Appendix N: Noise Impact Calculations

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Site Preparation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	Commercial	689995.07	5203693.46	41.6	45.0	43	37
NSA 2 - Residence	Residential	690294.55	5203664.71	41.6	45.0	43	37
NSA 3 - Residence	Residential	690077.91	5203373.11	41.6	45.0	43	37
NSA 4 - Residence	Residential	689517.04	5203651.95	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Better Life for Dogs	690019.21	5203652.81
NSA 2 - Residence	690216.68	5203702.59
NSA 3 - Residence	690000.14	5203410.21
NSA 4 - Residence	689730.67	5203564.20

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	689945.81	5203342.84

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Grader	3	40	10	50	85
Excavator	3	40	6	50	81
Dozer	6	40	10	50	82
Dump Truck	10	40	12	50	76
All Other Equipment > 5 HP	2	50	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	57.7	55.1	66.0	54.2			
Excavator	51.5	48.9	59.8	48.0			
Dozer	57.7	55.1	66.0	54.2			
Dump Truck	54.7	52.2	63.0	51.2			
All Other Equipment > 5 HP	54.7	52.1	63.0	51.2			
Total [1]	**62.8**	**60.2**	**71.1**	**59.3**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	75.2	69.9	70.0	61.4			
Excavator	68.9	63.7	63.7	55.2			
Dozer	75.2	69.9	70.0	61.4			
Dump Truck	72.2	66.9	67.0	58.4			
All Other Equipment > 5 HP	72.2	66.9	66.9	58.4			
Total [1]	**80.3**	**75.0**	**75.1**	**66.5**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Site Preparation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	62.8	80.3	59.8	62.2	37.0	59.9	15.0	65
NSA 2 - Residence	60.2	75.0	57.4	59.7	37.0	57.5	12.5	60
NSA 3 - Residence	71.1	75.1	68.1	70.5	37.0	68.1	23.2	60
NSA 4 - Residence	59.3	66.5	56.4	58.8	37.0	56.6	11.7	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Excavation/Foundation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	Commercial	689995.07	5203693.46	41.6	45.0	43	37
NSA 2 - Residence	Residential	690294.55	5203664.71	41.6	45.0	43	37
NSA 3 - Residence	Residential	690077.91	5203373.11	41.6	45.0	43	37
NSA 4 - Residence	Residential	689517.04	5203651.95	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Better Life for Dogs	690019.21	5203652.81
NSA 2 - Residence	690216.68	5203702.59
NSA 3 - Residence	690000.14	5203410.21
NSA 4 - Residence	689730.67	5203564.20

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	689945.81	5203342.84

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Concrete Mixer Truck	2	40	8	50	79
Vibratory Pile Driver	1	20	6	50	101
Pickup Truck	2	40	6	50	75
Tractor	3	40	12	50	84
All Other Equipment > 5 HP	4	50	6	50	85
Compactor (ground)	1	20	6	50	83
Crane	3	16	6	50	81
Jackhammer	1	20	6	50	89
All Other Equipment > 5 HP	4	50	6	50	85
Backhoe	3	40	6	50	78
Front End Loader	5	40	10	50	79
Welder/Torch	2	40	8	50	74
Dozer	10	40	10	50	82
Roller	1	20	10	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	48.9	46.4	57.3	45.5			
Vibratory Pile Driver	63.7	61.1	72.0	60.2			
Pickup Truck	43.7	41.2	52.0	40.2			
Tractor	57.5	54.9	65.8	54.0			
All Other Equipment > 5 HP	57.7	55.1	66.0	54.2			
Compactor (ground)	45.7	43.1	54.0	42.2			
Crane	47.5	44.9	55.8	44.0			
Jackhammer	51.7	49.1	60.0	48.2			
All Other Equipment > 5 HP	57.7	55.1	66.0	54.2			
Backhoe	48.5	45.9	56.8	45.0			
Front End Loader	53.9	51.4	62.2	50.4			
Welder/Torch	43.9	41.4	52.3	40.5			
Dozer	59.9	57.4	68.2	56.4			
Roller	44.9	42.4	53.2	41.4			
Total [1]	**67.6**	**65.1**	**75.9**	**64.1**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	66.4	61.2	61.2	52.7			
Vibratory Pile Driver	81.2	75.9	76.0	67.4			
Pickup Truck	61.2	55.9	56.0	47.4			
Tractor	75.0	69.7	69.7	61.2			
All Other Equipment > 5 HP	75.2	69.9	70.0	61.4			
Compactor (ground)	63.2	57.9	58.0	49.4			
Crane	65.0	59.7	59.8	51.2			
Jackhammer	69.2	63.9	64.0	55.4			
All Other Equipment > 5 HP	75.2	69.9	70.0	61.4			
Backhoe	65.9	60.7	60.7	52.2			
Front End Loader	71.4	66.1	66.2	57.6			
Welder/Torch	61.4	56.2	56.2	47.7			
Dozer	77.4	72.1	72.2	63.6			
Roller	62.4	57.1	57.2	48.6			
Total [1]	**85.1**	**79.8**	**79.9**	**71.3**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Excavation/Foundation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	67.6	85.1	64.6	66.9	37.0	64.6	19.7	65
NSA 2 - Residence	65.1	79.8	62.1	64.4	37.0	62.1	17.2	60
NSA 3 - Residence	75.9	79.9	72.9	75.3	37.0	72.9	28.0	60
NSA 4 - Residence	64.1	71.3	61.2	63.5	37.0	61.2	16.3	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Equipment Installation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	Commercial	689995.07	5203693.46	41.6	45.0	43	37
NSA 2 - Residence	Residential	690294.55	5203664.71	41.6	45.0	43	37
NSA 3 - Residence	Residential	690077.91	5203373.11	41.6	45.0	43	37
NSA 4 - Residence	Residential	689517.04	5203651.95	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Better Life for Dogs	690019.21	5203652.81
NSA 2 - Residence	690216.68	5203702.59
NSA 3 - Residence	690000.14	5203410.21
NSA 4 - Residence	689730.67	5203564.20

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	689945.81	5203342.84

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Pickup Truck	2	40	6	50	75
Tractor	5	40	12	50	84
Auger Drill Rig	2	20	6	50	84
Vibratory Pile Driver	2	20	6	50	101
Crane	3	16	6	50	81
Concrete Mixer Truck	1	40	8	50	79
Drill Rig Truck	1	20	6	50	79
Backhoe	6	40	10	50	78
Welder/Torch	2	40	8	50	74
All Other Equipment > 5 HP	6	50	12	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	43.7	41.2	52.0	40.2			
Tractor	59.7	57.1	68.0	56.2			
Auger Drill Rig	49.7	47.1	58.0	46.2			
Vibratory Pile Driver	66.7	64.1	75.0	63.2			
Crane	47.5	44.9	55.8	44.0			
Concrete Mixer Truck	45.9	43.4	54.3	42.5			
Drill Rig Truck	41.7	39.1	50.0	38.2			
Backhoe	53.7	51.1	62.0	50.2			
Welder/Torch	43.9	41.4	52.3	40.5			
All Other Equipment > 5 HP	62.4	59.9	70.8	59.0			
Total [1]	**68.9**	**66.4**	**77.3**	**65.5**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	61.2	55.9	56.0	47.4			
Tractor	77.2	71.9	72.0	63.4			
Auger Drill Rig	67.2	61.9	62.0	53.4			
Vibratory Pile Driver	84.2	78.9	79.0	70.4			
Crane	65.0	59.7	59.8	51.2			
Concrete Mixer Truck	63.4	58.2	58.2	49.6			
Drill Rig Truck	59.2	53.9	54.0	45.4			
Backhoe	71.2	65.9	66.0	57.4			
Welder/Torch	61.4	56.2	56.2	47.7			
All Other Equipment > 5 HP	79.9	74.7	74.7	66.2			
Total [1]	**86.4**	**81.2**	**81.2**	**72.7**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Equipment Installation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	68.9	86.4	65.9	68.3	37.0	66.0	21.0	65
NSA 2 - Residence	66.4	81.2	63.4	65.8	37.0	63.4	18.5	60
NSA 3 - Residence	77.3	81.2	74.3	76.6	37.0	74.3	29.3	60
NSA 4 - Residence	65.5	72.7	62.5	64.8	37.0	62.5	17.6	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Clean-up and Restoration

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	Commercial	689995.07	5203693.46	41.6	45.0	43	37
NSA 2 - Residence	Residential	690294.55	5203664.71	41.6	45.0	43	37
NSA 3 - Residence	Residential	690077.91	5203373.11	41.6	45.0	43	37
NSA 4 - Residence	Residential	689517.04	5203651.95	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Better Life for Dogs	690019.21	5203652.81
NSA 2 - Residence	690216.68	5203702.59
NSA 3 - Residence	690000.14	5203410.21
NSA 4 - Residence	689730.67	5203564.20

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	689945.81	5203342.84

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Compressor (air)	3	40	10	50	78
Dozer	5	40	6	50	82
Grader	5	40	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	50.7	48.1	59.0	47.2			
Dozer	54.7	52.1	63.0	51.2			
Grader	57.7	55.1	66.0	54.2			
Total [1]	**60.0**	**57.4**	**68.3**	**56.5**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	68.2	62.9	63.0	54.4			
Dozer	72.2	66.9	67.0	58.4			
Grader	75.2	69.9	70.0	61.4			
Total [1]	**77.5**	**72.2**	**72.3**	**63.7**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Camas Solar Site

Noise Impact Assessment - Clean-up and Restoration

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Better Life for Dogs	60.0	77.5	57.1	59.4	37.0	57.2	12.3	65
NSA 2 - Residence	57.4	72.2	54.6	56.9	37.0	54.9	9.9	60
NSA 3 - Residence	68.3	72.3	65.3	67.7	37.0	65.4	20.4	60
NSA 4 - Residence	56.5	63.7	53.8	56.1	37.0	54.1	9.1	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Site Preparation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	683365.08	5214369.85	41.6	45.0	43	37
NSA 2 - Residence	Residential	682993.24	5214592.21	41.6	45.0	43	37
NSA 3 - Residence	Residential	683746.65	5215469.99	41.6	45.0	43	37
NSA 4 - Residence	Residential	683750.14	5215577.07	41.6	45.0	43	37
NSA 5 - Residence	Residential	683671.64	5215299.76	41.6	45.0	43	37
NSA 6 - Residence	Residential	683719.03	5215093.36	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	683385.16	5214483.19
NSA 2 - Residence	683344.44	5214597.08
NSA 3 - Residence	683571.84	5215199.10
NSA 4 - Residence	683571.84	5215199.10
NSA 5 - Residence	683571.84	5215199.10
NSA 6 - Residence	683573.56	5215086.63

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	683459.62	5214800.55

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Grader	3	40	10	50	85
Excavator	3	40	6	50	81
Dozer	6	40	10	50	82
Dump Truck	10	40	12	50	76
All Other Equipment > 5 HP	2	50	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	55.8	54.5	51.4	50.3	54.0	56.8	
Excavator	49.6	48.3	45.2	44.1	47.8	50.6	
Dozer	55.8	54.5	51.4	50.3	54.0	56.8	
Dump Truck	52.8	51.5	48.4	47.3	51.0	53.8	
All Other Equipment > 5 HP	52.8	51.5	48.4	47.3	51.0	53.8	
Total [1]	**60.9**	**59.6**	**56.5**	**55.4**	**59.1**	**61.9**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	67.4	57.7	58.5	56.2	65.6	65.4	
Excavator	61.2	51.5	52.3	50.0	59.4	59.2	
Dozer	67.4	57.8	58.5	56.2	65.6	65.4	
Dump Truck	64.5	54.8	55.5	53.3	62.6	62.4	
All Other Equipment > 5 HP	64.4	54.7	55.5	53.2	62.6	62.4	
Total [1]	**72.5**	**62.9**	**63.6**	**61.3**	**70.7**	**70.5**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Site Preparation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	60.9	72.5	58.0	60.3	37.0	58.1	13.1	60
NSA 2 - Residence	59.6	62.9	56.7	59.0	37.0	56.9	11.9	60
NSA 3 - Residence	56.5	63.6	53.8	56.1	37.0	54.1	9.1	60
NSA 4 - Residence	55.4	61.3	52.7	55.0	37.0	53.1	8.2	60
NSA 5 - Residence	59.1	70.7	56.2	58.5	37.0	56.4	11.4	60
NSA 6 - Residence	61.9	70.5	59.0	61.3	37.0	59.1	14.1	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Excavation/Foundation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	683365.08	5214369.85	41.6	45.0	43	37
NSA 2 - Residence	Residential	682993.24	5214592.21	41.6	45.0	43	37
NSA 3 - Residence	Residential	683746.65	5215469.99	41.6	45.0	43	37
NSA 4 - Residence	Residential	683750.14	5215577.07	41.6	45.0	43	37
NSA 5 - Residence	Residential	683671.64	5215299.76	41.6	45.0	43	37
NSA 6 - Residence	Residential	683719.03	5215093.36	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	683385.16	5214483.19
NSA 2 - Residence	683344.44	5214597.08
NSA 3 - Residence	683571.84	5215199.10
NSA 4 - Residence	683571.84	5215199.10
NSA 5 - Residence	683571.84	5215199.10
NSA 6 - Residence	683573.56	5215086.63

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	683459.62	5214800.55

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Concrete Mixer Truck	2	40	8	50	79
Vibratory Pile Driver	1	20	6	50	101
Pickup Truck	2	40	6	50	75
Tractor	3	40	12	50	84
All Other Equipment > 5 HP	4	50	6	50	85
Compactor (ground)	1	20	6	50	83
Crane	3	16	6	50	81
Jackhammer	1	20	6	50	89
All Other Equipment > 5 HP	4	50	6	50	85
Backhoe	3	40	6	50	78
Front End Loader	5	40	10	50	79
Welder/Torch	2	40	8	50	74
Dozer	10	40	10	50	82
Roller	1	20	10	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	47.0	45.8	42.7	41.6	45.2	48.1	
Vibratory Pile Driver	61.8	60.5	57.4	56.3	60.0	62.8	
Pickup Truck	41.8	40.5	37.4	36.3	40.0	42.8	
Tractor	55.6	54.3	51.2	50.1	53.8	56.6	
All Other Equipment > 5 HP	55.8	54.5	51.4	50.3	54.0	56.8	
Compactor (ground)	43.8	42.5	39.4	38.3	42.0	44.8	
Crane	45.6	44.3	41.2	40.1	43.8	46.6	
Jackhammer	49.8	48.5	45.4	44.3	48.0	50.8	
All Other Equipment > 5 HP	55.8	54.5	51.4	50.3	54.0	56.8	
Backhoe	46.6	45.3	42.2	41.1	44.8	47.6	
Front End Loader	52.0	50.7	47.6	46.5	50.2	53.0	
Welder/Torch	42.0	40.8	37.7	36.6	40.2	43.1	
Dozer	58.0	56.7	53.6	52.5	56.2	59.0	
Roller	43.0	41.7	38.6	37.5	41.2	44.0	
Total [1]	**65.7**	**64.4**	**61.3**	**60.2**	**63.9**	**66.7**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	58.7	49.0	49.8	47.5	56.9	56.7	
Vibratory Pile Driver	73.4	63.7	64.5	62.2	71.6	71.4	
Pickup Truck	53.5	43.8	44.5	42.3	51.6	51.4	
Tractor	67.2	57.5	58.3	56.0	65.4	65.2	
All Other Equipment > 5 HP	67.4	57.7	58.5	56.2	65.6	65.4	
Compactor (ground)	55.4	45.7	46.5	44.2	53.6	53.4	
Crane	57.2	47.5	48.3	46.0	55.4	55.2	
Jackhammer	61.4	51.7	52.5	50.2	59.6	59.4	
All Other Equipment > 5 HP	67.4	57.7	58.5	56.2	65.6	65.4	
Backhoe	58.2	48.5	49.3	47.0	56.4	56.2	
Front End Loader	63.7	54.0	54.7	52.5	61.8	61.6	
Welder/Torch	53.7	44.0	44.8	42.5	51.9	51.7	
Dozer	69.7	60.0	60.7	58.5	67.9	67.6	
Roller	54.7	45.0	45.7	43.5	52.8	52.6	
Total [1]	**77.4**	**67.7**	**68.4**	**66.2**	**75.6**	**75.3**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Excavation/Foundation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	65.7	77.4	62.7	65.1	37.0	62.8	17.8	60
NSA 2 - Residence	64.4	67.7	61.5	63.8	37.0	61.5	16.6	60
NSA 3 - Residence	61.3	68.4	58.4	60.7	37.0	58.5	13.6	60
NSA 4 - Residence	60.2	66.2	57.3	59.6	37.0	57.5	12.5	60
NSA 5 - Residence	63.9	75.6	60.9	63.3	37.0	61.0	16.0	60
NSA 6 - Residence	66.7	75.3	63.8	66.1	37.0	63.8	18.8	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Equipment Installation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	683365.08	5214369.85	41.6	45.0	43	37
NSA 2 - Residence	Residential	682993.24	5214592.21	41.6	45.0	43	37
NSA 3 - Residence	Residential	683746.65	5215469.99	41.6	45.0	43	37
NSA 4 - Residence	Residential	683750.14	5215577.07	41.6	45.0	43	37
NSA 5 - Residence	Residential	683671.64	5215299.76	41.6	45.0	43	37
NSA 6 - Residence	Residential	683719.03	5215093.36	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	683385.16	5214483.19
NSA 2 - Residence	683344.44	5214597.08
NSA 3 - Residence	683571.84	5215199.10
NSA 4 - Residence	683571.84	5215199.10
NSA 5 - Residence	683571.84	5215199.10
NSA 6 - Residence	683573.56	5215086.63

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	683459.62	5214800.55

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Pickup Truck	2	40	6	50	75
Tractor	5	40	12	50	84
Auger Drill Rig	2	20	6	50	84
Vibratory Pile Driver	2	20	6	50	101
Crane	3	16	6	50	81
Concrete Mixer Truck	1	40	8	50	79
Drill Rig Truck	1	20	6	50	79
Backhoe	6	40	10	50	78
Welder/Torch	2	40	8	50	74
All Other Equipment > 5 HP	6	50	12	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	41.8	40.5	37.4	36.3	40.0	42.8	
Tractor	57.8	56.5	53.4	52.3	56.0	58.8	
Auger Drill Rig	47.8	46.5	43.4	42.3	46.0	48.8	
Vibratory Pile Driver	64.8	63.5	60.4	59.3	63.0	65.8	
Crane	45.6	44.3	41.2	40.1	43.8	46.6	
Concrete Mixer Truck	44.0	42.8	39.7	38.5	42.2	45.1	
Drill Rig Truck	39.8	38.5	35.4	34.3	38.0	40.8	
Backhoe	51.8	50.5	47.4	46.3	50.0	52.8	
Welder/Torch	42.0	40.8	37.7	36.6	40.2	43.1	
All Other Equipment > 5 HP	60.5	59.3	56.2	55.1	58.7	61.6	
Total [1]	**67.0**	**65.8**	**62.7**	**61.6**	**65.2**	**68.1**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	53.5	43.8	44.5	42.3	51.6	51.4	
Tractor	69.4	59.8	60.5	58.2	67.6	67.4	
Auger Drill Rig	59.4	49.8	50.5	48.2	57.6	57.4	
Vibratory Pile Driver	76.4	66.8	67.5	65.2	74.6	74.4	
Crane	57.2	47.5	48.3	46.0	55.4	55.2	
Concrete Mixer Truck	55.7	46.0	46.8	44.5	53.9	53.7	
Drill Rig Truck	51.4	41.7	42.5	40.2	49.6	49.4	
Backhoe	63.4	53.8	54.5	52.2	61.6	61.4	
Welder/Torch	53.7	44.0	44.8	42.5	51.9	51.7	
All Other Equipment > 5 HP	72.2	62.5	63.3	61.0	70.4	70.2	
Total [1]	**78.7**	**69.0**	**69.8**	**67.5**	**76.9**	**76.7**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Equipment Installation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	67.0	78.7	64.1	66.4	37.0	64.1	19.1	60
NSA 2 - Residence	65.8	69.0	62.8	65.1	37.0	62.8	17.9	60
NSA 3 - Residence	62.7	69.8	59.7	62.1	37.0	59.8	14.9	60
NSA 4 - Residence	61.6	67.5	58.6	61.0	37.0	58.7	13.8	60
NSA 5 - Residence	65.2	76.9	62.3	64.6	37.0	62.3	17.4	60
NSA 6 - Residence	68.1	76.7	65.1	67.4	37.0	65.1	20.2	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Clean-up and Restoration

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	683365.08	5214369.85	41.6	45.0	43	37
NSA 2 - Residence	Residential	682993.24	5214592.21	41.6	45.0	43	37
NSA 3 - Residence	Residential	683746.65	5215469.99	41.6	45.0	43	37
NSA 4 - Residence	Residential	683750.14	5215577.07	41.6	45.0	43	37
NSA 5 - Residence	Residential	683671.64	5215299.76	41.6	45.0	43	37
NSA 6 - Residence	Residential	683719.03	5215093.36	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	683385.16	5214483.19
NSA 2 - Residence	683344.44	5214597.08
NSA 3 - Residence	683571.84	5215199.10
NSA 4 - Residence	683571.84	5215199.10
NSA 5 - Residence	683571.84	5215199.10
NSA 6 - Residence	683573.56	5215086.63

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	683459.62	5214800.55

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Compressor (air)	3	40	10	50	78
Dozer	5	40	6	50	82
Grader	5	40	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	48.8	47.5	44.4	43.3	47.0	49.8	
Dozer	52.8	51.5	48.4	47.3	51.0	53.8	
Grader	55.8	54.5	51.4	50.3	54.0	56.8	
Total [1]	**58.1**	**56.8**	**53.7**	**52.6**	**56.3**	**59.1**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	60.4	50.7	51.5	49.2	58.6	58.4	
Dozer	64.4	54.7	55.5	53.2	62.6	62.4	
Grader	67.4	57.7	58.5	56.2	65.6	65.4	
Total [1]	**69.7**	**60.1**	**60.8**	**58.5**	**67.9**	**67.7**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Fumara Solar Site

Noise Impact Assessment - Clean-up and Restoration

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	58.1	69.7	55.3	57.6	37.0	55.5	10.5	60
NSA 2 - Residence	56.8	60.1	54.0	56.3	37.0	54.3	9.4	60
NSA 3 - Residence	53.7	60.8	51.2	53.5	37.0	51.7	6.8	60
NSA 4 - Residence	52.6	58.5	50.2	52.4	37.0	50.9	5.9	60
NSA 5 - Residence	56.3	67.9	53.6	55.8	37.0	53.9	8.9	60
NSA 6 - Residence	59.1	67.7	56.3	58.6	37.0	56.4	11.5	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Site Preparation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	691972.94	5204117.51	41.6	45.0	43	37
NSA 2 - Residence	Residential	691964.73	5204214.37	41.6	45.0	43	37
NSA 3 - Residence	Residential	691648.53	5204187.28	41.6	45.0	43	37
NSA 4 - Residence	Residential	691311.39	5204205.31	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	691900.97	5204116.28
NSA 2 - Residence	691897.37	5204152.55
NSA 3 - Residence	691649.32	5204139.75
NSA 4 - Residence	691530.40	5204130.31

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	691729.04	5203950.08

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Grader	3	40	10	50	85
Excavator	3	40	6	50	81
Dozer	6	40	10	50	82
Dump Truck	10	40	12	50	76
All Other Equipment > 5 HP	2	50	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	59.2	57.7	60.7	54.9			
Excavator	53.0	51.5	54.5	48.6			
Dozer	59.2	57.7	60.7	54.9			
Dump Truck	56.3	54.7	57.7	51.9			
All Other Equipment > 5 HP	56.2	54.7	57.7	51.9			
Total [1]	**64.4**	**62.8**	**65.8**	**60.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	71.5	69.4	75.1	61.4			
Excavator	65.3	63.2	68.9	55.2			
Dozer	71.5	69.4	75.1	61.4			
Dump Truck	68.5	66.5	72.1	58.4			
All Other Equipment > 5 HP	68.5	66.4	72.1	58.4			
Total [1]	**76.6**	**74.6**	**80.2**	**66.5**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Site Preparation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	64.4	76.6	61.4	63.7	37.0	61.4	16.5	60
NSA 2 - Residence	62.8	74.6	59.8	62.2	37.0	59.9	15.0	60
NSA 3 - Residence	65.8	80.2	62.8	65.2	37.0	62.9	17.9	60
NSA 4 - Residence	60.0	66.5	57.1	59.4	37.0	57.2	12.3	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Excavation/Foundation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	691972.94	5204117.51	41.6	45.0	43	37
NSA 2 - Residence	Residential	691964.73	5204214.37	41.6	45.0	43	37
NSA 3 - Residence	Residential	691648.53	5204187.28	41.6	45.0	43	37
NSA 4 - Residence	Residential	691311.39	5204205.31	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	691900.97	5204116.28
NSA 2 - Residence	691897.37	5204152.55
NSA 3 - Residence	691649.32	5204139.75
NSA 4 - Residence	691530.40	5204130.31

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	691729.04	5203950.08

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Concrete Mixer Truck	2	40	8	50	79
Vibratory Pile Driver	1	20	6	50	101
Pickup Truck	2	40	6	50	75
Tractor	3	40	12	50	84
All Other Equipment > 5 HP	4	50	6	50	85
Compactor (ground)	1	20	6	50	83
Crane	3	16	6	50	81
Jackhammer	1	20	6	50	89
All Other Equipment > 5 HP	4	50	6	50	85
Backhoe	3	40	6	50	78
Front End Loader	5	40	10	50	79
Welder/Torch	2	40	8	50	74
Dozer	10	40	10	50	82
Roller	1	20	10	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	50.5	48.9	52.0	46.1			
Vibratory Pile Driver	65.2	63.7	66.7	60.9			
Pickup Truck	45.3	43.7	46.7	40.9			
Tractor	59.0	57.5	60.5	54.7			
All Other Equipment > 5 HP	59.2	57.7	60.7	54.9			
Compactor (ground)	47.2	45.7	48.7	42.9			
Crane	49.0	47.5	50.5	44.7			
Jackhammer	53.2	51.7	54.7	48.9			
All Other Equipment > 5 HP	59.2	57.7	60.7	54.9			
Backhoe	50.0	48.5	51.5	45.6			
Front End Loader	55.5	53.9	56.9	51.1			
Welder/Torch	45.5	43.9	47.0	41.1			
Dozer	61.5	59.9	62.9	57.1			
Roller	46.5	44.9	47.9	42.1			
Total [1]	**69.2**	**67.6**	**70.6**	**64.8**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	62.8	60.7	66.4	52.6			
Vibratory Pile Driver	77.5	75.4	81.1	67.4			
Pickup Truck	57.5	55.5	61.1	47.4			
Tractor	71.3	69.2	74.9	61.2			
All Other Equipment > 5 HP	71.5	69.4	75.1	61.4			
Compactor (ground)	59.5	57.4	63.1	49.4			
Crane	61.3	59.2	64.9	51.2			
Jackhammer	65.5	63.4	69.1	55.4			
All Other Equipment > 5 HP	71.5	69.4	75.1	61.4			
Backhoe	62.3	60.2	65.9	52.2			
Front End Loader	67.7	65.7	71.3	57.6			
Welder/Torch	57.8	55.7	61.4	47.6			
Dozer	73.7	71.7	77.3	63.6			
Roller	58.7	56.7	62.3	48.6			
Total [1]	**81.4**	**79.4**	**85.0**	**71.3**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Excavation/Foundation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	69.2	81.4	66.2	68.5	37.0	66.2	21.2	60
NSA 2 - Residence	67.6	79.4	64.6	66.9	37.0	64.6	19.7	60
NSA 3 - Residence	70.6	85.0	67.6	69.9	37.0	67.6	22.7	60
NSA 4 - Residence	64.8	71.3	61.8	64.2	37.0	61.9	16.9	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Equipment Installation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	691972.94	5204117.51	41.6	45.0	43	37
NSA 2 - Residence	Residential	691964.73	5204214.37	41.6	45.0	43	37
NSA 3 - Residence	Residential	691648.53	5204187.28	41.6	45.0	43	37
NSA 4 - Residence	Residential	691311.39	5204205.31	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	691900.97	5204116.28
NSA 2 - Residence	691897.37	5204152.55
NSA 3 - Residence	691649.32	5204139.75
NSA 4 - Residence	691530.40	5204130.31

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	691729.04	5203950.08

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Pickup Truck	2	40	6	50	75
Tractor	5	40	12	50	84
Auger Drill Rig	2	20	6	50	84
Vibratory Pile Driver	2	20	6	50	101
Crane	3	16	6	50	81
Concrete Mixer Truck	1	40	8	50	79
Drill Rig Truck	1	20	6	50	79
Backhoe	6	40	10	50	78
Welder/Torch	2	40	8	50	74
All Other Equipment > 5 HP	6	50	12	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	45.3	43.7	46.7	40.9			
Tractor	61.2	59.7	62.7	56.9			
Auger Drill Rig	51.2	49.7	52.7	46.9			
Vibratory Pile Driver	68.2	66.7	69.7	63.9			
Crane	49.0	47.5	50.5	44.7			
Concrete Mixer Truck	47.5	45.9	48.9	43.1			
Drill Rig Truck	43.2	41.7	44.7	38.9			
Backhoe	55.2	53.7	56.7	50.9			
Welder/Torch	45.5	43.9	47.0	41.1			
All Other Equipment > 5 HP	64.0	62.4	65.5	59.6			
Total [1]	**70.5**	**68.9**	**71.9**	**66.1**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	57.5	55.5	61.1	47.4			
Tractor	73.5	71.4	77.1	63.4			
Auger Drill Rig	63.5	61.4	67.1	53.4			
Vibratory Pile Driver	80.5	78.4	84.1	70.4			
Crane	61.3	59.2	64.9	51.2			
Concrete Mixer Truck	59.8	57.7	63.4	49.6			
Drill Rig Truck	55.5	53.4	59.1	45.4			
Backhoe	67.5	65.4	71.1	57.4			
Welder/Torch	57.8	55.7	61.4	47.6			
All Other Equipment > 5 HP	76.3	74.2	79.9	66.1			
Total [1]	**82.8**	**80.7**	**86.4**	**72.6**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Equipment Installation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	70.5	82.8	67.5	69.8	37.0	67.5	22.6	60
NSA 2 - Residence	68.9	80.7	65.9	68.3	37.0	66.0	21.0	60
NSA 3 - Residence	71.9	86.4	68.9	71.3	37.0	69.0	24.0	60
NSA 4 - Residence	66.1	72.6	63.1	65.5	37.0	63.2	18.2	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Clean-up and Restoration

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	691972.94	5204117.51	41.6	45.0	43	37
NSA 2 - Residence	Residential	691964.73	5204214.37	41.6	45.0	43	37
NSA 3 - Residence	Residential	691648.53	5204187.28	41.6	45.0	43	37
NSA 4 - Residence	Residential	691311.39	5204205.31	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	691900.97	5204116.28
NSA 2 - Residence	691897.37	5204152.55
NSA 3 - Residence	691649.32	5204139.75
NSA 4 - Residence	691530.40	5204130.31

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	691729.04	5203950.08

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Compressor (air)	3	40	10	50	78
Dozer	5	40	6	50	82
Grader	5	40	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	52.2	50.7	53.7	47.9			
Dozer	56.2	54.7	57.7	51.9			
Grader	59.2	57.7	60.7	54.9			
Total [1]	**61.5**	**60.0**	**63.0**	**57.2**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence			
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	64.5	62.4	68.1	54.4			
Dozer	68.5	66.4	72.1	58.4			
Grader	71.5	69.4	75.1	61.4			
Total [1]	**73.8**	**71.7**	**77.4**	**63.7**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Penstemon Solar Site

Noise Impact Assessment - Clean-up and Restoration

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	61.5	73.8	58.6	60.9	37.0	58.7	13.8	60
NSA 2 - Residence	60.0	71.7	57.1	59.4	37.0	57.2	12.3	60
NSA 3 - Residence	63.0	77.4	60.0	62.4	37.0	60.1	15.2	60
NSA 4 - Residence	57.2	63.7	54.4	56.7	37.0	54.7	9.7	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Site Preparation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	680253.24	5210449.71	41.6	45.0	43	37
NSA 2 - Commercial	Commercial	680574.34	5210407.37	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	680268.85	5210529.39
NSA 2 - Commercial	680523.25	5210473.44

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	680321.76	5210743.10

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Grader	3	40	10	50	85
Excavator	3	40	6	50	81
Dozer	6	40	10	50	82
Dump Truck	10	40	12	50	76
All Other Equipment > 5 HP	2	50	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	59.1	56.2					
Excavator	52.9	50.0					
Dozer	59.1	56.2					
Dump Truck	56.1	53.2					
All Other Equipment > 5 HP	56.1	53.2					
Total [1]	**64.2**	**61.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	70.5	70.2					
Excavator	64.3	64.0					
Dozer	70.5	70.2					
Dump Truck	67.5	67.2					
All Other Equipment > 5 HP	67.5	67.2					
Total [1]	**75.6**	**75.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Site Preparation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	64.2	75.6	61.2	63.6	37.0	61.3	16.3	60
NSA 2 - Commercial	61.3	75.3	58.4	60.7	37.0	58.5	13.5	65

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Excavation/Foundation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	680253.24	5210449.71	41.6	45.0	43	37
NSA 2 - Commercial	Commercial	680574.34	5210407.37	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	680268.85	5210529.39
NSA 2 - Commercial	680523.25	5210473.44

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	680321.76	5210743.10

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Concrete Mixer Truck	2	40	8	50	79
Vibratory Pile Driver	1	20	6	50	101
Pickup Truck	2	40	6	50	75
Tractor	3	40	12	50	84
All Other Equipment > 5 HP	4	50	6	50	85
Compactor (ground)	1	20	6	50	83
Crane	3	16	6	50	81
Jackhammer	1	20	6	50	89
All Other Equipment > 5 HP	4	50	6	50	85
Backhoe	3	40	6	50	78
Front End Loader	5	40	10	50	79
Welder/Torch	2	40	8	50	74
Dozer	10	40	10	50	82
Roller	1	20	10	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	50.4	47.5					
Vibratory Pile Driver	65.1	62.2					
Pickup Truck	45.1	42.2					
Tractor	58.9	56.0					
All Other Equipment > 5 HP	59.1	56.2					
Compactor (ground)	47.1	44.2					
Crane	48.9	46.0					
Jackhammer	53.1	50.2					
All Other Equipment > 5 HP	59.1	56.2					
Backhoe	49.9	47.0					
Front End Loader	55.3	52.4					
Welder/Torch	45.4	42.5					
Dozer	61.3	58.4					
Roller	46.3	43.4					
Total [1]	**69.0**	**66.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	61.7	61.5					
Vibratory Pile Driver	76.5	76.2					
Pickup Truck	56.5	56.2					
Tractor	70.3	70.0					
All Other Equipment > 5 HP	70.5	70.2					
Compactor (ground)	58.5	58.2					
Crane	60.3	60.0					
Jackhammer	64.5	64.2					
All Other Equipment > 5 HP	70.5	70.2					
Backhoe	61.3	61.0					
Front End Loader	66.7	66.4					
Welder/Torch	56.7	56.5					
Dozer	72.7	72.5					
Roller	57.7	57.4					
Total [1]	**80.4**	**80.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Excavation/Foundation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	69.0	80.4	66.0	68.3	37.0	66.0	21.1	60
NSA 2 - Commercial	66.1	80.1	63.1	65.5	37.0	63.2	18.2	65

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Equipment Installation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	680253.24	5210449.71	41.6	45.0	43	37
NSA 2 - Commercial	Commercial	680574.34	5210407.37	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	680268.85	5210529.39
NSA 2 - Commercial	680523.25	5210473.44

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	680321.76	5210743.10

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Pickup Truck	2	40	6	50	75
Tractor	5	40	12	50	84
Auger Drill Rig	2	20	6	50	84
Vibratory Pile Driver	2	20	6	50	101
Crane	3	16	6	50	81
Concrete Mixer Truck	1	40	8	50	79
Drill Rig Truck	1	20	6	50	79
Backhoe	6	40	10	50	78
Welder/Torch	2	40	8	50	74
All Other Equipment > 5 HP	6	50	12	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	45.1	42.2					
Tractor	61.1	58.2					
Auger Drill Rig	51.1	48.2					
Vibratory Pile Driver	68.1	65.2					
Crane	48.9	46.0					
Concrete Mixer Truck	47.3	44.5					
Drill Rig Truck	43.1	40.2					
Backhoe	55.1	52.2					
Welder/Torch	45.4	42.5					
All Other Equipment > 5 HP	63.9	61.0					
Total [1]	**70.3**	**67.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	56.5	56.2					
Tractor	72.5	72.2					
Auger Drill Rig	62.5	62.2					
Vibratory Pile Driver	79.5	79.2					
Crane	60.3	60.0					
Concrete Mixer Truck	58.7	58.5					
Drill Rig Truck	54.5	54.2					
Backhoe	66.5	66.2					
Welder/Torch	56.7	56.5					
All Other Equipment > 5 HP	75.2	75.0					
Total [1]	**81.7**	**81.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Equipment Installation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	70.3	81.7	67.3	69.7	37.0	67.4	22.4	60
NSA 2 - Commercial	67.5	81.5	64.5	66.8	37.0	64.5	19.5	65

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Clean-up and Restoration

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	680253.24	5210449.71	41.6	45.0	43	37
NSA 2 - Commercial	Commercial	680574.34	5210407.37	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	680268.85	5210529.39
NSA 2 - Commercial	680523.25	5210473.44

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	680321.76	5210743.10

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Compressor (air)	3	40	10	50	78
Dozer	5	40	6	50	82
Grader	5	40	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	52.1	49.2					
Dozer	56.1	53.2					
Grader	59.1	56.2					
Total [1]	**61.4**	**58.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial					
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	63.5	63.2					
Dozer	67.5	67.2					
Grader	70.5	70.2					
Total [1]	**72.8**	**72.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Typha Solar Site

Noise Impact Assessment - Clean-up and Restoration

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	61.4	72.8	58.5	60.8	37.0	58.6	13.6	60
NSA 2 - Commercial	58.5	72.5	55.7	58.0	37.0	55.9	10.9	65

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Site Preparation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	684861.58	5205189.99	41.6	45.0	43	37
NSA 2 - Residence	Residential	684855.61	5204996.93	41.6	45.0	43	37
NSA 3 - Residence	Residential	684935.41	5205143.97	41.6	45.0	43	37
NSA 4 - Residence	Residential	683878.54	5205083.31	41.6	45.0	43	37
NSA 5 - Residence	Residential	684467.02	5205357.91	41.6	45.0	43	37
NSA 6 - Residence	Residential	683985.47	5204942.77	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	684814.77	5205169.23
NSA 2 - Residence	684778.11	5204997.52
NSA 3 - Residence	684796.12	5205137.42
NSA 4 - Residence	684032.91	5205081.69
NSA 5 - Residence	684445.83	5205295.88
NSA 6 - Residence	684032.38	5205085.40

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	684414.18	5205150.96

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Grader	3	40	10	50	85
Excavator	3	40	6	50	81
Dozer	6	40	10	50	82
Dump Truck	10	40	12	50	76
All Other Equipment > 5 HP	2	50	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	55.6	55.3	54.3	54.0	62.1	55.1	
Excavator	49.4	49.0	48.1	47.8	55.8	48.9	
Dozer	55.6	55.3	54.3	54.0	62.1	55.1	
Dump Truck	52.6	52.3	51.3	51.0	59.1	52.1	
All Other Equipment > 5 HP	52.6	52.3	51.3	51.0	59.1	52.1	
Total [1]	**60.7**	**60.4**	**59.4**	**59.1**	**67.2**	**60.2**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Grader	74.5	70.9	65.8	64.9	72.3	65.1	
Excavator	68.3	64.7	59.6	58.7	66.1	58.9	
Dozer	74.5	70.9	65.8	64.9	72.3	65.1	
Dump Truck	71.5	67.9	62.8	61.9	69.3	62.2	
All Other Equipment > 5 HP	71.5	67.9	62.8	61.9	69.3	62.1	
Total [1]	**79.6**	**76.0**	**70.9**	**70.0**	**77.4**	**70.2**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Site Preparation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	60.7	79.6	57.8	60.1	37.0	57.9	13.0	60
NSA 2 - Residence	60.4	76.0	57.5	59.8	37.0	57.6	12.7	60
NSA 3 - Residence	59.4	70.9	56.6	58.9	37.0	56.7	11.8	60
NSA 4 - Residence	59.1	70.0	56.3	58.6	37.0	56.4	11.5	60
NSA 5 - Residence	67.2	77.4	64.2	66.5	37.0	64.2	19.3	60
NSA 6 - Residence	60.2	70.2	57.3	59.6	37.0	57.4	12.5	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Excavation/Foundation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	684861.58	5205189.99	41.6	45.0	43	37
NSA 2 - Residence	Residential	684855.61	5204996.93	41.6	45.0	43	37
NSA 3 - Residence	Residential	684935.41	5205143.97	41.6	45.0	43	37
NSA 4 - Residence	Residential	683878.54	5205083.31	41.6	45.0	43	37
NSA 5 - Residence	Residential	684467.02	5205357.91	41.6	45.0	43	37
NSA 6 - Residence	Residential	683985.47	5204942.77	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	684814.77	5205169.23
NSA 2 - Residence	684778.11	5204997.52
NSA 3 - Residence	684796.12	5205137.42
NSA 4 - Residence	684032.91	5205081.69
NSA 5 - Residence	684445.83	5205295.88
NSA 6 - Residence	684032.38	5205085.40

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	684414.18	5205150.96

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Concrete Mixer Truck	2	40	8	50	79
Vibratory Pile Driver	1	20	6	50	101
Pickup Truck	2	40	6	50	75
Tractor	3	40	12	50	84
All Other Equipment > 5 HP	4	50	6	50	85
Compactor (ground)	1	20	6	50	83
Crane	3	16	6	50	81
Jackhammer	1	20	6	50	89
All Other Equipment > 5 HP	4	50	6	50	85
Backhoe	3	40	6	50	78
Front End Loader	5	40	10	50	79
Welder/Torch	2	40	8	50	74
Dozer	10	40	10	50	82
Roller	1	20	10	50	80

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	46.9	46.5	45.6	45.3	53.3	46.4	
Vibratory Pile Driver	61.6	61.3	60.3	60.0	68.1	61.1	
Pickup Truck	41.6	41.3	40.3	40.0	48.1	41.1	
Tractor	55.4	55.1	54.1	53.8	61.9	54.9	
All Other Equipment > 5 HP	55.6	55.3	54.3	54.0	62.1	55.1	
Compactor (ground)	43.6	43.3	42.3	42.0	50.1	43.1	
Crane	45.4	45.1	44.1	43.8	51.9	44.9	
Jackhammer	49.6	49.3	48.3	48.0	56.1	49.1	
All Other Equipment > 5 HP	55.6	55.3	54.3	54.0	62.1	55.1	
Backhoe	46.4	46.0	45.1	44.8	52.8	45.9	
Front End Loader	51.8	51.5	50.5	50.2	58.3	51.3	
Welder/Torch	41.9	41.5	40.6	40.3	48.3	41.4	
Dozer	57.8	57.5	56.5	56.2	64.3	57.3	
Roller	42.8	42.5	41.5	41.2	49.3	42.3	
Total [1]	**65.5**	**65.2**	**64.2**	**63.9**	**72.0**	**65.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Concrete Mixer Truck	65.7	62.1	57.0	56.2	63.6	56.4	
Vibratory Pile Driver	80.5	76.9	71.8	70.9	78.3	71.1	
Pickup Truck	60.5	56.9	51.8	50.9	58.3	51.2	
Tractor	74.3	70.7	65.6	64.7	72.1	64.9	
All Other Equipment > 5 HP	74.5	70.9	65.8	64.9	72.3	65.1	
Compactor (ground)	62.5	58.9	53.8	52.9	60.3	53.1	
Crane	64.3	60.7	55.6	54.7	62.1	54.9	
Jackhammer	68.5	64.9	59.8	58.9	66.3	59.1	
All Other Equipment > 5 HP	74.5	70.9	65.8	64.9	72.3	65.1	
Backhoe	65.3	61.7	56.6	55.7	63.1	55.9	
Front End Loader	70.7	67.1	62.0	61.1	68.5	61.3	
Welder/Torch	60.7	57.1	52.0	51.2	58.6	51.4	
Dozer	76.7	73.1	68.0	67.1	74.6	67.4	
Roller	61.7	58.1	53.0	52.1	59.5	52.3	
Total [1]	**84.4**	**80.8**	**75.7**	**74.8**	**82.3**	**75.1**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Excavation/Foundation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	65.5	84.4	62.6	64.9	37.0	62.6	17.6	60
NSA 2 - Residence	65.2	80.8	62.2	64.5	37.0	62.3	17.3	60
NSA 3 - Residence	64.2	75.7	61.3	63.6	37.0	61.3	16.4	60
NSA 4 - Residence	63.9	74.8	61.0	63.3	37.0	61.0	16.1	60
NSA 5 - Residence	72.0	82.3	69.0	71.3	37.0	69.0	24.0	60
NSA 6 - Residence	65.0	75.1	62.0	64.4	37.0	62.1	17.1	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Equipment Installation

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	684861.58	5205189.99	41.6	45.0	43	37
NSA 2 - Residence	Residential	684855.61	5204996.93	41.6	45.0	43	37
NSA 3 - Residence	Residential	684935.41	5205143.97	41.6	45.0	43	37
NSA 4 - Residence	Residential	683878.54	5205083.31	41.6	45.0	43	37
NSA 5 - Residence	Residential	684467.02	5205357.91	41.6	45.0	43	37
NSA 6 - Residence	Residential	683985.47	5204942.77	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	684814.77	5205169.23
NSA 2 - Residence	684778.11	5204997.52
NSA 3 - Residence	684796.12	5205137.42
NSA 4 - Residence	684032.91	5205081.69
NSA 5 - Residence	684445.83	5205295.88
NSA 6 - Residence	684032.38	5205085.40

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	684414.18	5205150.96

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Pickup Truck	2	40	6	50	75
Tractor	5	40	12	50	84
Auger Drill Rig	2	20	6	50	84
Vibratory Pile Driver	2	20	6	50	101
Crane	3	16	6	50	81
Concrete Mixer Truck	1	40	8	50	79
Drill Rig Truck	1	20	6	50	79
Backhoe	6	40	10	50	78
Welder/Torch	2	40	8	50	74
All Other Equipment > 5 HP	6	50	12	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	41.6	41.3	40.3	40.0	48.1	41.1	
Tractor	57.6	57.3	56.3	56.0	64.1	57.1	
Auger Drill Rig	47.6	47.3	46.3	46.0	54.1	47.1	
Vibratory Pile Driver	64.6	64.3	63.3	63.0	71.1	64.1	
Crane	45.4	45.1	44.1	43.8	51.9	44.9	
Concrete Mixer Truck	43.9	43.5	42.6	42.3	50.3	43.4	
Drill Rig Truck	39.6	39.3	38.3	38.0	46.1	39.1	
Backhoe	51.6	51.3	50.3	50.0	58.1	51.1	
Welder/Torch	41.9	41.5	40.6	40.3	48.3	41.4	
All Other Equipment > 5 HP	60.4	60.0	59.1	58.8	66.8	59.9	
Total [1]	**66.9**	**66.5**	**65.6**	**65.3**	**73.3**	**66.4**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Pickup Truck	60.5	56.9	51.8	50.9	58.3	51.2	
Tractor	76.5	72.9	67.8	66.9	74.3	67.1	
Auger Drill Rig	66.5	62.9	57.8	56.9	64.3	57.1	
Vibratory Pile Driver	83.5	79.9	74.8	73.9	81.3	74.1	
Crane	64.3	60.7	55.6	54.7	62.1	54.9	
Concrete Mixer Truck	62.7	59.1	54.0	53.1	60.6	53.4	
Drill Rig Truck	58.5	54.9	49.8	48.9	56.3	49.1	
Backhoe	70.5	66.9	61.8	60.9	68.3	61.1	
Welder/Torch	60.7	57.1	52.0	51.2	58.6	51.4	
All Other Equipment > 5 HP	79.2	75.6	70.5	69.7	77.1	69.9	
Total [1]	**85.7**	**82.1**	**77.0**	**76.2**	**83.6**	**76.4**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Equipment Installation

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	66.9	85.7	63.9	66.2	37.0	63.9	19.0	60
NSA 2 - Residence	66.5	82.1	63.5	65.9	37.0	63.6	18.6	60
NSA 3 - Residence	65.6	77.0	62.6	64.9	37.0	62.6	17.7	60
NSA 4 - Residence	65.3	76.2	62.3	64.6	37.0	62.3	17.4	60
NSA 5 - Residence	73.3	83.6	70.3	72.7	37.0	70.3	25.4	60
NSA 6 - Residence	66.4	76.4	63.4	65.7	37.0	63.4	18.5	60

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Clean-up and Restoration

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	Residential	684861.58	5205189.99	41.6	45.0	43	37
NSA 2 - Residence	Residential	684855.61	5204996.93	41.6	45.0	43	37
NSA 3 - Residence	Residential	684935.41	5205143.97	41.6	45.0	43	37
NSA 4 - Residence	Residential	683878.54	5205083.31	41.6	45.0	43	37
NSA 5 - Residence	Residential	684467.02	5205357.91	41.6	45.0	43	37
NSA 6 - Residence	Residential	683985.47	5204942.77	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

L_{MAX} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
NSA 1 - Residence	684814.77	5205169.23
NSA 2 - Residence	684778.11	5204997.52
NSA 3 - Residence	684796.12	5205137.42
NSA 4 - Residence	684032.91	5205081.69
NSA 5 - Residence	684445.83	5205295.88
NSA 6 - Residence	684032.38	5205085.40

[1] Source location is represented as the edge of the construction site closest to the NSA listed in the description column.

L_{eq} - Construction site location

Description	UTM Coordinates [1]	
	Latitude	Longitude
	(m)	(m)
Property Center	684414.18	5205150.96

[1] Source location is represented as the geometric center of the project location.

Work Schedule

Construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. (i.e., 12 hours/day), Monday through Saturday (i.e., 6 days/week)

Sources

Description	Quantity	Acoustical Usage Factor[1]	Usage	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
		%/hr.	hours/day	(feet)	(dBA)
Compressor (air)	3	40	10	50	78
Dozer	5	40	6	50	82
Grader	5	40	6	50	85

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results - L_{eq}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	48.6	48.3	47.3	47.0	55.1	48.1	
Dozer	52.6	52.3	51.3	51.0	59.1	52.1	
Grader	55.6	55.3	54.3	54.0	62.1	55.1	
Total [1]	**57.9**	**57.6**	**56.6**	**56.3**	**64.4**	**57.4**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

Results - L_{MAX}

Equipment	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)	67.5	63.9	58.8	57.9	65.3	58.1	
Dozer	71.5	67.9	62.8	61.9	69.3	62.1	
Grader	74.5	70.9	65.8	64.9	72.3	65.1	
Total [1]	**76.8**	**73.2**	**68.1**	**67.2**	**74.6**	**67.4**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously

TUUSSO Energy, LLC

Kittitas County Solar Projects

Urtica Solar Site

Noise Impact Assessment - Clean-up and Restoration

Receiver	L_{eq}	L_{MAX}	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Daytime Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
NSA 1 - Residence	57.9	76.8	55.1	57.4	37.0	55.3	10.4	60
NSA 2 - Residence	57.6	73.2	54.8	57.1	37.0	55.0	10.1	60
NSA 3 - Residence	56.6	68.1	53.9	56.2	37.0	54.2	9.2	60
NSA 4 - Residence	56.3	67.2	53.6	55.9	37.0	53.9	9.0	60
NSA 5 - Residence	64.4	74.6	61.4	63.7	37.0	61.5	16.5	60
NSA 6 - Residence	57.4	67.4	54.6	56.9	37.0	54.9	9.9	60

TUUSSO Energy, LLC
Kittitas County Solar Projects

Camas Solar Site
Noise Impact Assessment

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	Commercial	690075.54	5203711.82	41.6	45.0	43	37
NSA 1 - Better Life for Dogs	Commercial	690003.75	5203666.90	41.6	45.0	43	37
NSA 2 - Residence	Residential	690200.00	5203672.71	41.6	45.0	43	37
NSA 3 - Residence	Residential	690001.19	5203408.97	41.6	45.0	43	37
NSA 4 - Residence	Residential	689609.28	5203629.24	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Usage	UTM Coordinates		Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
	%	Latitude	Longitude	(feet)	(dBA)
Inverter 1.1	100	689718.00	5203122.00	33	67
Inverter 1.2	100	689718.00	5203122.00	33	67
Inverter 2.1	100	689776.13	5203284.53	33	67
Inverter 2.2	100	689776.13	5203284.53	33	67
Inverter 3.1	100	689811.00	5203368.00	33	67
Inverter 3.2	100	689811.00	5203368.00	33	67
Inverter 4.1	100	689906.00	5203576.00	33	67
Inverter 4.2	100	689906.00	5203576.00	33	67
Inverter 5.1	100	689787.00	5203566.00	33	67
Inverter 5.2	100	689787.00	5203566.00	33	67
Inverter 6.1	100	690082.00	5203705.00	33	67

[1] Sound power pressure from SGI 500-750XTM Datasheet.

Results

Equipment	Leq - @ Closest property boundary	Leq - @ NSA 1 - Better Life for Dogs	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence		
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Inverter 1.1	30.3	31.3	29.8	34.9	32.8		
Inverter 1.2	30.3	31.3	29.8	34.9	32.8		
Inverter 2.1	32.7	34.1	31.9	38.8	35.4		
Inverter 2.2	32.7	34.1	31.9	38.8	35.4		
Inverter 3.1	34.3	36.0	33.2	41.3	36.7		
Inverter 3.2	34.3	36.0	33.2	41.3	36.7		
Inverter 4.1	40.3	44.5	37.2	41.4	37.5		
Inverter 4.2	40.3	44.5	37.2	41.4	37.5		
Inverter 5.1	36.9	39.5	34.5	38.6	41.5		
Inverter 5.2	36.9	39.5	34.5	38.6	41.5		
Inverter 6.1	67.6	48.3	45.3	37.3	33.4		
Total [1]	**67.6**	**52.0**	**47.7**	**49.8**	**47.9**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Receiver	Leq	Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	67.6	67.6	65.6	67.6	37.0	65.6	20.7	65
NSA 1 - Better Life for Dogs	52.0	48.3	50.5	52.5	37.0	51.1	6.2	65
NSA 2 - Residence	47.7	45.3	47.1	49.0	37.0	48.3	3.4	60
NSA 3 - Residence	49.8	41.4	48.7	50.6	37.0	49.6	4.6	60
NSA 4 - Residence	47.9	41.5	47.2	49.1	37.0	48.4	3.5	60

[1] Calculated Lmax is the loudest individual value.

TUUSSO Energy, LLC
Kittitas County Solar Projects

Fumaria Solar Site
Noise Impact Assessment

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	Residential	683365.08	5214369.85	41.6	45.0	43	37
NSA 1 - Residence	Residential	683410.97	5214386.22	41.6	45.0	43	37
NSA 2 - Residence	Residential	682993.24	5214592.21	41.6	45.0	43	37
NSA 3 - Residence	Residential	683568.80	5215347.69	41.6	45.0	43	37
NSA 4 - Residence	Residential	683563.82	5215498.86	41.6	45.0	43	37
NSA 5 - Residence	Residential	683572.23	5215198.70	41.6	45.0	43	37
NSA 6 - Residence	Residential	683574.90	5215094.00	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Usage	UTM Coordinates		Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
	%	Latitude	Longitude	(feet)	(dBA)
Inverter 1.1	100	683464.63	5215095.92	33	67
Inverter 1.2	100	683464.63	5215095.92	33	67
Inverter 2.1	100	683471.54	5214821.53	33	67
Inverter 2.2	100	683471.54	5214821.53	33	67
Inverter 3.1	100	683475.87	5214821.53	33	67
Inverter 3.2	100	683475.87	5214821.53	33	67
Inverter 4.1	100	683477.67	5214655.27	33	67
Inverter 4.2	100	683477.67	5214655.27	33	67
Inverter 5.1	100	683482.19	5214655.34	33	67
Inverter 5.2	100	683482.19	5214655.34	33	67

[1] Sound power pressure from SGI 500-750XTM Datasheet.

Results

Equipment	Leq - @ Closest property boundary	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Inverter 1.1	29.8	30.0	30.3	38.3	34.7	43.6	46.2
Inverter 1.2	29.8	30.0	30.3	38.3	34.7	43.6	46.2
Inverter 2.1	33.7	34.2	32.6	32.5	30.4	35.2	37.8
Inverter 2.2	33.7	34.2	32.6	32.5	30.4	35.2	37.8
Inverter 3.1	33.7	34.2	32.5	32.5	30.4	35.2	37.8
Inverter 3.2	33.7	34.2	32.5	32.5	30.4	35.2	37.8
Inverter 4.1	37.3	38.2	33.3	30.2	28.5	32.2	34.0
Inverter 4.2	37.3	38.2	33.3	30.2	28.5	32.2	34.0
Inverter 5.1	37.3	38.2	33.2	30.2	28.5	32.2	34.0
Inverter 5.2	37.3	38.2	33.2	30.2	28.5	32.2	34.0
Total [1]	**45.1**	**45.9**	**42.5**	**44.0**	**41.2**	**48.2**	**50.7**

[1] Noise Level assumes all equipment is operating simultaneously.

Receiver	Leq	Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	45.1	37.3	45.4	47.2	37.0	47.1	2.2	60
NSA 1 - Residence	45.9	38.2	45.9	47.7	37.0	47.4	2.5	60
NSA 2 - Residence	42.5	33.3	44.1	45.8	37.0	46.3	1.3	60
NSA 3 - Residence	44.0	38.3	44.8	46.5	37.0	46.7	1.8	60
NSA 4 - Residence	41.2	34.7	43.5	45.2	37.0	46.0	1.0	60
NSA 5 - Residence	48.2	43.6	47.4	49.3	37.0	48.6	3.6	60
NSA 6 - Residence	50.7	46.2	49.4	51.4	37.0	50.2	5.2	60

[1] Calculated Lmax is the loudest individual value.

TUUSSO Energy, LLC
Kittitas County Solar Projects

Urtica Solar Site
Noise Impact Assessment

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	Residential	684156.38	5205308.08	41.6	45.0	43	37
NSA 1 - Residence	Residential	684832.20	5205192.85	41.6	45.0	43	37
NSA 2 - Residence	Residential	684836.00	5204998.15	41.6	45.0	43	37
NSA 3 - Residence	Residential	684833.88	5205143.30	41.6	45.0	43	37
NSA 4 - Residence	Residential	684031.64	5205075.33	41.6	45.0	43	37
NSA 5 - Residence	Residential	684465.23	5205300.89	41.6	45.0	43	37
NSA 6 - Residence	Residential	684027.12	5205007.29	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Usage	UTM Coordinates		Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
	%	Latitude	Longitude	(feet)	(dBA)
Inverter 1.1	100	684162.81	5205206.48	33	67
Inverter 1.2	100	684162.81	5205206.48	33	67
Inverter 2.1	100	684279.03	5205202.60	33	67
Inverter 2.2	100	684279.03	5205202.60	33	67
Inverter 3.1	100	684530.21	5205159.59	33	67
Inverter 3.2	100	684530.21	5205159.59	33	67
Inverter 4.1	100	684660.46	5205167.98	33	67
Inverter 4.2	100	684660.46	5205167.98	33	67
Inverter 5.1	100	684537.29	5205159.42	33	67
Inverter 5.2	100	684537.29	5205159.42	33	67

[1] Sound power pressure from SGI 500-750XTM Datasheet.

Results

Equipment	Leq - @ Closest property boundary	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence	Leq - @ NSA 5 - Residence	Leq - @ NSA 6 - Residence
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Inverter 1.1	46.9	30.5	30.1	30.5	41.7	37.0	39.4
Inverter 1.2	46.9	30.5	30.1	30.5	41.7	40.6	37.0
Inverter 2.1	42.9	32.2	31.6	32.1	38.2	40.6	37.0
Inverter 2.2	42.9	32.2	31.6	32.1	38.2	43.2	32.6
Inverter 3.1	35.0	37.4	36.3	37.4	33.0	43.2	32.6
Inverter 3.2	35.0	37.4	36.3	37.4	33.0	39.6	30.7
Inverter 4.1	32.7	42.3	39.3	42.2	31.0	39.6	30.7
Inverter 4.2	32.7	42.3	39.3	42.2	31.0	43.0	32.5
Inverter 5.1	34.8	37.6	36.4	37.6	32.9	43.0	32.5
Inverter 5.2	34.8	37.6	36.4	37.6	32.9		
Total [1]	**51.8**	**47.9**	**45.9**	**47.9**	**47.2**	**51.1**	**44.5**

[1] Noise Level assumes all equipment is operating simultaneously.

Receiver	Leq	Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	51.8	46.9	50.4	52.4	37.0	51.0	6.1	60
NSA 1 - Residence	47.9	42.3	47.2	49.1	37.0	48.4	3.5	60
NSA 2 - Residence	45.9	39.3	45.9	47.7	37.0	47.5	2.5	60
NSA 3 - Residence	47.9	42.2	47.2	49.1	37.0	48.4	3.5	60
NSA 4 - Residence	47.2	41.7	46.8	48.6	37.0	48.1	3.1	60
NSA 5 - Residence	51.1	43.2	49.8	51.7	37.0	50.5	5.5	60
NSA 6 - Residence	44.5	39.4	45.1	46.8	37.0	46.9	1.9	60

[1] Calculated Lmax is the loudest individual value.

TUUSSO Energy, LLC
Kittitas County Solar Projects

Typha Solar Site
Noise Impact Assessment

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	Residential	680293.41	5210511.00	41.6	45.0	43	37
NSA 1 - Residence	Residential	680279.70	5210477.13	41.6	45.0	43	37
NSA 2 - Commercial	Commercial	680545.74	5210461.44	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Usage	UTM Coordinates		Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
	%	Latitude	Longitude	(feet)	(dBA)
Inverter 1.1	100	680285.56	5210871.48	33	67
Inverter 1.2	100	680285.56	5210871.48	33	67
Inverter 2.1	100	680268.56	5210870.86	33	67
Inverter 2.2	100	680268.56	5210870.86	33	67
Inverter 3.1	100	680269.04	5210857.70	33	67
Inverter 3.2	100	680269.04	5210857.70	33	67
Inverter 4.1	100	680267.34	5210678.21	33	67
Inverter 4.2	100	680267.34	5210678.21	33	67
Inverter 5.1	100	680316.62	5210537.77	33	67
Inverter 5.2	100	680316.62	5210537.77	33	67

[1] Sound power pressure from SGI 500-750XTM Datasheet.

Results

Equipment	Leq - @ Closest property boundary	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Commercial				
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Inverter 1.1	35.9	35.1	33.3				
Inverter 1.2	35.9	35.1	33.3				
Inverter 2.1	35.9	35.1	33.2				
Inverter 2.2	35.9	35.1	33.2				
Inverter 3.1	36.2	35.4	33.4				
Inverter 3.2	36.2	35.4	33.4				
Inverter 4.1	42.5	41.0	36.1				
Inverter 4.2	42.5	41.0	36.1				
Inverter 5.1	56.1	50.0	39.4				
Inverter 5.2	56.1	50.0	39.4				
Total [1]	**59.4**	**53.9**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Receiver	Leq	Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	59.4	56.1	57.5	59.5	37.0	57.6	12.6	60
NSA 1 - Residence	53.9	50.0	52.3	54.3	37.0	52.7	7.7	60
NSA 2 - Commercial	45.8	39.4	45.8	47.7	37.0	47.4	2.5	65

[1] Calculated Lmax is the loudest individual value.

TUUSSO Energy, LLC
Kittitas County Solar Projects

Penstemon Solar Site
Noise Impact Assessment

Project Land Use:	Industrial

Receivers

Description	Land Use	UTM Coordinates		Baselines (Representative Existing Conditions)[1]			
		Latitude	Longitude	LAeq	Ldn	Day	Night
		(m)	(m)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	Residential	691925.58	5203978.43	41.6	45.0	43	37
NSA 1 - Residence	Residential	691939.68	5204068.49	41.6	45.0	43	37
NSA 2 - Residence	Residential	691938.86	5204178.97	41.6	45.0	43	37
NSA 3 - Residence	Residential	691662.51	5204162.26	41.6	45.0	43	37
NSA 4 - Residence	Residential	691512.98	5204151.39	41.6	45.0	43	37

[1] Source: ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Usage	UTM Coordinates		Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
	%	Latitude	Longitude	(feet)	(dBA)
Inverter 1.1	100	691679.73	5203962.05	33	67
Inverter 1.2	100	691679.73	5203962.05	33	67
Inverter 2.1	100	691679.22	5203967.36	33	67
Inverter 2.2	100	691679.22	5203967.36	33	67
Inverter 3.1	100	691808.56	5203972.38	33	67
Inverter 3.2	100	691808.56	5203972.38	33	67
Inverter 4.1	100	691682.47	5203957.05	33	67
Inverter 4.2	100	691682.47	5203957.05	33	67
Inverter 5.1	100	691808.67	5203967.23	33	67
Inverter 5.2	100	691808.67	5203967.23	33	67

[1] Sound power pressure from SGI 500-750XTM Datasheet.

Results

Equipment	Leq - @ Closest property boundary	Leq - @ NSA 1 - Residence	Leq - @ NSA 2 - Residence	Leq - @ NSA 3 - Residence	Leq - @ NSA 4 - Residence		
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Inverter 1.1	39.2	38.1	36.5	41.0	39.0		
Inverter 1.2	39.2	38.1	36.5	41.0	39.0		
Inverter 2.1	39.2	38.1	36.6	41.2	39.2		
Inverter 2.2	39.2	38.1	36.6	41.2	39.2		
Inverter 3.1	45.7	42.8	39.3	39.5	36.3		
Inverter 3.2	45.7	42.8	39.3	39.5	36.3		
Inverter 4.1	39.3	38.1	36.4	40.8	38.8		
Inverter 4.2	39.3	38.1	36.4	40.8	38.8		
Inverter 5.1	45.7	42.7	39.1	39.3	36.2		
Inverter 5.2	45.7	42.7	39.1	39.3	36.2		
Total [1]	**53.0**	**50.6**	**47.8**	**50.4**	**48.1**	**0.0**	**0.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Receiver	Leq	Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Washington State Maximum Allowed Noise Level
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Closest property boundary	53.0	45.7	51.4	53.4	37.0	51.9	6.9	60
NSA 1 - Residence	50.6	42.8	49.3	51.3	37.0	50.1	5.2	60
NSA 2 - Residence	47.8	39.3	47.2	49.0	37.0	48.4	3.4	60
NSA 3 - Residence	50.4	41.2	49.2	51.1	37.0	50.0	5.1	60
NSA 4 - Residence	48.1	39.2	47.4	49.3	37.0	48.5	3.6	60

[1] Calculated Lmax is the loudest individual value.