CIMARRON CORPORATION

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S. JESS LARSEN
VICE PRESIDENT

July 27, 1998

Mr. Kenneth L. Kalman, Project Manager
Facilities Decommissioning Section
Low-Level Waste & Decommissioning Projects Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket No. 70-925; License No. SNM-928
Final Status Survey Report for Sub-Area L Surface

Dear Mr. Kalman:

Cimarron Corporation submits the enclosed Final Status Survey Report for Phase III Sub-Area L Surface dated July, 1998. The Final Status Survey Report, Phase III, Sub-Area L (Subsurface) was previously approved via NRC letter dated November 8, 1996. As stated in this letter, "...NRC staff is satisfied that the criteria for unrestricted release have been met.".

The Final Status Survey Report for Phase III Sub-Area L Surface dated July, 1998 provides all the data necessary to demonstrate that all radiological criteria for the property designated as Sub-Area L have been satisfied and that unrestricted release from license is appropriate.

Please feel free to contact me if there are any additional questions or concerns.

Sincerely,

Jess Larsen

Jess Larsen
Vice President

Enclosure

jl072798.le1

FINAL STATUS SURVEY REPORT FOR SUBAREA L

for
Cimarron Corporation's Former
Nuclear Fuel Fabrication Facility
Crescent, Oklahoma

License Number: SNM-928

Prepared for:

Cimarron Corporation
Oklahoma City, Oklahoma

July 1998

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REFERENCES

1. Cimarron Corporation Nuclear Materials License, SNM-928 Docket No. 70-0925, issued for possession only March 31, 1983; Amendment No. 14, issued April 23, 1996.

2. Cimarron Corporation Nuclear Materials License, SNM-1174, Docket No. 070-1193, terminated February 5, 1993.

3. Cimarron Corporation letter to USNRC, August 20, 1990.

4. USNRC letter from Mr. Richard E. Cunningham, Director, Division of Industrial and Medical Nuclear Safety to Dr. John Stauter, Director of Environmental Services, Cimarron Corporation, dated February 5, 1993.

5. Chase Environmental Group, Inc. "Radiological Characterization Report for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", October 1994.

6. Chase Environmental Group, Inc. "Decommissioning Plan for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", April 1995.

7. Chase Environmental Group, Inc. "Final Status Survey Plan for Unaffected Areas for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", October 1994.

8. USNRC letter from Mr. Michael F. Weber, Chief Low-Level Waste and Decommissioning Project Branch, Division of Waste Management, to Mr. Jess Larsen, Vice President Kerr-McGee Corporation, dated May 1, 1995.

9. Cimarron Corporation, "Final Status Survey Report, Phase I Areas at the Cimarron Facility, License No. SNM-928", July 1995.

10. USNRC letter from Mr. R. A. Nelson Acting Chief Low-Level Waste and Decommissioning Project Branch, Division of Waste Management, to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated April 23, 1996.

11. Chase Environmental Group, Inc., "Final Status Survey Plan for Phase II Areas for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility", Crescent, Oklahoma, July 1995.

12. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Low-Level Waste and Decommissioning Projects Branch, to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated March 14, 1997.

13. US NRC letter from Mr. George M. McCann, Chief, Materials Licensing Section to Dr. John Stauter, Vice President, Kerr-McGee Corporation, dated December 30, 1992.

14. Cimarron Corporation, "Final Status Survey Report, Phase II-Subarea J for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", September 1997.

15. Chase Environmental Group, Inc. "Final Status Survey Plan for Phase III Areas for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility", Crescent, Oklahoma, June 1997.

16. Cimarron Corporation, "Final Status Survey Report, Phase III-Subarea L (Subsurface) for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", May 1996.

17. US NRC letter from Mr. Ken Kalman, Project Manager, Facilities Decommissioning Section, to Mr. Jess Larsen, Vice President Cimarron Corporation, dated August 16, 1996.

18. Cimarron Corporation letter from Mr. Jess Larsen, Vice President Cimarron Corporation, to Mr. Ken Kalman, Project Manager, USNRC, dated September 9, 1996.

19. Cimarron Corporation letter from Mr. Jess Larsen, Vice President, Cimarron Corporation, to Mr. Ken Kalman, Project Manager, USNRC, dated October 17, 1996.

20. Cimarron Corporation letter from Mr. Jess Larsen, Vice President Cimarron Corporation to Mr. Ken Kalman, Project Manager, USNRC, dated November 4, 1996.

21. USNRC letter from Mr. Ken Kalman, Project Manager, USNRC to Mr. Jess Larsen Vice President, Cimarron Corporation, dated November 8, 1996.

22. ORAU Final Report, "Confirmatory Survey of the Cimarron Corporation Mixed Oxide Fuel Fabrication Plant", January 1991.

23. J.D. Berger, "Manual for Conducting Radiological Surveys in Support of License Termination"; Draft Report for Comment, Oak Ridge Associated Universities, NUREG/CR-5849, June 1992.

24. USNRC, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for By-Product, Source, or Special Nuclear Material", August 1987.

25. USNRC, "Branch Technical Position on Disposal or On-site Storage of Residual Thorium and Uranium from Past Operations", FR. Vol. 46, No. 205, Page 52061, October 23, 1981.

26. American National Standards Institute, "Radiation Protection Instrumentation Test and Calibration", ANSI N323-1978, Institute of Electrical and Electronic Engineers, Inc. September 1977.

27. Cimarron Corporation, "Response to NRC Comments on Cimarron's Final Status Survey for Phase II, Subarea "J" for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", dated May 13, 1998.

28. USNRC letter from Mr. Ross A. Scarano, Director Division of Nuclear Materials Safety to Mr. S. Jess Larsen, Vice President, Cimarron Corporation, dated July 31, 1997.

29. E.W. Abelquist, "Confirmatory Survey for the South Uranium Yard Remediation, Kerr-McGee Corporation, Cimarron Facility, Crescent, Oklahoma", Oak Ridge Institute for Science and Education, November 1995.

30. USNRC letter from Mr. Michael F. Weber, Chief, Low-Level Waste and Decommissioning Project Branch, Division of Waste Management to Mr. Jess Larsen, Vice President, Kerr-McGee Corporation, dated May 31, 1995.

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FINAL STATUS SURVEY REPORT FOR DECOMMISSIONING CIMARRON FACILITY SUBAREA L

1.0 PURPOSE

This Final Status Survey Report is being submitted by Cimarron Corporation to the Nuclear Regulatory Commission (NRC) for the surface area located on the Cimarron site and designated as Phase III, Subarea L. Subarea L is shown on Figure 1.1 and was an affected area that has been extensively excavated as part of the ongoing site decommissioning process. A Final Status Survey Report for the subsurface soils located within Subarea L was submitted to the NRC in May 1996. The Subarea L subsurface was determined to meet release criteria and subsequently approved for backfilling by the NRC with the understanding that Cimarron would perform a final status survey on the surface soils upon completion of final contouring. This report includes the final status survey that was completed over the entire surface of Subarea L and demonstrates that the established guideline values for unrestricted release have been met. The results of the final survey are presented as justification to release the entire Subarea L from License SNM-928 for unrestricted use.

2.0 BACKGROUND

Cimarron Corporation, a subsidiary of Kerr-McGee Corporation, operated two plants near Crescent, Oklahoma, for the manufacture of enriched uranium and mixed oxide reactor fuels. The 840 acre Cimarron Facility site was originally licensed under two separate SNM Licenses. License SNM-928[1] was issued in 1965 for the Uranium Plant (U-Plant) and License SNM-1174[2] was issued in 1970 for the Mixed Oxide Fuel Fabrication (MOFF) Facility. Both facilities operated through 1975, at which time they were shut down and decommissioning work was initiated.

Decommissioning efforts at the MOFF Facility were completed in 1990 and Cimarron Corporation applied to the NRC on August 20, 1990[3], to terminate License SNM-1174. After confirmatory surveys, the NRC terminated the MOFF Facility License, SNM-1174, on February 5, 1993[4].

Decommissioning efforts involving characterization, decontamination and decommissioning for the 840 acres, licensed under SNM-928 were initiated in 1976 and are still ongoing. The goal of the decommissioning effort is to release the entire 840 acre site for unrestricted use.

Based upon historic knowledge of site operations and the characterization work completed to date, Cimarron Corporation completed and submitted in October 1994 the Cimarron Radiological Characterization Report[5]. As discussed in that report, the site was divided into affected and unaffected areas. The affected and unaffected areas are shown on Drawing No. 95MOST-RF3, included in Appendix I. For the Final Survey Plan the entire 840 acre site was divided into three major areas containing both affected and unaffected areas. Each of these three major areas are shown on Drawing No. 95MOST-RF3 and are designated by Roman Numerals

I, II, and III (herein referenced as Phases I, II, and III). These three major areas are then further subdivided into smaller sections (i.e. A, B, C, D, etc.).

2.1 Phase I Area

As presented in the Cimarron Decommissioning Plan[6], the Final Status Survey Plans (Phases I, II and III) were discussed in general terms, with the understanding that each of the three phases would be submitted to the NRC under separate cover for approval. The Final Status Survey Plan for the first of these three phases (Phase I[7]) was approved by the NRC via letter dated May 1, 1995[8]. The Final Status Survey Report[9] for Phase I was submitted to the NRC and confirmatory sampling for the Phase I subarea was completed by the Oak Ridge Institute for Science and Education (ORISE). Cimarron Corporation received Amendment #14 which released all the Phase I areas from license SNM-928; the amendment was forwarded by letter dated April 23, 1996[10]. This amendment reduced the licensed facility acreage from 840 to 152 acres.

2.2 Phase II Area

The area designated as Phase II on Drawing No. 95MOST-RF3 contains both affected and some contiguous unaffected areas, and represents approximately 122 of the remaining licensed 152-acres. The Final Status Survey Plan for Phase II was submitted to the NRC in July 1995[11] and approved on March 14, 1997[12]. Phase II includes subareas F, G, H, I and J. Included within Phase II are Burial Area #1 which was released in December 1992 by the NRC[13], backfilled with clean soil, and seeded. Also included in Phase II are the East and West Sanitary Lagoons, the MOFF Plant Building exterior and yard area, the Emergency Building, the Warehouse Building (Building #4) and surrounding yard, and numerous drainage areas. Cimarron has substantially completed the remediation of each of these subareas and final status surveys are currently underway. The Final Status Survey Report for Subarea J was the first area from Phase II to be submitted to the NRC for final license release. This Report was submitted to the NRC in September 1997[14]. This subarea is West of Highway #74, and includes approximately 7 of the 122 licensed acres originally included in Phase II. The FSSR for Subarea J is presently under review by the NRC. Final survey reports for subareas F, G, H, and I are pending.

2.3 Phase III Area

The Phase III area survey includes the last areas for completing the final status survey for the entire Cimarron site, and represents approximately 30 acres. This area is designated as Phase III on Drawing No. 95MOST-RF3. The Final Status Survey Plan for release of this area from the site license, was submitted to the NRC for approval in June 1997[15]. The Phase III area includes the former Uranium Processing buildings and yard area, Burial Areas #2 and #3, and New Sanitary Lagoon; the New BTP Option 2 On-site Disposal Cell (Burial Area #4), and the Five Former Waste Water Ponds, consisting of Uranium Waste Ponds #1 and #2, the Plutonium Waste Pond, the Uranium Emergency Pond, and the Plutonium Emergency Pond. Subarea L, as shown on Drawing No.

95MOST-RF3, is included within the Phase III area, and represents approximately 5 acres.

The FSSR for Subarea L (subsurface) was submitted to the NRC on May 29, 1996[16]. The NRC, by letter dated August 16, 1996[17], sent Cimarron comments concerning the Subarea L FSSR. Cimarron responded to the NRC comments by letters dated September 9, 1996[18] and October 17, 1996[19]. Additionally, to resolve the NRC's concerns pertaining to the potential presence of subsurface contamination, additional soil samples were collected for analysis within Subarea L. Cimarron provided the results of this additional subsurface sampling to the NRC by letter dated November 4, 1996[20]. Based upon the NRC's review of these submittals and the additional sampling data, Cimarron's request to backfill Subarea L was approved by letter dated November 8, 1996[21]. Subarea L has been backfilled and contoured. A final status survey has been performed on the Subarea L surface soils as part of the Phase III final status survey for release of this subarea from license SNM-928. The results of the surface survey for Subarea L are presented in this Report.

3.0 DECOMMISSIONING ACTIVITIES

The purpose of this section is to discuss briefly the status of the site decommissioning activities in Subarea L and to present the radiological criteria and guideline values utilized throughout the remediation and final status survey. A discussion of the characterization sampling and survey results for the areas remediated for the Subsurface Final Status Survey can be found in the Subarea L (subsurface) FSSR[16]. Based upon the FSSR (subsurface), the NRC released this subarea for backfilling and final grading. Small stockpiles of soil located within Subarea L were utilized for backfilling. Any additional soils required to complete the area contouring were taken from on site locations which were unaffected by prior site operations.

3.1 Identification of Contaminants

Based upon the knowledge of past site operations, the results of numerous characterization efforts to date, and other independent characterization efforts by regulatory agencies and their respective subcontractors, the radiological contaminants on the Cimarron site have been determined to consist of U-234, U-235 and U-238. The uranium is comprised of natural, depleted, and enriched forms, with an average enrichment above the naturally occurring level of approximately 2.7 weight percent.

Former Burial Area #2, which was located within the Phase III area in Subarea L, contained some waste and soil with slightly elevated thorium activity. A limited amount of thorium contaminated materials from the Kerr-McGee Cushing Facility were stored on-site prior to being packaged and transported off-site to a LLRW disposal facility. Thus, thorium, although not considered the primary contaminant of concern for this facility, has been included in the soil analysis and reported on the data summary sheets with the total uranium values.

3.2 Site Background Levels

Natural background levels for uranium in soil have been established through numerous measurements by Cimarron personnel utilizing the on-site soil counter and through independent regulatory review and laboratory analysis. Analytical results from Cimarron Corporation's environmental sampling program are reported to the NRC annually in Environmental Reports. These reports provide results for soil samples collected from numerous off-site locations which are representative of background in surrounding soils.

Cimarron personnel collected and analyzed 30 surface soil samples from the perimeter of the Cimarron site during the first quarter of 1995 to further validate background levels. Total uranium ranged from 2.3 pCi/g to 6.6 pCi/g, with the average being 4.0 ± 2.6 (2σ) pCi/g. These values were obtained as a result of using the Cimarron on-site soil counter. This on-site soil counter is calibrated to assume an enrichment of 2.7 weight percent as this is the average enrichment found throughout the site. When a correction factor (0.67/1.5) is applied to these results to convert the values from an assumed 2.7 weight percent enrichment to a natural enrichment, the converted results ranged from 1.0 pCi/g to 2.9 pCi/g with an average of 1.8 ± 1.0 (2σ) pCi/g total uranium. Based upon these results, the average value of 4 pCi/g total uranium for background was adopted and applied when the on-site soil counter sample analytical results were compared to guideline values.

Background exposure rates have been established at the Cimarron site by taking micro-R readings and pressurized ion chamber (PIC) readings at off-site sample locations in addition to Cimarron site areas which are unaffected by past operations. Site background exposure rates of approximately 7 μR/h have been observed in background areas by Cimarron personnel utilizing a Ludlum Micro-R survey meter, and have been used in past reports to the NRC[16]. Site background exposure rates of approximately 7 μR/h have also been determined by ORISE personnel utilizing similar instrumentation. In addition, site background exposure rates were measured by ORAU (now ORISE) personnel utilizing a PIC[22], and were determined to be 9 to 10 μR/h. Based on the PIC measurements, the site background was determined to be approximately 10 μR/h. Thus, depending upon instrumentation utilized, the background exposure rate at the Cimarron site ranges from 7 to 10 μR/h. Since Cimarron utilizes a Ludlum Micro-R Survey Meter, 7 μR/h represents average background.

Cimarron personnel performed exposure rate measurements at background locations in Subarea "F" in 1995 using a Micro-R meter. Confirmatory measurements were obtained at the same locations in 1997 using a Reuter-Stokes PIC. These data are tabulated below in Table 6.1. The average background as measured using the Micro-R meter was 7.6 ± 1.3 (2σ) μR/h, and is about 15 percent less than the average for the PIC measurements of 9.0 ± 1.1 (2σ) μR/h. These differences are not significant and indicate good agreement between the Micro-R measurements and the PIC measurements. Cimarron will continue the use of 7 μR/h as representative of background exposure rates for Micro-R measurements.

TABLE 3.1			
Sample ID No.	**Grid Location**	**Micro-R Reading (μR/h)**	**PIC Reading (μR/h)**
UAF-BKG-1	819W-81N	9	9.8
UAF-BKG-7	1600E-120N	7	7.6
UAF-BKG-11	840W-700S	8	9.5
UAF-BKG-13	840W-288S	9	9.8
UAF-BKG-16	808W-282S	8	9.7
UAF-BKG-19	640W-700S	9	10.5
UAF-BKG-23	1610E-300S	5	7.8
UAF-BKG-25	1610E-69N	6	7.6
UAF-BKG-27	1610E-469N	7	7.8
UAF-BKG-28	1610E-634N	8	9.6
	AVERAGE	**7.6 ± 2.7 (2σ)**	**9.0 ± 2.3 (2σ)**

3.3 Characterization Data

Throughout the decommissioning process at the Cimarron site, a survey unit was characterized, remediated (if required), and resurveyed. The description of the decommissioning activities and final survey data were then submitted to the NRC for review and approval. After review of the submittal, the NRC either released the unit or contracted with ORISE (previously ORAU) to perform a confirmatory release survey. Based upon the ORISE confirmatory survey (if requested by the NRC), the NRC would either release the unit or require additional remediation.

The status of the Subarea L characterization and decommissioning activities was discussed in the FSSR[16] for Subarea L (subsurface). Based upon this report and subsequent responses to NRC questions, Subarea L (subsurface) was released for backfilling. The subsurface characterization data and final status survey data generated for former Burial Area #2, the three Former Waste Ponds and the lined Sanitary Lagoon can be found in the FSSR for Subarea L (subsurface).

3.4 Environmental Monitoring Data

As previously discussed with the NRC's staff, Cimarron Corporation has committed to address groundwater site-wide in a separate report. This report, which is scheduled to be submitted to the NRC in July 1998, evaluates the site's environmental data, presents trending analyses and a dose assessment, and commits to a plan to resolve issues dealing with elevated areas of residual groundwater contamination. The only monitoring well actually located within Subarea L is Well #1331 (see Drawing No. 95 MOST-RF3 for location).

4.0 FINAL SURFACE SURVEY PROCEDURE

The purpose of this section is to discuss the methodology utilized for the collection of the surface survey and soil sampling data presented as Final Status Survey data in this report. The methodology employed is similar to that utilized for the release of other subareas on site. The final status survey data were used to demonstrate that the applicable radiological parameters (guideline values) are satisfied for release of this subarea from License SNM-928. The guideline values utilized for comparison to the final status survey data are described in this section.

In general, for Phase III areas, Cimarron Corporation has committed to follow the methodology prescribed in NUREG/CR-5849[23] for performing the Final Status Survey. This report includes all necessary data to support the final status survey for the surface soils contained within Subarea L. This report completes all final status survey requirements for unrestricted release of this subarea.

4.1 Survey Method

In general, survey and soil sampling data were collected utilizing established methods that have been demonstrated through the release of other areas on the Cimarron site. The instrumentation available for use by site personnel as well as the minimum detectable activity (MDA) and typical efficiency for those instruments are listed in Table 4.1. The survey methods are discussed further below:

4.1.1 Grid Areas

For purposes of release evaluation, Subarea L was subdivided into the 100 m x 100 m grid pattern shown on Drawing No 95MOST-RF3. The 100 m x 100 m grids were further subdivided into 5 m x 5 m grids. The 5 m x 5 m grids were utilized for locating survey and soil sampling points for this final status survey. Cimarron employs a Global Positioning Survey (GPS) unit to check pre-established grid points and to locate sample collection and survey positions in the field. This GPS unit is accurate to within less than ± 1 m. The 0.0 grid point is located just south and slightly west of the main Uranium Building. This grid point has been tied into a permanent marker for future reference.

4.1.2 Survey Locations (Open Land Areas)

In general, this subarea surface was 100% scanned utilizing a 3" x ½" unshielded NaI detector. The specific instruments used were selected by the RSO/Health Physics Supervisor.

Where possible, 10 m x 10 m grid areas were surveyed by technicians who surveyed the grid by traversing back and forth within the grid area. Each traverse performed by the technician covered an area approximately 2 meters in width. In some cases, grid areas were less than ten (10) meters in width; thus requiring fewer traverses. The highest

TABLE 4.1

RADIATION MONITORING INSTRUMENTS

INSTRUMENT TYPE	NUMBER AVAILABLE	RADIATION DETECTED	SCALE RANGE	BKG	TYPICAL EFFICIENCY	TYPICAL MDA 95% CONFIDENCE LEVEL
Scintillation (Ludlum 2224) Scaler/Ratemeter	2	Alpha Beta	0-500,000 cpm	< 10 cpm < 300 cpm	20% 19%	100 dpm/100 cm^2 500 dpm/100cm^2
Micro-R Meter (Ludlum 12 & 19) 1" x 1" Nal Detector	3	Gamma	0 – 5,000 μR/h	7 μR/h	N/A	2 μR/h
Ion Chamber (Victoreen)	1	Gamma	0.1 - 300 mR/h	<.0 1 mR/h	N/A	< 0.2 mR/h
3" x 1/2" Nal Scintillation (Ludlum 2220/2221)	3	Gamma	0 - 500,000 cpm	3,000 cpm avg shielded 9,000 cpm avg unshielded	N/A	250 cpm 500 cpm
100 cm^2 gas flow (43-68) Digital Scaler (Ludlum 2220/2221)	2	Alpha	0 - 500,000 cpm	<10 cpm	20	100 dpm/100 cm^2
60 cm^2 gas flow (43-4) Digital Scaler	1	Alpha	0 - 500,000 cpm	<10 cpm	25	200 dpm/100 cm^2
60 cm^2 Count Rate Meter (PRM-6)	7	Alpha	0 - 500,000 cpm	<100 cpm	50%	350 dpm/100 cm^2
50 cm^2 Personnel Room Monitor (Ludlum 177)	2	Alpha	0 - 500,000 cpm	<100 cpm	50%	500 dpm/100 cm^2
Tennelec LB5100 Computer Based Auto Sample Counter	1	Alpha Beta	0 - 99,999,999 cpm	<0.3 cpm 1.5 cpm	38% 42%	0.4 dpm 1.5 dpm
Soil Counter - Computer Linked 4" x 4" x16" Nal (T1) Detector	1	Gamma	---	4 pCi/g Total U 1.5 pCi/g Th (Nat)	4% 15%	5 pCi/g U (5 minute count) 0.6 Th Nat (5 min. count) 3 pCi/g U (15 min. count) 0.3 pCi/t Th (Nat) (15 min. count)
100 cm^2 Gas Flow Digital Scaler	2	Beta, Gamma	0 - 10,000 cpm	<300 cpm	20	600 dpm/100 cm^2
*Reuter-Stokes PIC Model RSS-112	1	Gamma	0 - 100 mR/h	9 – 10 μR/h	N/A	.5 μR/h (10 min, count)

*(Cushing Instrument available for Cimarron Use)

reading found within each 10 m x 10 m grid area or approximate ten (10) meter length was recorded. Survey performance, documentation, and record retention was performed in accordance with the Cimarron Radiation Protection Program. In the event that any of the survey readings exceeded the limits discussed in Section 4.2.3, their location was flagged for additional surveys and/or soil sampling. The survey procedures followed were specified in Cimarron's Special Work Permit(s) and Work Plan(s) for this subarea.

Additionally, within the subarea, at the intersect of each 5 m x 5 m grid location, a systematic survey was completed at ground surface and at 1 m above the surface for ambient radiation using a Micro-R meter. Also, a gamma survey at the ground surface, using a shielded 3" x 1/2" NaI detector was performed and documented.

4.1.3 Soil Sample Locations

The soil sampling frequency was specified in Cimarron Special Work Permit(s) and/or Work Plan(s). Where practical, a surface soil sample (0 to 6 inches deep) was obtained from each 5 m x 5 m grid intersect located within Subarea L. The 5 m x 5 m grid sampling frequency is equivalent to the guidance contained in NUREG/CR-5849 which recommends four samples be collected at locations equidistant between the center and each corner of a 10 m grid. A total of 795 soil samples were collected, composited and analyzed utilizing the Cimarron on-site soil counter for total uranium and total thorium. The soil samples analyzed were surface soil samples collected after the area was backfilled and graded. Any locations found exceeding the guideline values discussed in Section 4.2.2 were investigated further with off-set and depth samples.

4.2 Radiological Guidelines Values

The radiological guideline values discussed in this section were utilized for comparison with the final survey data in order to confirm that Subarea L can be released from License SNM-928.

4.2.1 Equipment and Materials

Release limits for contamination of all materials and equipment is in compliance with Facility License SNM-928 and is identical to the limits specified in Table 1 of the NRC's "Guidance for Decommissioning of Facilities and Equipment Prior to Release for Unrestricted Use"[24]. Subarea L contains no buildings or equipment and therefore these type surveys were not applicable.

4.2.2 Volumetric Activity of Soil

For Subarea L, the guideline value for residual concentrations of total uranium which may remain in the soil is specified as BTP[25] Option #1 material. For enriched uranium, as specified in Table 2 of the BTP, the Option #1 limit is up to 30 pCi/g total uranium above background. For this area, systematic soil sampling was performed within each 10 m x 10 m grid area to determine the average value for residual activity. This systematic

sampling equates to four surface samples per 100 m^2 area; which is the same sample frequency as one sample collected at the intersect of each 5 m x 5 m grid. Hot spot averaging was performed for all locations which contained average total uranium concentrations in excess of 30 pCi/g above background as described in NUREG/CR-5849. Areas of elevated activity were determined based upon discrete sampling within the grid or were assumed to have a constant value (e.g., 25 m^2 based upon 5 m x 5 m grid sampling frequency). The maximum enriched uranium soil concentration within any 10 m x 10 m grid area may not exceed three times the BTP Option #1 limit (90 pCi/g total uranium above background). The average value for the 10 m x 10 m grid then was compared to the BTP Option #1 guideline value of 30 pCi/g total uranium above background. The average uranium background has been established at 4 pCi/g

The Option #1 guideline value for residual concentrations of thorium which may remain in soil per Table 2 of the BTP is up to 10 pCi/g above background. The average background for natural thorium has been determined to be 1.5 pCi/g for soil analyzed with the on-site counter.

4.2.3 Gamma Surface Survey (Open Land Areas)

Cimarron personnel utilize a shielded or unshielded 3" X 0.5" sodium iodide (NaI) detector as a final screening device for qualitative identification of residual contamination in soil. Prior to the commencement of site-wide remediation, Cimarron evaluated several portable survey instruments for performing scan surveys including the 2" x 2" NaI detector. Based upon recommendations from Ludlum, Cimarron decided to use an unshielded 3" x 0.5" NaI detector for general area scans. This system is one of the more sensitive detection systems available to Cimarron.

Twice background guideline has been used for scan surveys utilizing the 3" x 0.5" NaI detector since the inception of Cimarron site decommissioning. This guideline has been a standard in the nuclear industry for many years. With the submittal and approval by the NRC of numerous plans and reports, twice background also has become the accepted standard for the Cimarron Facility as a qualitative screening device. This qualitative guideline was included in the Phase I Final Status Survey Plan, Phase I Final Status Survey Report, and the Phase II Final Status Survey Plan just to name a few of the documents where this guideline was addressed and approved by NRC for this site.

This twice background (as noted in Section 6.4.2 of NUREG/CR-5849) is the low end of the range discernable for scanning instrumentation. During the scan survey the technician upon noting a "discernable" difference in the audio output from the meter will stop and attempt to locate the elevated area. It is difficult to discriminate low levels of residual uranium contamination when other naturally occurring isotopes are present which affect the gross count rate of the scan instrument. However, this guideline value seems to provide a sufficient margin for technicians when conducting a scan to conclude that residual contamination may be present when a signal exceeds the twice background level (i.e., a discernable audible increases above background). This discernable audible response alerts the surveyor to momentarily stop moving the probe (i.e., 2 to 3 seconds)

and to investigate the response. The survey instruments utilized at Cimarron indicate increases in radioactivity levels via either a higher or lower pitch. These changes in pitch are easier to detect rather than simply noting a change in the count rate.

The unshielded detector was utilized to perform the initial 100% surface scan survey for areas of Subarea L to identify regions or areas of slightly elevated activity. The shielded detector was utilized for systematic surveys at grid intersects to identify elevated areas. As stated above, these instruments are only utilized for qualitative measurements. Quantitative measurement of residual contamination levels in soil is performed with the Cimarron soil counter.

4.2.4 Exposure Rate Survey (Open Land Areas)

For Subarea L release for unrestricted use, the average exposure rate may not exceed 10 μR/h above background, at 1 meter above the surface. Exposure rates may be averaged over a 100 m^2 grid area as described in NUREG/CR-5849. The maximum exposure rate at any discrete location within a 100 square meter area cannot exceed 20 μR/h above background. Any area with average exposure rates greater than 10 μR/h above background and any discrete location within a 100 square meter area with an exposure rate greater than 20 μR/h above background was delineated and remediated as required. Cimarron has measured and adopted 7 μR/h as the average background exposure rate.

4.3 Equipment Selection

Special Work Permits (SWP) and Work Plans (WP) were written and approved prior to commencement of the field work required for this final status survey. The SWP and/or WP for this project specified the type of instrumentation to be utilized in performing the site surveys. The instrumentation utilized by site personnel is discussed below:

4.3.1 Equipment and Instrumentation

The instrumentation utilized to generate the final survey data discussed herein was calibrated and maintained by site personnel in accordance with the Cimarron Radiation Protection Program procedures. These procedures utilize the guidance contained in ANSI N323-1978[26], "Radiation Protection Instrumentation Test and Calibration". Specific requirements, as specified by the Cimarron procedures for instrumentation, include traceability of calibrations to NIST standards, field checks for operability, background radioactivity checks, operation of instruments within established environmental bounds, training of individuals, scheduled performance checks, calibration with isotopes of energies similar to those to be measured, quality assurance tests, data review, and recordkeeping. An explanation of how Cimarron's Radiation Protection Program procedures are implemented with respect to instrumentation was discussed in Cimarron's May 13, 1998[27] letter to the NRC.

Portable survey instruments (Micro-R survey meters, α/β survey meters, dose rate instruments, scalers/ratemeters, etc.) are calibrated on a quarterly basis. Where

applicable, activities of sources utilized for calibration are corrected for decay. In addition to the quarterly calibration requirements, source checks are required on a daily basis for all instruments being utilized during characterization, remediation and final status survey work. A calibrated electronic pulse generator is utilized for instrument scale linearity checks.

All calibration and source check records are completed, reviewed, signed-off and retained in accordance with the Cimarron Quality Assurance Program. With the exception of the exposure rates instrumentation (ion chamber, PIC and Micro-R meter), Cimarron health physics staff performs in-house calibration on each of the instruments listed in Table 4.1. The instrumentation utilized by site personnel is discussed below.

4.3.1.1 Unshielded 3" x 0.5" NaI Gamma Detector

The 3" x 0.5" detector is a sodium iodide (NaI) crystal gamma detector which is unshielded around the sides. The NaI detector is utilized with a portable scaler/ratemeter that has single channel analyzer capability. Americium-241, Uranium-235, and Natural Thorium sources are utilized to set the instrumentation window and threshold to detect gamma energies in the range of 50 to 250 keV. This energy range corresponds to the energies of interest when surveying for uranium and natural thorium contamination. The instrument is operated in the window "out" mode, meaning that the instrument response is for the entire range of detectable energies.

4.3.1.2 Shielded 3" x 0.5" NaI Gamma Detector

The 3" x 0.5" detector is a NaI crystal gamma detector which is shielded with lead around the top socket and sides to improve the directional sensing capabilities of the equipment. Similar to the unshielded detector, the shielded detector is utilized with a portable scaler/rate meter that has single channel analyzer capacity. This instrument is normally utilized in areas where background may be elevated.

4.3.1.3 Micro-R Meters

The Micro-R Meter is a 1" x 1" NaI crystal gamma detector which measures exposure rates between 0 and 5,000 µR/h. Background readings are obtained daily at a defined location prior to placing each instrument into service. This instrument is utilized, in general, for determination of exposure rates at both systematic and random locations and at locations of elevated radiation identified by area scans.

Quarterly comparisons and/or confirmatory measurements are obtained routinely to provide information concerning any measurement bias. These comparisons or confirmatory measurements are made using a pressurized ion chamber. The confirmatory measurements for Subarea L are included in Table 4.2 and show results indicative of site background.

TABLE 4.2			
Sample ID No.	Grid Location	Micro-R Reading (μR/h)	PIC Reading (μR/h)
Phase III Affected Area L	270N-25E	7	9.3
Phase III Affected Area L	330N-30E	12	10.9
Phase III Affected Area L	275N-35E	9	10.5
Phase III Affected Area L	220N-40E	8	9.8
Phase III Affected Area L	250N-50E	7	10.0
Phase III Affected Area L	265N-65E	10	10.4
Phase III Affected Area L	280N-90E	10	10.3
Phase III Affected Area L	210N-105E	6	9.3
Phase III Affected Area L	200N-170E	6	8.9
Phase III Affected Area L	140N-235E	5	8.2
Phase III Affected Area L	150N-310E	6	8.0
	AVERAGE	**7.8**	**9.6**

4.3.1.4 Soil Counter (Gamma Spectroscopy)

The Cimarron Soil Counter System consists of a 4" x 4" x 16" sodium iodide crystal housed in a shielded chamber which is computer linked to a multi-channel analyzer (MCA). Cimarron's counting system is programmed to determine the total uranium present in the soil sample by calculating the U-234 present from the U-235 valued detected in the soil. Additionally, these two values then are summarized with the detected U-238 value for determining total U. The counter also adjusts for system background. Calibration of this counting system is performed annually and is traceable to NIST standards through contractor laboratory evaluations of the on-site standards.

ORISE has been used by the NRC for verification of a majority of the decommissioning work completed to date at the Cimarron site. ORISE has conducted an evaluation of the Cimarron Soil Counting system's ability to measure accurately total uranium concentrations in soil samples. This was done by comparing ORISE sample analysis results obtained by alpha pulse height analysis and gamma spectroscopy with the results obtained from the use of the Cimarron Soil Counter. ORISE and Cimarron analysis results compared favorably at levels above background as demonstrated by the confirmatory analysis performed for the On-Site Disposal Cell, Pit #3 (NRC cover letter dated July 31, 1997)[28]. NRC inspection Report #70-925/97-02, which accompanied this letter, states that "no significant bias or statistical errors between the licensee's soil results and the NRC's results were identified". Additionally, the confirmatory analysis performed on select soil samples collected during ORISE's site visit to investigate the South U-Yard[29], and DAP-3 stockpile[30] verified previously that Cimarron's on-site counter results are statistically identical to ORISE's results.

Established quality assurance measures for the soil counter include Cesium-137 centroid checks, Chi-square tests, background determinations, and the counting of soil standards.

All of these quality assurance controls are recorded on control charts and are trended on a continuing basis.

Standards used for calibration and quality assurance checks for the soil counter have been analyzed by outside laboratories and are NIST traceable through these analyses. Comparisons have been made between the standards as counted using the soil counter and two off-site laboratories. The assigned values for the standards are the average of the results obtained from the off-site laboratories, when the standards were analyzed by more than one laboratory. The standards range in concentration from 4.5 pCi/g total uranium to 292 pCi/g total uranium. Additional information pertaining to these standards and typical MDA calculations for the counting system were included in Cimarron's responses to the NRC's comments on Subarea J[27].

Cimarron personnel determine uranium and thorium activities based upon the evaluation of net counts from the soil counter. Activities are calculated through the use of efficiency and correction factors obtained using appropriate standards. Soil concentrations are calculated by dividing the net activity by the soil mass. Soil masses are determined on a laboratory scale which is checked on a daily basis (when in use) utilizing NIST traceable standards. Corrections for soil moisture content are also made as necessary.

4.4 Procedures/Plans

As discussed in Section 4.3, SWPs and WPs are written and approved prior to commencement of field work required for this final status survey. These SWPs and WPs are an integral part of this site's radiation protection and quality assurance program. Project organization and responsibilities, which are a part of the site's quality assurance program, are discussed in this section.

4.4.1 Organization

The Subarea L final status survey was performed by a survey team consisting of qualified personnel from the Cimarron site. The final survey team operated under the general direction of a Project Manager who reports directly to the Site Manager at the Cimarron Facility.

The selection of field measurement equipment and sample collection techniques was under the direction of the RSO/Health Physics Supervisor who reports to the Cimarron Site Manager. Actual field measurements and sample collection were under the direction of the Project Manager. The Project Manager was responsible for developing the SWP and WP for this sub-area with input from the RSO/Health Physics Supervisor. The SWP and WP were reviewed and approved by the Cimarron Site Manager.

4.4.2 Training

Cimarron Corporation provides continuing training to Cimarron personnel and any other personnel (i.e., contractors, visitors, etc.) who are allowed access to the site. All

members of the final survey team attended an in-house training session on the SWP and WP prior to commencement of work under the final status survey plan. All survey procedures and quality assurance requirements were reviewed during this training session.

4.4.3 Radiation Protection Program

Cimarron Corporation maintains a radiation protection program that meets and/or exceeds all of the applicable regulatory requirements associated with activities conducted under Special Nuclear Materials License SNM-928. The Cimarron Radiation Protection Program currently in place for all decommissioning activities is administered through the use of the following documents:

- Cimarron Radiation Protection Procedures
- Cimarron Site Health and Safety Plan
- Cimarron Quality Assurance Plan and Procedures
- Cimarron Emergency Plan

It is the policy of Cimarron Corporation to perform all work in strict compliance with applicable regulatory and internal requirements. The goal of the Cimarron decommissioning effort is to conduct all operations at a level of excellence that exceeds regulatory requirements. Cimarron staff will continue to exercise appropriate radiation protection precautions throughout the remaining decommissioning work and final survey process.

Independent Kerr-McGee Corporate audits for regulatory and internal requirements are conducted on a periodic basis and include the review of the Cimarron Radiation Protection Program and associated programs. Assessments of program effectiveness are also performed periodically by the Cimarron RSO/Health Physics Supervisor. Additionally, the Cimarron Radiation Protection Program is inspected for compliance with applicable rules and regulations by NRC Region IV and NRC Headquarters staff.

4.4.4 Cimarron Quality Assurance Program

The Cimarron Corporation QAP is an integral part of the Cimarron Radiation Protection Program. A principal component of the QAP is the confirmation of the quality of project work performed during decommissioning by assuring that all tasks are performed in a quality manner by qualified personnel. The Program ensures that samples are collected, controlled, and analyzed in accordance with applicable quality controls to provide confidence in the resulting data accuracy and validity. Cimarron's QA/QC program is structured to generate data that can be verified by a third party review should they desire to perform an audit of the data.

The Cimarron QAP is implemented and maintained in accordance with written policies, procedures, and instructions. This Program is administered under the direction of the Quality Assurance Manager. Periodic surveillance and reviews are conducted to ensure

that all aspects of the Program are addressed. The Cimarron QAP satisfies all of the applicable requirements of ASME NQA-1[31].

Written procedures designated as SWPs and WPs, are prepared, reviewed and approved for activities involved in carrying out the decommissioning process. The Subarea L Survey SWP and WP were written in accordance with the Cimarron QAP. These documents designate the type of surveys to be performed, samples to be collected, frequency of sample collection, and the type of field instrumentation required for the tasks required.

Selection, calibration and use of radiation detection instrumentation used for final status survey release at Cimarron are directed by the Radiation Safety Officer (RSO). The RSO is responsible for the calibration performed by Cimarron Health Physics staff or by contract services. The RSO maintains a file for each technician on staff as to their qualifications and training.

The facility performs its own radiological soil analysis in accordance with written procedures and QA/QC protocols. Field data are gathered and maintained in logs for all samples in accordance with the Cimarron QAP. Necessary data are transferred to the on-site laboratory sample log when the sample is brought to the on-site laboratory for analysis. The sample logs provide a record of sample collection and transport (chain of custody) and are incorporated into the facility quality assurance records.

In addition, off-site independent radiological analysis of split samples (samples are first counted on site and then sent to an off-site independent laboratory) is an integral part of the Cimarron QAP. Samples sent to an off-site independent laboratory for analysis are accompanied by a chain of custody form in accordance with the Cimarron QAP. These forms provide documentation for all aspects of sample control and are maintained by the Quality Assurance Manager as permanent records.

Sample and survey data are reviewed by the Health Physics Department for accuracy and consistency and to determine if further characterization or remediation is required or if the data is acceptable. Additionally, the data are compared to the guideline values. The data review process is to verify that approved QA/QC procedures have been followed. Reviews are performed on a regular basis. When identified, corrections to recognized deficiencies are performed.

Kerr-McGee Corporate assures that quarterly audits are performed by individuals who do not have direct responsibilities for the areas being audited. Audit results are documented for review and action by management.

5.0 SURVEY FINDINGS

As discussed in Section 1.0, final status survey data were generated for Subarea L to justify release of the area from License SNM-928. The survey findings, including the statistical methodology employed to evaluate the data for Subarea L, are discussed in this section. After

the completion of backfilling and subarea contouring, no areas were found during the final status survey that required additional remediation.

5.1 Data Evaluation

As discussed in NUREG/CR-5849, the guideline values for soil activity concentrations and exposure rates are average values (above background) established for areas of survey units. In order to compare the analytical and survey data developed for the final status survey with guideline values; data at each individual survey grid location was compared to the respective guideline value. The guideline value for leaving soil in place is Option #1 material (up to 30 pCi/g total uranium above background).

If an individual soil activity measurement (representing $25m^2$) exceeded the applicable guideline value, then the average was determined for the survey unit (100 square meters). Areas of residual activity exceeding the guideline value, known as elevated areas, were acceptable provided they did not exceed the guideline value by greater than a factor of $(100/A)^{1/2}$, where A was the area of residual activity in m^2, and provided the activity level at any location did not exceed three times the guideline value. The average for the survey unit was then compared to the guideline value. If the average was below the guideline plus background, further remediation was not required and the data was presented as final status survey data.

5.2 Comparison With Guideline Values

The data for Subarea L were compared to the guideline value criteria and are discussed separately below:

5.2.1 Survey Data for Subarea L

This section evaluates the data collected from both the 100% scan and the systematic survey performed at the grid intersects for the entire subarea. The data includes analytical soil sample results, systematic survey readings for the 5 m x 5 m grid intersects, and survey results from the 100% scan performed after completion of backfilling and surface contouring. A total of 795 soil samples were collected from the surface area within Subarea L.

The 100% scan that was performed with the unshielded NaI detector after soil contouring and prior to the systematic survey identified no locations that exceeded twice background. The maximum NaI detector survey results for each grid ranged from 7,040 up to 12,210 CPM. All survey results were less than twice background (i.e. 2 x 8,600 CPM as described in Section 4.2.3). Background for the unshielded NaI detector varies across the site from approximately 5,500 to 11,500 CPM. For the Phase I unaffected areas, the average was determined to be 8,600 CPM. This value was used for this subarea for background. The average for the unshielded survey scan results for this subarea was 7,930 CPM.

For the surface sampling, all soil samples analytical results for this unit were below the total uranium guideline value (i.e. 30 pCi/g total uranium above background), except for one location. This location was 40E x 215N and showed a total uranium concentration of 35.1 pCi/g. The soil sample analytical results for each 5 m x 5 m grid location are tabulated in tables included in Appendix II. The soil sample locations and analytical results for both total uranium and thorium, are shown on Drawing No. 97POALSS-O (Sheet 1 and Sheet 2) and Drawing No. 97POALTH-O (Sheet 1 and Sheet 2) respectively. These drawings are included in Appendix III.

The mean value for all 795 sample locations was 7.4 pCi/g total uranium, with a standard deviation of 4.3 pCi/g. The 95% confidence level value was 7.6 pCi/g which is below the guideline values for total uranium. Also, the soil sample analytical results for this unit were all below the thorium guideline value (i.e., 10 pCi/g total thorium above background), varying from 2.0 pCi/g down to 0.5 pCi/g. The mean value was 1.3 pCi/g natural thorium, with a standard deviation of 0.2 pCi/g thorium. The statistical analyses for the soil sample data and systematic survey data are included in Appendix II.

For the single location that exceeded the guideline value of 30 pCi/g total uranium, hot spot averaging was performed. The average activity was determined for the 10 m x 10 m grid containing the "hot spot" location (40E x 215N), and it was below the total uranium guideline value. The average soil concentration for the 10 m x 10 m grid, including the 1 m off-set analytical results, is 16.3 pCi/g. The off-set sample data and sample locations are shown on Drawing No. 97POALOS-O, which is included in Appendix IV. Additionally, the hotspot averaging calculations are included in Appendix IV.

At elevated location 40E – 215N, subsurface soil samples also were collected at depths of 6"-1' and 1'-2', composited and analyzed for total uranium. The analytical results showed total uranium concentrations of 16.4 and 8.9 pCi/g respectively.

The systematic surveys performed at the grid intersects with the 3" x 0.5" shielded NaI detector and the μR meter were all within guideline values. The ground level NaI detector survey results for the grid intersect sample locations ranged from 2,110 to 5,470 CPM. All survey results were less than twice background (i.e., 2 x 3,000 CPM as described in Section 4.2.3). The survey results are presented on Drawing No. 97POAL-3D-O (Sheets 1 and 2) included in Appendix V. The exposure rates at surface and at one meter above the surface as measured using a μR/h meter ranged from 5 to 12 μR/h, with the mean being 7.8 μR/h. All measured exposure rates were below the guideline value of 17 μR/h (i.e., 10 μR/h above the average background of 7 μR/h). The exposure rates are presented on Drawing Nos. 97POALUR-O (Sheets 1 and 2) and 97POALUR-1 (Sheets 1 and 2). These drawings are included in Appendix V.

5.3 QA/QC Procedures

Cimarron Corporation's Quality Assurance Plans and Procedures are an integral part of the overall site decommissioning program and include off-site independent isotopic analysis of split samples. For the soil activity ranges that apply to this final status survey

and for soil samples collected during the time frame that the survey data was being generated, a total of 6 soil samples were split and sent off-site for analysis. The soil samples were first analyzed using the on-site counter prior to being packaged and sent off site for analysis at an independent laboratory. The independent laboratory was Core Laboratories and they do participate in a national inter-comparison. The results for both off-site and on-site analysis are listed in Table 5.1. These sample results show excellent agreement.

TABLE 5.1

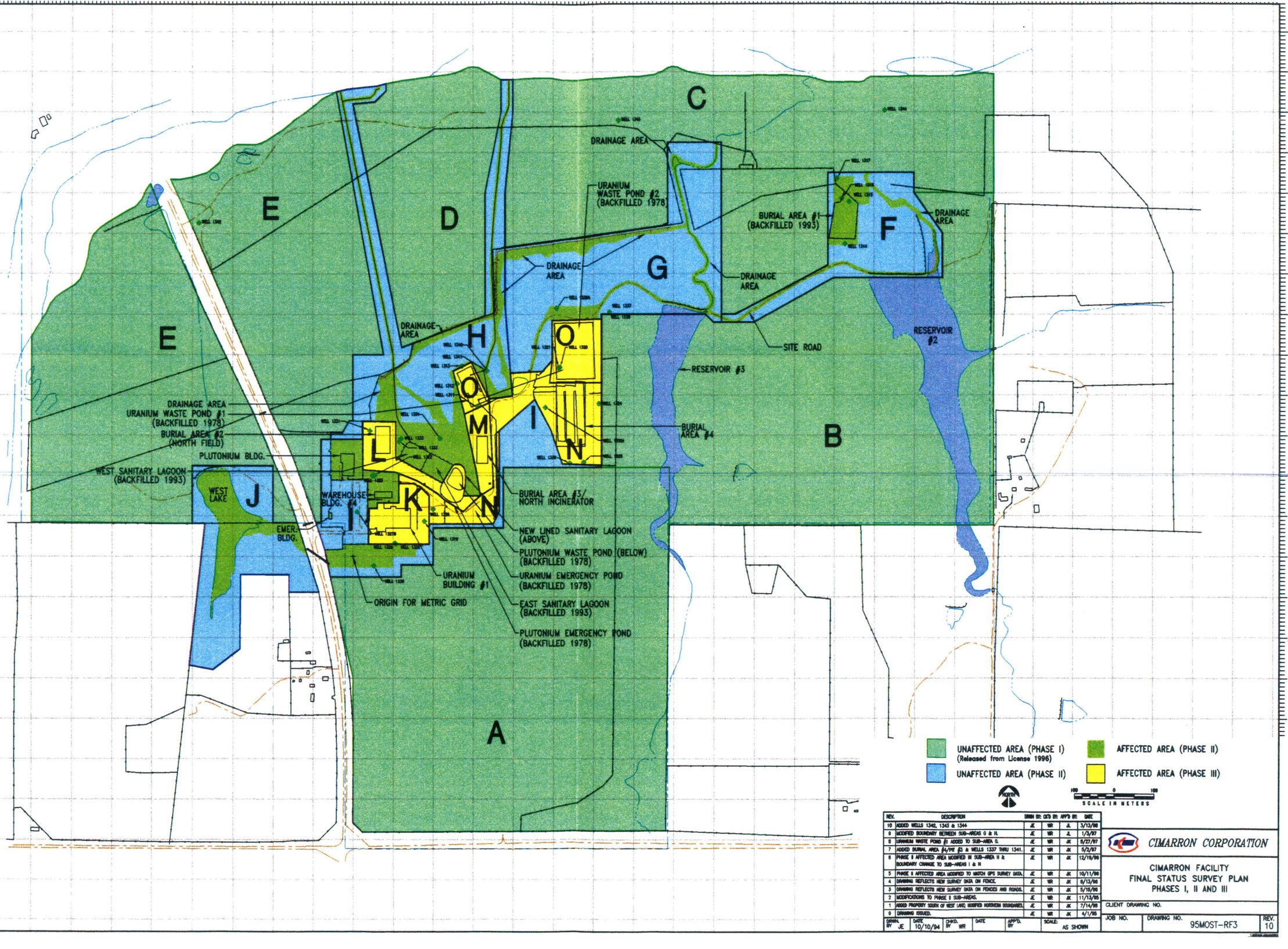
Sample ID No.	Off-Site Lab Results Core Lab (pCi/g U)	On-Site Results Cimarron (pCi/g U)
SC-06	1.5 ± 0.7	2.1 ± 1.7
FA-542	1.0 ± 0.5	5.1 ± 1.4
MISC-21	27.9 ± 4.0	31.6 ± 1.6
MISC-29	17.7 ± 2.7	20.5 ± 1.9
OWP-1-106	30.0 ± 4.4	29.8 ± 1.7
AO-4026	42.0 ± 5.4	36.8 ± 1.9

6.0 SUMMARY

A Final Status Survey was performed in accordance with the SWP and WP approved by Cimarron Management for Subarea L. This report presents a comparison of the results of the Final Status Survey to the clean-up criteria (guideline values) for an affected area at the Cimarron site. The comparison presented herein demonstrates that all clean-up criteria (guideline values) have been met and/or exceeded and thus Subarea L now can be released from License SNM-928. Therefore, this report is being submitted to the NRC in conjunction with a request to release this subarea from License SNM-928.

7.0 APPENDIXES

- Appendix I Drawing 95 MOST-RF3
- Appendix II Subarea L Data Tabulation Sheets and Data Statistical Analyses
- Appendix III Soil Sample Results Plotted on Location Drawings
- Appendix IV Hot Spot Averaging Evaluation
- Appendix V Micro-R and NaI Survey Results Plotted on Location Drawings



REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
10	ADDED WELLS 1342, 1343 & 1344	JE	WR	JL	3/13/98
9	MODIFIED BOUNDARY BETWEEN SUB-AREAS G & H.	JE	WR	JL	1/3/97
8	URANIUM WASTE POND #1 ADDED TO SUB-AREA O.	JE	WR	JK	8/27/97
7	ADDED BURIAL AREA #4/PIT #3 & WELLS 1337 THRU 1341.	JE	WR	JK	5/2/97
6	PHASE II AFFECTED AREA MODIFIED IN SUB-AREA H & BOUNDARY CHANGE TO SUB-AREAS I & N	JE	WR	JK	12/19/96
5	PHASE II AFFECTED AREA MODIFIED TO MATCH GPS SURVEY DATA.	JE	WR	JK	10/11/96
4	DRAWING REFLECTS NEW SURVEY DATA ON FENCE.	JE	WR	JK	6/13/96
3	DRAWING REFLECTS NEW SURVEY DATA ON FENCES AND ROADS.	JE	WR	JK	5/16/96
2	MODIFICATIONS TO PHASE I SUB-AREAS.	JE	WR	JK	11/13/95
1	ADDED PROPERTY SOUTH OF WEST LAKE, MODIFIED NORTHERN BOUNDARIES.	JE	WR	JK	7/14/95
0	DRAWING ISSUED.	JE	WR	JK	4/1/95

DRWN. BY	DATE	CHK'D. BY	DATE	APP'D. BY	SCALE:
JE	10/10/94	WR			AS SHOWN

CIMARRON CORPORATION

CIMARRON FACILITY
FINAL STATUS SURVEY PLAN
PHASES I, II AND III

CLIENT DRAWING NO.

JOB NO.	DRAWING NO.	REV.
	95MOST-RF3	10

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	25E - 215N	3690	7	7	3.9	0.4
2	25E - 220N	3650	8	8	5.7	1.3
3	25E - 225N	4170	8	7	7.2	1.3
4	25E - 230N	4260	9	9	5.4	1.7
5	25E - 235N	3250	6	7	2.1	0.5
6	25E - 240N	3630	8	8	5.3	0.9
7	25E - 245N	3920	9	7	4.6	1.5
8	25E - 250N	4260	8	7	4.5	1.5
9	25E - 255N	3820	9	8	4.1	1.3
10	25E - 260N	3310	8	8	6.7	1.2
11	25E - 265N	3330	7	7	5.6	1.3
12	25E - 270N	4050	8	7	4.9	1.1
13	25E - 275N	3780	7	7	13.2	1.3
14	25E - 280N	3220	7	7	7.5	1.1
15	25E - 295N	4530	8	8	6.3	1.3
16	25E - 300N	4750	9	9	6.1	1.8
17	25E - 305N	4720	10	9	6.7	1.7
18	25E - 310N	4560	10	9	11.7	1.7
19	25E - 315N	5030	10	10	7.1	1.6
20	25E - 320N	4650	9	8	7.3	1.5
21	25E - 325N	5250	9	10	9	1.4
22	25E - 330N	5150	10	10	9.3	1.7
23						
24						
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" Nal DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" Nal DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

FILE: BKSSFORM
PAGE 1

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample Total-U	0-6" Sample Th (Nat)
1	30E - 215N	4510	8	8	7.3	1.4
2	30E - 220N	4510	8	7	10.8	1.6
3	30E - 225N	4950	9	9	8.6	1.6
4	30E - 230N	4990	9	8	8.3	1.5
5	30E - 235N	4490	8	8	8.6	1.4
6	30E - 240N	4770	9	8	6.6	1.5
7	30E - 245N	5190	9	9	8.6	1.5
8	30E - 250N	5360	10	9	9.8	1.3
9	30E - 255N	5020	9	9	6.4	1.6
10	30E - 260N	4490	10	9	5.7	1.6
11	30E - 265N	5000	8	9	7.3	1.7
12	30E - 270N	4800	9	8	14	1.5
13	30E - 275N	5030	10	9	18.5	1.3
14	30E - 280N	4900	10	10	5.8	1.4
15	30E - 285N	3940	8	7	6.6	0.9
16	30E - 290N	4370	8	8	7.2	0.9
17	30E - 295N	4150	9	7	5.8	1.1
18	30E - 300N	3560	8	8	4.8	1
19	30E - 305N	5300	9	9	5.7	1.6
20	30E - 310N	5410	9	9	8.8	1.6
21	30E - 315N	4030	9	9	5.5	1.3
22	30E - 320N	5100	9	9	8.9	1.7
23	30E - 325N	4770	9	10	8.6	1.6
24	30E - 330N	5370	11	12	8.7	1.6
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 10-27-97

FILE: BKSSFORM
PAGE 2

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	35E - 215N	4500	7	9	15.5	1.3
2	35E - 220N	4260	7	8	7.7	1.4
3	35E - 225N	4190	8	7	7.3	1.2
4	35E - 230N	4890	8	9	8.6	1.4
5	35E - 235N	4340	9	8	7	1.2
6	35E - 240N	4330	7	8	7.1	1.3
7	35E - 245N	4580	10	8	5.7	1.5
8	35E - 250N	4310	10	10	4.1	1.6
9	35E - 255N	5180	11	11	11.5	1.7
10	35E - 260N	4700	10	9	11.3	1.5
11	35E - 265N	5140	10	11	14.6	1.2
12	35E - 270N	4870	10	9	5.2	1.8
13	35E - 275N	4690	10	9	12.3	1.4
14	35E - 280N	4910	10	9	5.4	1.4
15	35E - 285N	4940	10	10	8.9	1.5
16	35E - 290N	5110	9	9	4.3	1.5
17	35E - 295N	4370	9	7	7.2	1.4
18	35E - 300N	4710	9	8	8	1.5
19	35E - 305N	4200	9	9	8	1.4
20	35E - 310N	4170	8	9	7.4	1.5
21	35E - 315N	4580	9	9	6.6	1.5
22	35E - 320N	4720	8	8	5.6	1.6
23	35E - 325N	4880	9	10	8.4	1.4
24	35E - 330N	5120	6	8	9.3	1.3
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	40E - 215N	4760	9	9	35.1	1
2	40E - 220N	3930	8	8	7.2	1.2
3	40E - 225N	4250	8	7	10.2	1.1
4	40E - 230N	4320	8	9	6.2	1.2
5	40E - 235N	4200	7	9	7.1	1.4
6	40E - 240N	4400	8	8	7.2	1.3
7	40E - 245N	4000	8	9	5.2	1.1
8	40E - 250N	5000	11	9	9.1	1.4
9	40E - 255N	5300	9	9	7.4	1.4
10	40E - 260N	4740	10	9	8.7	1.5
11	40E - 265N	4460	8	9	7.3	1.2
12	40E - 270N	4690	10	9	4.9	1.4
13	40E - 275N	4730	10	9	9	1.2
14	40E - 280N	4950	10	10	10.4	1.3
15	40E - 285N	4750	9	9	6.8	1.3
16	40E - 290N	4220	7	9	5.2	1.5
17	40E - 295N	4220	8	9	3.9	1.7
18	40E - 300N	4050	7	8	6.3	1
19	40E - 305N	4030	8	9	4.1	1.5
20	40E - 310N	4360	8	8	5	1.3
21	40E - 315N	4750	8	9	9.1	1
22	40E - 320N	4450	9	10	5.8	1.5
23	40E - 325N	4420	8	8	5.1	1.3
24	40E - 330N	4600	9	8	8	1.3
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	45E - 215N	4260	7	8	14.7	1.1
2	45E - 220N	4540	9	8	9.2	1.3
3	45E - 225N	4310	9	9	7.8	1.4
4	45E - 230N	4740	8	8	5.9	1.8
5	45E - 235N	4010	9	7	8.2	1.2
6	45E - 240N	4940	9	8	4.8	0.5
7	45E - 245N	4080	8	8	2.9	0.3
8	45E - 250N	4300	9	8	18	0.7
9	45E - 255N	4220	9	9	4.9	0.9
10	45E - 260N	4190	10	9	5.4	0.6
11	45E - 265N	3950	8	8	6	1
12	45E - 270N	4120	8	9	6	1.1
13	45E - 275N	4680	8	8	7	1.1
14	45E - 280N	4020	9	9	8.1	1.3
15	45E - 285N	4340	10	8	7	1
16	45E - 290N	5110	9	9	8.3	1.2
17	45E - 295N	4820	10	9	4.8	1.6
18	45E - 300N	4470	9	9	7	1.2
19	45E - 305N	3770	9	9	9	1.2
20	45E - 310N	3910	10	9	8.3	1.3
21	45E - 315N	4280	8	8	6.8	1.4
22	45E - 320N	4410	9	9	8.2	1.1
23	45E - 325N	4280	9	9	5.9	1.3
24	45E - 330N	4850	9	10	7.4	1.3
25						

INSTRUMENTS:			RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7		7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000		N/A
			Total U	4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat)	1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	50E - 215N	4190	9	8	11.4	1
2	50E - 220N	4190	8	9	7.7	1.4
3	50E - 225N	4270	8	9	8	1.5
4	50E - 230N	4410	9	8	9.9	1.2
5	50E - 235N	3810	8	8	7.3	1.2
6	50E - 240N	4140	8	8	11.4	1.2
7	50E - 245N	3560	6	6	5.4	1
8	50E - 250N	4180	7	7	7.9	1.3
9	50E - 255N	4330	8	8	9.1	1.2
10	50E - 260N	4170	9	8	9.2	1.3
11	50E - 265N	4310	7	8	9.4	1.4
12	50E - 270N	3930	6	8	6.9	1.3
13	50E - 275N	4050	9	9	7.5	1.3
14	50E - 280N	4060	10	9	8.5	1.5
15	50E - 285N	5230	8	8	10.9	1.4
16	50E - 290N	4060	9	9	9.4	1.1
17	50E - 295N	4320	8	9	7.8	1.1
18	50E - 300N	4000	8	7	7.9	1.1
19	50E - 305N	4280	9	8	9.9	1.1
20	50E - 310N	4860	7	8	10.2	1.3
21	50E - 315N	4430	9	9	10.2	1.4
22	50E - 320N	4650	8	8	7.9	1.1
23	50E - 325N	4440	9	9	9.1	1.4
24	50E - 330N	4130	9	9	7.7	1.1
25						

INSTRUMENTS:

		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	55E - 215N	3880	9	9	11.9	1.5
2	55E - 220N	4230	8	9	5.1	1.5
3	55E - 225N	4320	9	9	5.9	1.5
4	55E - 230N	4420	9	10	10.3	1.2
5	55E - 235N	3990	9	7	4.9	1.1
6	55E - 240N	4010	9	9	7.8	1.3
7	55E - 245N	3650	9	8	5.1	1.1
8	55E - 250N	3980	9	8	7.4	1.2
9	55E - 255N	4390	10	8	8	1.2
10	55E - 260N	4090	8	8	5.8	1.4
11	55E - 265N	4390	10	9	6.8	1.5
12	55E - 270N	4310	9	7	4.7	1.3
13	55E - 275N	4220	9	8	5.5	1.7
14	55E - 280N	4380	9	9	6.5	1.4
15	55E - 285N	4430	10	10	6.3	1.2
16	55E - 290N	4700	9	9	10.8	1.2
17	55E - 295N	4470	10	9	4	1.8
18	55E - 300N	4650	9	8	9	1.4
19	55E - 305N	4940	8	8	8.9	1.5
20	55E - 310N	4500	8	9	8.1	1.3
21	55E - 315N	4300	9	9	5.8	1.4
22	55E - 320N	3880	8	9	6.8	1.6
23	55E - 325N	3950	9	8	8.2	1.4
24	55E - 330N	4420	8	9	6	1.6
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	60E - 215N	4230	8	8	9.9	1.5
2	60E - 220N	3930	8	8	6.6	1.5
3	60E - 225N	4250	9	9	6.5	1.5
4	60E - 230N	4000	9	8	10	1.2
5	60E - 235N	3770	9	8	7.2	1.2
6	60E - 240N	4380	7	8	13.6	1.6
7	60E - 245N	3760	7	8	9.4	1.3
8	60E - 250N	4300	8	7	8	1.7
9	60E - 255N	4560	8	8	11.9	1.8
10	60E - 260N	4500	8	9	8	1.3
11	60E - 265N	3950	9	8	8.6	1.1
12	60E - 270N	4210	10	8	6.8	1.6
13	60E - 275N	4420	9	7	5.4	1.7
14	60E - 280N	4440	9	8	7.1	1.4
15	60E - 285N	4390	8	8	9.1	1.2
16	60E - 290N	3720	8	8	4.5	1.5
17	60E - 295N	3790	9	9	2	1.3
18	60E - 300N	3680	9	9	5.7	1.4
19	60E - 305N	4260	8	8	6.7	1.6
20	60E - 310N	4150	9	8	7.3	1.6
21	60E - 315N	4260	8	9	5.2	1.7
22	60E - 320N	4370	8	9	9.5	1.6
23	60E - 325N	4110	9	8	5.8	1.8
24	60E - 330N	4410	8	7	5.5	1.5
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 10-27-97

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	65E - 215N	3770	8	7	11.2	0.9
2	65E - 220N	4080	8	8	7.3	1.2
3	65E - 225N	4280	8	9	12.9	1.3
4	65E - 230N	4490	8	8	7.2	1.3
5	65E - 235N	4340	8	8	11.8	1.2
6	65E - 240N	4280	8	9	9.7	1.2
7	65E - 245N	4040	9	8	8.7	1.1
8	65E - 250N	4110	7	8	7.5	1.1
9	65E - 255N	3630	8	7	4.6	1.5
10	65E - 260N	4200	8	7	6	1.3
11	65E - 265N	4580	10	10	9.2	1.4
12	65E - 270N	4270	9	8	7.6	1.4
13	65E - 275N	4380	9	9	6.7	1.5
14	65E - 280N	4330	9	9	6.4	1.5
15	65E - 285N	4150	9	9	6.9	1.3
16	65E - 290N	3790	9	8	7.7	1.4
17	65E - 295N	3840	9	8	8.4	1.3
18	65E - 300N	4120	9	9	6.9	1.2
19	65E - 305N	3670	8	8	7.5	1
20	65E - 310N	4090	8	9	5.1	1.3
21	65E - 315N	4080	9	8	6.8	1.5
22	65E - 320N	4270	10	9	6.7	1.4
23	65E - 325N	4120	9	9	5.7	1.4
24	65E - 330N	3940	9	9	4.8	1.4
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	70E - 210N	4180	8	8	16.4	0.9
2	70E - 215N	4120	9	9	8	1.2
3	70E - 220N	4330	8	8	4.8	1.7
4	70E - 225N	4360	9	9	5.3	1.3
5	70E - 230N	3670	9	8	7.1	1.3
6	70E - 235N	4260	8	8	4.7	1.3
7	70E - 240N	4010	7	8	4.1	1.3
8	70E - 245N	3960	10	8	12.1	1.2
9	70E - 250N	4050	8	8	6.1	1
10	70E - 255N	4370	10	8	8.6	1.3
11	70E - 260N	4210	9	9	4.4	1.5
12	70E - 265N	4360	9	9	7.2	1.5
13	70E - 270N	4300	8	8	4.5	1.4
14	70E - 275N	3760	8	8	5.2	1.3
15	70E - 280N	3750	8	8	7.8	1.2
16	70E - 285N	4640	7	8	12	1.3
17	70E - 290N	3620	7	7	9.4	1
18	70E - 295N	3430	8	7	9.3	1.1
19	70E - 300N	3750	7	7	10.5	1
20	70E - 305N	4220	7	7	8	1.3
21	70E - 310N	3940	8	9	7.3	1.2
22	70E - 315N	3910	7	8	3.9	1.3
23	70E - 320N	3800	8	8	3	1.1
24	70E - 325N	4000	7	7	6.9	1.1
25	70E - 330N	3860	8	8	5.2	1.2

INSTRUMENTS:			RESULTS IN BACKGROUND	MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	75E - 210N	3820	8	8	14.8	1.1
2	75E - 215N	4170	8	8	26.5	1.2
3	75E - 220N	4570	9	9	5.5	1.4
4	75E - 225N	4470	9	9	7.9	1.5
5	75E - 230N	4680	9	9	11.8	1.1
6	75E - 235N	4170	8	7	7.2	1.3
7	75E - 240N	3930	8	7	7.2	1.1
8	75E - 245N	4450	8	7	10.4	1.4
9	75E - 250N	4680	9	8	8.2	1.3
10	75E - 255N	3510	7	8	6.3	1.3
11	75E - 260N	4470	8	8	7.9	1.4
12	75E - 265N	4290	9	10	6.5	1.4
13	75E - 270N	4190	9	8	6.1	1.4
14	75E - 275N	4030	8	8	6.1	1.4
15	75E - 280N	4290	9	9	6.9	1.4
16	75E - 285N	4570	8	10	9	1.4
17	75E - 290N	3870	9	9	8	1.4
18	75E - 295N	3940	8	8	8.6	1.2
19	75E - 300N	3870	7	8	8.5	1.2
20	75E - 305N	3870	7	7	10.1	1
21	75E - 310N	3470	7	8	7.5	1.5
22	75E - 315N	4270	9	9	5	1.1
23	75E - 320N	4100	8	9	4.7	1.3
24	75E - 325N	4030	8	8	7.9	1.3
25	75E - 330N	4120	7	8	7.3	1.3

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" Nal DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" Nal DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample Total-U	0-6" Sample Th (Nat)
1	80E - 210N	4150	9	8	10.8	0.9
2	80E - 215N	3910	7	7	15.3	1.2
3	80E - 220N	4160	8	8	6.6	1.3
4	80E - 225N	4330	9	9	16.7	1
5	80E - 230N	4380	9	8	9.1	1.6
6	80E - 235N	4300	8	8	10.1	1.4
7	80E - 240N	4130	8	9	8.3	1
8	80E - 245N	4230	8	7	10.3	1.3
9	80E - 250N	3950	7	7	11.4	1.1
10	80E - 255N	4120	7	8	8.5	1.2
11	80E - 260N	4220	8	9	5.8	1.7
12	80E - 265N	4150	9	9	5.9	1.6
13	80E - 270N	4780	9	8	6.5	1.4
14	80E - 275N	4420	9	10	4.9	1.5
15	80E - 280N	4150	8	8	2.4	1.8
16	80E - 285N	4160	8	8	4.6	1.3
17	80E - 290N	4410	9	8	5.2	1.5
18	80E - 295N	4220	8	8	6.9	1.3
19	80E - 300N	3540	8	8	4.8	1.1
20	80E - 305N	3770	8	8	6.6	1.1
21	80E - 310N	3750	8	8	7.5	1.1
22	80E - 315N	3840	8	8	4.8	1.3
23	80E - 320N	3250	7	8	5.9	0.8
24	80E - 325N	3370	7	8	6.8	1.2
25	80E - 330N	3350	7	10	4.1	1.2

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" Nal DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" Nal DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	85E - 210N	3970	6	7	17.1	1.2
2	85E - 215N	3500	7	8	22	1
3	85E - 220N	4540	8	8	26.6	1.2
4	85E - 225N	4370	7	8	6.1	1.4
5	85E - 230N	4430	8	8	7.8	1.3
6	85E - 235N	3860	8	8	6.4	1.3
7	85E - 240N	4150	8	9	7.8	1.5
8	85E - 245N	3770	8	8	10.8	1.4
9	85E - 250N	4090	8	8	8.5	1.5
10	85E - 255N	3990	8	8	9.9	1.3
11	85E - 260N	4030	7	7	7.7	1.4
12	85E - 265N	4200	8	8	3.9	1.4
13	85E - 270N	4660	9	9	8.3	1.4
14	85E - 275N	4340	9	9	7.4	1.4
15	85E - 280N	4600	9	9	7.7	1.4
16	85E - 285N	4500	9	9	5.2	1.3
17	85E - 290N	4950	8	8	9.6	1.4
18	85E - 295N	4630	9	8	5	1.7
19	85E - 300N	4510	9	8	6.5	1.2
20	85E - 305N	3730	8	8	7.4	1.2
21	85E - 310N	4410	8	8	9.4	1.7
22	85E - 315N	3920	9	8	9.3	1.4
23	85E - 320N	3930	7	8	7.6	1.2
24	85E - 325N	3980	7	8	8.4	1.3
25	85E - 330N	3580	8	8	6.8	1.1

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	90E - 210N	3480	7	7	16.7	1.2
2	90E - 215N	3350	7	7	10.1	1.1
3	90E - 220N	4380	7	8	18.4	1.4
4	90E - 225N	3610	8	8	5.6	1.3
5	90E - 230N	4470	9	7	7.9	1.5
6	90E - 235N	4100	8	8	9.3	1.2
7	90E - 240N	4490	9	8	8.1	1.5
8	90E - 245N	3800	8	8	4.6	1.3
9	90E - 250N	4300	8	8	8.5	1.4
10	90E - 255N	3740	8	8	14.6	1.1
11	90E - 260N	4050	9	8	5	1.2
12	90E - 265N	3840	8	8	5.6	1.3
13	90E - 270N	4570	7	8	5.8	1.3
14	90E - 275N	4460	9	8	4.9	1.3
15	90E - 280N	4570	10	10	8.8	1.2
16	90E - 285N	4380	8	8	5.5	1.6
17	90E - 290N	4470	9	8	4.5	1.4
18	90E - 295N	4300	9	9	5.5	1.3
19	90E - 300N	4660	8	8	5.2	1.4
20	90E - 305N	4060	9	8	6.2	1.4
21	90E - 310N	4350	10	9	7.7	1.5
22	90E - 315N	4650	8	8	7.5	1.6
23	90E - 320N	3840	8	8	18.4	0.9
24	90E - 325N	4580	8	9	5.3	1.2
25	90E - 330N	3400	8	7	10	1

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
		Total U	4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g Th(Nat)	1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	95E - 210N	4110	8	7	13.8	1.3
2	95E - 215N	3810	7	7	20.7	0.9
3	95E - 220N	3920	7	8	22.6	0.9
4	95E - 225N	3990	6	8	19.4	1.3
5	95E - 230N	4130	8	7	4.1	1.7
6	95E - 235N	4670	8	9	7.9	1.5
7	95E - 240N	4390	9	8	8.9	1.3
8	95E - 245N	4070	7	8	9.2	1.4
9	95E - 250N	4090	8	8	8.8	1.3
10	95E - 255N	3990	8	8	7.8	1.2
11	95E - 260N	3780	8	9	16.4	1.2
12	95E - 265N	4160	7	8	6.5	1.1
13	95E - 270N	5100	9	8	8	1.5
14	95E - 275N	4760	7	9	8	1.4
15	95E - 280N	4600	8	8	10.3	1.3
16	95E - 285N	4870	9	9	5.1	1.4
17	95E - 290N	4960	11	10	7.2	1.5
18	95E - 295N	4750	8	9	7.8	1.3
19	95E - 300N	4750	8	9	3.6	1.3
20	95E - 305N	4390	9	8	6.2	1.3
21	95E - 310N	5030	9	10	12.5	1.4
22	95E - 315N	4760	9	9	8.6	1.3
23	95E - 320N	4780	9	8	10.6	1.4
24	95E - 325N	3880	9	7	19.2	1.5
25	95E - 330N	3290	8	8	9.2	1

INSTRUMENTS:			RESULTS IN BACKGROUND	MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample Total-U	0-6" Sample Th (Nat)
1	100E - 210N	4340	7	8	18	1.1
2	100E - 215N	4250	8	8	20	1.3
3	100E - 220N	3760	8	8	26.5	1.2
4	100E - 225N	4310	7	8	17.1	1
5	100E - 230N	3870	8	8	18.1	1.2
6	100E - 235N	4560	9	7	7.2	1.5
7	100E - 240N	4650	8	7	13.7	1.3
8	100E - 245N	4200	9	8	7.5	1.4
9	100E - 250N	4580	8	8	8.6	1.6
10	100E - 255N	4620	8	8	5.7	1.6
11	100E - 260N	3930	7	8	11.8	1.2
12	100E - 265N	4000	8	7	8.4	1.1
13	100E - 270N	5110	9	9	7.7	1.7
14	100E - 275N	4350	9	8	6.5	1.5
15	100E - 280N	5030	8	9	12.9	1.4
16	100E - 285N	4590	9	10	8	1.6
17	100E - 290N	5290	9	9	9.4	1.4
18	100E - 295N	5180	9	10	9.5	1.6
19	100E - 300N	4770	8	9	5.5	1.6
20	100E - 305N	4950	9	9	7.2	1.5
21	100E - 310N	5060	11	9	15.2	1.7
22	100E - 315N	4410	9	9	11.2	1.6
23	100E - 320N	4940	9	8	15.4	1.3
24	100E - 325N	4590	9	8	12.6	1.6
25	100E - 330N	4490	9	9	12.8	1.5

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" Nal DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" Nal DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	105E - 210N	3680	6	6	14.8	1.3
2	105E - 215N	4640	8	8	15.9	1.2
3	105E - 220N	4500	9	8	15.9	1.2
4	105E - 225N	4280	9	7	22	1.1
5	105E - 230N	5110	9	9	11.9	1.2
6	105E - 235N	4520	9	9	6	1.5
7	105E - 240N	5470	9	10	7.7	1.5
8	105E - 245N	4640	9	8	7.3	1.4
9	105E - 250N	5080	8	8	4.8	1.4
10	105E - 255N	5070	10	9	4.9	1.6
11	105E - 260N	5000	10	8	6.1	1.6
12	105E - 265N	4530	9	9	4.7	1.2
13	105E - 270N	4430	9	8	10.6	1.3
14	105E - 275N	4770	8	7	12.4	1.4
15	105E - 280N	3690	7	7	5.3	1.6
16	105E -285N	3980	9	8	8.3	1.6
17	105E - 290N	4610	9	9	5.1	1.6
18	105E - 295N	4930	10	9	7	1.6
19	105E - 300N	4560	8	8	9	1.5
20	105E - 305N	4410	9	9	20.5	1.6
21	105E - 310N	4040	8	8	19.6	1.2
22	105E - 315N	3950	8	8	15.5	1.4
23	105E - 320N	4350	8	8	8.4	1.6
24	105E - 325N	3980	8	8	12.6	1.8
25	105E - 330N	4030	7	7	7.6	1.4

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" Nal DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" Nal DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. a. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample Total-U	0-6" Sample Th (Nat)
1	110E - 205N	3640	8	8	9.1	1.2
2	110E - 210N	3620	7	7	9.1	1.2
3	110E - 215N	4210	7	6	6	1.2
4	110E - 220N	3650	8	7	18.7	1.2
5	110E - 225N	4480	8	8	17	1
6	110E - 230N	3950	7	8	8.3	1
7	110E - 235N	4290	7	7	12.9	1.3
8	110E - 240N	4620	9	8	10.7	1.4
9	115E - 200N	4320	7	7	14.7	1.2
10	115E - 205N	3930	7	7	6.8	1.4
11	115E - 210N	3720	7	8	5.1	1.3
12	115E - 215N	3230	7	6	4.4	1.4
13	115E - 220N	3220	7	7	6.4	1.2
14	115E - 225N	3500	7	7	8.8	1.2
15	115E - 230N	3980	8	8	13.2	1.4
16	115E - 235N	3610	8	7	19	1.4
17	120E - 200N	3270	7	6	9.7	1
18	120E - 205N	3570	8	7	27.1	0.9
19	120E - 210N	3440	6	7	3.8	1.3
20	120E - 215N	3250	8	7	5.6	1.2
21	120E - 220N	3660	8	8	5.5	1.4
22	120E - 225N	3260	7	7	5.2	0.8
23	120E - 230N	3700	7	8	5.6	1.4
24	120E - 235N	3810	7	8	7.6	1.4
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 10-27-97

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	125E - 200N	4170	8	7	12	1.1
2	125E - 205N	3770	8	7	28.9	1.2
3	125E - 210N	3650	8	7	6.9	1..0
4	125E - 215N	4000	7	8	7.3	1.3
5	125E - 220N	3190	7	6	5.1	1.1
6	125E - 225N	2990	7	8	3.4	1
7	125E - 230N	3580	7	8	5.8	1.3
8	130E - 195N	4090	7	7	9.6	1.3
9	130E - 200N	3700	7	8	17.2	1
10	130E - 205N	3750	7	7	22.6	0.9
11	130E - 210N	3910	7	7	3	1.4
12	130E - 215N	3740	7	7	4.3	1
13	130E - 220N	3410	6	7	3.6	0.8
14	130E - 225N	3480	7	7	6.8	1.4
15	130E - 230N	4060	7	8	8.7	1.1
16	135E - 195N	3900	7	7	10.6	1.2
17	135E - 200N	3880	7	7	9.4	0.9
18	135E - 205N	4350	7	7	17.7	1
19	135E - 210N	3560	8	9	5.8	1.2
20	135E - 215N	3180	6	7	4	1
21	135E - 220N	3670	6	7	5.8	1.2
22	135E - 225N	2890	7	7	9.1	1.2
23						
24						
25						

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	140E - 195N	4320	7	8	11.5	1.2
2	140E - 200N	3840	8	8	10.1	1.2
3	140E - 205N	3740	7	8	16.4	1.2
4	140E - 210N	3870	8	8	4.7	1.5
5	140E - 215N	3200	8	8	5	1
6	140E - 220N	3270	7	7	17.3	1.3
7	140E - 225N	4000	8	8	15.8	1.2
8	145E - 190N	4200	8	8	14.7	1.6
9	145E - 195N	4250	8	8	26.8	1.1
10	145E - 200N	3970	8	8	11	1.3
11	145E - 205N	4170	7	7	10	1.2
12	145E - 210N	3730	7	8	4.2	1.2
13	145E - 215N	2990	7	8	2.7	1.5
14	145E - 220N	3860	8	8	9.5	1.4
15	150E - 190N	4670	7	8	14.5	1.3
16	150E - 195N	3780	8	6	7.7	1.3
17	150E - 200N	3840	7	6	12.4	1.4
18	150E - 205N	4060	8	7	18.9	1.4
19	150E - 210N	3710	8	8	7.2	1.2
20	150E -215N	3880	7	7	4.6	1.4
21						
22						
23						
24						
25						

INSTRUMENTS:

RESULTS IN:

LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7		7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000		N/A
			Total U	4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat)	1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 10-27-97

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CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III, SUB-AREA "L"
FINAL SURFACE SURVEY AFTER BACK FILL

DATE: 10/22/97

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0-6" Sample	
					Total-U	Th (Nat)
1	155E - 190N	4060	8	9	10.8	1.3
2	155E - 195N	4220	7	6	15.6	1.1
3	155E - 200N	3380	7	8	5.3	1
4	155E - 205N	4090	8	7	6.6	1.2
5	155E - 210N	4230	8	7	5.2	1.4
6	155E - 215N	3600	8	7	7.1	1.2
7	160E - 185N	4400	7	7	12.9	1.3
8	160E - 190N	4080	8	8	11.2	1.2
9	160E - 195N	3910	7	7	8.3	1.2
10	160E - 200N	4280	8	8	14.9	1.2
11	160E - 205N	4290	8	7	5.6	1.3
12	160E - 210N	4160	7	7	8.6	1.3
13	160E - 215N	3660	7	8	8	1.2
14	165E - 185N	4390	7	7	7.8	1.5
15	165E - 190N	3630	7	8	8.6	1.5
16	165E - 195N	3950	8	7	6.9	1.3
17	165E - 200N	3780	8	8	13.8	1.2
18	165E - 205N	4070	8	8	7.9	1.4
19	165E - 210N	3580	8	7	5.2	1.3
20	170E - 180N	4040	8	7	6.7	1.4
21	170E - 185N	4570	7	7	10.2	1.1
22	170E - 190N	3520	8	7	5.1	1.5
23	170E - 195N	3350	7	6	8.3	1.1
24	170E - 200N	3540	6	6	9.9	0.9
25	170E - 205N	3970	9	8	10.6	1.3

INSTRUMENTS:		RESULTS IN BACKGROUND		MDA
LUDLUM MICRO 'R' METER MODEL 12S S/N 111299		µR/hr	7	7
LUDLUM 220, LEAD SHIELDED 3" X 1/2" NaI DETECTOR	S/N 48395	CPM	3000	N/A
			Total U 4	10
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/g	Th(Nat) 1.5	1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 10-27-97

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