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ABC RECYCLING - BELLINGHAM, WA

SITE NOISE STUDY

Submitted to:

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I. INTRODUCTION / EXECUTIVE SUMMARY

This report presents the results of an environmental noise study conducted for the proposed ABC Recycling metal processing facility in Bellingham, WA. The proposed facility will be located on Parcel #380223106374 in Bellingham. The proposed project consists of four buildings. The purpose of the study is to document the extent of the noise impact from metal processing operations associated with the site to the surrounding properties. Noise levels from the site were predicted to the receiving properties and compared to the exterior sound level limits established by applicable code requirements.

See Appendix I for descriptions and definitions of acoustical terminology used in this report.

II. PROJECT SITE AND ZONING

The project site is located within the Whatcom County zoning jurisdiction. According to the Whatcom County, the project site and nearest adjacent properties and noise sensitive properties are currently zoned as follows:

Table 1: Site and Surrounding Properties Zoning / WAC Classification

ID	Property	Parcel # / Addr.	Zoning	Current Use	EDNA
	Project Site	380223106374	HII	Industrial	Class C
R1	NW (Across Locust Rd.)	3191, 3199 Locust Rd,	UR	Residential	Class A
R2	NW (Adjacent)	851 Marine Dr.	LII	Undeveloped	Class C
R3	NE (Across Marine Drive)	856 Marine Dr.	URMX	Residential	Class A
R4	NE (Across Marine Drive)	746 – 840 Marine Dr.	LII	Industrial	Class C
R5	SE (Adjacent)	747 Marine Dr.	NC	Church	Class B
R6	SW (Across Cement Plant Rd)	701 – 727 Cement Plant Rd	UR	Residential	Class A
R7	SW (Across rail line)	741 Marine Dr.	HII	Concrete plant	Class C

The following figure presents the zoning of the proposed site and surrounding properties along with the receiver locations listed above.

Figure 1: Site and Surrounding Properties (City of Bellingham CityIQ)

Ambient Conditions

Existing ambient noise levels were measured on site between October 10 – 11 with one Svantek 971 noise monitor and one Svantek 307 noise monitor. Noise levels at the site are primarily from local traffic and the concrete plant. The following table presents a summary of the hourly noise levels during daytime and nighttime hours. Please refer to the appendix for more information regarding the site noise measurements.

Table 2: Measured Ambient Noise Levels

Time Period	Hourly Sound Level Range, dBA Leq
Daytime (7 AM – 10 PM)	47 – 56
Nighttime (10 PM – 7 AM)	46 – 53

III. IMPACT REGULATIONS AND CRITERIA

Whatcom County code adopts Washington Administrative Code 173-60 maximum environmental noise levels. The following are the maximum environmental hourly noise levels based on the Environmental Designation for Noise Abatement (EDNA) for the source and receiving properties from WAC 173-60:

Table 3: Maximum permissible environmental noise levels

District of Sound Source	District of Receiving Property		
	EDNA A Residential (dBA) (Leq)	**EDNA B Commercial (dBA) (Leq)**	**EDNA C Industrial (dBA) (Leq)**
EDNA A Residential	55	57	60
EDNA B Commercial	57	60	65
EDNA C Industrial	60	65	70

WAC Code 173-60-040(B) states that between the hours of 10:00 pm and 7:00 am, the limits provided in the table above are reduced by 10 dBA for residential district receivers.

In addition, during any hour of the day or night the applicable noise limitations may be exceeded for any receiving property by no more than:

(a) 5 dBA for a total of 15 minutes in any one-hour period; or

(b) 10 dBA for a total of 5 minutes in any one-hour period; or

(c) 15 dBA for a total of 1.5 minutes in any one-hour period.

Washington Administrative Code (WAC) Section 173-60 identifies industrial use properties as Class C EDNA and residential properties as Class A EDNA. Under WAC 173-60, Maximum Permissible Environmental Noise Levels, noise from equipment on a Class C EDNA property is limited as follows:

Class C EDNA Receiver: Noise is limited to 70 dBA at all hours of the day.

Class B EDNA Receiver: Noise is limited to 65 dBA at all hours of the day.

Class A EDNA Receiver: Noise is limited to 60 dBA during daytime hours. During nighttime hours, between the hours of 10 p.m. and 7 a.m., the maximum permissible sound level is decreased by 10 decibels.

The facility will be in operation between 7:00 AM – 10:00 PM, during daytime hours only. Therefore, noise from the facility must not exceed the daytime noise limits at the Class A EDNA receiving properties.

Noise from motor vehicles are exempt at Class B and Class C receivers.

IV. NOISE SOURCES

Site Description:

The proposed site consists of four buildings, a paved area for truck and material handling equipment, and material processing and storage areas.

The following are the proposed buildings and associated uses:

- Building 1: Office / Shop
- Building 2: Separation
- Building 3: Reclamation
- Building 5: Twitch

The following figure presents the proposed site plan:

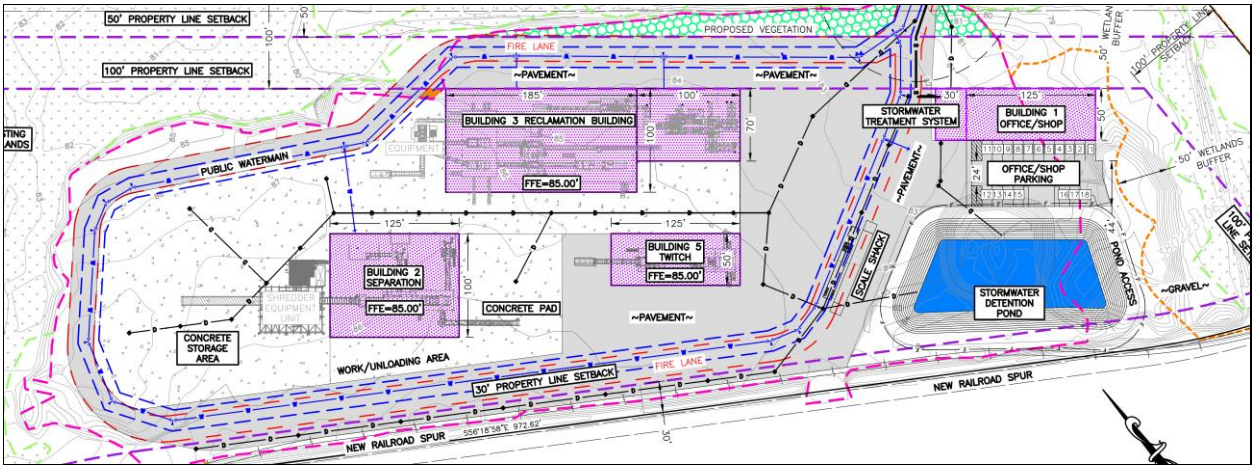

Figure 2: ABC Recycling Site Plan

Major noise-generating equipment includes the metal shredder (3Tek Alpha 7400), vertical ball mills, and conveyers. Material handling equipment will consist of frontloaders and excavators equipment with grapples or magnets. Heavy trucks will deliver and pick up material.

The hours of operation will be from 7:00 AM to 10:00 PM. The metal shredding activity will not occur for this entire timeframe.

Metal Shredder:

The metal shredder will be a 3Tek Alpha 7400. The shredder components include the 7400 hammer mill, motor, power module, vibratory shaker, and various separators and conveyers. The shredder system will be located north of Building 2.

The shredder equipment will be surrounded by noise barriers. The conveyer openings will be kept to a minimum to reduce noise transfer through the barrier.

Separation Building:

This building will be used have material separation equipment and conveyers which do not generate significant noise levels.

Reclamation & Twitch Buildings:

These buildings will be used in sorting processed materials and will have conveyers and possibly 1 - 2 vertical ball mills.

The buildings are expected to be primarily constructed of corrugated sheet metal, which is estimated to reduce noise levels by 27 dB.

Truck Events:

- Trucks will enter / exit the site from Marine Drive, travel along the SE side of the facility to the work/unloading area. After unloading / loading, the trucks will travel along the path around the NE side of the site to the exit.
- Trucks will be either flatbed or end dump trucks.
- There will be 3 - 5 trucks during any one-hour period.

Noises associated with the site related to truck and activity typically include truck transit, startup and idling, air brakes, backup beepers, and dumping or loading activities. Truck transit consists of a truck pulling into the site, traveling to the scales or unloading area, and parking. Truck transit events where trucks pass closest to receiving properties will last for up to 30 seconds. Trucks idling are assumed to idle for no more than a few minutes before transit or after parking, and less than a total of 15 minutes during a one-hour period. Air brakes and engine starts are essentially instantaneous or last no more than a few seconds and would last less than a total of 1.5 minutes during a one-hour period.

Source Sound Levels

The following is a summary of typical noise levels generated by activity associated with the site:

Table 4: Source Sound Levels and Reference Distances

Source / Equipment	Reference Distance (Feet)	Sound Pressure Level (SPL, dBA)	Duration per Hour
Metal Processing Equipment			
3Tek Alpha 7400 Hammer Mill Shredder	180	83 (Avg)	Continuous
3Tek Alpha 7400 Hammer Mill Shredder	180	93 (Max)	<1.5 Minutes
Ball Mill	5	93	< 15 Minutes
Heavy Truck Sources			
Heavy Truck Transit (< 10 MPH)	25	86	< 5 Minutes
Heavy Truck Idling	25	80	< 15 Minutes
Heavy Truck Engine Start	25	74	< 1.5 Minutes
Heavy Truck Air Brakes	25	75	< 1.5 Minutes
Heavy Truck Dumping Metal	25	98	< 1.5 Minutes
Unloading / Moving / Loading Scrap Metal			
Excavator w/ grapple picking up metal	40	90	< 1.5 Minutes
Excavator w/ grapple moving metal	40	80	< 5 Minutes
Excavator w/ grapple or magnet dropping metal	40	90	< 1.5 Minutes
Frontloader pushing metal pile	30	94	< 15 Minutes

Reference sound levels were obtained from published data or field measurements of activities and equipment at similar sites.

Noise levels from conveyers will be less than 45 dBA at the building exteriors and will be well below the code limits at all receiving properties.

Equipment, sources, activities, etc. that are expected to occur / be in operation for a duration of not more than 15 minutes in an hour are subject to the 5 dBA allowable exceedance to the hourly limit.

Equipment, sources, activities, etc. that are expected to occur / be in operation for a duration of not more than 5 minutes in an hour are subject to the 10 dBA allowable exceedance to the hourly limit.

Short-term noise levels from equipment, sources, activities, etc that expected to occur for not more than 1.5 minutes in an hour are subject to the 15 dBA allowable exceedance to the hourly limit.

V. PREDICTED NOISE LEVELS

The following sections provide the predicted noise levels from the proposed site to the nearest receiving properties. Noise levels were predicted based on distance attenuation. Distances from each source to the receiving properties were based on the closest possible source location to the nearest receiving properties. Noise reduction due to intervening elements, such as buildings, earth berms, and barrier walls were accounted for in the calculations.

Predicted Noise Levels – Metal Shredder

The metal shredder system is expected to be in continuous operation during any one-hour period. The following table presents a summary of predicted noise levels at the receiving properties from the metal shredder. Distances were calculated from the shredder building walls to the receiving properties. As noted previously, sound absorptive material will be installed on the walls and ceiling of the building to reduce noise from the shredder, and conveyer openings will be kept to a minimum to reduce noise transfer to the exterior.

Table 5: Predicted Noise Levels – Metal Shredder – Average Noise Levels

Metal Shredder L_{eq} SPL @ 180' (dBA)	Barrier Atten[1]	Receiver	EDNA	Dist. to rcvr (ft)	Dist. Attn.[2]	SPL @ Receiver (dBA)	Noise Limit (dBA)
83	-17	R1	Class A	1300	-19	47	**60**
83	-17	R2	Class C	1100	-16	50	**70**
83	-17	R3	Class A	1030	-15	51	**60**
83	-17	R4	Class C	380	-6	60	**70**
83	-30	R5	Class B	1050	-15	38	**65**
83	-30	R6	Class A	1300	-17	36	**60**
83	-17	R7	Class C	160	+1	67	**70**

1. Noise reduction from barrier or intervening building
2. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted hourly noise levels from the metal shredder meet the 60 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 65 dBA code limit at the Class B receiving properties, and the 70 dBA limit at the Class C receiving properties.

Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Table 6: Predicted Noise Levels – Metal Shredder – Max Noise Levels

Metal Shredder L_{max} SPL @ 180' (dBA)	Bldg. Wall NR[1]	Receiver	EDNA	Dist. to rcvr (ft)	Dist. Attn.[2]	SPL @ Receiver (dBA)	Noise Limit (dBA)
93	-17	R1	Class A	1600	-19	57	**75**
93	-17	R2	Class C	1170	-16	60	**85**
93	-17	R3	Class A	1420	-15	61	**75**
93	-17	R4	Class C	400	-6	70	**85**
93	-30	R5	Class B	1000	-15	48	**80**
93	-30	R6	Class A	1170	-17	46	**75**
93	-17	R7	Class C	145	+1	77	**85**

1. Noise reduction from barrier or intervening building
2. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted maximum noise levels from the metal shredder meet the 1.5-minute 75 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 1.5-minute 80 dBA code limit at the Class B receiving properties, and the 1.5-minute 85 dBA limit at the Class C receiving properties.

Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Predicted Noise Levels – Reclamation & Twitch Buildings

The following are the predicted noise levels from (2) ball mills operating in the buildings. Ball mills will operate for less than 15 minutes during any one-hour period. Distances were calculated from the building walls to the receiving properties.

Table 7: Predicted Noise Levels – Reclamation Building #3 - Ball Mills

Ball Mill SPL @ 5' (dBA) (2 mills)	Bldg. Wall NR[1]	Receiver	EDNA	Dist. to rcvr (ft)	Dist. Attn.[2]	SPL @ Receiver (dBA)	Noise Limit (dBA)
96	-27	R1	Class A	1450	-49	20	**65**
96	-27	R2	Class C	1030	-46	23	**75**
96	-27	R3	Class A	1130	-47	22	**65**
96	-27	R4	Class C	160	-30	39	**75**
96	-27	R5	Class B	480	-40	29	**70**
96	-27	R6	Class A	820	-44	25	**65**
96	-27	R7	Class C	215	-33	36	**75**

1. Estimated noise reduction through building walls.
2. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from ball mills in Reclamation Building #3 meet the 15-minute 65 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 15-minute 70 dBA code limit at the Class B receiving properties, and the 15-minute 75 dBA limit at the Class C receiving properties. Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Table 8: Predicted Noise Levels – Twitch Building #5 - Ball Mills

Ball Mill SPL @ 5' (dBA) (2 mills)	Bldg. Wall NR[1]	Receiver	EDNA	Dist. to rcvr (ft)	Dist. Attn.[2]	SPL @ Receiver (dBA)	Noise Limit (dBA)
96	-27	R1	Class A	1600	-50	19	**65**
96	-27	R2	Class C	1170	-47	22	**75**
96	-27	R3	Class A	1300	-48	21	**65**
96	-27	R4	Class C	300	-36	33	**75**
96	-27	R5	Class B	560	-41	28	**70**
96	-27	R6	Class A	810	-44	25	**65**
96	-27	R7	Class C	115	-27	42	**75**

1. Estimated noise reduction through building walls.
2. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from ball mills in Twitch Building #5 meet the 15-minute 65 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 15-minute 70 dBA code limit at the Class B receiving properties, and the 15-minute 75 dBA limit at the Class C receiving properties. Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Predicted Noise Levels – Material Loading Events

Scrap metal to be processed will be loaded from trucks or the scrap pile onto the shredder input conveyer. This will be done with frontloaders or excavators equipped with grapples or magnetic pickers. Processed materials will be loaded from the stock piles onto trucks with frontloaders or excavators.

The following are the predicted noise levels from unloading and moving scrap metal or loading trucks with processed materials.

Table 9: Predicted Noise Levels – Picking up or dropping metal

Picking up or dropping metal SPL @ 40' (dBA)	Receiver	EDNA	Dist. to rcvr (ft)	Dist. Attn.[1]	SPL @ Receiver (dBA)	Noise Limit (dBA)
90	R1	Class A	1150	-29	61	**75**
90	R2	Class C	680	-25	65	**85**
90	R3	Class A	900	-27	63	**75**
90	R4	Class C	600	-24	66	**85**
90	R5	Class B	770	-26	64	**80**
90	R6	Class A	980	-28	62	**75**
90	R7	Class C	130	-10	80	**85**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from dropping metal meet the 1.5-minute 75 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 1.5-minute 80 dBA code limit at the Class B receiving properties, and the 1.5-minute 85 dBA limit at the Class C receiving properties.

Table 10: Predicted Noise Levels – Moving metal

Excavator moving metal SPL @ 40' (dBA)	Receiver	EDNA	Dist. to rcvr (ft)	Dist. Attn.[1]	SPL @ Receiver (dBA)	Noise Limit (dBA)
80	R1	Class A	1150	-29	51	**70**
80	R2	Class C	680	-25	55	**80**
80	R3	Class A	900	-27	53	**70**
80	R4	Class C	600	-24	56	**80**
80	R5	Class B	770	-26	54	**75**
80	R6	Class A	980	-28	52	**70**
80	R7	Class C	130	-10	70	**80**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from moving metal meet the 5-minute 70 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 5-minute 75 dBA code limit at the Class B receiving properties, and the 5-minute 80 dBA limit at the Class C receiving properties.

Table 11: Predicted Noise Levels – Frontloader pushing metal pile

Frontloader pushing metal SPL @ 30' (dBA)	Receiver	EDNA	Rcvr dist. (ft)	Dist. Attn.[1]	SPL @ Receiver (dBA)	Noise Limit (dBA)
94	R1	Class A	1150	-32	62	**75**
94	R2	Class C	680	-27	67	**85**
94	R3	Class A	900	-30	64	**75**
94	R4	Class C	600	-26	68	**85**
94	R5	Class B	770	-28	66	**80**
94	R6	Class A	980	-30	64	**75**
94	R7	Class C	130	-13	81	**85**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from a frontloader pushing metal piles meet the 1.5-minute 75 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 1.5-minute 80 dBA code limit at the Class B receiving properties, and the 1.5-minute 85 dBA limit at the Class C receiving properties.

Table 12: Predicted Noise Levels – Truck dumping metal

Truck dumping metal @ 25' (dBA)	Receiver	EDNA	Rcvr dist. (ft)	Dist. Attn.[1]	SPL @ Receiver (dBA)	Noise Limit (dBA)
98	R1	Class A	1410	-35	63	**75**
98	R2	Class C	980	-32	66	**85**
98	R3	Class A	1310	-34	64	**75**
98	R4	Class C	600	-28	70	**85**
98	R5	Class B	960	-32	66	**80**
98	R6	Class A	1130	-33	65	**75**
98	R7	Class C	130	-14	84	**85**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from a truck dumping metal meet the 1.5-minute 75 dBA daytime limit at all of the Class A receiving properties. Noise levels meet the 1.5-minute 80 dBA code limit at the Class B receiving properties, and the 1.5-minute 85 dBA limit at the Class C receiving properties.

Predicted Noise Levels – Heavy Truck Events - Class A Receiving Properties

The following are the predicted noise levels from truck events to the Class A receiving properties.

Truck Transit (Hourly Code Limit)

The following tables present a summary of predicted noise levels from truck transit to the receiving properties compared to the hourly code limit. Distance to the receiver was determined from the closest portion of the truck path to the nearest receiving property for a truck in transit on the site.

Table 13: Predicted Noise Levels – Truck Transit

Source Area	Receiver	Lp, s (dBA)	Ref. Dist.	Rcv. Dist.	Dist. Attn.[1]	Lp, r (dBA)	Event Duration (s)	SEL[2]	Events per Hour	Hourly Leq at Rcvr.[3]
North path	R1	86	25 ft	1100	-33	**53**	30	68	5	**39**
North path	R3	86	25 ft	830	-29	**57**	30	71	5	**43**
Entry path	R6	86	25 ft	770	-29	**57**	30	71	5	**43**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)
2. SEL = (Lp, r)+10*LOG(Event Duration (s))
3. Hourly Leq at Receiver = (SEL)+10*LOG(Events per Hour)-10*LOG(3600)

As shown in the table above, the predicted noise levels from truck transit events meet the 60 dBA daytime limit at all of the Class A receiving properties. Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Truck Idling Events (15-minute Code Limit)

The following tables present a summary of predicted noise levels from truck idling events to the receiving properties compared to the 15-minute code limit. Distance to the receiver was calculated from the closest portion of the unloading area or scales to the nearest receiving property.

Table 14: Predicted Noise Levels – Truck Idling

Source Area	Receiver	Lp, s (dBA)	Ref. Dist.	Rcv. Dist.	Dist. Attn.[1]	Lp, r (dBA)
Unload	R1	80	25 ft	1150	-33	**47**
Unload	R3	80	25 ft	830	-30	**50**
Scales	R6	80	25 ft	770	-30	**50**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from truck idling events meet the 65 dBA 15-minute daytime limit at all of the Class A receiving properties. Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Truck Engine Starts (1.5-minute Code Limit)

The following tables present a summary of predicted noise levels from truck engine starts to the receiving property compared to the 1.5-minute code limit. Distance to the receiver was calculated from the closest portion of the unloading area or scales to the nearest receiving property.

Table 15: Predicted Noise Levels – Truck Engine Starts

Source Area	Receiver	Lp, s (dBA)	Ref. Dist.	Rcv. Dist.	Dist. Attn.[1]	Lp, r (dBA)
Unload	R1	74	25 ft	1150	-33	**41**
Unload	R3	74	25 ft	830	-30	**44**
Scales	R6	74	25 ft	770	-30	**44**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from truck engine start events meet the 75 dBA 1.5-minute daytime limit at all of the Class A receiving properties. Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

Truck Air Brakes (1.5-minute Code Limit)

The following tables present a summary of predicted noise levels from truck air brake events to the receiving property compared to the 1.5-minute code limit. Distance to the receiver was calculated from the closest portion of the unloading area or scales to the nearest receiving property.

Table 16: Predicted Noise Levels – Truck Air Brakes

Source Area	Receiver	Lp, s (dBA)	Ref. Dist.	Rcv. Dist.	Dist. Atten.[1]	Lp, r (dBA)
Unload	R1	75	25 ft	1150	-33	**42**
Unload	R3	75	25 ft	830	-30	**45**
Scales	R6	75	25 ft	770	-30	**45**

1. Distance Attenuation Factor = -10*LOG(Q)+20*LOG(R2/R1)

As shown in the table above, the predicted noise levels from truck air brake events meet the 75 dBA 1.5-minute daytime limit at all of the Class A receiving properties. Additionally, the predicted noise levels are within or below the range of ambient noise levels measured at the site.

VIII. SUMMARY

This report has provided the results of the site noise study from the proposed ABC Recycling metal processing facility to the surrounding properties. Predicted noise levels were compared and evaluated relative to Whatcom County Code requirements for maximum permissible sound levels. Noise levels are expected to meet the noise code requirements. Please contact us if you have questions or need further information.

APPENDIX I: ACOUSTICAL DESCRIPTORS

Sound is measured as sound level in units of decibels, dB. The human ear responds differently to sounds at different frequencies. This is demonstrated by the fact that we hear higher pitched sounds more easily than lower ones of the same magnitude. To compensate for the different "loudness" as perceived by humans, a standard weighting curve is applied to measured sound levels. The weighting curve represents the frequency response of the human ear and is labeled as dBA ("A" weighted decibels).

People normally experience sound levels between 30 and 90 dBA, depending on their activities. Locations near highways or urban arterials may be 70 dBA, whereas quiet rural areas may be 40 dBA.

Each 10 dB increase in sound level corresponds to a tenfold increase of sound energy, but is judged by a listener as only a doubling of loudness. The smallest changes in sound level considered just noticeable are about 2 to 3 dBA.

Sound levels from two or more sources are combined logarithmically, not by adding the levels arithmetically. When two levels are combined, the louder level predominates, and the combined level is the louder level plus 0 to 3 dBA. Some examples: 50 dBA combined with 50 dBA is 53 dBA; 50 dBA combined with 40 dBA results in 50.4 dBA, which is rounded off to 50 dBA since fractions of a dB are negligible from the point of view of perception of environmental noise.

When measuring noise that is fluctuating over time, it is common practice to use a descriptor called equivalent A-weighted sound level, Leq. The Leq is that constant sound level in dBA which contains the same amount of sound energy over a given time period as the measured fluctuating noise. The Leq is often determined for one-hour time periods.

Another descriptor is the Lmax. The Lmax is the highest instantaneous sound level for a given sound event or time period. Similarly, Lmin is the lowest instantaneous sound level for a given sound event or time period.

APPENDIX II: SITE NOISE MEASUREMENTS

Hourly monitoring of noise levels at the site was conducted on the northwest and southeast portions of the lot with one Svantek 971 type 1 sound level meter and one Svantek 307 type 1 sound level meter. The monitors were set to record noise levels over a 24-hour period from 1:00 PM on October 10 to 1:00 PM on October 11, 2023. Short-term noise measurements were also taken at the monitoring locations and at several locations in the area surrounding the site. Monitoring and short-term measurement locations are indicated in the following figure.

Figure 3: Noise Monitor Locations (Whatcom County GIS)

The following charts present the results of the monitoring at locations M1 and M2:

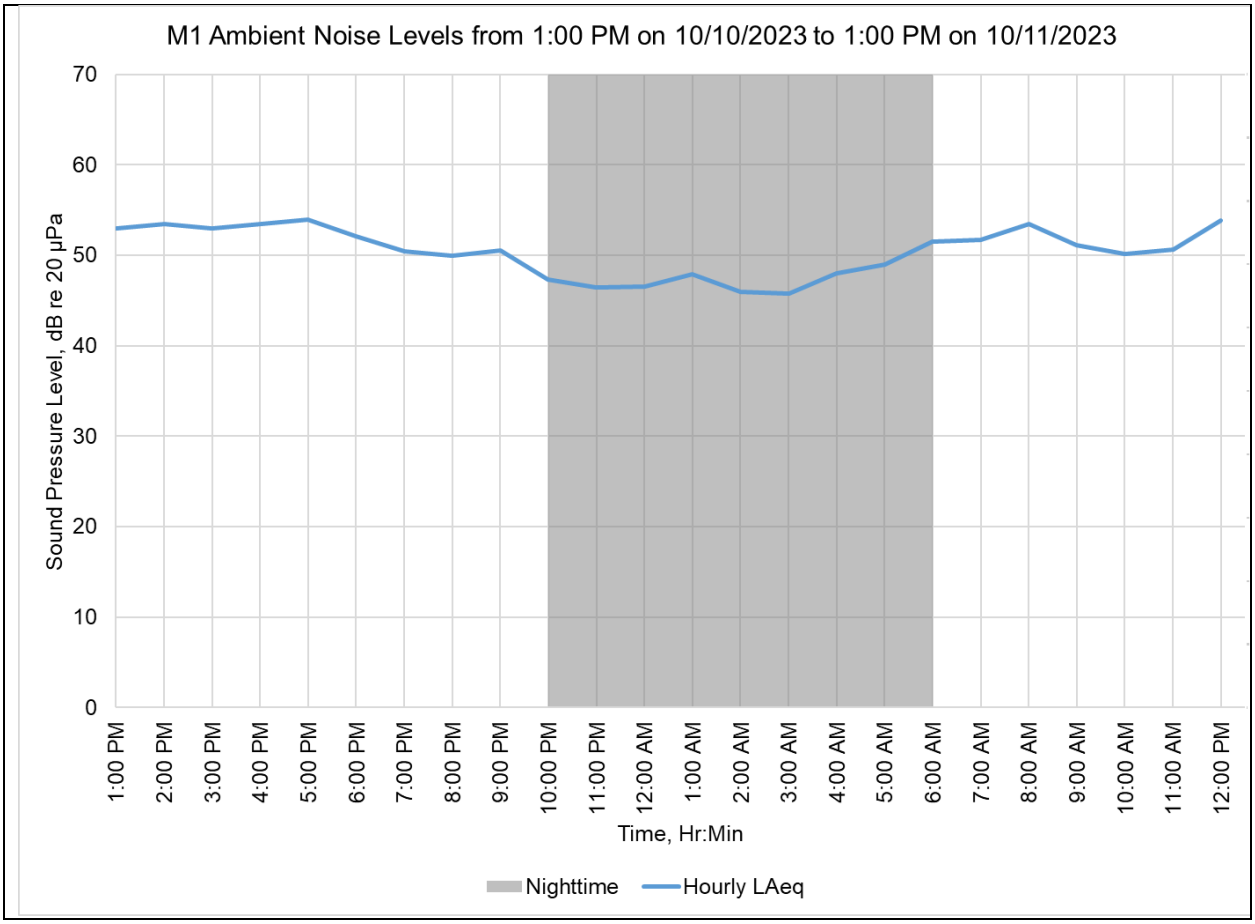

Figure 4: Hourly Noise Levels – Location M1

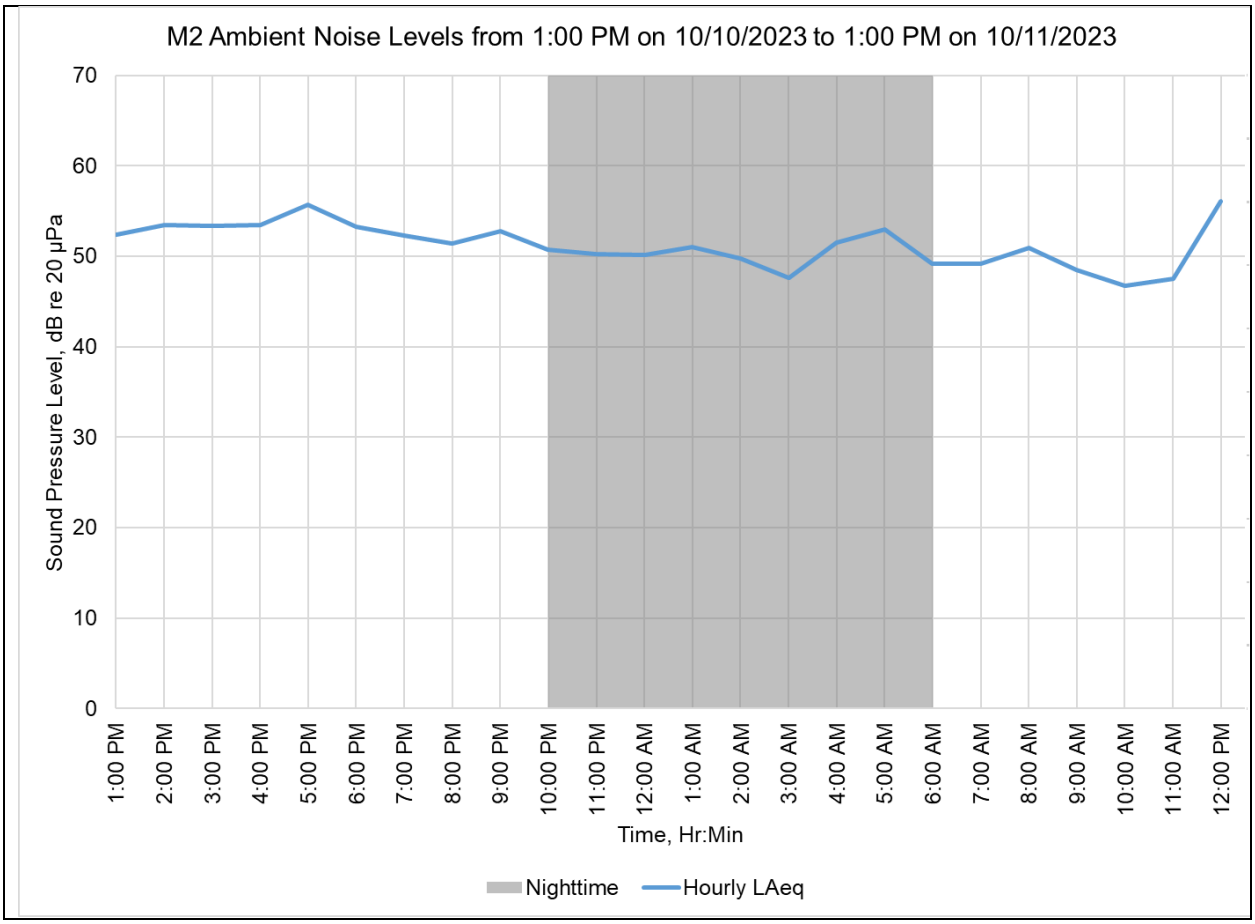

Figure 5: Hourly Noise Levels – Location M2

The following table provides a summary of the short-term measurements.

Table 17: Short-Term Measurement Summary

Location	Sound Level, Leq (dBA)
M1	52
M2	52
S3	62
S4	51
S5	62
S6	68
S7	48
S8	47