

VOLUME IIA

APPENDIX 9D

Addendum – Updated Acoustical Evaluation Berne Meter Station

June 3, 2015



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From: Ronald R. Spillman, P.E.
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Re: ADDENDUM –Updated Acoustical Evaluation – Berne Meter Station
Rover Pipeline Project
SLR File No. 119.01324.00001

TECHNICAL MEMORANDUM

SLR Report 119.01324.00001C, Rev. 1

At the request of Rover Pipeline LLC, SLR International Corporation (SLR) has conducted baseline sound level measurements and noise impact evaluations for meter stations associated with the Rover Project. This Technical Memorandum is an addendum to previously submitted information, as needed to address the updated location proposed for the **Berne Meter Station**. No significant noise impact is expected from the updated meter station site at any Noise Sensitive Area (NSA).

Baseline ambient sound level measurements were collected near the closest NSA in the vicinity of the updated Berne Meter Station location on June 3, 2015.

The meter station is expected to have flow meters, regulator skids, control valves, and associated piping, and calculations have been made for the sound level contributions of those sources. The calculations account for distance and other attenuation factors to the nearest NSA from the meter station.

1 BASELINE ENVIRONMENTAL SOUND LEVELS

Baseline environmental sound level conditions were collected on June 3, 2015 near the updated location for the planned Berne Meter Station. The daytime sound level average was measured, and the day-night equivalent (L_{dn}) sound level was estimated from that measurement. Audible

sources included birds and an existing compressor station. A Larson Davis 824 Type 1 Sound Level Meter was used, with calibration before and after the measurement period.

The weather conditions were suitable for acoustical measurement, with a temperature of 68 °F, relative humidity at 58%, and wind speed at 0 to 5 mph from the southwest. Short-term noises from sources such as barking dogs, and close-by traffic were avoided to the extent possible. The baseline sound survey results for the Berne Meter Station are summarized in **Table 1** below.

Table 1: Baseline Sound Level Survey Results for Berne Meter Station

Distance from Meter Station to Nearest NSA	Direction to NSA	Meas. Date	Start Time	Duration	Meas. Level, Day	Existing Sound Level, Day-Night	Audible Noise Sources
				Min.	Ld, dB(A)	Ldn, dB(A)	
1960 ft	SSW	6/3/2015	9:58 a.m.	5.0	45.5	51.9	Birds and compressor station approximately 1500 ft NE of NSA

Figure 1, attached, show the updated Berne Meter Station location, the baseline measurement position, the nearest NSA, and a ½-mile radius around the meter station. The predicted noise contribution from the updated meter station position has been revised for the closest NSA, as noted in the next section.

2 ACOUSTICAL ANALYSIS

The noise evaluation for the meter station was based on conservative (maximum) values for noise generated by meter station equipment. These values are based on sound level measurements of similar operating facilities and include noise radiated by typical meter station equipment without any noise mitigation measures. **Table 2** below summarizes the ambient and predicted sound level conditions for the meter station.

Table 2: Summary of Sound Level Survey and Prediction Results for Berne Meter Station

Nearest NSA		Existing Ambient Sound Level	Calculated Meter Station Contrib.	Combined Meter Station and Ambient	Predicted Increase Due to Meter Station	Noise Mitigation Included in Analysis
Dist. feet	Dir.					
		Ldn, dB(A)	Ldn, dB(A)	Ldn, dB(A)	dB(A)	
1960	SSW	51.9	29.8	51.9	0.0	None

The calculation details are shown in **Table 3**, attached to this document. The table shows the detailed octave band sound level calculation for the closest NSA to the updated meter station location. The table shows the sound power level used for the meter station along with the geometrical divergence (hemispherical spreading), attenuation by foliage or land contours, atmospheric absorption, and ground effects per ISO 9613-2.

3 NOISE MITIGATION

The sound level target for the meter stations on this project is a contribution of less than 55 dBA L_{dn} at the closest NSA. For this updated location, the nearest NSA will receive a contribution of only 29.8 dBA L_{dn} , and thus there is no need for noise mitigation equipment or materials for this meter station.

4 ACOUSTICAL SUMMARY

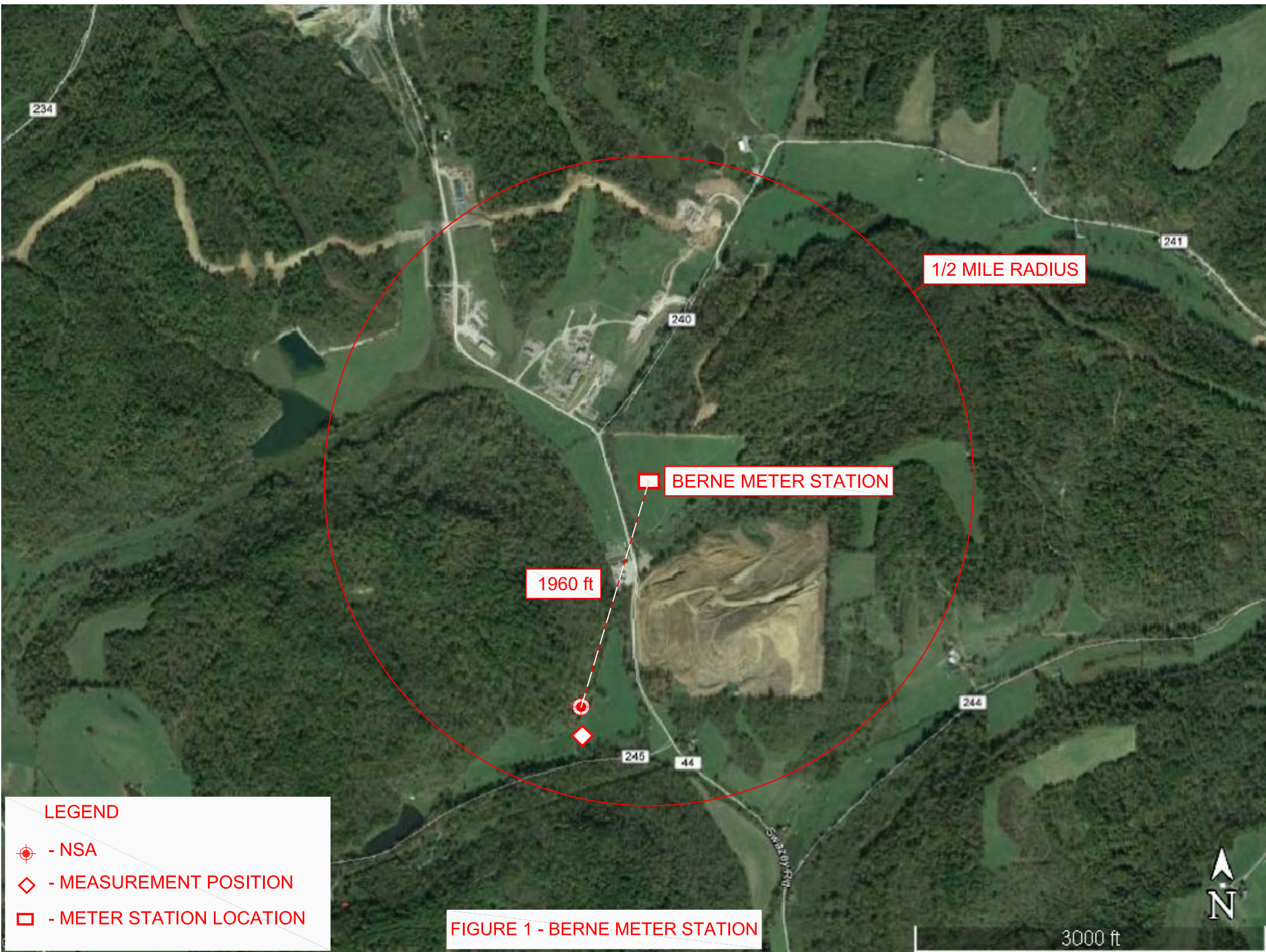
The predicted meter station sound level contribution at the closest NSA is 29.8 dBA L_{dn} . This contribution is predicted to cause no increase in the sound levels at the closest NSA.

Sincerely,
SLR International Corporation



Ronald R. Spillman, P.E.
Principal

Attachments
Figure 1 (meter station site map)
Table 3 (sound level prediction calculations)



Detailed ISO-9613 Calculations for Sound Levels at NSA Near Berne Meter Station

Table 3: Calculation of Sound Levels for NSA Nearest to Berne Meter Station

Source		Ground Absorption Coefficient		
Meter Station		Source	Receiver	Middle
		0.5	0.5	0.5

Dist., ft.	Item	SPL or PWL at Octave Center Frequency. (dB at Hz)									Total, dB(A)	Total, dB(A) Ldn
		31.5	63	125	250	500	1000	2000	4000	8000		
	Operational Peak PWL for Meter Station	102	98	93	96	100	100	96	96	93	104.3	
1960	Geometrical Divergence	-67	-67	-67	-67	-67	-67	-67	-67	-67		
1000	Additional Attenuation by Foliage and/or Land Contour	-1	-4	-6	-8	-10	-12	-16	-18	-24		
	Atmospheric Absorption (70% R.H., 60 deg F)	0	0	0	-1	-1	-3	-6	-17	-58		
	Ground Effect	6	6	-1	-4	-1	2	3	3	3		
	- Total Attenuation per ISO 9613-2 (includes Divergence, Additional Attenuation, Absorption, Ground Effect)	-62	-65	-74	-79	-79	-79	-85	-98	-146		
	Calculated Meter Station Contribution at NSA	40	33	19	17	21	21	11	-2	-53	23.4	29.8
		Existing Ambient Sound Level									45.5	51.9
		Combined Meter Station Contribution and Ambient Sound Level									45.5	51.9
		Predicted Temporary Increase During Meter Station Activities									0.0	0.0