

**Addendum to Ambient Air Quality Modeling Protocol and Results
Bear Lodge Project – Upton Hydrometallurgical Plant
Rare Element Resources, Inc.
Weston County, Wyoming**

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1 BACKGROUND

Rare Element Resources, Inc. (RER) proposes to construct the Bear Lodge Project, a rare earth element mine and separate processing facility in northeast Wyoming. The proposed processing facility will be a hydrometallurgical plant located in Weston County, at the outskirts of Upton, Wyoming. An assessment of the potential air quality impacts of the proposed facility was conducted by IML Air Science. The assessment included a model of the potential near-field impacts of criteria pollutant emissions on ambient air quality (IML 2014).

Modeling of 24-hour PM₁₀ impacts, using the AERMOD Dry Depletion option, showed a single receptor in exceedance of the National Ambient Air Quality Standard (NAAQS) of 150 µg/m³. This receptor falls on the Upton Plant permit boundary near the proposed plant location. Boundary receptors in the initial modeling runs were placed at 100 meter spacing. This addendum documents a refined modeling exercise conducted with model receptors placed at 25 meters apart in the area of the predicted NAAQS exceedance.

2 REFINED AERMOD MODELING RESULTS AND ANALYSIS

2.1. Receptor Placement and Modeled Concentrations

Table 2-1 lists the top 50 receptor concentrations from the refined modeling run. As in the original modeling analysis, only the receptor at the corner of the permit boundary showed a modeled concentration above the NAAQS when the background concentration was added. The coordinates of this receptor are (526962, 4883832).

Figure 2-1 maps the receptors used for this refined modeling run. The hot spot receptors were placed on a 25-meter grid to provide higher model resolution in the vicinity of the projected exceedance. Since all but the corner receptor at coordinates (526962, 4883832) showed compliance in the initial modeling run, and since the receptor grid spacing in the initial run was 100 meters, the refined grid extends outward 100 meters from the corner receptor.

Figure 2-2 is an isopleth map of modeled 2nd-high 24-hour PM₁₀ concentrations from the initial Dry Depletion modeling run. Only the top 50 receptors from the screening run were included in this analysis. Figure 2-3 is an isopleth map of modeled 2nd-high 24-

hour PM₁₀ concentrations from the refined Dry Depletion modeling run. The top 50 receptors from the initial screening run plus the 24 hot spot receptors were included in this analysis. Figure 2-3 provides a higher-resolution view of the modeled PM₁₀ concentration gradient extending outward from the corner receptor. It confirms that concentrations diminish with distance from the corner receptor, which is the only receptor predicted to exceed the NAAQS.

2.1. Conclusion

The refined modeling run predicted 2nd-high 24-hour PM₁₀ concentrations below the NAAQS at all hot-spot receptors. Table 2-1 shows the highest predicted concentration at any hot-spot receptor to be approximately 143 µg/m³, compared to a NAAQS of 150 µg/m³. Figure 2-3 confirms this graphically. Therefore, the refined modeling exercise demonstrates compliance with the 24-hour PM₁₀ standard at a distance greater than or equal to 25 meters from the corner receptor along the Upton Plant permit boundary.

Table 2-1: Top 50 Receptors, 24-Hr 2nd High PM₁₀ Concentrations (Refined Run)

UTM Easting	UTM Northing	Maximum Modeled Concentration (µg/m ³)	Maximum Concentration with Background (µg/m ³)	NAAQS Concentration (µg/m ³)
526962	4883832	117.14	157.14	150
526962	4883857	102.72	142.72	150
526987	4883832	93.16	133.16	150
526962	4883882	89.19	129.19	150
526987	4883857	80.04	120.04	150
526962	4883913	73.33	113.33	150
526962	4883907	72.57	112.57	150
526962	4883932	67.64	107.64	150
526987	4883882	61.55	101.55	150
526987	4883907	55.49	95.49	150
527012	4883832	49.72	89.72	150
526987	4883932	49.55	89.55	150
527294	4882218	45.69	85.69	150
527194	4882217	44.09	84.09	150
527037	4883832	43.88	83.88	150
526820	4884211	43.47	83.47	150
527012	4883857	43.26	83.26	150
527012	4883882	40.33	80.33	150
527037	4883857	38.98	78.98	150
526812	4884244	38.97	78.97	150
527062	4883832	37.65	77.65	150
527094	4882215	37.28	77.28	150
526321	4884221	36.96	76.96	150
526720	4884209	36.03	76.03	150
526221	4884218	35.44	75.44	150
527389	4882333	35.40	75.40	150
526712	4884244	35.33	75.33	150
527385	4882433	35.15	75.15	150
527062	4883857	34.56	74.56	150
526962	4884013	33.91	73.91	150
527012	4883907	33.84	73.84	150
526775	4884333	33.61	73.61	150
526121	4884216	32.15	72.15	150
527037	4883882	31.84	71.84	150
527393	4882233	31.72	71.72	150
527394	4882220	31.23	71.23	150
526421	4884223	31.06	71.06	150
526972	4882614	31.06	71.06	150
526972	4882613	30.96	70.96	150
527037	4883907	30.37	70.37	150
527062	4883882	29.82	69.82	150
527012	4883932	29.75	69.75	150
526318	4884321	29.53	69.53	150
527062	4883907	29.34	69.34	150
526675	4884333	29.03	69.03	150
526168	4884317	28.53	68.53	150
526737	4884423	28.37	68.37	150
526620	4884208	28.19	68.19	150
526837	4884423	27.37	67.37	150
526657	4884469	27.08	67.08	150

Figure 2-1. Initial 24-Hour PM₁₀ Concentrations (With Dry Depletion, no Background)

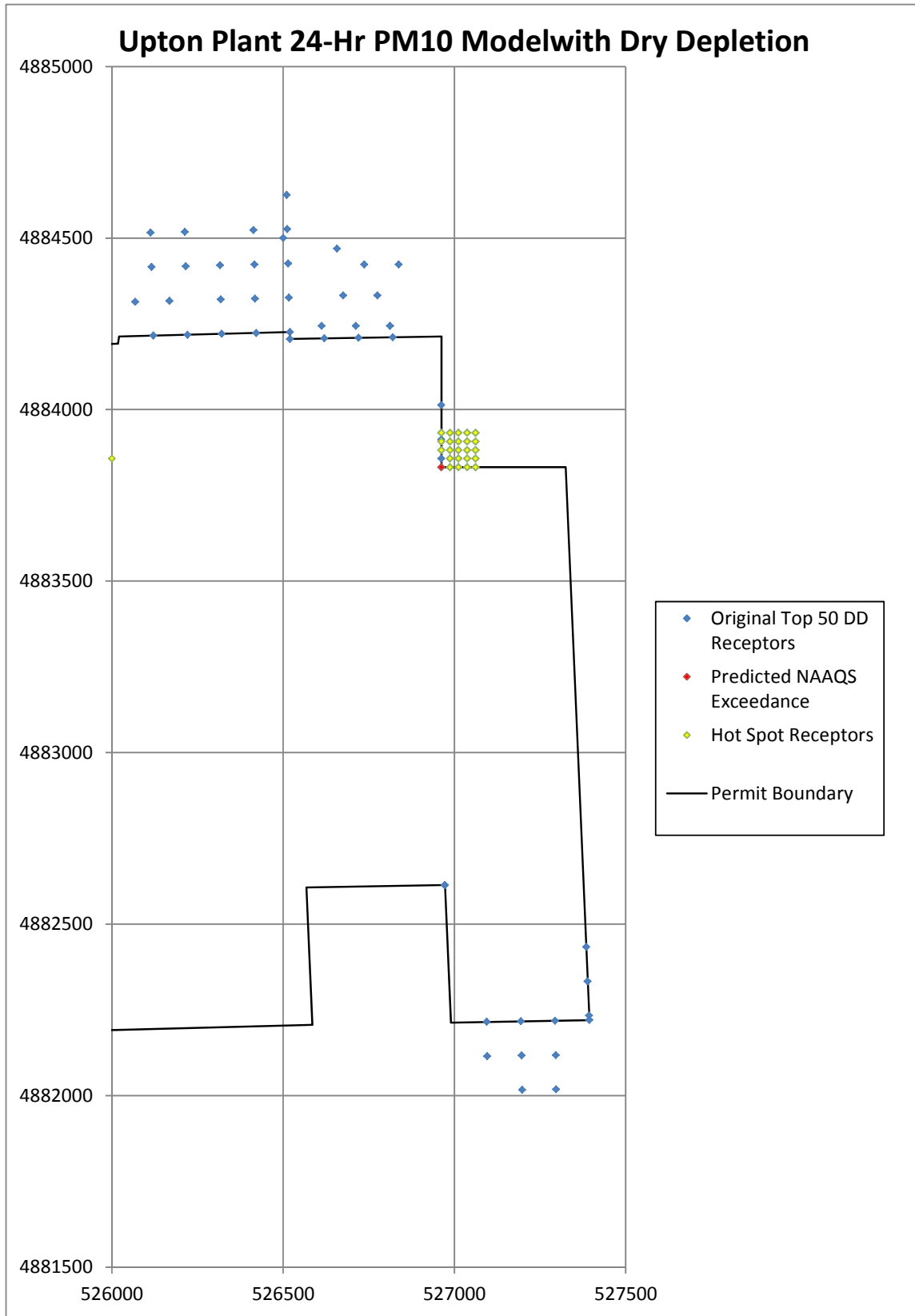


Figure 2-2. 24-Hour PM₁₀ Concentrations at Initial Receptors (Dry Depletion Option)

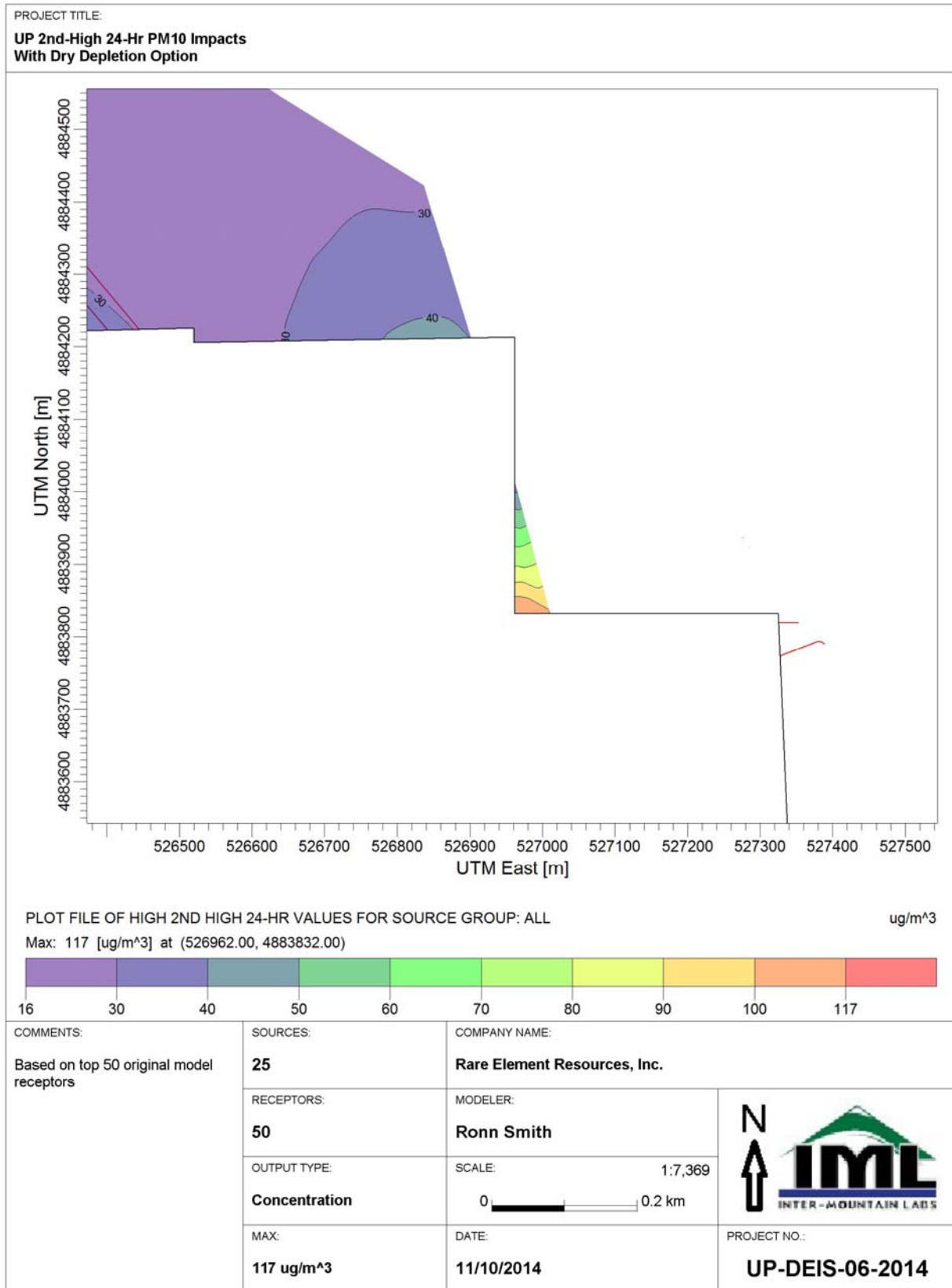
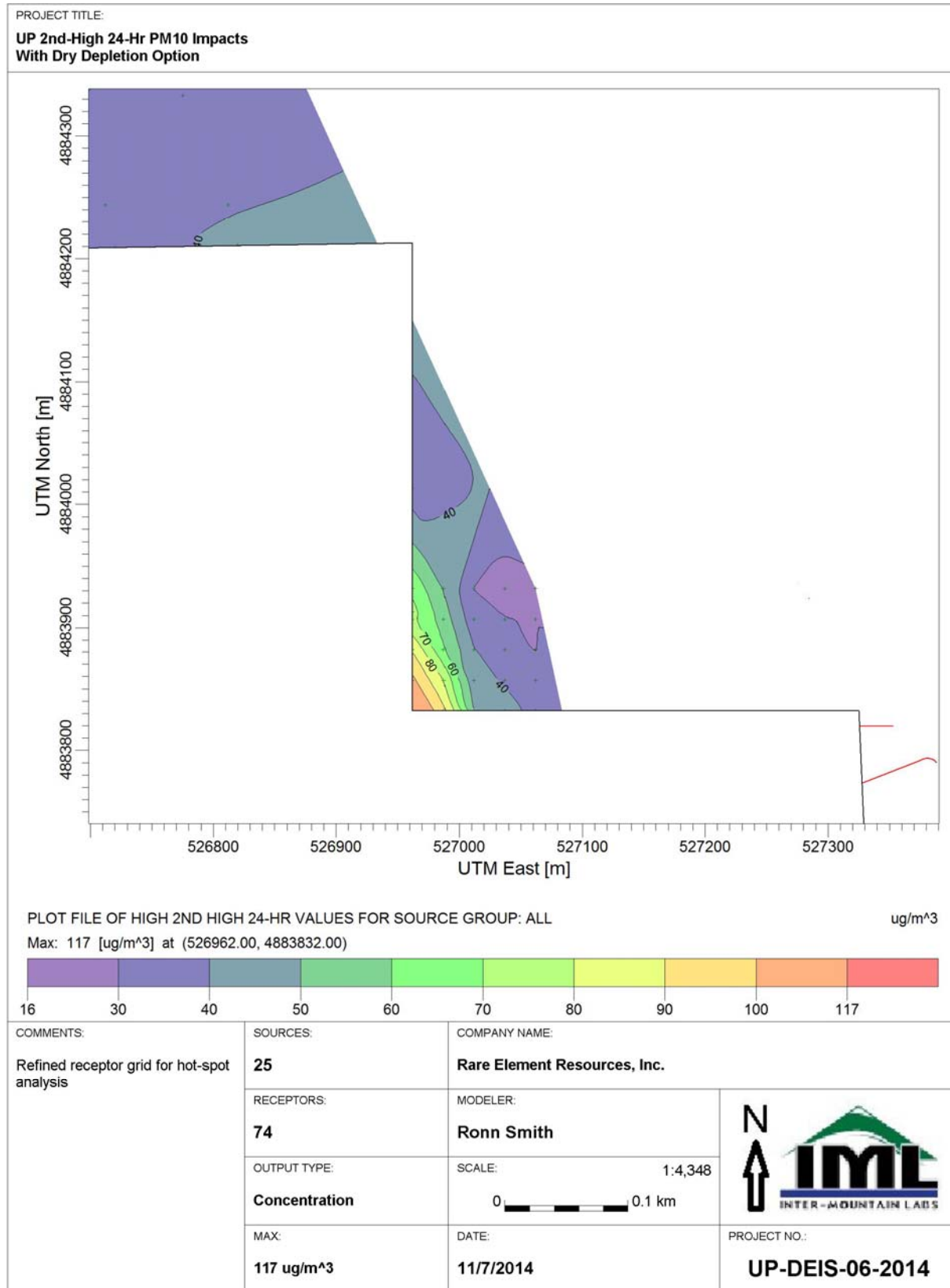


Figure 2-3. 24-Hour PM₁₀ Concentrations w/ Hot Spot Receptors (Dry Depletion Option)



3 REFERENCES

1. IML 2014, *Ambient Air Quality Modeling Protocol and Results Bear Lodge Project – Upton Hydrometallurgical Plant Rare Element Resources, Inc.*, September 2014.