

CS-4000 Unit #726 Full Noise Survey
29 March 2000
US Borax Mine Site, Boron, California

Site Description

This full noise survey was conducted between 1400 and 1615 on 29 March 2000 at the US Borax, Boron Mine. This active borate mine is located near the southern California town of Boron. It is a high desert area with rocky soil and scrub brush. The altitude is approximately 4,000 feet above sea level. The site was in the desert terrain outside of the town and inside of an inactive mine pit. The drill rig was on a road with a five foot (5') dirt/rock berm on the left (Figure 1). There were some additional noise sources such as heavy equipment and aircraft that could have contributed to noise levels in the survey. There were some vehicles (running occasionally) positioned around the site.

Environmental Conditions

During the entire survey, winds were negligible from various directions at speeds no more than 5 miles per hour. Temperatures were in the mid 70^os F during the course of the survey with low humidity. The background noise level taken with the SLM before drilling operations was 78.0 dBA.

Site Equipment

The drill surveyed was unit #726 based out of Chandler, Arizona. The main engine of the drill rig is a deck mounted, six cylinder, 653 Detroit diesel. Associated equipment included with the rig is an FMC W1122BCD hydraulic powered water pump, which runs off of power supplied by the drill rig engine and a Ford F-250 driller's pick-up truck. The rig is mounted on a 1984 F-2275 Freightliner truck.

Technical Approach

Layne Christensen Safety Coordinator, Jim Wright, conducted this survey. During the survey, the drill crew wore the noise dosimeters for approximately four hours while performing routine drilling operations. For this time, there were no shut downs or work stoppages. This survey would constitute an "average" time frame of drilling on a CS 4000 core drill rig.

Audio Dosimetry Results

Dosimetry of personnel on this CS-4000 drill rig showed exposure averages above the OSHA/ MSHA action levels of 85 dBA TWA₈ and the 50% dose. The tables on the following pages outline specific dosimetry results.

Instantaneous Sound Level Measurement Results

Instantaneous SLM results for the CS-4000 drill rig at Morenci showed noise levels above 85 dBA up to thirty feet (30') away from the rig during drilling operations. These levels were dependent upon the direction of the rig. The front showed the lowest levels

beginning at ~ 90 dBA. The noise levels at the left and right sides of the drill produced levels of ~ 106 dBA due to the close proximity of the engine.

Conclusion

The dosimetry data, 85 dBA line and instantaneous SLM readings taken during this survey are within other historical surveys conducted.

Equipment List	
Instrument	Serial Number
Quest Model 215 sound level meter	M2050070
Quest Model CA12 Acoustical Calibrator	6100450
DuPont AC-1 Acoustical Calibrator	01149
DuPont Mk1 Personal Dosimeter	14902
DuPont Mk1 Personal Dosimeter	14904

Calibration Records						
Serial Number	Pre-Cal			Post-Cal		
	94dBA	114dBA	124dBA	94dBA	114dBA	124dBA
14902	94.0	114.0	124.0	94.0	114.0	124.0
14904	94.0	114.1	124.1	94.0	114.0	124.0
M2050070	110 dBA @ 1,000 Hz			110 dBA @ 1,000 Hz		

Noise Dosimeter Survey Results						
	Survey Dose %	anticipated Dose ₈ %	survey dBA _{avg}	anticipated ¹ TWA ₈	dBA _{max}	Time (hrs:min)
14902 – driller	52.7	103.0	85.7	85.4	111.5	4:15
14904 - helper	51.0	100.0	84.7	85.1	105.7	4:15

¹ based on survey dose% in equation $TWA_8 = 16.61 \log_{10} (D\%/100) + 90$

Instantaneous SLM Readings				
Distance from Rig in feet	SLM Readings in dBA from Position			
	Front	Rear	Left	Right
0	90.0	103.5	104.0	107.0
5	89.5	100.5	102.0	102.0
10	86.0	93.5	100.0	97.0
15	83.5	90.0	96.5	94.0
20	82.5	86.0	93.0	92.0
25	78.5	85.0	87.5	88.0
30	-	84.0	85.0	85.0
35	-	81.5	82.5	82.0
40	-	78.0	79.5	79.0

Misc. Instantaneous SLM Readings	
Operator's Station	102.0 dBA

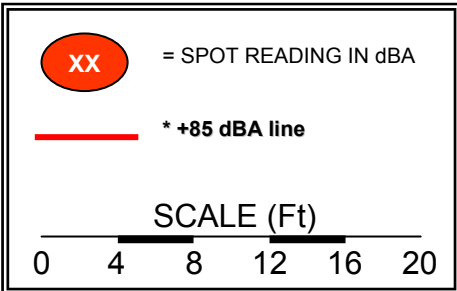
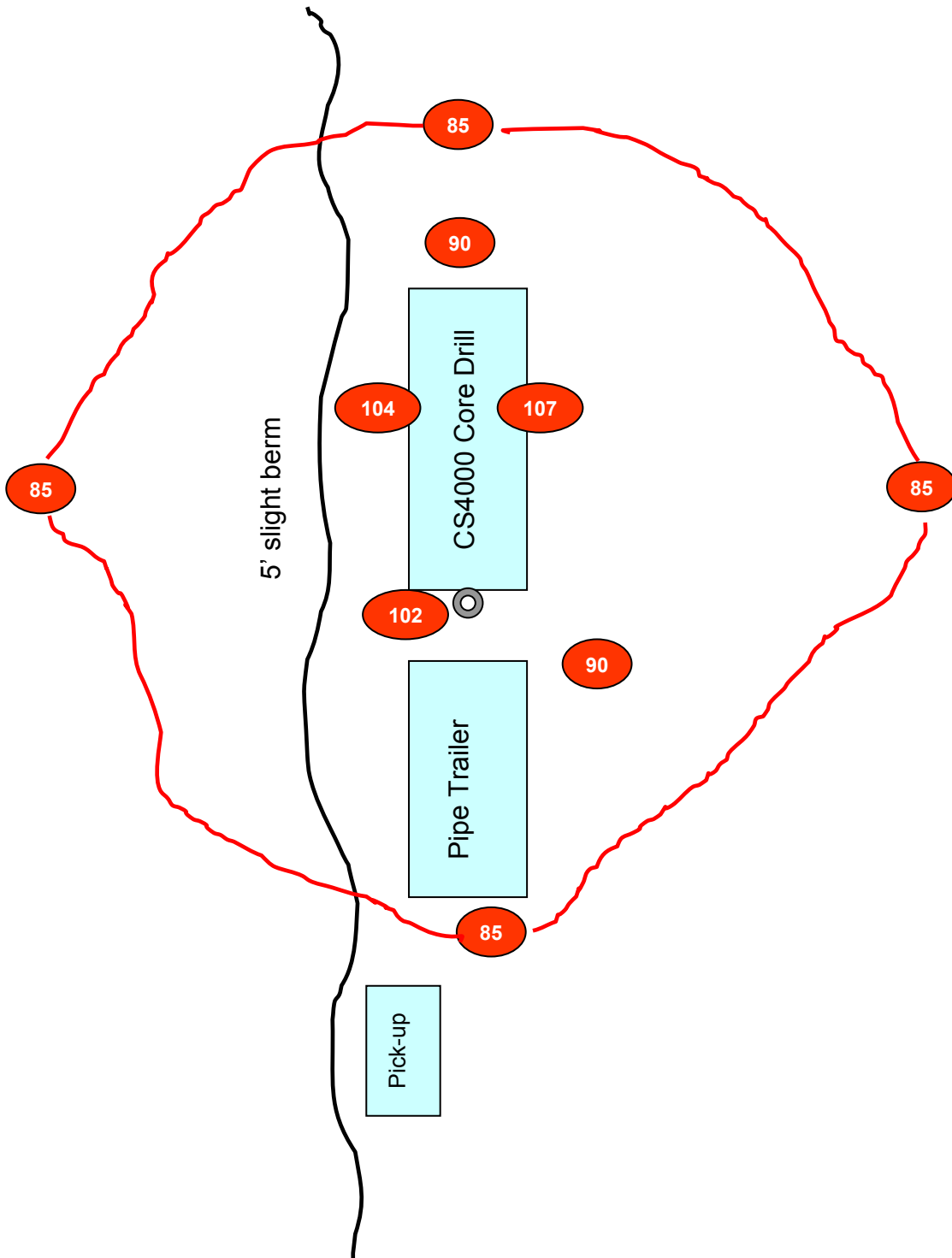


Figure 1 US Borax Mine CS4000
#726
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