APPENDIX G

Noise Analysis

NOISE ANALYSIS

CARROLL SOLID WASTE MANAGEMENT FACILITY
CARROLL, NEW YORK

Prepared on behalf of:

Sealand Waste, LLC
85 High Tech Drive
Rush, New York 14543

Prepared by:

DAIGLER ENGINEERING P.C.
2620 Grand Island Blvd.
Grand Island, New York 14072-2131

February 2015

Revised January 2017

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TABLE OF CONTENTS

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TABLE OF CONTENTS

List of Tables **page**

List of Figures **page**

List of Attachments

1 INTRODUCTION

Sealand Waste, LLC (Sealand) retained Daigler Engineering, PC (DE) and Aurora Acoustical Consultants Inc. (AAC) to complete a noise analysis for the Carroll Solid Waste Management Facility (SWMF) expansion application. The project site is a 54.1-acre parcel at the now closed Jones-Carroll Landfill, a Construction and Demolition (C&D) debris landfill in the Town of Carroll, Chautauqua County, New York. The location of the project is shown in Figure 1.

To complete the analysis, existing land use and receptors were identified, and noise measurements were obtained at select locations. The character of the project was defined in terms of the construction and operational methods, identification of noise generating equipment and activities, and future noise predictions were completed to evaluate the consistency of the proposed facility operation to the requirements of the solid waste management facility regulations. Noise abatement measures were examined and incorporated into the project design as needed. The results of the analysis and abatement measures are compared to the thresholds found in the governing set of regulations regarding operational noise from a solid waste management facility under 6 NYCRR Part 360-1.14(p).

Combined construction and operational noise levels were compared to impact thresholds identified in the Assessing and Mitigating Noise Impacts (DEP-00-1, October 2001) program policy issued by the New York State Department of Environmental Conservation (NYSDEC) and the requirements of the State Environmental Quality Review (SEQR) Act.

1.1 NOISE DEFINED

Frequency and loudness are characteristics of sound, or noise. Frequency, perceived as pitch, is the rate of vibration of the source itself, or the rate at which the source vibrates the surrounding air. Loudness, or what is heard, is expressed using the decibel scale which is a measure of the sound pressure level (SPL). The L_{eq} is the equivalent steady-state SPL, which contains the same acoustic energy as the time varying SPL during a one hour period consistent with the averaging procedures adopted by the standards. The L_{eq} is expressed in the A-weighted decibel scale, dB(A). The terms SPL, L_{eq}, and noise/sound levels are used interchangeably throughout the text. The A-weighted scale is commonly used in noise assessments because it most closely correlates with the human perception of sound levels. Additionally, paragraph 360-1.14(p)(2) requires that the sound level be A-weighted.

Sound power level (PWL) is the acoustical energy emitted by a source. The PWL is not affected by environmental factors and is independent of distance from a source. Generally, equipment sound power ratings are determined in acoustics laboratories by a manufacturer.

1.2 Noise Regulations and Policy

The directives that are included in the governing regulations under 6 NYCRR subdivision 360-1.14(p) are as follows:

> *Noise levels resulting from equipment or operations at the facility must be controlled to prevent transmission of sound levels beyond the property line at locations zoned or otherwise authorized for residential purposes to exceed the following L_{eq} energy equivalent sound levels:*

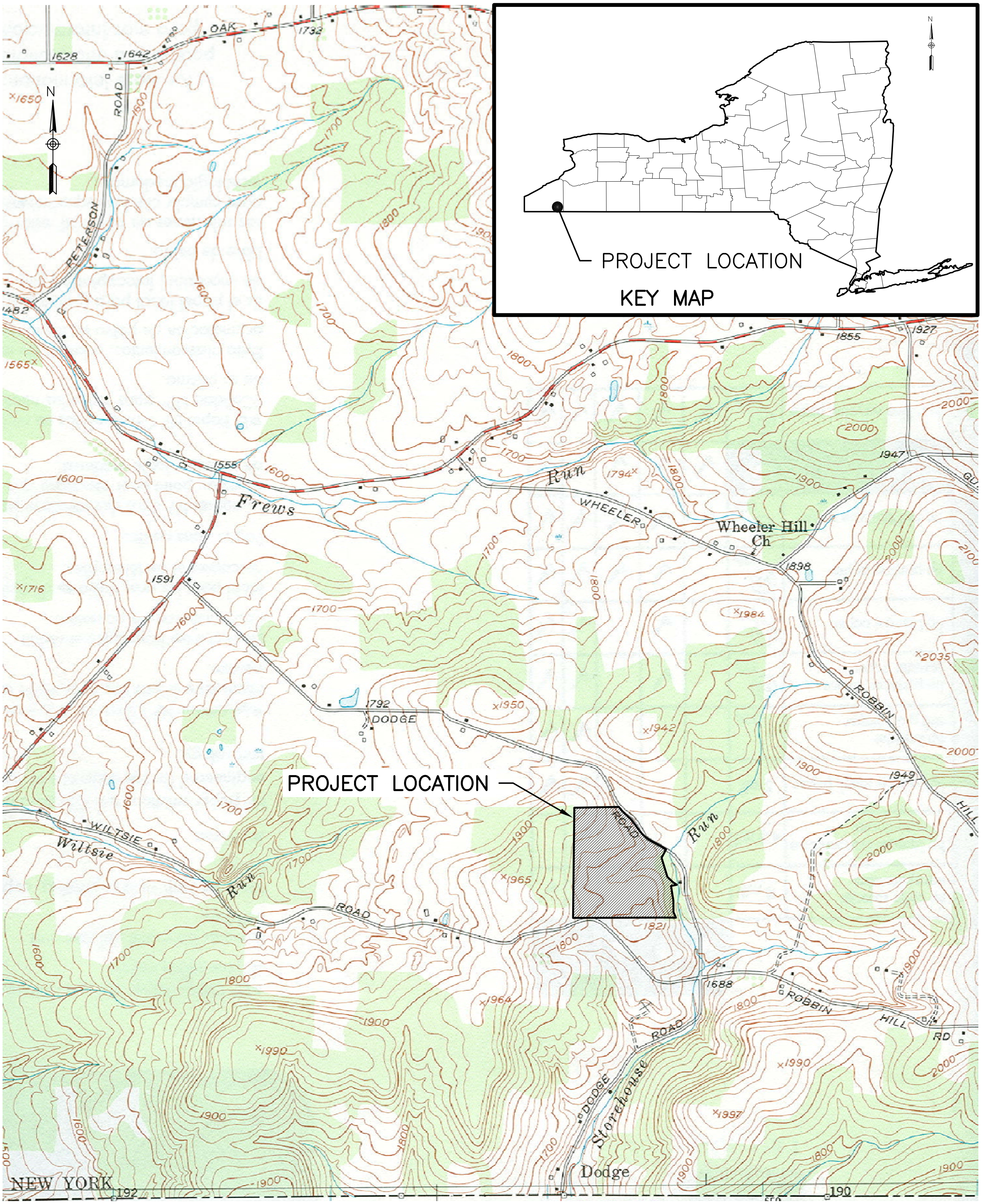
Table 1: Part 360 Noise Levels

Character of Community	L_{eq} Energy Equivalent Sound Levels	
	7 a.m.-10 p.m.	10 p.m.-7 a.m.
Rural	57 dB(A)	47 dB(A)
Suburban	62 dB(A)	52 dB(A)
Urban	67 dB(A)	57 dB(A)

The site is most accurately defined as rural in character.

If the background residual sound levels exceed the above limits, the facility must not produce a L_{eq} exceeding that level. Part 360 also requires that mufflers be fitted to all internal combustion-powered equipment used at the facility.

The NYSDEC also provides a program policy for assessing and mitigating noise impacts that is intended for use by its staff in the evaluation of sound levels and characteristics generated by regulated facilities. The policy states the following as thresholds for significant SPL increases which are pursuant to the requirements of SEQR:



TOPOGRAPHY FROM USGS IVORY 2 QUADRANGLE

Q:\Sealand\02-0104 Carroll Landfill\03 DEIS\Section 1\Figures\FIG 1-1 CARROLL SITE LOCATION.dwg 11/25/2014 2:51 PM

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GENERAL LOCATION MAP NOISE ANALYSIS			
SEALAND WASTE, LLC.			FIGURE 1
TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	
November 2014	SCALE: NOT TO SCALE	REVISION # 0	

The goal for any permitted operation should be to minimize increases in sound pressure level above ambient levels at the chosen point of sound reception. Increases ranging from 0 to 3 dB(A) should have no appreciable effect on receptors. Increases from 3 to 6 dB(A) may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Sound pressure increases of more than 6 dB(A) may require a closer analysis of impact potential depending on existing SPLs and the character of surrounding land use and receptors. SPL increase approaching 10 dB(A) result in a perceived doubling of SPL. The perceived doubling of the SPL results from the fact that SPLs are measured on a logarithmic scale. An increase of 10 dB(A) deserve consideration of avoidance and mitigation in most cases.

1.3 Modeling Software

Aurora Acoustical Consultants utilized a program to model future noise levels called CadnaA, a dynamic 3D state-of-the-art sound propagation software for modeling, calculating, and assessing environmental noise. The CadnaA software calculates the cumulative A-weighted SPLs resulting from equipment used in the construction and operation of the facility based on standards defined by the International Organization of Standardization (ISO). ISO 9613, which "specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources" is the industry standard for calculation of noise levels emanating from sources.

Modeling provides an effective and controlled demonstration of sound levels from an activity occurring outdoors, considering the environmental conditions that affect sound propagation such as topography, distance between source and receptor, source height, receptor height, meteorological conditions, etc. Furthermore, this sophisticated 3D modeling reasonably predicts noise levels for compliance with the applicable regulations and requirements.

The source noise information input into the model represents reasonable and appropriate assumptions for operating landfill and recycling equipment based on operating conditions found at existing landfills, and the literature. Given that the governing metric is the one-hour L_{eq}, all sources were conservatively assumed to be operating continuously for a one-hour period.

1.4 NOISE ATTENUATION

1.4.1 General

Attenuation of sound is the loss of SPL. Propagation distance, topographic features, and man-made features attenuate sound.

Vegetation has been used for many years to reduce traffic noise from roadways. Plants and trees are known to attenuate SPL by absorption, diffraction, and deflection.

Topographic features, such as a high ridge, can change how sound is received. When the ridge is large enough to intersect the line-of-sight of the receiver to the noise source, a sound barrier effect will occur and can greatly reduce the SPL at the receptor.

Man-made features such as berms will reduce the SPL at the receiver's location by intersecting the line-of-sight of the receiver of the noise source. The closer the berm to the sound source or the receptor, the greater degree of attenuation will be accomplished at the receptor location.

1.4.2 Method for Calculating L_{eq}

The measured noise levels and related noise measurements are reported as L_{eq} sound measurements. To calculate the cumulative L_{eq}, Equation 4.36 from Rau & Wooten (1980) was used, as follows:

$$L_{eq} = 10\log\left(\sum_{i=1}^{n} f_i 10^{Li/10}\right)$$

Where;

L_{eq} = Cumulative equivalent sound level [dB(A)]

f_i = Ratio of time per receptor session to the total amount of time lapsed for all measurements in the set

L_i = Measured equivalent sound level for a single source [dB(A)]

1.4.3 General Mitigation Measures

With the exception of routine site preparation in the morning hours, most site activities will normally be limited to between 7:00 am and 7:00 pm Monday through Friday. Waste will be accepted between 7:00 am and 5:00 pm, Monday through Friday, and between 7:00 am and 2:00 pm on Saturdays. The operating hours are consistent with Part 360 regulations regarding noise levels during operations between 7:00 am and 10:00 pm. In the event foreseeable and unusual before/after hour work is required, the NYSDEC, the Town Clerk and adjacent residents will be notified in advance.

Beyond initial operations that are well below grade, much of the site operation will be occurring behind a waste slope or operational screening berm, which automatically creates an attenuation feature. Construction of these screening berms will create temporary noise impacts as construction equipment will be exposed to offsite receptors; however, long term benefits will result as noise from operational activities occurring behind these screening berms is shielded from offsite receptors.

Barrier walls are commonly used to attenuate noise levels, and will be used as necessary to control sound pressure levels at the property boundary.

The use of jake brakes is a common concern in evaluating noise impacts. Sealand will establish a No Jake Brake Rule for users of the facility as a mitigation option.

For situations where sound levels are relatively low, select machines can be equipped with back up alarms that produce an alarm about 5 dB(A) above the instantaneous sound level. An example of this type of alarm is shown in Attachment 3.

1.4.4 Attenuation Calculations

For this evaluation, universally accepted noise attenuation rules are applied in CadnaA, as follows:

1. **Distance to Receptor**: At distances greater than 50 feet, every doubling of distance results in a 6 dB(A) attenuation. CadnaA takes into account receptor distance and attenuates the sound levels in accordance with ISO 9613-2.
2. **Line of Site**: The use of a barrier wall or berm provides attenuation when the line of sight is blocked and is defined by ISO 9613-2. A receptor, is expected to measure five feet in height while the source of noise varies based on the type of noise source and location of the prominent noise features (e.g., vehicle engine versus the vehicle exhaust stack).
3. **Ground Effects**: Ground absorption and reflection of sound can either decrease or increase the perceived sound levels at a receptor. Hard ground such as roads, are

modeled with a ground absorption factor of zero. More porous and softer ground such as porous soil berms, interfering grass covered buffers, soil cover, brush stockpiles, and construction debris are modeled with an absorption factor of 1.0. The height of a receiver and source affect the level of attenuation from ground effects; that is, the farther a source or receptor are from the ground, the less attenuation ground effects will provide. Ground absorption is defined in ISO 9613-2.

2 EXISTING CONDITIONS

2.1 General

The site lies on the southeastern facing slope of a ridge that rises above a valley floor with ground surface slopes ranging from five to 15 percent or steeper. Existing ground surface elevations are based on the North American Vertical Datum of 1988 (NAVD88) and range from about 1,890 feet MSL in the northwestern corner of the site, down to about 1,710 feet MSL at the southeastern property corner.

A review of the Chautauqua County GIS online mapping services was completed to help identify property classes and to help better understand land use in the areas near the site. While general in nature, property classes are defined by the New York State Office of Real Property Tax Services (ORPTS) to describe the primary use of real property on an assessment roll[1]. The majority of the property classes are listed as vacant lands, defined as property that is not in use, is in temporary use, or lacks permanent improvements. The other major property class category is rural, estate, seasonal and mobile residential. The project site is identified in the public service class in the waste disposal category.

Figure 2 is the property class map of the site and surrounding area. Much of the site activity will occur in close proximity to the southern and eastern margins of the site, which offer limited natural attenuation features.

2.2 Ambient Noise

Land use in the vicinity of the site is a mix of residential homes, farm lands, and vacant wooded lands. Ambient noise is primarily generated by residential and agricultural traffic, and by agricultural activities in nearby farm lands.

Noise monitoring was completed over a four day period, between April 12th and April 15th, 2011. Noise measurements were obtained between 6:00 am and 7:00 pm over three morning sessions, (6:00 am to 12:00 pm) and three afternoon sessions (2:00 pm to 7:00 pm).

[1] Chautauqua County GIS Online Mapping Service: http://gis.co.chautauqua.ny.us:8080/parcels/default.htm

Two Quest Sound Pro DL Type 2 sound level meters, serial numbers BIJ090030 and BIJ090028, were used to obtain the sound measurements. A windscreen, tripod, and waterproof case were also used during the noise monitoring to enhance the quality of the data.

2.2.1 Measurement Locations

Six locations in close proximity to the site were selected for sound measurements that are representative of the general area. The measurement locations are in areas zoned for residential use. Figure 3 is a map with labeled "receptor" locations and the site property boundary.

R-1 and R-7

Receptor 1 (R-1) is located at 622 Dodge Road, near the Dodge and Wiltsie Road intersection and R-7[2] is located at 454 Dodge Road. Land use in the area surrounding these measurement locations is primarily open-undeveloped or agricultural in nature. The noise character of these locations is primarily related to animal noise, and farm machinery using the roadways and working in the surrounding fields.

R-2

R-2 is located at 282 Dodge Road, one of the two homes on the east side of Dodge Road opposite the site. A large stand of evergreen trees separates the homes from Dodge Road, providing a vegetative sound buffer.

R-3

R-3, at 247 Dodge Road, is the representative measurement location south of the site entrance on the west side of Dodge Road. The stormwater management sediment basins and graded filters are slated to be positioned along this property boundary.

R-4

R-4 is considered representative of the areas south and east of the site. The ambient noise measurements were obtained at the southwest corner of Dodge Road and Sandberg Road.

[2] During the planning stages for the ambient noise measurements, R-6 was selected and then subsequently eliminated since it was considered duplicative of R-5 given its close proximity to that receptor.

SOURCE: CHAUTAUQUA COUNTY PARCEL VIEWER, PUBLICLY AVAILABLE ONLINE AT HTTP://WWW.CO.CHAUTAUQUA.NY.US/DEPARTMENTS/IS/GIS

LAND USE PERCENTAGES

38% – VACANT LAND

31% – RURAL, ESTATE, SEASONAL, MOBILE RESIDENTIAL

9% – WILD FOREST

6% – SINGLE OR DOUBLE FAMILY RESIDENTIAL

13% – AGRICULTURAL LAND

3% – PUBLIC SERVICES

N

LEGEND:

- PROPERTY BOUNDARY
- VACANT LAND
- RURAL, ESTATE, SEASONAL, MOBILE, RESIDENTIAL
- AGRICULTURAL LAND
- WILD FOREST
- SINGLE/DOUBLE FAMILY RESIDENTIAL
- PUBLIC SERVICES
- COMMUNITY SERVICES

Q:\Sealand\02–0104 Carroll Landfill\03 DEIS\Section 3\Figures\FIG 3–15 PROPERTY CLASS MAP.dwg 11/25/2014 2:54 PM

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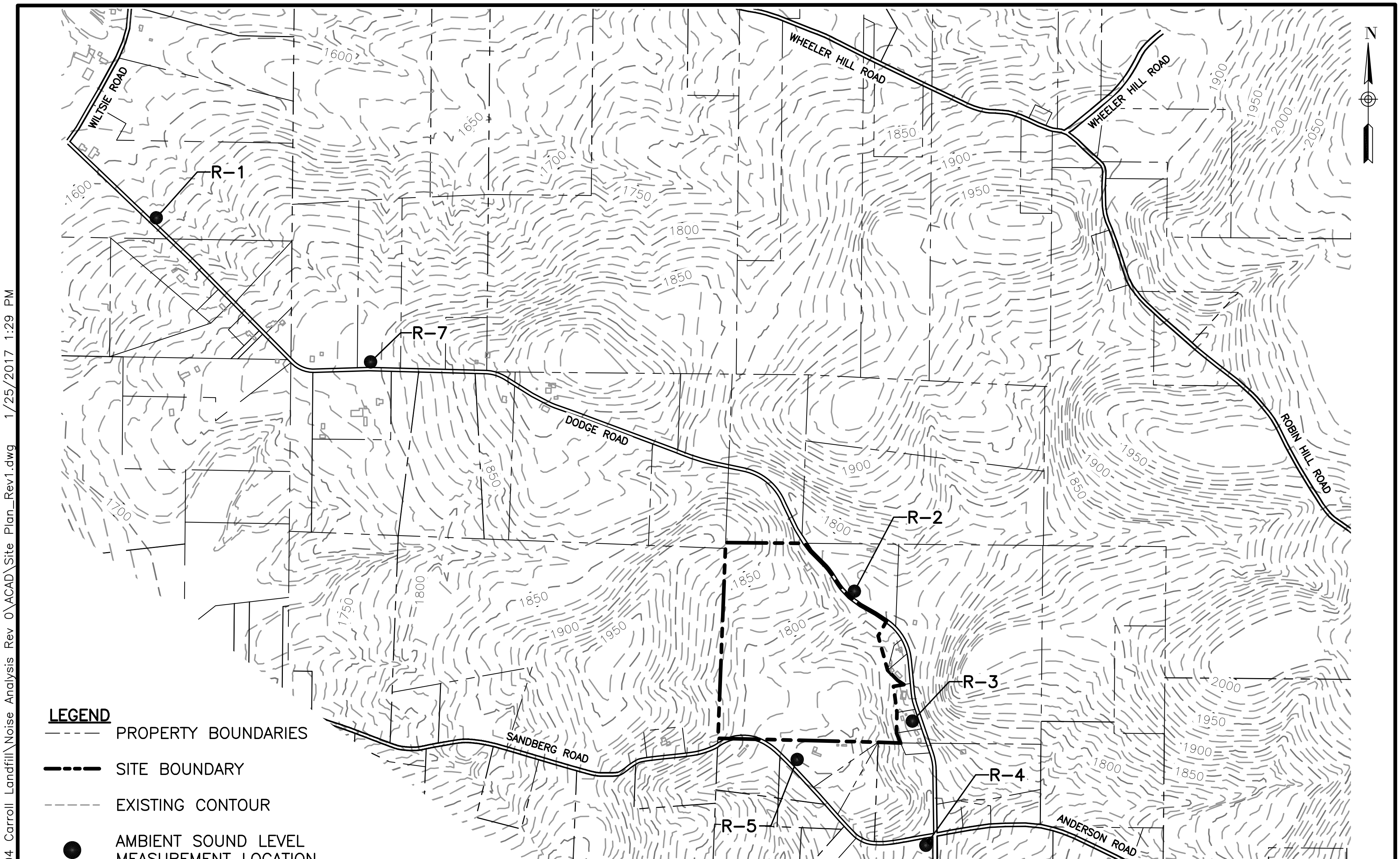
SEALAND WASTE, LLC		PROPERTY CLASS MAP NOISE ANALYSIS			FIGURE 2
SCALE: 1" = 2000'	REVISION # 0				
November 2014		TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	



LEGEND

- PROPERTY BOUNDARIES
- SITE BOUNDARY
- EXISTING CONTOUR
- AMBIENT SOUND LEVEL MEASUREMENT LOCATION

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SEALAND WASTE, LLC		SOUND MEASUREMENT LOCATION MAP			FIGURE 3
SCALE: 1" = 1200'	REVISION # 1	NOISE ANALYSIS			
January 2017		TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	

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R-5

R-5 is located at 400 Sandberg Road, and is considered representative of the area along the southern boundary of the site. This parcel shares about 960 feet of property boundary with the site.

2.2.2 Ambient Sound Level Measurement Schedule

The goal of measuring ambient noise was to obtain sound pressure levels at each measurement location during three separate occasions for each morning and afternoon session. This goal was met for every location except R-3; however, on the third day of the field work, the sound sampling session at receptor R-2 was extended to account for the unused time. The actual sampling schedule and sampling duration times are presented in Table 3. Raw data from the measurements were evaluated for each morning and afternoon session and a histogram was created for each monitoring session as an effective tool for quickly comparing sound measurements and calculated L_{eq}. The full set of histograms is presented in Attachment 1.

2.2.3 Summary and Discussion of Measurements

The L_{eq}'s calculated from the ambient sound measurements are presented for each measurement location. Each morning (AM) and afternoon (PM) session, and cumulative L_{eq}, reported in dB(A) for each receptor is presented in Table 2.

Table 2: Summary of Ambient Noise Monitoring Results [dB(A)]

Description	R-1	R-2	R-3	R-4	R-5	R-7
AM-1	51.6	54.5	41.4	47.9	55.0	52.0
AM-2	57.4	57.3	48.2	52.4	53.1	60.1
AM-3	56.1	49.5	--	51.6	45.7	60.2
PM-1	56.9	51.0	52.4	61.9	46.3	54.7
PM-2	59.8	59.8	56.8	54.4	47.5	57.3
PM-3	57.8	53.5	--	56.5	47.8	49.9
Cumulative L_{eq}	57.9	54.5	51.2	56.0	50.7	57.2
Community Noise Level	55.5					

The measurement locations that were found to experience the highest sound levels are R-1 and R-7. The main source of noise in that area is from vehicle noise originating on Dodge and Wiltsie Roads. The two locations experiencing the lowest sound levels are R-5 and R-3.

The Community L_{eq} was established by using the L_{eq}'s calculated for each measurement location and applying the general L_{eq} equation with the corresponding total time frame used for all of the measurements. This cumulative L_{eq} noise level was calculated using all of the sound level meter data and is also reported in Table 2. A sound level of 55.5 dB(A) is considered the representative sound level of the area surrounding the site, and coincides well with the daytime noise threshold for rural communities of 57 dB(A) as presented in subdivision 360-1.14(p). Since the Community L_{eq} of 55.5 dB(A) is not greater than the maximum allowable Part 360 daytime L_{eq} sound level, the daytime limit of 57 dB(A) shall be used as the limiting value in comparing future predicted operational sound levels at the property boundaries. For the purpose of assessing the noise impacts due to construction and operations at the facility in accordance with NYSDEC's program policy, the lowest cumulative ambient noise L_{eq} measured at R-5 of 50.7 dB(A) has been conservatively selected.

2.2.4 Phase 1, 2, & 3 Landfill Operations

The measured noise levels include natural noises (e.g., animal noises, wind-generated noise), noises commonly produced by the residence occupants and their pets and road noise, but do not include noise levels generated by the previously permitted landfilling and recycling activity at the site.

The proposed project is an expansion of an existing landfill and recycling operation; therefore, the assessment of operational noise levels considered the previously permitted activity at the facility, similar to noise measurements and analyses commonly performed for other expansion applications which have been permitted (e.g., Casella's Hakes Landfill in Painted Post, New York and Seneca Meadows Landfill located in Waterloo, New York). For this project site, this included the following equipment and task work[3]:

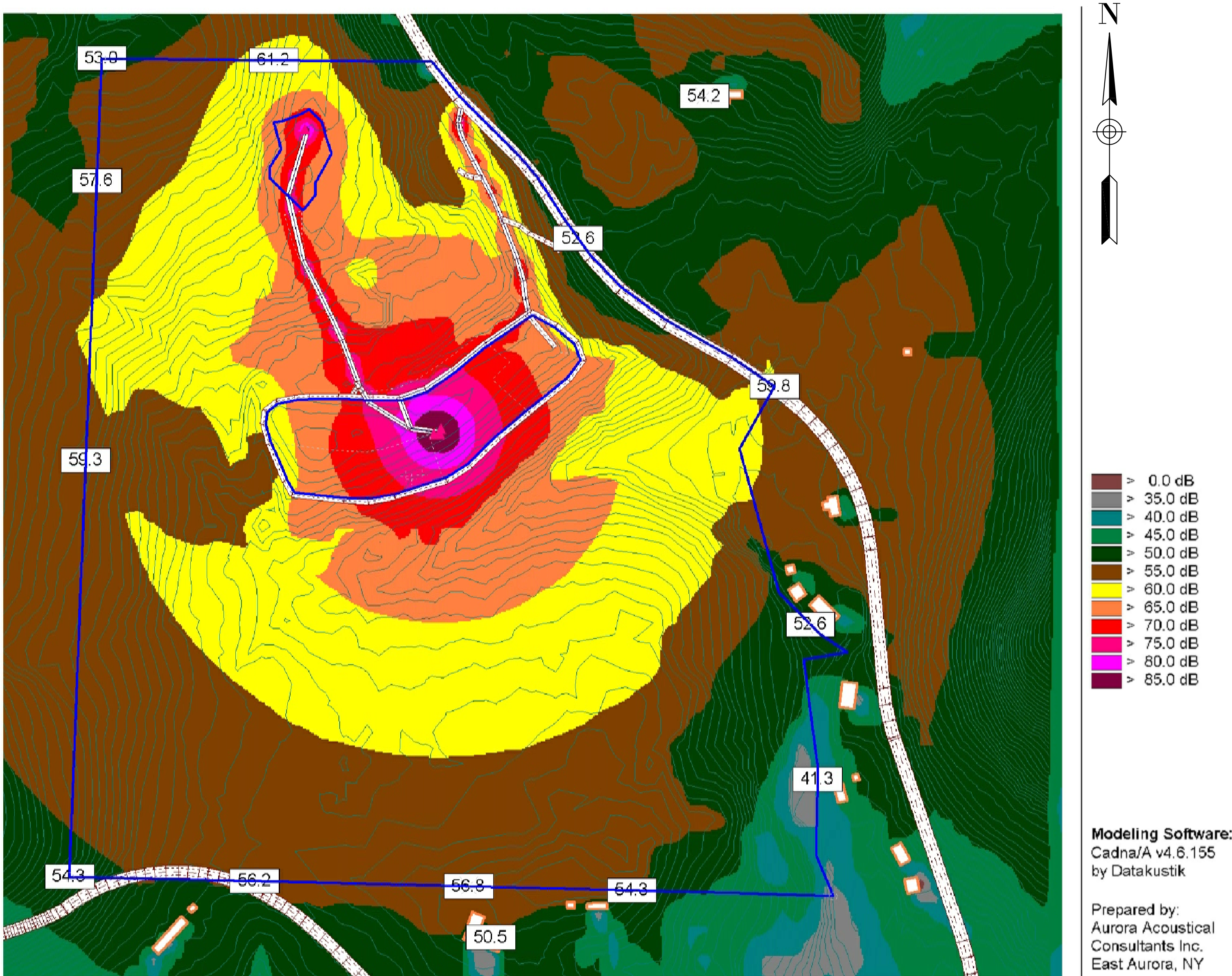
- One bulldozer at the working face to spread and compact waste and soil cover;
- Four waste trucks in/out of the working face;
- One backhoe removing unacceptable or recyclable wastes from the working face;
- One dump truck hauling cover soil to the working face; and,
- One loader loading cover soil at the borrow area.

[3] Information provided by Mike Jones, in telephone conference of November 28, 2016.

Table 3: Ambient Noise Sampling Schedule and Duration

	Field Day 1			Field Day 2			Field Day 3		
	Location	***Time***	***Duration***	***Location***	***Time***	***Duration***	***Location***	***Time***	***Duration***
Morning Session	R-1	6:13-6:53 am	40	R-5	6:14-6:48 am	34	R-2	6:00-7:40 am	100
	R-7	7:01-7:40 am	39	R-4	7:02-7:42 am	40	R-3	--	--
	R-2	8:01-8:40 am	39	R-1	7:59-8:41 am	41	R-5	8:00-8:41 am	41
	R-3	9:00-09:40 am	40	R-7	9:00-09:40 am	40	R-4	9:00-09:40 am	40
	R-5	10:00-10:40 am	40	R-2	9:59-10:40 am	41	R-1	10:00-10:40 am	40
	R-4	11:00-11:40 am	40	R-3	11:00-11:41 am	41	R-7	10:50-11:30 am	40
Evening Session	R-1	2:00-2:40 pm	40	R-5	2:20-3:00 pm	40	R-2	2:20-3:50 pm	90
	R-7	2:55-3:40 pm	45	R-4	3:10-3:36 pm	26	R-3	--	--
	R-2	4:00-4:40 pm	40	R-1	4:04-4:45 pm	41	R-5	4:00-4:40 pm	40
	R-3	4:54-5:30 pm	36	R-7	4:54-5:30 pm	36	R-4	4:50-5:30 pm	40
	R-5	5:40-6:20 pm	40	R-2	5:40-6:10 pm	30	R-1	5:40-6:20 pm	40
	R-4	6:27-6:57 pm	30	R-3	6:15-6:32 pm	17	R-7	6:30-7:10 pm	40

SPLs emanating from past landfill operations, not including construction noise, have been determined using CadnaA. The equipment noise sources were modeled at the center of the existing landfill and at the borrow area are shown in Figure 4. The predicted SPLs suggest that some mitigation would be required to meet the current Part 360 regulations.



Modeling Software:
Cadna/A v4.6.155
by Datakustik

Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY

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SEALAND WASTE, LLC		SOUND LEVELS PHASE 1, 2, & 3 OPERATIONS CARROLL LANDFILL EXPANSION APPLICATION			FIGURE 4
SCALE: NOT TO SCALE	REVISION # 0				
January 2017		TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	

3 PHASED FACILITY DEVELOPMENT

The expansion landfill progression plan shown on the copy of Sheet PD-10A included in Attachment 4 is shown as eight progressive stages of filling, illustrating a phased liner construction and waste placement strategy[4]. The initial construction phase for the continued development of the site will include the construction and installation of all required ancillary facilities. The initial construction phase of the expansion landfill will also include liner construction of Cell 1 in the southeastern part of the project site and soil borrowing in the southwestern corner of the project site. No landfilling operations will occur during the initial construction phase.

Phase 4 will begin with the active filling of Cell 1, and during this phase of landfilling, the great majority of the activities will be occurring below grade. The sound levels at the property boundary during this initial activity will be significantly muted by the sideslope conditions and embankments, and do not represent the worst case condition for sound level propagation. The CDPO will be constructed in its initial location within the design area of Cell 4 and begin operation during Phase 4, as well. Liner construction will continue with Cell 2 to the southwest corner of the project site. The entrance road will be temporary and located away from the property boundary during Phase 4. Phase 5 will continue with active landfilling of Cell 1 and Cell 2 in the southern portion of the project site, and during this phase of site development, waste placement activity will progress to above grade elevations. Liner construction will continue with Cell 3 and borrowing will move into the northern portion of the site. A new access road, located closer to the eastern property boundary, will be constructed and the weigh scale, residential drop off, leachate storage tank, and leachate forcemain will be relocated. Toward the latter stages of Phase 5, the CDPO also will be relocated sequentially to accommodate borrow activity in Cell 4. The new location for the CDPO will be above the intermediate cover within Cells 1 and 2. Phase 6 will begin with active filling of Cell 3. Phase 7 involves active landfill operation in the central and northern regions but borrow area operations will no longer be conducted.

[4]Note that the existing landfill development had been designated Phase 1, 2 and 3.

4 FUTURE NOISE MODELING

Initial screening for impacts at offsite sensitive receptors was conducted using the Federal Highway Administrations (FHWA's) national model for the prediction of noise related to the use of construction equipment. The Road Construction Noise Model (RCNM) was developed during the Central Artery/Tunnel (CA/T) project in Boston, Massachusetts, reported to be the largest urban construction project in the United States. The FHWA developed the RCNM based on the noise prediction calculations and equipment noise level database used for the CA/T project. The RCNM predicts noise levels for a variety of operations based on a compilation of empirical data and the application of acoustical propagation formulas. As such, RCNM was utilized to determine the operational activities generating the greatest noise impacts, as well as, the need for screening berms and mitigation.

Following initial screening, CadnaA was utilized to model potential SPL's resulting from the operation of the facility along the property boundaries as required by Part 360. Additionally, the combined SPLs from operations and construction activity were evaluated for potentially adverse impacts as required by the NYSDEC noise assessment program policy at the closest appropriate residential receptor that will result in the highest possible sound level impacts. Worst case scenarios for both construction and operational sound generation are evaluated at the property boundary. Modeling of onsite activities by considering the simultaneous emittance of noise from onsite sources was completed as described below.

4.1 OPERATIONS

Worst-case operational noise levels, described in the following sections, will be generated by everyday activities at the site including:

- Operation of an impact crusher, shaker screen, and front end loader as part of the construction and demolition debris processing operation;
- Operation of an excavator and articulated dump trucks in the borrow area;
- Waste placement activities in the active landfilling areas from a dozer, solid waste compactor, and waste trucks depositing waste at the working face;

- Use of the onsite roadways by waste trucks, delivery vehicles, and leachate hauling trucks entering the site from Dodge Road; and,
- Operation of the landfill gas management system near the southeast corner of Cell 1.

Sound levels for each piece of equipment associated with operational activities, as well as, other pertinent information is provided in a table titled Reference Source Inputs in Attachment 2.

4.1.1 Construction and Demolition Debris Processing Operation (CDPO)

The CDPO operations will complement the land disposal operation. The CDPO will process construction and demolition debris delivered to the facility that is amenable to processing. The C&D processable and recyclable materials are expected to include concrete, masonry, wood, plumbing fixtures, glass, metal, paper, and asphalt shingles.

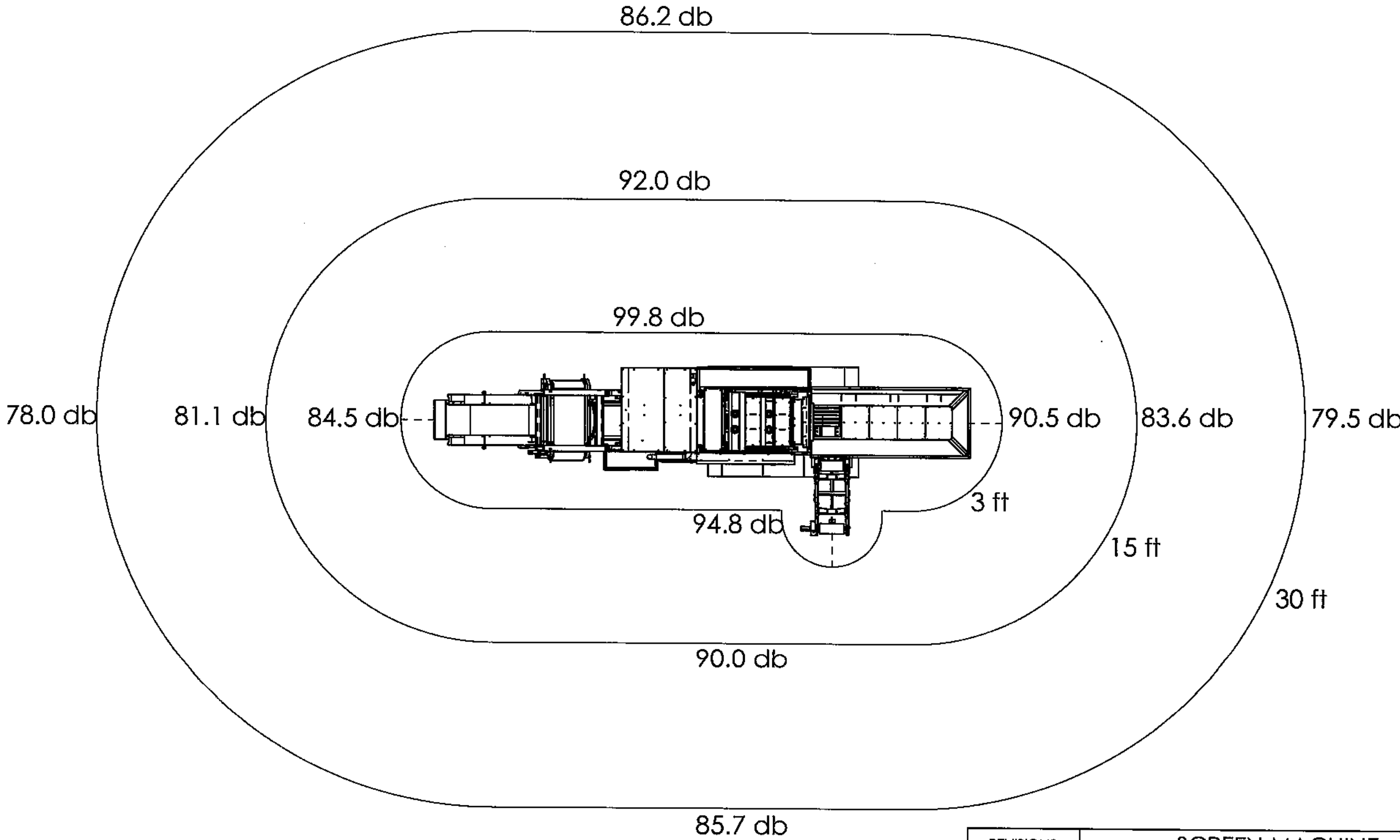
The CDPO will be contained within the landfill's ultimate footprint. Mobile machinery, which will contribute to the worst-case SPLs generated by the CDPO include an impact crusher (Screen Machine Industries, Inc. Model 4043T, or equivalent)/shaker screen (Screen Machine Industries, Inc. Model Spyder 516T, or equivalent) combination and front-end loader. Conveyors will be used to move equipment from the shaker screen to the crusher, and from the crusher into stockpiles. The noise levels from the conveyors are negligible compared to the impact crusher/shaker screen. The front-end loader will be used to load material into the impact crusher, to transport material within the CDPO, and for stockpiling.

The noise level contours emanating from the impact crusher and shaker screen to be used at the facility are depicted in Figure 5 and Figure 6. The loader was modeled operating with the impact crusher/shaker screen to simulate loading of material into and away from the CDPO machinery.

4.1.2 Borrow Area

Borrow areas are locations where soil will be excavated for use at other locations onsite, or stockpiled for future use as cover material. Designated borrow areas are shown on the phasing plan for the different phases of landfill development and activities will generally occur below grade as excavation occurs. An excavator and three onsite articulated dump trucks will be utilized in the borrow operation. Their equipment parameters are directly from RCNM.

FIGURE 5: IMPACT CRUSHER SOUND LEVELS DIAGRAM



Notes:
Measurements made while all functions running.
Engine is at 2200 rpm.
No material being processed.
Test performed at Screen Machine yard.

PROPRIETARY AND CONFIDENTIAL

REVISIONS	
DATE	NAME

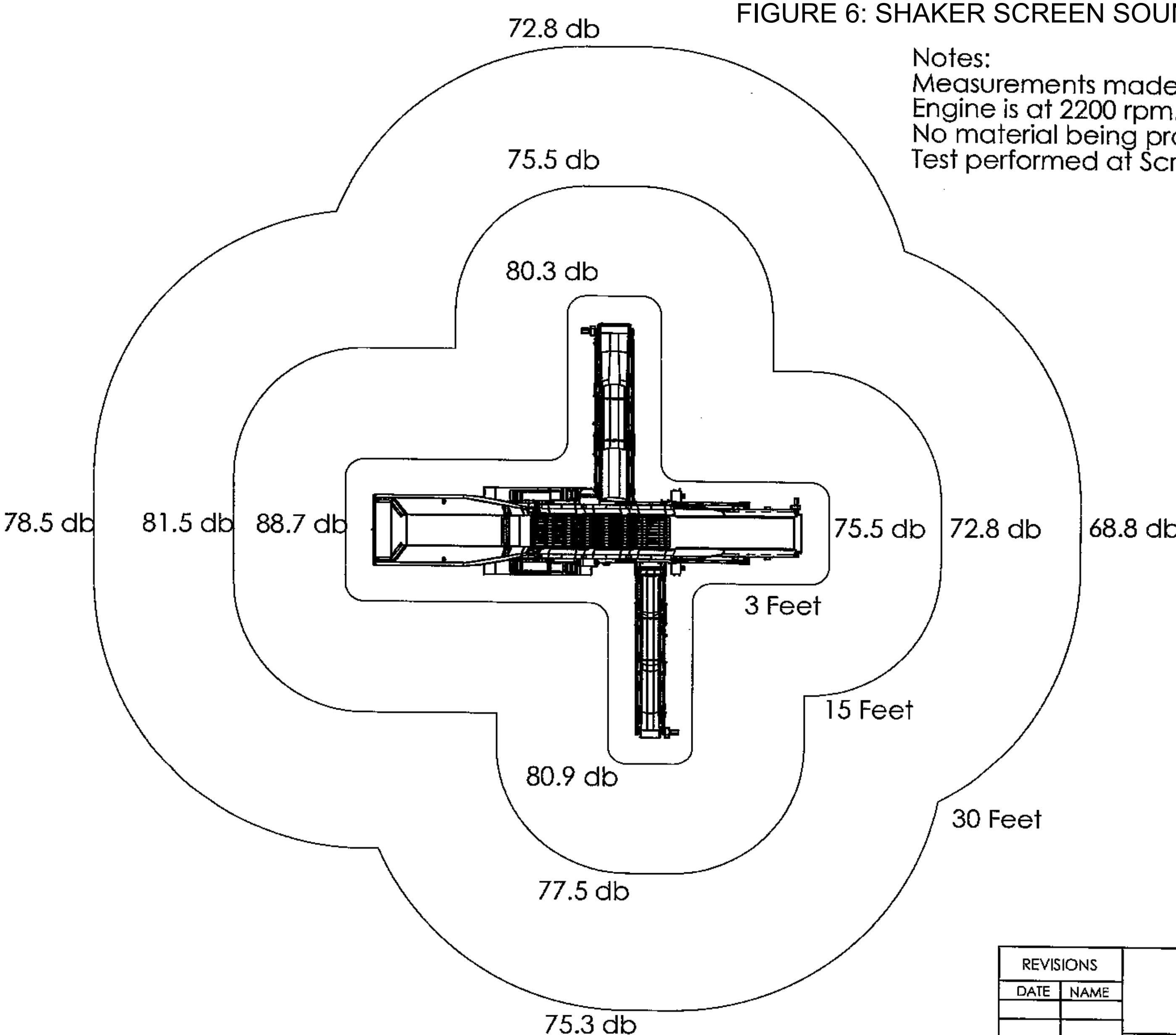
COMMENTS:

SCREEN MACHINE INDUSTRIES
Pataskala, Ohio

TITLE: 4043T Impact Crusher Noise Levels	
DRAWN BY: Mauricio Escobar	
SCALE: 1:150	
DATE	DWG. NO.

FIGURE 6: SHAKER SCREEN SOUND LEVELS DIAGRAM

Notes:
Measurements made while all functions running.
Engine is at 2200 rpm.
No material being processed.
Test performed at Screen Machine Yard.



REVISIONS		
DATE	NAME	
COMMENTS:		

SCREEN MACHINE INDUSTRIES
Pataskala, Ohio

TITLE: SPYDER 516T NOISE LEVELS

DRAWN BY: Mauricio Escobar

SCALE: 1:200

DATE

DWG. NO.

4.1.3 Waste Placement Related Activities

Worst case land disposal related equipment noise sources were determined to consist of a bulldozer, solid waste compactor, and the waste delivery trucks.

For this analysis, waste trucks are assumed to be stationary while depositing their load at the working face. The volume of projected traffic for the weekday peak hour as identified in the Traffic Impact Study prepared by SRF Associates was used to predict peak maximum noise levels associated with onsite traffic. Ten waste trucks will enter/exit the facility during the peak hour.

4.1.4 Onsite Roadways

The entrance roadway runs parallel to the eastern property boundary and Dodge Road. It is expected that ten waste trucks and one delivery/sales vehicle will comprise the traffic flow along the entrance road during the peak hour. Onsite speed limitations will be posted at 15 mph. Delivery/sales vehicles will travel along the entrance road to the shop. Up to six leachate tank trucks a day will be used to haul leachate to one of two wastewater treatment plants five days per week. This equates to approximately one truck per hour during the peak hour.

The landfill access road is the route waste trucks travel to unload their waste in a cell. Once unloaded, the waste trucks then travel the same path along the landfill access road to exit the property. It is assumed that ten waste trucks per hour will comprise the traffic flow along this landfill access road at 15 mph.

4.1.5 Landfill Gas Management System

The landfill gas management system will consist of two stationary noise sources located in the southeast corner of Cell 1, namely the landfill gas blower and an enclosed flare. The blower will be connected to the landfill gas collection system and serve to convey a vacuum to be distributed throughout the system. The blower will move landfill gas to a passive hydrogen sulfide control unit and an enclosed flare for treatment before being vented to the atmosphere. The treatment equipment will be constructed during the initial construction phase of landfill development and operate through post-closure. Both the blower and enclosed flare are assumed to be continuously operating during the one hour daily peak.

4.2 Construction Activities

Temporarily elevated noise levels will be generated by relatively short term construction activities at the site. The following construction activities were determined to generate the worst-case sound levels at sensitive receptors:

- Construction of the perimeter embankment by a bulldozer, soil compactor, and articulated dump trucks; and,

- Construction of the final cover system which includes the use of a bulldozer and articulated dump trucks.

These activities are conservatively assumed to be taking place while daily operations at the landfill, as described above, are occurring. Sound levels for each piece of equipment associated with construction activities and other pertinent information are provided in Attachment 2.

4.2.1 Earthwork Construction

The worst-case sound levels at sensitive receptors will be when perimeter embankment construction occurs nearest the residence at 263 Dodge Road. As such, the noise levels associated with construction of the perimeter embankments along the outside slopes of the subgrade for Sediment Basin 2 and its associated graded filters were modeled. Equipment includes a bulldozer, soil compactor, and articulated dump trucks.

The majority of baseliner construction will occur behind the earthen embankments comprising the subgrade for installation of the baseliner system. As such, noise levels predicted for baseliner construction are not presented, as perimeter embankment construction activities pose a greater potential impact to offsite sensitive receptors.

4.2.2 Final Cover Construction

Final cover construction is closest to the property boundary and the most sensitive receptor along the southern side of the site. Equipment used for final cover construction includes a bulldozer and articulate dump trucks along the side slopes.

4.3 MODELING RESULTS

The following table summarizes the mitigation measures applied to operations and construction activities. Each measure is described in the following subsections. Modeling results are provided in Attachment 2.

Table 4: Mitigation Measures Summary

Scenarios	Mitigation Measures
CDPO (Impact Crusher/Shaker Screen & Front End Loader)	-Will only run when all other equipment onsite is not operating -Screening berms along west & east sides constructed during initial construction phase operations in northwest corner -Screening berms along west, east, and south sides when CDPO is moved during future operations -L-shaped sound barriers blocking top openings of the impact crusher/shaker screen
Borrow Area (3 Dump Trucks & Excavator)	-Screening berm (created by excavating from the center and moving towards the outside) -15 mph site speed limit restriction
Waste Placement (Compactor & 10 Waste Trucks)	-Operational screening berms (created naturally as landfill progresses) -330-foot offset of waste trucks from southern property boundary & only compactor operating closest to limit of waste (no bulldozer) -15 mph site speed limit restriction
Entrance Road (10 Waste Trucks & 1 Leachate Truck & 1 Delivery/Sales vehicle)	-13-foot tall barrier providing attenuation along east side of entrance road -15 mph site speed limit restriction
Landfill Access Road (10 Waste Trucks)	-4.9-foot tall barrier providing attenuation along south side -15 mph site speed limit restriction
Landfill Gas Management System (Blower & Flare)	-Gardner Denver, or equivalent, blower enclosure installed around the blower -The flare will be enclosed, rather than a candlestick flare

4.3.1 Operations

4.3.1.1 Construction and Demolition Debris Processing Operation

A generalized layout of the CDPO in the northwest corner of the facility as shown on the Phasing Plan was modeled; see figure titled "Construction and Demolition Debris Processing Operation (CDPO)" in Attachment 2. Operations of the CDPO will be on an as needed basis. Given the relatively loud nature of the equipment at the CDPO, the impact crusher/shaker screen (denoted V-A) will run only when all other equipment onsite is not operating, with the exception of the landfill gas blower and flare.

A screening berm along the north and west sides of the site is to be constructed during the initial construction phase of site development and will remain through Phase 5. When the CDPO is moved during Phase 6, an operational screening berm will also be constructed along the east, west, and south sides of the CDPO to attenuate SPLs as shown in the Phasing Plan. The impact crusher/shaker screen will be retrofitted with minimum 17.7-foot tall L-shaped sound barriers extending beyond the height of the crusher and screen top openings to mitigate the associated noise levels. All levels are below the Part 360 limit of 57 dB(A)..

At any time during operations at the site, the CDPO can be moved but will remain inside the limit of waste. Outfitting the CDPO equipment with L-shaped sound barriers and increasing the distance from the nearest property line when the facility is relocated during other phases of landfill development will provide significant attenuation of noise levels at the property boundary.

4.3.1.2 Landfill Operations

Landfilling operations consist of waste placement at the working face and borrow area operations. Two scenarios were modeled as shown in Attachment 2 on "Landfill Operations (1)" and Landfill Operations (2).

Attenuation will naturally increase with the progression of filling toward the center of the site and away from the limit of waste. Operational screening berms are to be constructed inside the limit of waste with the progression of waste placement as shown on Figure 7 so that screening is routinely achieved. These screening berms will block the line of site between a receptor at the property line and the vehicles associated with waste placement.

“Landfill Operations (1)” shows the working face (denoted IV-A) at the worst-case location, that is, adjacent to the limit of waste along the southern side of the site. When the working face is located adjacent to the property boundary and an operational screening berm is not in place, only a compactor will operate nearest the limit of waste, and waste trucks will be restricted to dumping their waste a distance of 330 feet from the property boundary to achieve 57 dB(A) as required by Part 360. Once operational screening berms are in place, as depicted in “Landfill Operations (2)”, attenuation is provided and restricting the waste trucks will not be required. Additionally, operations occurring behind an operational screening berm will add a bulldozer at the working face as is typical for working face operations.

Attenuation in the borrow area (denoted IV-B) will be achieved by excavating from the center of the borrow area towards the outside, so that a berm is naturally constructed. One excavator and two soil loading trucks were modeled at the borrow area, while one soil dumping truck is modeled near the working face stockpiling soil.

Noise barriers designed to intersect the line of site between the noise source and receptor are proposed to mitigate entrance road noise along the eastern property boundary and landfill access road noise. The minimum barrier height to attenuate noise levels at the eastern edge of the property was determined to be 13 feet in height along the entrance road from Dodge Road to the maintenance shop. Figure 8 illustrates the proposed barrier. The minimum barrier wall height to attenuate noise levels from the landfill access road was determined to be 4.9 feet as illustrated on Figure 9. SPLs at the property boundaries from landfill operations are 57 dB(A) or less, and comply with Part 360 regulations.

4.3.1.3 Landfill Gas Management System

The blower and flare were modeled alone to represent nighttime conditions as shown in the figure titled “Landfill Gas Control System Enclosed Flare and Blower Operations” in Attachment 2. The flare was designed to be enclosed, rather than a candlestick design, to provide quieter conditions. A blower enclosure, manufactured by Gardner Denver, or equivalent, is specified to provide a minimum SPL of 80 dB(A) at three feet from the enclosure.

Operation of the landfill gas management system meets the Part 360 nighttime noise level of 47 dB(A). The blower and flare are modeled with all other scenarios described in this section, as it will operate continuously.

4.3.2 Construction Activities

Table 5 shows temporary increases in construction noise levels above ambient for construction activities associated with perimeter embankment construction and final cover construction when equipment is closest to the property boundary and sensitive receptors. SPLs represent the L_{eq} energy-equivalent noise levels produced at the property boundary by the specified equipment and operations, which can be calculated or measured to describe a varying sound level received over a specified time period, which for landfill assessments, is defined to be one hour. The assessed L_{eq} sound levels do not represent the instantaneous noise levels that might be perceived at the property boundary during construction and operation activities. Negative differences demonstrate that average noise levels produced at the property boundary by the selected equipment are lower than the average ambient noise from traffic and other environmental sources.

Short duration sound level increases from construction activities will be temporary until construction moves away from the property boundary, screening is provided via excavation below the embankment, or construction is complete. The perimeter embankment construction and final cover construction modeled scenarios are described below.

4.3.2.1 Earthwork Construction

Attachment 2 shows the noise generated from perimeter embankment construction on the figure titled "Perimeter Embankment Construction with Compaction". Perimeter embankment construction equipment (denoted III-A) will generate worst-case noise levels along the eastern property nearest the sensitive receptor at 263 Dodge Road during the embankment construction for Sediment Basin 2 and the associated graded filters. Operations are also modeled at IV-A with waste dumping restricted as shown on "Landfill Operations (1)". Borrow area operations consist of one excavator and two soil loading trucks at IV-B and one soil truck depositing at III-A. The blower and flare are operating as described in Section 4.3.1.3 and onsite roadways consists of waste trucks, a leachate hauling truck, and a delivery/sales vehicle consistent with the peak hour operational traffic associated with onsite roadways.

4.3.2.2 Final Cover Construction

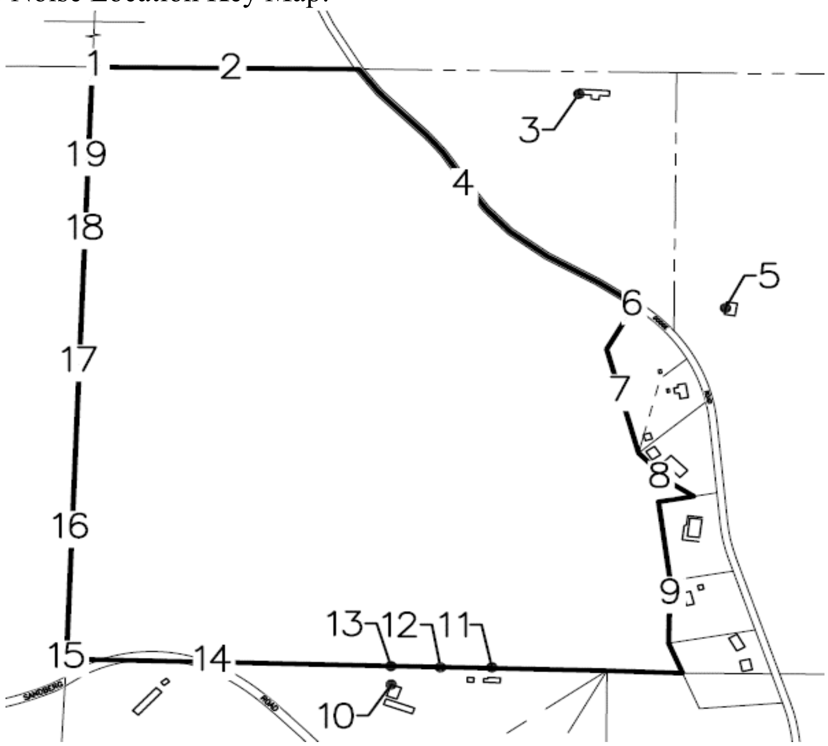
Worst-case final cover construction (denoted III-C) occurs adjacent to the southern property boundary and nearest the sensitive receptor at 400 Sandberg Road as presented on the "Final Cover Side Slope Construction" figure in Attachment 2. Operations are also modeled at IV-A with waste dumping occurring behind an operational screening berm as shown in "Landfill Operations (2)". Borrow area operations consist of one excavator and two soil loading trucks at IV-B and one soil truck depositing at III-C. The blower and flare are operating as described in Section 4.3.1.3 and onsite roadways consists of waste trucks, a leachate hauling truck, and a delivery/sales vehicle consistent with the peak hour operational traffic associated with onsite roadways.

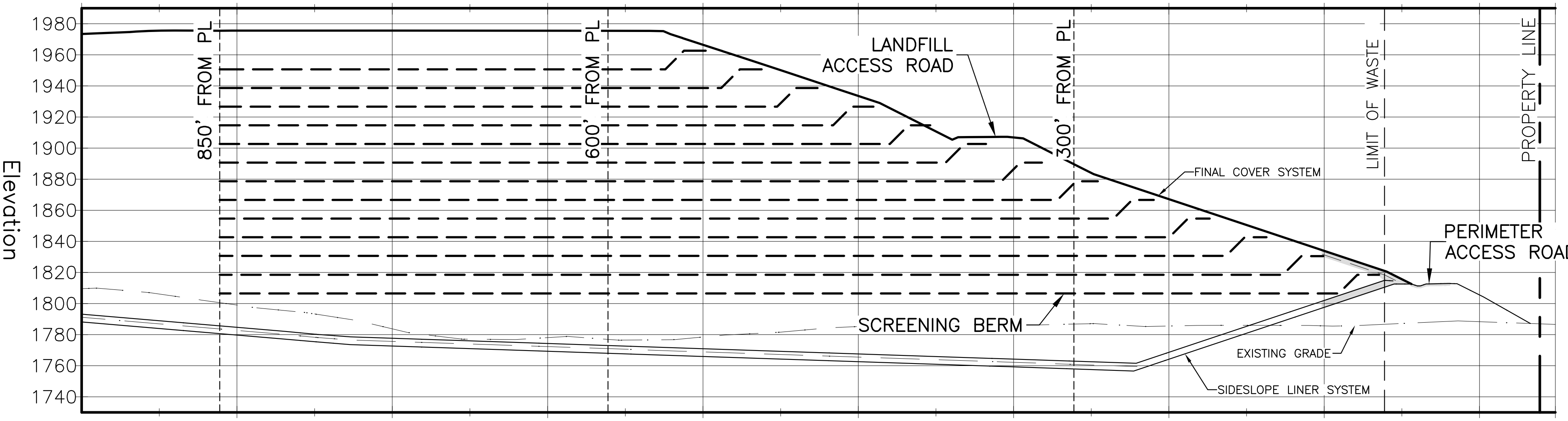
Table 5: Summary of SPLs from Construction Activities

Ambient Noise SPL [dB(A)]: 50.7

Noise Location*	**Final Cover Side Slope Construction**		**Perimeter Embankment Construction**	
	SPL [dB(A)]	*Difference [dB(A)]*	*SPL [dB(A)]*	*Difference [dB(A)]*
1	44.3	-6.4	44.6	-6.1
2	44.8	-5.9	43.7	-7.0
3	47.2	-3.5	53.0	2.3
4	41.9	-8.8	40.0	-10.7
5	45.0	-5.7	56.4	5.7
6	46.5	-4.2	59.4	8.7
7	46.8	-3.9	63.1	12.4
8	45.2	-5.5	72.8	22.1
9	41.5	-9.2	60.3	9.6
10	63.7	13.0	56.6	5.9
11	56.2	5.5	51.4	0.7
12	62.8	12.1	53.2	2.5
13	65.1	14.4	49.1	-1.6
14	55.0	4.3	47.2	-3.5
15	52.4	1.7	51.6	0.9
16	39.0	-11.7	50.9	0.2
17	40.7	-10.0	45.4	-5.3
18	47.2	-3.5	45.1	-5.6
19	46.1	-4.6	44.9	-5.8

Notes:
Difference = SPL [dB(A)] - Ambient Noise SPL [dB(A)]
*Approximate Noise Location Key Map:





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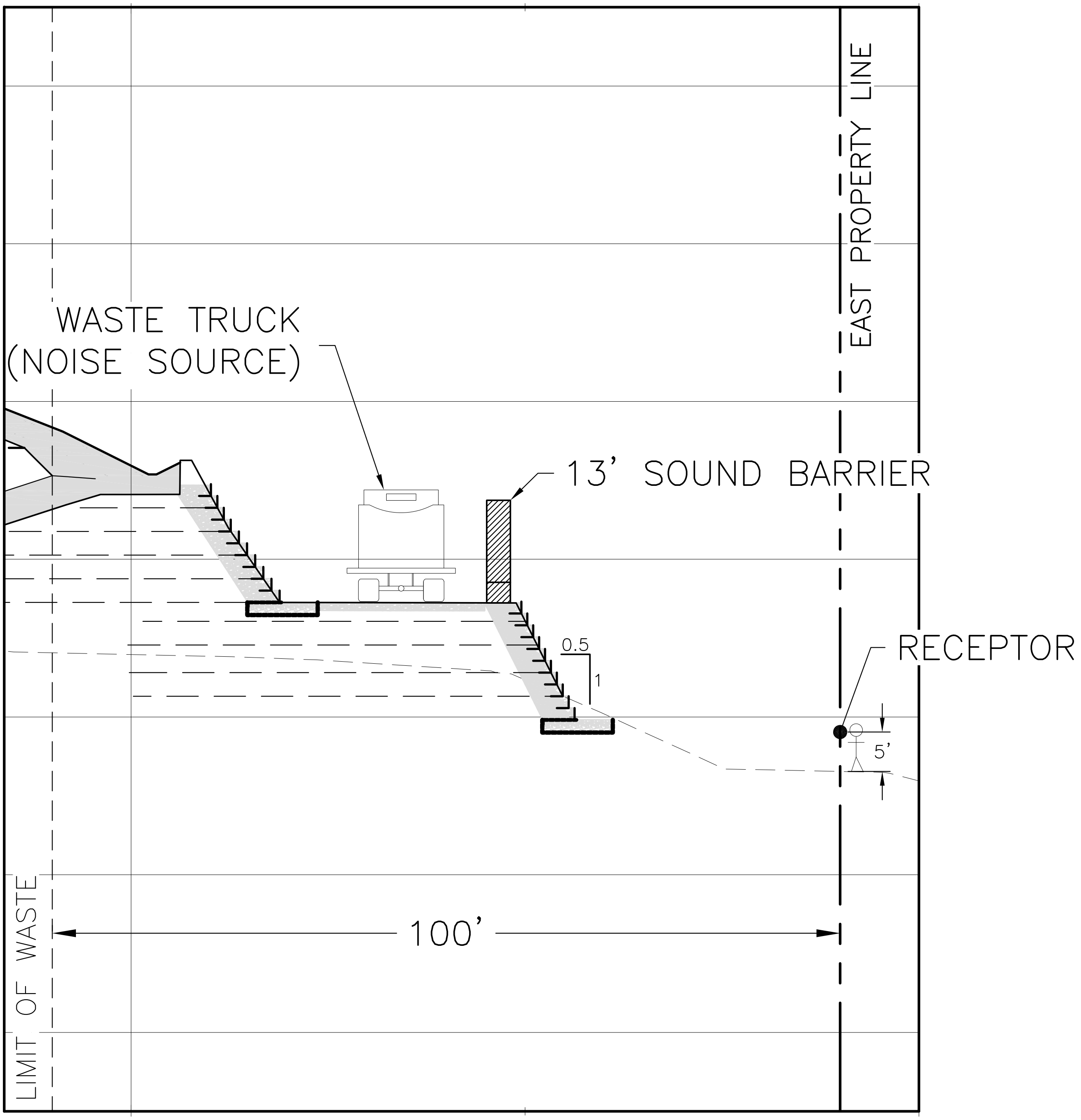
2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072

SEALAND WASTE, LLC		WASTE PLACEMENT SCREENING BERMS			FIGURE 7
SCALE: 1"=100'	REVISION # 0	NOISE ANALYSIS			
February 2015		TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	



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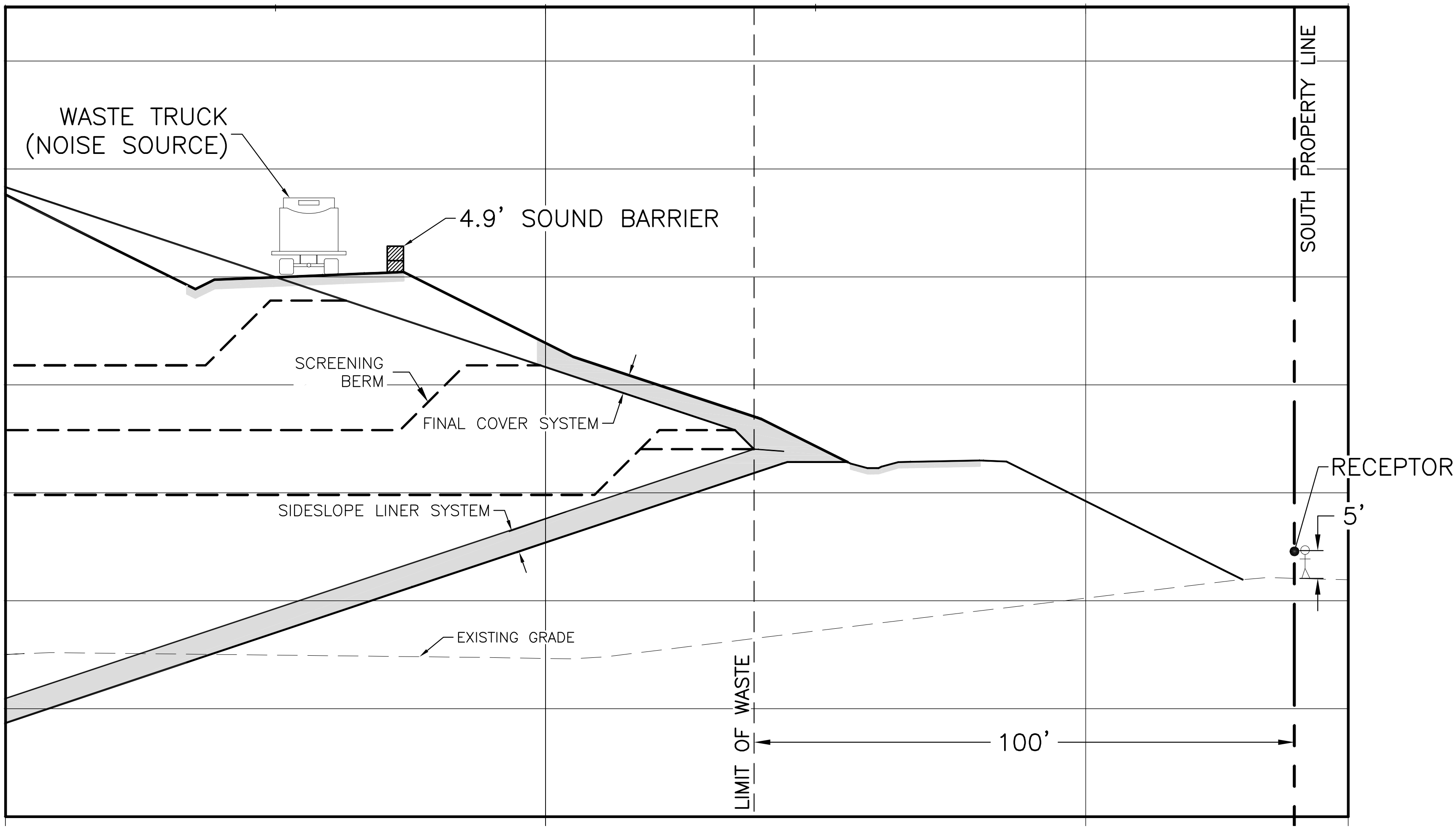
(716) 773-6872 (716) 773-6873 FAX

ENTRANCE RD SECTION AT EAST PROPERTY LINE NOISE ANALYSIS			
SEALAND WASTE, LLC			FIGURE 8
TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	
February 2015	SCALE: 1" = 20'	REVISION # 1	



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2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072

SEALAND WASTE, LLC		LANDFILL ACCESS ROAD SECTION AT SOUTH PL NOISE ANALYSIS			FIGURE 9
SCALE: 1"=30'	REVISION # 1				
February 2015		TOWN OF CARROLL	CHAUTAUQUA COUNTY	NEW YORK	

5 CONCLUSIONS

This noise analysis was completed to determine the need for and the design of mitigation measures to control the SPL at the property boundaries and at sensitive receptors.

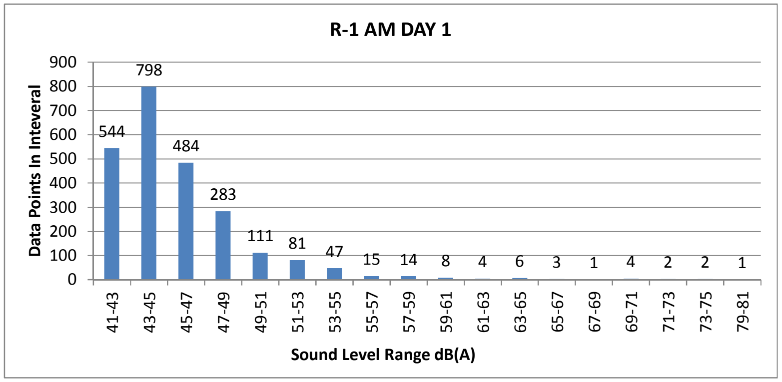
The design and operational plans for the facility include appropriate and reasonable measures to mitigate noise impacts to the required extent.

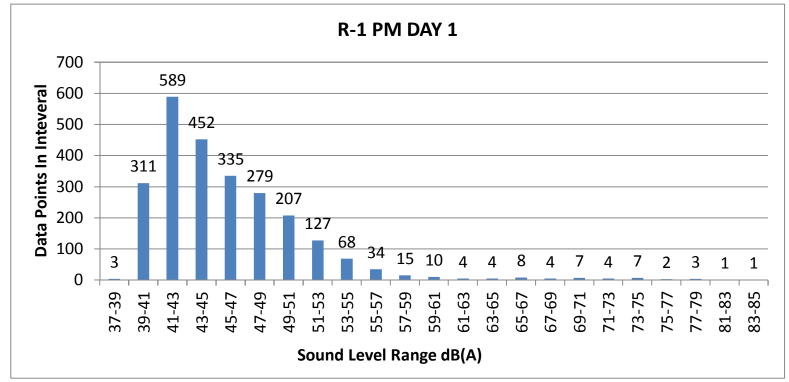
It was shown that with the addition of sound barriers and the planned operations of onsite activities adherence to Part 360 regulations can be achieved for site operations. Construction activities will be temporary in nature and cause short durations of sound level increases when construction related equipment is closest to the property boundary.

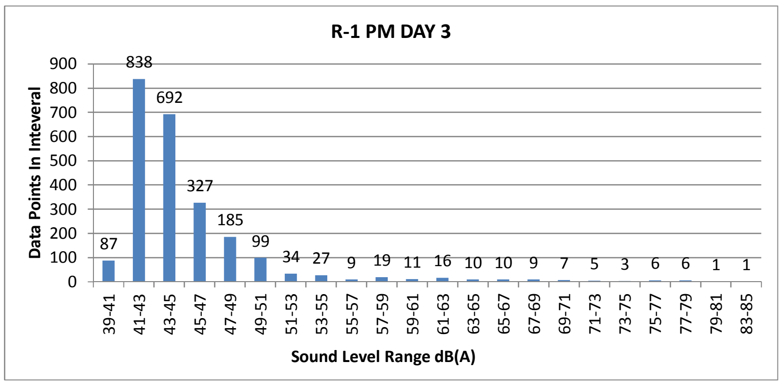
ATTACHMENT 1

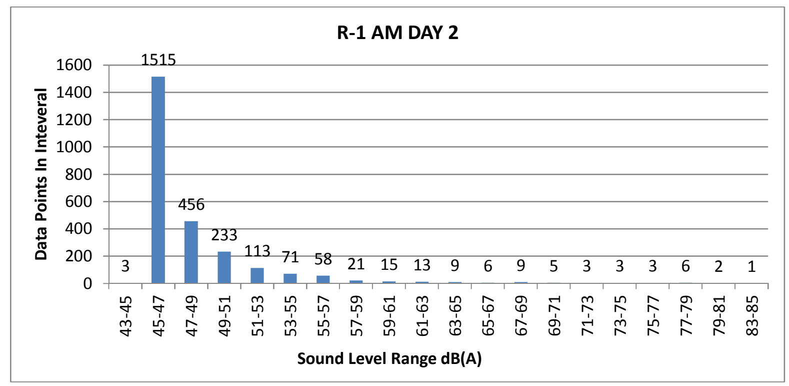
Measured Sound Level Calculations

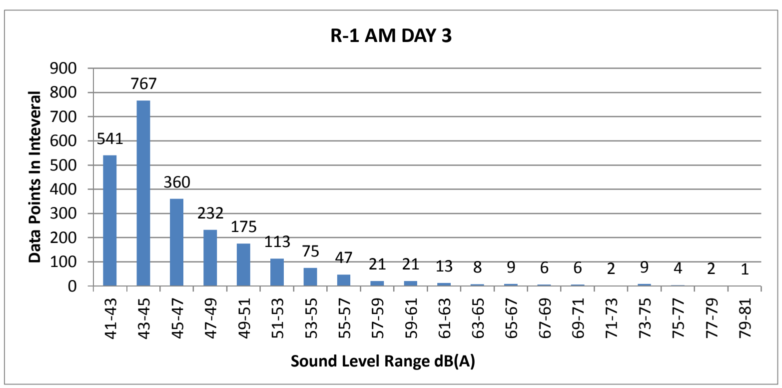
Attachment 1
Sound Level Range Histograms - Receptor R-1

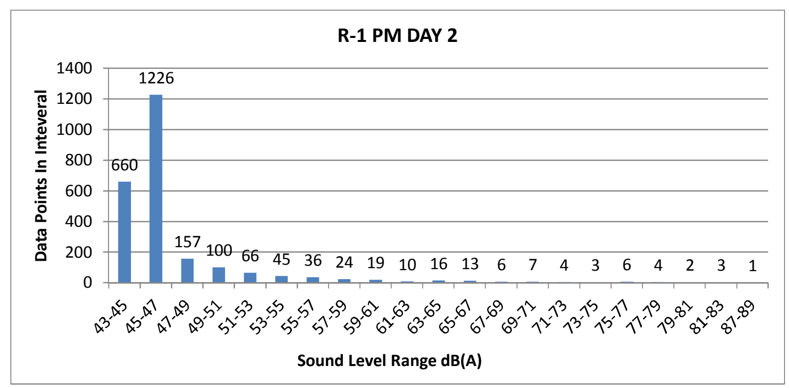




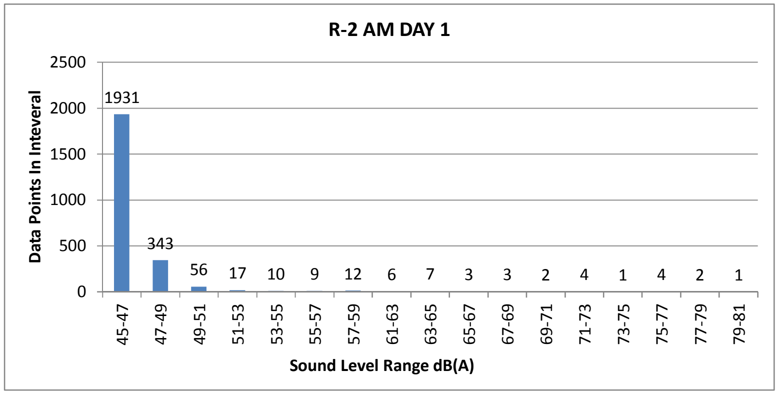


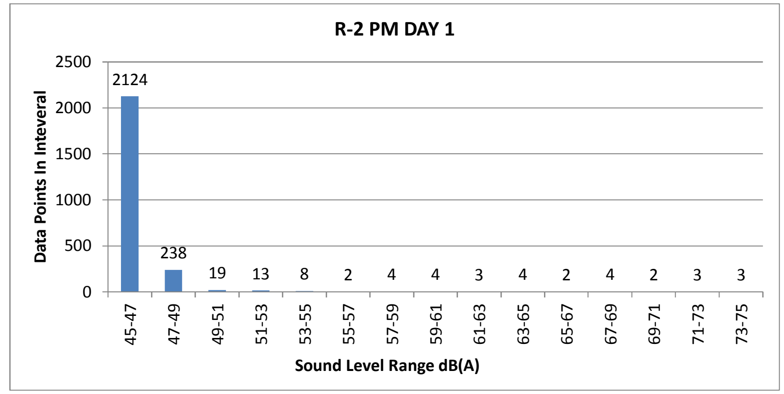


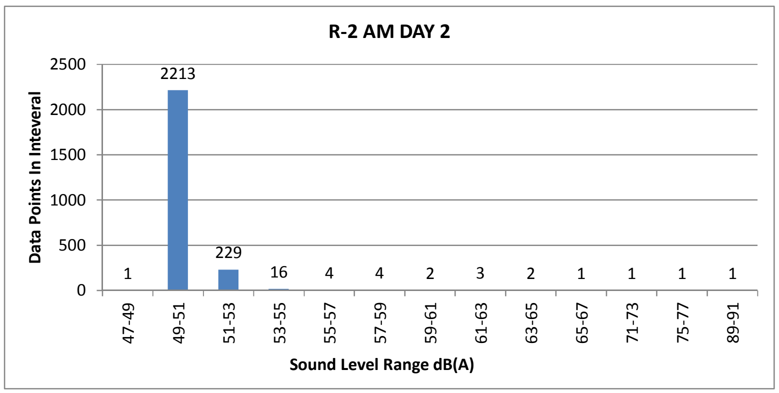


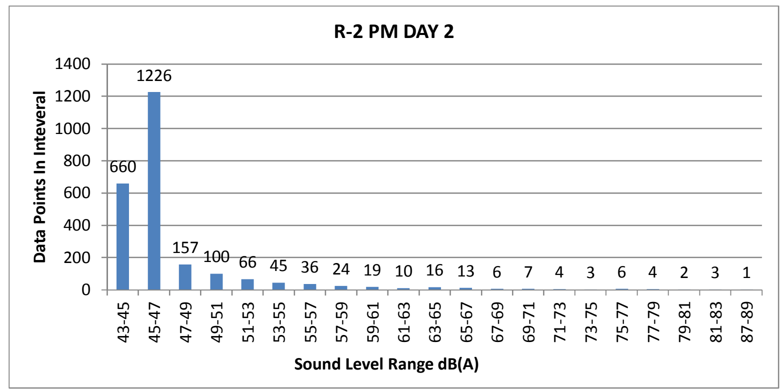


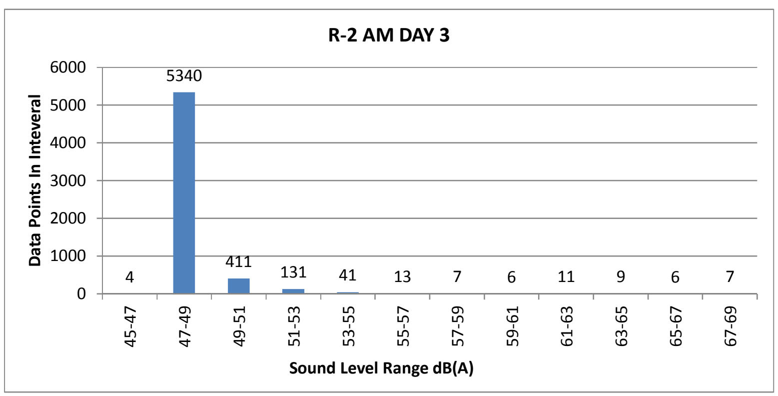
Attachment 1
Sound Level Range Histograms - Receptor R-2

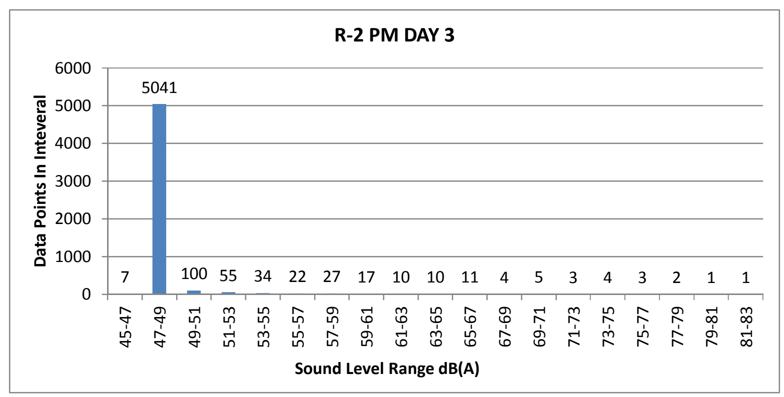




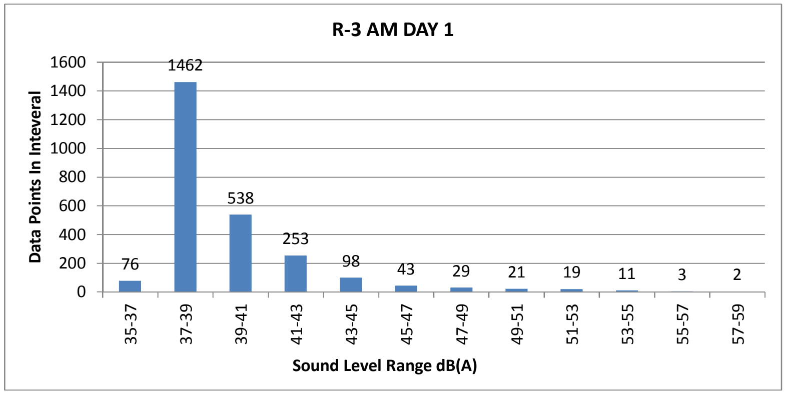


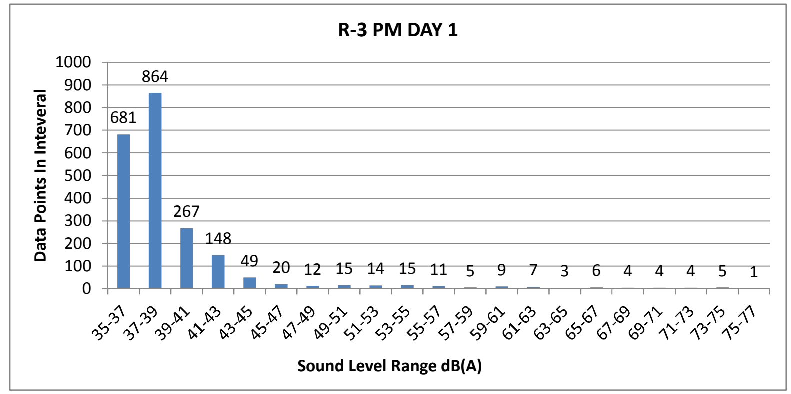


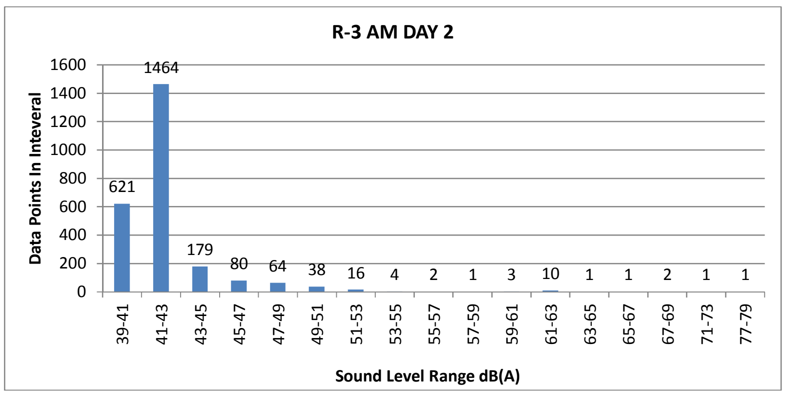


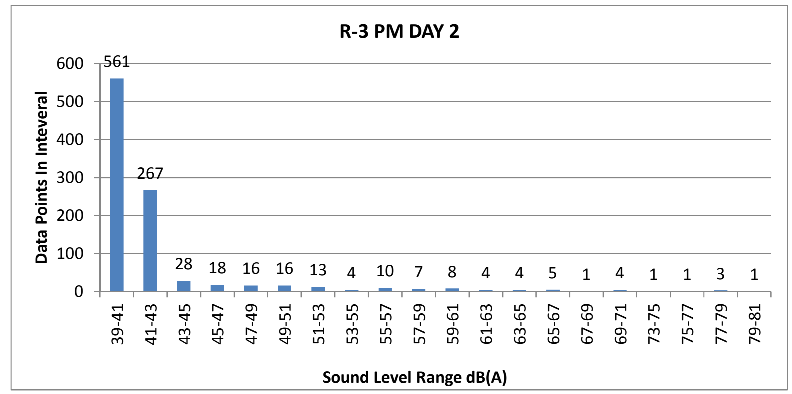


Attachment 1
Sound Level Range Histograms - Receptor R-3

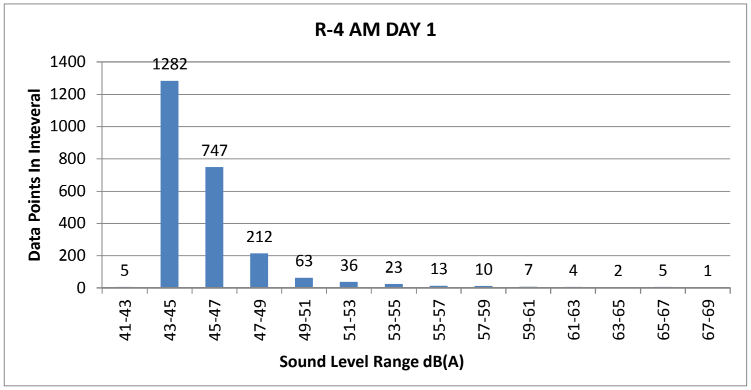


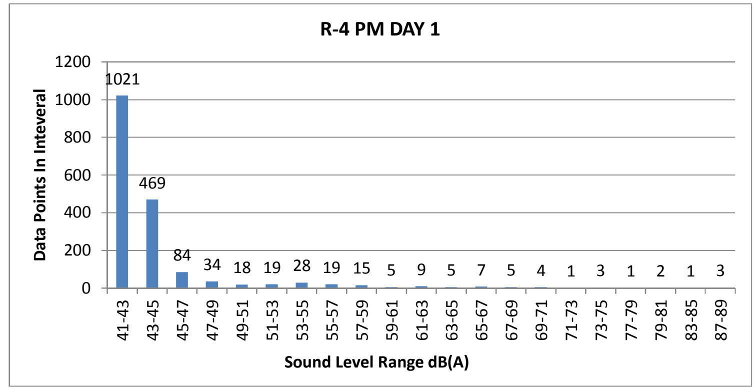


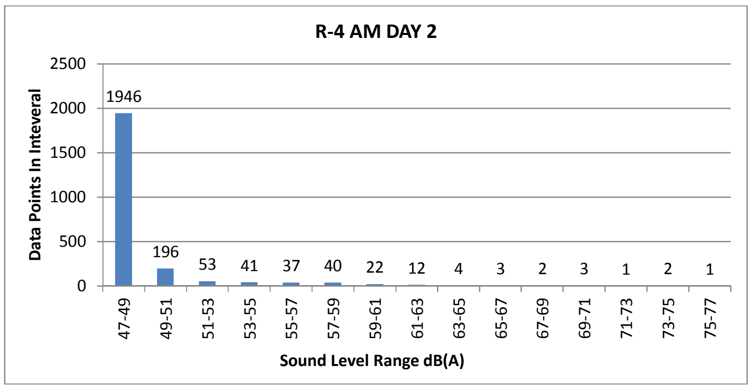


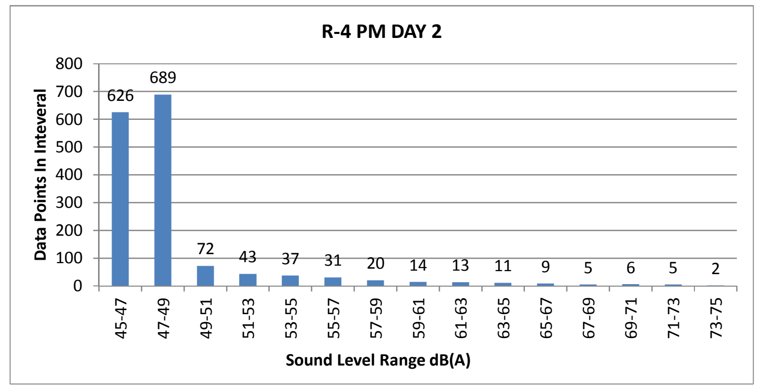


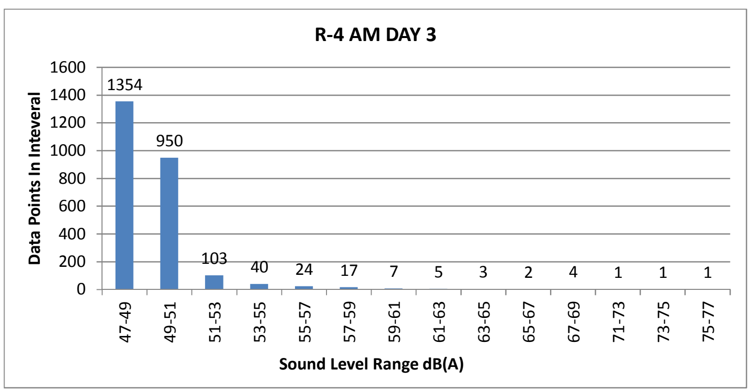
Attachment 1
Sound Level Range Histograms - Receptor R-4

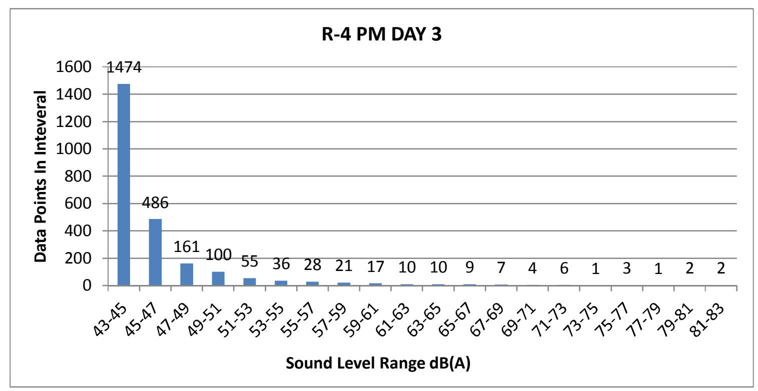




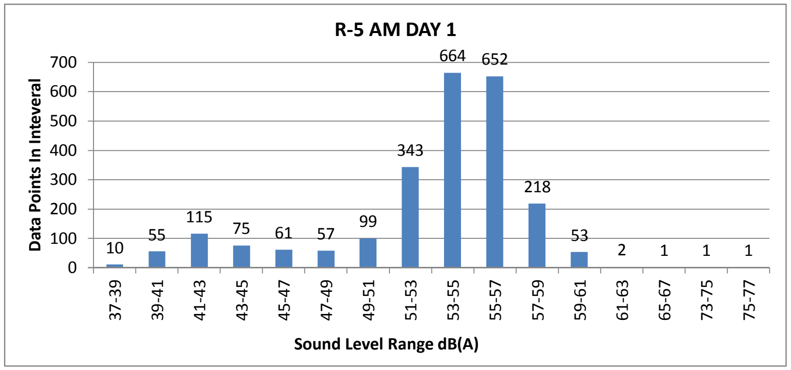


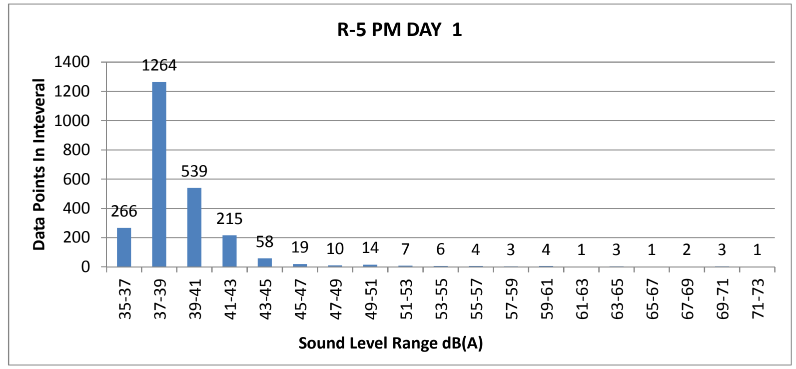


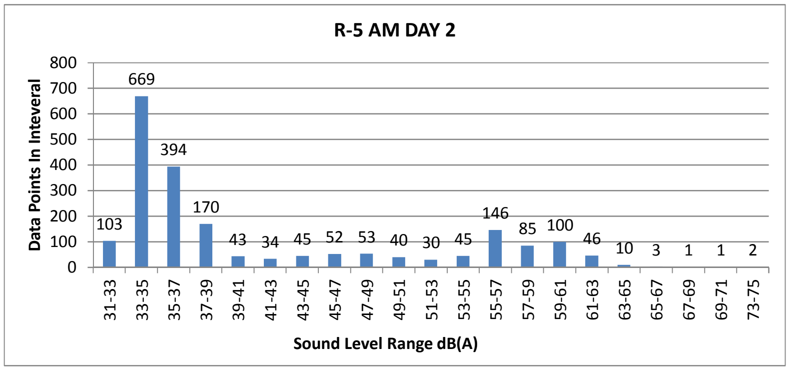


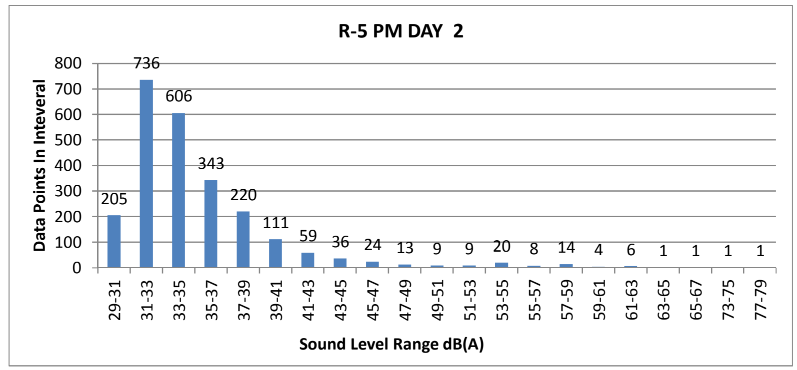


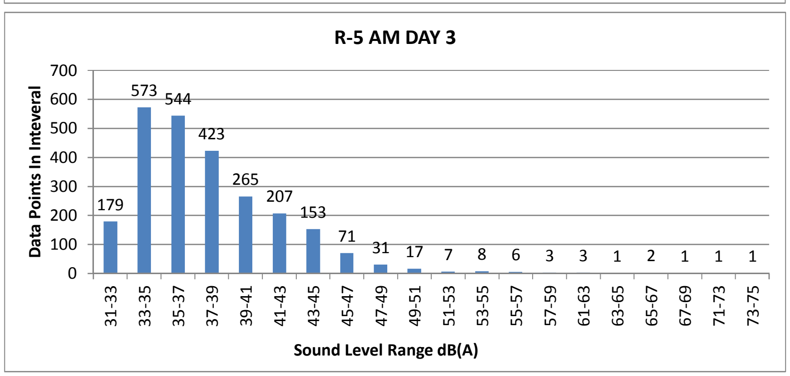
Attachment 1
Sound Level Range Histograms - Receptor R-5

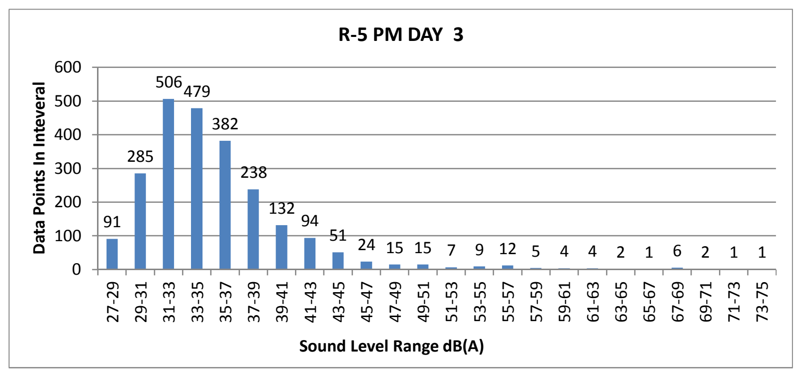




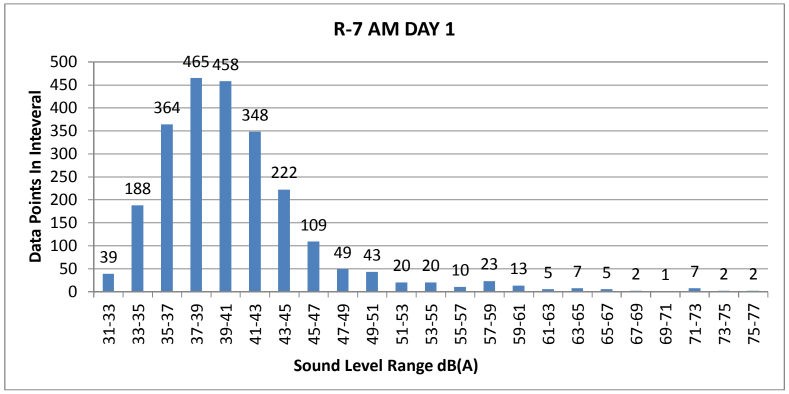


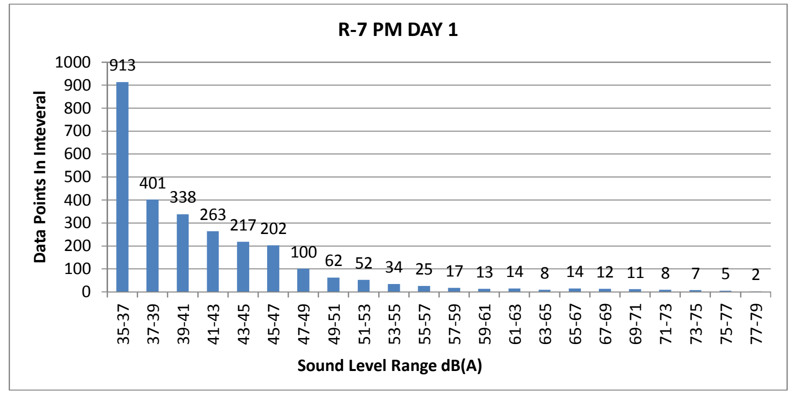


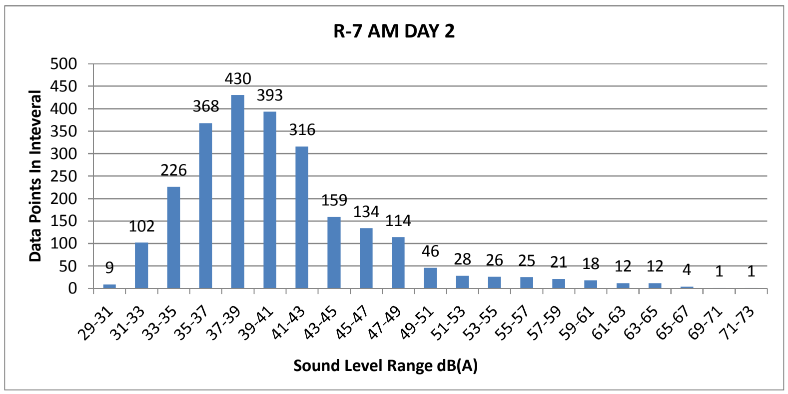


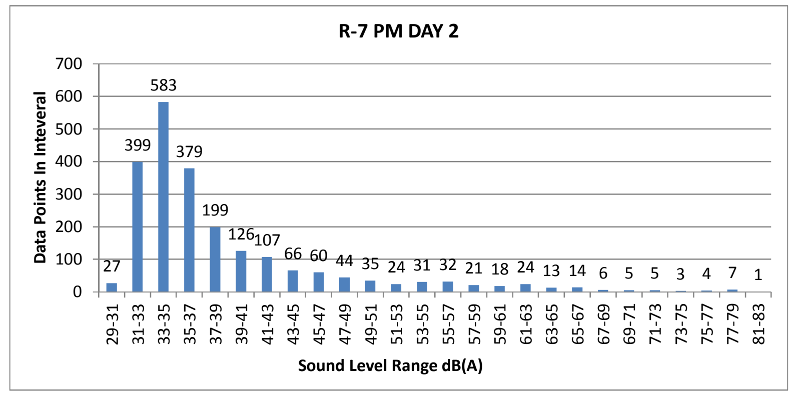


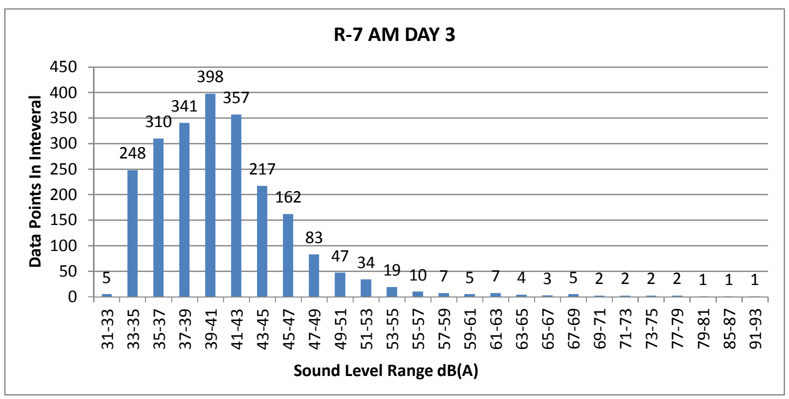
Attachment 1
Sound Level Range Histograms - Receptor R-7

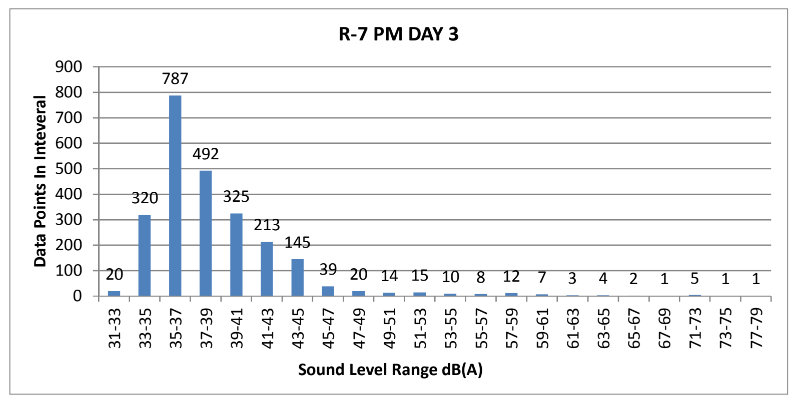












ATTACHMENT 2

CadnaA Modeling Results

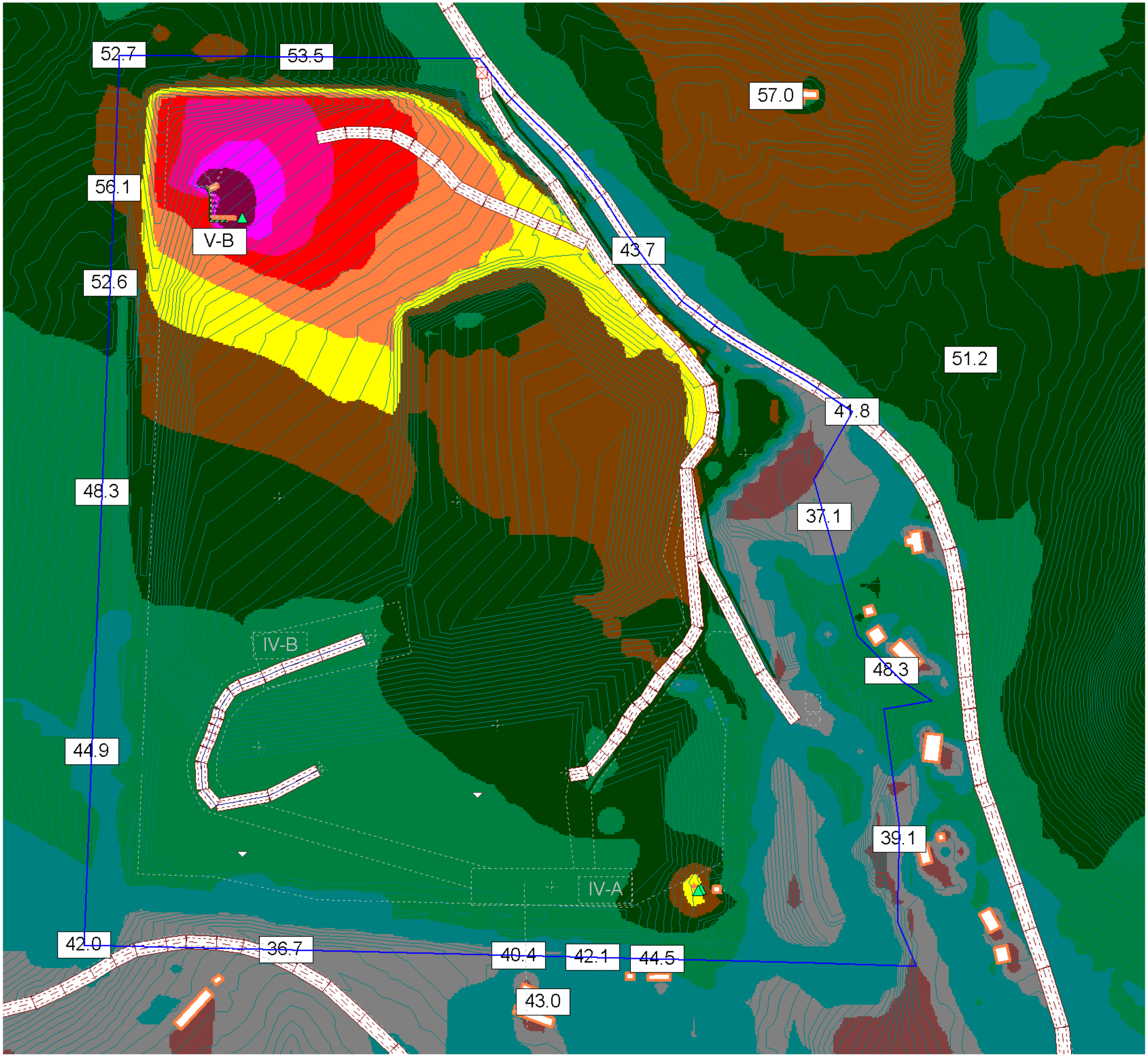
Carroll Landfill Expansion
Modeling Assessments
Reference Source Inputs

Aurora Acoustical Consultants Inc.
745 Warren Drive
East Aurora, NY 14052

Source	Manufacturer/Model	Rated or Calculated PWL	Rated SPL max	Modeled Source type	Src Elev	Dim	Reference
Soil truck, dumping, loading	Volvo A35G/A40G with noise reduction kit	110.0 dBA	-	point	1.5m	-	Volvo
Dozer	Caterpillar D6N	110.0 dBA	-	point	3.0m	-	Caterpillar
Excavator	Caterpillar 324DL	104.0 dBA	-	point	3.0m	-	Caterpillar
Wheel excavator	Caterpillar 910M	103.0 dBA	-	point	2.6m	-	Caterpillar
Wheel loader	Caterpillar 962M	107.0 dBA	-	point	2.6m	-	Caterpillar
Compactor	Caterpillar CP44	109.0 dBA	-	point	2.6m	-	Caterpillar
Waste trucks, dumping	-	110.5 dBA	76 dBA@50 ft	point	1.5m	-	RCNM
Leachate trucks, loading, unloading	-	110.5 dBA	76 dBA@50 ft	point	1.5m	-	RCNM
Delivery trucks	-	110.5 dBA	76 dBA@50 ft	point	1.5m	-	RCNM
Flare blower	Gardener Denver Turbotron	90.2 dBA	80 dBA@3 ft	point	1.2m	-	Gardener Denver
Flare stack opening	-	82.0 dBA	-	point	10.1m	1.4m dia x 10m	Peterborough landfill: 1.52m dia x 12.2m H John Zink 500cfm
Crusher engine vertical openings (2)	Screen Industries 4043T	116.4 dBA	86.2 dBA at 30 ft	vert. area	3.12m top edge	1.52m x 1.52m	Screen Industries
Crusher top opening	Screen Industries 4043T	116.4 dBA	86.2 dBA at 30 ft	area	2.9-3.35m	1.83m x 2.44m	Screen Industries
Screener cooler vertical openings (2)	Spyder 516T	108.7 dBA	78.5 dBA at 30 ft	vert. area	1.68m top edge	.45m x .45m	Screen Machine
Screener engine vertical openings (2)	Spyder 516T	108.7 dBA	78.5 dBA at 30 ft	vert. area	1.52m top edge	.38m x .24m	Screen Machine
Screener top opening	Spyder 516T	108.7 dBA	78.5 dBA at 30 ft	area	2.4-3m	1.52m x 4.57m	Screen Machine
Conveyors	-	90 dBA		area	various	various	est.

Recycling equipment noise barrier height	5.4m
Entrance road noise barrier height	4m
Access road noise barrier height	1.5m

Road source		Rated or Calculated PWL	Rated SPL max	Modeled Source type	Source Elevation	Speed	VPH (RT)	Reference
Access road, waste trucks	-	110.5 dBA	76 dBA@50 ft	moving point	1.5m	25 kph	20	RCNM
CDPO road, waste trucks	-	110.5 dBA	76 dBA@50 ft	moving point	1.5m	25 kph	2	RCNM
Access road, soil trucks	Volvo A35G/A40G with noise reduction kit	110.0 dBA	-	moving point	1.5m	25 kph	6	Volvo
Entrance road, leachate trucks	-	110.5 dBA	76 dBA@50 ft	moving point	1.5m	25 kph	2	RCNM
Entrance road, delivery trucks	-	110.5 dBA	76 dBA@50 ft	moving point	1.5m	25 kph	2	RCNM



Noise Modeling
Carroll Landfill Expansion
Carroll, New York

Construction and Demolition Debris Processing Operation (CDPO)

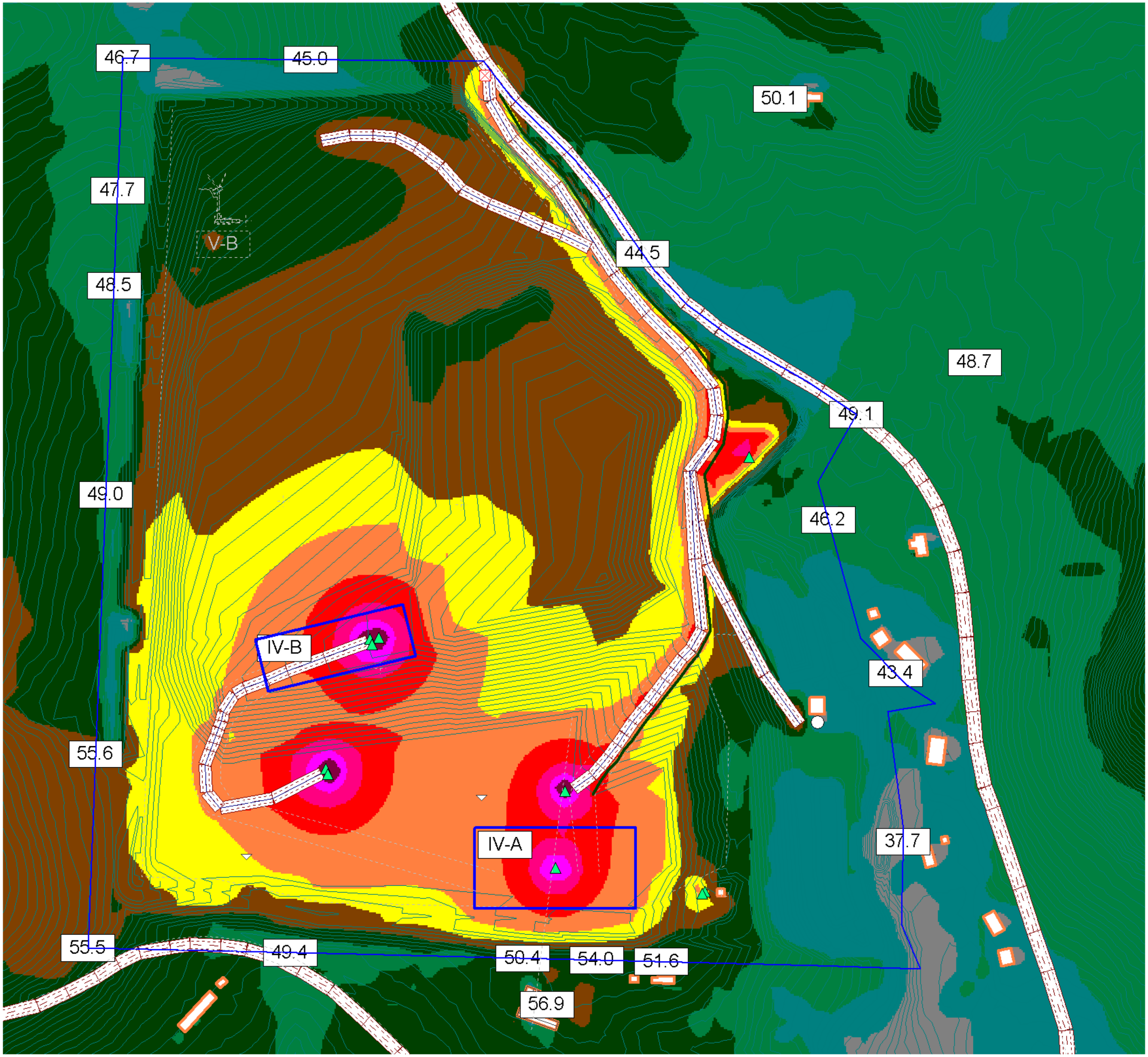
Map Scale: 1 : 3200

Modeling Software:
Cadna/A v4.6.155
by Datakustik

Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY

Noise Prediction Model
Carroll Landfill Expansion
Carroll, New York

Landfill Operations (1)



> 0.0 dB
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

Map Scale: 1 : 3200

Modeling Software:
Cadna/A v4.6.155
by Datakustik

Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY

Noise Modeling
Carroll Landfill Expansion
Carroll, New York

Landfill Operations (2)

> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

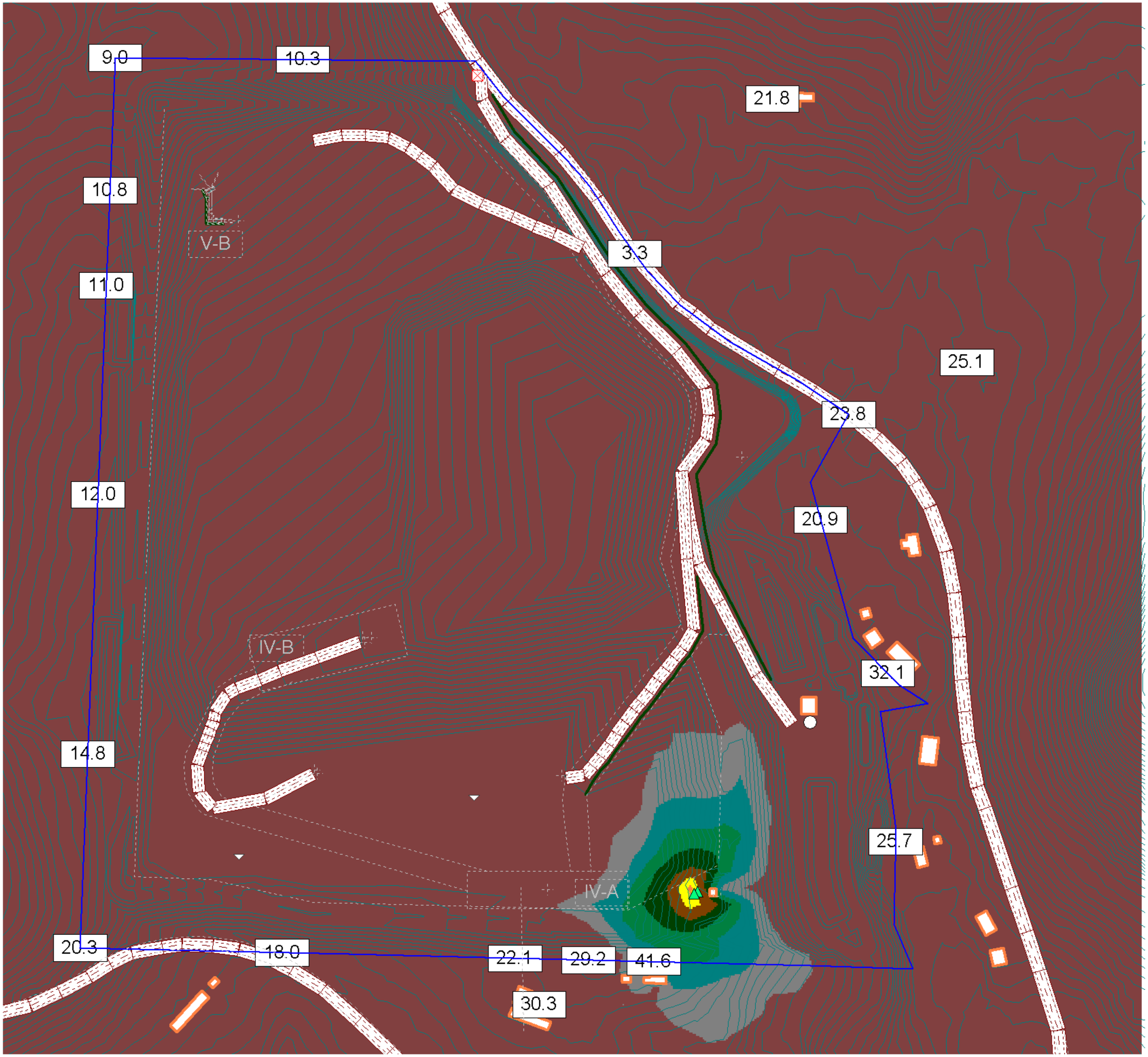
Map Scale: 1 : 3200

Modeling Software:
Cadna/A v4.6.155
by Datakustik

Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY

Noise Modeling
Carroll Landfill Expansion
Carroll, New York

Landfill Gas Control System
Enclosed Flare and Blower Operations

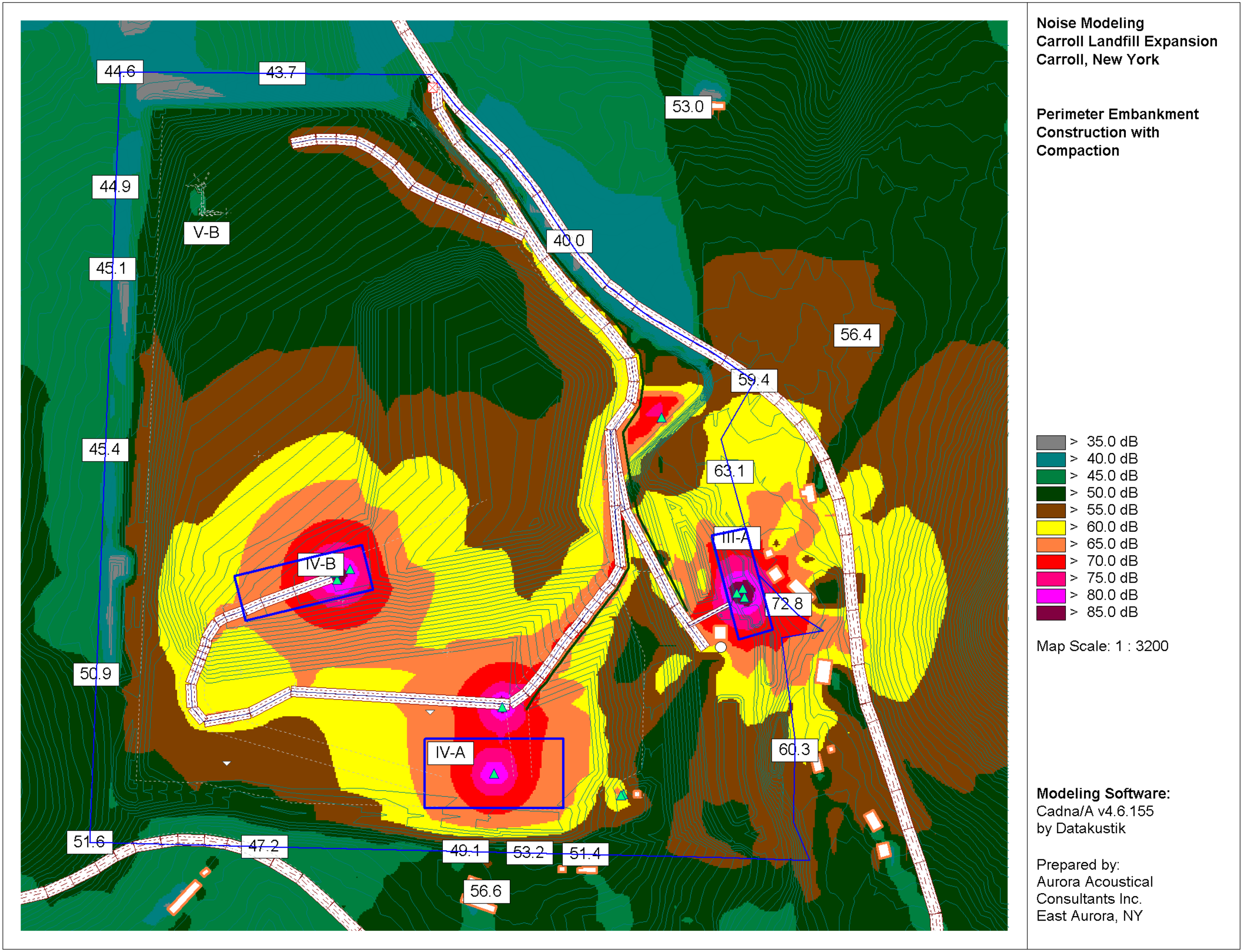


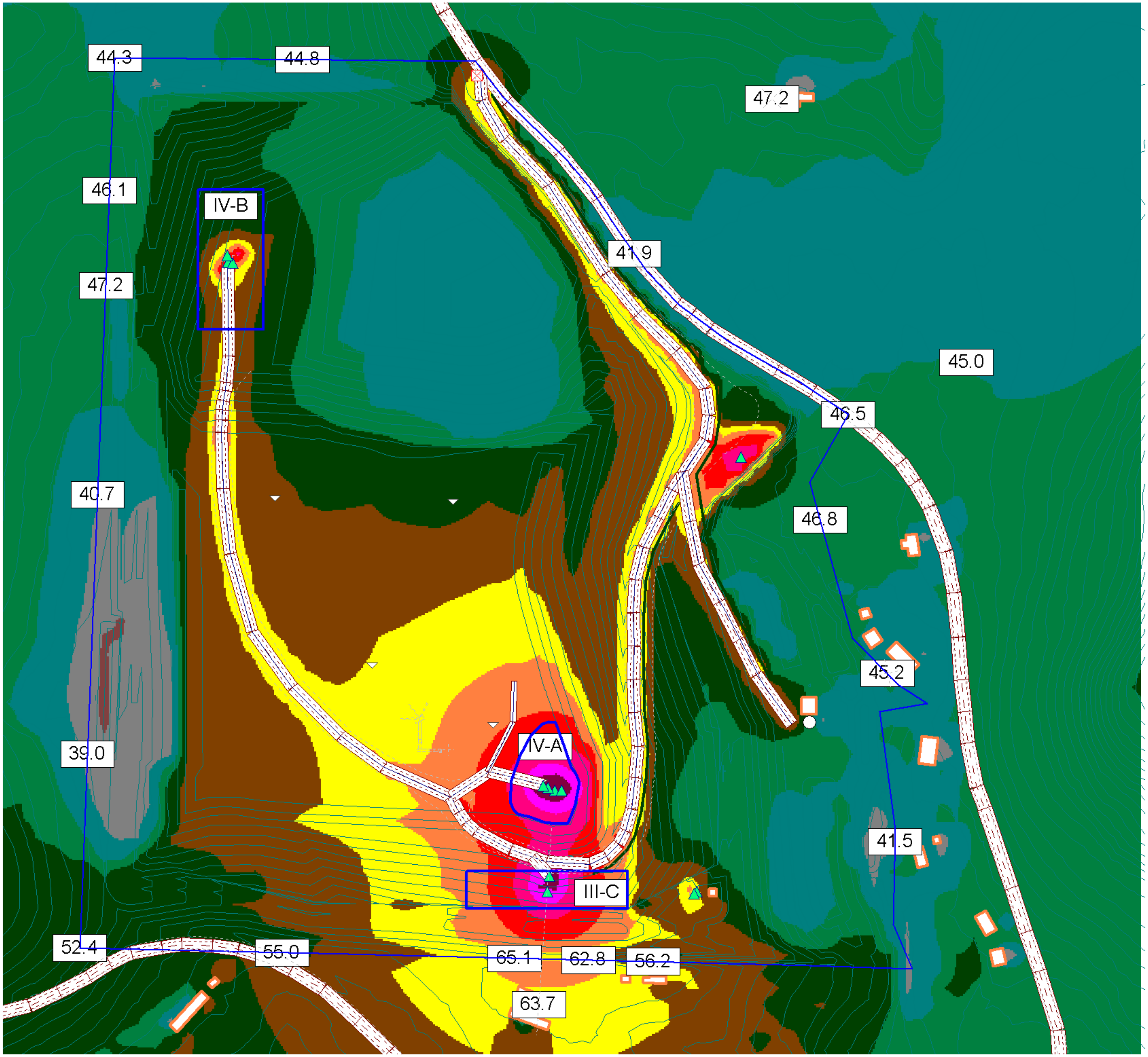
>	0.0 dB
>	35.0 dB
>	40.0 dB
>	45.0 dB
>	50.0 dB
>	55.0 dB
>	60.0 dB
>	65.0 dB
>	70.0 dB
>	75.0 dB
>	80.0 dB
>	85.0 dB

Map Scale: 1 : 3200

Modeling Software:
Cadna/A v4.6.155
by Datakustik

Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY


44.6
43.7
53.0
44.9
V-B
40.0
45.1
56.4
59.4
45.4
63.1
III-A
IV-B
72.8
50.9
IV-A
60.3
51.6
47.2
49.1
53.2
51.4
56.6
Noise Modeling
Carroll Landfill Expansion
Carroll, New York
Perimeter Embankment
Construction with
Compaction
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB
Map Scale: 1 : 3200
Modeling Software:
Cadna/A v4.6.155
by Datakustik
Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY



Noise Modeling
Carroll Landfill Expansion
Carroll, New York

Final Cover Side Slope Construction

>	35.0 dB
>	40.0 dB
>	45.0 dB
>	50.0 dB
>	55.0 dB
>	60.0 dB
>	65.0 dB
>	70.0 dB
>	75.0 dB
>	80.0 dB
>	85.0 dB

Map Scale: 1 : 3200

Modeling Software:
Cadna/A v4.6.155
by Datakustik

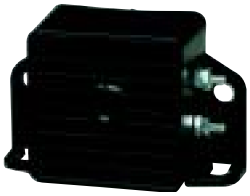
Prepared by:
Aurora Acoustical
Consultants Inc.
East Aurora, NY

ATTACHMENT 3

Backup Alarm Specifications

BACK-UP ALARMS
SPECIALTY ALARMS

Model 861 Mechanical Alarm (210402)



Reactor (210350)

Two-Tone Alarm (210361)

Specialty Alarms

REACTOR®

Reactor® back-up alarms feature solid-state electronics that automatically adjust to changing noise environments. The alarms self-adjust to a minimum of 5 decibels above the surrounding noise levels.

All Reactor models are environmentally sealed in epoxy to protect against moisture, dirt and vibration. Reactor alarms meet SAE J994 and OHSA requirements.

TWO-TONE ALARMS

The two-tone alarms produce a distinct sound to signal hazards other than backup warning. Applications include lift gates, stabilizing outriggers, or any situation where bystanders need to be warned of moving equipment. These alarms are available in multi-volt (12–48 VDC) and 115 VAC versions and can be activated through existing controls. All models feature unique terminal inserts that power the alarm and protect against water and dirt. Universal mounts are included.

ELECTRONIC BACK-UP ALARMS

These alarms are dependable and affordable. Each uses a glass reinforced nylon housing for durability and has an operating temperature range of –40°F to 170°F. Model 258 meets SAE Class B, and models 252 and 256 meet SAE Class C requirements.

ACTIVATING SWITCHES

When it isn't possible to wire your back-up alarm directly to your vehicle's back-up light circuit, these dependable switches fill the need. Installed adjacent to the gear shift lever or linkage, these switches activate the alarm when the actuating shaft is moved.

MODELS 660 AND 861 MECHANICAL ALARMS

These heavy gauge, chrome-plated steel back-up alarms are gravity activated. When the vehicle backs up at a reasonable speed, four heavy steel balls fall and strike the bell housing. Models are also available that sound when the vehicle moves forward. Mechanical alarms do not require a battery and will function with the motor on or off.

EFFECTIVE

- Models available to fit a variety of applications
- Reactor models automatically adjust for ambient noise levels
- Easy to install
- Electronic models feature "Piezo" sound technology

RELIABLE

- Proven in thousands of hours of field use
- Electronic models have reliable solid-state circuitry

DURABLE

- Resistant to heat and weather
- Solid-state units have no moving parts to wear down

APPLICATIONS

- Tow and Recovery vehicles
- Utility trucks
- Waste haulers
- Pickup trucks

APPROVALS

- Reactor – SAE J994 and OSHA requirements
- Electronic:
  258 – SAE Class B
  252 – SAE Class C
  256 – SAE Class C

WARNING FOR MECHANICAL ALARMS: While these alarms should begin to sound after one-quarter revolution of the vehicle's wheel, a half turn may be required in some instances. To avoid serious injury, ensure that no person or obstruction is within 10 feet of the rear of the vehicle. The vehicle must also be backed up at a safe and reasonable speed to assure proper performance of mechanical alarms.

ORDERING INFORMATION

REACTOR MODELS

210504 87-112 dB, plastic housing, 12-24 VDC

210505 87-107 dB, plastic housing, 12-48 VDC

210350 77-102 dB, reinforced nylon housing, 12-24 VDC

210502 107 dB and 112 dB, (manually adjustable), 12-24 VDC

MECHANICAL ALARMS MODELS 660 AND 861

210400 Model 660 for right rear mount, 87 dB (±5 dB), rings only when backing up

210401 Model 660 for right or left rear mount, 87 dB (±5 dB), rings in both directions

210402 Model 861 for right rear mount, 105 dB (±5 dB), rings only when backing up

210403 Model 861 for right or left rear mount, 105 dB (±5 dB), rings in both directions

MODELS 660 AND 861 REPLACEMENT PART

210288 Universal mounting bracket

ELECTRONIC BACK-UP ALARM MODELS

252 97 dB, 12–48 VDC

254 87 dB, 12 VDC

256 97 dB, 6–36 VDC

258 107 dB, 6–36 VDC

ACTIVATING SWITCH MODELS

210298 Activates in all directions

210299 Activates in one direction only

ACTIVATING SWITCH OPTION

200053 Mounting bracket for 210298

210298

TWO-TONE ALARM MODELS

210358 Two-tone, 87 dB, 12–48 VDC

210359 Two-tone, 87 dB, 115 VAC

210361 Two-tone, 97 dB, 12–48 VDC

210363 Two-tone, 107 dB, 12–48 VDC

210365 Two-tone, 112 dB, 12-48 VDC

210366 Two-tone, 112 dB, 115 VAC

SPECIFICATIONS

Reactor Back-Up Alarms

Dimensions (H. × W. × D.):

210504 – 4.0 in × 5.7 in × 3.1 in (102 mm × 145 mm × 79 mm)

210505 – 2.9 in × 5.0 in × 2.7 in (74 mm × 127 mm × 69 mm)

210350 – 2.7 in × 4.0 in × 1.6 in (69 mm × 102 mm × 41 mm)

210502 – 3.0 in × 5.0 in × 4.0 in (76 mm × 127 mm × 102 mm)

Output: 77–112 dB

Voltage: 12–48 VDC

Amp Draw: 0.06 to 1.0

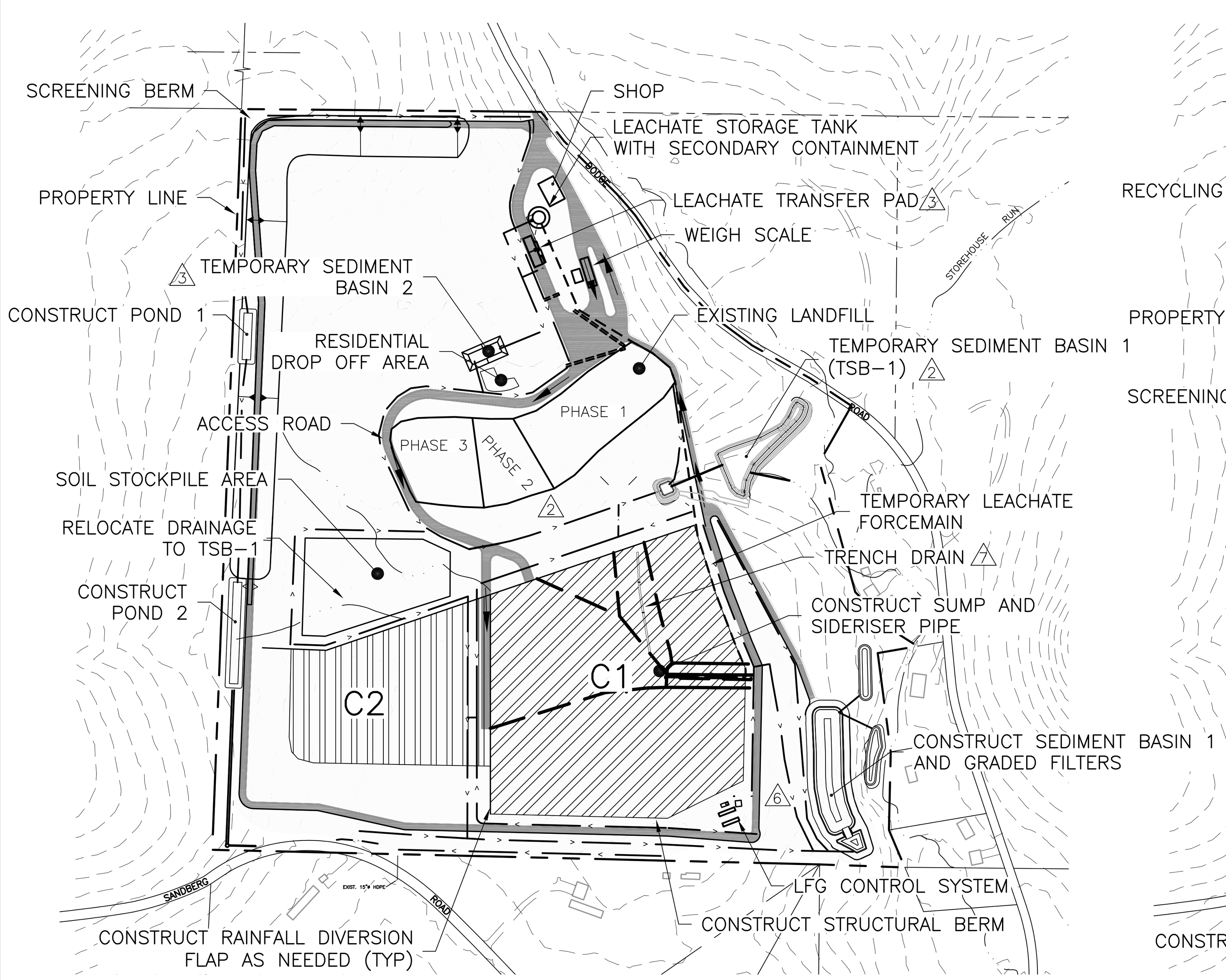
Ship. Weight: 2.0 lbs (0.9 kg)

MECHANICAL ALARMS AND SPECIALITY ALARMS

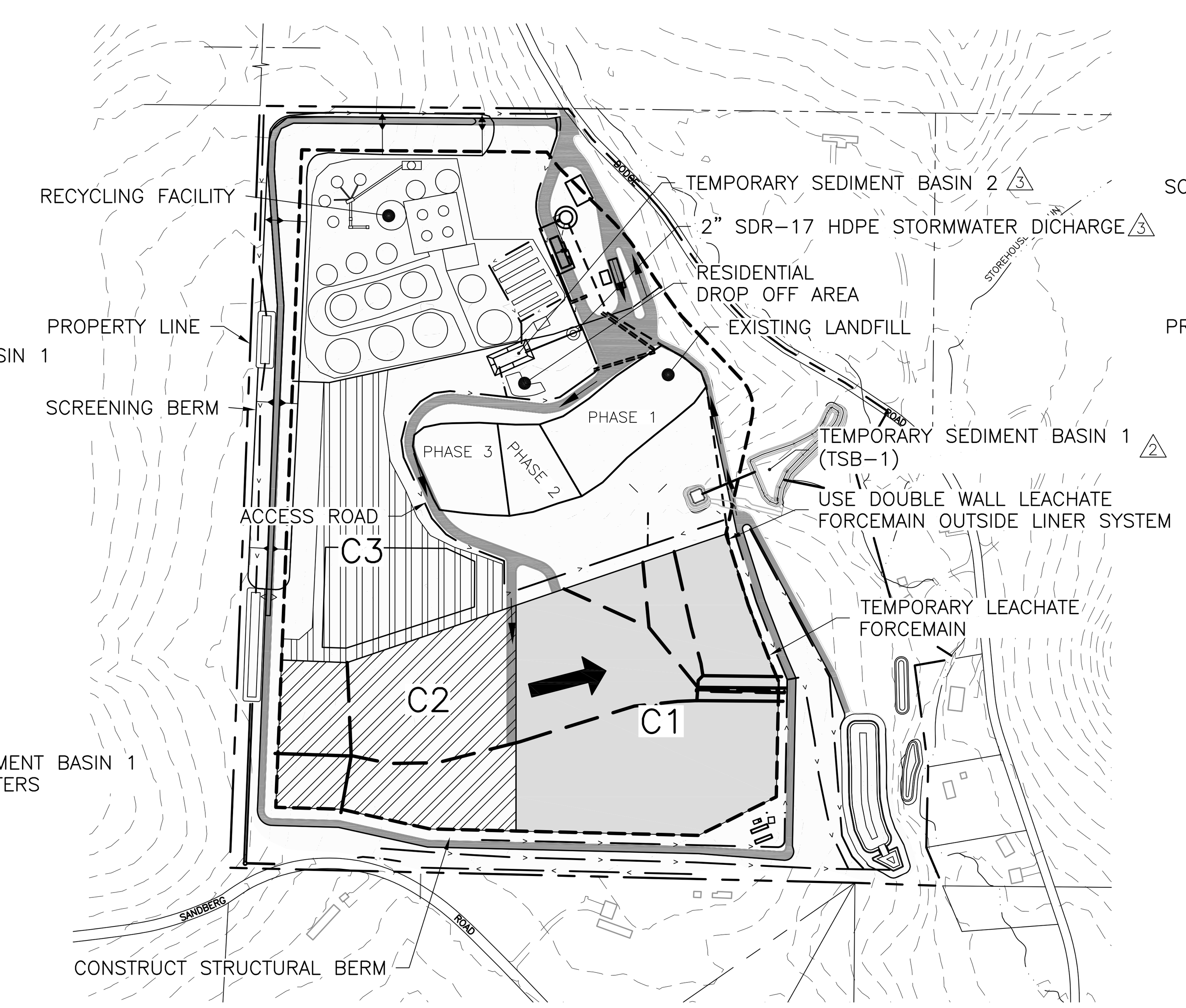
Model	*Sound Frequency*	*Sound Level*	*Voltage*	*Amp Draw*	*L × W × H in*	*L × W × H mm*	*Ship Weight lbs*	*Ship Weight kg*
210400/210401		87dB	N/A	N/A	6.0 × 6.0 × 3.6	152 x 152 x 91	7.0	3.2
210402/210403		105dB	N/A	N/A	8.7 × 8.7 × 3.6	221 x 221 x 91	7.8	3.5
252		97dB	12-48VDC	0.2	4.0 x 3.0 x 1.5	102 x 76 x 38	1.0	0.5
254		87dB	12VDC	0.3	4.0 x 3.0 x 1.5	102 x 76 x 38	1.0	0.5
256		97dB	6-36	0.3	4.0 x 3.0 x 1.5	102 x 76 x 38	1.0	0.5
258		107dB	6-36	0.5	5.0 x 4.0 x 3.0	127 x 102 x 76	2.0	0.9
210358	2.5/2.7kHz	87dB	12-48VDC	0.05@12V	2.9 x 2.9 x 2.4	73 x 73 x 62	0.6	0.3
210359	2.5/2.7kHz	87dB	115VAC	0.01	2.9 x 2.9 x 2.4	73 x 73 x 62	1.2	0.6
210361	2.5/2.7kHz	97dB	12-48VDC	0.1@12V	2.9 x 2.9 x 2.4	73 x 73 x 62	0.6	0.3
210363	2.5/2.7kHz	107dB	12-48VDC	0.12@12V	2.9 x 2.9 x 2.4	73 x 73 x 62	0.6	0.3
210365	2.5/2.7kHz	112dB	12-48VDC	0.14@12V	2.9 x 2.9 x 2.4	73 x 73 x 62	0.6	0.3
210366	2.5/2.7kHz	112dB	115VAC	0.03	2.9 x 2.9 x 2.4	73 x 73 x 62	1.2	0.6

ATTACHMENT 4

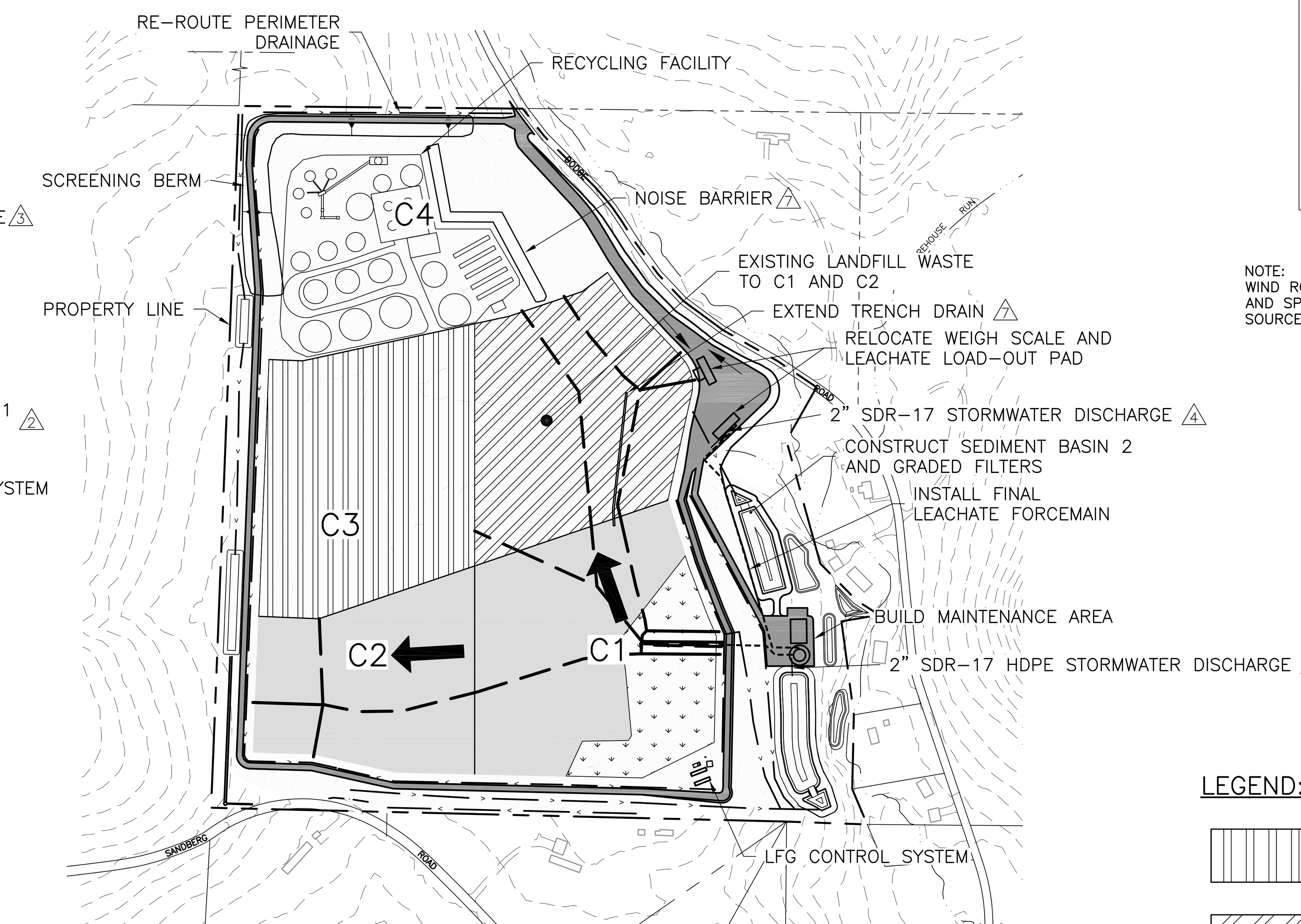
Copy of Phasing Plan



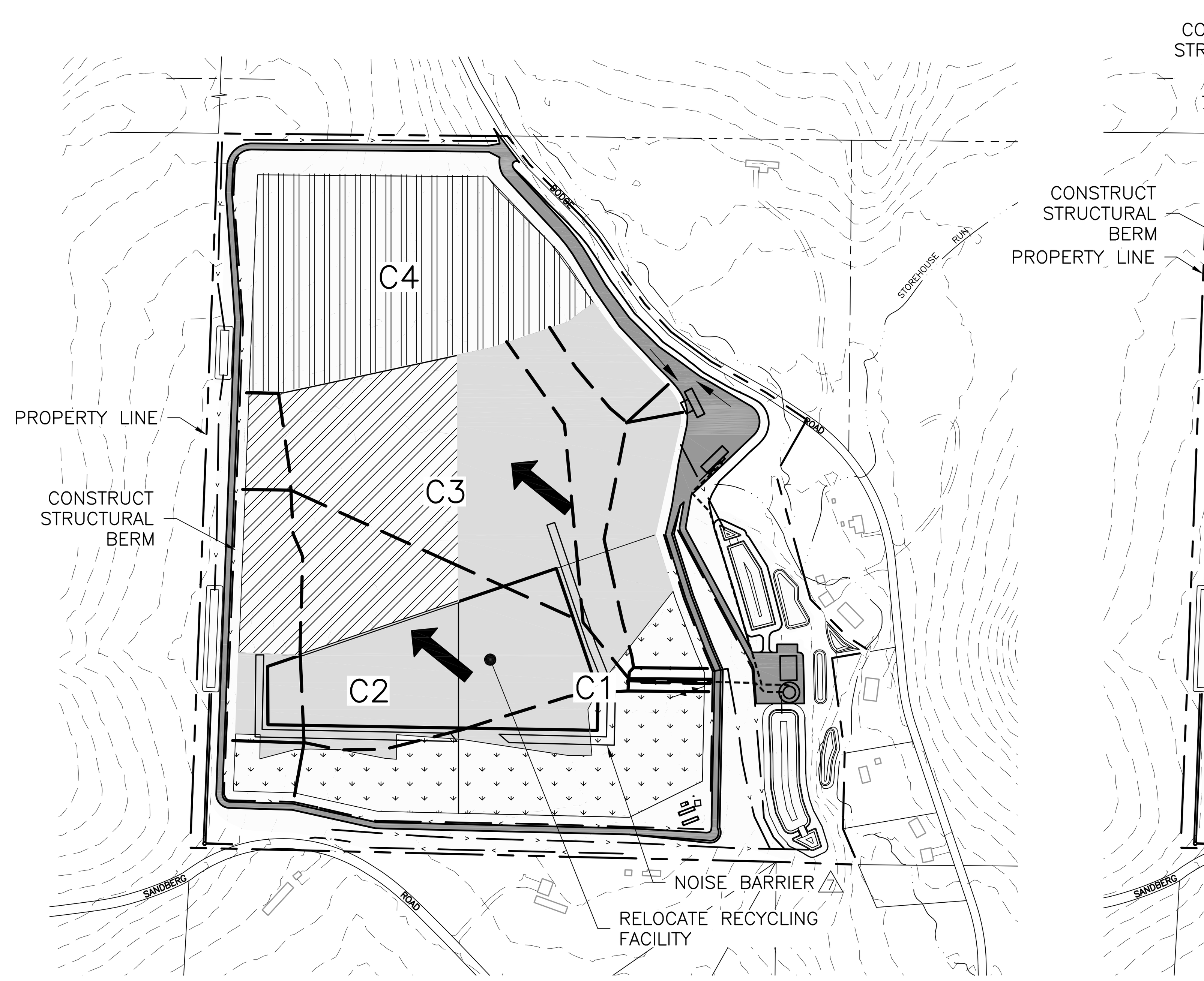
1 INITIAL CONSTRUCTION
Scale: 1"=300'



2 PHASE 4
Scale: 1"=300'

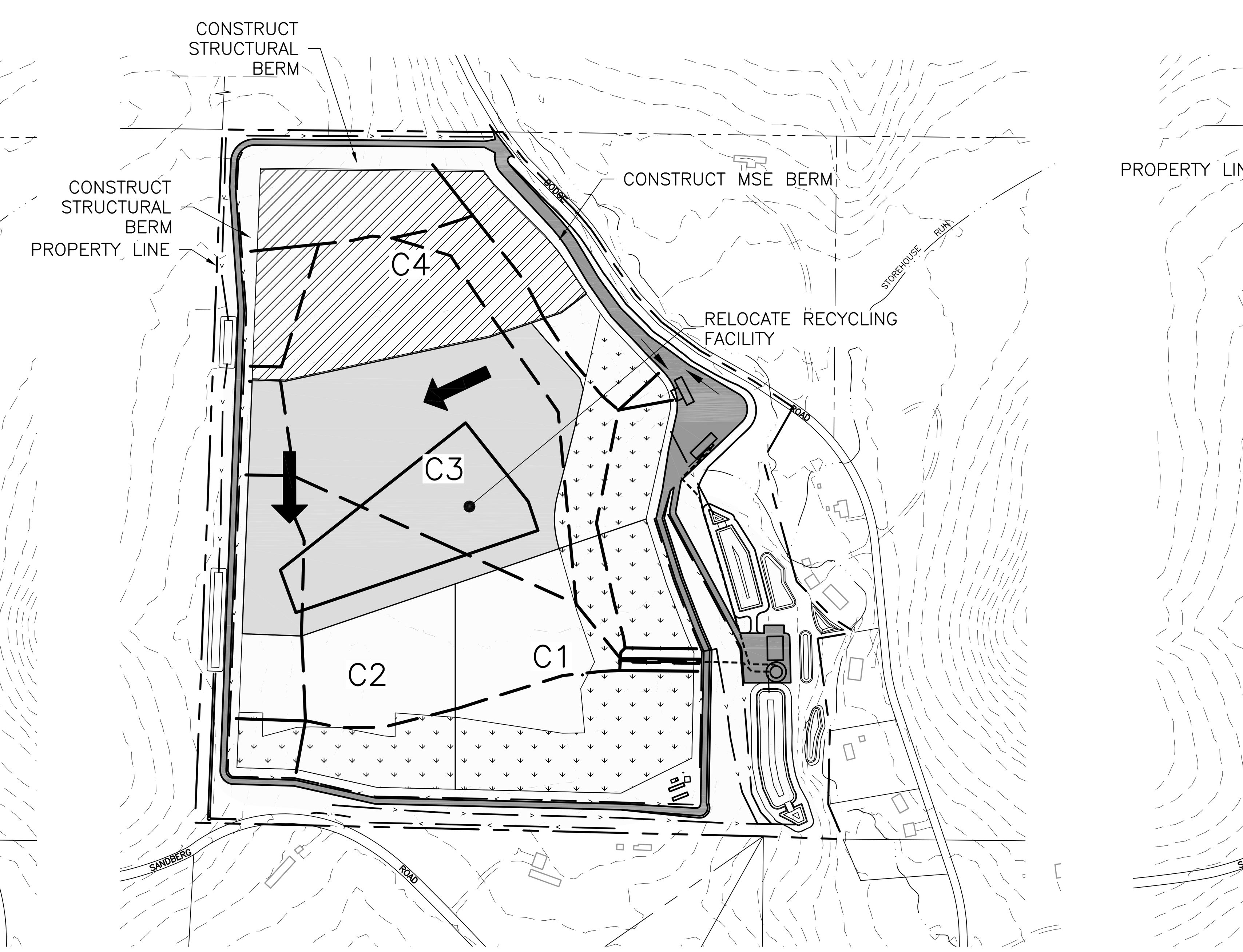


3 PHASE 5
Scale: 1"=300'



4 PHASE 6
Scale: 1"=300'

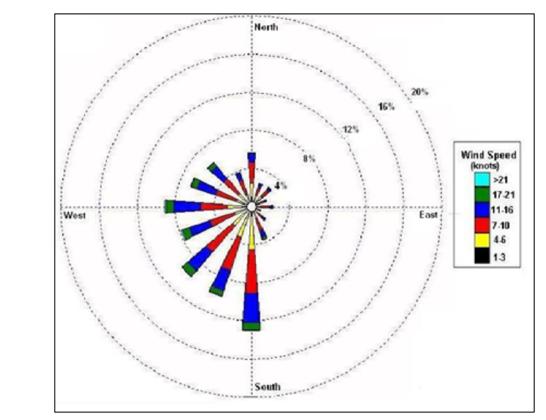
NOTE:
RECYCLING FACILITY TO BE RELOCATED SEQUENTIALLY DURING PHASE 6 TO ACCOMMODATE PROGRESS OF LANDFILLING IN CELL 1 AND 3, AND BORROW AREA IN CELL 4.



5 PHASE 7
Scale: 1"=300'

NOTE:
RECYCLING FACILITY TO BE RELOCATED SEQUENTIALLY DURING PHASE 7 TO ACCOMMODATE PROGRESS OF LANDFILLING IN CELL 3 AND CELL 4.

6 PHASE 8
Scale: 1"=300'



WIND ROSE

NOTE:
WIND ROSE REPRESENTS THE AVERAGE ANNUAL WIND DIRECTION AND SPEED DATA COLLECTED BY NOAA, JAMESTOWN, NEW YORK
SOURCE DATES: 1973 TO 2003

LEGEND:

- BORROW AREA
- LINER CONSTRUCTION
- ACTIVE LANDFILLING
- FINAL COVER
- DIRECTION OF INITIAL FILL PLACEMENT
- DRAINAGE CHANNEL FLOW DIRECTION
- LEACHATE FORCEMAIN
- ACCESS ROAD
- LD1 LEAK DETECTION POINT
- PRIMARY LEACHATE COLLECTION PIPE
- PRIMARY LEACHATE CLEAN OUT PIPE

NOTE:
1. THE SIZE OF THE LANDFILL CELLS SHOWN HEREON ARE FOR ILLUSTRATION PURPOSES TO SHOW FILL SEQUENCING. THE ACTUAL SIZE AND NUMBER OF CELLS WILL BE DEPENDENT ON WEATHER AND MARKET CONDITIONS.
2. SEE PD-8 FOR FINAL GRADING AND DRAINAGE PLAN

NO.	REVISION	BY	DATE
7	ADDED TRENCH DRAIN AND NOISE BARRIER	TPP	10/02/15
6	ADDED LFG PAD AND DRAINAGE	TPP	10/02/15
5	REVISED FINAL COVER PLACEMENT PROGRESSION	TPP	5/14/15
4	ADDED DRAINAGE PHASE 5 TANK AND TRANSFER PAD TO FOREBAY SB 1 AND 2	TPP	3/06/15
3	ADDED DRAINAGE TO INITIAL PHASE TANK AND TRANSFER PAD TO TEMPORARY SEDIMENT BASIN 2	TPP	3/02/15
2	ADDED INITIAL CONSTRUCTION RETENTION BASIN	TPP	6/06/14
1	ADDED PLCRS PIPING AND SUBGRADE DRAIN IN PHASES	TPP	7/01/14

DAIGLER ENGINEERING, P.C.
CIVIL & GEO-ENVIRONMENTAL ENGINEERING
2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
(716) 773-6872 (716) 773-6873 FAX

JAMES A. DAIGLER, P.E.
NYSPE NO. 061689

DATE: March 2014

SCALE: 1"=300'

PREPARED FOR:	SEALAND WASTE, LLC.		PHASING PLAN	SHEET PD-10A
DES. BY:	DRW. BY:	CHK. BY:	CARROLL LANDFILL EXPANSION APPLICATION	
DWG.	PD-10A CARROLL-PHASING.dwg		TOWN OF CARROLL / CHAUTAUQUA COUNTY / STATE OF NEW YORK	

Q:\Sealand\02-0104 Carroll Landfill\Permit Drawings\2015 REVISIONS\PD-10A CARROLL-PHASING.dwg 9/14/2016 8:29 AM