

LAND USE SERVICES DEPARTMENT

MAR 18 2013

COUNTY OF SAN BERNARDINO

**Baseline Vegetation Analysis
for Brubaker-Mann's Gold, Brown, and Lilac Quarries
Near the Community of Yermo, San Bernardino County, California**

(U.S. Geological Survey 7.5' Nebo quadrangle, Township 9 North, Range 1 West, a portion of the Southwest $\frac{1}{4}$ of Section 1, S.B.B. &M.)

Job #13-003b

Prepared by:

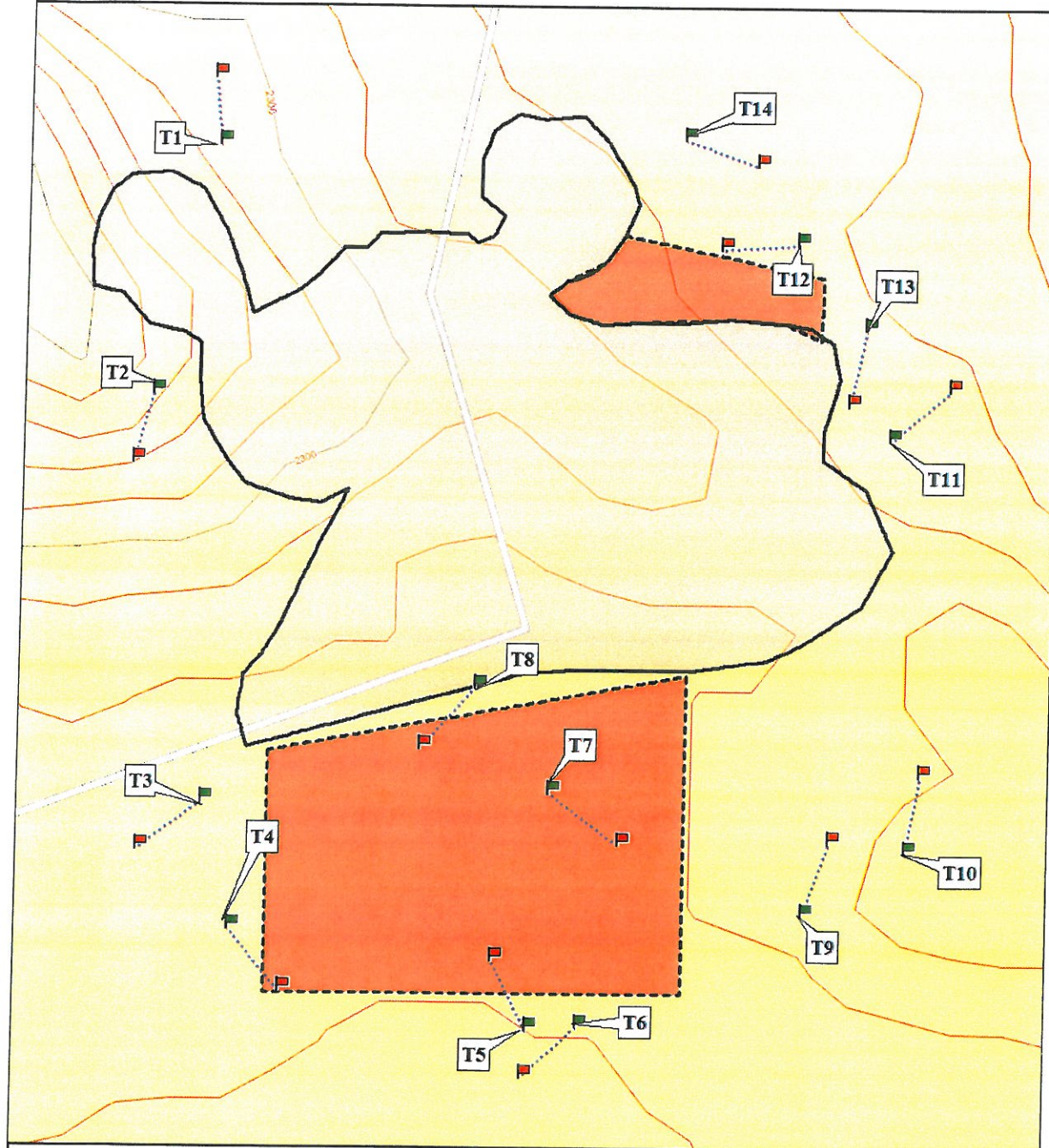
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March 2013

Figure 1. Brubaker-Mann Gold, Brown, & Lilac Quarries: Revegetation Plan Transect Locations



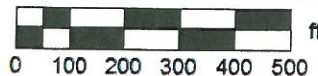
Map produced by Circle Mountain Biological Consultants, 31 January 2013



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MN (12.3° E)



Data Zoom 15-7

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1.0. Introduction

Brubaker-Mann, Inc. is proposing the revegetation of its Gold, Brown, and Lilac Quarries, a mine site, near the community of Yermo, San Bernardino County, California (T.9 N, R.1 W, a portion of the SW ¼ of Sect. 1). The site encompasses 47.2 acres, and includes a 29-acre± existing quarry and two expansion areas, 2 acres± to the north and 12 acres± to the south of the existing quarry. Revegetation is planned for only the 43± acres of the quarries and expansion areas. The project area is located approximately 4 miles east of Barstow and about 1½ miles south of I-15. The site is located within a larger property of 275 acres, which is relatively undisturbed, although there is a network of dirt roads. Lands to the west are open space, administered by the U.S. Bureau of Land Management.

Sharon Dougherty of CMBC and Michael Radakovich, a subcontractor, carried out a vegetation analysis of undisturbed areas in the vicinity of the project site on 29 January 2013, especially in the expansion areas. This study is intended to document baseline vegetation conditions on the site, and provide a basis for establishing targets for revegetation efforts.

2.0. Methods

Fourteen 50-m linear transects and fourteen 25 m² plots were sampled at random locations, determined using a random number generator to select UTM coordinates for start points and compass bearings for the direction of the transects. (See Figure 1.)

Linear transects are intended to provide data on perennial cover. These transects are carried out by stretching a 50-m tape in a straight line and at each half meter point on the tape, a probe is extended downwards vertically. Perennial plants that are touched by the probe are recorded for each of these 100 "points," to allow an estimate of total canopy cover and cover by species.

Perennial plant densities were estimated by establishing a 25 m by 1 m plot and tallying each perennial species that occurs within this plot. These plots were located at the same location as the linear transects described above. The center line of each plot was identified by the first 25 m of the linear transect, and the sample area was defined by a stick held parallel to the linear transect, 0.5 m from the center line on each side. Perennial plants found within the boundaries defined by the stick were identified to species and counted to determine perennial densities.

Estimates of species richness were made by counting the species recorded within the linear transects and density plots for each of the fourteen sampled areas. Digital photos were taken at the start of each transect, facing towards the end, to visually document site conditions and vegetation.

3.0. Results

Table 1, below, shows the results of the 14 linear transects for **perennial cover**. Only five perennial species occurred in sufficient numbers to be represented on linear transects. The total cover from living perennials on fourteen 50 m transects ranged from 0 to 22% (i.e., out of 100 points on the line, live plants were present on 0 to 22 points). The average perennial cover was about 8%. The most abundant species, in terms of cover, was creosote bush, with an average of 4.2%, followed by burrobush (1.8%), peach thorn (1.5%), shadscale (0.2%) and desert holly (0.2%). These are averages, with different species producing more cover on some transects than others. For example, on Transect 4, peach thorn was encountered on 10 of the 22 points where vegetation was present; i.e., nearly half of the 22% live cover came from peach thorn. This species was found on 5 of 14 transects. Shadscale accounted for 50% of the cover on Transect 1, but did not occur on any of the other transects. Two transects (5 and 7) had such sparse vegetation that no live perennial cover was recorded.

Table 1. Perennial Cover

TRANSECT	<i>Larrea tridentata</i> Creosote bush	<i>Ambrosia dumosa</i> Burrobush	<i>Lycium cooperi</i> Peach thorn	<i>Atriplex confertiflora</i> Shadscale	<i>Atriplex hymenolytra</i> Desert holly	TOTAL LIVE COVER (%)
1	3.0	0	0	3.0	0	6
2	6.0	0	0	0	0	6
3	5.5	3.0	4.5	0	0	13
4	3.5	5.5	10.0	0	3.0	22
5	0	0	0	0	0	0
6	7.0	5.0	0	0	0	12
7	0	0	0	0	0	0
8	2.0	0	0	0	0	2
9	6.0	2.0	0	0	0	8
10	6.0	0	0	0	0	6
11	2.0	0	0	0	0	2
12	9.0	8.0	1.0	0	0	18
13	1.0	1.0	4.0	0	0	6
14	8.0	1.0	1.0	0	0	10
MEAN	4.2	1.8	1.5	0.2	0.2	7.9
STD. DEV.	3.0	2.6	2.9	0.8	0.8	6.6

Perennial densities measured on the fourteen 25 m² plots were quite low, with an average of only about 10.9 perennials per plot. This translates to only about 434 perennial plants per square kilometer. Burrobush was the most common shrub by density, with a mean of 5.0 plants per 25 m² plot, followed by creosote bush, averaging about 3.3 shrubs per plot, peach thorn (1.6 per plot), shadscale (0.5 per plot), desert holly (0.3), and cottontop cactus and desert tea (0.1 each).

As with cover, the results of different sample plots were very different in terms of species composition. Creosote bush was found on all transects but one, while desert holly and shadscale appeared only on Transect 1.

Table 2, below, shows the results of the fourteen 25 m² density plots.

Table 2. Perennial Densities (Plants per 25 square meters)

Transect	<i>Ambrosia dumosa</i>	<i>Larrea tridentata</i>	<i>Lycium cooperi</i>	<i>Atriplex confertiflora</i>	<i>Atriplex hymenolytra</i>	<i>Echinocactus polycephalus</i>	<i>Ephedra californica</i>	MEAN
1	7	6	0	7	1	0	0	21.0
2	0	5	0	0	0	0	0	5.0
3	12	2	2	0	0	0	0	16.0
4	11	5	11	0	3	0	0	30.0
5	0	1	0	0	0	0	0	1.0
6	2	4	0	0	0	0	0	6.0
7	0	0	0	0	0	0	0	0.0
8	0	2	0	0	0	0	0	2.0
9	2	3	0	0	0	0	0	5.0
10	1	4	0	0	0	1	0	6.0
11	1	2	0	0	0	0	0	3.0
12	3	4	1	0	0	0	0	8.0
13	13	4	7	0	0	0	1	25.0
14	18	4	2	0	0	0	0	24.0
MEAN	5.0	3.3	1.6	0.5	0.3	0.1	0.1	10.9
ST. DEV.	6.0	1.7	3.3	1.9	0.8	0.3	0.3	10.2

Only perennials were considered during these winter surveys. **Perennial species richness** was low, with only 7 species recorded in sampled areas. CMBC’s more extensive biological surveys of the site found a total of 24 perennials, including about 17 shrub and subshrub species, one grass, and six species of cactus (Circle Mountain Biological Consultants, Inc. 2012).

Appendix A, following, includes photographs taken at the start point of each transect, facing along the transect line towards its end.

APPENDIX A. Photo Points



Exhibit 1. Transect 1 (start towards end)



Exhibit 2. Transect 2 (start towards end)



Exhibit 3. Transect 3 (start towards end)



Exhibit 4. Transect 4 (start towards end)

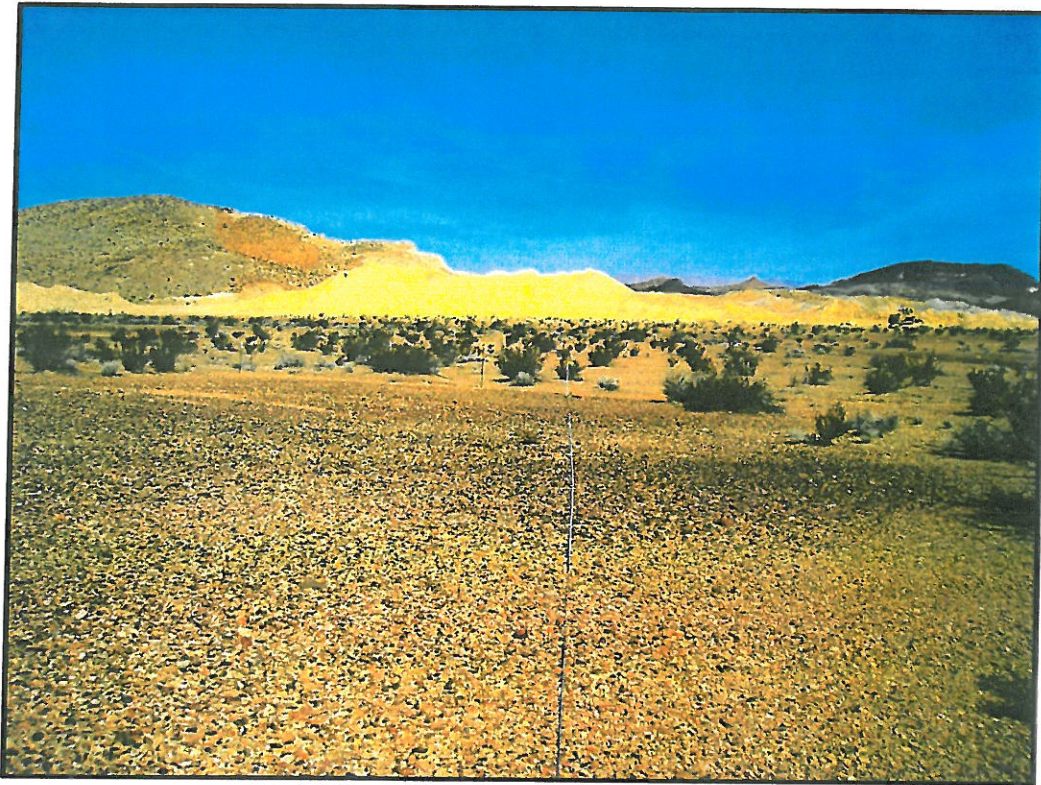


Exhibit 5. Transect 5 (start towards end)



Exhibit 6. Transect 6 (start towards end)



Exhibit 7. Transect 7 (start towards end)

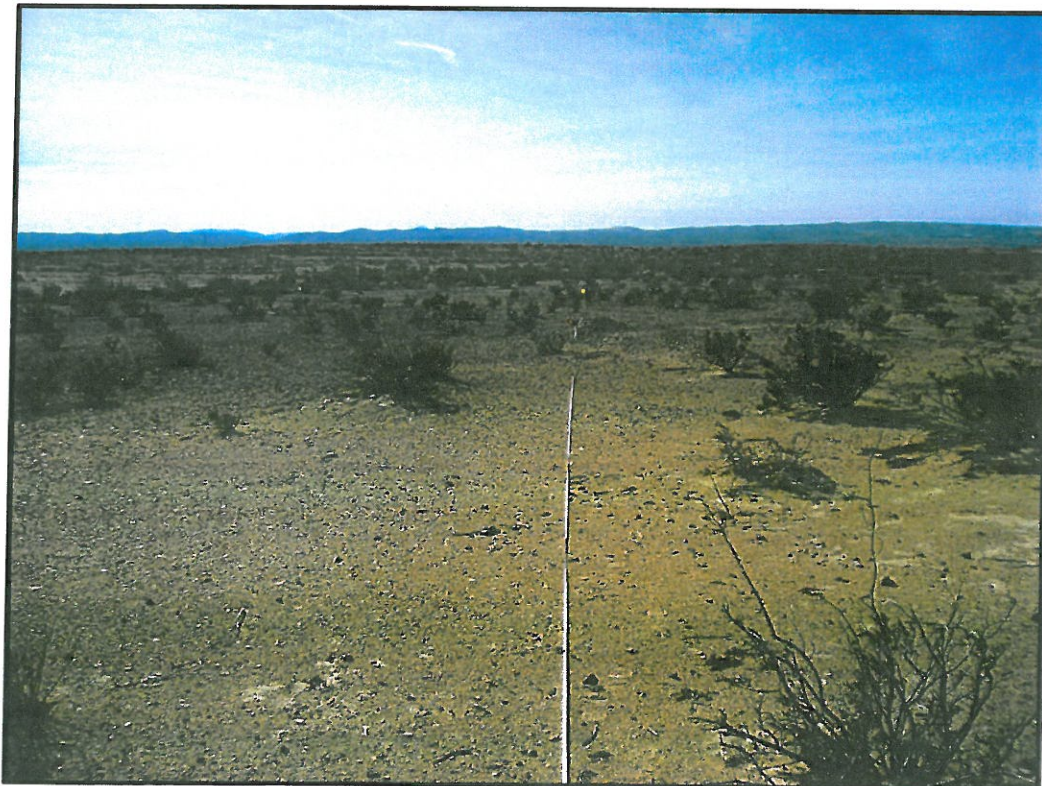


Exhibit 8. Transect 8 (start towards end)



Exhibit 9. Transect 9 (start towards end)

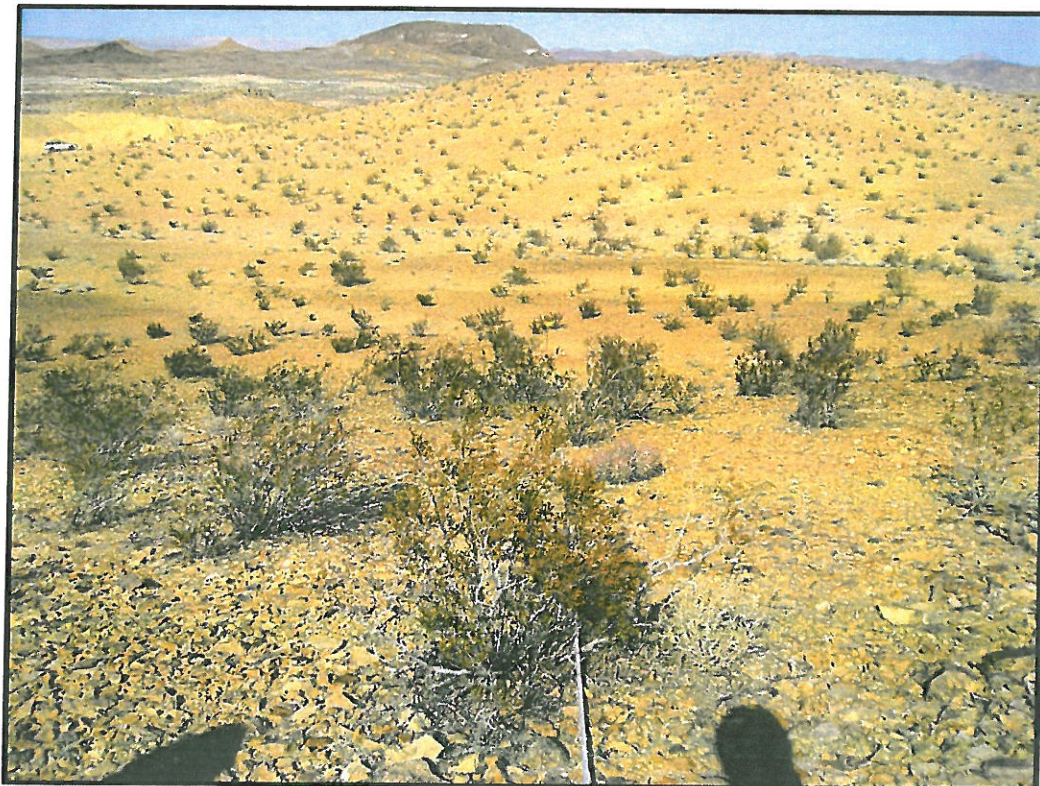


Exhibit 10. Transect 10 (start towards end)

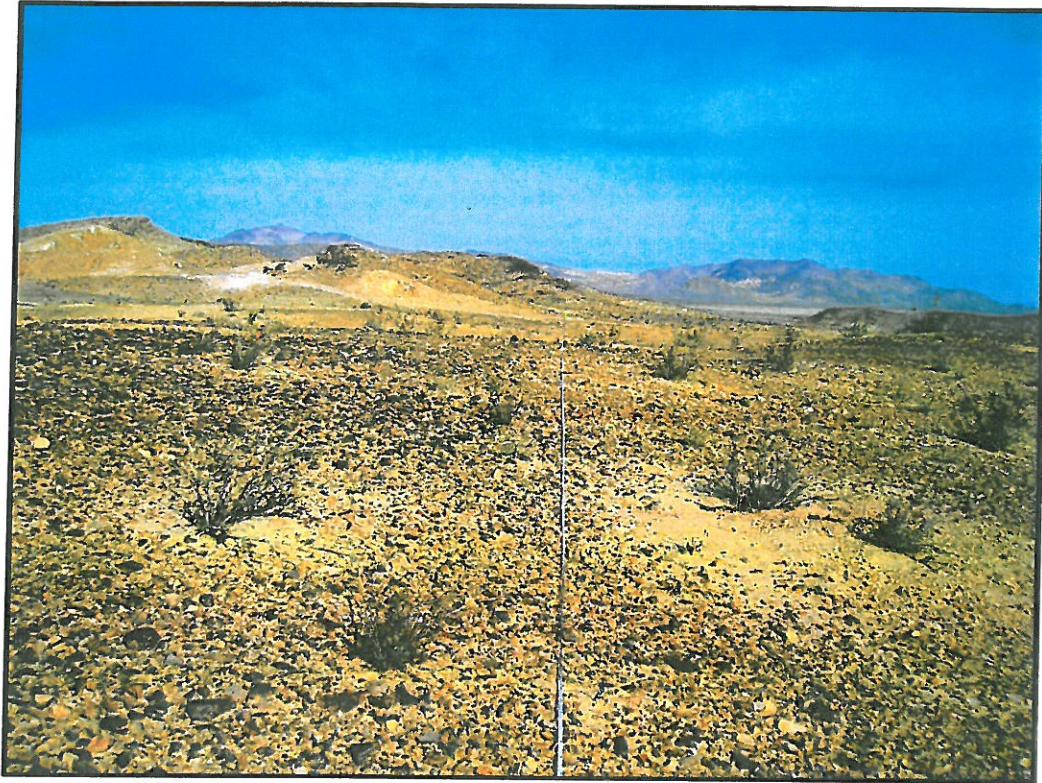


Exhibit 11. Transect 11 (start towards end)



Exhibit 12. Transect 12 (start towards end)



Exhibit 13. Transect 13 (start towards end)



Exhibit 14. Transect 14 (start towards end)