M E M O R A N D U M

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To: Mark Ader, USEPA-10
Doug Tanner, IDEQ
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Lenna Cope, ENE

Date: July 3, 2008

From: Bill Wright and Colin Duffy, MWH

Reference: P4 Production, Monsanto Elemental Phosphorus Plant

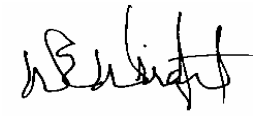
Subject: Transmittal of *Draft Second CERCLA Five-Year Review Soil Report – Rev. 1*

Dear Mark, Doug, Clyde, and Lenna,

Please find enclosed the *Draft Second CERCLA Five-Year Review Soil Report – Rev. 1* for agency review. This document was transmitted electronically via our FTP site as well as in hard copy accompanied by CD. This soil report is submitted as one of two reports that MWH plan to submit. A technical sediment report is to accompany and will be submitted at the same time.

Included at the beginning of this document are P4 Productions responses to the comments provided by EPA on June 18, 2008. We trust that each comment has been addressed in full, and we look forward to finalizing this document following your review.

Sincerely,



Bill Wright
Project Manager

EPA Comments from 6/18/2008 on Draft Second Five-year Review Soil Report P4 Production - Monsanto Elemental Phosphorus Plant Soda Springs, ID April 2008

General Comments

General Comment 1: According to the ROD there are conditions on the No Further Action (NFA) determination for the various source areas and off site impacts. The condition placed on the NFA for these areas is that Monsanto will stay in compliance with all other environmental regulations. These include the Clean Air Act, the Clean Water Act and other federal and state laws. Provide a section in the reports that addresses Monsanto's compliance with the various permits in effect at the plant.

P4 Response: *A letter from Bob Geddes summarizing compliance status at the plant is summarized in the text of, and appended to, the report.*

General Comment 2: Include protectiveness statements for the remedies that are in place at the facility.

P4 Response: *A statement that the remedies in place at the plant are protective is included in the text of the report.*

General Comment 3: Figure 1 – add the 2004 and 2005 radium concentrations to the figure. Differentiate between the off plant properties that were purchased by Monsanto from those that are under an Environmental Easement.

P4 Response: *Figures 1 and 2 were modified to include 1996, 2002, 2004, and 2007 Ra^{226} results and were blown up to minimize noise. These were made into new figures are now Figures 9 and 10.*

The report text has been revised to point out that the same institutional control document has been filed on all land noted in Figure 1 as being under institutional control – whether such land is owned by Monsanto or under easement to Monsanto. Thus, from an institutional control legal perspective, there is no difference between the two land categories.

Specific Comments

Comment 1: Page 1, Second Paragraph, first sentence – States that the first five year review was reported in 2005. The first five year review was completed in 2003.

P4 Response: *The text has been revised.*

Comment 2: Page 2, fourth paragraph – In describing the land use the term developed is used. State whether this implies industrial or residential development.

P4 Response: *The term "land use" has been changed to the more descriptive "land surface condition" and the following text has been added: "The term developed refers to both residential and industrial development. Please note that from this point forward, when the term "land use" is used, it is referring to land surface condition."*

Comment 3: Page 3, land use discussion – Note that land use was not identified in the Record of Decision as relevant to cleanup decisions. The fifth paragraph discusses a 25 % change in land use classification. How were classification decisions made, where the field staff trained to make these classifications and how were the classification documented?

P4 Response: *The phrase "land use" is used in the report not to refer to land use in the meaning of affecting exposure potentials; rather, it is used to refer to the physical condition of the land surface at a particular location. Thus, the use of the phrase in the 2nd 5-year review soil report (as well as in the followup to the 1st 5-year review report, submitted in 2005) has no relevance to cleanup decisions or status. (See response to Comment 2 above.)*

During both the 2004 and 2007 field efforts, two crews of two samplers each were used. One of the members of each crew defined the surface condition of each station and recorded the observation in the crew's field notebook. These observations are what was presented in the 1st 5-year review followup report and this 2nd 5-year review report.

When Dr. Clark suggested that land surface condition appears to significantly affect kriging results and Monsanto decided to have her incorporate this information into her geostatistical model, it became necessary to map land surface condition over the entire study area, not just for each sampling station. The mapping was conducted by Colin Duffy and Leland Fuhrig of MWH. Colin and Leland were on the sampling team 2007 field effort. To produce the map they used the following information:

- *Observations at each sampled station, as recorded in field notebooks from 2004 and 2007;*
- *Photographs of each sampled station in 2004 and 2007 from MWH project files;*
- *A recent aerial photograph of the study area provided by Monsanto; and,*
- *Their familiarization with the study area.*

No formal training was provided to differentiate between native, tilled, pastured, and developed land surfaces, but the differences are rather obvious. Mr. Duffy and Mr. Fuhrig generated independent classifications. The number of disagreements between the two was very small (only a couple stations). Where a

disagreement existed, it was resolved by taking the classification of the person *who had actually sampled the station in 2007. This was the first joint classification performed, thus providing a consensus classification. Also, this effort was the first to classify land surface conditions on a large scale for the entire study area, rather than merely at each localized sampling point. As such, we believe the relatively high rate of differences between the consensus 2007 classification and those available for the 2004 field season is acceptable. If questions remain as to how certain they are, the classification of the entire study area can be repeated by another team of classifiers using the same information used by Mr. Duffy and Mr. Fuhrig. The result would allow for a valid quantification of classification precision attributable to the classifier team.*

The report text has been revised to clarify potential reasons for the difference in land surface condition classifications in 2004 vs. those reported for 2007.

Comment 4: Appendix C- Page 3, Figure 2 – add legend for colors on figure. Change colors to yellow and light blue.

P4 Response: *The following text was added to the sentence introducing the figure: "(If this figure is difficult to view, please refer to Figure 3:* Surface Soil Sampling Locations, Topography, and Land Use in the Vicinity of the Plant, 2007 *in the main body of this report, for a larger scale and clearer version of the map from which this was derived)."*

P4 PRODUCTION
MONSANTO ELEMENTAL PHOSPHORUS PLANT

Second CERCLA Five-Year Review Soil Report - Rev. 1 - Final

Prepared by

MWH

2353 130th Avenue N.E., Suite 200
Bellevue, Washington 98005

July 2008

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TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS

ARARs	applicable or relevant or appropriate requirements
COC	contaminant of concern
COPC	constituent of potential concern
DW	dry weight
USEPA-10	US Environmental Protection Agency Region 10
FS	feasibility study
IDEQ	Idaho Department of Environmental Quality
K-S	Kolmogorov-Smirnov
K-W	Kruskal-Wallis
LSD	Fisher's least significant difference
NPDES	National Pollutant Discharge Elimination System
RI/FS	remedial investigation/feasibility study
RI	remedial investigation
ROD	record of decision

1.0 INTRODUCTION

Surface soil samples were collected as part of the remedial investigation (RI, referred to herein as the 1996 investigation event presenting the RI data reported in the site feasibility study), the five-year monitoring event (in 2002), the monitoring event conducted in response to agency comments on the five-year review report (in 2004), and the ten-year monitoring event (in 2007, also known as the second five-year monitoring effort). In each of these efforts samples were collected in the plant vicinity, specifically the roughly 11 mi^2 of area surrounding the plant, and from background locations further away to avoid any possible influence from the plant. The ongoing monitoring program is required under CERCLA and is done primarily to ensure that the extent of contamination at the site is not expanding or that the contamination levels are not increasing.

Surface soil samples from the uppermost inch of the soil column were analyzed only for ^{226}Ra. This is because the USEPA-10's baseline risk assessment for the site demonstrates that potential risk associated with external gamma radiation exposure attributable to elevated levels ^{226}Ra overwhelms all other exposure pathways and all other contaminants.

Ever since the first five-year monitoring review was reported in 2003, P4 Production has chosen to evaluate the surface soil data geostatistically. Geostatistics provides an objective, reproducible, and defensible way to estimate the contour of the remediation threshold, 3.7 pCi/g dw of ^{226}Ra. During the RI the USEPA-10 established a 39-station investigation network in the plant vicinity that was used to define the nature and extent of soil contamination. Because the source of the elevated ^{226}Ra in soil is fugitive dust and historic stack emissions, the surface is the only soil stratum of interest and is defined as the uppermost inch. With the introduction of geostatistical analysis in 2004, it was shown that the original 39-station network is inadequate for reliably estimating contaminant extent. Thus, the monitoring network was expanded to 188 stations in the plant vicinity during the 2004 event. This was shown to be more than adequate, so for the 2007 monitoring effort the number of stations in the plant vicinity was pared back a bit to 146 (this number includes additional stations to the north-northwest and to the south of the plant where the 2004 monitoring failed to fully bound the 3.7 pCi/g contour).

While the number of monitoring stations in the plant vicinity has changed as P4 Production searched for an optimal number and density of stations, it is possible to make comparable assessments of change over time by looking at the original 39 investigation stations established during the RI. These 39 stations have been retained in the current network and have been sampled during each event. The 20 background samples are also the same as they were during the RI.

The remedial action consent decree for the plant requires that Monsanto operate the plant in compliance with all other relevant environmental regulations. Neither federal nor state environmental agencies provide certifications of compliance, but Monsanto has a strict

internal policy requiring environmental compliance. A self assessment of such compliance is provided in Appendix E.

The selected remedies for the soil exposure pathway -- institutional controls and stockpile fugitive dust management -- are known, ***a priori***, to be effective. This is because the remedies were established to be protective of exposures associated with potential future residential land use. Because no residential development has occurred, or is likely to occur, in areas of interest around the plant, effectiveness is assured regardless of off-site surface soil concentrations. The continuance of the protective status of the remedies is assured not only by the five-year CERCLA review process, but by the fact that all eight members of Monsanto's plant environmental department are aware of the need to monitor the potential for land use changes in the plant vicinity, and would take immediate steps to prevent any changes not allowed by the deed restrictions obtained as the institutional control.

2.0 Methodology

Sample collection and analysis in 2007 was the same as during 2004, with two exceptions – different stations in the plant vicinity, as explained above, and field radiological measurements were not taken. The 188-station plant vicinity network monitored in 2004 was pared back to 125 as follows:

- First priority was to include the 39 original investigation stations to ensure a degree of continuity; and,

- Second priority was to add stations on the basis of geostatistical information content as determined by the project geostatistician, Dr. Isobel Clark.

The second step proceeded until 125 stations were selected. We added more stations to the north-northwest and to the south of the plant in the hope of fully bounding all surface soil concentrations greater than 3.7 pCi/g dw ^{226}Ra, then added a few more to fill in obvious spatial gaps. The resulting monitoring network consists of 146 stations around the plant, plus the 20 original background stations.

Field radiological measurements were taken in 2004 in the hope of establishing a correlation between laboratory ^{226}Ra results and field readings. If established, future monitoring could be done much more quickly, frequently, and inexpensively. However, no correlation was found. Thus, no field measurements were taken in 2007.

As was done in 2004, the condition of the land surface at each station was recorded. This condition is called "land surface condition," and is either native (undisturbed), tilled, pasture, or developed. The term ***developed*** refers to both residential and industrial development. Please note that from this point forward, when the term "land use" is used, it is referring to land surface condition.

As in 2004 the data are evaluated geostatistically. In P4 Production's response to agency comments on the first five-year review, the details of the geostatistical approach are extensively discussed so they are not repeated here.

The locations of the 20 background stations are shown in Figure 1. Figure 2 shows the locations of the 146 stations sampled in the vicinity of the plant. Figure 2 also shows plant vicinity stations for 2004 that were not sampled in 2007, as well as the extent of land surrounding the plant that P4 Production has institutional control over by means of either ownership or easement.

While Figure 2 presents the boundaries of lands that are under institutional control, the deed restrictions filed at the courthouse and provided to USEPA-10 at the time of filing are presented in appendix D.

3.0 Results and Discussion

The project geostatistician thought that some additional data might prove useful in refining and getting more information out of the geostatistical analysis: specifically, land use and topography, which Figure 3 displays. Land use was noted for each sampling station, but to characterize the entire study area, aerial photos, photographs taken of each soil monitoring station and field notes as to land use classification of each station were examined to generate the land use information in Figure 3.

The data validation report for the 2007 surface soil data is presented as Appendix A. The project geostatistician identified one result as a substantial outlier. Specifically, station S3-73 reported a value of 0.16 pCi/g dw ^{226}Ra. This is far lower than any other result. In fact, the lowest concentration ever seen in background is 0.60 pCi/g dw. We therefore asked the laboratory to rerun the sample.

The reanalysis of the sample for S3-73 was reported as 0 pCi/g dw by the laboratory because the result was rejected due to counting error larger than the concentration observed. However, a detailed review of the laboratory package indicates that the laboratory reported a concentration of about 0.3 pCi/g dw before rejecting it; thus, either way one looks at the reanalysis – whether it yielded another very small concentration or an even smaller non-concentration – it confirmed the initial result, which was retained. An abridged version of the laboratory report for this reanalysis is provided as Appendix B.

The results of the 2007 monitoring effort, in terms of surface soil ^{226}Ra concentrations, are presented in Table 1, along with results from the remedial investigation and the previous two monitoring efforts. Coordinates for each station are presented in Table 1, as are land use classifications for both 2007 and 2004.

Of interest is that for those stations monitored in both 2004 and 2007, about 25% have land use classifications that changed. In the field, during both years, the two-person crew that sampled a particular station classified it with regard to land surface condition. In 2007, two members of the sampling team used the field station classifications from both years, field photographs of each station for both years, and recent aerial photographs to make independent assessments of current land surface condition for the entire study area. These two independent assessments were compared, and in only a couple of instances did they vary. In these instances, the classification of the team member who actually sampled the station in question was accepted. Thus, we have good confidence in the 2007 classifications. Some of the different classifications of stations in 2004 could be attributed to actual changes in surface conditions in the three-year interim, but uncertainty in the 2004 classifications likely accounts for the majority of the differences. The geostatistical analysis is documented in Appendix C. Dr. Clark's software generates colored and shaded maps that are difficult for some to see and interpret; thus, we have replotted her results in a simplified manner – by merely plotting the 3.7 pCi/g dw ^{226}Ra contours. These replotted figures are presented herein.

Figure 4 shows the 3.7 pCi/g dw contours for 2007 based on all 146 stations in the plant vicinity. There are three pockets of elevated surficial soil ^{226}Ra – one adjacent to the southeastern corner of the plant in an industrial and transportation corridor. It is possible that this pocket could be attributable not to P4 Production's operations, but to Soda Springs Phosphate Industries or Evergreen Resources, both of which convert phosphate ore to fertilizer.

The other two pockets of elevated ^{226}Ra are to the north of the plant – one adjacent to the plant's northern boundary, off the southwest corner of Three Mile Knoll; the other off the northwest corner of the plant in a small notch between areas institutionally controlled.

Figure 5 uses all of the information used to generate Figure 4, plus topography. The three pockets of elevated ^{226}Ra are in the same locations and of similar size to those in Figure 4. Figure 6 uses the same concentration data as used in Figure 4, but this time land use is accounted for. In Figure 6 the three locations move a bit from where they are in Figures 4 and 5, and they change shape considerably. In particular additional, albeit small, pockets of soil are seen to exist, and these can extend quite a ways from the plant boundary. In particular there are nine of these small pockets extending in a chain to the edge of the study area to the north and northwest. When looking at the land use map (Figure 3) one can see that these small pockets correspond to small islands of native land. They appear to be basalt outcrops associated with a fault that runs out of the plant to the north-northwest.

We can compare results from different monitoring efforts to get an idea of how the soil concentrations are changing over time. Figure 7 shows the results from 2004, when 188 stations were available. However, the 2004 plot doesn't make for a good comparison to 2007 results because the 2004 monitoring network did not fully bound the 3.7 pCi/g dw contour.

For temporal comparison purposes, plotting the results of geostatistical analyses based on only the original 39 stations set up for the RI gives a more useful, albeit uncertain, picture of change. Given that the study area is 6,961 ac, the percentage exceedance information from Table 1 of Appendix C can be used to estimate areas above 3.7 pCi/g dw ^{226}Ra as measured by the 39 station network:

1996	1,831 ac
2002	1,469 ac
2004	2,144 ac
2007	1,469 ac.

Given that a 39-station monitoring network is well below one with an optimal station number, the above acreages are best interpreted as showing no evidence of any significant change over time. The results are plotted in Figure 8, showing all four investigation or monitoring events on one figure.

The 2007 monitoring is the first time that the 3.7 pCi/g dw remediation threshold was bounded all around the plant. However, the version of the geostatistical model using land use information predicts small occurrences of elevated ^{226}Ra far to the north and northwest of the plant, despite no observations documented that far out. Because the number and density of samples in 2007 were geostatistically optimized, because the 2007 monitoring observations completely bounded the cleanup threshold for the first time, and because the model using land use provides the most information content, the 2007 results presented in Figure 6 are regarded as the best quality results available.

The design used to generate Figure 6 should be used for all subsequent monitoring events. Dr. Clark, who resides in Scotland, periodically visits British Columbia and Nevada to visit with clients or teach short courses. As such, she can be made available with advanced notice and a bit of planning to meet with the agencies to discuss planning how best to approach the 15-year review.

In the 2005 report Dr. Clark performed simulations to determine the uncertainty of the 3.7 pCi/g dw contours. This was done by plotting an outer 95% confidence bound for the contour, which was typically and roughly about only 1,000 ft from the contour. This was interpreted as the 188-station network used in 2004 being more than adequate. If there are any questions about the degree of uncertainty associated with any of the contours presented herein, Dr. Clark could run simulations on the existing data and models to estimate outer confidence bounds.

Another potential refinement to the geostatistical model is to incorporate wind direction and speed. Finally, uncertainty in the land use classification merits further thought and discussion.

TABLES

Table 1. Surface Soil ^{226}Ra Results for the 2007 10-Year Monitoring and All Prior Monitoring and Investigation Efforts

Station	Land Use*		Coordinates		^{226}Ra, pCi/g dw**			
	2004	2007	Easting	Northing	1996	2002	2004	2007
Plant Vicinity								
L1-01	1		659199.0	368378.6			3.5	
L1-02	1		659617.3	368381.5			2.6	
L1-03	2		660349.4	368376.5			1.7	
L1-04	2		660692.9	368389.1			1.6	
L1-05	2	2	661365.3	368393.8			1.6	1.1
L1-06	2	2	661753.8	368376.4			1.8	1.3
L1-07	1		658845.1	368781.1			3.8	
L1-08	1		658842.3	369186.0			5.2	
L1-09	3		658845.2	369833.9			2.0	
L1-10	3		658843.1	370127.5			2.2	
L1-11	3		658838.6	370775.4			2.1	
L1-12	3		658844.0	371069.0			1.9	
L1-13	1		658842.0	371352.4			3.6	
L2-01	3		651674.1	373206.7			1.4	
L2-02	3		651948.8	373441.4			1.5	
L2-03	3		652216.2	373665.9			1.7	
L2-04	3		652490.9	373900.6			1.5	
L2-05	3		652750.8	374135.2			1.6	
L2-06	3		653033.0	374369.9			1.4	
L2-07	3		653300.3	374594.4			1.8	
L2-08	3		653575.1	374829.1			2.2	
L2-09	1		653691.7	375255.1			8.3	
L2-10	1		653541.1	375436.3			5.8	
L2-11	1		653397.9	375627.7			6.9	
L2-12	1		653247.3	375819.0			2.6	
L2-13	1		653096.7	376000.3			2.8	
L2-14	3		652946.1	376191.6			2.0	
L2-15	3		652802.9	376383.0			2.3	
L2-16	3		652652.3	376564.2			2.9	
MS2-01	4	1	651374.4	369975.3	1.2	0.51	0.60	0.51
MS2-02	1	2	652428.6	367603.3	1.2	0.60	1.1	0.60
MS2-04	2	2	662783.4	373779.7	2.9	1.1	1.5	1.4
MS2-5	3	3	652501.6	376755.5	2.0	1.6	1.6	1.6
MS2-6	3	3	651461.1	378267.1	1.6	1.4	2.0	1.4
MS2-7	3	3	656437.6	376681.1	17	1.5	3.1	2.6
MS2-8	1	3	658216.9	376389.7	1.5	2.8	8.2	8.3
MS2-9	1	1	656015.3	367485.9	1.9	4.7	4.9	2.5
MS2-10	1	1	655805.9	366431.6	1.8	4.6	6.6	5.2
MS2-11	3	3	654007.3	378274.1	2.5	1.5	2.1	1.7
MS2-12	3	3	656538.8	378250.9	1.6	2.4	2.0	1.9
MS2-13	3	3	651303.7	375657.6	1.3	1.5	1.7	1.2
MS2-14	3	1	651406.8	372972.1	1.5	1.1	2.6	0.99
MS2-16	3	3	653863.8	366388.0	1.4	1.2	1.7	1.3
MS2-17	3	2	652533.9	366379.0	1.2	1.2	1.8	1.0
MS2-22	3	2	660518.7	374026.8	1.8	0.96	1.5	1.1
MS2-24	3	3	662457.0	376601.8	1.0	6.4	2.1	2.0
MS2-25	3	3	658637.4	369630.0	1.6	1.6	2.2	1.3
MS2-26	1	1	659198.1	366374.1	1.1	1.3	2.4	1.9

Table 1. Surface Soil ^{226}Ra Results for the 2007 10-Year Monitoring and All Prior Monitoring and Investigation Efforts

Station	Land Use*		Coordinates		^{226}Ra, pCi/g dw**			
	2004	2007	Easting	Northing	1996	2002	2004	2007
MS2-27	3	3	659186.3	376578.7	0.80	3.1	4.9	2.0
MS2-28	3	3	660436.1	378318.6	1.3	0.96	1.6	1.1
MS2-29	1	3	660903.1	376692.0	1.5	1.9	4.4	2.0
MS2-34	2	3	662638.8	369982.2	0.79	2.1	2.3	1.9
MS2-35	1	2	660825.8	367559.9	1.2	1.3	1.7	1.4
S-01	1	1	656970.7	369770.3	3.4	6.3	6.0	11
S-03	1	1	652358.0	377017.8	12	9.2	13	1.6
S-04	1	1	655118.5	368623.7	9.2	2.7	3.3	4.3
S-07	3	3	656673.1	377168.6	1.6	1.4	1.9	1.8
S-08	3	3	653794.8	371054.5	3.9	1.5	3.2	1.2
S-09	3	3	653777.4	373625.8	3.4	1.7	2.5	1.7
S-10	1	1	653842.3	375063.8	10	15	5.2	6.5
S-12	3	3	654740.3	375900.0	5.7	1.5	3.7	3.1
S-13	3	3	655082.9	376023.8	9.6	2.7	3.4	3.1
S-14	3	3	656757.4	375782.3	13	5.6	7.5	8.8
S-15	3	3	657713.3	375778.8	4.8	4.9	5.1	6.3
S-16	3	3	658667.5	376018.3	2.3	1.5	2.2	2.2
S2-06	3	3	653337.8	369046.9	5.3	0.98	1.4	*1.1***
S2-11	1	1	653503.3	375496.8	17	6.9	6.5	1.7
SN-05	1	1	653923.4	368615.6	1.5	2.8	1.4	1.1
S3-01	1		652739.3	379176.7			8.7	
S3-02	3	3	651312.6	377020.9			1.6	1.3
S3-03	3	3	655895.8	368578.4			2.0	2.0
S3-04	1	1	653470.4	377055.6			16	9.6
S3-05	3	3	654530.6	377083.1			2.4	2.3
S3-06	3	3	655591.1	377070.1			2.9	2.4
S3-07	3		656673.5	377118.0			3.1	
S3-08	3	1	657733.8	377125.3			3.8	2.6
S3-09	1	1	658809.1	377132.8			3.7	5.6
S3-10	1	1	659824.3	377180.4			4.1	3.0
S3-11	3		660959.8	377127.7			1.8	
S3-12	3	3	662020.2	377115.0			1.9	1.3
S3-13	3		655412.4	379174.6			1.5	
S3-14	3	3	651320.0	375907.3			2.0	1.2
S3-15	1		652342.9	375934.4			5.8	
S3-16	1		653455.5	375941.9			11	
S3-17	3	3	654523.3	375969.4			2.9	2.4
S3-18	3	3	655169.6	376449.6			3.1	2.7
S3-19	3	3	656755.6	376045.5			5.4	4.6
S3-20	3	3	657726.6	376021.8			5.3	5.6
S3-21	3	3	659899.7	376016.8			2.1	1.3
S3-22	3	3	660952.7	376014.1			1.8	1.3
S3-23	3	3	662042.9	376021.8			1.9	1.2
S3-24	3		658824.8	374895.6			2.5	
S3-25	3	3	659900.0	374913.3			1.8	1.5
S3-26	3	3	660930.6	374920.6			1.6	1.2
S3-27	3	3	662028.3	374928.3			2.2	1.1
S3-28	3	2	658816.9	373883.2			1.9	1.2
S3-29	3	2	659899.9	373860.4			1.8	1.1

Table 1. Surface Soil ^{226}Ra Results for the 2007 10-Year Monitoring and All Prior Monitoring and Investigation Efforts

Station	Land Use*		Coordinates		^{226}Ra, pCi/g dw**			
	2004	2007	Easting	Northing	1996	2002	2004	2007
S3-30	1		660968.1	373847.7			5.0	
S3-31	3	2	662042.9	373936.3			1.7	1.2
S3-32	3	4	658817.4	372739.2			1.9	1.4
S3-33	3	4	659809.5	372918.3			1.6	0.78
S3-34	1	4	660975.6	372784.8			4.6	0.97
S3-35	2	2	662109.3	373005.4			1.9	0.97
S3-36	1	4	657779.2	371669.0			14	6.3
S3-37	1		658839.8	371676.4			4.0	
S3-38	1	1	659893.1	371643.3			2.8	1.4
S3-39	3	3	660990.8	371691.5			1.6	1.1
S3-40	1	1	662095.8	371750.0			2.2	2.3
S3-41	1	1	657727.6	370494.3			4.8	1.2
S3-42	3	3	658795.8	370491.6			2.2	1.2
S3-43	3	3	659871.3	370509.3			1.6	1.2
S3-44	3	3	660969.3	370517.0			1.7	1.3
S3-45	1		661969.6	370595.0			2.3	
S3-46	3	3	657757.5	369411.3			2.7	2.2
S3-47	1	1	659908.6	369446.5			4.0	2.8
S3-48	3	2	660969.3	369454.0			2.0	0.79
S3-49	1	1	662262.0	369402.5			2.3	1.3
S3-50	1		658242.3	379173.9			1.4	
S3-51	2	1	651312.3	374813.9			1.5	1.0
S3-52	3	3	652410.2	374811.2			2.2	1.3
S3-53	1	1	658238.1	377624.9			5.0	2.0
S3-54	3		651319.3	373761.1			1.4	
S3-55	3		652409.8	373758.3			1.7	
S3-56	3		653477.5	373795.9			2.0	
S3-57	3	2	660825.7	379181.9			2.0	1.3
S3-58	3		651341.7	372647.7			1.4	
S3-59	3	3	652394.4	372705.3			2.6	1.2
S3-60	3	3	653492.2	372722.8			2.0	1.6
S3-61	3	3	662477.0	379021.5			2.1	1.5
S3-62	3	4	651363.6	371595.0			2.1	0.75
S3-63	3	3	652401.8	371601.9			1.5	1.1
S3-65	3	3	653499.8	371609.3			2.0	1.2
S3-66	3	3	663537.3	379019.0			2.8	1.7
S3-67	1	2	651385.7	370532.2			1.7	1.2
S3-68	1		664638.5	376465.7			2.0	
S3-69	3	3	652461.4	370519.1			1.9	1.0
S3-70	3	3	653507.0	370536.3			1.9	1.4
S3-71	3	3	663103.0	378155.4			2.7	2.2
S3-73	2	2	652446.1	369456.0			1.4	0.16
S3-74	3		653506.6	369483.4			1.9	
S3-75	3		664611.3	378156.2			1.9	
S3-76	1		651370.1	368385.8			1.3	
S3-77	1	2	652445.8	368382.9			1.7	0.78
S3-78	3	3	653686.4	368300.1			1.6	1.0
S3-79	1	1	664059.8	376987.9			2.2	2.0
S3-80	1	1	651399.7	367302.8			1.7	0.95

Table 1. Surface Soil ^{226}Ra Results for the 2007 10-Year Monitoring and All Prior Monitoring and Investigation Efforts

Station	Land Use*		Coordinates		^{226}Ra, pCi/g dw**			
	2004	2007	Easting	Northing	1996	2002	2004	2007
S3-81	1	2	652512.4	367360.9			0.80	0.57
S3-82	1	1	654597.3	368377.2			1.8	1.4
S3-83	1		655650.6	368384.4			6.2	
S3-84	4	4	656694.1	368715.5			5.8	3.2
S3-85	3	3	653528.9	367286.7			1.4	1.1
S3-86	3	3	654604.8	367273.8			2.1	1.2
S3-87	1	1	655643.3	367260.6			4.1	1.3
S3-88	1	4	656904.3	367481.9			6.4	14
S3-89	4	4	657794.6	368378.9			4.8	4.1
S3-90	1	1	658840.4	368386.2			2.2	1.4
S3-91	2		659990.8	368384.1			1.7	
S3-92	2		661036.6	368381.4			1.6	
S3-93	3	2	662119.9	368379.0			2.1	1.4
S3-94	4	4	657794.8	367275.4			2.1	2.4
S3-95	1	1	658840.7	367272.6			3.9	2.6
S3-96	1	2	659991.2	367270.5			1.2	0.80
S3-97	1	2	661037.0	367277.9			1.3	1.2
S3-98	2	2	662120.3	367275.5			1.5	1.3
S3-99	3	4	651836.0	369087.5			1.9	*0.93*
S3-100	1	1	663613.1	375749.6			2.6	2.4
S3-101	1	1	664636.3	375746.9			2.2	3.1
S3-102	1		664077.1	374578.6			3.0	
S3-103	2		664278.7	372524.9			2.3	
S3-104	1		664255.6	370560.8			2.4	
S3-105	3	2	653167.0	365563.3			0.90	1.2
S3-106	1		655826.8	365561.1			4.2	
S3-107	1	1	658673.3	365560.5			1.4	0.73
S3-108	1		660884.8	365565.9			1.6	
S3-109	2		660526.4	380323.8			1.4	
S3-110	2	2	661371.4	380147.5			2.1	2.4
S3-111	1		662276.3	379951.5			2.2	
S3-112	3	3	663521.9	380122.4			1.7	1.2
S3-113	3		664648.3	380272.3			1.6	
S3-114	3	3	664723.2	379209.8			2.1	2.3
S3-115	1	1	651673.9	366515.0			1.2	1.0
S3-116	1		652051.9	365839.2			1.5	
S3-117	2	1	656572.7	366821.5			2.3	1.8
S3-118	2	4	657291.7	366563.3			3.1	2.1
S3-119	2	4	657115.7	366086.3			1.4	1.3
S3-120	4	4	656592.6	366092.8			2.8	1.7
S3-121	2		656620.4	365323.6			2.2	
S3-122	2		661334.3	381159.6			2.5	
S4-1		3	15514545.6	1476396.9				1.1
S4-2		3	15514545.4	1478397.1				1.2
S4-3		3	15514545.2	1480996.5				1.3
S4-5		3	15514545.4	1482996.7				1.2
S4-6		3	15513545.7	1476396.4				0.99
S4-7		3	15513545.5	1478396.6				1.3
S4-8		3	15513545.3	1480997.0				1.3

Table 1. Surface Soil ^{226}Ra Results for the 2007 10-Year Monitoring and All Prior Monitoring and Investigation Efforts

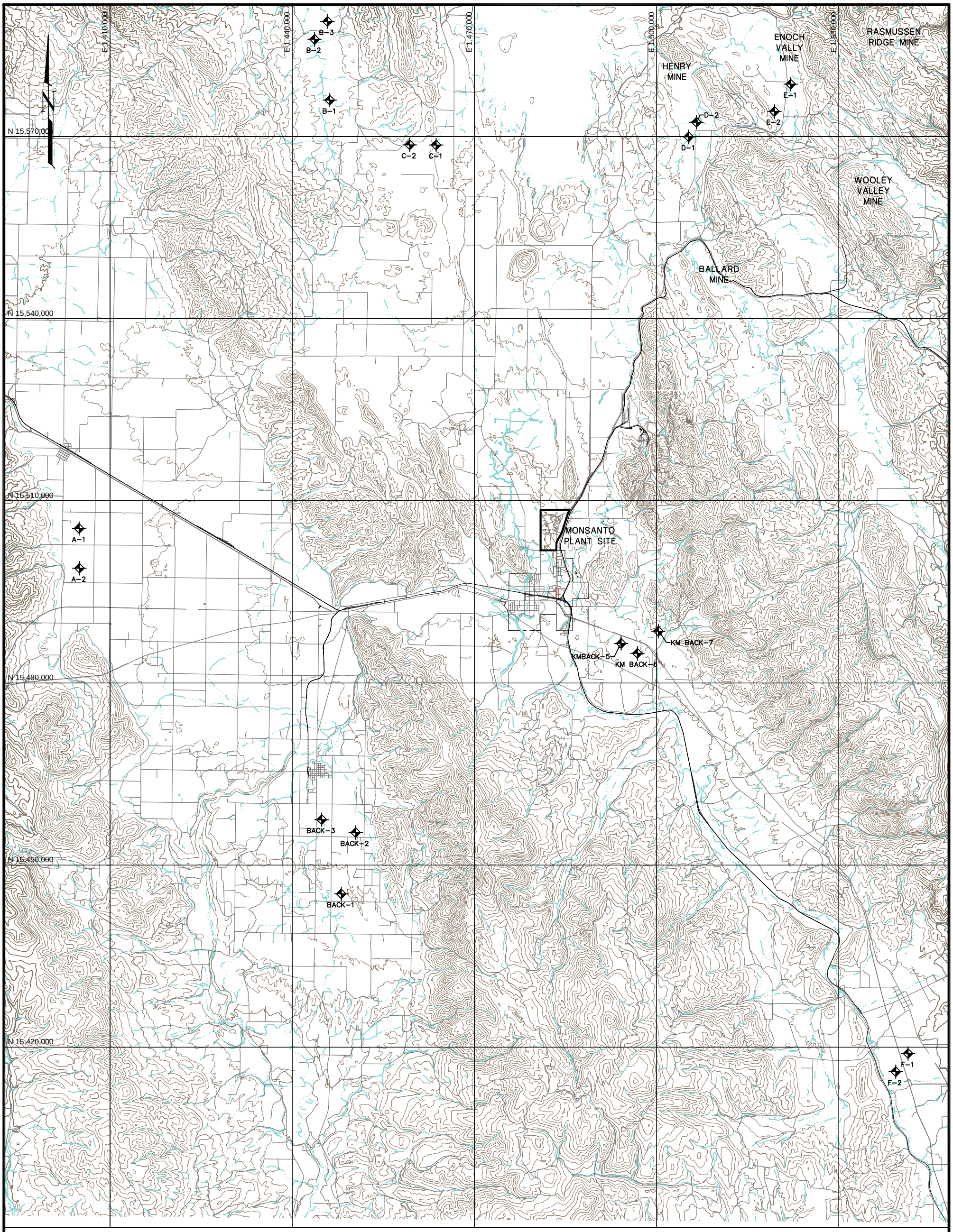
Station	Land Use*		Coordinates		^{226}Ra, pCi/g dw**			
	2004	2007	Easting	Northing	1996	2002	2004	2007
S4-9		3	15513545.5	1482996.5				1.3
S4-10		3	15512544.8	1476396.6				0.90
S4-11		3	15512545.6	1478397.0				1.2
S4-12		3	15512545.5	1480996.7				1.6
S4-13		3	15512545.7	1482997.0				1.2
S4-14		3	15497123.5	1481412.7				1.8
S4-15		3	15497123.2	1482613.0				2.4
S4-16		4	15497123.0	1483813.3				*2.0*
S4-17		4	15495923.2	1481413.3				1.6
S4-18		4	15495924.0	1482612.9				1.7
S4-19		4	15495923.8	1483813.2				3.4
Background								
A-1-0-C(5)			371366.7	578071.3	0.60	1.2	2.3	0.88
A-2-0-C(5)			364939.1	578265.2	2.2	1.2	1.3	1.0
B-1-0-C(5)			442619.0	618411.5	1.7	0.65	1.9	0.87
B-2-0-C(5)			452607.6	615784.0	1.6	0.65	1.2	1.1
B-3-1-C(5)QA			455584.7	617859.8	1.6	0.65	1.5	1.1
Back-1-0-C(5)			311883.7	622105.5	1.3	1.2	1.3	1.2
Back-2-0-C(5)			321998.8	624342.0	1.1	1.2	1.6	1.1
Back-3-0-C(5)			324064.4	618739.7	0.80	1.2	1.3	1.0
C-1-0-C(5)			435459.5	636041.3	2.0	0.65	1.9	1.2
C-2-0-C(5)			435433.7	631684.3	1.9	0.65	1.1	0.99
D-1-0-C(5)			437398.4	677609.4	1.8	1.1	1.6	0.95
D-2-0-C(5)			439817.9	678863.8	2.7	1.1	1.4	1.1
E-1-1-C(5)QA			446303.6	694305.2	2.4	1.1	1.6	1.2
E-2-0-C(5)			441796.1	691685.6	1.6	1.1	1.2	1.1
F-1-0-C(5)			286852.2	715825.9	1.6	1.2	1.6	0.96
F-2-1-C(5)QA			283827.0	713852.3	2.0	1.2	1.4	0.90
G-1-0-C(5)			286110.0	717624.9	1.8	1.2	1.4	0.99
KM-5-0-C(5)			323390.9	667867.1	1.0	0.95	2.1	1.1
KM-6-0-C(5)			352180.4	670331.5	1.7	0.95	1.9	0.92
KM-7-0-C(5)			325511.7	673943.8	1.3	0.95	1.8	1.0

*Land Use: 1 is Native, 2 is Pasture, 3 is Tilled, and 4 is Developed.

**Shaded values exceed the 3.7 pCi/g dw remediation threshold.

***Numerical values underlined and italicized have been qualified as estimated during data validation.

FIGURES



LEGEND

- CONTOURS
- ROADS
- DRAINAGE
- SITE BOUNDARY
- OCTOBER 2007 SAMPLING STATIONS

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
BACKGROUND SURFACE SOIL SAMPLING LOCATIONS, 2007

MWH

Sheet 1 Of 1 Sheets

SCALE: As Shown

FIGURE No. 1

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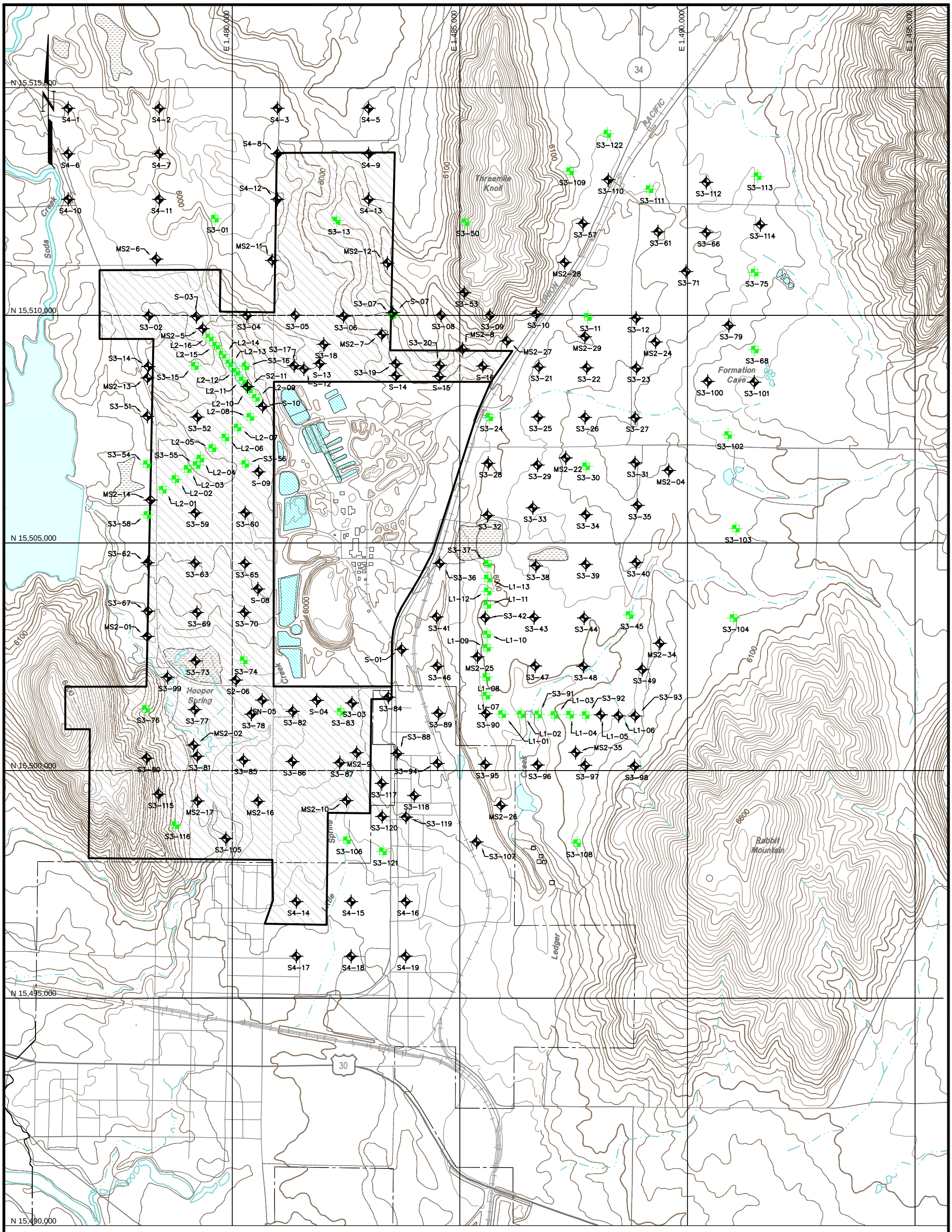

LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- OCTOBER 2007 SAMPLING STATIONS
- DISCONTIUNED SAMPLING STATIONS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- RAIL ROADS
- LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
SURFACE SOIL SAMPLING LOCATIONS IN THE VICINITY OF THE PLANT, 2007

MWH

Sheet 1 Of 1 Sheets

SCALE: As Shown

FIGURE No. 2

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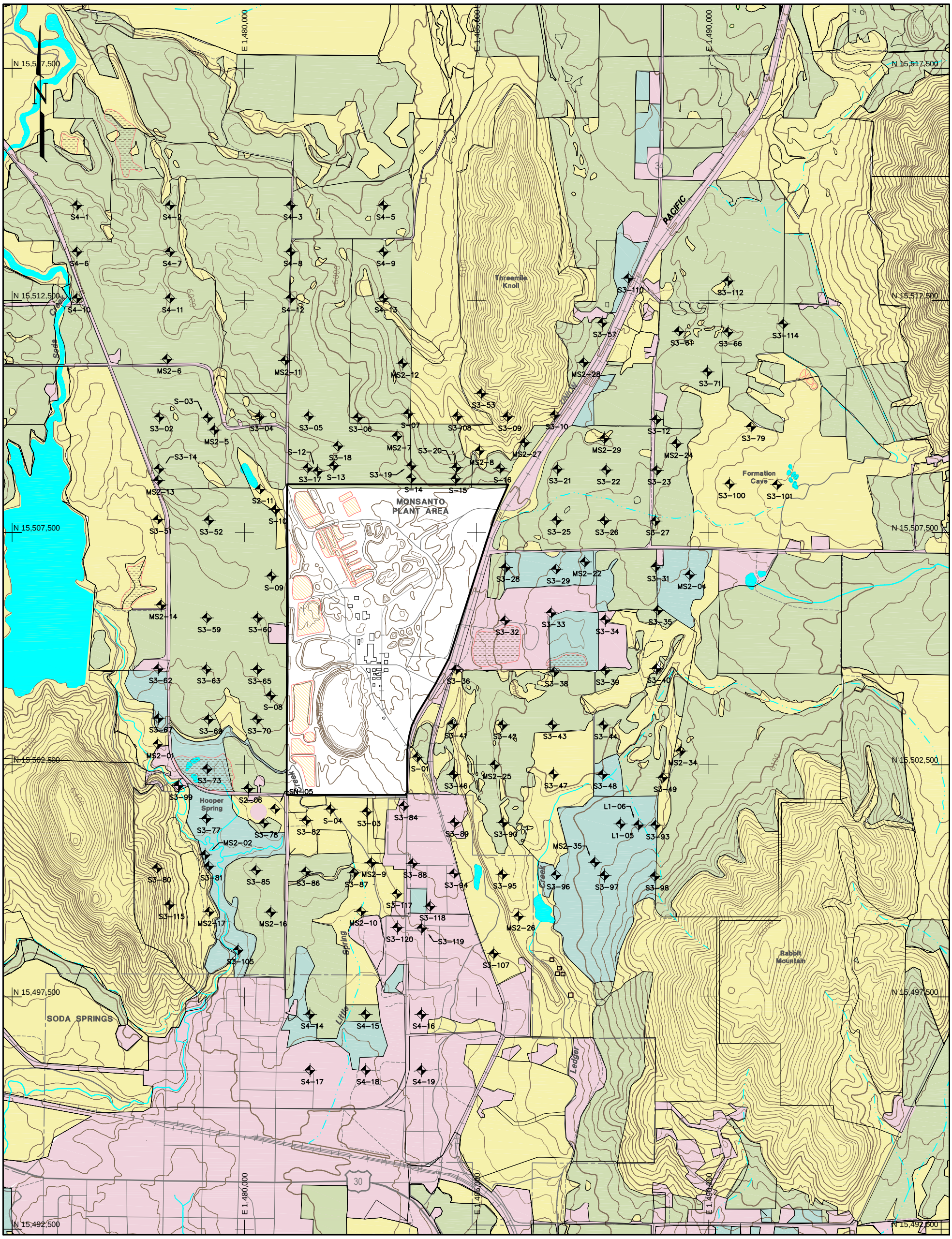


SCALE
1000' 0 1000' 2000'
CONTOUR INTERVAL 20'

LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- WETLANDS
- RAIL ROADS
- DEVELOPED LAND
- PASTURE LAND
- NATIVE LAND
- TILLED LAND

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
SURFACE SOIL SAMPLING LOCATIONS, TOPOGRAPHY AND LAND USE IN THE VICINITY OF THE PLANT, 2007

MWH

Sheet 1 Of 1 Sheets

SCALE: As Shown

FIGURE No. 3

J:\1005215 OSEC\Phase II Spent Oil Shale Stockpile Plans\Sheet Set\2 EXISTING CONDITIONS UTILITIES SURVEY CONTROL

E 1,476,000
E 1,479,000
E 1,482,000
E 1,485,000
E 1,488,000
N 15,513,000
N 15,510,000
N 15,507,000
N 15,504,000
N 15,501,000
N 15,498,000
34
PACIFIC
UNION
Threemile Knoll
6000
6100
Soda Creek
LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO
KERR-McGEE PROPERTY
KERR-McGEE PLANT SITE
EVERGREEN RESOURCES PLANT SITE
SODA SPRINGS PHOSPHATE INDUSTRIES
Hooper Spring
Creek
Little Spring
Creek
Ledger
SCALE
750' 0 750' 1500'
CONTOUR INTERVAL 20'

LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- RAIL ROADS
- 3.7 pCi/g dw ^{226}Ra CONTOUR
- LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.
3. THE AREAL EXTENT OF THE FIGURE SHOULD EXTEND OUT SUFFICIENTLY TO SHOW ALL STATIONS SAMPLED IN 2007 (SEE FIGURE 3).
4. LAST YEAR'S MONITORING EFFORT HAS THE LARGEST AREAL EXTENT TO DATE.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

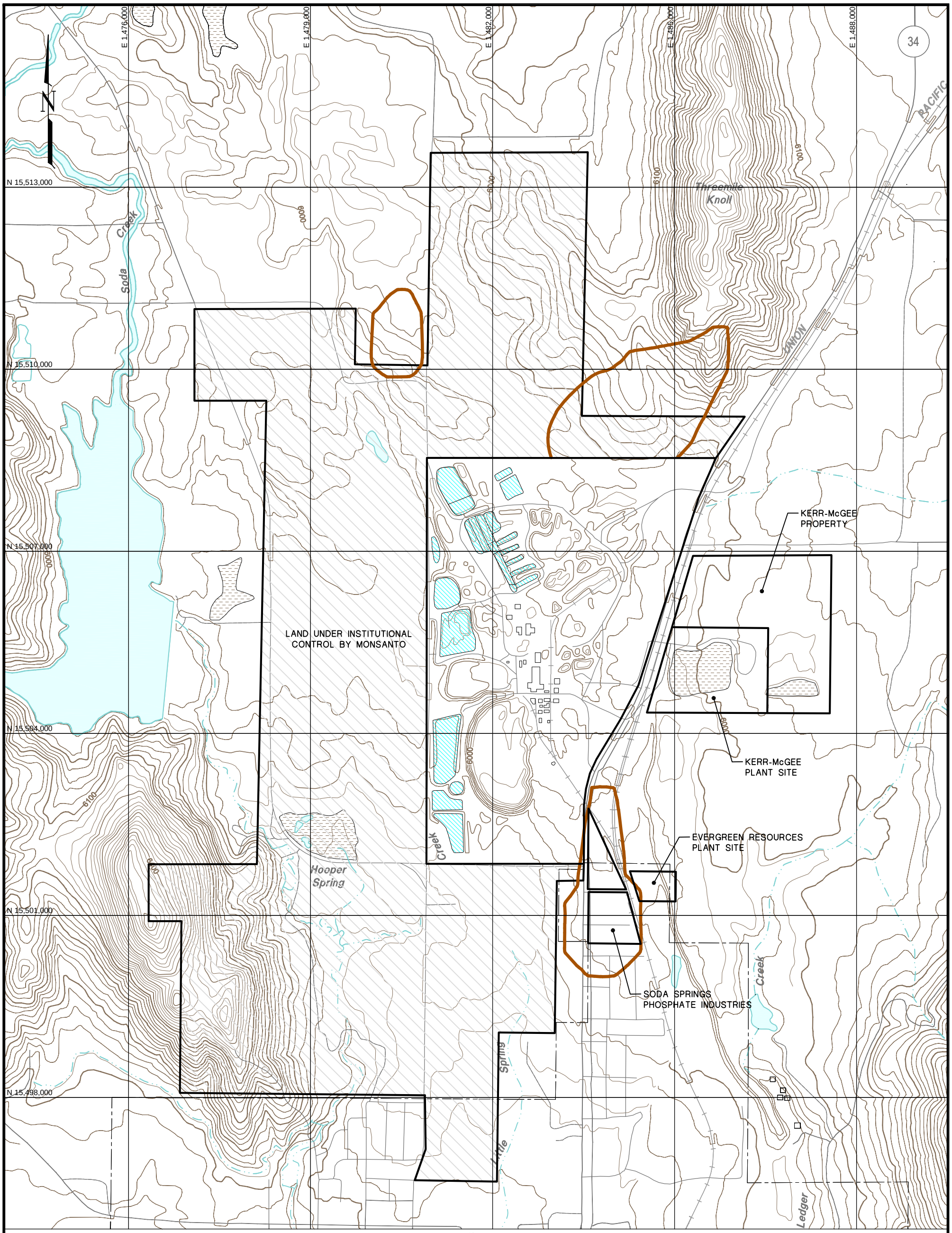
PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
2007 SURFACE SOIL MONITORING RESULTS: 3.7 PICOCURIES PER GRAM (DRY WEIGHT) OF RADIUM-226 CONTOUR DERIVED USING ALL 146 STATIONS

MWH

Sheet 1 Of 1 Sheets
SCALE: As Shown
FIGURE No. 4

N:\Design-Drafting\Clients I-P\Monsanto-P4 Production\1010076-CERCLA 10 Year Review Rev0\013-Sheet Set\1010076D072-0



LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- RAIL ROADS
- 3.7 pCi/g dw ^{226}Ra CONTOUR
- LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.
3. THE AREAL EXTENT OF THE FIGURE SHOULD EXTEND OUT SUFFICIENTLY TO SHOW ALL STATIONS SAMPLED IN 2007 (SEE FIGURE 3).
4. LAST YEAR'S MONITORING EFFORT HAS THE LARGEST AREAL EXTENT TO DATE.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
2007 SURFACE SOIL MONITORING RESULTS: 3.7 PICOCURIES PER GRAM (DRY WEIGHT) OF RADIUM-226 CONTOUR DERIVED USING ALL 146 STATIONS PLUS TOPOGRAPHY

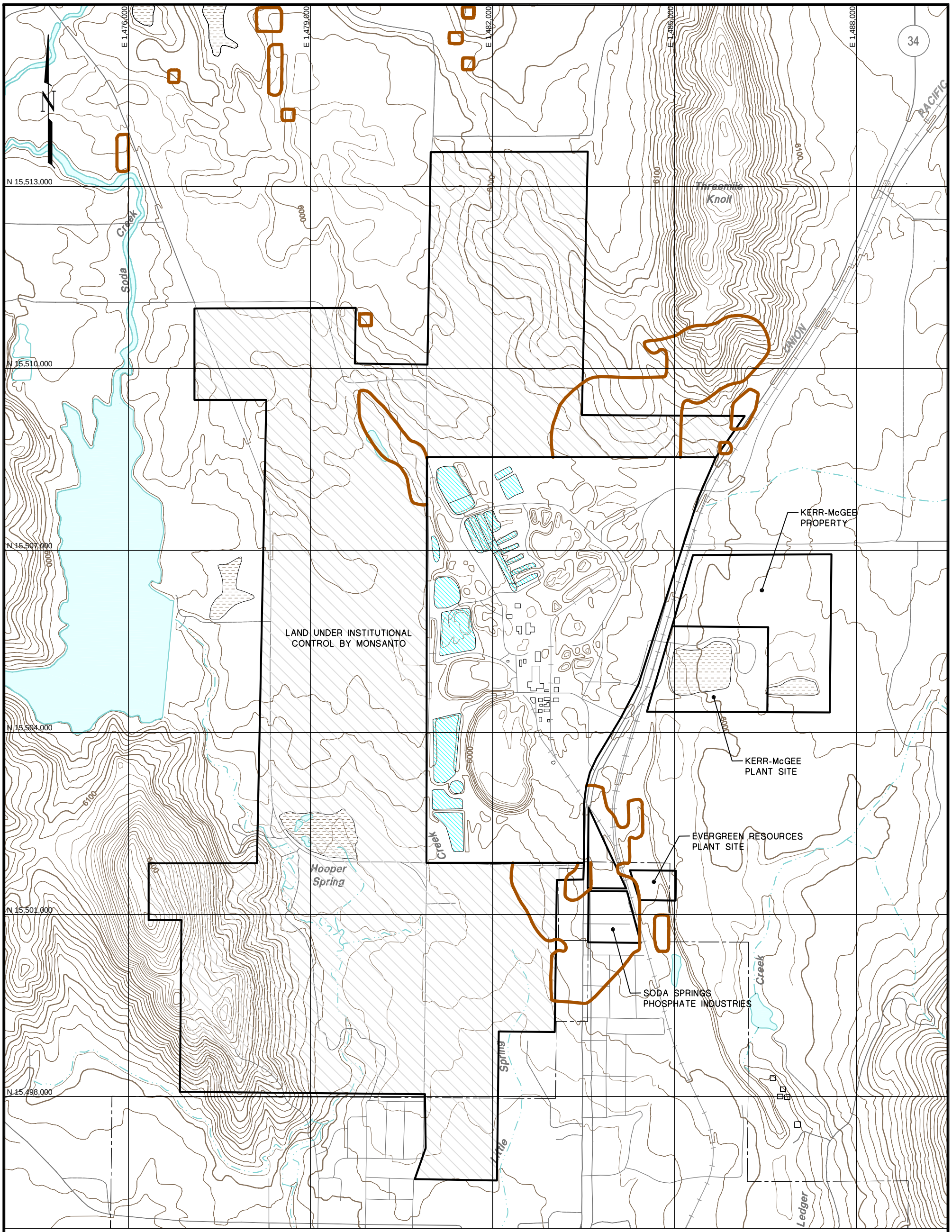
MWH

Sheet 1 Of 1 Sheets

SCALE: As Shown

FIGURE No. 5

N:\Design-Drafting\Clients I-P\Monsanto-P4 Production\1010076-CERCLA 10 Year Review Rev0\013-Sheet Set\1010076D073-0



LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- RAIL ROADS
- 3.7 pCi/g dw ^{226}Ra CONTOUR
- LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.
3. THE AREAL EXTENT OF THE FIGURE SHOULD EXTEND OUT SUFFICIENTLY TO SHOW ALL STATIONS SAMPLED IN 2007 (SEE FIGURE 3).
4. LAST YEAR'S MONITORING EFFORT HAS THE LARGEST AREAL EXTENT TO DATE.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
2007 SURFACE SOIL MONITORING RESULTS: 3.7 PICOCURIES PER GRAM (DRY WEIGHT) OF RADIUM-226 CONTOUR DERIVED USING ALL 146 STATIONS PLUS LAND USE

MWH

Sheet 1 Of 1 Sheets

SCALE: As Shown

FIGURE No. 6

N:\Design-Drafting\Clients I-P\Monsanto-P4 Production\1010076-CERCLA 10 Year Review Rev0\013-Sheet Set\1010076D074-0

E 1,476,000
E 1,479,000
E 1,482,000
E 1,485,000
E 1,488,000
N 15,513,000
N 15,510,000
N 15,507,000
N 15,504,000
N 15,501,000
N 15,498,000
34
PACIFIC
UNION
Threemile Knoll
Soda Creek
Hooper Spring
Little Spring Creek
Ledger Creek
6000
6100
LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO
KERR-McGEE PROPERTY
KERR-McGEE PLANT SITE
EVERGREEN RESOURCES PLANT SITE
SODA SPRINGS PHOSPHATE INDUSTRIES

SCALE
750' 0 750' 1500'
CONTOUR INTERVAL 20'

LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- RAIL ROADS
- 3.7 pCi/g dw ^{226}Ra CONTOUR
- LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.
3. THE AREAL EXTENT OF THE FIGURE SHOULD EXTEND OUT SUFFICIENTLY TO SHOW ALL STATIONS SAMPLED IN 2007 (SEE FIGURE 3).
4. LAST YEAR'S MONITORING EFFORT HAS THE LARGEST AREAL EXTENT TO DATE.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
2004 SURFACE SOIL MONITORING RESULTS: 3.7 PICOCURIES PER GRAM (DRY WEIGHT) OF RADIUM-226 CONTOUR DERIVED USING ALL 188 STATIONS

MWH

Sheet 1 Of 1 Sheets
SCALE: As Shown
FIGURE No. 7

N:\Design-Drafting\Clients I-P\Monsanto-P4 Production\1010076-CERCLA 10 Year Review Rev0\013-Sheet Set\1010076D070-0

E 1,476,000
E 1,479,000
E 1,482,000
E 1,485,000
E 1,488,000
N 15,513,000
N 15,510,000
N 15,507,000
N 15,504,000
N 15,501,000
N 15,498,000
34
PACIFIC
Threemile Knoll
Soda Creek
Hooper Spring
Little Spring
Ledger Creek
6000
6100
LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO
KERR-McGEE PROPERTY
KERR-McGEE PLANT SITE
EVERGREEN RESOURCES PLANT SITE
SODA SPRINGS PHOSPHATE INDUSTRIES

SCALE
750' 0 750' 1500'
CONTOUR INTERVAL 20'

LEGEND

- CONTOURS
- MAJOR ROADS
- SECONDARY ROADS
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- RAIL ROADS
- LAND UNDER INSTITUTIONAL CONTROL BY MONSANTO
- YEAR 1996 3.7 pCi/g dw ^{226}Ra CONTOUR
- YEAR 2002 3.7 pCi/g dw ^{226}Ra CONTOUR
- YEAR 2004 3.7 pCi/g dw ^{226}Ra CONTOUR
- YEAR 2007 3.7 pCi/g dw ^{226}Ra CONTOUR

NOTES:

1. TOPOGRAPHY IS FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.
3. THE AREAL EXTENT OF THE FIGURE SHOULD EXTEND OUT SUFFICIENTLY TO SHOW ALL STATIONS SAMPLED IN 2007 (SEE FIGURE 3).
4. LAST YEAR'S MONITORING EFFORT HAS THE LARGEST AREAL EXTENT TO DATE.

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT:
MONSANTO 10-YEAR CERCLA REVIEW

DRAWING TITLE:
1996 SURFACE SOIL INVESTIGATION RESULTS AND MONITORING RESULTS FROM 2002, 2004 AND 2007: 3.7 PICOCURIES PER GRAM (DRY WEIGHT) OF RADIUM-226 CONTOUR DERIVED USING ONLY THE ORIGINAL 39 INVESTIGATION STATIONS

MWH

Sheet 1 Of 1 Sheets
SCALE: As Shown
FIGURE No. 8

N:\Design-Drafting\Clients I-P\Monsanto-P4 Production\1010076-CER\CLA 10 Year Review Rev0\013-Sheet Set\1010076D071-0

E 1,475,000
E 1,480,000
E 1,485,000
E 1,490,000
N 15,515,000
N 15,510,000
N 15,505,000
N 15,500,000

Creek
Soda
Spring
Hooper Spring
Little Spring
Rabbit Mountain
Threemile Knoll
Phosphoria
Meade
34

S4-1 '96-NA '02-NA '04-NA '07-1.10
S4-2 '96-NA '02-NA '04-NA '07-1.20
S4-3 '96-NA '02-NA '04-NA '07-1.30
S4-5 '96-NA '02-NA '04-NA '07-1.20
S4-6 '96-NA '02-NA '04-NA '07-0.99
S4-7 '96-NA '02-NA '04-NA '07-1.30
S4-8 '96-NA '02-NA '04-NA '07-1.30
S4-9 '96-NA '02-NA '04-NA '07-1.30
S4-10 '96-NA '02-NA '04-NA '07-0.90
S4-11 '96-NA '02-NA '04-NA '07-1.20
S4-12 '96-NA '02-NA '04-NA '07-1.60
S4-13 '96-NA '02-NA '04-NA '07-1.20
S3-01 '96-NA '02-NA '04-8.70 '07-NA
S3-13 '96-NA '02-NA '04-1.50 '07-NA
MS2-11 '96-2.50 '02-1.50 '04-2.10 '07-1.70
MS2-12 '96-1.60 '02-2.40 '04-2.00 '07-1.90
MS2-6 '96-1.60 '02-1.40 '04-2.00 '07-1.40
S-03 '96-12.00 '02-9.20 '04-13.00 '07-1.60
S3-04 '96-NA '02-NA '04-16.00 '07-9.60
S-07 '96-1.60 '02-1.40 '04-1.90 '07-1.80
S3-53 '96-NA '02-NA '04-5.00 '07-2.00
S3-10 '96-NA '02-NA '04-4.10 '07-3.00
S3-05 '96-NA '02-NA '04-2.40 '07-2.30
S3-06 '96-NA '02-NA '04-2.90 '07-2.40
MS2-7 '96-17.00 '02-1.50 '04-3.10 '07-2.60
S3-07 '96-NA '02-NA '04-3.10 '07-NA
S3-08 '96-NA '02-NA '04-3.80 '07-2.60
S3-09 '96-NA '02-NA '04-3.70 '07-5.60
MS2-8 '96-1.50 '02-2.80 '04-8.20 '07-8.30
MS2-27 '96-0.80 '02-3.10 '04-4.90 '07-2.00
S3-02 '96-NA '02-NA '04-1.60 '07-1.30
MS2-5 '96-2.00 '02-1.60 '04-1.60 '07-1.60
S3-14 '96-NA '02-NA '04-2.00 '07-1.20
L2-15 '96-NA '02-NA '04-2.30 '07-NA
L2-14 '96-NA '02-NA '04-2.00 '07-NA
L2-16 '96-NA '02-NA '04-2.90 '07-NA
S3-15 '96-NA '02-NA '04-5.80 '07-NA
L2-13 '96-NA '02-NA '04-2.80 '07-NA
S3-16 '96-NA '02-NA '04-11.00 '07-NA
S3-17 '96-NA '02-NA '04-2.90 '07-2.40
S3-18 '96-NA '02-NA '04-3.10 '07-2.70
S-12 '96-5.70 '02-1.50 '04-3.70 '07-3.10
S-13 '96-9.60 '02-2.70 '04-3.40 '07-3.10
S-14 '96-13.00 '02-5.60 '04-7.50 '07-8.80
S3-19 '96-NA '02-NA '04-5.40 '07-4.60
S3-20 '96-NA '02-NA '04-5.30 '07-5.60
S-16 '96-2.30 '02-1.50 '04-2.20 '07-2.20
S-15 '96-4.80 '02-4.90 '04-5.10 '07-6.30
S3-21 '96-NA '02-NA '04-2.10 '07-1.30
S3-22 '96-NA '02-NA '04-1.80 '07-1.30
S3-23 '96-NA '02-NA '04-1.90 '07-1.20
S3-122 '96-NA '02-NA '04-2.50 '07-NA
S3-109 '96-NA '02-NA '04-1.40 '07-NA
S3-110 '96-NA '02-NA '04-2.10 '07-2.40
S3-111 '96-NA '02-NA '04-2.20 '07-NA
S3-112 '96-NA '02-NA '04-1.70 '07-1.20
S3-113 '96-NA '02-NA '04-1.60 '07-NA
S3-114 '96-NA '02-NA '04-2.10 '07-2.30
S3-50 '96-NA '02-NA '04-1.40 '07-NA
S3-57 '96-NA '02-NA '04-2.00 '07-1.30
S3-61 '96-NA '02-NA '04-2.10 '07-1.50
S3-66 '96-NA '02-NA '04-2.80 '07-1.70
MS2-28 '96-1.30 '02-0.96 '04-1.60 '07-1.10
S3-71 '96-NA '02-NA '04-2.70 '07-2.20
S3-75 '96-NA '02-NA '04-1.90 '07-NA
S3-11 '96-NA '02-NA '04-1.80 '07-NA
S3-12 '96-NA '02-NA '04-1.90 '07-1.30
MS2-29 '96-1.50 '02-1.90 '04-4.40 '07-2.00
MS2-24 '96-1.00 '02-6.40 '04-2.10 '07-2.00
S3-79 '96-NA '02-NA '04-2.20 '07-2.00
S3-68 '96-NA '02-NA '04-2.00 '07-NA
S3-100 '96-NA '02-NA '04-2.60 '07-2.40
S3-101 '96-NA '02-NA '04-2.20 '07-3.10
S3-24 '96-NA '02-NA '04-2.50 '07-3.80
S3-25 '96-NA '02-NA '04-1.80 '07-1.50
S3-26 '96-NA '02-NA '04-1.60 '07-1.20
S3-27 '96-NA '02-NA '04-2.20 '07-1.10
S3-102 '96-NA '02-NA '04-3.00 '07-NA
S-10 '96-10.00 '02-15.00 '04-5.20 '07-6.50
S3-55 '96-NA '02-NA '04-1.70 '07-NA
S3-54 '96-NA '02-NA '04-1.40 '07-NA
L2-03 '96-NA '02-NA '04-1.70 '07-NA
S3-52 '96-NA '02-NA '04-2.20 '07-1.30
L2-12 '96-NA '02-NA '04-2.60 '07-NA
L2-11 '96-NA '02-NA '04-6.90 '07-NA
L2-09 '96-NA '02-NA '04-8.30 '07-NA
L2-07 '96-NA '02-NA '04-1.80 '07-NA
L2-08 '96-NA '02-NA '04-2.20 '07-NA
L2-05 '96-NA '02-NA '04-1.60 '07-NA
L2-06 '96-NA '02-NA '04-1.40 '07-NA
S3-56 '96-NA '02-NA '04-2.00 '07-NA
L2-04 '96-NA '02-NA '04-1.50 '07-NA
S-09 '96-3.40 '02-1.70 '04-2.50 '07-1.70
L2-02 '96-NA '02-NA '04-1.50 '07-NA
L2-01 '96-NA '02-NA '04-1.40 '07-NA
S3-59 '96-NA '02-NA '04-2.60 '07-1.20
S3-60 '96-NA '02-NA '04-2.00 '07-1.60
MS2-14 '96-1.50 '02-1.10 '04-2.60 '07-0.99
S3-58 '96-NA '02-NA '04-1.40 '07-NA
S3-28 '96-NA '02-NA '04-1.90 '07-1.20
S3-29 '96-NA '02-NA '04-1.80 '07-1.10
MS2-22 '96-1.80 '02-0.96 '04-1.50 '07-1.10
S3-30 '96-NA '02-NA '04-5.00 '07-NA
S3-31 '96-NA '02-NA '04-1.70 '07-1.20
MS2-04 '96-2.90 '02-1.10 '04-1.50 '07-1.40
S3-32 '96-NA '02-NA '04-1.90 '07-1.40
S3-33 '96-NA '02-NA '04-1.60 '07-0.78
S3-34 '96-NA '02-NA '04-4.60 '07-0.97
S3-35 '96-NA '02-NA '04-1.90 '07-0.97
S3-103 '96-NA '02-NA '04-2.30 '07-NA
S3-62 '96-NA '02-NA '04-2.10 '07-0.75
S3-63 '96-NA '02-NA '04-1.50 '07-1.10
S3-65 '96-NA '02-NA '04-2.00 '07-1.20
S-08 '96-3.90 '02-1.50 '04-3.20 '07-1.20
S3-67 '96-NA '02-NA '04-1.70 '07-1.20
S3-69 '96-NA '02-NA '04-1.90 '07-1.00
S3-70 '96-NA '02-NA '04-1.90 '07-1.40
MS2-01 '96-1.20 '02-0.51 '04-0.60 '07-0.51
S3-73 '96-NA '02-NA '04-1.40 '07-0.16
S3-74 '96-NA '02-NA '04-1.90 '07-NA
S3-99 '96-NA '02-NA '04-1.90 '07-0.93
S2-06 '96-5.30 '02-0.98 '04-1.40 '07-1.10
S3-36 '96-NA '02-NA '04-14.00 '07-6.30
S3-37 '96-NA '02-NA '04-4.00 '07-NA
S3-38 '96-NA '02-NA '04-2.80 '07-1.40
S3-39 '96-NA '02-NA '04-1.60 '07-1.10
S3-40 '96-NA '02-NA '04-2.20 '07-2.30
L1-12 '96-NA '02-NA '07-NA
L1-13 '96-NA '02-NA '04-3.60 '07-NA
L1-11 '96-NA '02-NA '04-2.10 '07-NA
S3-42 '96-NA '02-NA '04-2.20 '07-1.20
S3-41 '96-NA '02-NA '04-4.80 '07-1.20
S3-43 '96-NA '02-NA '04-1.60 '07-1.20
S3-44 '96-NA '02-NA '04-1.70 '07-1.30
S3-45 '96-NA '02-NA '04-2.30 '07-NA
S3-104 '96-NA '02-NA '04-2.40 '07-NA
L1-10 '96-NA '02-NA '04-2.20 '07-NA
L1-09 '96-NA '02-NA '04-2.00 '07-NA
S-01 '96-3.40 '02-6.30 '04-6.00 '07-11.00
MS2-25 '96-1.60 '02-1.60 '04-2.20 '07-1.30
S3-47 '96-NA '02-NA '04-4.00 '07-2.80
S3-48 '96-NA '02-NA '04-2.00 '07-0.79
MS2-34 '96-0.79 '02-2.10 '04-2.30 '07-1.90
S3-49 '96-NA '02-NA '04-2.30 '07-1.30
S3-46 '96-NA '02-NA '04-2.70 '07-2.20
S3-03 '96-NA '02-NA '04-2.00 '07-2.00
L1-08 '96-NA '02-NA '04-5.20 '07-NA
L1-07 '96-NA '02-NA '04-3.80 '07-NA
L1-01 '96-NA '02-NA '04-3.50 '07-NA
S3-91 '96-NA '02-NA '04-1.70 '07-NA
L1-04 '96-NA '02-NA '04-1.60 '07-NA
L1-05 '96-NA '02-NA '04-1.60 '07-1.10
S3-93 '96-NA '02-NA '04-2.10 '07-1.40
SN-05 '96-1.50 '02-2.80 '04-1.40 '07-1.10
S-04 '96-9.20 '02-2.70 '04-3.30 '07-4.30
S3-84 '96-NA '02-NA '04-5.80 '07-3.20
S3-89 '96-NA '02-NA '04-4.80 '07-4.10
S3-78 '96-NA '02-NA '04-1.60 '07-1.00
S3-82 '96-NA '02-NA '04-1.80 '07-1.40
S3-83 '96-NA '02-NA '04-6.20 '07-NA
S3-90 '96-NA '02-NA '04-2.20 '07-1.40
L1-02 '96-NA '02-NA '04-2.60 '07-NA
L1-03 '96-NA '02-NA '04-1.70 '07-NA
S3-92 '96-NA '02-NA '04-1.60 '07-NA
L1-06 '96-NA '02-NA '04-1.80 '07-1.30
S3-76 '96-NA '02-NA '04-1.30 '07-NA
S3-77 '96-NA '02-NA '04-1.70 '07-0.78
MS2-9 '96-1.90 '02-4.70 '04-4.90 '07-2.50
MS2-02 '96-1.20 '02-0.60 '04-1.10 '07-0.60
S3-80 '96-NA '02-NA '04-1.70 '07-0.95
S3-81 '96-NA '02-NA '04-0.80 '07-0.57
S3-85 '96-NA '02-NA '04-1.40 '07-1.10
S3-86 '96-NA '02-NA '04-2.10 '07-1.20
S3-87 '96-NA '02-NA '04-4.10 '07-1.30
S3-88 '96-NA '02-NA '04-6.40 '07-14.00
S3-117 '96-NA '02-NA '04-3.30 '07-1.80
S3-94 '96-NA '02-NA '04-2.10 '07-2.40
S3-95 '96-NA '02-NA '04-3.90 '07-2.60
S3-96 '96-NA '02-NA '04-1.20 '07-0.80
S3-97 '96-NA '02-NA '04-1.30 '07-1.20
S3-98 '96-NA '02-NA '04-1.50 '07-1.30
S3-115 '96-NA '02-NA '04-1.20 '07-1.00
MS2-17 '96-1.20 '02-1.20 '04-1.80 '07-1.00
MS2-16 '96-1.40 '02-1.20 '04-1.70 '07-1.30
MS2-10 '96-1.80 '02-4.60 '04-6.60 '07-5.20
S3-118 '96-NA '02-NA '04-3.10 '07-2.10
MS2-35 '96-1.20 '02-1.30 '04-1.70 '07-1.40
S3-116 '96-NA '02-NA '04-1.50 '07-NA
S3-105 '96-NA '02-NA '04-0.90 '07-1.20
S3-120 '96-NA '02-NA '04-2.80 '07-1.70
S3-119 '96-NA '02-NA '04-1.40 '07-1.30
MS2-26 '96-1.10 '02-1.30 '04-2.40 '07-1.90
S3-106 '96-NA '02-NA '04-4.20 '07-NA
S3-121 '96-NA '02-NA '04-2.20 '07-NA
S3-107 '96-NA '02-NA '04-1.40 '07-0.73
S3-108 '96-NA '02-NA '04-1.60 '07-NA
S4-14 '96-NA '02-NA '04-NA '07-1.80
S4-15 '96-NA '02-NA '04-NA '07-2.40
S4-16 '96-NA '02-NA '04-NA '07-2.00
S4-17 '96-NA '02-NA '04-NA '07-1.60
S4-18 '96-NA '02-NA '04-NA '07-1.70
S4-19 '96-NA '02-NA '04-NA '07-3.40

LEGEND:

- 7000 — PRE-MINE CONTOUR & ELEVATION, FEET
- RIVER
- POND OR LAKE
- STREAM – PERENNIAL
- STREAM – INTERMITTENT
- WETLANDS
- ROAD – CLASS 2
- ROAD – CLASS 3
- ROAD – CLASS 4
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- INSTITUTIONAL CONTROL BOUNDARY
- RAIL ROADS
- OCTOBER 2007 SAMPLING LOCATIONS
- DISCONTINUED SAMPLING LOCATIONS

SCALE
600 0 600 1200 FEET
CONTOUR INTERVAL = 20 FEET

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DRAWING REFERENCE(S):
1. TOPOGRAPHY GENERATED FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.

DESIGNED BY	C.DUFFY	July 2008
DRAWN BY	E.MARKS	July 2008
CHECKED BY	C.DUFFY	July 2008
APPROVED BY	C.DUFFY	July 2008
PROJECT MANAGER	W.WRIGHT	July 2008
CLIENT APPROVAL		
CLIENT REFERENCE NO		

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT LOCATION: MONSANTO ELEMENTAL PHOSPHORUS PLANT
PROJECT: MONSANTO 10-YEAR CERCLA REVIEW
TITLE: HISTORICAL SURFACE SOIL MONITORING RESULTS - Ra ***226*** (pCi/g, dw)
MWH
FIGURE: 9
REVISION: A
FILE NAME: 1010076X068-2

N

E 1,410,000
E 1,440,000
E 1,470,000
E 1,500,000
E 1,530,000
E 1,560,000

N 15,600,000
N 15,570,000
N 15,540,000
N 15,510,000
N 15,480,000
N 15,450,000

BLACKFOOT RESERVOIR

B-3
'96-1.60
'02-0.65
'04-1.50
'07-1.10

B-2
'96-1.60
'02-0.65
'04-1.20
'07-1.10

B-1
'96-1.70
'02-0.65
'04-1.90
'07-0.87

C-2
'96-1.90
'02-0.65
'04-1.10
'07-0.99

C-1
'96-2.00
'02-0.65
'04-1.90
'07-1.20

D-2
'96-2.70
'02-1.10
'04-1.40
'07-1.10

D-1
'96-1.80
'02-1.10
'04-1.60
'07-0.95

E-1
'96-2.40
'02-1.10
'04-1.60
'07-1.20

E-2
'96-1.60
'02-1.10
'04-1.20
'07-1.10

A-1
'96-0.60
'02-1.20
'04-2.30
'07-0.88

A-2
'96-2.20
'02-1.20
'04-1.30
'07-1.00

INSTITUTIONAL CONTROL BOUNDARY

MONSANTO PLANT SITE

ALEXANDER RESERVOIR

SODA SPRINGS

34
30

KM-6
'96-1.70
'02-0.95
'04-1.90
'07-0.92

KM-7
'96-1.30
'02-0.95
'04-1.80
'07-1.00

KM-5
'96-1.00
'02-0.95
'04-2.10
'07-1.10

Back-3
'96-0.80
'02-1.20
'04-1.30
'07-1.00

Back-2
'96-1.10
'02-1.20
'04-1.60
'07-1.10

Back-1
'96-1.30
'02-1.20
'04-1.30
'07-1.20

F-1
'96-1.60
'02-1.20
'04-1.60
'07-0.96

G-1
'96-1.80
'02-1.20
'04-1.40
'07-0.99

F-2
'96-2.00
'02-1.20
'04-1.40
'07-0.90

LEGEND:

- 7000 — PRE-MINE CONTOUR & ELEVATION, FEET
- RIVER
- POND OR LAKE
- STREAM – PERENNIAL
- STREAM – INTERMITTENT
- WETLANDS
- ROAD – CLASS 2
- ROAD – CLASS 3
- ROAD – CLASS 4
- MUNICIPAL BOUNDARY
- SITE BOUNDARY
- INSTITUTIONAL CONTROL BOUNDARY
- RAIL ROADS
- OCTOBER 2007 SAMPLING LOCATIONS
- DISCONTINUED SAMPLING LOCATIONS

SCALE
5000 0 5000 10000 FEET
CONTOUR INTERVAL = 100 FEET

DRAWING REFERENCE(S):
1. TOPOGRAPHY GENERATED FROM USGS DIGITAL ELEVATION MODELS (DEM)-24K FOR SODA SPRINGS, ID.
2. TOPOGRAPHY PROJECTION IS UTM, ZONE 12, NAD 27, U.S FEET.

DESIGNED BY	C.DUFFY	July 2008
DRAWN BY	E.MARKS	July 2008
CHECKED BY	C.DUFFY	July 2008
APPROVED BY	C.DUFFY	July 2008
PROJECT MANAGER	W.WRIGHT	July 2008
CLIENT APPROVAL		
CLIENT REFERENCE NO.		

MONSANTO ELEMENTAL PHOSPHORUS PLANT

PROJECT LOCATION: MONSANTO ELEMENTAL PHOSPHORUS PLANT
PROJECT: MONSANTO 10-YEAR CERCLA REVIEW
TITLE: HISTORICAL BACKGROUND SURFACE SOIL MONITORING RESULTS - Ra ***226*** (pCi/g, dw)

MWH

FIGURE 10 | REVISION A
FILE NAME 1010076X109-0

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