm that work activities do not spread contamination off-site through the air.

Depending upon the nature of the site-related contaminants of concern, chemical-specific monitoring, with appropriately-sensitive methods, may be required during field work (please refer to the HASP for details).

Reliance on this CAMP does not preclude simple, common-sense measures to keep potential VOCs, dust, and odor emissions at a minimum around work areas.

The following sections of this CAMP present the monitoring instrumentation required to comply with NYSDOH policy, the frequency of monitoring, response levels, and response actions.

2. Monitoring Instrumentation

Based on the currently available analytical data and the contaminants of concern for the NGC Site, real-time air monitoring for VOCs and particulates at the perimeter areas of the work area (i.e., the exclusion zone – see HASP for definition) will be necessary for field activities associated with investigation and remediation of the NGC Site.

VOC monitoring will be performed using real-time monitoring instrumentation that is appropriate to measure the types of VOCs known or suspected to be present at the work location (please refer to the HASP for details). The equipment will be calibrated on the frequency and using the methods described in the HASP. It is preferable to use instrumentation that is capable of calculating 15-minute running average concentrations or provide a written record of readings taken during monitoring events. If neither capability is available, then the reading obtained every 15 minutes will be used for decision making.

The particulate monitoring will be performed using real-time monitoring instrumentation that is capable of measuring particulates less than 10 micrometers in size (PM-10). It is preferable to use instrumentation that is capable of calculating 15-minute running average concentrations or provide a written record of readings taken during monitoring events. If neither capability is available, then the reading obtained every 15 minutes will be used for decision making. The particulate monitoring equipment will be equipped with an audible alarm to indicate exceedence of the response level.

3. Monitoring Frequency

This section defines the typical activities that will occur in relation to the NGC Site and relates these activities to the frequency of monitoring required.

Continuous Monitoring for VOCs and Particulates Will be Carried out for Intrusive Activities. Additionally, upwind VOC and particulate concentrations will be measured at the **start** of each work day and **periodically** (see below) thereafter to establish the background concentration. Ground intrusive activities typically include the following:

1. Soil excavation and handling.
2. Test pitting or trenching.
3. Drilling and installation of vertical profile borings, soil borings, and/or wells.
4. During the demolition of contaminated or potentially contaminated structures.
5. Construction activities involving earthwork or disturbance of earthen surfaces.

6. Other activities specified in this CAMP.

Periodic monitoring for VOCs will be carried out during non-intrusive activities. For non-intrusive activities, the upwind concentrations will be measured at the **start and finish** of the work effort to establish the background concentration. Non-intrusive activities typically include the following:

1. Site Mobilization/Demobilization of equipment and machinery.
2. Drum or container sampling.
3. Soil sampling (to the extent not coinciding with intrusive work).
4. Groundwater sampling.
5. Water-level measurements.
6. Surveying (geophysical, coordinate/elevation).
7. Well development.
8. Waste transportation.
9. Site preparation and restoration that does not involve re-grading or other disturbances to surface materials.

"Periodic" monitoring should be performed, at a minimum as follows:

1. Upon arrival at a work location to determine the ambient, or background concentrations.
2. During each phase of work that potentially may generate VOC emissions to the air.
3. Prior to leaving the work location.

As an example, "Periodic" monitoring for VOCs during sample collection activities shall include monitoring as above and during the following times:

1. When accessing wells, opening drums or containers, or overturning soil.

2. During well bailing/purging.

3. During collection of samples (soil/sediment/water).

For non-intrusive activities, particulate monitoring will not be performed.

Continuous monitoring for VOCs will be carried out during activities that occur on the Bethpage Community Park property.

3.1 VOC Monitoring Stations Locations, Response Levels, and Action

During each workday, the VOC monitoring station will be positioned at the downwind perimeter of the work area (i.e., the exclusion zone – see HASP for definition). As stated above, monitoring frequency (periodic or continuous) will be determined based on whether the activity is considered intrusive or non-intrusive (or whether the activity is occurring on Bethpage Community Park property). The direction of wind (if any) will be periodically recorded during each work day and re-positioning of upwind/downwind monitoring stations will be performed accordingly.

The VOC monitoring instrumentation output documenting 15-minute running average concentrations (or printed output of readings taken or the reading taken every 15 minutes, as available), will be compared to the following response levels:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 parts per million (ppm) **above background** for the 15-minute average, work activities will be temporarily halted and monitoring continued.

  If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm **above background** but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the work area or half the distance to the nearest potential

receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15- minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All readings will be recorded on the appropriate air monitoring log (please refer to the HASP for details) or the electronic log will be printed out. Air monitoring results will be appended to the appropriate report.

3.2 Particulate Monitoring Stations Locations, Response Levels, and Actions

For intrusive activities, the particulate (i.e., dust) monitoring station will be positioned at the downwind perimeter of the work zone (i.e., exclusion zone – see HASP for definition). In addition, fugitive dust migration will be visually assessed during all work activities. The direction of wind (if any) will be periodically recorded during each work day and re-positioning of the downwind monitoring station will be performed accordingly. The response levels and actions for fugitive dust are as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater **than background** (upwind perimeter) for the 15-minute period or if airborne dust is visually observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is observed leaving the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the **background** concentration, then work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and/or other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust from leaving the work area.

All readings will be recorded on the appropriate air monitoring log (please refer to the HASP for details) or the electronic log will be printed out. Air monitoring results will be appended to the appropriate report.

APPENDIX C

Example Noise Attenuation Barriers


856-694-4200
43
UNITECH DRILLING CO. INC.
WELLS • PUMPS • TEST BORINGS
MALAGA, N.J.
GVW 46,600
US DOT 58022

UNI-TECH DRILLING CO. INC.

WELLS • PUMPS • TEST BORINGS

MALAGA, N.J.

GVW 46,600

US DOT 513122


DANGER
LIQUEFIED PETROLEUM GAS
UN 1075
FLAMMABLE GAS 2
PELIGRO
WARNING
ADVERTENCIA

Arcadis of New York, Inc.

Two Huntington Quadrangle

Suite 1S10

Melville, New York 11747

Tel 631 249 7600

Fax 631 249 7610

www.arcadis.com