

CS-1000 Unit #6580 Full Noise Survey
22 April 1997
Morenci Mine Site, Morenci, Arizona

Site Description

This full noise survey was conducted between 0915 and 1435 on 22 April 1997 at the Phelps Dodge, Morenci Mine. This active copper mine is located near the northeastern Arizona town of Morenci. It is a high desert area with rocky soil and scrub brush. The altitude is approximately 5,000 feet above sea level. The site was in the mountainous terrain outside of the town and outside of the active mine pit. The drill rig was on a pad area with a steep upslope on the left and a down slope on the right (Figure 1). There were no additional noise sources 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 moderate from the southwest at speeds of 5 – 15 miles per hour. Temperatures started in the mid 70^os F and rose to the high 80^os F during the course of the survey with low humidity. The background noise level taken with the SLM before drilling operations was less than 75.0 dBA.

Site Equipment

The drill surveyed was unit #6580 based out of Chandler, Arizona. Associated equipment included a Ford F700 4x4 water truck and a Ford F-150 driller's pick-up truck. The rig is a four-cylinder, skid-mounted model.

Technical Approach

Layne Christensen Safety Coordinator, Jim Wright, conducted this survey. During the survey, the drill crew wore the noise dosimeters for approximately five hours while performing routine drilling operations. For this time, there was one shut down for maintenance of approximately one hour. The helper made one water haul totaling approximately 1 hour of the survey time. The helper drove the F700 water truck to a location, filled the tank and returned to the rig. This survey would constitute an "average" time frame of drilling on a CS 1000 core drill rig.

Audio Dosimetry Results

Dosimetry of personnel on this CS-1500 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-1500 drill rig at Morenci showed noise levels above 85 dBA up to twenty-five feet (25') away from the rig during drilling operations. It was difficult to get distance readings on this rig due to the tight drill pad site. Readings stopped at approximately fifteen feet from rig due to the highwall and down-slope.

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 |
| DuPont Mk3 Personal Dosimeter in SLM mode | 027257 |
| DuPont AC-1 Acoustical Calibrator | 01149 |
| DuPont Mk1 Personal Dosimeter – driller | 14902 |
| DuPont Mk1 Personal Dosimeter - helper | 14904 |

| Calibration Records | | | | | | |
|----------------------------|---------|--------|--------|----------|--------|--------|
| Serial Number | Pre-Cal | | | Post-Cal | | |
| | 94dBA | 114dBA | 124dBA | 94dBA | 114dBA | 124dBA |
| 027257 SLM | 94.0 | 114.1 | 124.1 | 94.1 | 114.1 | 124.1 |
| 14902 | 94.0 | 114.2 | 124.2 | 94.0 | 114.1 | 124.2 |
| 14904 | 94.0 | 114.2 | 124.0 | 94.1 | 114.0 | 124.1 |

| Noise Dosimeter Survey Results | | | | | | |
|---------------------------------------|---------------|---------------------------------|---------------------------|---|--------------------|----------------|
| Serial Number | Survey Dose % | anticipated Dose ₈ % | survey dBA _{avg} | anticipated ¹ TWA ₈ | dBA _{max} | Time (hrs:min) |
| 14902 – driller | 67.9 | 135.0 | 91.6 | 87.2 | 106.1 | 4:53 |
| 14904 - helper | 27.9 | 56.0 | 85.3 | 80.8 | 110.2 | 4:53 |

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 | 106.5 | 96.3 | 107.7 | 103.8 |
| 5 | 100.0 | 92.3 | 100.5 | 97.0 |
| 10 | 96.6 | 86.1 | 96.5 | 93.5 |
| 15 | 94.8 | 82.7 | 89.2 | - |
| 20 | 90.4 | - | 86.5 | - |
| 25 | - | - | 84.8 | - |
| 30 | - | - | 81.9 | - |
| 35 | - | - | 78.6 | - |

| Misc. Instantaneous SLM Readings | |
|---|----------|
| Operator's Station | 94.3 dBA |

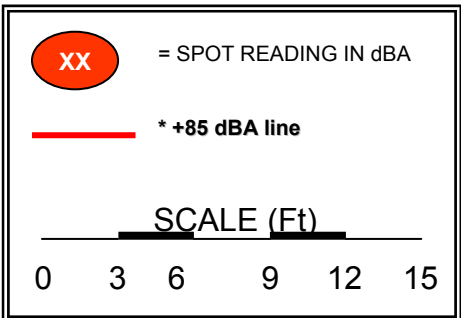
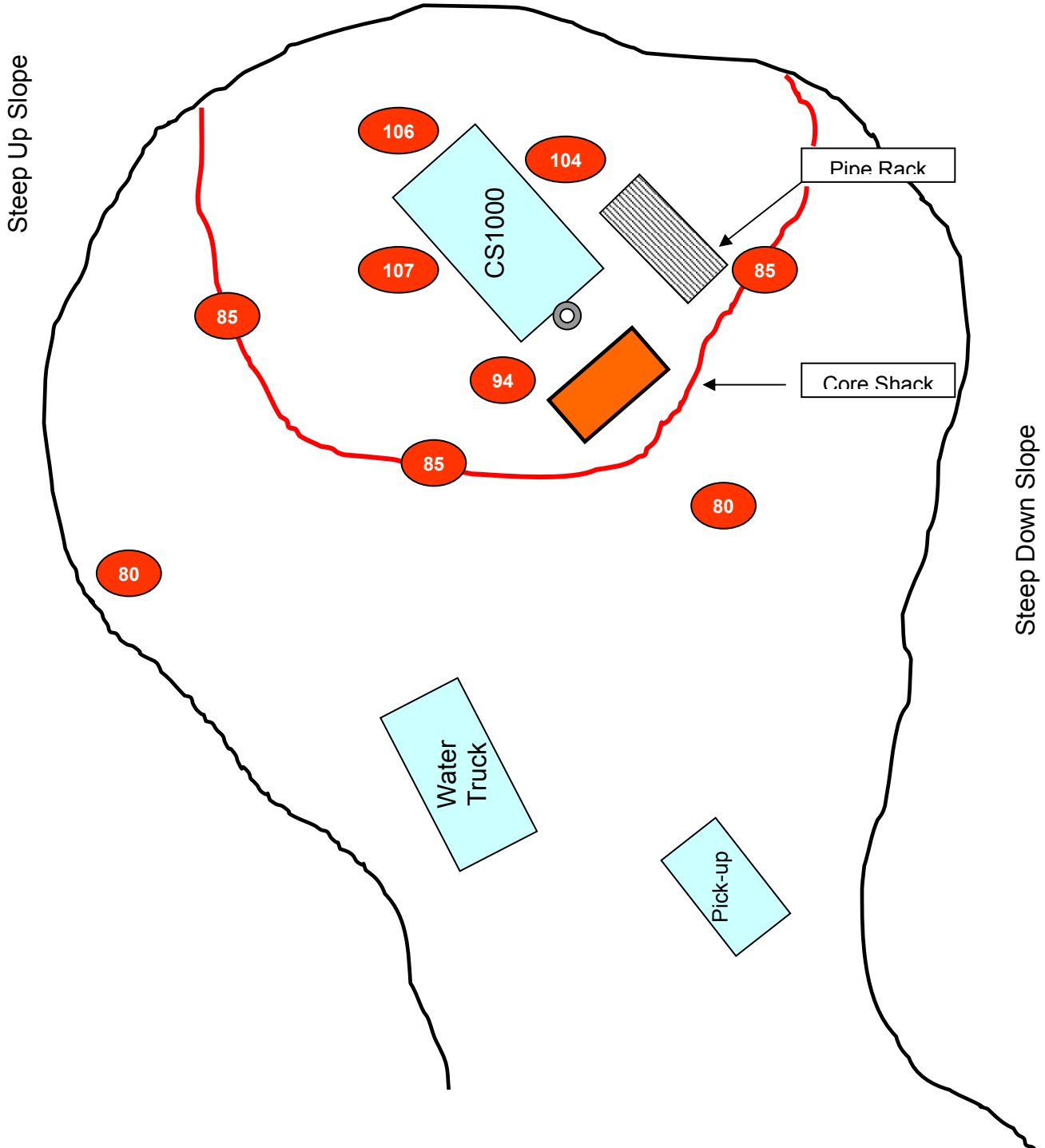


Figure 1 Morenci Mine CS1000
 #6580
 22 April 1997