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KERR-McGEE CORPORATION

CIMARRON FINAL STATUS SURVEY REPORT
for
PHASE II - SUB-AREA I

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

June, 1999

License Number: SNM-928
Docket No. 70-0925

CIMARRON CORPORATION
CRESCENT, OKLAHOMA

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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 July 7, 1997.

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 Letter from Mr. Jess Larsen, Vice President, Cimarron Corporation to Mr. Michael F. Weber, Chief Low-Level Waste and Decommissioning Branch, Division of Waste Management, USNRC, dated November 13, 1995.

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

11. 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.

12. 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.

13. 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.

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

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

16. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Low-Level Waste and Decommissioning Project Branch, to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated July 31, 1998.

17. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Low-Level Waste and Decommissioning Project Branch, to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated December 4, 1998.

18. Cimarron Corporation, "Final Status Survey Report for Subarea H for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", November 1998.

19. Cimarron Corporation, "Final Status Survey Report for Concrete Rubble in Subarea F, Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", March 1998.

20. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Low-Level Waste and Decommissioning Project Branch, to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated March 1, 1999.

21. 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.

22. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated September 11, 1998

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

24. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section, to Mr. Jess Larsen, Vice President, Cimarron Corporation, dated August 16, 1996.

25. Cimarron Corporation letter from Mr. Jess Larsen, Vice President Cimarron Corporation, to Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section, USNRC, dated September 9, 1996.

26. Cimarron Corporation letter from Mr. Jess Larsen, Vice President, Cimarron Corporation, to Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section, USNRC, dated October 17, 1996.

27. Cimarron Corporation letter from Mr. Jess Larsen, Vice President Cimarron Corporation to Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section, USNRC, dated November 4, 1996.

28. USNRC letter from Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section, to Mr. Jess Larsen Vice President, Cimarron Corporation, dated November 8, 1996.

29. Cimarron Corporation letter from Mr. Jess Larsen, Vice President, Cimarron Corporation to Mr. Kenneth L. Kalman, Project Manager, Facilities Decommissioning Section, USNRC, dated July 27, 1998.

30. Cimarron Corporation, "Final Status Survey Report Phase III – Subarea "O" Subsurface for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", dated March 1998.

31. Cimarron Corporation, "Cimarron Final Status Survey Report for Phase III - Sub-Area O Surface for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma," dated February 1999.

32. Cimarron Corporation, "Final Status Survey Report Phase III – Subarea "M" for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma", dated December 1998

33. Cimarron Corporation letter from Mr. Jess Larsen, Vice President, to Mr. Michael F. Weber, Chief Low-Level Waste and Decommission Projects Branch, Division of Waste Management, USNRC, dated June 21, 1995.

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

35. Kerr-McGee Corporation letter from Dr. Edwin Still to Mr. Gary Comfort, Project Officer, Licensing Branch, Division of Fuel Safety and Safeguards, Officer of Nuclear Material Safety and Safeguards, USNRC, dated July 7, 1993.

36. Kerr-McGee Corporation letter from Dr. Edwin Still to Mr. Gary Comfort, Project Officer, Licensing Branch, Division of Fuel Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, USNRC, dated September 2, 1993.

37. Kerr-McGee Corporation letter from Dr. Edwin Still to Mr. Dave Fauver, Project Officer, Decommissioning and Regulatory Issues Branch, Division of Low-Level Waste Management and Decommissioning, USNRC, dated November 15, 1993.

38. USNRC letter from W. T. Crew, Section Leader, Uranium Process Licensing Section, to Mr. William J. Shelley, Kerr-McGee Nuclear Corporation, December 28, 1979.

39. USNRC letter from William O. Miller, Chief License Fee Management Branch, to Mr. William J. Shelley, Kerr-McGee Nuclear Corporation, March 28, 1980.

40. S. A. Wical, "Interim Report on Confirmatory Survey of Portions of the Sequoyah Fuels Corporation Cimarron Plant, Crescent, Oklahoma', Oak Ridge Associated Universities, January 31, 1989.

41. D. Berger and L. F. Friedman, "Confirmatory Survey of the Cimarron Corporation Mixed Oxide Fuel Fabrication Plant, Crescent, Oklahoma," Oak Ridge Associated Universities, January 1991.

42. USNRC, "Environmental Assessment for License Termination at the Cimarron Corporation's Mixed Oxide Fuel Fabrication Plant", February 1993.

43. USNRC, Federal Register, Volume 58, No. 28, pages 8432 through 8434, February 12, 1993.

44. Kerr-McGee Corporation, "Decommissioning Plan – Groundwater Evaluation Report for Cimarron Corporation's Former Nuclear Fuel Fabrication Facility, Crescent, Oklahoma," July 1998.

45. 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 January 19, 1999.

46. 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.

47. 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.

48. 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.

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

50. 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.

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

52. 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.

53. 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.

54. USNRC letter from Mr. Ross A. Scarano, Director, Division of Nuclear Materials Safety, Region IV to Mr. S. Jess Larsen, Vice President, Cimarron Corporation, dated November 3, 1998.

55. American Society of Mechanical Engineers, "Quality Assurance Requirements for Nuclear Facility Applications" ASME NQA-I, 1994.

FINAL STATUS SURVEY REPORT FOR DECOMMISSIONING CIMARRON FACILITY SUBAREA I

1.0 PURPOSE

This Final Status Survey Report (FSSR) is being submitted by Cimarron Corporation to the Nuclear Regulatory Commission (NRC) for an area on the Cimarron site designated as Phase II Subarea I. This subarea is shown on Drawing No. 95MOST-RF3 which is included in Appendix 1, and includes both affected and unaffected areas that have been surveyed as part of the ongoing site decommissioning process. This report discusses the initial characterization surveys which were performed to precisely define the extent and magnitude of residual contamination present in soils and on surface structures located within Subarea I. The characterization data generated during the initial surveys were utilized in designing the Final Status Survey (FSS) for this subarea which is included in the NRC approved Phase II Final Status Survey Plan (FSSP). Based upon the Phase II FSSP, this FSS was performed for Subarea I to demonstrate that the established guideline values for unrestricted release had been met. The results of the Subarea I FSS are presented in this FSSR as justification for release of this Subarea 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 (Pu-Plant) Facility. Both facilities operated through 1975, at which time they were shut down and decommissioning work was initiated.

Decommissioning efforts at the Pu-Plant 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 Pu-Plant License, SNM-1174, on February 5, 1993[4].

Decommissioning efforts at the Cimarron U-Plant Facility involving characterization, decontamination and remediation were initiated in 1976 and are nearing completion. 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 the 1994 Cimarron Radiological Characterization Report[5] to the NRC. 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 which is included in Appendix 1. For the final status survey 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 were

then further subdivided into smaller "subareas" (i.e., A, B, C, D, etc.). The FSSP's for the Phase I, II and III areas have been approved by the NRC and are discussed briefly below:

2.1 Phase I Area

As presented in the Cimarron Decommissioning Plan[6], the FSSP's (Phases I, II and III) were discussed in general terms, with the understanding that each of these three phases would be submitted to the NRC under separate cover for approval. The FSSP for the first of these three phases (Phase I[7]), which includes Subareas A, B, C, D, and E, was approved by the NRC by letter dated May 1, 1995[8]. By letter dated November 13, 1995[9], Cimarron modified the southern boundary of two Phase I areas (i.e., Subareas C and E) and placed these portions of Subareas C and E into Phase II Subareas G and H. With this modification, the Phase I FSSR[10] 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 #13 which released all of the Phase I areas from License SNM-928; the amendment was forwarded to Cimarron by NRC letter dated April 23, 1996[11]. This amendment reduced the licensed facility acreage from 840 to approximately 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 Phase II FSSP was submitted to the NRC in July 1995[12] and approved on March 14, 1997[13]. Phase II includes Subareas F, G, H, I and J. Included within Phase II is Burial Area #1 which was released in December 1992 by the NRC[14], subsequently backfilled with clean soil, and then seeded. Also included in Phase II are the East and West Sanitary Lagoons, the Pu-Plant Building exterior and yard area, the Emergency Building, Warehouse Building #4 and surrounding yard, and numerous drainage areas. Cimarron has essentially completed all remediation in each of the Phase II Subareas and final status surveys are currently being completed.

The FSSR for Subarea J was the first Phase II Subarea to be submitted to the NRC for license release; it was submitted in September 1997[15]. Subarea J is West of Highway #74, and represents approximately 7 of the 122 acres in Phase II. The FSSR for Subarea J has been approved by the NRC[16], and a confirmatory survey was performed by NRC staff during their site visit of September 21-23, 1998. By NRC letter dated December 4, 1998[17], Cimarron was informed that the NRC staff plans to release Subarea J from license SNW-928 in the near future.

Subarea H is the second Subarea included within Phase II where final status surveys have been completed. As discussed above, the East and West Sanitary Lagoons are included within Subarea H, which includes approximately 38.5 acres. The FSSR for Subarea H was submitted to the NRC on November 16, 1998[18].

Also included in Phase II is the concrete previously surveyed for release and placed in a drainage way located within Subarea F. These survey results have been reported to the

NRC in the March 1998 FSSR[19] for the concrete rubble located in Subarea F. By letter dated March 1, 1999[20], the NRC informed Cimarron that all NRC staff comments concerning the Subarea F Concrete FSSR have been resolved.

Subarea I is the next subarea included within Phase II where final status surveys have been completed. Included within Subarea I are both affected and unaffected open land areas, buildings, fences and walkways. Also included are the recently installed trailers which now house the site offices, change rooms, and on-site laboratory. The office, restrooms and laboratory were moved to the trailers in April 1997 in anticipation of decommissioning those areas within the U-Plant Building. The open land area under the trailers has been left within Subarea I; the trailer interiors will be surveyed prior to final license termination. The results of the Subarea I FSS are presented in this Report. Subarea I represents approximately 19.1 acres.

Final Status Survey Report preparation for Subareas F and G are in progress.

2.3 Phase III Area

The area designated as Phase III on Drawing No. 95MOST-RF3 contains only affected areas and represents approximately 30 acres of the remaining licensed 152 acres. This area is designated as Phase III on Drawing No. 95MOST-RF3. The FSSP for release of this area from the site license, was submitted to the NRC for approval in June 1997[21]. Phase III includes the former Uranium Processing buildings and yard area, Burial Areas #2 and #3, New Sanitary Lagoon, the NRC approved 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. By letter dated September 11, 1998[22], the NRC approved the Phase III Final Status Survey Plan.

The FSSR for Subarea L (Subsurface) was the first Phase III FSS to be submitted to the NRC. The Subarea L FSSR (Subsurface) was submitted to the NRC on May 29, 1996[23]. The NRC, by letter dated August 16, 1996[24], sent Cimarron comments concerning the Subarea L FSSR. Cimarron responded to the NRC comments by letters dated September 9, 1996[25] and October 17, 1996[26]. Additionally, in order to resolve the NRC staff concerns pertaining to the potential presence of subsurface contamination, additional subsurface soil samples were collected for analysis within Subarea L. Cimarron provided the results of this additional subsurface sampling event to the NRC by letter dated November 4, 1996[27]. Based upon the NRC staff review of these submittals and the additional subsurface sampling data, Cimarron's request to backfill Subarea L was approved by NRC letter dated November 8, 1996[28]. Subarea L has been backfilled, contoured and vegetated. Subsequently, the FSS for the Subarea L surface soils was completed and the FSSR was submitted to the NRC on July 27, 1998[29]. Subarea L represents approximately 5-acres.

The FSSR for Subarea O (Subsurface) was submitted to the NRC in March 1998[30]. Subsequent to the submittal of the FSSR for Subarea O (Subsurface), a FSS was performed on the surface soils with the results presented in the February 1999[31] FSSR.

Subarea O represents approximately 6.4 acres. By letter dated March 1, 1999[20], the NRC staff notified Cimarron that they have no further questions concerning the Subarea O (Subsurface) FSSR. Another subarea recently addressed by Cimarron personnel was Subarea M, which is shown on Drawing No. 95MOST-RF3 and represents approximately 2.5 acres. The Subarea M FSS has been completed and the results were presented in the December 1998 FSSR[32].

Final Status Survey Report preparation for Subareas K and N are in progress.

3.0 DECOMMISSIONING ACTIVITIES

The purpose of this section is to discuss briefly the status of the site decommissioning activities for Subarea I and to present the radiological criteria and guideline values utilized throughout the remediation and final status survey. Subarea I includes the former Warehouse Building #4 that was first converted to coal liquefaction research and then to titanium dioxide (TiO_2) research. Additionally, within this subarea are the Emergency Building, affected open land areas, and unaffected open land areas. Also included in this section is a discussion of the characterization data and remediation performed in the open land areas and on the buildings located within Subarea I.

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 with an average enrichment above the naturally occurring level of approximately 2.7 weight percent. Thorium, although not considered a significant contaminant of concern for this subarea, has been included in the soil and sediment analyses and reported on the data summary sheets along with the total uranium sample results.

3.2 Site Background Levels

3.2.1 Soils

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. Cimarron personnel collected, analyzed and performed a statistical evaluation on 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 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 uranium 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. This evaluation was submitted to the NRC staff in Cimarron's June 1995 letter[33]. Based upon this sampling event, 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.

3.2.2 Exposure Rate

Background exposure rates have been established by Cimarron 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. Exposure rates of approximately 7 to 10 μR/h have been observed in background areas by Cimarron personnel utilizing Ludlum micro-R survey meters. In addition, site background exposure rates were measured by ORAU (now ORISE) personnel utilizing a PIC[34], and were determined to be 9 to 10 μR/h.

Cimarron personnel performed exposure rate measurements at background locations along the site boundary 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 3.1. The average background as measured using the micro-R meter was 7.6 μR/h, and is about 15 percent less than the average for the PIC measurements of 9.0 μR/h. Cimarron had used 7 μR/h as representative of the average background exposure rate for micro-R measurements. Recently, Cimarron began sending their micro-R-meters off-site for calibration by the manufacturer. With this change in calibration procedure, measurements at background locations were taken for comparison to the PIC. This data also is presented in Table 3.1 and illustrates an increase in the average measured background of approximately 2 μR/h. Based upon this data, Cimarron now uses 9 μR/h as representative of background exposure rates for micro-R measurements taken with the off-site calibrated meters. Table 3.1 demonstrates good agreement between the micro-R measurements and the PIC measurements.

TABLE 3.1

Sample ID No.	Grid Location	Micro-R Reading (μR/h)	PIC Reading (μR/h)	Micro-R Reading μR/h*
UAF-BKG-1	819W-81N	9	9.8	10
UAF-BKG-7	1600E-120N	7	7.6	7.5
UAF-BKG-11	840W-700S	8	9.5	10
UAF-BKG-13	840W-288S	9	9.8	10.5
UAF-BKG-16	808W-282N	8	9.7	9.5
UAF-BKG-19	640W-700S	9	10.5	11
UAF-BKG-23	1610E-300S	5	7.8	7.5
UAF-BKG-25	1610E-69N	6	7.6	8
UAF-BKG-27	1610E-469N	7	7.8	8.5
UAF-BKG-28	1610E-634N	8	9.6	9.5
	AVERAGE	**7.6 ± 2.7 (2σ)**	**9.0 ± 2.3 (2σ)**	**9.2 ± 2.8 (2σ)**

*Background survey results taken with instruments now calibrated off-site by manufacturer.

3.3 Characterization Data

Throughout the decommissioning process at the Cimarron site, a survey unit was characterized, remediated (if required), and then a final status survey was performed. The description of the decommissioning activities and final status survey data were then submitted to the NRC for review and approval (i.e., FSSR). After review of the final status survey report, the NRC either released the unit, performed confirmatory survey with staff personnel, or contracted with ORISE to perform a confirmatory survey. Based upon the confirmatory survey (if requested by the NRC), the NRC would either release the unit or require additional characterization and/or remediation.

For discussion and data presentation, Subarea I has been divided into survey units (for reference see drawing 95MOST-RF3) as follows:

- Affected Area Surrounding Warehouse (TiO_2) Building #4;
- Warehouse (TiO_2) Building #4 Interior;
- Warehouse (TiO_2) Building #4 Exterior;
- Pu-Plant Building Exterior;
- Affected Area Surrounding Pu-Plant Building;
- Unaffected Areas including; (1) parking lot and grassy areas West and South of the Pu-Plant yard; and (2) the open land area separating Subareas K and N from Subarea A;
- Emergency Building Interior;
- Emergency Building Exterior; and
- Affected Area South of U-Plant Yard including:
  - Surface area soil samples;
  - Drainage way soil samples, and
  - Subsurface soil samples.

Since several of these survey units contained both buildings and/or structures (either interior or exterior) and open land areas, further segregation of the survey data was required prior to performing the statistical evaluation for demonstrating that the established release criteria had been met. This segregation is delineated on Drawing No. 99MOST-RF4 included in Appendix 1. For example, survey data for fences were evaluated separate from the survey data for an open land area. The segregation of the survey data is discussed below and in Section 5.2.1.

3.3.1 Affected Area Surrounding Warehouse (TiO_2) Building #4

The restricted area surrounding Warehouse Building #4 has been extensively characterized and remediated. A random soil sampling program was undertaken in late 1989, with the analysis completed by February 1, 1990. The soil sampling program included corings taken from 0 to 2 ft. in this area. In order to further characterize this area, in 1993 an extensive soil sampling program was completed on a 5m x 5m grid to depths of 0 to 4 ft. The analytical data was included in Section 13.0 of the 1994 Characterization Report[5], and showed residual levels of uranium in soil from background up to 208 pCi/g. This characterization data also was submitted to the NRC under separate cover in July 1993[35] as part of Kerr-McGee's request to install a titanium dioxide pilot plant on the Cimarron site utilizing the former Warehouse Building and land area north of this Building.

Based upon this characterization data, the area around the Warehouse Building was remediated prior to TiO_2 pilot plant construction. Twenty-seven locations were excavated to depths from 1 to 5 feet, with both BTP Option #2 and #4 soils removed. In general, the entire yard area surface was disturbed during the remediation process. Option #2 soils were placed in a stockpile, subsequently tested for total uranium, then placed into the on-site disposal cell. Option #4 soils were packaged and shipped to an off-site LLRW disposal facility.

Need survey results

Soil sampling was performed within each excavation and showed residual uranium varying from 5.5 to 32.4 pCi/g with a mean of 16.7 pCi/g. Subsequent to remediation, additional soil sampling was performed on the entire area at a depth of 0 to 6' at the 10m x 10m grid intersect locations. Seventy-seven soil samples were collected for the 10m x 10m sampling event, with analytical results varying from 4.2 to 28.9 pCi/g total uranium with a mean value of 14.8 pCi/g. All post remediation data was submitted to the NRC in September 1993 by letter[36] which confirmed a phone conversation between Dr. Ed Still, Vice President, Cimarron Corporation and Mr. Gary Comfort, NRC's project officer. In this letter Dr. Still stated: "Based on our telephone discussions, we understand this submittal and the data previously provided are adequate for confirming the radiological status of the soil around the Warehouse Building and that future soil borings will not be necessary. Cimarron is therefore proceeding with work related to installation of the titanium dioxide pilot plant we have described in earlier correspondence, to include pouring of concrete pads and walkways."

1) See 9/93 letter

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The area was backfilled soon after NRC's verbal approval. After backfilling, the surface soils were randomly sampled and surveyed. The survey data for the backfill soils were sent to the NRC in November 1993[37], along with confirmation that the area had been backfilled in preparation for installation of the TiO_2 pilot plant.

The former drain lines from the west side of the U-Building to the former East and West Sanitary Lagoons traversed through the Warehouse Building yard area. This drain serviced the U-Plant laboratory, restrooms and change rooms. In 1985, the East and West Sanitary Lagoons were removed from service in preparation for decommissioning. Prior to isolation, a new septic tank lateral field was installed at approximate 210N – 20E.

The facility's rest rooms were then connected to this septic tank and the original drain line was isolated.

In 1992, the drain line from the U-Plant building to the former Sanitary Lagoons was removed with the exception of a small section under the north-west corner of Warehouse Building #4. The interior of this drain line located under the Building and the soils beneath the excavated drain line were surveyed. The drain line survey results are discussed in Section 15.0 in the Characterization Report. After sampling, this drain line excavation was backfilled. Additionally, the entire yard area traversed by this drain line was included in the 1993 5m x 5m depth sampling and remediation event and the follow-up 10m x 10m grid sampling. As noted, with permission from the NRC, the entire yard area was backfilled and graded in 1993. Cimarron considers the subsurface soils released from license. However, for the FSS, these surface soils were surveyed at a frequency equivalent to the guidance contained in NUREG/CR-5849. This survey unit has been treated as an affected area with the FSS data presented in Section 5.2.1.

See CR for results

No not until License is amended to release them

Also, included with this survey unit are the walkways and concrete pads installed at part of the pilot plant studies and the fencing remaining around the perimeter of the Warehouse yard area. The concrete was surveyed as an unaffected structure and the fencing as an affected structure.

3.3.2 Warehouse (TiO_2) Building #4 – Interior

Warehouse Building #4 is a sheet-metal building (50 ft. x 160 ft.) which was never used to process radioactive materials. However, cladded fuel assemblies were inspected and packaged for a short period of time within this building. Cimarron personnel requested permission from the NRC on September 18, 1979 to use the building for pilot plant coal liquefraction research. Approval was granted on December 28, 1979 by the NRC[38]. However, a license amendment was not issued. This building remained under Uranium License SNM-928. The NRC's December approval letter stated:

Check this letter 12/28/79

> "We agree with your proposal to decontaminate the building to below the NRC guidelines for release for unrestricted use prior to using it for non-nuclear activities; however, we will not eliminate this area as a place of use under our license since it is an integral part of the Cimarron facilities".

Final release surveys were completed on the inside surface of this building in 1980. The results of the floor survey showed an average fixed activity of 500 dpm/100 cm^2 gross alpha. The walls, fixtures and other surfaces showed an average fixed activity of less than 500 dpm/100 cm^2 gross alpha with a maximum fixed activity of 2,500 dpm/100 cm^2 gross alpha. The NRC gave approval on March 28, 1980[39] to use the Warehouse Building for non-nuclear purposes.

The survey conducted in 1980 was for gross alpha only. Additional surveys were conducted on the inside surface of the building in 1993 for both gross alpha and gross beta-gamma. This survey revealed several small areas with elevated levels of beta activity in the concrete floor which required decontamination. The gross beta

contamination was located at the entrance to the Warehouse Building near the south exit door. The contamination was ostensibly tracked into the Warehouse Building from the Uranium Yard Area and from the Uranium Building during site operations. Subsequent to the 1993 survey, the three small areas were decontaminated utilizing a needle gun and then re-surveyed. After decontamination, the beta-gamma activities ranged from an average of 760 dpm/100 cm^2 to a maximum of 1,430 dpm/100 cm^2. The gross alpha survey performed at the same time showed a maximum fixed activity of 500 dpm/100 cm^2 and an average of 200 dpm/100 cm^2.

As discussed, this Warehouse Building was utilized for a bench scale coal liquefraction development project for several years from 1980 through 1984, at which time it was shutdown. After remediation of the Warehouse yard area in 1993, and with NRC approval, the TiO_2 equipment was installed in 1994 inside the Warehouse Building and on concrete pads added just north of the Warehouse. This equipment is still located on site and is in use.

As discussed in the NRC approved Final Status Survey Plan for Phase II Areas; the interior of the Warehouse Building will be treated as an unaffected area for this FSS with the exception of the floor area near the south entrance to the warehouse which was classified an affected area. The FSS for this unit is further discussed in Section 5.2.2.

Check Phase II FSSP -End

3.3.3 Warehouse (TiO_2) Building #4 – Exterior

The exterior of this building was included in the 1980 gross alpha survey which found several areas on the roof which required decontamination. Additionally, the building exterior was included in the 1993 beta-gamma survey in an effort to further characterize the residual contamination present prior to installation of the TiO_2 process. Based upon the 1993 survey data, Cimarron performed additional decontamination on the roof panels and classified a portion of the roof of the Warehouse an affected area. The exterior walls were classified as an unaffected area for the FSS. The FSS for this survey unit is discussed in Section 5.2.3.

3.3.4 Pu-Plant Building Exterior

The Pu-Plant was licensed under License No. SNM-1174, which was terminated by the NRC on February 5, 1993[2]. This license termination was in response to the request submitted to the NRC by Cimarron Corproation[3]. The following was stated in the February 5, 1993 NRC letter:

> "The staff has determined that (1) all special nuclear material relating to this license has been properly disposed, (2) reasonable effort has been made to eliminate residual radioactive contamination, and (3) a radiation survey has been performed, and confirmed by the NRC, which demonstrates that the premises are suitable for release for unrestricted use."

A detailed confirmatory survey was performed on the Pu-Plant and all associated areas by ORAU, and included measurements for both plutonium and uranium in soil samples and surface activities on the building exterior, walkways, and other miscellaneous surfaces. The confirmatory survey included gross alpha and gross beta-gamma measurements of fixed and removable contamination levels, exposure rate measurements, and the determination of radionuclide concentrations in soil, concrete, and paint samples. The Interim Confirmatory Survey Report was issued by ORAU on January 31, 1989[40] and the Final Confirmatory Survey Report was issued in January 1991[41]. The final report states the following: "Based on the results of the confirmatory survey, it is ORAU's opinion that the decontamination efforts have been successful in satisfying the guideline levels and that the licensee's documentation adequately and accurately describes the final radiological status of the site." Based upon the ORAU survey, the NRC issued an Environmental Assessment and Finding of Significant Impact (FONSI) on February 5, 1993[42], to support the termination of License No. SNM-1174 for the Pu-Plant and associated areas at the Cimarron Facility. The FONSI and Notice of Opportunity for Hearing appeared in the Federal Register on February 12, 1993[43]. The following section appears in item (2) and (3) on page 8432 of this Federal Register notice:

> "(2) There is limited contamination of the surrounding soils. The average uranium content of the exterior soils is two to three times background levels but about two orders of magnitude below NRC soil guidelines for disposition of contaminated soils with no restrictions. The average plutonium content of the exterior soils is indistinguishable from background and over two orders of magnitude below NRC soil guidelines for disposition of contaminated soil with no restrictions.
>
> (3) The surface contamination levels of plant interior and exterior surfaces are, on the average, three orders of magnitude below NRC decontamination guidelines."

Based upon the confirmatory survey and finding of no significant impact, License No. SNM-1174 was terminated in 1993[4]. Cimarron believes that the confirmatory survey, completed as a prerequisite to the termination of License SNM-1174, adequately addressed the residual concentrations of radionuclide, including total uranium, on the exterior of the Pu-Plant. Thus, this building exterior was not included in any additional final status surveys.

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3.3.5 Affected Area Surrounding Pu-Plant Building

As discussed in Section 3.3.4, the Pu-Plant yard was included in the final ORAU Confirmatory Survey Report issued in January 1991. As noted in Section 3.3.4, the NRC stated in the FONSI that, "[T]he average uranium content of the exterior soils is two to three times background levels but about two orders of magnitude below NRC soil guidelines. . ." Even though the confirmatory survey completed by ORAU in 1988 showed that the Pu-Plant yard soils were acceptable for free release, Cimarron elected to survey the yard as an affected area for this FSS. The reason for classifying this survey unit affected was based upon preliminary characterization data that identified several

locations with elevated total uranium activity. Based upon the preliminary survey, several locations within this survey unit were subsequently remediated; the areas remediated and FSS data for this unit are discussed in Section 5.2.4.1.

Also included with this survey unit is the fencing still remaining around the perimeter of this affected area survey unit. The fencing was surveyed for both gross alpha and gross beta-gamma with the results discussed in Section 5.2.4.2.

3.3.6 Unaffected Areas

The open land area which includes the U-Plant parking lot and the grassy areas west and south of the Pu-Plant yard and south of Subareas K and N are classified as unaffected areas. Limited data was presented in the Characterization Report[5] for these areas with the exception of the parking lot west of the U-Plant Building. Data was collected from twenty-six locations in 1990 at soil sample increments of 0-6", 6"-1', 1'-2', 2'-3' and 3'-4'. The samples were analyzed for total uranium and showed residual activity varying from 7 to 20 pCi/g with a mean of 12.0 pCi/g. Also, systematic surveys were collected at the 10m x 10m grid intersects for the parking lot using both shielded NaI and micro-R meters. This data was discussed in Section 6.0 of the Characterization Report[5].

It should be noted that in 1990, the on-site counter was calibrated to reflect the higher concentrations in soil expected during the remediation phase of site decommissioning. As remediation has progressed, the computer-based spectrum analysis capabilities for the on-site counter has been enhanced to mirror the lower concentrations in residual activity encountered in performing the final status surveys. A comparison between the 1990 data and the more recent soil analytical data along with the FSS for this unit are discussed in Section 5.2.5.1. The data comparison shows a high bias for the 1990 characterization data.

Also included with this survey unit is the fencing remaining at various locations throughout the unaffected area. The fencing was surveyed for both gross alpha and gross beta-gamma with the results discussed in Section 5.2.5.2.

3.3.7 Emergency Building Interior

This building, during facility operations, housed the site emergency coordinator, records, emergency supplies, and emergency decontamination showers. This unit was surveyed as an affected area in accordance with the Phase II FSSP. The FSS for this unit is discussed in Section 5.2.6.

3.3.8 Emergency Building Exterior

This building is surrounded by an unaffected area. Thus the exterior of the building was surveyed as an unaffected area. The FSS for this unit is discussed in Section 5.2.7.

3.3.9 Affected Area South of U-Plant Yard

This area received drainage from the U-Plant yard area and thus has been designated an affected area for the FSS. This area received limited characterization surveying in 1990 when general area soil samples were collected on a ten meter grid to a depth of 4 feet for total uranium analysis. The analytical results which were presented in the Characterization Report showed two surface locations with residual activity at 47 pCi/g total uranium. These two locations at 20N-100E and 20N-120E were remediated prior to the FSS. Also, at 20N-130E at a dept of 1' – 2', the sample result showed a residual total uranium activity in soil of 58 pCi/g. This location also was remediated prior to the FSS. The FSS for this unit is discussed in Section 5.2.8.

3.4 Environmental Monitoring Data

As previously discussed with the NRC's staff, Cimarron Corporation has committed to address groundwater for the site in a separate report. This report is titled, "Decommissioning Plan – Groundwater Evaluation Report", and was submitted to the NRC in July 1998[44]. This Groundwater Evaluation Report summarizes the site environmental data, presents trending analyses and a dose assessment, and commits to a plan for resolving the issues associated with elevated residual groundwater radionuclide concentrations. Per discussions held at NRC headquarters on January 11, 1999, and by letter dated January 19, 1999[45], the NRC approved a groundwater criteria of 180 pCi/l for total uranium. ~~There are four~~ monitoring wells located within Subarea I; the wells are #1322, #1323, #1327B, and #1330. None of the wells within Subarea I contain total uranium concentrations in groundwater exceeding the criteria as prescribed in NRC's January 1999 letter.

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4.0 FINAL STATUS SURVEY PROCEDURE

The purpose of this section is to discuss the methodology utilized for the collection of the survey and soil sampling data presented as FSS data in this report, and to discuss the radiological guideline values utilized for comparison to the FSS data. The FSS data were used to demonstrate that the applicable radiological parameters (i.e., guideline values) were satisfied for release of Subarea I from License SNM-928. The guideline values utilized for comparison to the FSS data are described in this section.

In general, for Phase II areas, Cimarron Corporation has committed to follow the methodology prescribed in NUREG/CR-5849[46] and as approved in the Phase II FSSP for performing the FSS. This report includes all necessary data to support the FSS for the soils and building contained within Subarea I and the release for unrestricted use of Subarea I from License SNM-928.

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 at 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

Subarea I was subdivided into the 100m x 100m grid pattern shown on Drawing No 95MOST-RF3. The 100m x 100m grids were further subdivided for affected area surveys into 10m x 10m grids. For systematic surveys, the 10m grids were further subdivided into 5m x 5m grids. The 5m x 5m grids were utilized for locating survey and soil sampling points for this FSS. 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 and has been tied into a permanent marker for future reference.

For a building designated as an affected area the interior and exterior were divided into either 1m x 1m or 2m x 2m grids for locating survey points. The GPS unit was used only to locate the corners of the building and not for locating the actual surveys on the building surfaces.

4.1.2 Survey Procedure (Open Land Areas)

In general, the Subarea I open land affected areas were 100% scanned utilizing a 3" x 1/2" unshielded NaI detector. The specific instruments used were selected by the RSO/Health Physics Supervisor.

Each 5m x 5m grid was surveyed by technicians by traversing back and forth within the grid. Each traverse performed by the technician covered an area approximately 2 meters in width. The highest reading found within each grid area 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, at the intersect of each 5m x 5m 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 or unshielded 3" x 1/2" NaI detector was performed and documented.

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" NaI Detector	3	Gamma	0 – 5,000 μR/h	7 μR/h- 9 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" NaI Scintillation (43-82) Digital Scaler (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" NaI (Tl) Detector	1	Gamma	---	4 pCi/g Total U 1.5 pCi/g Th (Nat)	4% 15%	5 pCi/g U (5min. count) 0.6 pCi/g Th (Nat) (5min. count) 3 pCi/g U (15min. count) 0.3 pCi/g Th (Nat) (15min. count)
100 cm^2 gas flow (43-68) Digital Scaler (Ludlum 2220/2221)	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	0.5 μR/h (10min. count)

*(Cushing Instrument available for Cimarron Use)

4.1.3 Soil Sampling Procedure

The soil sampling frequency was specified in the Cimarron Special Work Permit(s) and Work Plan(s). Where practicable, systematic surface soil samples were collected at each 5m x 5m grid intersect location. All soil samples collected were analyzed for total uranium and natural thorium using the on-site soil counter. Any locations found exceeding the soil guideline values for affected areas as discussed in Section 4.2.2 were investigated further.

4.1.4 Survey Buildings and Structures

If characterization surveys showed that the upper interior surfaces and exterior surfaces were not expected to contain residual activity that exceeds 25% of the guideline value, then the surfaces were 10% scanned as an unaffected structure for alpha and beta-gamma. Additionally, a minimum of thirty random locations were selected for systematic surveys.

In general, for affected surfaces, the interior floors, lower walls, and external roof panels were 100% scanned for alpha and beta-gamma. Areas of elevated activity which were identified during the scan were further surveyed with direct measurements to define the extent and activity levels. Remediation was performed if guideline values (Table 1 of NRC's 1987 guidance) were exceeded; areas were then resurveyed as necessary.

Systematic surveys (fixed surveys and smear surveys) for alpha and beta-gamma were performed at a spacing equivalent to a maximum of a 2m x 2m grid on the floor, lower walls, and roof panels. Systematic micro-R measurements also were taken at one meter from the floor at a frequency equivalent to one measurement per every 4 m^2 (i.e., 2m x 2m grid) of surface area.

4.2 Radiological Guideline Values

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

4.2.1 Buildings and Equipment

The unconditional release limits for surface contamination on buildings and fixtures are in compliance with Facility License SNM-928, and are 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"[47]. Residual activity exceeding 15,000 dpm/100 cm^2 were remediated and follow-up surveys performed. Areas of elevated activity between 5,000 and 15,000 dpm/100 cm^2 were tested in accordance with NUREG-5849, Section 8.5.2, to assure that the average surface activity level within a contiguous 1 m^2 area containing the elevated areas was less than 5,000 dpm/100 cm^2.

Unaffected areas that show surface reading above 25% of the guideline values were evaluated to determine if the general area should be reclassified as an affected area. For

example, a survey reading, either from a scan or fixed survey above 1,250 dpm/100 cm^2 (i.e., 25% of the surface guideline value of 5,000 dpm/100 cm^2) would be evaluated. Additionally, the average exposure rate guideline values as measured at 1 meter from the surface for internal building surfaces is 5μR/h above background. Subarea I contains three buildings, fencing, and light poles surveyed in accordance with the August 1987 NRC Guidance.

4.2.2 Volumetric Activity of Soil

For Subarea I, the unrestricted release guideline value for residual concentrations of total uranium, which may remain in the soil for unrestricted release is specified as BTP[48] Option #1 material. For enriched uranium, as specified in Table 2 of the BTP, the Option #1 limit is 30 pCi/g total uranium above background. The average total uranium background concentration has been established at 4 pCi/g[33]. The maximum enriched uranium soil concentration within any 10m x 10m grid area may not exceed three times the BTP Option #1 limit (i.e., 90 pCi/g total uranium) above background. Systematic soil sampling was performed within each 10m x 10m grid area to determine the average residual total uranium concentration. 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 5m x 5m grid intersect. Areas of elevated activity were determined based upon discrete sampling within the grid or were assumed to have a constant value (e.g., 25m^2 based upon 5m x 5m grid sampling frequency). The average value for the 10m x 10m grid then was compared to the BTP Option #1 guideline value of 30 pCi/g total uranium above background. Remediation or hot spot averaging was performed for each individual location which contained average total uranium concentrations in excess of 30 pCi/g above background as described in NUREG/CR-5849. Areas of elevated activity not remediated between one and three times the guideline value were tested to assure that the average concentration was less than $(100/A)^{1/2}$ times the guideline value, where "A" is the area of elevated activity in m^2.

The Option #1 unconditional release guideline value for residual concentrations of natural 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 Instruments, Inc., Cimarron decided to use the 3" x 0.5" NaI detector for general area scans. This system is one of the more sensitive field detection instruments available to Cimarron.

Since the inception of Cimarron's site decommissioning, twice background has been used as the guideline for scan surveys when utilizing the 3" x 0.5" NaI detector. Survey

readings above this guideline indicate an area requiring additional investigation. 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 measure. This qualitative guideline was included in the Phase I Final Status Survey Plan[7], Phase I Final Status Survey Report[10], and the Phase II Final Status Survey Plan[12] just to name a few of the documents where this guideline was addressed and approved by NRC staff for this site.

Twice background (as noted in Section 6.4.2 of NUREG/CR-5849) is at the lower 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. The guideline value of twice background provides 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 increase above background). This discernable audible response alerts the surveyor to momentarily stop moving the probe (i.e., 2 to 3 seconds) and to further investigate the area. The survey instruments utilized at Cimarron indicate changes in radioactivity levels via either a higher or lower pitch. These changes in pitch are easier to detect rather than simply noting an audible change in the count rate.

The unshielded detector was utilized to perform the initial 100% surface scan survey for Subarea I open land areas to identify regions or areas of slightly elevated activity. Also, the shielded or unshielded detector was utilized for systematic surveys at each grid intersect to identify elevated areas. As stated above, this instrument is only utilized for qualitative measurements. Quantitative measurements of residual contamination levels in soil are performed with the Cimarron soil counter. Additionally, daily "background" surveys are taken prior to performing surveys within a survey unit. These average daily "backgrounds" are listed on the data tables and drawings and were used for comparison to the guideline (i.e., twice background).

4.2.4 Exposure Rate Survey

The average exposure rate for Subarea I open land areas to be released for unrestricted use is 10 μR/h above background, at 1 meter above the surface. This includes paved surfaces and building exteriors. 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 in the past measured 7 μR/h as the average background exposure rate. However, as discussed in Section 3.2.2, since sending their micro-R meters off-site for calibration by the manufacturer, Cimarron has demonstrated that 9 μR/h is representative of the average

background exposure rate for micro-R measurements. The tables and drawings included in the Appendices provide the average background for the micro-R meter used in developing the tabulated survey data. A background of 7 μR/h indicates that the instrument utilized for performing the survey was calibrated on-site; and likewise a background of 9 μR/h indicates calibration off-site.

The average exposure rate guideline value as measured at 1 meter from the surface for internal building surfaces is 5 μR/h above background. Residual activity which exceeded 3 times the guideline values, resulting in external radiation in excess of 2 times the guideline values above background at 1 m from the surface, or resulted in an average activity above the guideline value in any contiguous 1 m^2 for internal building surfaces was remediated until these conditions were satisfied.

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 FSS. The SWP and/or WP for Subarea I specified the type of instrumentation to be utilized in performing the FSS.

4.3.1 Equipment and Instrumentation

The instrumentation utilized to generate the FSS 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, "Radiation Protection Instrumentation Test and Calibration[49]". 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 responses to the NRC letter dated May 13, 1998[50].

With the exception of the exposure rate 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. Portable survey instruments are calibrated on a quarterly basis. The exposure rate instruments are sent off-site for vendor calibration on a semi-annual basis. Where applicable, activities of sources utilized for on-site calibration are corrected for decay. In addition to the periodic calibration requirements, source response checks are performed on a daily basis for all instruments being utilized during characterization, remediation and final status survey work.

All calibration and source check records are completed, reviewed, signed-off and retained in accordance with the Cimarron Quality Assurance Program. 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 all 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 normally 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.

Confirmatory measurements are obtained routinely to provide information concerning any measurement bias. These comparisons or confirmatory measurements are made using a pressurized ion chamber. Confirmatory measurements for Subarea I are included in Table 4.2 and show results indicative of site background for Micro-R meters calibrated off-site.

TABLE 4.2
CONFIRMATORY MEASUREMENTS
(Readings 1 Meter Above Grade)

Reading Location	Micro-R Reading (μR/h)	PIC Reading (μR/h)
82N-20N	8.5	8.3
150N-40E	8.5	8.5
180N-45E	8.5	8.8
200N-95E	9.0	8.8
165N-85E	9.0	9.1
135N-105E	7.5	7.9
Average	**8.5**	**8.6**

4.3.1.4 Gross Alpha/Beta Detector

Surface activity measurements for gross beta-gamma were obtained using a Ludlum Model 2221 with a Model 43-68 gas proportional probe, or equivalent (e.g., Ludlum Model 43-89). Gross alpha surface scans were obtained using an Eberline Model PRM-6 with an Eberline Model AS-15 probe.

4.3.1.5 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 activity based upon the U-235 activity measured in the soil sample. The U-234 and U-235 activities are summed with the detected U-238 activity to obtain the total U activity. 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.

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 cards 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 response to the NRC's comments on Subarea J[50].

Cimarron personnel determine uranium and thorium activities in soil 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.

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 gross 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)[51]. 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 selected soil samples collected during ORISE's site visit to investigate the South U-Yard[52], and DAP-3 stockpile[53] verified previously that Cimarron's on-site counter results are statistically identical to ORISE's results.

A more recent inspection by the NRC also confirmed Cimarron's Soil Counting system's ability to accurately measure total uranium concentrations in soil samples. On September 24, 1998, the NRC collected twelve (12) soils and sediment samples from Subarea J. The samples were first counted on the On-Site Counter by Cimarron and then shipped by NRC to their Region III laboratory for analyses. The November 3, 1998 Inspection Report[54] (i.e., Report No. 70-925/98-02) stated the following:

> "Overall, the NRC measurements confirmed that Subarea J soil and sediment had less than 30 pCi/g uranium. No significant bias or statistical errors between the licensee's soil and sediment sample results and the NRC's results were identified. Licensee measurement methods and counting times were found to be acceptable."

4.4 Procedures/Plans

As discussed in Section 4.3, SWPs and WPs were written and approved prior to commencement of fieldwork 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 I FSS was performed by a survey team consisting of qualified personnel from the Cimarron Facility. The FSS 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. 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 Subarea I 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 FSS team attended an in-house training session on the SWP and WP prior to

commencement of work. All FSS 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 (QAP)

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 through independent 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 the applicable requirements of ASME NQA-1[55].

Written procedures designated as SWPs and WPs, are prepared, reviewed and approved for activities involved in carrying out the decommissioning process. The Subarea I 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 on a regular basis. The data review process verifies that approved QA/QC procedures have been followed. When identified, corrections to recognized deficiencies are performed in accordance with the QAP.

5.0 SURVEY FINDINGS

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

5.1 Data Evaluation

As discussed in NUREG/CR-5849, the guideline values for soil activity concentrations, surface activity, 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 were compared to the appropriate guideline values discussed in Section 4.2.

5.2 Comparison with Guideline Values

The FSS data for Subarea I was compared to the guideline value criteria and are discussed separately in this section. This section evaluates the data collected from both the scan and the systematic surveys performed at the grid intersects for open land area and building surfaces for Subarea I which is shown on Drawing No. 95MOST-RF3 (Appendix 1).

For Subarea I, daily average NaI detector backgrounds were determined for comparing either scan or systematic survey results to the guideline values. The detectors average background values for both NaI and micro-R detectors are listed for the systematic surveys on the data tables and on the drawings.

For discussion and comparison purposes the FSS data for Subarea I were divided into the survey units outlined in Section 3.3. Additionally, several of the survey units had distinct features that were surveyed as a sub-unit separate from the base survey unit. For example, the unaffected open land area was surveyed and the data evaluated separate from the walkways included within the unaffected area survey unit. The specific features are shown on Drawing 99MOST-RF4. The sub-units are discussed separately in the following sections.

5.2.1 Data Evaluation - Area Surrounding Warehouse (TiO_2) Building #4

5.2.1.1 Warehouse Building Open Land Area

The subsurface soils in this area were characterized, remediated, final surveyed and then backfilled and graded in 1993 prior to the installation of the TiO_2 pilot plant. As discussed in Section 3.3.1, based upon verbal permission from NRC staff in 1993, the remediated areas were released for backfilling. Thus only the surface soils were surveyed per NUREG/CR-5849 as part of the FSS of this unit. Prior to collecting the soil samples for the FSS, a 100% scan was performed on this survey unit with a shielded NaI detector; no locations were found that exceeded twice background. Surface soil samples were collected at each 5m x 5m grid location and analyzed for total uranium.

A total of 230 FSS surface soil samples were collected for analysis with soil sample analytical results ranging from 1 to 26 pCi/g total uranium. The mean value for all surface soil samples was 10.5 pCi/g total uranium, with a standard deviation of 4.8 pCi/g. The 95% confidence level value was 11.1 pCi/g, which is below the guideline value for total uranium. The soil sample locations and analytical results for total uranium are shown on Drawing No. 99POSIWASS-0. This drawing, the statistical analyses, and data tables are included in Appendix 2. Also, the soil sample analytical results for this survey unit showed natural thorium ranging from 1 pCi/g to 2 pCi/g. The mean value was 1.1 pCi/g natural thorium, with a standard deviation of 0.3 pCi/g thorium. The statistical analyses and data tables for the natural thorium soil sample data also are included in Appendix 2. In summary all soil measurements were below the Option #1 guideline for uranium and thorium.

Systematic surveys were performed during the FSS at the 230 grid intersects with 3" x 0.5" shielded NaI detectors and the μR meter. The exposure rates at the surface and at one meter above the surface, as measured using a μR/h meter, ranged from 6 to 13 μR/h, with the mean being 9 μR/h and from 6 to 12 μR/h, with a mean of 9 μR/h, respectively. All measured exposure rates were below the guideline value of 19 μR/h (i.e., 10 μR/h above the average background of 9 μR/h). The exposure rate data tables are included in Appendix 2. The ground level shielded NaI detector survey results for the grid intersect sample locations ranged from 1,500 to 4,820 CPM. All survey results were less than twice background with background at 2,500 CPM. The survey results are presented in tables included in Appendix 2.

This survey unit also includes a section of open land area less than 5m in width that was not sampled initially for the FSS because no 5m x 5m grid locations fall within the area. This area is located between 90N and 118N as shown on Drawing No. 99POSIWASS-0. As a separate sampling event, Cimarron did collect and analyze 15 soil samples from this small area. The analytical results showed a total uranium average of 15 pCi/g. This data was not included in the Appendix 2 tables for the Warehouse Building Open Land Area Survey Unit.

5.2.1.2 Warehouse Building Yard Concrete Pads

Numerous concrete pads were installed as part of the coal liquefaction and TiO_2 installations to provide access and foundation support of process equipment located within the open land area of the former Warehouse Building. These pads were surveyed as unaffected structures as part of the FSS since they were installed after U-Plant shutdown. A scan survey was completed on 10% of the concrete surfaces and systematic surveys were performed at thirty-two locations for gross alpha and beta-gamma surface activity. The beta-gamma scan survey results averaged 750 dpm/100 cm^2 with a maximum of 3,500 dpm/100 cm^2 and the systematic surveys ranged from 715 dpm/100 cm^2 to 1,991 dpm/100 cm^2 with a mean of 1,252.3 dpm/100 cm^2. The systematic alpha survey results ranged from 10 dpm/100 cm^2 to 700 dpm/100 cm^2 with a mean of 83.8 dpm/100 cm^2. Background for concrete was established for the March 1998 FSSR[19] for Subarea F Concrete had an average gross beta-gamma surface activity ranging from 278 dpm/100 cm^2 to 1,199 dpm/100 cm^2 with a mean of 800 dpm/100 cm^2. The maximum gross beta-gamma activities ranged from 649 dpm/100 cm^2 to 3,212 dpm/100 cm^2 with a mean of 1,520 dpm/100 cm^2. The average gross beta-gamma surface activities for these concrete pads are considered representative of background for the Cimarron Site. Micro-R survey results collected from the thirty-two random locations averaged from 5 μR/h to 12 μR/h which are representative of natural background. The survey locations are shown on Drawing No. 99POSIWAS-1. The statistical analysis and data tables for this unit are included in Appendix 3.

5.2.1.3 Warehouse Building Yard Drain Lines

As discussed in Section 3.3.1, the sanitary drain lines within this survey unit, that were an integral part of the U-Plant, have been removed from service, excavated and surveyed (both the drain lines and the excavation itself). One small section of the original sanitary

drain line (no longer in use) is still located beneath Warehouse Building #4. All excavations and surveys performed during the drain line removals involved sampling and surveys to demonstrate that Option #1 levels were achieved. The one small section of sanitary drain line located beneath Warehouse Building #4 has been decontaminated and surveyed for free releases. The survey was completed in March of 1993 and all of the survey results were below 2,000 dpm/100 cm^2 gross alpha. The sanitary drain line to the new septic drain field is currently in use.

5.2.1.4 Warehouse Building Yard Fencing

The chain link fence surrounding this survey unit was surveyed as an affected area structure. The vertical and horizontal support poles were 100% scanned for both alpha and beta-gamma surface activity with the recorded activity ranging from 0 to 4,646 dpm/100 cm^2 and the average surface activity recorded as 1,500 dpm/100 cm^2. Next, systematic measurements for surface activity including direct and smears were performed with measurements collected at one meter intervals along all fence supports, as noted on the "Typical Survey Pattern for Fencing" Figure included in Appendix 3. The general arrangement drawing for the fences surveyed, Drawing No. 99POSIWAS-2, is included in Appendix 3. A total of 510 locations were surveyed with the direct gross alpha measurements ranging from 0 to 1,738 dpm/100 cm^2, with a mean of 321.6 dpm/100 cm^2 and a standard deviation of 271.3 dpm/100 cm^2. The direct beta-gamma survey results ranged from 0 to 4,646 dpm/100 cm^2, with a mean of 1,159.4 dpm/100 cm^2 and a standard deviation of 883.4 dpm/100 cm^2. All survey results were below the guideline value of 5,000 dpm/100 cm^2. The survey results for removable activity were all below the guideline value of 25 dpm/100 cm^2. The survey data are included in tables located in Appendix 3.

5.2.2 Data Evaluation – Warehouse (TiO_2) Building #4 - Interior

As discussed in Section 3.3.2, this Building has been released by the NRC for non-nuclear purposes and thus is being treated as an unaffected area. For the FSS, scans and random systematic surveys for gross alpha and gross beta-gamma were performed on the interior walls and floors. A 10% gross beta-gamma scan was performed on accessible areas of the floor and lower walls up to two meters in height. The survey results for the inside wall scan averaged less than 532 dpm/100 cm^2 which is the MDA for the instrumentation used. The maximum surface activity recorded was 950 dpm/100 cm^2. For the interior walls, thirty random locations were systematic surveyed with the fixed alpha results varying from 0 to 90 dpm/100 cm^2, with a mean of 10.0 dpm/100 cm^2 and the beta-gamma results varying from 0 to 950 dpm/100 cm^2 with a mean of 134.0 dpm/100 cm^2. The survey results for removable activity were all at or below 10 dpm/100 cm^2. Additionally, micro-R surveys were taken at the 30 random locations at one meter with results ranging from 5 μR/h to 7 μR/h. The general arrangement drawing, Drawing No. 99POSIWAS-3, showing the location for the systematic surveys, is included in Appendix 4. The survey results are also included in tables located in Appendix 4.

Initially the floor of the Warehouse Building was scanned as an unaffected area with average beta-gamma survey results ranging from 650 dpm/100 cm^2 to 800 dpm/100 cm^2.

The maximum beta-gamma surface activity ranged from 1,000 dpm/100 cm^2 to 5,500 dpm/100 cm^2. With the detection during the scan survey of the elevated beta-gamma activity (i.e., 5,500 dpm/100 cm^2) near the south entrance to the Warehouse, Cimarron elected to further investigate this floor section and classify it an affected area. The area was 100% scanned with a beta-gamma detector and 85 locations were surveyed for fixed alpha and beta-gamma and for removable activity. The grid spacing for this survey was 1m x 1m, as shown on Drawing No. 99POSIWAS-4, included in Appendix 4. The fixed gross alpha survey results ranged from 0 to 380 dpm/100 cm^2 with a mean of 88.1 dpm/100 cm^2; the gross beta-gamma survey results ranged from 120 dpm/100 cm^2 to 3,450 dpm/100 cm^2 with a mean of 1,427.3 dpm/100 cm^2. For the scan location that showed a beta-gamma survey result of 5,500 dpm/100 cm^2, an additional investigation of the area floor was performed. Systematic surveys for beta-gamma surface activity were taken around this location and "hot spot" averaging was performed. The resulting average was 3,573 dpm/100 cm^2. All final survey results when "hot spot" averaged were below 5,000 dpm/100 cm^2. The survey results for removable activity were all at or below 12 dpm/100 cm^2. These FSS results are listed in tables included in Appendix 4.

As part of the remaining unaffected area survey of the building interior, thirty floor locations were systematically surveyed for alpha, beta-gamma, and micro-R. The survey locations are shown on Drawing No. 99POSIWAS-5. The fixed gross alpha results varied from 0 to 60 dpm/100 cm^2, with a mean of 19.7 dpm/100 cm^2 and the gross beta-gamma results varied from 0 to 1,804 dpm/100 cm^2 with a mean of 703.8 dpm/100 cm^2. The survey results for removable activity were all below 5 dpm/100 cm^2. Micro-R surveys were taken at each of the fixed locations with results ranging from 5 μr/h to 8 μr/h. These FSS results are listed in tables included in Appendix 4.

5.2.3 Data Evaluation – Warehouse (TiO_2) Building #4 - Exterior

As discussed in Section 3.3.3, the exterior of Warehouse Building #4 was treated as an unaffected area with the exception of the original roof panels. The high bay section of the Warehouse, including a new roof section, was installed after cessation of plant operations as part of the coal-liquefraction testing program. This section of the roof was not surveyed. The other larger section of the roof was surveyed as an affected areas and 100% scanned.

The preliminary scan survey on the roof panels showed several locations of residual contamination in excess of 5,000 dpm/100 cm^2. For the scan survey, the average activity was recorded at 2,000 dpm/100 cm^2 with a maximum surface activity of 8,000 dpm/100 cm^2. A total of eleven locations were identified with surface activity greater than 5,000 dpm/100 cm^2. Cimarron reclassified this roof section as an affected area. Additional surveys and follow-up decontamination was performed prior to the systematic surveys. After being classified as an affected area, a 100% scan was completed on the lower roof and systematic gross alpha and gross beta-gamma direct surveys (with corresponding smears) were performed on a 1m x 1m grid. The general arrangement for the grid survey locations are shown on Drawing No. 99POSIWAS-6 included in Appendix 5.

For the systematic survey of the roof panels, a total of 646 grid locations were surveyed for gross alpha and gross beta-gamma, both direct and smear readings were collected. The direct alpha surveys ranged from 30 dpm/100 cm^2 to 2,460 dpm/100 cm^2 with a mean of 715.3 dpm/100 cm^2 and a standard deviation of 421.7 dpm/100 cm^2. The beta-gamma surveys ranged from 0 to 5,900 dpm/100 cm^2 with a mean of 2,529.9 dpm/100 cm^2 and a standard deviation of 902.1 dpm/100 cm^2. The measured removable activities were all below 100 dpm/100 cm^2. The FSS results are listed in tables included in Appendix 5.

Four systematic survey locations had beta-gamma survey results greater than the 5,000 dpm/100 cm^2 guideline value and were "hot spot" averaged. The grid numbers, the initial survey results, and the "hot spot" average are shown in Table 5.1. All four locations averaged below the guideline value of 5,000 dpm/100 cm^2. The statistical evaluations for these locations are included in Appendix 5

TABLE 5.1

Grid No.	Initial Survey (dpm/100 cm^2)	"Hot Spot" Average (dpm/100 cm^2)
119	5,380	3,063
205	5,900	3,258
239	5,030	3,218
307	5,160	3,217

For the unaffected building side panels, a 10% beta-gamma scan was performed on the exterior walls up to two meters in height with all readings recorded as less than MDA. Additionally, systematic surveys for the side wall panels were performed at thirty random locations on the exterior wall panels for gross alpha and beta-gamma. The survey locations are shown on Drawing No. 99POSIWAS-7 included in Appendix 5. The fixed gross alpha survey results varied from 0 to 190 dpm/100 cm^2 with a mean of 64.7 and the fixed gross beta-gamma results varied from 0 to 530 dpm/100 cm^2 with a mean of 44.7 dpm/100 cm^2. For the scan and systematic surveys all readings were below 1,250 dpm/100 cm^2, which is 25% of the guideline value for an unaffected surface area. The micro-R survey results ranged from 4 μR/h to 9 μR/h. The survey results for removal activity were all at or below 12 dpm/100 cm^2. The micro-R survey results from the thirty random systematic locations were all below the guideline value of 19 μR/h (i.e., 10μR/h above the average background of 9 μR/h). The survey results are listed in tables included in Appendix 5.

5.2.4 Data Evaluation – Pu-Plant Building Yard

5.2.4.1 Pu-Plant Open Land Area

As discussed in Section 3.3.4, confirmatory surveys were performed on this unit in support of license termination for the Pu-Plant. The FONSI and Notice of Opportunity for Hearing included this statement:

"(2) There is limited contamination of the surrounding soils. The average uranium content of the exterior soils is two to three times background levels but about two orders of magnitude below NRC soil guidelines for disposition of contaminated soils with no restrictions. The average gamma dose rate at 1 meter above the soil is indistinguishable from background.

Although confirmatory surveys were performed by the NRC contractors for this survey unit, Cimarron elected to perform systematic surveys including surface soil sampling and surveys with portable instrumentation for verification of the previous results. These surveys were performed on a 5m x 5m grid.

The 100% scan survey performed with the shielded NaI detector and completed prior to the FSS, identified eight isolated locations with elevated surface activity that were further investigated. The residual contamination was located on the surface along the southeastern boundary of this survey unit and required remediation. The locations remediated, pre-remediation analytical results and post remediation final analytical results are tabulated below.

Table 5.2
Affected Area Pu-Plant-Yard

Sample Location	Pre-Remediation Analytical Results (pCi/g Total-U)	Post-Remediation Analytical Results (pCi/g Total-U)
5E-220N	49	9
15E-200N	32	5
20E-210N	43	5
15E-199N	31	8
20E-209N	44	9
20E-209N	32	8
21E-210N	197	5
21E-210N	66	5

With the remediation completed a total of 241 FSS surface soil samples were collected for analysis with soil sample analytical results ranging from 3 to 27 pCi/g total uranium. The mean value for all subsurface samples was 8.5 pCi/g total uranium, with a standard deviation of 3.1 pCi/g. The 95% confidence level value was 8.9 pCi/g, which is below the guideline value for total uranium. These survey results are presented on Drawing No. 99POSIPUSS-0 and are listed in tables included in Appendix 6. Also, the soil sample analytical results for this survey unit showed natural thorium ranging from 1 pCi/g to 3 pCi/g. The mean value was 1.3 pCi/g natural thorium, with a standard deviation of 0.5 pCi/g thorium. The statistical analyses for the natural thorium soil sample data also are included in Appendix 6.

Systematic surveys were performed during the FSS at the 241 grid intersects with 3" x 0.5" unshielded NaI detectors and the μR meter. The exposure rates at the surface and at one meter above the surface were measured using a μR meter, both ranged from 5 μR/h to

10 μR/h with the mean being 8 μR/h and from 4 μR/h to 9 μR/h with the mean being 7 μR/h respectively. All measured exposure rates were below the guideline value of 19 μR/h (i.e., 10 μR/h above the average background of 9 μR/h). The exposure rate data tabulation is included in Appendix 6. The ground level unshielded NaI detector survey results for the grid intersect sample locations ranged from 4,418 to 10, 470 CPM. All survey results were less than twice average background with background recorded at 6,850 CPM. These survey results are included in Appendix 6

For the subsurface sampling, soil samples were collected at the locations and depths shown on Drawing Nos. 99POSIPUSS-1 thru 99POSIPUSS-5. Samples were collected and composited at intervals of 0-6", 6"-1', 1'-2', 2'-3' and 3'-4'. A total of 303 FSS subsurface soil samples were collected for analysis with soil sample analytical results ranging from 1 to 25 pCi/g total uranium. The mean value for all samples was 9.3 pCi/g total uranium, with a standard deviation of 3.5 pCi/g. The 95% confidence level value was 9.6 pCi/g, which is below the guideline value for total uranium. The sample analytical results are shown on the drawings and are listed in the tables included in Appendix 6. Also, the soil sample analytical results for this survey unit showed natural thorium ranging from 1 pCi/g to 2 pCi/g. The mean value was 1.5 pCi/g natural thorium, with a standard deviation of 0.5 pCi/g thorium. The statistical analyses for the natural thorium soil sample data also are included in Appendix 6.

5.2.4.2 Pu-Plant Fencing

The chain link fence surrounding this survey unit was surveyed as an affected area structure. The fencing included with this survey is shown on Drawing No. 99POSIPUS-1, included in Appendix 7. This Drawing also was used to reference the survey locations included in the data tables. The vertical and horizontal support poles were 100% scanned for gross beta-gamma surface activity with the average surface activity recorded as 1,500 dpm/100 cm^2 and the maximum recorded activity at 3,174 dpm/100 cm^2. Additionally, systematic measurements for surface activity were taken at one meter intervals along all fence supports. A total of 962 locations were surveyed with the direct gross alpha measurements ranging from 0 to 2,808 dpm/100 cm^2, with a mean of 317 dpm/100 cm^2 and a standard deviation of 256.7 dpm/100 cm^2. The direct gross beta-gamma survey results ranged from 0 to 4,209 dpm/100 cm^2, with a mean of 800.4 dpm/100 cm^2 and a standard deviation of 645.3 dpm/100 cm^2. All survey results were below the guideline value of 5,000 dpm/100 cm^2. The survey results for removal activity were all below 25 dpm/100 cm^2. The survey locations and data are included in tables located in Appendix 7.

5.2.4.3 Pu-Plant Light Poles

The light poles located within the Pu-Plant yard were surveyed as affected structures with 100% scans and systematic surveys being performed for the FSS. The location of these light poles are shown on Drawing No. 99POSIPUS-2. The 100% scan was performed for gross beta-gamma with the average surface activity recorded as 1,500 dpm/100 cm^2 and the maximum recorded activity at 2,585 dpm/100 cm^2. These results are below the guideline value of 5,000 dpm/100 cm^2. For the systematic survey, fixed and removable surveys were performed at 77 locations on the light poles. The survey locations on the

light poles are as noted on the "Survey Pattern Location" Figure included in Appendix 7. The fixed gross alpha survey results ranged from 0 to 372 dpm/100 cm^2 with a mean of 122.2 dpm/100 cm^2 and the gross beta-gamma results ranged from 0 to 2,587 dpm/100 cm^2 with a mean of 428.4 dpm/100 cm^2. Removable activity measurements were all at or below 12 dpm/100 cm^2. The survey locations result are presented in tables included in Appendix 7.

5.2.4.4 Affected Area Sidewalks

The sidewalks designated as affected areas located within the Pu-Plant yard and also the Warehouse yard were surveyed as affected open land areas and as one survey unit. The sidewalks included with the survey are shown on Drawing No. 99POSIPUS-3, included in Appendix 7. The sidewalks were 100% scanned for beta-gamma with the average surface activity recorded as 2,000 dpm/100 cm^2 and the maximum recorded activity at 2,900 dpm/100 cm^2. Next, systematic surveys were performed at 102 locations for fixed alpha and beta-gamma activity, removal activity and micro-R exposure. For the systematic survey, the fixed gross alpha survey results ranged from 0 to 300 dpm/100 cm^2 with a mean of 54.4 dpm/100 cm^2, and the fixed gross beta-gamma survey results ranged from 624 dpm/100 cm^2 to 1,610 dpm/100 cm^2 with a mean of 1,076.5 dpm/100 cm^2. Removable activity measurements were all at or below the 10 dpm/100 cm^2. Micro-R readings collected at each of the fixed locations ranged from 8 μR/h to 10 μR/h. The survey locations and results are presented in tables included in Appendix 7.

5.2.5 Data Evaluation – Unaffected Areas

5.2.5.1 "Open Land" Areas

The unaffected open land areas are shown on Drawing No. 95MOST-RF-3 included in Appendix 1. For this survey unit, the open land areas received a survey scan with the unshielded NaI detector which included 10% of all land surfaces. The results of this survey showed results from 4,890 CPM to 9,316 CPM with no reading in excess of the guideline value of twice background with background recorded at 6,200 CPM.

Additionally, thirty random surface soil samples (0 to 6 inches depth) were collected for analysis for total uranium, and the thirty random soil sample locations received systematic surveys with NaI and micro-R meters. The soil samples locations are shown on Drawing No. 99POSIUNSS-0 included in Appendix 8. The soil analytical results show total uranium varying from 3.4 to 11.1 pCi/g; all were below the guideline value for an unaffected area of 11.5 pCi/g total uranium. The sample mean for this data set is 7.2 pCi/g with a standard deviation 2.1 pCi/g total uranium. Appendix 8 includes the analytical results which are presented in tables and shown on Drawing No. 99POSUNSS-0.

Systematic surveys were performed during the FSS at the 30 grid intersects with the 3" x 0.5" unshielded NaI detectors and the μR meter. The exposure rates at the surface and at one meter above the surface, as measured using a μR meter, ranged from 5 to 10 μR/h

with the mean being 8 μR/h and from 6 to 10 μR/h, with a mean of 8 μR/h respectively. All measured exposure rates were below the guideline value of 19 μR/h (i.e., 10 μR/h above the average background of 9 μR/h). The exposure rate data tabulation is included in Appendix 8. The ground level unshielded NaI detector survey results for the grid intersect sample locations ranged from 5,676 to 9,696 CPM. All survey results were less than twice background with background recorded at 7,578 CPM. The survey results are included in Appendix 8.

As discussed in Section 3.3.6, numerous unaffected area locations were cored and soil sampled in 1990 for the characterization survey. The data was reported in the Characterization Report. Several of these previously sampled locations were again sampled for this FSS for comparison to the on-site counter analytical results. The data comparisons are shown below in Table 5.3.

Table 5.3

Grid Location	Depth	Original Sample Results (pCi/g Total-U)	1999 Sample Results (pCi/g Total-U)
50N-20E	0-6"	15	8.1
	6"-1'	9	7.0
	1'-2'	12	4.9
	2'-3'	10	6.7
	3'-4'	12	5.9
50N-30E	0-6"	16	10.4
	6"-1'	15	5.2
	1'-2'	9	6.5
	2'-3'	14	4.9
	3'-4'	10	5.4
70N-0E	0-6"	16	4.9
	6"-1'	15	8.4
	1'-2'	11	5.7
	2'-3'	11	5.4
	3'-4'	11	2.2
120N-0E	0-6"	16	4.8
	6"-1'	11	7.2
	1'-2'	11	2.0
	2'-3'	13	2.6
	3'-4'	10	2.6
120N–10E	0-6"	17	4.8
	6"-1'	10	1.7
	1'-2'	13	5.5
	2'-3'	15	4.0
	3'-4'	12	4.5
180N-30E	0-6"	20	21.3
	6"-1'	13	16.4
	1'-2'	13	11.1
	2'-3'	15	10.6
	3'-4'	10	7.8
AVERAGE		**12.8**	**6.6**

These results indicate that the soil counter, as anticipated, was biased high in 1990 when the original characterization survey was completed. In 1990, the on-site counter was calibrated to reflect the high concentrations in soil expected during the remediation phase of site decommissioning. As noted, the average high bias at the low uranium concentrations in soil was approximately 100%.

The location at 180N-30E, upon resample, still showed residual activity in soil above 25% of the guideline value. At this level, unaffected areas require further investigation. This location was included within a small "grassy" area just west of the Warehouse yard area as shown on Drawing No. 99POSIUNSS-1 included in Appendix 8. Because of the slightly elevated activity, Cimarron decided to perform extensive sampling of the small "grassy" area located between the rock drive and the asphalt parking lot and to classify it as an affected area. A total of 30 soil samples were collected from the surface and to a depth of 4 feet. The analytical results are shown on Drawing No.99POSIUNSS-1 and show total uranium varying from 3 to 29 pCi/g with a mean of 12.1 pCi/g. Since all results were below the affected area guideline of 34 pCi/g (i.e., 30 pCi/g + 4 pCi/g background) total uranium, no further sampling was performed. These survey results are included in Appendix 8.

This survey unit also included the paved parking lot, concrete walks, several light poles and fencing that were surveyed as unaffected. These survey results are discussed in the next four sections.

5.2.5.2 Unaffected Area Fencing

This unaffected area survey unit includes various fencing structures which were surveyed as part of this FSS. The fencing included with this survey are shown on Drawing No. 99POSIUNS-1, included in Appendix 9. The vertical and horizontal support poles were 10% scanned for gross beta-gamma surface activity. Additionally, systematic measurements, including direct and smears were collected at 322 locations on the support poles. The direct gross alpha measurements ranged from 0 to 473 dpm/100 cm^2 with a mean of 113.0 dpm/100 cm^2 and the gross beta-gamma survey results ranged from 0 to 1,541 dpm/100 cm^2 with a mean of 649.0 dpm/100 cm^2. All final survey results were below the guideline value of 1,250 dpm/100^2 with the exception of two locations with survey results of 1,311 dpm/100 cm^2 and 1,541 dpm/100 cm^2. These two locations also were identified during the scan survey and further evaluations showed them to be isolated locations. The survey results for removal activity were all below 30 dpm/100 cm^2. The survey locations and data are included in tables located in Appendix 9.

5.2.5.3 Unaffected Area Light Poles

The two parking lot light poles were surveyed as unaffected structures, a third pole had previously been removed. The locations of these light poles are shown on Drawing No. 99POSIUNS-2, included in Appendix 9. The light poles were scanned for gross beta-gamma and 26 random locations were systematically surveyed for surface activity. The systematic surveys consisted of fixed readings for gross alpha and gross beta-gamma and smears for removable surface activity. The general locations for the surveys are shown on

the "Survey Pattern Location" Figure included in Appendix 9. The fixed alpha survey results varied from 10 dpm/100 cm^2 to 820pm/100 cm^2 with a mean of 232.8 dpm/100 cm^2. The fixed beta-gamma survey results varied from 0 to 1,242 dpm/100 cm^2 with a mean of 603.2 dpm/100 cm^2. The survey results for removable activity were all below 20 dpm/100 cm^2. All survey results were below the guideline value for an unaffected structure. The survey data are included in tables located in Appendix 9.

5.2.5.4 Unaffected Area Paved Parking Lot

The parking area is located outside of the controlled area and was used by employees during site operations and is still in use. The parking lot was scanned as an unaffected area with an unshielded NaI detector; the survey results ranging from 4,518 CPM to 6,032 CPM, with all readings less than twice background. At the completion of the scan survey, 35 random systematic surveys were performed on the surface areas. The locations for the random surveys are shown on Drawing No. 99POSIUNS-3 included in Appendix 9. The systematic surveys consisted of fixed readings for gross alpha and gross beta-gamma and smear samples for removable surface activity. The fixed alpha survey results varied from 0 to 72 dpm/100 cm^2 with a mean of 21.9 dpm/100 cm^2 and fixed beta-gamma survey results varied from 80 dpm/100 cm^2 to 680 dpm/100 cm^2 with a mean of 428.3 dpm/100 cm^2. The survey results for removable activity were all below 10 dpm/100 cm^2. Additionally, NaI and micro-R readings were collected for each of the systematic survey locations. The shielded NaI survey results varied from 1,320 CPM to 2,480 CPM, with a mean of 1,989 CPM. Background was recorded at 1,400 CPM. The micro-R survey results ranged from 6 μR/h to 9 μR/h at the surface and from 6 μR/h to 10 μR/h at one meter. All survey results were below the guideline value. The statistical evaluation, data tables and drawing showing the location of the paved areas are included in Appendix 9.

5.2.5.5 Unaffected Area Concrete Walkways

These walkways are located at various locations throughout the unaffected area and were scanned and systematically surveyed as unaffected structures. The walkways included with this survey are shown on Drawing No. 99POSIUNS-4, included in Appendix 9. The sidewalks were scanned for beta-gamma surface activity with the average recorded activity ranging from 750 dpm/100 cm^2 to 1,100 dpm/100 cm^2. Next, thirty locations were randomly selected for performing systematic surveys. The fixed gross alpha survey results varied from 0 to 140 dpm/100 cm^2 with a mean of 72.7 dpm/100 cm^2 and the fixed beta-gamma survey results varied from 730 dpm/100 cm^2 to 1,180 dmp/100 cm^2 with a mean of 925.7 dpm/100 cm^2. The survey results for removable activity were all at or below 10 dpm/100 cm^2. The micro-R survey results ranged from 8 μR/h to 11 μR/h at one meter. All survey results were below the guideline values for an unaffected survey. The statistical evaluation, data tables and drawing showing the location of the walkways are included in Appendix 9.

5.2.6 Data Evaluation – Emergency Building Interior

This building was used to house the on-site soil counter and to store records and soil samples at varying periods since the suspension of site operations. This survey unit was

surveyed as an affected area. The floors and walls (up to 2 meters in height) were 100% scanned for gross alpha and gross beta-gamma. The entire surface areas where radioactive materials were stored and/or handled, including counter tops, sinks, drains, and shelving were scanned. The coverage for ceilings was dependent upon the number of locations of elevated activity (exceeding the guideline values) identified within the lower scanned areas. Since no areas of elevated activity were found, the upper walls and ceilings were 10% scanned and thirty randomly selected locations received systematic surveys.

In general, systematic measurements were performed on a 1m x 1m grid spacing on floors and lower wall with measurements recorded for both gross alpha and gross beta-gamma. Smears for removable surface activity were obtained at locations where direct measurements were taken. The FSS locations are shown on Drawing Nos. 99POSIEMS-1 thru 99POSIEMS-14 which are included in Appendix 10.

For the floor, a total of 166 grid locations were surveyed for gross alpha and gross beta-gamma, both direct and smear readings were collected. The direct alpha surveys ranged from 0 to 36 dpm/100 cm^2 with a mean of 8.0 dpm/100 cm^2 and a standard deviation of 11.0 dpm/100 cm^2. The beta-gamma survey results ranged from 0 to 891 dpm/100 cm^2, with a mean of 204.4 dpm/100 cm^2 and a standard deviation of 176.7 dpm/100 cm^2. The measurements of removable activity were all less than 10 dpm/100 cm^2.

For the lower walls, a total of 399 grid locations were surveyed for gross alpha and gross beta-gamma, both direct and smear reading was collected. The direct alpha surveys ranged from 0 to 72 dpm/100 cm^2 with a mean of 9.3 dpm/100 cm^2 and a standard deviation of 9.9 dpm/100 cm^2. The beta-gamma surveys ranged from 0 to 378 dpm/100 cm^2 with a mean of 9.4 dpm/100 cm^2 and a standard deviation of 27.9 dpm/100 cm^2. The measurements for removable activity were all less than 25 dpm/100 cm^2.

For the upper walls and ceilings a total of 30 random locations were surveyed. The direct alpha surveys ranged from 0 to 36 dpm/100 cm^2 with a mean of 10.9 dpm/100 cm^2 and a standard deviation of 10.1 dpm/100 cm^2. The beta-gamma surveys ranged from 0 to 288 dpm/100 cm^2 with a mean of 24.3 dpm/100 cm^2 and a standard deviation of 56.9 dpm/100 cm^2. The measurements for removable activity were all less than 12 dpm/100 cm^2.

The emergency building fixtures, which included counter tops, sinks, ventilation ductwork, and storage cabinets were surveyed as affected area structures. Both scan surveys and systematic surveys were collected. The 100% scan survey identified no locations exceeding the guideline value of 5,000 dpm/100 cm^2. For the systematic surveys, 116 locations were surveyed with direct alpha survey results ranging form 0 to 80 dpm/100 cm^2 with a mean of 6.5 dpm/100 cm^2 and the direct beta-gamma survey results ranging from 0 to 2,070 dpm/100 cm^2 with a mean of 81.0 dpm/100 cm^2. Removable activity survey results were all less than 25 dpm/100 cm^2. Tabulation of all the survey results and the statistical evaluations are included in Appendix 10.

5.2.7 Data Evaluation – Emergency Building Exterior

The exterior of this building was treated as an unaffected area. The exteriors of building surfaces typically have a low potential for residual contamination; however, there were several building exterior surfaces which were scan surveyed. The building roof, drainage points, window ledges, ventilation points, and entry doors were included in the 10% scan of the exterior surface. Systematic surface measurements would be performed at any elevated locations discovered during the scan surveying or at a minimum of thirty locations randomly selected on the roof, sides, and walls. Since no elevated locations were found during the scan, thirty random locations were selected for systematic surveys. The FSS locations for this unit are shown on Drawing Nos. 99POSIEMS-15 and 99POSIEMS-16, which are included in Appendix 11.

For the exterior walls and roof, a total of 30 random locations were surveyed for gross alpha and gross beta-gamma; both direct and smear readings were collected. The direct alpha survey results ranged from 18 to 162 dpm/100 cm^2 with a mean of 85.9 dpm/100 cm^2 and a standard deviation of 46.6 dpm/100 cm^2. The beta-gamma survey results ranged from 0 to 459 dpm/100 cm^2 with a mean of 101.8 and a standard deviation of 145.7 dpm/100 cm^2. The measurements of removable activity were all less than 25 dpm/100 cm^2. The FSS data for the random locations are tabulated in Appendix 11.

For both the exterior and interior of the Emergency Building μR surveys were taken at one-meter form the floors and walls. The survey locations and survey results are shown on Drawing No. 99POSIEMS-17, included in Appendix 11. The survey results ranged from 4 μR to 9 μR, with all results being below the guideline value.

The Emergency Building also had several small underground tanks that were associated with emergency decontamination and emergency site operations. These tanks were:

- Fresh Water Tank – supplied wash water for personnel decontamination purposes;
- Discharge Collection Holding Tank – used to collect discharge from personnel decontamination;
- Septic Tank – used by personnel manning the Emergency Building during periods when the building was occupied.

The Fresh Water Tank and Discharge Collection Holding Tank have been excavated and removed. The surveys performed on the interior of the tanks and the sludge sample collected from within the tank showed survey results representative of background. Also, five soil samples each were collected from within the excavated pits and showed total uranium ranging from 5.7 pCi/g to 8.7 pCi/g for the Fresh Water Tank and from 6.0 pCi/g to 13.1 pCi/g for the Holding Tank. These excavations have been backfilled.

The Septic Tank is still in operation. However, a sludge sample was collected from the tank and analyzed for total uranium. The analytical results show total uranium at 10.7 pCi/g.

5.2.8 Data Evaluation – Affected Drainage Area

This survey unit received drainage from the south U-yard area during plant operations. For this reason it has been surveyed as an affected area and has been divided into three data sets for FSS data presentation. The three data sets are listed as:

- Surface Area Survey Data;
- Drainage Way Survey Data; and
- Subsurface Survey Data.

For this survey unit, a 100% scan was performed on the open land area with an unshielded NaI detector for locating any area exceeding twice background. No reading exceeded the twice background guideline.

The Surface Area Survey included a total of 456 FSS soil samples collected for analysis with soil sample analytical results ranging from 3 pCi/g to 34 pCi/g total uranium (including background of 4 pCi/g total uranium). The mean value for all surface samples was 10.4 pCi/g total uranium, with a standard deviation of 4.2 pCi/g. The 95% confidence level value was 10.8 pCi/g, which is below the guideline value for total uranium. The soil sample analytical results are shown on Drawing No. 99POSISS-0 and in tables included in Appendix 12. Also, the soil sample analytical results for this subarea showed natural thorium ranging from 1 pCi/g to 2 pCi/g. The mean value was 1.4 pCi/g natural thorium, with a standard deviation of 0.5 pCi/g thorium.

Systematic surveys were performed during the FSS at the 456 grid intersects with 3" x 0.5" shielded NaI detectors and the μR meter. The exposure rates at the surface and at one meter above the surface, as measured using a μR/h meter, both ranged from 5 μR/h to 10 μR/h, with the mean being 8 μR/h. All measured exposure rates were below the guideline value of 19 μR/h (i.e., 10 μR/h above the average background of 9 μR/h). The exposure rate data tabulation is included in Appendix 12. The ground level unshielded NaI detector survey results for the grid intersect sample locations ranged from 4,980 to 10,624 CPM. All survey results were less than twice background which was recorded at 7,160 CPM. The survey results are included in Appendix 12.

For the Drainage Way Survey, a total of 30 FSS soil samples were collected for analysis with soil sample analytical results ranging from 5 pCi/g to 14 pCi/g total uranium. The mean value for all surface samples was 9.1 pCi/g total uranium, with a standard deviation of 2.1 pCi/g. The 95% confidence level value was 9.7 pCi/g, which is below the guideline value for total uranium. The soil sample locations and analytical results for total uranium are shown on Drawing No. 99POSISS-1, which is included in Appendix 12. Also, the soil sample analytical results for this subarea showed natural thorium ranging from 1 pCi/g to 2 pCi/g. The mean value was 1.2 pCi/g natural thorium. The soil sample analytical results are listed in tables included in Appendix 12.

For the Subsurface Sampling Survey, soil samples were collected at 5m x 5m grid intersects where possible based upon field conditions. Samples were collected and composited at intervals of 0-6", 6"-1', 1'-2', 2'-3', and 3'-4'.

A total of 90 FSS subsurface soil samples were collected for analysis with soil sample analytical results ranging from 2 to 29 pCi/g total uranium. The mean value for all subsurface samples was 9.0 pCi/g total uranium, with a standard deviation of 4.0 pCi/g. The 95% confidence level value was 9.7 pCi/g, which is below the guideline value for total uranium. The sample analytical results are listed in tables included in Appendix 12. The soil sample locations are shown on Drawing No. 99POSISS-2 which is included in Appendix 12. Also, the soil sample analytical results for this subarea showed natural thorium ranging from 1 pCi/g to 2 pCi/g. The mean value was 1.4 pCi/g natural thorium, with a standard deviation of 0.5 pCi/g thorium. The statistical analyses and data tables for both total uranium and natural thorium are included in Appendix 12.

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 fourteen 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 for this project was Core Laboratories and they participate in a national inter-comparison quality assurance program. The results for both off-site and on-site analysis are listed in Table 5.4. These sample results show good agreement.

Table 5.4
Area I – QA/QC Comparisons

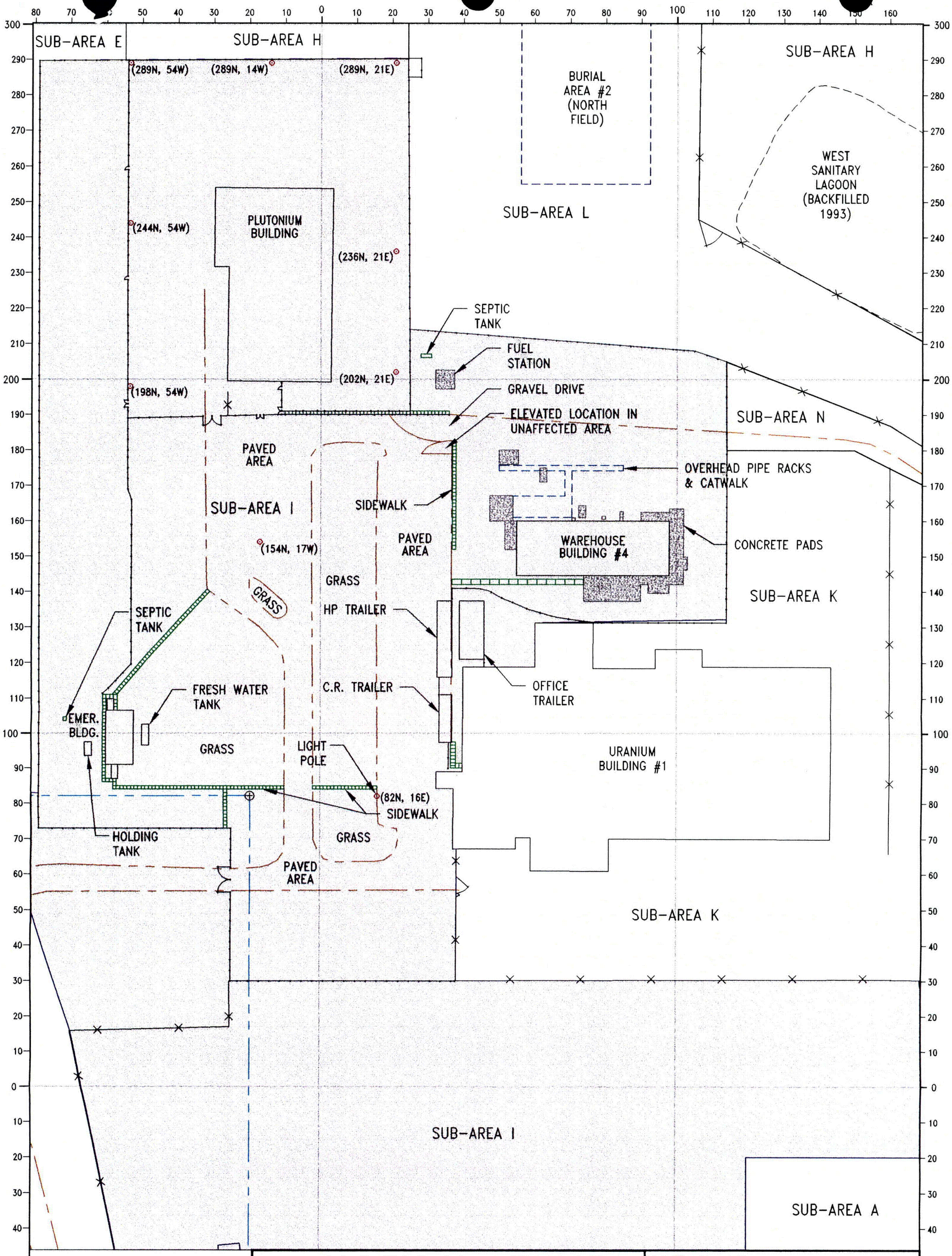
Sample ID No.	Cimarron (pCi/g Total-U)	Core Lab (pCi/g Total–U)
IU-02	6.0 ± 3.6	2.1 ± 1.6
IU-27	4.2 ± 3.7	1.4 ± 1.4
IA-905	184.0 ± 3.5	194.9 ± 22.5
IA-884	28.2 ± 2.9	27.0 ± 7.1
IA-899	42.1 ± 2.6	32.5 ± 7.9
IA-900	26.4 ± 2.4	26.6 ± 7.3
IA –906	54.2 ± 2.9	51.4 ± 10.8
IA-1217	78.9 ± 3.3	76.5 ± 15.3
IU-69	5.6 ± 2.1	7.8 ± 2.7
IU-75	4.1 ± 1.6	4.1 ± 1.7
IU-88	2.6 ± 2.1	1.3 ± 0.9
IU-93	3.4 ± 2.1	1.9 ± 1.3
IU-94	22.5 ± 2.2	27.5 ± 6.3
IU-95	17.4 ± 2.4	20.0 ± 4.7

6.0 SUMMARY

A FSS was performed in accordance with the NRC approved Phase II FSSP and the SWP and WP approved by Cimarron Management for Subarea I. This report presents a comparison of the FSS results to the guideline values for affected and unaffected areas at the Cimarron site. The comparisons presented herein demonstrates that all guideline values for unrestricted release have been met and thus Subarea I can now be released from License SNM-928. Therefore, this report is being submitted to the NRC in conjunction with a request to release Subarea I from License SNM-928 for unrestricted use.

7.0 APPENDICES

- Appendix 1 — Drawings 95MOST-RF3 and 99MOST-RF4
- Appendix 2 — Data Tabulation Sheets, Statistical Analyses and Drawings for Open Land Area Surrounding Warehouse (TiO_2) Building #4
- Appendix 3 — Data Tabulation Sheets, Statistical Analyses and Drawings for Warehouse (TiO_2) Building #4 Area Concrete Pads and Fencing
- Appendix 4 — Data Tabulation Sheets, Statistical Analyses and Drawings for Warehouse (TiO_2) Building #4 Interior
- Appendix 5 — Data Tabulation Sheets, Statistical Analyses and Drawings for Warehouse (TiO_2) Building #4 Exterior
- Appendix 6 — Data Tabulation Sheets, Statistical Analyses and Drawings for Open Land Area Surrounding Pu-Plant Building
- Appendix 7 — Data Tabulation Sheets, Statistical Analyses and Drawings for Pu-Plant Area Fencing, Light Poles, and Sidewalks
- Appendix 8 — Data Tabulation Sheets, Statistical Analyses and Drawings for Unaffected Open Land Areas
- Appendix 9 — Data Tabulation Sheets, Statistical Analyses and Drawings for Unaffected Area Fencing, Light Poles, Paved Parking Lot, and Concrete Walkways
- Appendix 10 — Data Tabulation Sheets, Statistical Analyses and Drawings for Emergency Building Interior
- Appendix 11 — Data Tabulation Sheets, Statistical Analyses and Drawings for Emergency Building Exterior
- Appendix 12 — Data Tabulation Sheets, Statistical Analyses and Drawings for Open Land Area South of U-Plant Yard



25 0 25
SCALE IN METERS

NORTH

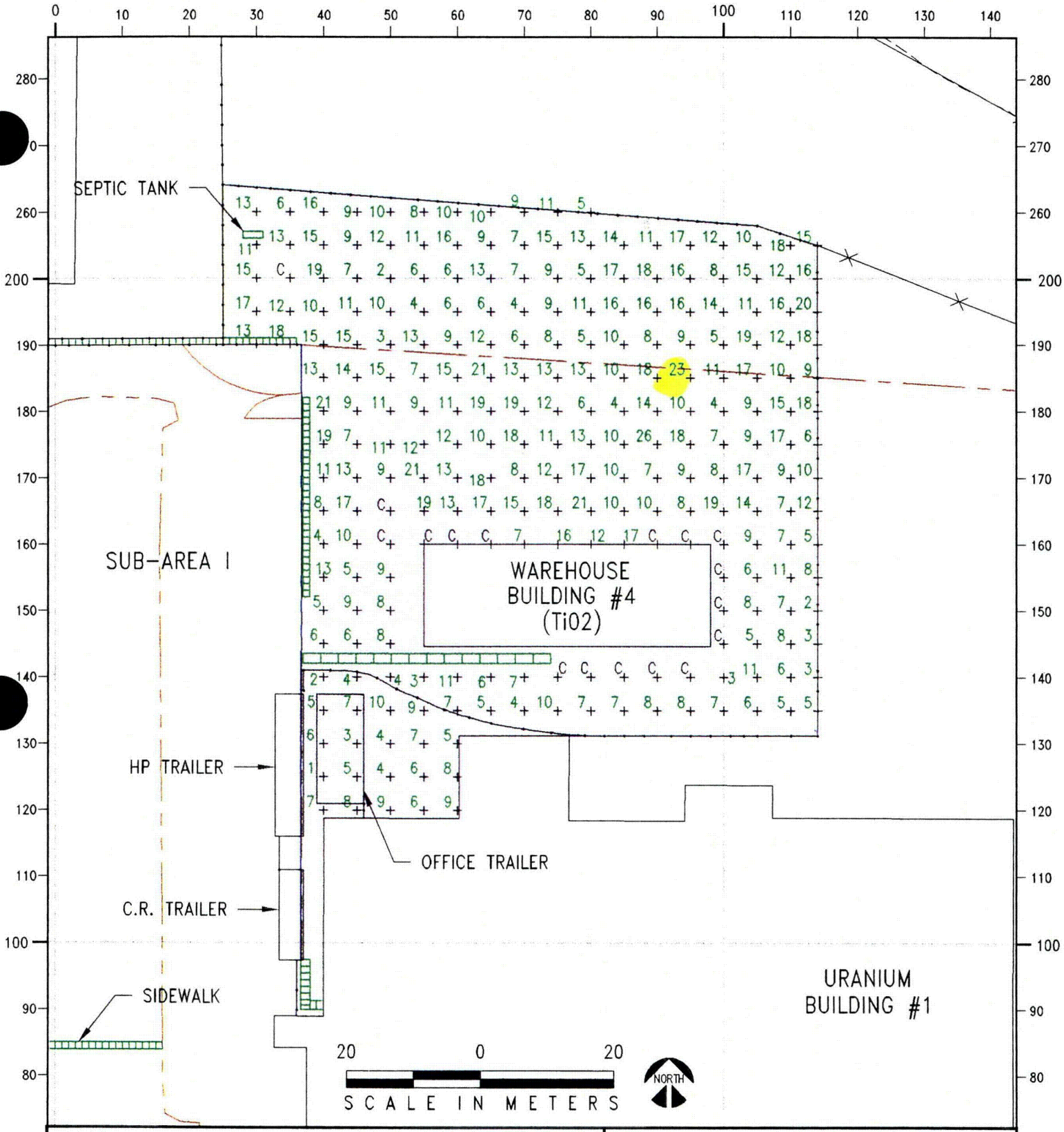
REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
FEATURES MAP

DRWN. BY	DATE	SCALE:
JE	5-17-99	AS SHOWN
JOB NO.	DRAWING NO. 99MOST-RF4	REV. 0

...SUBAREAI\FEATURES\99MOST-RF4



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6_+ URANIUM, 1 - 30 pCi/g U

45_+ URANIUM, > 30 pCi/g U

C_+ CONCRETE

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
AFFECTED AREA - TiO2 YARD
SOIL SAMPLE RESULTS - SURFACE

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-10-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIWASS-0	0

...\SUBAREAI\Tio2YARD-SURFACE\99POSITYSS

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
1	30	E	-	190	N	3330	10	9	13	1
2	30	E	-	195	N	3930	11	11	17	1
3	30	E	-	200	N	3910	12	10	15	1
4	30	E	-	205	N	3940	8	8	11	1
5	30	E	-	210	N	4820	11	11	13	1
6	35	E	-	190	N	3160	9	9	18	1
7	35	E	-	195	N	3730	10	10	12	1
8	35	E	-	200	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
9	35	E	-	205	N	4040	12	12	13	1
10	35	E	-	210	N	4710	12	12	6	1
11	40	E	-	120	N	3460	7	7	7	1
12	40	E	-	125	N	3540	7	6	1	2
13	40	E	-	130	N	3710	7	7	6	1
14	40	E	-	135	N	4170	7	7	5	2
15	40	E	-	140	N	3480	7	7	2	1
16	40	E	-	145	N	3020	9	9	6	1
17	40	E	-	150	N	2640	9	9	5	1
18	40	E	-	155	N	3030	8	9	13	1
19	40	E	-	160	N	2850	8	9	4	1
20	40	E	-	165	N	3520	10	10	8	1
21	40	E	-	170	N	3700	10	11	11	1
22	40	E	-	175	N	4510	11	11	19	1
23	40	E	-	180	N	3240	9	9	21	2
24	40	E	-	185	N	2970	9	9	13	1
25	40	E	-	190	N	2430	9	8	15	1
26	40	E	-	195	N	2820	9	9	10	1
27	40	E	-	200	N	3070	10	8	19	1
28	40	E	-	205	N	3560	10	10	15	1
29	40	E	-	210	N	3020	10	10	16	1
30	45	E	-	120	N	4080	7	7	8	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
31	45	E	-	125	N	3610	7	7	5	1
32	45	E	-	130	N	3960	6	7	3	2
33	45	E	-	135	N	3840	7	7	7	1
34	45	E	-	140	N	4010	7	6	4	1
35	45	E	-	145	N	3160	9	9	6	1
36	45	E	-	150	N	3030	9	9	9	1
37	45	E	-	155	N	2890	9	8	5	1
38	45	E	-	160	N	3230	9	8	10	1
39	45	E	-	165	N	3270	9	9	17	1
40	45	E	-	170	N	3400	10	10	13	1
41	45	E	-	175	N	3420	10	9	7	1
42	45	E	-	180	N	4520	10	9	9	1
43	45	E	-	185	N	3110	10	8	14	1
44	45	E	-	190	N	2260	9	9	15	1
45	45	E	-	195	N	3550	9	10	11	1
46	45	E	-	200	N	3170	10	10	7	1
47	45	E	-	205	N	4060	12	10	9	1
48	45	E	-	210	N	3720	11	11	9	1
49	50	E	-	120	N	4170	8	7	9	1
50	50	E	-	125	N	3840	6	6	4	2
51	50	E	-	130	N	3640	7	7	4	2
52	50	E	-	135	N	3700	7	7	10	2
53	50	E	-	140	N	4040	6	6	4	1
54	50	E	-	145	N	3360	10	9	8	1
55	50	E	-	150	N	2650	10	9	8	1
56	50	E	-	155	N	3050	10	9	9	1
57	50	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
58	50	E	-	165	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
59	50	E	-	170	N	2970	10	9	9	1
60	50	E	-	175	N	3140	9	9	11	2

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
61	50	E	-	180	N	2690	8	9	11	1
62	50	E	-	185	N	3000	10	10	15	1
63	50	E	-	190	N	2940	10	10	3	1
64	50	E	-	195	N	3720	11	11	10	1
65	50	E	-	200	N	3010	10	10	2	2
66	50	E	-	205	N	3900	12	12	12	1
67	50	E	-	210	N	3720	12	10	10	1
68	55	E	-	120	N	4200	6	7	6	1
69	55	E	-	125	N	3850	7	6	6	1
70	55	E	-	130	N	3530	7	7	7	2
71	55	E	-	135	N	4040	7	6	9	1
72	55	E	-	140	N	3840	8	7	3	1
73	55	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
74	55	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
75	55	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
76	55	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
77	55	E	-	165	N	3910	8	8	19	1
78	55	E	-	170	N	3350	9	9	21	1
79	55	E	-	175	N	2660	8	8	12	1
80	55	E	-	180	N	3420	9	9	9	1
81	55	E	-	185	N	3240	8	8	7	1
82	55	E	-	190	N	3070	8	8	13	1
83	55	E	-	195	N	3100	10	9	4	1
84	55	E	-	200	N	3470	9	9	6	1
85	55	E	-	205	N	4090	10	10	11	1
86	55	E	-	210	N	3360	10	10	8	1
87	60	E	-	120	N	3710	7	7	9	1
88	60	E	-	125	N	3890	7	6	8	1
89	60	E	-	130	N	3900	8	6	5	1
90	60	E	-	135	N	2760	8	8	7	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
91	60	E	-	140	N	3600	7	6	11	1
92	60	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
93	60	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
94	60	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
95	60	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
96	60	E	-	165	N	4220	11	11	13	1
97	60	E	-	170	N	3030	9	10	13	1
98	60	E	-	175	N	3710	10	10	12	1
99	60	E	-	180	N	2860	10	10	11	1
100	60	E	-	185	N	3090	9	9	15	1
101	60	E	-	190	N	2610	9	9	9	1
102	60	E	-	195	N	3020	10	10	6	1
103	60	E	-	200	N	3350	9	8	6	2
104	60	E	-	205	N	3520	13	12	16	1
105	60	E	-	210	N	3600	11	11	10	1
106	65	E	-	135	N	2360	7	7	5	1
107	65	E	-	140	N	2820	8	8	6	1
108	65	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
109	65	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
110	65	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
111	65	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
112	65	E	-	165	N	2920	9	9	17	1
113	65	E	-	170	N	4570	9	10	18	1
114	65	E	-	175	N	3770	10	10	10	1
115	65	E	-	180	N	4290	10	10	19	1
116	65	E	-	185	N	3680	11	11	21	1
117	65	E	-	190	N	3390	9	9	12	1
118	65	E	-	195	N	2970	9	9	6	1
119	65	E	-	200	N	3390	11	11	13	1
120	65	E	-	205	N	3380	10	10	9	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:		S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER -	M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR		48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR			pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
121	65	E	-	210	N	2820	10	9	10	1
122	70	E	-	135	N	2670	7	7	4	1
123	70	E	-	140	N	2390	10	10	7	1
124	70	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
125	70	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
126	70	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
127	70	E	-	160	N	2380	9	8	7	1
128	70	E	-	165	N	2870	9	9	15	1
129	70	E	-	170	N	3500	9	9	8	2
130	70	E	-	175	N	3760	10	9	18	1
131	70	E	-	180	N	3360	9	10	19	1
132	70	E	-	185	N	3340	9	9	13	1
133	70	E	-	190	N	3180	9	9	6	2
134	70	E	-	195	N	3340	10	10	4	2
135	70	E	-	200	N	2810	8	10	7	2
136	70	E	-	205	N	2720	10	10	7	1
137	70	E	-	210	N	2680	11	10	9	1
138	75	E	-	135	N	2460	8	7	10	1
139	75	E	-	140	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
140	75	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
141	75	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
142	75	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
143	75	E	-	160	N	3460	10	10	16	1
144	75	E	-	165	N	2830	8	8	18	1
145	75	E	-	170	N	2610	9	9	12	1
146	75	E	-	175	N	4000	10	10	11	1
147	75	E	-	180	N	3840	12	11	12	1
148	75	E	-	185	N	2940	12	11	13	1
149	75	E	-	190	N	2990	10	10	8	1
150	75	E	-	195	N	3540	11	10	9	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. G. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
151	75	E	-	200	N	3220	10	10	9	1
152	75	E	-	205	N	3280	11	11	15	2
153	75	E	-	210	N	3140	9	9	11	1
154	80	E	-	135	N	2350	8	8	7	1
155	80	E	-	140	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
156	80	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
157	80	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
158	80	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
159	80	E	-	160	N	4640	11	10	12	1
160	80	E	-	165	N	3700	11	11	21	1
161	80	E	-	170	N	3630	9	10	17	1
162	80	E	-	175	N	3000	10	10	13	1
163	80	E	-	180	N	3190	11	9	6	2
164	80	E	-	185	N	3260	9	9	13	1
165	80	E	-	190	N	3260	11	9	5	1
166	80	E	-	195	N	3310	10	10	11	1
167	80	E	-	200	N	3060	10	8	5	1
168	80	E	-	205	N	3410	11	11	13	1
169	80	E	-	210	N	3140	11	9	5	1
170	85	E	-	135	N	2570	8	8	7	1
171	85	E	-	140	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
172	85	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
173	85	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
174	85	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
175	85	E	-	160	N	3330	10	9	17	1
176	85	E	-	165	N	3750	9	9	10	1
177	85	E	-	170	N	3870	11	11	10	1
178	85	E	-	175	N	2870	9	9	10	1
179	85	E	-	180	N	3270	10	9	4	1
180	85	E	-	185	N	2770	10	10	10	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
181	85	E	-	190	N	3570	10	10	10	1
182	85	E	-	195	N	3590	10	10	16	1
183	85	E	-	200	N	3420	11	11	17	1
184	85	E	-	205	N	4120	10	9	14	1
185	90	E	-	135	N	2340	8	8	8	1
186	90	E	-	140	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
187	90	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
188	90	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
189	90	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
190	90	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
191	90	E	-	165	N	3400	9	9	10	1
192	90	E	-	170	N	3070	11	10	7	2
193	90	E	-	175	N	2570	9	8	26	1
194	90	E	-	180	N	2530	10	10	14	1
195	90	E	-	185	N	3760	10	9	18	1
196	90	E	-	190	N	2830	10	9	8	1
197	90	E	-	195	N	2720	9	9	16	1
198	90	E	-	200	N	3440	9	10	18	2
199	90	E	-	205	N	2930	9	9	11	1
200	95	E	-	135	N	2530	8	7	8	1
201	95	E	-	140	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
202	95	E	-	145	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
203	95	E	-	150	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
204	95	E	-	155	N	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4	BLDG.# 4
205	95	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
206	95	E	-	165	N	2950	9	8	8	1
207	95	E	-	170	N	3200	10	9	9	1
208	95	E	-	175	N	3230	9	9	18	1
209	95	E	-	180	N	3530	10	10	10	2
210	95	E	-	185	N	3800	10	10	23	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:		S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER -	M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR		48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR			pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
211	95	E	-	190	N	3260	9	10	9	1
212	95	E	-	195	N	3250	10	10	16	1
213	95	E	-	200	N	3930	11	10	16	1
214	95	E	-	205	N	4210	12	11	17	1
215	100	E	-	135	N	2480	7	7	7	1
216	100	E	-	140	N	2500	6	7	3	1
217	100	E	-	145	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
218	100	E	-	150	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
219	100	E	-	155	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
220	100	E	-	160	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
221	100	E	-	165	N	2640	9	9	19	1
222	100	E	-	170	N	3140	10	9	8	1
223	100	E	-	175	N	3110	9	9	7	2
224	100	E	-	180	N	3080	11	9	4	1
225	100	E	-	185	N	3640	10	9	11	1
226	100	E	-	190	N	3140	10	9	5	1
227	100	E	-	195	N	2790	9	9	14	1
228	100	E	-	200	N	3551	10	10	8	2
229	100	E	-	205	N	3170	10	9	12	1
230	105	E	-	135	N	2940	8	8	6	1
231	105	E	-	140	N	2380	8	8	11	1
232	105	E	-	145	N	2670	8	8	5	1
233	105	E	-	150	N	2560	9	8	8	1
234	105	E	-	155	N	2740	9	9	6	2
235	105	E	-	160	N	2830	10	10	9	1
236	105	E	-	165	N	2650	9	9	14	1
237	105	E	-	170	N	3630	10	10	17	1
238	105	E	-	175	N	3120	10	10	9	2
239	105	E	-	180	N	3210	9	9	9	1
240	105	E	-	185	N	3720	11	11	17	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:		S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER -	M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR		48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR			pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
241	105	E	-	190	N	3340	10	10	19	1
242	105	E	-	195	N	3560	11	10	11	1
243	105	E	-	200	N	3470	11	11	15	1
244	105	E	-	205	N	3870	11	11	10	1
245	110	E	-	135	N	2500	8	8	5	1
246	110	E	-	140	N	2210	6	7	6	1
247	110	E	-	145	N	2560	8	8	8	2
248	110	E	-	150	N	2740	8	8	7	1
249	110	E	-	155	N	2860	9	9	11	1
250	110			160		3050	7	6	7	2
251	110			165		4250	11	11	7	2
252	110			170		3170	9	9	9	2
253	110			175		3560	10	10	17	1
254	110			180		2690	9	8	15	1
255	110			185		3040	10	8	10	1
256	110			190		2720	10	8	12	1
257	110			195		3680	11	10	16	1
258	110			200		3270	9	9	12	1
259	110			205		3060	10	10	18	1
260	114			135		1680	7	7	5	1
261	114			140		1800	7	6	3	1
262	114			145		1500	7	6	3	1
263	114			150		1510	7	7	2	1
264	114			155		1650	8	7	8	1
265	114			160		2360	9	9	5	2
266	114			165		2560	10	9	12	1
267	114			170		2950	9	10	10	1
268	114			175		2880	10	10	6	1
269	114			180		2730	9	8	18	1
270	114			185		2250	8	8	9	1

CIMARRON FACILITY

SUB AREA "I" PHASE II AFFECTED

TIO2 AREA SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	138420	µr/hr	9	2
LUDLUM 2220, SHIELDED 3" X 1/2" NaI DETECTOR	48395	CPM	2500	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. C. Rogers DATE: 5-12-99

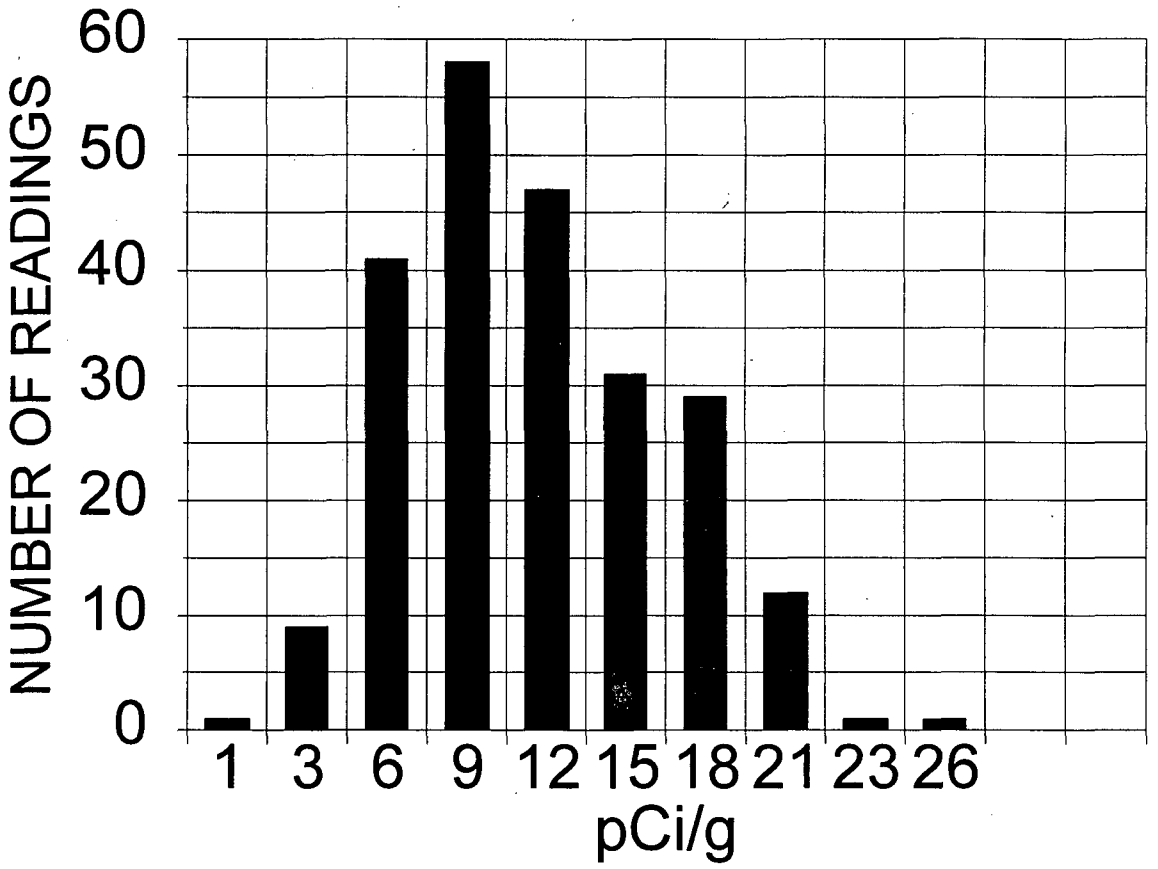
LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
271	114			190		3610	10	11	18	1
272	114			195		3280	10	10	20	1
273	114			200		3190	9	10	16	2
274	114			205		2580	10	9	15	1

PHASE II SUB-AREA "I" TIO2 AREA AFFECTED
CIMARRON SOIL COUNTER SURFACE
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

URANIUM SAMPLE DATA

FREQUENCY DISTRIBUTION

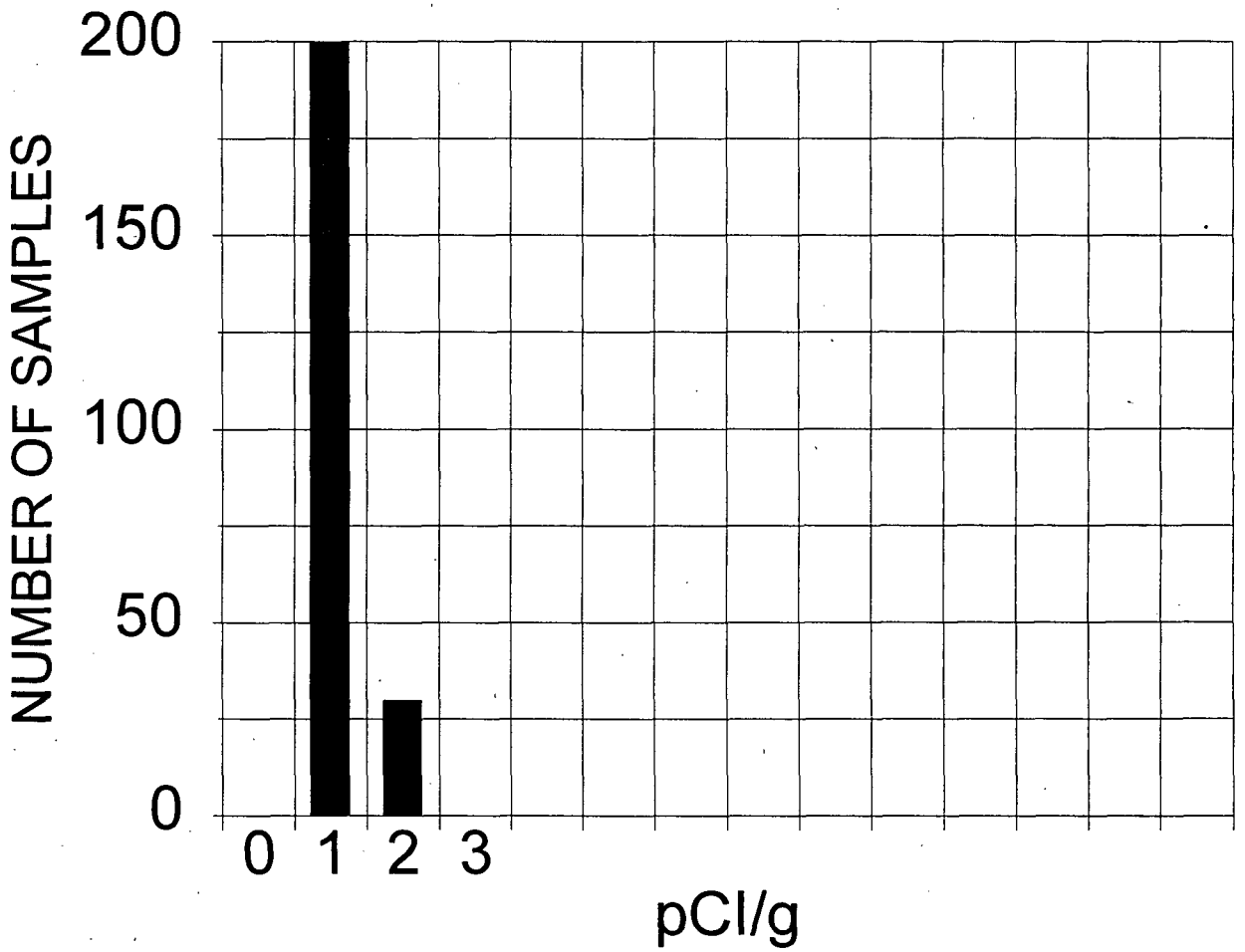


NUMBER OF SAMPLES	230
AVERAGE SAMPLE	10.5
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	26.0
STANDARD DEVIATION	4.8

PHASE II SUB-AREA "I" TIO2 AREA AFFECTED
CIMARRON SOIL COUNTER SURFACE
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED

MARCH, 1999

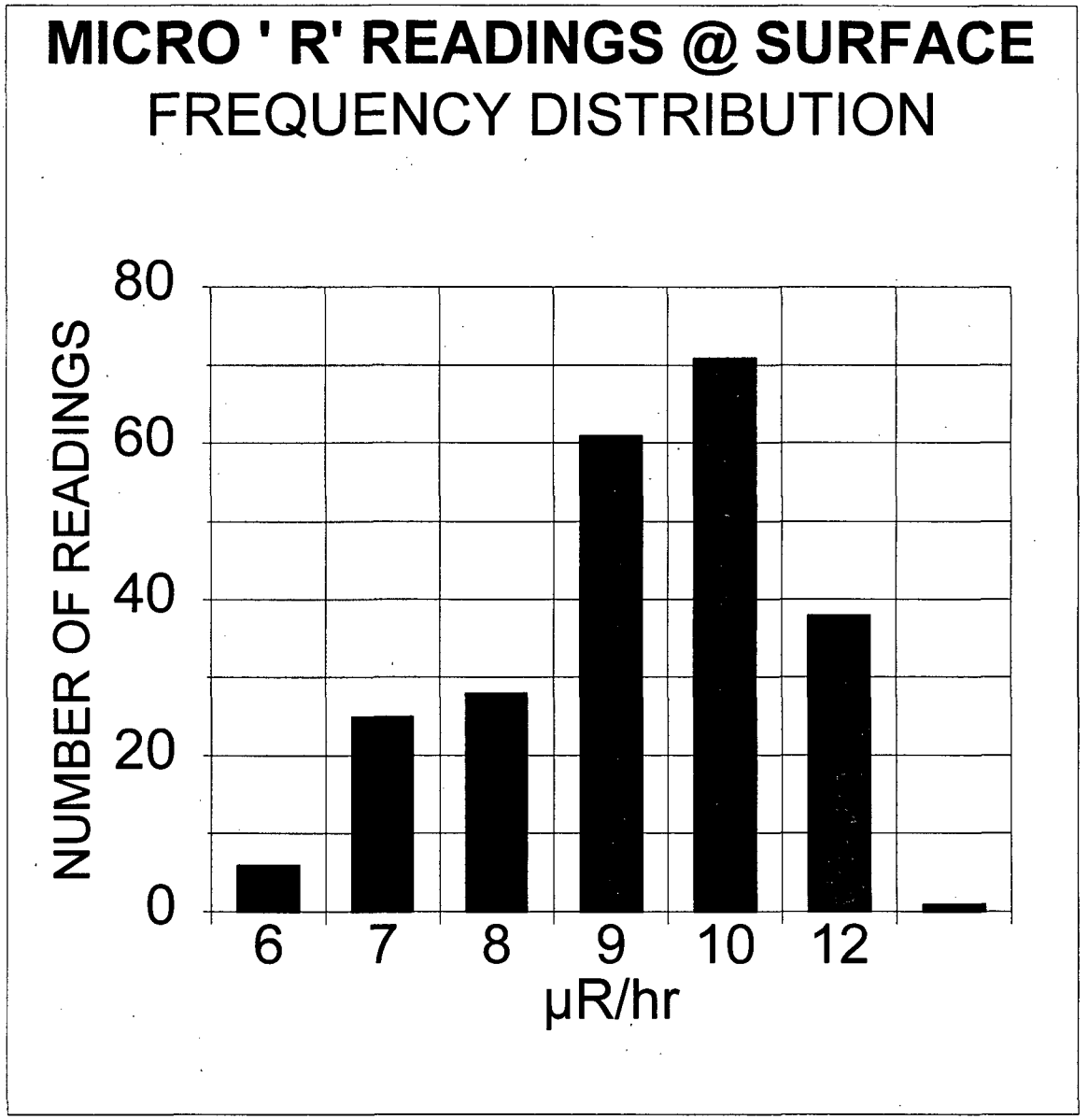
THORIUM SAMPLE RESULTS
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	230
AVERAGE SAMPLE	1.1
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	2.0
STANDARD DEVIATION	0.3

PHASE II SUB-AREA "I" TIO2 AREA
MICRO-R METER READINGS AT SURFACE - AFFECTED - SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 138420
RESULTS IN µR/hr

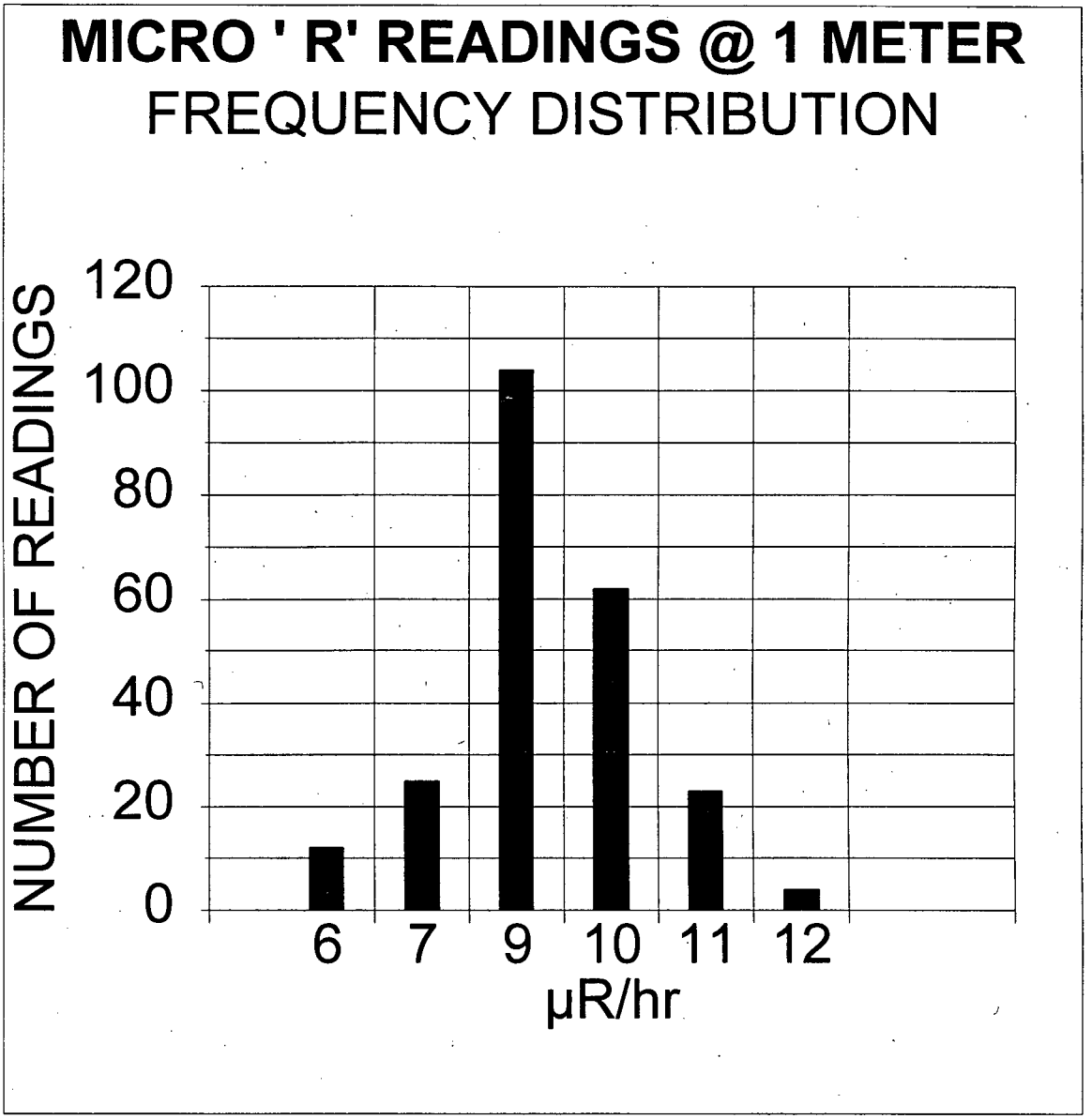
MARCH, 1999



NUMBER OF READINGS	230
AVERAGE READING	9
MINIMUM READING	6
MAXIMUM READING	13
STANDARD DEVIATION	1.4

PHASE II SUB-AREA "I" TIO2 AREA
MICRO-R METER READINGS AT 1 METER - AFFECTED - SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 138420
RESULTS IN µR/hr

MARCH, 1999

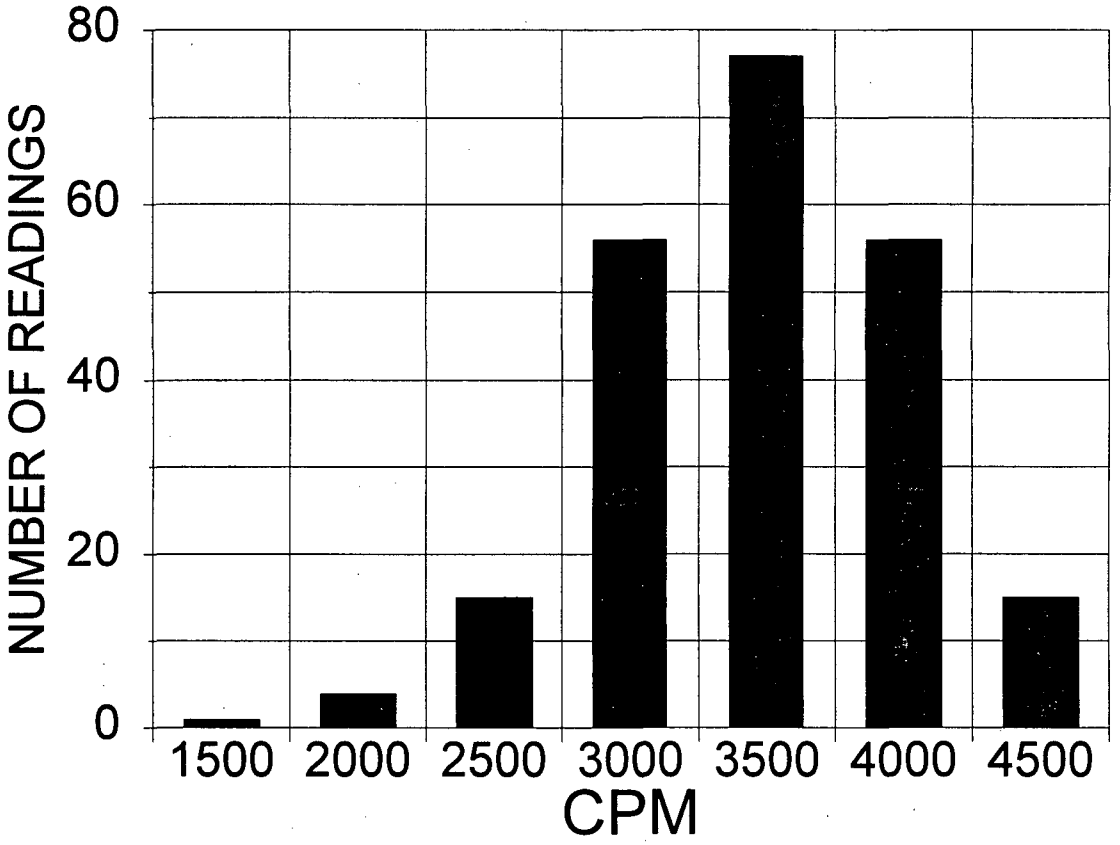


NUMBER OF READINGS	230
AVERAGE READING	9
MINIMUM READING	6
MAXIMUM READING	12
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" TIO2 AREA
3" NaI DETECTOR AFFECTED - SURFACE
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 48395 (SHIELDED)
BACKGROUND AVERAGE: 2500 CPM

MARCH, 1999

3" NaI DETECTOR READINGS
FREQUENCY DISTRIBUTION



NUMBER OF READINGS	230
AVERAGE READING	3244
MINIMUM READING	1500
MAXIMUM READING	4820
STANDARD DEVIATION	578

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 AREA (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	13.0	2.5	6.1
2	17.0	6.5	41.7
3	15.0	4.5	19.9
4	11.0	0.5	0.2
5	13.0	2.5	6.1
6	18.0	7.5	55.7
7	12.0	1.5	2.1
8	13.0	2.5	6.1
9	6.0	-4.5	20.6
10	7.0	-3.5	12.5
11	1.0	-9.5	91.0
12	6.0	-4.5	20.6
13	5.0	-5.5	30.7
14	2.0	-8.5	72.9
15	6.0	-4.5	20.6
16	5.0	-5.5	30.7
17	13.0	2.5	6.1
18	4.0	-6.5	42.8
19	8.0	-2.5	6.4
20	11.0	0.5	0.2
21	19.0	8.5	71.6
22	21.0	10.5	109.4
23	13.0	2.5	6.1
24	15.0	4.5	19.9
25	10.0	-0.5	0.3
26	19.0	8.5	71.6
27	15.0	4.5	19.9
28	16.0	5.5	29.8
29	8.0	-2.5	6.4
30	5.0	-5.5	30.7
31	3.0	-7.5	56.8
32	7.0	-3.5	12.5
33	4.0	-6.5	42.8
34	6.0	-4.5	20.6
35	9.0	-1.5	2.4
36	5.0	-5.5	30.7
37	10.0	-0.5	0.3
38	17.0	6.5	41.7
39	13.0	2.5	6.1
40	7.0	-3.5	12.5
41	9.0	-1.5	2.4
42	14.0	3.5	12.0
43	15.0	4.5	19.9
44	11.0	0.5	0.2
45	7.0	-3.5	12.5
46	9.0	-1.5	2.4
47	9.0	-1.5	2.4
48	9.0	-1.5	2.4
49	4.0	-6.5	42.8
50	4.0	-6.5	42.8
	489.0		981.4
	535.0		981.8
	591.0		1359.4
	310.0		779.9
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	2424		5327.1
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **230**

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) + (x)

Sample Mean (N) : **10.54**

Standard Deviation (Sd) = SQRT [(n-N)² + (x - 1)]

Standard Deviation: **4.82**

2 Std Deviations: **9.65**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.654**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **11.07** pCi/gU TOTAL U

GUIDELINE VALUE: **30** pCi/gU TOTAL U

Acceptable Level: **34.0** pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	229	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	229	1.654	95%

PERFORMED BY: Mickey Hodo DATE: 4-8-99

REVIEWED BY: W.A. Bogen DATE: 4-12-99

C:\OFFICE\AREAII\TIO2\CMSURFU.WB2

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 AREA (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
51	10.0	-0.54	0.29
52	4.0	-6.54	42.76
53	8.0	-2.54	6.45
54	8.0	-2.54	6.45
55	9.0	-1.54	2.37
56	9.0	-1.54	2.37
57	11.0	0.46	0.21
58	11.0	0.46	0.21
59	15.0	4.46	19.90
60	3.0	-7.54	56.84
61	10.0	-0.54	0.29
62	2.0	-8.54	72.92
63	12.0	1.46	2.13
64	10.0	-0.54	0.29
65	6.0	-4.54	20.60
66	6.0	-4.54	20.60
67	7.0	-3.54	12.53
68	9.0	-1.54	2.37
69	3.0	-7.54	56.84
70	19.0	8.46	71.59
71	21.0	10.46	109.43
72	12.0	1.46	2.13
73	9.0	-1.54	2.37
74	7.0	-3.54	12.53
75	13.0	2.46	6.06
76	4.0	-6.54	42.76
77	6.0	-4.54	20.60
78	11.0	0.46	0.21
79	8.0	-2.54	6.45
80	9.0	-1.54	2.37
81	8.0	-2.54	6.45
82	5.0	-5.54	30.68
83	7.0	-3.54	12.53
84	11.0	0.46	0.21
85	13.0	2.46	6.06
86	13.0	2.46	6.06
87	12.0	1.46	2.13
88	11.0	0.46	0.21
89	15.0	4.46	19.90
90	9.0	-1.54	2.37
91	6.0	-4.54	20.60
92	6.0	-4.54	20.60
93	16.0	5.46	29.82
94	10.0	-0.54	0.29
95	5.0	-5.54	30.68
96	6.0	-4.54	20.60
97	17.0	6.46	41.74
98	18.0	7.46	55.66
99	10.0	-0.54	0.29
100	19.0	8.46	71.59
	489.0		981.4
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
101	21.0	10.46	109.43
102	12.0	1.46	2.13
103	6.0	-4.54	20.60
104	13.0	2.46	6.06
105	9.0	-1.54	2.37
106	10.0	-0.54	0.29
107	4.0	-6.54	42.76
108	7.0	-3.54	12.53
109	7.0	-3.54	12.53
110	15.0	4.46	19.90
111	8.0	-2.54	6.45
112	18.0	7.46	55.66
113	19.0	8.46	71.59
114	13.0	2.46	6.06
115	6.0	-4.54	20.60
116	4.0	-6.54	42.76
117	7.0	-3.54	12.53
118	7.0	-3.54	12.53
119	9.0	-1.54	2.37
120	10.0	-0.54	0.29
121	16.0	5.46	29.82
122	18.0	7.46	55.66
123	12.0	1.46	2.13
124	11.0	0.46	0.21
125	12.0	1.46	2.13
126	13.0	2.46	6.06
127	8.0	-2.54	6.45
128	9.0	-1.54	2.37
129	9.0	-1.54	2.37
130	15.0	4.46	19.90
131	11.0	0.46	0.21
132	7.0	-3.54	12.53
133	12.0	1.46	2.13
134	21.0	10.46	109.43
135	17.0	6.46	41.74
136	13.0	2.46	6.06
137	6.0	-4.54	20.60
138	13.0	2.46	6.06
139	5.0	-5.54	30.68
140	11.0	0.46	0.21
141	5.0	-5.54	30.68
142	13.0	2.46	6.06
143	5.0	-5.54	30.68
144	7.0	-3.54	12.53
145	17.0	6.46	41.74
146	10.0	-0.54	0.29
147	10.0	-0.54	0.29
148	10.0	-0.54	0.29
149	4.0	-6.54	42.76
150	10.0	-0.54	0.29
	535.0		981.8
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 AREA (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
151	10.0	-0.54	0.29
152	16.0	5.46	29.82
153	17.0	6.46	41.74
154	14.0	3.46	11.98
155	8.0	-2.54	6.45
156	10.0	-0.54	0.29
157	7.0	-3.54	12.53
158	26.0	15.46	239.04
159	14.0	3.46	11.98
160	18.0	7.46	55.66
161	8.0	-2.54	6.45
162	16.0	5.46	29.82
163	18.0	7.46	55.66
164	11.0	0.46	0.21
165	8.0	-2.54	6.45
166	8.0	-2.54	6.45
167	9.0	-1.54	2.37
168	18.0	7.46	55.66
169	10.0	-0.54	0.29
170	23.0	12.46	155.27
171	9.0	-1.54	2.37
172	16.0	5.46	29.82
173	16.0	5.46	29.82
174	17.0	6.46	41.74
175	7.0	-3.54	12.53
176	3.0	-7.54	56.84
177	19.0	8.46	71.59
178	8.0	-2.54	6.45
179	7.0	-3.54	12.53
180	4.0	-6.54	42.76
181	11.0	0.46	0.21
182	5.0	-5.54	30.68
183	14.0	3.46	11.98
184	8.0	-2.54	6.45
185	12.0	1.46	2.13
186	6.0	-4.54	20.60
187	11.0	0.46	0.21
188	5.0	-5.54	30.68
189	8.0	-2.54	6.45
190	6.0	-4.54	20.60
191	9.0	-1.54	2.37
192	14.0	3.46	11.98
193	17.0	6.46	41.74
194	9.0	-1.54	2.37
195	9.0	-1.54	2.37
196	17.0	6.46	41.74
197	19.0	8.46	71.59
198	11.0	0.46	0.21
199	15.0	4.46	19.90
200	10.0	-0.54	0.29
	591.0		1359.4
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
201	5.0	-5.54	30.68
202	6.0	-4.54	20.60
203	8.0	-2.54	6.45
204	7.0	-3.54	12.53
205	11.0	0.46	0.21
206	7.0	-3.54	12.53
207	7.0	-3.54	12.53
208	9.0	-1.54	2.37
209	17.0	6.46	41.74
210	15.0	4.46	19.90
211	10.0	-0.54	0.29
212	12.0	1.46	2.13
213	16.0	5.46	29.82
214	12.0	1.46	2.13
215	18.0	7.46	55.66
216	5.0	-5.54	30.68
217	3.0	-7.54	56.84
218	3.0	-7.54	56.84
219	2.0	-8.54	72.92
220	8.0	-2.54	6.45
221	5.0	-5.54	30.68
222	12.0	1.46	2.13
223	10.0	-0.54	0.29
224	6.0	-4.54	20.60
225	18.0	7.46	55.66
226	9.0	-1.54	2.37
227	18.0	7.46	55.66
228	20.0	9.46	89.51
229	16.0	5.46	29.82
230	15.0	4.46	19.90
231	0.0	0.00	0.00
232	0.0	0.00	0.00
233	0.0	0.00	0.00
234	0.0	0.00	0.00
235	0.0	0.00	0.00
236	0.0	0.00	0.00
237	0.0	0.00	0.00
238	0.0	0.00	0.00
239	0.0	0.00	0.00
240	0.0	0.00	0.00
241	0.0	0.00	0.00
242	0.0	0.00	0.00
243	0.0	0.00	0.00
244	0.0	0.00	0.00
245	0.0	0.00	0.00
246	0.0	0.00	0.00
247	0.0	0.00	0.00
248	0.0	0.00	0.00
249	0.0	0.00	0.00
250	0.0	0.00	0.00
	310.0		779.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 AREA (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
1	1.0	-0.13	0.02
2	1.0	-0.13	0.02
3	1.0	-0.13	0.02
4	1.0	-0.13	0.02
5	1.0	-0.13	0.02
6	1.0	-0.13	0.02
7	1.0	-0.13	0.02
8	1.0	-0.13	0.02
9	1.0	-0.13	0.02
10	1.0	-0.13	0.02
11	2.0	0.87	0.76
12	1.0	-0.13	0.02
13	2.0	0.87	0.76
14	1.0	-0.13	0.02
15	1.0	-0.13	0.02
16	1.0	-0.13	0.02
17	1.0	-0.13	0.02
18	1.0	-0.13	0.02
19	1.0	-0.13	0.02
20	1.0	-0.13	0.02
21	1.0	-0.13	0.02
22	2.0	0.87	0.76
23	1.0	-0.13	0.02
24	1.0	-0.13	0.02
25	1.0	-0.13	0.02
26	1.0	-0.13	0.02
27	1.0	-0.13	0.02
28	1.0	-0.13	0.02
29	1.0	-0.13	0.02
30	1.0	-0.13	0.02
31	2.0	0.87	0.76
32	1.0	-0.13	0.02
33	1.0	-0.13	0.02
34	1.0	-0.13	0.02
35	1.0	-0.13	0.02
36	1.0	-0.13	0.02
37	1.0	-0.13	0.02
38	1.0	-0.13	0.02
39	1.0	-0.13	0.02
40	1.0	-0.13	0.02
41	1.0	-0.13	0.02
42	1.0	-0.13	0.02
43	1.0	-0.13	0.02
44	1.0	-0.13	0.02
45	1.0	-0.13	0.02
46	1.0	-0.13	0.02
47	1.0	-0.13	0.02
48	1.0	-0.13	0.02
49	2.0	0.87	0.76
50	2.0	0.87	0.76
	55		4.546
	56		5.285
	57		6.025
	36		4.945
	0		0.000
	0		0.000
	260.0		26.087
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 230

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.13

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 0.34
2 Std Deviations: 0.68
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.654

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.17 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	229	is calculated as follow:		

EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]

The (df) value for (X)	229	1.654	95%

PERFORMED BY: Mackey Hodo DATE: 4-8-99

REVIEWED BY: W. A. Boyce DATE: 4-12-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 AREA (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
51	2.0	0.87	0.76
52	1.0	-0.13	0.02
53	1.0	-0.13	0.02
54	1.0	-0.13	0.02
55	1.0	-0.13	0.02
56	1.0	-0.13	0.02
57	2.0	0.87	0.76
58	1.0	-0.13	0.02
59	1.0	-0.13	0.02
60	1.0	-0.13	0.02
61	1.0	-0.13	0.02
62	2.0	0.87	0.76
63	1.0	-0.13	0.02
64	1.0	-0.13	0.02
65	1.0	-0.13	0.02
66	1.0	-0.13	0.02
67	2.0	0.87	0.76
68	1.0	-0.13	0.02
69	1.0	-0.13	0.02
70	1.0	-0.13	0.02
71	1.0	-0.13	0.02
72	1.0	-0.13	0.02
73	1.0	-0.13	0.02
74	1.0	-0.13	0.02
75	1.0	-0.13	0.02
76	1.0	-0.13	0.02
77	1.0	-0.13	0.02
78	1.0	-0.13	0.02
79	1.0	-0.13	0.02
80	1.0	-0.13	0.02
81	1.0	-0.13	0.02
82	1.0	-0.13	0.02
83	1.0	-0.13	0.02
84	1.0	-0.13	0.02
85	1.0	-0.13	0.02
86	1.0	-0.13	0.02
87	1.0	-0.13	0.02
88	1.0	-0.13	0.02
89	1.0	-0.13	0.02
90	1.0	-0.13	0.02
91	1.0	-0.13	0.02
92	2.0	0.87	0.76
93	1.0	-0.13	0.02
94	1.0	-0.13	0.02
95	1.0	-0.13	0.02
96	1.0	-0.13	0.02
97	1.0	-0.13	0.02
98	1.0	-0.13	0.02
99	1.0	-0.13	0.02
100	1.0	-0.13	0.02
	55		4.546
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
101	1.0	-0.13	0.02
102	1.0	-0.13	0.02
103	1.0	-0.13	0.02
104	1.0	-0.13	0.02
105	1.0	-0.13	0.02
106	1.0	-0.13	0.02
107	1.0	-0.13	0.02
108	1.0	-0.13	0.02
109	1.0	-0.13	0.02
110	1.0	-0.13	0.02
111	2.0	0.87	0.76
112	1.0	-0.13	0.02
113	1.0	-0.13	0.02
114	1.0	-0.13	0.02
115	2.0	0.87	0.76
116	2.0	0.87	0.76
117	2.0	0.87	0.76
118	1.0	-0.13	0.02
119	1.0	-0.13	0.02
120	1.0	-0.13	0.02
121	1.0	-0.13	0.02
122	1.0	-0.13	0.02
123	1.0	-0.13	0.02
124	1.0	-0.13	0.02
125	1.0	-0.13	0.02
126	1.0	-0.13	0.02
127	1.0	-0.13	0.02
128	1.0	-0.13	0.02
129	1.0	-0.13	0.02
130	2.0	0.87	0.76
131	1.0	-0.13	0.02
132	1.0	-0.13	0.02
133	1.0	-0.13	0.02
134	1.0	-0.13	0.02
135	1.0	-0.13	0.02
136	1.0	-0.13	0.02
137	2.0	0.87	0.76
138	1.0	-0.13	0.02
139	1.0	-0.13	0.02
140	1.0	-0.13	0.02
141	1.0	-0.13	0.02
142	1.0	-0.13	0.02
143	1.0	-0.13	0.02
144	1.0	-0.13	0.02
145	1.0	-0.13	0.02
146	1.0	-0.13	0.02
147	1.0	-0.13	0.02
148	1.0	-0.13	0.02
149	1.0	-0.13	0.02
150	1.0	-0.13	0.02
	56		5.285
	Sum(n)		Sum(n-N)²

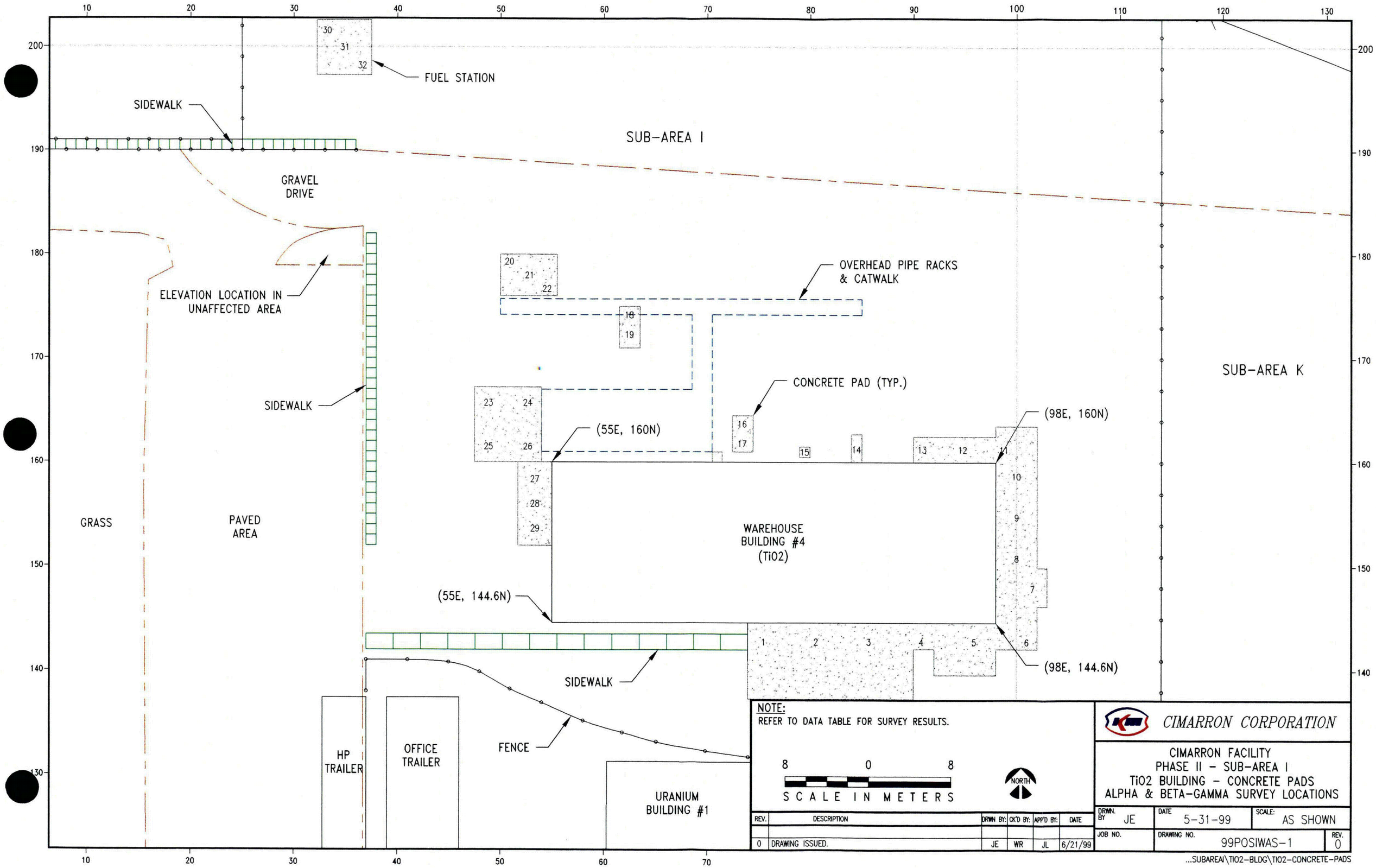
CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 AREA (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
151	1.0	-0.13	0.02
152	1.0	-0.13	0.02
153	1.0	-0.13	0.02
154	1.0	-0.13	0.02
155	1.0	-0.13	0.02
156	1.0	-0.13	0.02
157	2.0	0.87	0.76
158	1.0	-0.13	0.02
159	1.0	-0.13	0.02
160	1.0	-0.13	0.02
161	1.0	-0.13	0.02
162	1.0	-0.13	0.02
163	2.0	0.87	0.76
164	1.0	-0.13	0.02
165	1.0	-0.13	0.02
166	1.0	-0.13	0.02
167	1.0	-0.13	0.02
168	1.0	-0.13	0.02
169	2.0	0.87	0.76
170	1.0	-0.13	0.02
171	1.0	-0.13	0.02
172	1.0	-0.13	0.02
173	1.0	-0.13	0.02
174	1.0	-0.13	0.02
175	1.0	-0.13	0.02
176	1.0	-0.13	0.02
177	1.0	-0.13	0.02
178	1.0	-0.13	0.02
179	2.0	0.87	0.76
180	1.0	-0.13	0.02
181	1.0	-0.13	0.02
182	1.0	-0.13	0.02
183	1.0	-0.13	0.02
184	2.0	0.87	0.76
185	1.0	-0.13	0.02
186	1.0	-0.13	0.02
187	1.0	-0.13	0.02
188	1.0	-0.13	0.02
189	1.0	-0.13	0.02
190	2.0	0.87	0.76
191	1.0	-0.13	0.02
192	1.0	-0.13	0.02
193	1.0	-0.13	0.02
194	2.0	0.87	0.76
195	1.0	-0.13	0.02
196	1.0	-0.13	0.02
197	1.0	-0.13	0.02
198	1.0	-0.13	0.02
199	1.0	-0.13	0.02
200	1.0	-0.13	0.02
	57		6.025
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
201	1.0	-0.13	0.02
202	1.0	-0.13	0.02
203	2.0	0.87	0.76
204	1.0	-0.13	0.02
205	1.0	-0.13	0.02
206	2.0	0.87	0.76
207	2.0	0.87	0.76
208	2.0	0.87	0.76
209	1.0	-0.13	0.02
210	1.0	-0.13	0.02
211	1.0	-0.13	0.02
212	1.0	-0.13	0.02
213	1.0	-0.13	0.02
214	1.0	-0.13	0.02
215	1.0	-0.13	0.02
216	1.0	-0.13	0.02
217	1.0	-0.13	0.02
218	1.0	-0.13	0.02
219	1.0	-0.13	0.02
220	1.0	-0.13	0.02
221	2.0	0.87	0.76
222	1.0	-0.13	0.02
223	1.0	-0.13	0.02
224	1.0	-0.13	0.02
225	1.0	-0.13	0.02
226	1.0	-0.13	0.02
227	1.0	-0.13	0.02
228	1.0	-0.13	0.02
229	2.0	0.87	0.76
230	1.0	-0.13	0.02
231	0.0	0.00	0.00
232	0.0	0.00	0.00
233	0.0	0.00	0.00
234	0.0	0.00	0.00
235	0.0	0.00	0.00
236	0.0	0.00	0.00
237	0.0	0.00	0.00
238	0.0	0.00	0.00
239	0.0	0.00	0.00
240	0.0	0.00	0.00
241	0.0	0.00	0.00
242	0.0	0.00	0.00
243	0.0	0.00	0.00
244	0.0	0.00	0.00
245	0.0	0.00	0.00
246	0.0	0.00	0.00
247	0.0	0.00	0.00
248	0.0	0.00	0.00
249	0.0	0.00	0.00
250	0.0	0.00	0.00
	36		4.945
	Sum(n)		Sum(n-N)²



REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON FACILITY

TIO2 BUILDING - CONCRETE PADS SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	1 cpm	740 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	127 cpm	620 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.1 cpm 1 cpm	10 DPM/100cm² 15 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 6-16-99

LN #	TIO2 BUILDING CONCRETE PADS	READING ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA	µR/Hr @ 1 METER
1	CONCRETE PAD	1	70	1265	0	5	5
2	SOUTH OF TIO2	2	70	1122	0	7	5
3	SOUTH OF TIO2	3	50	1221	0	0	5
4	SOUTH OF TIO2	4	20	1397	2	10	6
5	SOUTH OF TIO2	5	90	913	0	2	6
6	CONCRETE PAD	6	60	1221	2	5	6
7	EAST OF TIO2	7	60	1430	0	7	6
8	EAST OF TIO2	8	30	1111	0	0	6
9	EAST OF TIO2	9	10	1254	0	2	6
10	EAST OF TIO2	10	30	1760	2	0	7
11	CONCRETE PAD	11	10	990	0	2	5
12	NORTH OF TIO2	12	30	1650	0	0	6
13	NORTH OF TIO2	13	60	1903	0	2	6
14	NORTH OF TIO2	14	20	1540	0	0	6
15	NORTH OF TIO2	15	70	1364	0	7	7
16	NORTH OF TIO2	16	50	1430	0	0	6
17	NORTH OF TIO2	17	30	1177	0	0	7
18	NORTH OF TIO2	18	100	1452	0	0	7
19	NORTH OF TIO2	19	100	1628	0	0	7
20	NORTH OF TIO2	20	700	1166	0	2	6
21	NORTH OF TIO2	21	120	1661	0	0	7
22	NORTH OF TIO2	22	220	1683	2	2	6
23	NORTH OF TIO2	23	170	1991	2	0	6
24	CONCRETE PAD	24	20	858	0	2	7
25	NORTH OF TIO2	25	100	737	0	5	7
26	NORTH OF TIO2	26	30	1551	0	0	7
27	CONCRETE PAD	27	70	792	0	5	6
28	WEST OF TIO2	28	40	880	0	2	6
29	WEST OF TIO2	29	70	858	0	5	6
30	FUEL PAD	30	80	583	0	0	6
31	FUEL PAD	31	10	770	0	5	7
32	FUEL PAD	32	90	715	0	7	6

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - CONCRETE PADS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	70	-13.8	189.1
2	70	-13.8	189.1
3	50	-33.8	1139.1
4	20	-63.8	4064.1
5	90	6.3	39.1
6	60	-23.8	564.1
7	60	-23.8	564.1
8	30	-53.8	2889.1
9	10	-73.8	5439.1
10	30	-53.8	2889.1
11	10	-73.8	5439.1
12	30	-53.8	2889.1
13	60	-23.8	564.1
14	20	-63.8	4064.1
15	70	-13.8	189.1
16	50	-33.8	1139.1
17	30	-53.8	2889.1
18	100	16.3	264.1
19	100	16.3	264.1
20	700	616.3	379764.1
21	120	36.3	1314.1
22	220	136.3	18564.1
23	170	86.3	7439.1
24	20	-63.8	4064.1
25	100	16.3	264.1
26	30	-53.8	2889.1
27	70	-13.8	189.1
28	40	-43.8	1914.1
29	70	-13.8	189.1
30	80	-3.8	14.1
31	10	-73.8	5439.1
32	90	6.3	39.1
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	2680		457750.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **32**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **83.75**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **121.52**

2 Std Deviations: **243.03**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.696**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **120.19** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	31	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	31	1.696	95%

PERFORMED BY: Debbie Beach DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

PAGES 1 OF 1 PAGES

A:\TI2PDACM.WB2

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - CONCRETE PADS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	1265	12.7	161.8
2	1122	-130.3	16973.2
3	1221	-31.3	978.5
4	1397	144.7	20943.5
5	913	-339.3	115111.8
6	1221	-31.3	978.5
7	1430	177.7	31584.0
8	1111	-141.3	19960.4
9	1254	1.7	3.0
10	1760	507.7	257778.3
11	990	-262.3	68791.5
12	1650	397.7	158180.2
13	1903	650.7	423434.9
14	1540	287.7	82782.1
15	1364	111.7	12481.1
16	1430	177.7	31584.0
17	1177	-75.3	5667.3
18	1452	199.7	39887.6
19	1628	375.7	141164.6
20	1166	-86.3	7444.5
21	1661	408.7	167051.0
22	1683	430.7	185518.6
23	1991	738.7	545705.4
24	858	-394.3	155457.7
25	737	-515.3	265514.8
26	1551	298.7	89232.9
27	792	-460.3	211858.8
28	880	-372.3	138593.3
29	858	-394.3	155457.7
30	583	-669.3	447937.4
31	770	-482.3	232595.2
32	715	-537.3	288671.1
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	40073		4319484.5
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **32**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) + (x)

Sample Mean (N) : **1252.28**

Standard Deviation (Sd) = SQRT [(n-N)² + (x - 1)]

Standard Deviation: **373.28**

2 Std Deviations: **746.56**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.696**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **1364.21** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	31	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

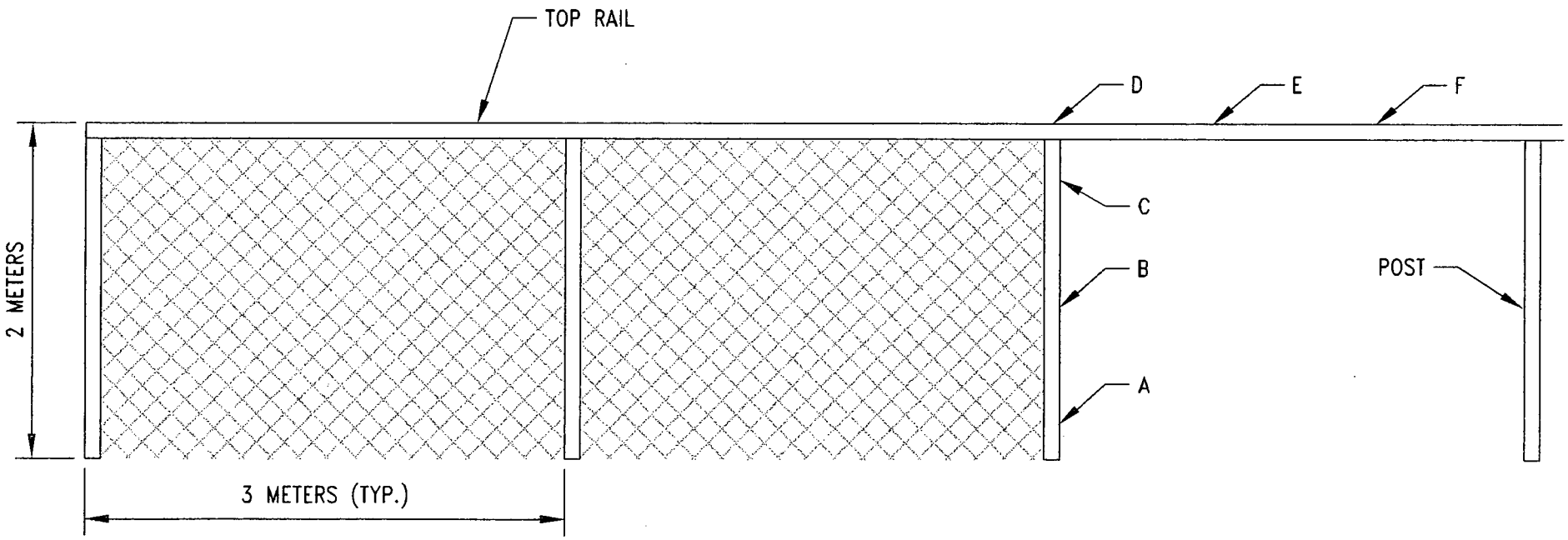
The (df) value for (X)	31	1.696	95%

PERFORMED BY: Debbie Boots DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

PAGES 1 OF 1 PAGES

A:\TI2PDBCM.WB2



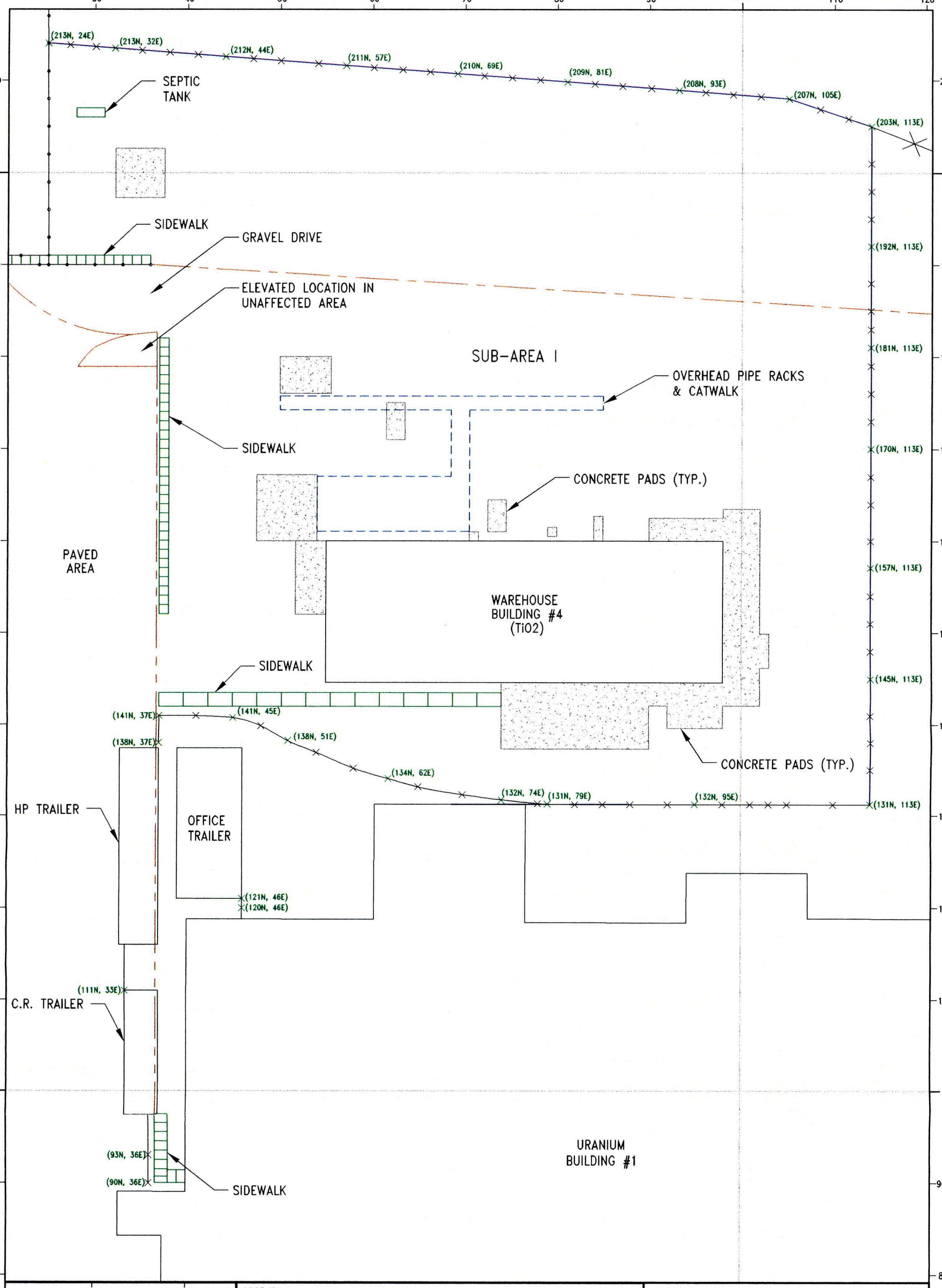
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
TYPICAL SURVEY PATTERN OF FENCING

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY JE	DATE 5-22-99	SCALE: NONE
JOB NO.	DRAWING NO. FNC-SURVEY	REV. 0

...SUBAREAI\FEATURES\FNC-SURVEY



LEGEND:

TiO2 YARD FENCE

10 0 10

SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
TiO2 YARD – AFFECTED FENCES

DRWN. BY	DATE	SCALE:
JE	6-1-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIWAS-2	0

...SUBAREAI\FEATURES\FNC-TIO2-YARD

Wednesday, May 12, 1999

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	36	E	90	N	1A	110	230	0	2
2	36	E	90	N	1B	187	0	0	0
3	36	E	90	N	1C	55	0	0	2
4	36	E	90	N	1D	253	1886	0	4
5	36	E	90	N	1E	275	1449	2	0
6	36	E	90	N	1F	308	1426	5	7
7	36	E	93	N	1A	110	230	0	0
8	36	E	93	N	1B	99	0	0	0
9	36	E	93	N	1C	143	161	0	0
10	46	E	120	N	1A	528	1012	0	0
11	46	E	120	N	1B	693	759	0	0
12	46	E	120	N	1C	473	1035	0	7
13	46	E	120	N	1D	484	2507	0	0
14	46	E	120	N	1E	484	1978	0	0
15	46	E	120	N	1F	1111	2622	0	7
16	46	E	120	N	1A	341	3013	0	2
17	46	E	120	N	1B	176	598	0	0
18	46	E	120	N	1C	385	598	0	0
19	46	E	121	N	1A	528	552	0	2
20	46	E	121	N	1B	352	322	0	4
21	46	E	121	N	1C	275	105	0	2
22	46	E	121	N	1A	638	1265	0	0
23	46	E	121	N	1B	396	621	0	2
24	46	E	121	N	1C	803	322	0	2
25	33	E	111	N	1D	110	1104	0	0
26	33	E	111	N	1E	88	1334	0	4
27	33	E	111	N	1F	33	2277	0	2
28	33	E	111	N	1D	77	483	0	2
29	33	E	111	N	1E	0	943	0	4
30	33	E	111	N	1F	55	529	3	2

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-11-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	37	E	138	N	1A	847	1081	2	0
32	37	E	138	N	1B	814	1219	4	4
33	37	E	138	N	1C	935	920	2	7
34	37	E	138	N	1D	792	1334	2	0
35	37	E	138	N	1E	814	1656	0	5
36	37	E	138	N	1F	781	1426	2	0
37	37	E	141	N	1A	957	552	2	0
38	37	E	141	N	1B	242	851	2	0
39	37	E	141	N	1C	484	552	4	0
40	37	E	141	N	1D	649	1150	2	7
41	37	E	141	N	1E	880	1702	2	2
42	37	E	141	N	1F	715	1311	4	2
43	41	E	141	N	1A	594	552	0	0
44	41	E	141	N	1B	660	552	2	14
45	41	E	141	N	1C	308	621	0	2
46	41	E	141	N	1D	737	1656	7	2
47	41	E	141	N	1E	825	1725	0	7
48	41	E	141	N	1F	979	2438	0	0
49	45	E *	141	N	1A	385	1886	2	2
50	45	E *	141	N	1B	363	46	2	7
51	45	E *	141	N	1C	451	621	0	2
52	45	E *	141	N	1D	704	2139	4	0
53	45	E *	141	N	1E	638	2530	9	4
54	45	E *	141	N	1F	605	2369	15	13
55	48	E	140	N	1A	550	690	2	7
56	48	E	140	N	1B	517	1150	2	0
57	48	E	140	N	1C	396	782	0	2
58	48	E	140	N	1D	451	1679	4	7
59	48	E	140	N	1E	374	1840	9	2
60	48	E	140	N	1F	264	2047	2	2

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

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ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
61	51	E	138	N	1A	374	1035	2	5
62	51	E	138	N	1B	451	483	2	0
63	51	E	138	N	1C	275	299	2	0
64	51	E	138	N	1D	473	1679	4	0
65	51	E	138	N	1E	429	1771	0	5
66	51	E	138	N	1F	451	3588	12	0
67	54	E	137	N	1A	264	322	2	0
68	54	E	137	N	1B	286	0	2	0
69	54	E	137	N	1C	330	207	0	0
70	54	E	137	N	1D	253	1127	9	2
71	54	E	137	N	1E	440	1978	0	2
72	54	E	137	N	1F	462	1794	2	0
73	58	E	135	N	1A	231	920	0	0
74	58	E	135	N	1B	297	437	2	5
75	58	E	135	N	1C	286	322	0	2
76	58	E	135	N	1D	462	1564	4	7
77	58	E	135	N	1E	418	1909	4	4
78	58	E	135	N	1F	341	1127	0	5
79	62	E	134	N	1A	231	506	2	0
80	62	E	134	N	1B	286	161	0	0
81	62	E	134	N	1C	308	529	0	2
82	62	E	134	N	1D	209	1449	4	14
83	62	E	134	N	1E	352	2783	7	2
84	62	E	134	N	1F	396	1403	4	16
85	65	E	133	N	1A	308	736	0	5
86	65	E	133	N	1B	231	345	0	2
87	65	E	133	N	1C	341	782	2	0
88	65	E	133	N	1D	451	1380	4	9
89	65	E	133	N	1E	385	1656	2	2
90	65	E	133	N	1F	429	2024	9	2

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
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ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
91	70	E	133	N	1A	231	437	0	5
92	70	E	133	N	1B	231	483	0	0
93	70	E	133	N	1C	253	506	2	0
94	70	E	133	N	1D	308	1359	7	4
95	70	E	133	N	1E	352	2185	0	5
96	70	E	133	N	1F	132	2047	0	7
97	74	E	132	N	1A	418	759	0	5
98	74	E	132	N	1B	440	1472	0	0
99	74	E	132	N	1C	418	667	4	0
100	74	E	132	N	1D	297	2047	2	0
101	74	E	132	N	1E	561	1863	2	0
102	74	E	132	N	1F	308	1748	0	5
103	78	E	131	N	1A	1738	1196	4	10
104	78	E	131	N	1B	924	920	0	5
105	78	E	131	N	1C	1353	1817	2	0
106	78	E	131	N	1D	132	368	0	0
107	78	E	131	N	1E	132	138	0	0
108	78	E	131	N	1F	275	805	2	5
109	79	E	131	N	1A	165	414	2	7
110	79	E	131	N	1B	198	207	2	0
111	79	E	131	N	1C	198	0	0	0
112	79	E	131	N	1D	55	506	4	0
113	79	E	131	N	1E	77	782	0	0
114	79	E	131	N	1F	110	552	7	2
115	82	E	131	N	1A	33	414	0	0
116	82	E	131	N	1B	99	345	0	0
117	82	E	131	N	1C	77	322	0	0
118	82	E	131	N	1D	165	598	0	10
119	82	E	131	N	1E	88	874	0	0
120	82	E	131	N	1F	44	1081	2	0

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
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ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
121	85	E	131	N	1A	66	92	0	3
122	85	E	131	N	1B	66	207	0	3
123	85	E	131	N	1C	88	644	0	0
124	85	E	131	N	1D	176	897	0	0
125	85	E	131	N	1E	66	437	2	5
126	85	E	131	N	1F	110	1242	2	0
127	88	E	131	N	1A	22	253	0	0
128	88	E	131	N	1B	55	0	0	0
129	88	E	131	N	1C	77	0	2	3
130	88	E	131	N	1D	88	1380	0	0
131	88	E	131	N	1E	99	1587	2	3
132	88	E	131	N	1F	33	1012	0	0
133	92	E	131	N	1A	66	0	0	3
134	92	E	131	N	1B	55	138	0	0
135	92	E	131	N	1C	66	928	0	0
136	92	E	131	N	1D	121	1794	2	3
137	92	E	131	N	1E	55	2093	2	3
138	92	E	131	N	1F	77	2967	7	5
139	95	E	132	N	1A	66	23	0	0
140	95	E	132	N	1B	198	483	2	0
141	95	E	132	N	1C	121	897	7	0
142	95	E	132	N	1D	176	1518	0	0
143	95	E	132	N	1E	88	2093	0	3
144	95	E	132	N	1F	99	621	2	0
145	98	E	132	N	1A	264	138	2	0
146	98	E	132	N	1B	110	0	2	0
147	98	E	132	N	1C	165	598	0	0
148	98	E	132	N	1D	44	667	0	0
149	98	E	132	N	1E	110	1219	0	3
150	98	E	132	N	1F	99	1035	0	10

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
151	101	E	132	N	1A	792	4439	0	0
152	101	E	132	N	1B	1001	1334	2	5
153	101	E	132	N	1C	1353	1817	2	0
154	101	E	132	N	1A	22	1909	0	0
155	101	E	132	N	1B	66	414	0	0
156	101	E	132	N	1C	55	92	0	3
157	101	E	132	N	1D	66	920	4	0
158	101	E	132	N	1E	55	1219	0	0
159	101	E	132	N	1F	132	1265	0	3
160	103	E	132	N	1A	22	759	0	0
161	103	E	132	N	1B	132	644	0	3
162	103	E	132	N	1C	77	276	0	0
163	103	E	132	N	1D	176	667	0	0
164	103	E	132	N	1E	198	1081	0	0
165	103	E	132	N	1F	110	667	0	8
166	105	E	132	N	1A	77	828	2	3
167	105	E	132	N	1B	66	0	0	0
168	105	E	132	N	1C	77	0	0	3
169	105	E	132	N	1A	77	414	0	0
170	105	E	132	N	1B	110	69	0	3
171	105	E	132	N	1C	66	828	2	7
172	105	E	132	N	1D	154	1518	0	8
173	105	E	132	N	1E	165	529	2	0
174	105	E	132	N	1F	143	1817	2	0
175	110	E	132	N	1A	77	1587	0	0
176	110	E	132	N	1B	77	437	0	3
177	110	E	132	N	1C	88	0	0	0
178	110	E	132	N	1D	132	437	0	0
179	110	E	132	N	1E	55	1081	2	0
180	110	E	132	N	1F	176	1196	0	0

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
181	113	E	131	N	1A	55	414	0	0
182	113	E	131	N	1B	132	1150	0	2
183	113	E	131	N	1C	198	851	0	0
184	113	E	131	N	1D	110	1081	2	2
185	113	E	131	N	1E	198	1081	4	4
186	113	E	131	N	1F	110	529	0	0
187	113	E	135	N	1A	99	0	0	2
188	113	E	135	N	1B	88	414	0	0
189	113	E	135	N	1C	90	207	4	0
190	113	E	135	N	1D	132	690	0	0
191	113	E	135	N	1E	165	2024	2	7
192	113	E	135	N	1F	198	598	0	2
193	113	E	138	N	1A	110	0	0	0
194	113	E	138	N	1B	132	805	0	2
195	113	E	138	N	1C	165	276	0	0
196	113	E	138	N	1D	66	322	0	0
197	113	E	138	N	1E	132	345	0	0
198	113	E	138	N	1F	132	138	7	2
199	113	E	141	N	1A	55	230	0	0
200	113	E	141	N	1B	121	529	2	0
201	113	E	141	N	1C	44	690	0	5
202	113	E	141	N	1D	88	805	0	0
203	113	E	141	N	1E	121	851	0	9
204	113	E	141	N	1F	121	759	0	0
205	113	E	145	N	1A	66	0	0	9
206	113	E	145	N	1B	66	0	0	2
207	113	E	145	N	1C	99	0	0	0
208	113	E	145	N	1D	55	3795	0	2
209	113	E	145	N	1E	121	1564	0	0
210	113	E	145	N	1F	66	2760	0	7

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
211	113	E	148	N	1A	198	0	0	0
212	113	E	148	N	1B	77	368	2	5
213	113	E	148	N	1C	121	667	2	2
214	113	E	148	N	1D	165	1403	0	0
215	113	E	148	N	1E	264	2093	0	2
216	113	E	148	N	1F	55	276	0	0
217	113	E	151	N	1A	33	368	0	3
218	113	E	151	N	1B	66	0	0	5
219	113	E	151	N	1C	110	46	0	12
220	113	E	151	N	1D	88	1173	0	0
221	113	E	151	N	1E	99	0	5	0
222	113	E	151	N	1F	99	943	0	0
223	113	E	154	N	1A	77	0	0	0
224	113	E	154	N	1B	121	184	2	2
225	113	E	154	N	1C	66	207	0	0
226	113	E	154	N	1D	99	1679	0	0
227	113	E	154	N	1E	33	1403	7	9
228	113	E	154	N	1F	88	1840	2	7
229	113	E	157	N	1A	99	0	0	7
230	113	E	157	N	1B	88	0	0	5
231	113	E	157	N	1C	77	0	7	4
232	113	E	157	N	1D	77	621	2	0
233	113	E	157	N	1E	55	460	4	19
234	113	E	157	N	1F	22	1771	0	0
235	113	E	160	N	1A	88	0	0	0
236	113	E	160	N	1B	110	460	0	5
237	113	E	160	N	1C	22	184	2	0
238	113	E	160	N	1D	44	1219	2	2
239	113	E	160	N	1E	44	483	0	3
240	113	E	160	N	1F	55	736	0	3

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-12-99

LN #	TIO2 FENCE					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
241	113	E	*	164	N	1A	11	0	0	0
242	113	E	*	164	N	1B	55	0	4	2
243	113	E	*	164	N	1C	99	368	0	0
244	113	E	*	164	N	1D	110	483	2	0
245	113	E	*	164	N	1E	33	851	2	2
246	113	E	*	164	N	1F	99	1104	0	5
247	113	E		167	N	1A	121	92	0	0
248	113	E		167	N	1B	143	391	0	0
249	113	E		167	N	1C	88	782	0	5
250	113	E		167	N	1D	99	851	0	0
251	113	E		167	N	1E	121	1081	0	3
252	113	E		167	N	1F	88	759	0	0
253	113	E		170	N	1A	55	874	0	3
254	113	E		170	N	1B	88	230	0	3
255	113	E		170	N	1C	66	69	0	0
256	113	E		170	N	1D	88	414	0	0
257	113	E		170	N	1E	143	690	2	2
258	113	E		170	N	1F	77	1357	0	0
259	113	E		173	N	1A	88	46	0	0
260	113	E		173	N	1B	99	0	0	0
261	113	E		173	N	1C	33	0	2	0
262	113	E		173	N	1D	110	1771	0	5
263	113	E		173	N	1E	88	851	0	12
264	113	E		173	N	1F	176	1104	2	2
265	113	E		176	N	1A	66	506	0	0
266	113	E		176	N	1B	55	23	0	3
267	113	E		176	N	1C	44	0	0	0
268	113	E		176	N	1D	176	1173	0	7
269	113	E		176	N	1E	66	1403	0	12
270	113	E		176	N	1F	77	759	0	10

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
271	113	E		179	N	1A	55	0	0	7
272	113	E		179	N	1B	154	161	2	0
273	113	E		179	N	1C	99	0	2	5
274	113	E		179	N	1A	44	0	0	5
275	113	E		179	N	1B	55	0	0	0
276	113	E		179	N	1C	154	69	0	0
277	113	E		179	N	1D	77	299	2	15
278	113	E		179	N	1E	99	920	4	0
279	113	E		179	N	1F	66	1081	4	7
280	113	E	*	181	N	1A	154	0	0	0
281	113	E	*	181	N	1B	143	69	0	5
282	113	E	*	181	N	1C	77	115	2	2
283	113	E	*	181	N	1D	253	1012	2	5
284	113	E	*	181	N	1E	121	1587	2	10
285	113	E	*	181	N	1F	187	943	4	5
286	113	E		183	N	1A	99	0	0	0
287	113	E		183	N	1B	99	46	2	5
288	113	E		183	N	1C	77	299	0	3
289	113	E		183	N	1D	198	1242	2	0
290	113	E		183	N	1E	88	1242	0	0
291	113	E		183	N	1F	143	1311	0	0
292	113	E		185	N	1A	330	0	2	0
293	113	E		185	N	1B	99	253	2	2
294	113	E		185	N	1C	77	552	0	0
295	113	E		185	N	1D	55	1035	0	10
296	113	E		185	N	1E	99	920	0	0
297	113	E		185	N	1F	99	1150	2	5
298	113	E		188	N	1A	110	230	0	0
299	113	E		188	N	1B	132	0	0	5
300	113	E		188	N	1C	176	0	0	0

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
301	113	E	188	N	1D	99	621	0	5
302	113	E	188	N	1E	77	1242	0	0
303	113	E	188	N	1F	22	851	2	2
304	113	E	192	N	1A	44	115	0	3
305	113	E	192	N	1B	132	276	2	0
306	113	E	192	N	1C	66	897	0	0
307	113	E	192	N	1D	110	1403	2	2
308	113	E	192	N	1E	44	1242	4	0
309	113	E	192	N	1F	77	1219	2	2
310	113	E	195	N	1A	33	460	0	0
311	113	E	195	N	1B	77	92	0	0
312	113	E	195	N	1C	0	46	0	0
313	113	E	195	N	1D	33	1610	0	0
314	113	E	195	N	1E	33	759	0	3
315	113	E	195	N	1F	55	943	0	5
316	113	E	198	N	1A	33	230	0	3
317	113	E	198	N	1B	55	69	0	0
318	113	E	198	N	1C	44	207	0	5
319	113	E	198	N	1D	121	621	4	7
320	113	E	198	N	1E	99	782	0	0
321	113	E	198	N	1F	110	1656	0	0
322	113	E	201	N	1A	77	0	0	0
323	113	E	201	N	1B	66	0	0	0
324	113	E	201	N	1C	110	0	0	0
325	113	E	201	N	1D	110	1311	0	0
326	113	E	201	N	1E	176	1242	2	0
327	113	E	201	N	1F	88	851	2	7
328	113	E	203	N	1A	121	966	2	0
329	113	E	203	N	1B	77	46	5	0
330	113	E	203	N	1C	176	0	0	0

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
331	24	E	213	N	1A	165	759	0	0
332	24	E	213	N	1B	198	322	0	0
333	24	E	213	N	1C	231	1081	4	0
334	24	E	213	N	1D	385	1978	4	5
335	24	E	213	N	1E	418	2116	2	2
336	24	E	213	N	1F	352	2001	0	7
337	27	E	213	N	1A	121	1104	2	5
338	27	E	213	N	1B	176	805	0	3
339	27	E	213	N	1C	253	989	0	7
340	27	E	213	N	1D	66	1472	2	12
341	27	E	213	N	1E	385	2254	0	12
342	27	E	213	N	1F	352	3243	2	7
343	30	E	213	N	1A	231	1610	4	9
344	30	E	213	N	1B	187	966	7	4
345	30	E	213	N	1C	253	598	0	0
346	30	E	213	N	1D	396	1725	2	7
347	30	E	213	N	1E	330	2622	7	7
348	30	E	213	N	1F	286	2162	2	2
349	32	E	213	N	1A	165	1127	2	0
350	32	E	213	N	1B	253	1564	2	0
351	32	E	213	N	1C	462	1194	0	0
352	32	E	213	N	1D	374	2231	4	0
353	32	E	213	N	1E	418	2622	0	10
354	32	E	213	N	1F	308	2668	2	7
355	35	E	213	N	1A	231	1334	0	0
356	35	E	213	N	1B	308	1219	0	0
357	35	E	213	N	1C	407	1081	0	0
358	35	E	213	N	1D	363	1656	0	0
359	35	E	213	N	1E	242	1909	4	0
360	35	E	213	N	1F	330	2346	0	0

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
361	38	E	213	N	1A	198	897	0	0
362	38	E	213	N	1B	451	1564	0	3
363	38	E	213	N	1C	495	1863	0	0
364	38	E	213	N	1D	176	1771	4	0
365	38	E	213	N	1E	583	2829	0	3
366	38	E	213	N	1F	297	2967	0	5
367	41	E	212	N	1A	297	1541	2	5
368	41	E	212	N	1B	319	621	4	9
369	41	E	212	N	1C	341	851	0	0
370	41	E	212	N	1D	484	2944	4	9
371	41	E	212	N	1E	263	2507	7	11
372	41	E	212	N	1F	396	3243	2	21
373	44	E	212	N	1A	187	805	0	7
374	44	E	212	N	1B	308	1334	4	0
375	44	E	212	N	1C	462	1679	0	2
376	44	E	212	N	1D	352	2714	2	7
377	44	E	212	N	1E	385	2369	9	4
378	44	E	212	N	1F	396	1725	2	0
379	47	E	212	N	1A	286	1633	0	0
380	47	E	212	N	1B	341	1932	2	2
381	47	E	212	N	1C	231	1334	2	9
382	47	E	212	N	1D	341	2116	7	9
383	47	E	212	N	1E	484	3151	9	9
384	47	E	212	N	1F	451	2231	12	11
385	50	E	212	N	1A	275	1449	0	0
386	50	E	212	N	1B	396	874	4	0
387	50	E	212	N	1C	418	1311	2	9
388	50	E	212	N	1D	506	2645	12	11
389	50	E	212	N	1E	539	2668	7	7
390	50	E	212	N	1F	517	3128	9	9

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
391	54	E	211	N	1A	198	989	0	0
392	54	E	211	N	1B	374	1127	0	9
393	54	E	211	N	1C	308	1357	2	0
394	54	E	211	N	1D	539	2415	2	9
395	54	E	211	N	1E	385	2852	0	5
396	54	E	211	N	1F	517	2691	7	7
397	57	E	211	N	1A	297	1380	0	7
398	57	E	211	N	1B	374	506	2	12
399	57	E	211	N	1C	462	1541	9	9
400	57	E	211	N	1D	495	2001	2	12
401	57	E	211	N	1E	418	2139	0	12
402	57	E	211	N	1F	374	2576	2	5
403	60	E	211	N	1A	396	1311	2	2
404	60	E	211	N	1B	451	1173	0	12
405	60	E	211	N	1C	440	1495	7	9
406	60	E	211	N	1D	528	2231	0	0
407	60	E	211	N	1E	561	2162	2	0
408	60	E	211	N	1F	528	1817	9	4
409	63	E	210	N	1A	418	1311	2	0
410	63	E	210	N	1B	407	1610	2	2
411	63	E	210	N	1C	363	1334	2	7
412	63	E	210	N	1D	440	2530	2	2
413	63	E	210	N	1E	374	2875	4	7
414	63	E	210	N	1F	462	2967	2	7
415	66	E	210	N	1A	231	1104	0	2
416	66	E	210	N	1B	297	1472	2	7
417	66	E	210	N	1C	396	1104	0	7
418	66	E	210	N	1D	616	2576	7	4
419	66	E	210	N	1E	561	2599	0	0
420	66	E	210	N	1F	561	3611	4	2

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
421	69	E	*	210	N	1A	231	1081	0	0
422	69	E	*	210	N	1B	495	1150	0	7
423	69	E	*	210	N	1C	528	1702	2	0
424	69	E	*	210	N	1D	660	2898	4	7
425	69	E	*	210	N	1E	517	1886	2	5
426	69	E	*	210	N	1F	506	2116	4	0
427	72	E		210	N	1A	187	1518	2	9
428	72	E		210	N	1B	528	3381	0	9
429	72	E		210	N	1C	726	1291	2	7
430	72	E		210	N	1D	528	2599	7	9
431	72	E		210	N	1E	550	3243	4	9
432	72	E		210	N	1F	704	3243	4	4
433	75	E		210	N	1A	605	2162	4	2
434	75	E		210	N	1B	462	1817	0	2
435	75	E		210	N	1C	572	1633	2	5
436	75	E		210	N	1D	462	4025	2	0
437	75	E		210	N	1E	572	4646	4	2
438	75	E		210	N	1F	594	2806	0	0
439	78	E		209	N	1A	484	1587	0	0
440	78	E		209	N	1B	660	1978	4	2
441	78	E		209	N	1C	583	1196	0	5
442	78	E		209	N	1D	781	3818	4	4
443	78	E		209	N	1E	715	3197	9	13
444	78	E		209	N	1F	715	2599	0	5
445	81	E		209	N	1A	484	1334	0	7
446	81	E		209	N	1B	583	1909	0	5
447	81	E		209	N	1C	814	2138	0	0
448	81	E		209	N	1D	594	2806	2	5
449	81	E		209	N	1E	517	1955	4	0
450	81	E		209	N	1F	627	2139	4	9

CIMARRON FACILITY

TI02 FENCE

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. Q. Rogers DATE: 5-12-99

LN #	TIO2 FENCE					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
451	84	E		209	N	1A	429	1265	2	0
452	84	E		209	N	1B	814	1978	0	0
453	84	E		209	N	1C	979	851	2	0
454	84	E		209	N	1D	781	2323	2	2
455	84	E		209	N	1E	627	1978	2	9
456	84	E		209	N	1F	803	2139	0	5
457	87	E		209	N	1A	374	1035	2	0
458	87	E		209	N	1B	605	299	2	7
459	87	E		209	N	1C	682	621	2	2
460	87	E		209	N	1D	759	1426	17	8
461	87	E		209	N	1E	748	1196	12	0
462	87	E		209	N	1F	869	1012	9	6
463	90	E	*	208	N	1A	495	0	4	0
464	90	E	*	208	N	1B	979	644	0	12
465	90	E	*	208	N	1C	880	253	7	4
466	90	E	*	208	N	1D	748	1265	2	2
467	90	E	*	208	N	1E	902	1334	2	9
468	90	E	*	208	N	1F	660	989	4	7
469	93	E		208	N	1A	473	552	2	14
470	93	E		208	N	1B	924	1127	0	0
471	93	E		208	N	1C	1001	1541	2	0
472	93	E		208	N	1D	495	1587	4	16
473	93	E		208	N	1E	594	1863	4	4
474	93	E		208	N	1F	616	1104	12	9
475	96	E		208	N	1A	451	1886	2	0
476	96	E		208	N	1B	671	736	0	0
477	96	E		208	N	1C	869	1357	4	0
478	96	E		208	N	1D	605	1817	4	2
479	96	E		208	N	1E	748	1449	4	4
480	96	E		208	N	1F	792	1817	0	0

CIMARRON FACILITY

TI02 FENCE SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	37807	DPM/100cm²	<10 cpm	125 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	358 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-12-99

LN #	TIO2 FENCE				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
481	99	E	208	N	1A	671	1587	2	0
482	99	E	208	N	1B	682	951	0	2
483	99	E	208	N	1C	825	713	0	2
484	99	E	208	N	1D	682	2691	4	4
485	99	E	208	N	1E	528	2576	2	7
486	99	E	208	N	1F	770	1564	2	2
487	102	E	208	N	1A	583	920	0	0
488	102	E	208	N	1B	748	782	4	0
489	102	E	208	N	1C	935	782	0	2
490	102	E	208	N	1D	935	1886	9	6
491	102	E	208	N	1E	737	1748	4	4
492	102	E	208	N	1F	957	2208	2	5
493	105	E	207	N	1A	418	989	2	0
494	105	E	207	N	1B	572	1035	0	0
495	105	E	207	N	1C	737	1955	2	5
496	105	E	207	N	1D	1001	1472	2	0
497	105	E	207	N	1E	770	1495	0	9
498	105	E	207	N	1F	759	1173	2	5
499	108	E	206	N	1A	726	920	0	0
500	108	E	206	N	1B	792	943	2	2
501	108	E	206	N	1C	880	598	2	0
502	108	E	206	N	1D	715	1403	7	4
503	108	E	206	N	1E	792	1242	4	4
504	108	E	206	N	1F	627	2760	2	7
505	111	E	205	N	1A	484	874	0	0
506	111	E	205	N	1B	539	184	2	5
507	111	E	205	N	1C	649	345	2	9
508	111	E	205	N	1D	726	2162	9	6
509	111	E	205	N	1E	473	2990	14	15
510	111	E	205	N	1F	462	2047	9	11

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	110.0	-211.6	44770.4
2	187.0	-134.6	18114.5
3	55.0	-266.6	71070.3
4	253.0	-68.6	4704.6
5	275.0	-46.6	2170.6
6	308.0	-13.6	184.7
7	110.0	-211.6	44770.4
8	99.0	-222.6	49546.4
9	143.0	-178.6	31894.5
10	528.0	206.4	42605.0
11	693.0	371.4	137945.2
12	473.0	151.4	22924.9
13	484.0	162.4	26376.9
14	484.0	162.4	26376.9
15	1111.0	789.4	623167.8
16	341.0	19.4	376.7
17	176.0	-145.6	21196.5
18	385.0	63.4	4020.8
19	528.0	206.4	42605.0
20	352.0	30.4	924.8
21	275.0	-46.6	2170.6
22	638.0	316.4	100115.2
23	396.0	74.4	5536.8
24	803.0	481.4	231755.4
25	110.0	-211.6	44770.4
26	88.0	-233.6	54564.4
27	33.0	-288.6	83284.3
28	77.0	-244.6	59824.4
29	0.0	-321.6	103420.3
30	55.0	-266.6	71070.3
31	847.0	525.4	276055.5
32	814.0	492.4	242467.4
33	935.0	613.4	376271.6
34	792.0	470.4	221285.4
35	814.0	492.4	242467.4
36	781.0	459.4	211057.4
37	957.0	635.4	403745.6
38	242.0	-79.6	6334.6
39	484.0	162.4	26376.9
40	649.0	327.4	107197.2
41	880.0	558.4	311821.5
42	715.0	393.4	154771.3
43	594.0	272.4	74207.1
44	660.0	338.4	114521.2
45	308.0	-13.6	184.7
46	737.0	415.4	172565.3
47	825.0	503.4	253421.4
48	979.0	657.4	432187.7
49	385.0	63.4	4020.8
50	363.0	41.4	1714.8
	18480.0		778811.1
	9658.0		5731546.5
	8285.0		3968114.2
	4345.0		2852770.9
	5423.0		2424412.4
	7568.0		2086721.5
	18567.0		643435.4
	25806.0		2786243.5
	36201.0		9417038.3
	6347.0		1168181.6
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	164011		37462209.4
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **510**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **321.59**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **271.29**

2 Std Deviations: **542.59**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.645**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **341.35** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	509	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	509	1.645	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W.A. Rogers DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	451.0	129.4	16746.90
52	704.0	382.4	146237.26
53	638.0	316.4	100115.16
54	605.0	283.4	80321.12
55	550.0	228.4	52171.04
56	517.0	195.4	38184.99
57	396.0	74.4	5536.82
58	451.0	129.4	16746.90
59	374.0	52.4	2746.79
60	264.0	-57.6	3316.63
61	374.0	52.4	2746.79
62	451.0	129.4	16746.90
63	275.0	-46.6	2170.65
64	473.0	151.4	22924.93
65	429.0	107.4	11536.87
66	451.0	129.4	16746.90
67	264.0	-57.6	3316.63
68	286.0	-35.6	1266.66
69	330.0	8.4	70.72
70	253.0	-68.6	4704.61
71	440.0	118.4	14020.88
72	462.0	140.4	19714.91
73	231.0	-90.6	8206.58
74	297.0	-24.6	604.68
75	286.0	-35.6	1266.66
76	462.0	140.4	19714.91
77	418.0	96.4	9294.85
78	341.0	19.4	376.74
79	231.0	-90.6	8206.58
80	286.0	-35.6	1266.66
81	308.0	-13.6	184.69
82	209.0	-112.6	12676.55
83	352.0	30.4	924.76
84	396.0	74.4	5536.82
85	308.0	-13.6	184.69
86	231.0	-90.6	8206.58
87	341.0	19.4	376.74
88	451.0	129.4	16746.90
89	385.0	63.4	4020.80
90	429.0	107.4	11536.87
91	231.0	-90.6	8206.58
92	231.0	-90.6	8206.58
93	253.0	-68.6	4704.61
94	308.0	-13.6	184.69
95	352.0	30.4	924.76
96	132.0	-189.6	35944.44
97	418.0	96.4	9294.85
98	440.0	118.4	14020.88
99	418.0	96.4	9294.85
100	297.0	-24.6	604.68
	18480.0		778811.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	561.0	239.4	57317.05
102	308.0	-13.6	184.69
103	1738.0	1416.4	2006216.73
104	924.0	602.4	362897.57
105	1353.0	1031.4	1063806.18
106	132.0	-189.6	35944.44
107	132.0	-189.6	35944.44
108	275.0	-46.6	2170.65
109	165.0	-156.6	24520.49
110	198.0	-123.6	15274.54
111	198.0	-123.6	15274.54
112	55.0	-266.6	71070.33
113	77.0	-244.6	59824.36
114	110.0	-211.6	44770.41
115	33.0	-288.6	83284.30
116	99.0	-222.6	49546.40
117	77.0	-244.6	59824.36
118	165.0	-156.6	24520.49
119	88.0	-233.6	54564.38
120	44.0	-277.6	77056.32
121	66.0	-255.6	65326.35
122	66.0	-255.6	65326.35
123	88.0	-233.6	54564.38
124	176.0	-145.6	21196.51
125	66.0	-255.6	65326.35
126	110.0	-211.6	44770.41
127	22.0	-299.6	89754.29
128	55.0	-266.6	71070.33
129	77.0	-244.6	59824.36
130	88.0	-233.6	54564.38
131	99.0	-222.6	49546.40
132	33.0	-288.6	83284.30
133	66.0	-255.6	65326.35
134	55.0	-266.6	71070.33
135	66.0	-255.6	65326.35
136	121.0	-200.6	40236.43
137	55.0	-266.6	71070.33
138	77.0	-244.6	59824.36
139	66.0	-255.6	65326.35
140	198.0	-123.6	15274.54
141	121.0	-200.6	40236.43
142	176.0	-145.6	21196.51
143	88.0	-233.6	54564.38
144	99.0	-222.6	49546.40
145	264.0	-57.6	3316.63
146	110.0	-211.6	44770.41
147	165.0	-156.6	24520.49
148	44.0	-277.6	77056.32
149	110.0	-211.6	44770.41
150	99.0	-222.6	49546.40
	9658.0		5731546.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	792.0	470.4	221285.38
152	1001.0	679.4	461597.68
153	1353.0	1031.4	1063806.18
154	22.0	-299.6	89754.29
155	66.0	-255.6	65326.35
156	55.0	-266.6	71070.33
157	66.0	-255.6	65326.35
158	55.0	-266.6	71070.33
159	132.0	-189.6	35944.44
160	22.0	-299.6	89754.29
161	132.0	-189.6	35944.44
162	77.0	-244.6	59824.36
163	176.0	-145.6	21196.51
164	198.0	-123.6	15274.54
165	110.0	-211.6	44770.41
166	77.0	-244.6	59824.36
167	66.0	-255.6	65326.35
168	77.0	-244.6	59824.36
169	77.0	-244.6	59824.36
170	110.0	-211.6	44770.41
171	66.0	-255.6	65326.35
172	154.0	-167.6	28086.47
173	165.0	-156.6	24520.49
174	143.0	-178.6	31894.46
175	77.0	-244.6	59824.36
176	77.0	-244.6	59824.36
177	88.0	-233.6	54564.38
178	132.0	-189.6	35944.44
179	55.0	-266.6	71070.33
180	176.0	-145.6	21196.51
181	55.0	-266.6	71070.33
182	132.0	-189.6	35944.44
183	198.0	-123.6	15274.54
184	110.0	-211.6	44770.41
185	198.0	-123.6	15274.54
186	110.0	-211.6	44770.41
187	99.0	-222.6	49546.40
188	88.0	-233.6	54564.38
189	90.0	-231.6	53634.02
190	132.0	-189.6	35944.44
191	165.0	-156.6	24520.49
192	198.0	-123.6	15274.54
193	110.0	-211.6	44770.41
194	132.0	-189.6	35944.44
195	165.0	-156.6	24520.49
196	66.0	-255.6	65326.35
197	132.0	-189.6	35944.44
198	132.0	-189.6	35944.44
199	55.0	-266.6	71070.33
200	121.0	-200.6	40236.43
	8285.0		3968114.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	44.0	-277.6	77056.32
202	88.0	-233.6	54564.38
203	121.0	-200.6	40236.43
204	121.0	-200.6	40236.43
205	66.0	-255.6	65326.35
206	66.0	-255.6	65326.35
207	99.0	-222.6	49546.40
208	55.0	-266.6	71070.33
209	121.0	-200.6	40236.43
210	66.0	-255.6	65326.35
211	198.0	-123.6	15274.54
212	77.0	-244.6	59824.36
213	121.0	-200.6	40236.43
214	165.0	-156.6	24520.49
215	264.0	-57.6	3316.63
216	55.0	-266.6	71070.33
217	33.0	-288.6	83284.30
218	66.0	-255.6	65326.35
219	110.0	-211.6	44770.41
220	88.0	-233.6	54564.38
221	99.0	-222.6	49546.40
222	99.0	-222.6	49546.40
223	77.0	-244.6	59824.36
224	121.0	-200.6	40236.43
225	66.0	-255.6	65326.35
226	99.0	-222.6	49546.40
227	33.0	-288.6	83284.30
228	88.0	-233.6	54564.38
229	99.0	-222.6	49546.40
230	88.0	-233.6	54564.38
231	77.0	-244.6	59824.36
232	77.0	-244.6	59824.36
233	55.0	-266.6	71070.33
234	22.0	-299.6	89754.29
235	88.0	-233.6	54564.38
236	110.0	-211.6	44770.41
237	22.0	-299.6	89754.29
238	44.0	-277.6	77056.32
239	44.0	-277.6	77056.32
240	55.0	-266.6	71070.33
241	11.0	-310.6	96466.27
242	55.0	-266.6	71070.33
243	99.0	-222.6	49546.40
244	110.0	-211.6	44770.41
245	33.0	-288.6	83284.30
246	99.0	-222.6	49546.40
247	121.0	-200.6	40236.43
248	143.0	-178.6	31894.46
249	88.0	-233.6	54564.38
250	99.0	-222.6	49546.40
	4345.0		2852770.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	121.0	-200.6	40236.43
252	88.0	-233.6	54564.38
253	55.0	-266.6	71070.33
254	88.0	-233.6	54564.38
255	66.0	-255.6	65326.35
256	88.0	-233.6	54564.38
257	143.0	-178.6	31894.46
258	77.0	-244.6	59824.36
259	88.0	-233.6	54564.38
260	99.0	-222.6	49546.40
261	33.0	-288.6	83284.30
262	110.0	-211.6	44770.41
263	88.0	-233.6	54564.38
264	176.0	-145.6	21196.51
265	66.0	-255.6	65326.35
266	55.0	-266.6	71070.33
267	44.0	-277.6	77056.32
268	176.0	-145.6	21196.51
269	66.0	-255.6	65326.35
270	77.0	-244.6	59824.36
271	55.0	-266.6	71070.33
272	154.0	-167.6	28086.47
273	99.0	-222.6	49546.40
274	44.0	-277.6	77056.32
275	55.0	-266.6	71070.33
276	154.0	-167.6	28086.47
277	77.0	-244.6	59824.36
278	99.0	-222.6	49546.40
279	66.0	-255.6	65326.35
280	154.0	-167.6	28086.47
281	143.0	-178.6	31894.46
282	77.0	-244.6	59824.36
283	253.0	-68.6	4704.61
284	121.0	-200.6	40236.43
285	187.0	-134.6	18114.52
286	99.0	-222.6	49546.40
287	99.0	-222.6	49546.40
288	77.0	-244.6	59824.36
289	198.0	-123.6	15274.54
290	88.0	-233.6	54564.38
291	143.0	-178.6	31894.46
292	330.0	8.4	70.72
293	99.0	-222.6	49546.40
294	77.0	-244.6	59824.36
295	55.0	-266.6	71070.33
296	99.0	-222.6	49546.40
297	99.0	-222.6	49546.40
298	110.0	-211.6	44770.41
299	132.0	-189.6	35944.44
300	176.0	-145.6	21196.51
	5423.0		2424412.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	99.0	-222.6	49546.40
302	77.0	-244.6	59824.36
303	22.0	-299.6	89754.29
304	44.0	-277.6	77056.32
305	132.0	-189.6	35944.44
306	66.0	-255.6	65326.35
307	110.0	-211.6	44770.41
308	44.0	-277.6	77056.32
309	77.0	-244.6	59824.36
310	33.0	-288.6	83284.30
311	77.0	-244.6	59824.36
312	0.0	-321.6	103420.25
313	33.0	-288.6	83284.30
314	33.0	-288.6	83284.30
315	55.0	-266.6	71070.33
316	33.0	-288.6	83284.30
317	55.0	-266.6	71070.33
318	44.0	-277.6	77056.32
319	121.0	-200.6	40236.43
320	99.0	-222.6	49546.40
321	110.0	-211.6	44770.41
322	77.0	-244.6	59824.36
323	66.0	-255.6	65326.35
324	110.0	-211.6	44770.41
325	110.0	-211.6	44770.41
326	176.0	-145.6	21196.51
327	88.0	-233.6	54564.38
328	121.0	-200.6	40236.43
329	77.0	-244.6	59824.36
330	176.0	-145.6	21196.51
331	165.0	-156.6	24520.49
332	198.0	-123.6	15274.54
333	231.0	-90.6	8206.58
334	385.0	63.4	4020.80
335	418.0	96.4	9294.85
336	352.0	30.4	924.76
337	121.0	-200.6	40236.43
338	176.0	-145.6	21196.51
339	253.0	-68.6	4704.61
340	66.0	-255.6	65326.35
341	385.0	63.4	4020.80
342	352.0	30.4	924.76
343	231.0	-90.6	8206.58
344	187.0	-134.6	18114.52
345	253.0	-68.6	4704.61
346	396.0	74.4	5536.82
347	330.0	8.4	70.72
348	286.0	-35.6	1266.66
349	165.0	-156.6	24520.49
350	253.0	-68.6	4704.61
	7568.0		2086721.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 FENCE SURVEY (AFFECTED)
n = DPM/100cm²

Number	n	(n-N)	(n-N)²
351	462.0	140.4	19714.91
352	374.0	52.4	2746.79
353	418.0	96.4	9294.85
354	308.0	-13.6	184.69
355	231.0	-90.6	8206.58
356	308.0	-13.6	184.69
357	407.0	85.4	7294.83
358	363.0	41.4	1714.77
359	242.0	-79.6	6334.60
360	330.0	8.4	70.72
361	198.0	-123.6	15274.54
362	451.0	129.4	16746.90
363	495.0	173.4	30070.96
364	176.0	-145.6	21196.51
365	583.0	261.4	68335.09
366	297.0	-24.6	604.68
367	297.0	-24.6	604.68
368	319.0	-2.6	6.71
369	341.0	19.4	376.74
370	484.0	162.4	26376.94
371	263.0	-58.6	3432.81
372	396.0	74.4	5536.82
373	187.0	-134.6	18114.52
374	308.0	-13.6	184.69
375	462.0	140.4	19714.91
376	352.0	30.4	924.76
377	385.0	63.4	4020.80
378	396.0	74.4	5536.82
379	286.0	-35.6	1266.66
380	341.0	19.4	376.74
381	231.0	-90.6	8206.58
382	341.0	19.4	376.74
383	484.0	162.4	26376.94
384	451.0	129.4	16746.90
385	275.0	-46.6	2170.65
386	396.0	74.4	5536.82
387	418.0	96.4	9294.85
388	506.0	184.4	34006.98
389	539.0	217.4	47267.02
390	517.0	195.4	38184.99
391	198.0	-123.6	15274.54
392	374.0	52.4	2746.79
393	308.0	-13.6	184.69
394	539.0	217.4	47267.02
395	385.0	63.4	4020.80
396	517.0	195.4	38184.99
397	297.0	-24.6	604.68
398	374.0	52.4	2746.79
399	462.0	140.4	19714.91
400	495.0	173.4	30070.96
	18567.0		643435.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	418.0	96.4	9294.85
402	374.0	52.4	2746.79
403	396.0	74.4	5536.82
404	451.0	129.4	16746.90
405	440.0	118.4	14020.88
406	528.0	206.4	42605.01
407	561.0	239.4	57317.05
408	528.0	206.4	42605.01
409	418.0	96.4	9294.85
410	407.0	85.4	7294.83
411	363.0	41.4	1714.77
412	440.0	118.4	14020.88
413	374.0	52.4	2746.79
414	462.0	140.4	19714.91
415	231.0	-90.6	8206.58
416	297.0	-24.6	604.68
417	396.0	74.4	5536.82
418	616.0	294.4	86677.13
419	561.0	239.4	57317.05
420	561.0	239.4	57317.05
421	231.0	-90.6	8206.58
422	495.0	173.4	30070.96
423	528.0	206.4	42605.01
424	660.0	338.4	114521.20
425	517.0	195.4	38184.99
426	506.0	184.4	34006.98
427	187.0	-134.6	18114.52
428	528.0	206.4	42605.01
429	726.0	404.4	163547.29
430	528.0	206.4	42605.01
431	550.0	228.4	52171.04
432	704.0	382.4	146237.26
433	605.0	283.4	80321.12
434	462.0	140.4	19714.91
435	572.0	250.4	62705.07
436	462.0	140.4	19714.91
437	572.0	250.4	62705.07
438	594.0	272.4	74207.10
439	484.0	162.4	26376.94
440	660.0	338.4	114521.20
441	583.0	261.4	68335.09
442	781.0	459.4	211057.37
443	715.0	393.4	154771.27
444	715.0	393.4	154771.27
445	484.0	162.4	26376.94
446	583.0	261.4	68335.09
447	814.0	492.4	242467.41
448	594.0	272.4	74207.10
449	517.0	195.4	38184.99
450	627.0	305.4	93275.15
	25806.0		2786243.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM/100cm²

Number	n	(n-N)	(n-N)²
451	429.0	107.4	11536.87
452	814.0	492.4	242467.41
453	979.0	657.4	432187.65
454	781.0	459.4	211057.37
455	627.0	305.4	93275.15
456	803.0	481.4	231755.40
457	374.0	52.4	2746.79
458	605.0	283.4	80321.12
459	682.0	360.4	129895.23
460	759.0	437.4	191327.34
461	748.0	426.4	181825.32
462	869.0	547.4	299657.49
463	495.0	173.4	30070.96
464	979.0	657.4	432187.65
465	880.0	558.4	311821.51
466	748.0	426.4	181825.32
467	902.0	580.4	336875.54
468	660.0	338.4	114521.20
469	473.0	151.4	22924.93
470	924.0	602.4	362897.57
471	1001.0	679.4	461597.68
472	495.0	173.4	30070.96
473	594.0	272.4	74207.10
474	616.0	294.4	86677.13
475	451.0	129.4	16746.90
476	671.0	349.4	122087.21
477	869.0	547.4	299657.49
478	605.0	283.4	80321.12
479	748.0	426.4	181825.32
480	792.0	470.4	221285.38
481	671.0	349.4	122087.21
482	682.0	360.4	129895.23
483	825.0	503.4	253421.43
484	682.0	360.4	129895.23
485	528.0	206.4	42605.01
486	770.0	448.4	201071.35
487	583.0	261.4	68335.09
488	748.0	426.4	181825.32
489	935.0	613.4	376271.59
490	935.0	613.4	376271.59
491	737.0	415.4	172565.31
492	957.0	635.4	403745.62
493	418.0	96.4	9294.85
494	572.0	250.4	62705.07
495	737.0	415.4	172565.31
496	1001.0	679.4	461597.68
497	770.0	448.4	201071.35
498	759.0	437.4	191327.34
499	726.0	404.4	163547.29
500	792.0	470.4	221285.38
	36201.0		9417038.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
501	880.0	558.4	311821.51
502	715.0	393.4	154771.27
503	792.0	470.4	221285.38
504	627.0	305.4	93275.15
505	484.0	162.4	26376.94
506	539.0	217.4	47267.02
507	649.0	327.4	107197.18
508	726.0	404.4	163547.29
509	473.0	151.4	22924.93
510	462.0	140.4	19714.91
511	0.0	0.00	0.00
512	0.0	0.00	0.00
513	0.0	0.00	0.00
514	0.0	0.00	0.00
515	0.0	0.00	0.00
516	0.0	0.00	0.00
517	0.0	0.00	0.00
518	0.0	0.00	0.00
519	0.0	0.00	0.00
520	0.0	0.00	0.00
521	0.0	0.00	0.00
522	0.0	0.00	0.00
523	0.0	0.00	0.00
524	0.0	0.00	0.00
525	0.0	0.00	0.00
526	0.0	0.00	0.00
527	0.0	0.00	0.00
528	0.0	0.00	0.00
529	0.0	0.00	0.00
530	0.0	0.00	0.00
531	0.0	0.00	0.00
532	0.0	0.00	0.00
533	0.0	0.00	0.00
534	0.0	0.00	0.00
535	0.0	0.00	0.00
536	0.0	0.00	0.00
537	0.0	0.00	0.00
538	0.0	0.00	0.00
539	0.0	0.00	0.00
540	0.0	0.00	0.00
541	0.0	0.00	0.00
542	0.0	0.00	0.00
543	0.0	0.00	0.00
544	0.0	0.00	0.00
545	0.0	0.00	0.00
546	0.0	0.00	0.00
547	0.0	0.00	0.00
548	0.0	0.00	0.00
549	0.0	0.00	0.00
550	0.0	0.00	0.00
	6347.0		1168181.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	230.0	-929.4	863777.1
2	0.0	-1159.4	1344199.3
3	0.0	-1159.4	1344199.3
4	1886.0	726.6	527953.3
5	1449.0	289.6	83870.4
6	1426.0	266.6	71077.7
7	230.0	-929.4	863777.1
8	0.0	-1159.4	1344199.3
9	161.0	-998.4	996794.7
10	1012.0	-147.4	21725.6
11	759.0	-400.4	160317.0
12	1035.0	-124.4	15474.4
13	2507.0	1347.6	1816036.3
14	1978.0	818.6	670112.4
15	2622.0	1462.6	2139210.2
16	3013.0	1853.6	3435847.5
17	598.0	-561.4	315165.6
18	598.0	-561.4	315165.6
19	552.0	-607.4	368930.0
20	322.0	-837.4	701232.2
21	105.0	-1054.4	1111751.1
22	1265.0	105.6	11152.2
23	621.0	-538.4	289870.3
24	322.0	-837.4	701232.2
25	1104.0	-55.4	3068.7
26	1334.0	174.6	30486.5
27	2277.0	1117.6	1249038.5
28	483.0	-676.4	457511.7
29	943.0	-216.4	46827.3
30	529.0	-630.4	397399.2
31	1081.0	-78.4	6145.9
32	1219.0	59.6	3552.6
33	920.0	-239.4	57310.5
34	1334.0	174.6	30486.5
35	1656.0	496.6	246615.5
36	1426.0	266.6	71077.7
37	552.0	-607.4	368930.0
38	851.0	-308.4	95108.1
39	552.0	-607.4	368930.0
40	1150.0	-9.4	88.3
41	1702.0	542.6	294419.0
42	1311.0	151.6	22983.7
43	552.0	-607.4	368930.0
44	552.0	-607.4	368930.0
45	621.0	-538.4	289870.3
46	1656.0	496.6	246615.5
47	1725.0	565.6	319907.8
48	2438.0	1278.6	1634828.0
49	1886.0	726.6	527953.3
50	46.0	-1113.4	1239650.8
	62125.0		31466305.6
	39913.0		28923217.0
	39928.0		34503798.1
	34730.0		41275343.7
	27646.0		32560413.4
	50255.0		29238208.5
	93815.0		53090944.1
	109850.0		89572666.9
	65834.0		18543644.5
	14605.0		9783520.2
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	591292		397217798.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **510**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **1159.40**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **883.40**
2 Std Deviations: **1766.79**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.645**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **1223.74** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	509	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	509	1.645	95%	

PERFORMED BY: K Morgan DATE: 6/15/99

REVIEWED BY: W. A. Rogers DATE: 6-15-99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	621.0	-538.4	289870.34
52	2139.0	979.6	959623.84
53	2530.0	1370.6	1878555.11
54	2369.0	1209.6	1463141.65
55	690.0	-469.4	220332.68
56	1150.0	-9.4	88.29
57	782.0	-377.4	142427.80
58	1679.0	519.6	269988.24
59	1840.0	680.6	463221.70
60	2047.0	887.6	787840.72
61	1035.0	-124.4	15474.38
62	483.0	-676.4	457511.65
63	299.0	-860.4	740281.41
64	1679.0	519.6	269988.24
65	1771.0	611.6	374059.36
66	3588.0	2428.6	5898117.01
67	322.0	-837.4	701232.19
68	0.0	-1159.4	1344199.27
69	207.0	-952.4	907058.29
70	1127.0	-32.4	1049.51
71	1978.0	818.6	670112.38
72	1794.0	634.6	402722.14
73	920.0	-239.4	57310.48
74	437.0	-722.4	521856.09
75	322.0	-837.4	701232.19
76	1564.0	404.6	163704.33
77	1909.0	749.6	561906.04
78	1127.0	-32.4	1049.51
79	506.0	-653.4	426926.44
80	161.0	-998.4	996794.73
81	529.0	-630.4	397399.22
82	1449.0	289.6	83870.43
83	2783.0	1623.6	2636089.69
84	1403.0	243.6	59342.87
85	736.0	-423.4	179264.24
86	345.0	-814.4	663240.97
87	782.0	-377.4	142427.80
88	1380.0	220.6	48666.09
89	1656.0	496.6	246615.45
90	2024.0	864.6	747539.94
91	437.0	-722.4	521856.09
92	483.0	-676.4	457511.65
93	506.0	-653.4	426926.44
94	1359.0	199.6	39841.73
95	2185.0	1025.6	1051863.40
96	2047.0	887.6	787840.72
97	759.0	-400.4	160317.02
98	1472.0	312.6	97721.21
99	667.0	-492.4	242453.90
100	2047.0	887.6	787840.72
	62125.0		31466305.6
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	1863.0	703.6	495058.48
102	1748.0	588.6	346454.58
103	1196.0	36.6	1339.85
104	920.0	-239.4	57310.48
105	1817.0	657.6	432442.92
106	368.0	-791.4	626307.75
107	138.0	-1021.4	1043249.95
108	805.0	-354.4	125596.58
109	414.0	-745.4	555615.31
110	207.0	-952.4	907058.29
111	0.0	-1159.4	1344199.27
112	506.0	-653.4	426926.44
113	782.0	-377.4	142427.80
114	552.0	-607.4	368930.00
115	414.0	-745.4	555615.31
116	345.0	-814.4	663240.97
117	322.0	-837.4	701232.19
118	598.0	-561.4	315165.56
119	874.0	-285.4	81450.92
120	1081.0	-78.4	6145.95
121	92.0	-1067.4	1139334.39
122	207.0	-952.4	907058.29
123	644.0	-515.4	265633.12
124	897.0	-262.4	68851.70
125	437.0	-722.4	521856.09
126	1242.0	82.6	6823.41
127	253.0	-906.4	821553.85
128	0.0	-1159.4	1344199.27
129	0.0	-1159.4	1344199.27
130	1380.0	220.6	48666.09
131	1587.0	427.6	182845.11
132	1012.0	-147.4	21725.60
133	0.0	-1159.4	1344199.27
134	138.0	-1021.4	1043249.95
135	928.0	-231.4	53544.15
136	1794.0	634.6	402722.14
137	2093.0	933.6	871616.28
138	2967.0	1807.6	3267431.94
139	23.0	-1136.4	1291396.05
140	483.0	-676.4	457511.65
141	897.0	-262.4	68851.70
142	1518.0	358.6	128596.77
143	2093.0	933.6	871616.28
144	621.0	-538.4	289870.34
145	138.0	-1021.4	1043249.95
146	0.0	-1159.4	1344199.27
147	598.0	-561.4	315165.56
148	667.0	-492.4	242453.90
149	1219.0	59.6	3552.63
150	1035.0	-124.4	15474.38
	39913.0		28923217.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	4439.0	3279.6	10755801.88
152	1334.0	174.6	30486.53
153	1817.0	657.6	432442.92
154	1909.0	749.6	561906.04
155	414.0	-745.4	555615.31
156	92.0	-1067.4	1139334.39
157	920.0	-239.4	57310.48
158	1219.0	59.6	3552.63
159	1265.0	105.6	11152.19
160	759.0	-400.4	160317.02
161	644.0	-515.4	265633.12
162	276.0	-883.4	780388.63
163	667.0	-492.4	242453.90
164	1081.0	-78.4	6145.95
165	667.0	-492.4	242453.90
166	828.0	-331.4	109823.36
167	0.0	-1159.4	1344199.27
168	0.0	-1159.4	1344199.27
169	414.0	-745.4	555615.31
170	69.0	-1090.4	1188963.61
171	828.0	-331.4	109823.36
172	1518.0	358.6	128596.77
173	529.0	-630.4	397399.22
174	1817.0	657.6	432442.92
175	1587.0	427.6	182845.11
176	437.0	-722.4	521856.09
177	0.0	-1159.4	1344199.27
178	437.0	-722.4	521856.09
179	1081.0	-78.4	6145.95
180	1196.0	36.6	1339.85
181	414.0	-745.4	555615.31
182	1150.0	-9.4	88.29
183	851.0	-308.4	95108.14
184	1081.0	-78.4	6145.95
185	1081.0	-78.4	6145.95
186	529.0	-630.4	397399.22
187	0.0	-1159.4	1344199.27
188	414.0	-745.4	555615.31
189	207.0	-952.4	907058.29
190	690.0	-469.4	220332.68
191	2024.0	864.6	747539.94
192	598.0	-561.4	315165.56
193	0.0	-1159.4	1344199.27
194	805.0	-354.4	125596.58
195	276.0	-883.4	780388.63
196	322.0	-837.4	701232.19
197	345.0	-814.4	663240.97
198	138.0	-1021.4	1043249.95
199	230.0	-929.4	863777.07
200	529.0	-630.4	397399.22
	39928.0		34503798.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	690.0	-469.4	220332.68
202	805.0	-354.4	125596.58
203	851.0	-308.4	95108.14
204	759.0	-400.4	160317.02
205	0.0	-1159.4	1344199.27
206	0.0	-1159.4	1344199.27
207	0.0	-1159.4	1344199.27
208	3795.0	2635.6	6946408.03
209	1564.0	404.6	163704.33
210	2760.0	1600.6	2561932.91
211	0.0	-1159.4	1344199.27
212	368.0	-791.4	626307.75
213	667.0	-492.4	242453.90
214	1403.0	243.6	59342.87
215	2093.0	933.6	871616.28
216	276.0	-883.4	780388.63
217	368.0	-791.4	626307.75
218	0.0	-1159.4	1344199.27
219	46.0	-1113.4	1239650.83
220	1173.0	13.6	185.07
221	0.0	-1159.4	1344199.27
222	943.0	-216.4	46827.26
223	0.0	-1159.4	1344199.27
224	184.0	-975.4	951397.51
225	207.0	-952.4	907058.29
226	1679.0	519.6	269988.24
227	1403.0	243.6	59342.87
228	1840.0	680.6	463221.70
229	0.0	-1159.4	1344199.27
230	0.0	-1159.4	1344199.27
231	0.0	-1159.4	1344199.27
232	621.0	-538.4	289870.34
233	460.0	-699.4	489154.87
234	1771.0	611.6	374059.36
235	0.0	-1159.4	1344199.27
236	460.0	-699.4	489154.87
237	184.0	-975.4	951397.51
238	1219.0	59.6	3552.63
239	483.0	-676.4	457511.65
240	736.0	-423.4	179264.24
241	0.0	-1159.4	1344199.27
242	0.0	-1159.4	1344199.27
243	368.0	-791.4	626307.75
244	483.0	-676.4	457511.65
245	851.0	-308.4	95108.14
246	1104.0	-55.4	3068.73
247	92.0	-1067.4	1139334.39
248	391.0	-768.4	590432.53
249	782.0	-377.4	142427.80
250	851.0	-308.4	95108.14
	34730.0		41275343.7
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	1081.0	-78.4	6145.95
252	759.0	-400.4	160317.02
253	874.0	-285.4	81450.92
254	230.0	-929.4	863777.07
255	69.0	-1090.4	1188963.61
256	414.0	-745.4	555615.31
257	690.0	-469.4	220332.68
258	1357.0	197.6	39047.31
259	46.0	-1113.4	1239650.83
260	0.0	-1159.4	1344199.27
261	0.0	-1159.4	1344199.27
262	1771.0	611.6	374059.36
263	851.0	-308.4	95108.14
264	1104.0	-55.4	3068.73
265	506.0	-653.4	426926.44
266	23.0	-1136.4	1291396.05
267	0.0	-1159.4	1344199.27
268	1173.0	13.6	185.07
269	1403.0	243.6	59342.87
270	759.0	-400.4	160317.02
271	0.0	-1159.4	1344199.27
272	161.0	-998.4	996794.73
273	0.0	-1159.4	1344199.27
274	0.0	-1159.4	1344199.27
275	0.0	-1159.4	1344199.27
276	69.0	-1090.4	1188963.61
277	299.0	-860.4	740281.41
278	920.0	-239.4	57310.48
279	1081.0	-78.4	6145.95
280	0.0	-1159.4	1344199.27
281	69.0	-1090.4	1188963.61
282	115.0	-1044.4	1090763.17
283	1012.0	-147.4	21725.60
284	1587.0	427.6	182845.11
285	943.0	-216.4	46827.26
286	0.0	-1159.4	1344199.27
287	46.0	-1113.4	1239650.83
288	299.0	-860.4	740281.41
289	1242.0	82.6	6823.41
290	1242.0	82.6	6823.41
291	1311.0	151.6	22983.75
292	0.0	-1159.4	1344199.27
293	253.0	-906.4	821553.85
294	552.0	-607.4	368930.00
295	1035.0	-124.4	15474.38
296	920.0	-239.4	57310.48
297	1150.0	-9.4	88.29
298	230.0	-929.4	863777.07
299	0.0	-1159.4	1344199.27
300	0.0	-1159.4	1344199.27
	27646.0		32560413.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	621.0	-538.4	289870.34
302	1242.0	82.6	6823.41
303	851.0	-308.4	95108.14
304	115.0	-1044.4	1090763.17
305	276.0	-883.4	780388.63
306	897.0	-262.4	68851.70
307	1403.0	243.6	59342.87
308	1242.0	82.6	6823.41
309	1219.0	59.6	3552.63
310	460.0	-699.4	489154.87
311	92.0	-1067.4	1139334.39
312	46.0	-1113.4	1239650.83
313	1610.0	450.6	203043.89
314	759.0	-400.4	160317.02
315	943.0	-216.4	46827.26
316	230.0	-929.4	863777.07
317	69.0	-1090.4	1188963.61
318	207.0	-952.4	907058.29
319	621.0	-538.4	289870.34
320	782.0	-377.4	142427.80
321	1656.0	496.6	246615.45
322	0.0	-1159.4	1344199.27
323	0.0	-1159.4	1344199.27
324	0.0	-1159.4	1344199.27
325	1311.0	151.6	22983.75
326	1242.0	82.6	6823.41
327	851.0	-308.4	95108.14
328	966.0	-193.4	37402.04
329	46.0	-1113.4	1239650.83
330	0.0	-1159.4	1344199.27
331	759.0	-400.4	160317.02
332	322.0	-837.4	701232.19
333	1081.0	-78.4	6145.95
334	1978.0	818.6	670112.38
335	2116.0	956.6	915091.06
336	2001.0	841.6	708297.16
337	1104.0	-55.4	3068.73
338	805.0	-354.4	125596.58
339	989.0	-170.4	29034.82
340	1472.0	312.6	97721.21
341	2254.0	1094.6	1198157.75
342	3243.0	2083.6	4341405.30
343	1610.0	450.6	203043.89
344	966.0	-193.4	37402.04
345	598.0	-561.4	315165.56
346	1725.0	565.6	319907.80
347	2622.0	1462.6	2139210.23
348	2162.0	1002.6	1005214.62
349	1127.0	-32.4	1049.51
350	1564.0	404.6	163704.33
	50255.0		29238208.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM/100cm²

Number	n	(n-N)	(n-N)²
351	1194.0	34.6	1197.43
352	2231.0	1071.6	1148334.96
353	2622.0	1462.6	2139210.23
354	2668.0	1508.6	2275885.79
355	1334.0	174.6	30486.53
356	1219.0	59.6	3552.63
357	1081.0	-78.4	6145.95
358	1656.0	496.6	246615.45
359	1909.0	749.6	561906.04
360	2346.0	1186.6	1408028.87
361	897.0	-262.4	68851.70
362	1564.0	404.6	163704.33
363	1863.0	703.6	495058.48
364	1771.0	611.6	374059.36
365	2829.0	1669.6	2787577.25
366	2967.0	1807.6	3267431.94
367	1541.0	381.6	145621.55
368	621.0	-538.4	289870.34
369	851.0	-308.4	95108.14
370	2944.0	1784.6	3184811.16
371	2507.0	1347.6	1816036.33
372	3243.0	2083.6	4341405.30
373	805.0	-354.4	125596.58
374	1334.0	174.6	30486.53
375	1679.0	519.6	269988.24
376	2714.0	1554.6	2416793.35
377	2369.0	1209.6	1463141.65
378	1725.0	565.6	319907.80
379	1633.0	473.6	224300.67
380	1932.0	772.6	596916.82
381	1334.0	174.6	30486.53
382	2116.0	956.6	915091.06
383	3151.0	1991.6	3966486.18
384	2231.0	1071.6	1148334.96
385	1449.0	289.6	83870.43
386	874.0	-285.4	81450.92
387	1311.0	151.6	22983.75
388	2645.0	1485.6	2207019.01
389	2668.0	1508.6	2275885.79
390	3128.0	1968.6	3875401.40
391	989.0	-170.4	29034.82
392	1127.0	-32.4	1049.51
393	1357.0	197.6	39047.31
394	2415.0	1255.6	1576541.21
395	2852.0	1692.6	2864908.04
396	2691.0	1531.6	2345810.57
397	1380.0	220.6	48666.09
398	506.0	-653.4	426926.44
399	1541.0	381.6	145621.55
400	2001.0	841.6	708297.16
	93815.0		53090944.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	2139.0	979.6	959623.84
402	2576.0	1416.6	2006766.67
403	1311.0	151.6	22983.75
404	1173.0	13.6	185.07
405	1495.0	335.6	112629.99
406	2231.0	1071.6	1148334.96
407	2162.0	1002.6	1005214.62
408	1817.0	657.6	432442.92
409	1311.0	151.6	22983.75
410	1610.0	450.6	203043.89
411	1334.0	174.6	30486.53
412	2530.0	1370.6	1878555.11
413	2875.0	1715.6	2943296.82
414	2967.0	1807.6	3267431.94
415	1104.0	-55.4	3068.73
416	1472.0	312.6	97721.21
417	1104.0	-55.4	3068.73
418	2576.0	1416.6	2006766.67
419	2599.0	1439.6	2072459.45
420	3611.0	2451.6	6010361.79
421	1081.0	-78.4	6145.95
422	1150.0	-9.4	88.29
423	1702.0	542.6	294419.02
424	2898.0	1738.6	3022743.60
425	1886.0	726.6	527953.26
426	2116.0	956.6	915091.06
427	1518.0	358.6	128596.77
428	3381.0	2221.6	4935523.98
429	1291.0	131.6	17319.59
430	2599.0	1439.6	2072459.45
431	3243.0	2083.6	4341405.30
432	3243.0	2083.6	4341405.30
433	2162.0	1002.6	1005214.62
434	1817.0	657.6	432442.92
435	1633.0	473.6	224300.67
436	4025.0	2865.6	8211685.84
437	4646.0	3486.6	12156406.91
438	2806.0	1646.6	2711304.47
439	1587.0	427.6	182845.11
440	1978.0	818.6	670112.38
441	1196.0	36.6	1339.85
442	3818.0	2658.6	7068174.81
443	3197.0	2037.6	4151829.74
444	2599.0	1439.6	2072459.45
445	1334.0	174.6	30486.53
446	1909.0	749.6	561906.04
447	2138.0	978.6	957665.64
448	2806.0	1646.6	2711304.47
449	1955.0	795.6	632985.60
450	2139.0	979.6	959623.84
	109850.0		89572666.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

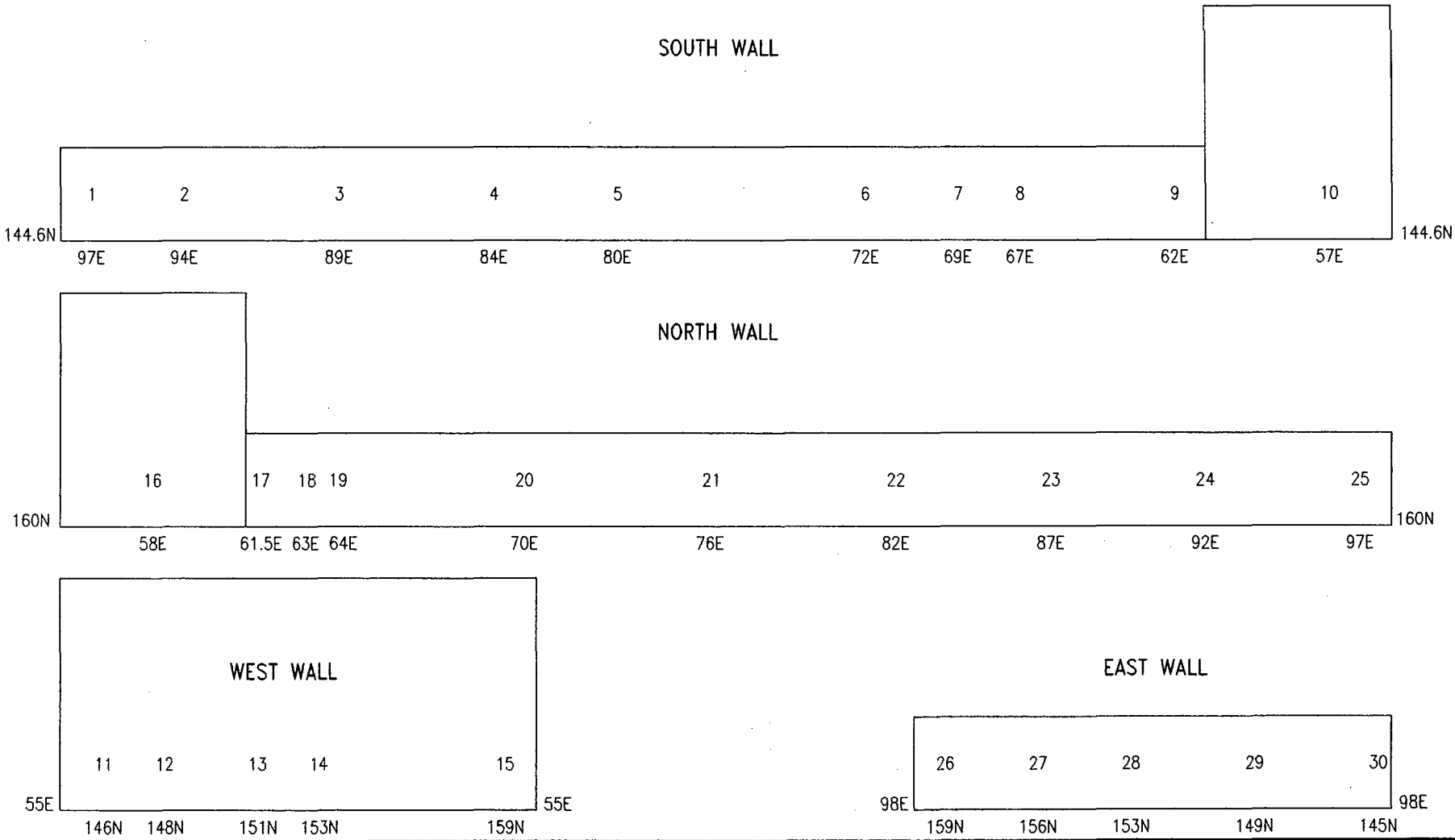
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 FENCE SURVEY (AFFECTED)

n = DPM/100cm²

Number	n	(n-N)	(n-N)²
451	1265.0	105.6	11152.19
452	1978.0	818.6	670112.38
453	851.0	-308.4	95108.14
454	2323.0	1163.6	1353974.09
455	1978.0	818.6	670112.38
456	2139.0	979.6	959623.84
457	1035.0	-124.4	15474.38
458	299.0	-860.4	740281.41
459	621.0	-538.4	289870.34
460	1426.0	266.6	71077.65
461	1196.0	36.6	1339.85
462	1012.0	-147.4	21725.60
463	0.0	-1159.4	1344199.27
464	644.0	-515.4	265633.12
465	253.0	-906.4	821553.85
466	1265.0	105.6	11152.19
467	1334.0	174.6	30486.53
468	989.0	-170.4	29034.82
469	552.0	-607.4	368930.00
470	1127.0	-32.4	1049.51
471	1541.0	381.6	145621.55
472	1587.0	427.6	182845.11
473	1863.0	703.6	495058.48
474	1104.0	-55.4	3068.73
475	1886.0	726.6	527953.26
476	736.0	-423.4	179264.24
477	1357.0	197.6	39047.31
478	1817.0	657.6	432442.92
479	1449.0	289.6	83870.43
480	1817.0	657.6	432442.92
481	1587.0	427.6	182845.11
482	951.0	-208.4	43428.93
483	713.0	-446.4	199269.46
484	2691.0	1531.6	2345810.57
485	2576.0	1416.6	2006766.67
486	1564.0	404.6	163704.33
487	920.0	-239.4	57310.48
488	782.0	-377.4	142427.80
489	782.0	-377.4	142427.80
490	1886.0	726.6	527953.26
491	1748.0	588.6	346454.58
492	2208.0	1048.6	1099570.18
493	989.0	-170.4	29034.82
494	1035.0	-124.4	15474.38
495	1955.0	795.6	632985.60
496	1472.0	312.6	97721.21
497	1495.0	335.6	112629.99
498	1173.0	13.6	185.07
499	920.0	-239.4	57310.48
500	943.0	-216.4	46827.26
	65834.0		18543644.5
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
501	598.0	-561.4	315165.56
502	1403.0	243.6	59342.87
503	1242.0	82.6	6823.41
504	2760.0	1600.6	2561932.91
505	874.0	-285.4	81450.92
506	184.0	-975.4	951397.51
507	345.0	-814.4	663240.97
508	2162.0	1002.6	1005214.62
509	2990.0	1830.6	3351110.72
510	2047.0	887.6	787840.72
511	0.0	0.00	0.00
512	0.0	0.00	0.00
513	0.0	0.00	0.00
514	0.0	0.00	0.00
515	0.0	0.00	0.00
516	0.0	0.00	0.00
517	0.0	0.00	0.00
518	0.0	0.00	0.00
519	0.0	0.00	0.00
520	0.0	0.00	0.00
521	0.0	0.00	0.00
522	0.0	0.00	0.00
523	0.0	0.00	0.00
524	0.0	0.00	0.00
525	0.0	0.00	0.00
526	0.0	0.00	0.00
527	0.0	0.00	0.00
528	0.0	0.00	0.00
529	0.0	0.00	0.00
530	0.0	0.00	0.00
531	0.0	0.00	0.00
532	0.0	0.00	0.00
533	0.0	0.00	0.00
534	0.0	0.00	0.00
535	0.0	0.00	0.00
536	0.0	0.00	0.00
537	0.0	0.00	0.00
538	0.0	0.00	0.00
539	0.0	0.00	0.00
540	0.0	0.00	0.00
541	0.0	0.00	0.00
542	0.0	0.00	0.00
543	0.0	0.00	0.00
544	0.0	0.00	0.00
545	0.0	0.00	0.00
546	0.0	0.00	0.00
547	0.0	0.00	0.00
548	0.0	0.00	0.00
549	0.0	0.00	0.00
550	0.0	0.00	0.00
	14605.0		9783520.2
	Sum(n)		Sum(n-N)²



NOTE:
REFER TO DATA TABLES FOR SURVEY RESULTS.

5 0 5
SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
TIO2 BLDG. - INSIDE WALLS
ALPHA & BETA-GAMMA SURVEY LOCATIONS

DRWN. BY	DATE	SCALE:
JE	5-28-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIWAS-3	0

...SUBAREAI\TIO2-BLDG\TIO2-INSIDE-WALLS

05/12/99

CIMARRON FACILITY

TIO2 BUILDING - INSIDE WALLS — SUB AREA "I"

ALPHA AND BETA/GAMMA — UNAFFECTED PHASE II

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	2 cpm	71 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	308 cpm	623 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-13-99

LN #	TIO2 BUILDING INSIDE WALLS	READING ID	DIRECT		SMEAR		µR/Hr @ 1 METER
			ALPHA	BETA	ALPHA	BETA	
1	SOUTH WALL	1	20	0	4	0	6
2	SOUTH WALL	2	0	0	0	0	5
3	SOUTH WALL	3	0	0	4	2	5
4	SOUTH WALL	4	0	0	0	2	5
5	SOUTH WALL	5	0	0	0	0	6
6	SOUTH WALL	6	90	0	0	0	4
7	SOUTH WALL	7	20	0	0	4	6
8	SOUTH WALL	8	20	130	2	7	7
9	SOUTH WALL	9	20	0	0	0	6
10	SOUTH WALL	10	20	310	2	2	7
11	WEST WALL	11	30	190	10	0	7
12	WEST WALL	12	20	950	2	0	6
13	WEST WALL	13	0	710	0	2	7
14	WEST WALL	14	0	350	0	2	6
15	WEST WALL	15	0	710	2	2	7
16	NORTH WALL	16	20	590	2	0	6
17	NORTH WALL	17	0	10	0	0	5
18	NORTH WALL	18	0	0	0	2	6
19	NORTH WALL	19	0	0	2	0	6
20	NORTH WALL	20	10	0	0	0	6
21	NORTH WALL	21	0	0	0	7	7
22	NORTH WALL	22	0	30	0	0	6
23	NORTH WALL	23	0	0	2	0	6
24	NORTH WALL	24	0	0	2	0	7
25	NORTH WALL	25	0	0	2	2	5
26	EAST WALL	26	0	0	4	0	5
27	EAST WALL	27	0	0	0	0	5
28	EAST WALL	28	0	0	0	9	5
29	EAST WALL	29	0	0	0	0	6
30	EAST WALL	30	30	40	0	0	6

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 BUILDING - INSIDE WALLS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	20.0	10.0	100.0
2	0.0	-10.0	100.0
3	0.0	-10.0	100.0
4	0.0	-10.0	100.0
5	0.0	-10.0	100.0
6	90.0	80.0	6400.0
7	20.0	10.0	100.0
8	20.0	10.0	100.0
9	20.0	10.0	100.0
10	20.0	10.0	100.0
11	30.0	20.0	400.0
12	20.0	10.0	100.0
13	0.0	-10.0	100.0
14	0.0	-10.0	100.0
15	0.0	-10.0	100.0
16	20.0	10.0	100.0
17	0.0	-10.0	100.0
18	0.0	-10.0	100.0
19	0.0	-10.0	100.0
20	10.0	0.0	0.0
21	0.0	-10.0	100.0
22	0.0	-10.0	100.0
23	0.0	-10.0	100.0
24	0.0	-10.0	100.0
25	0.0	-10.0	100.0
26	0.0	-10.0	100.0
27	0.0	-10.0	100.0
28	0.0	-10.0	100.0
29	0.0	-10.0	100.0
30	30.0	20.0	400.0
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	300		9800.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **10.00**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **18.38**
2 Std Deviations: **36.77**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **15.70** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W. A. Ayers DATE: 6-16-99

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06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - INSIDE WALLS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-134.0	17956.0
2	0.0	-134.0	17956.0
3	0.0	-134.0	17956.0
4	0.0	-134.0	17956.0
5	0.0	-134.0	17956.0
6	0.0	-134.0	17956.0
7	0.0	-134.0	17956.0
8	130.0	-4.0	16.0
9	0.0	-134.0	17956.0
10	310.0	176.0	30976.0
11	190.0	56.0	3136.0
12	950.0	816.0	665856.0
13	710.0	576.0	331776.0
14	350.0	216.0	46656.0
15	710.0	576.0	331776.0
16	590.0	456.0	207936.0
17	10.0	-124.0	15376.0
18	0.0	-134.0	17956.0
19	0.0	-134.0	17956.0
20	0.0	-134.0	17956.0
21	0.0	-134.0	17956.0
22	30.0	-104.0	10816.0
23	0.0	-134.0	17956.0
24	0.0	-134.0	17956.0
25	0.0	-134.0	17956.0
26	0.0	-134.0	17956.0
27	0.0	-134.0	17956.0
28	0.0	-134.0	17956.0
29	0.0	-134.0	17956.0
30	40.0	-94.0	8836.0
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	4020		1994320.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) + (x)

Sample Mean (N) : **134.00**

Standard Deviation (Sd) = SQRT [(n-N)² + (x - 1)]

Standard Deviation: **262.24**

2 Std Deviations: **524.48**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **215.35** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W.a. Rogers DATE: 6-16-99

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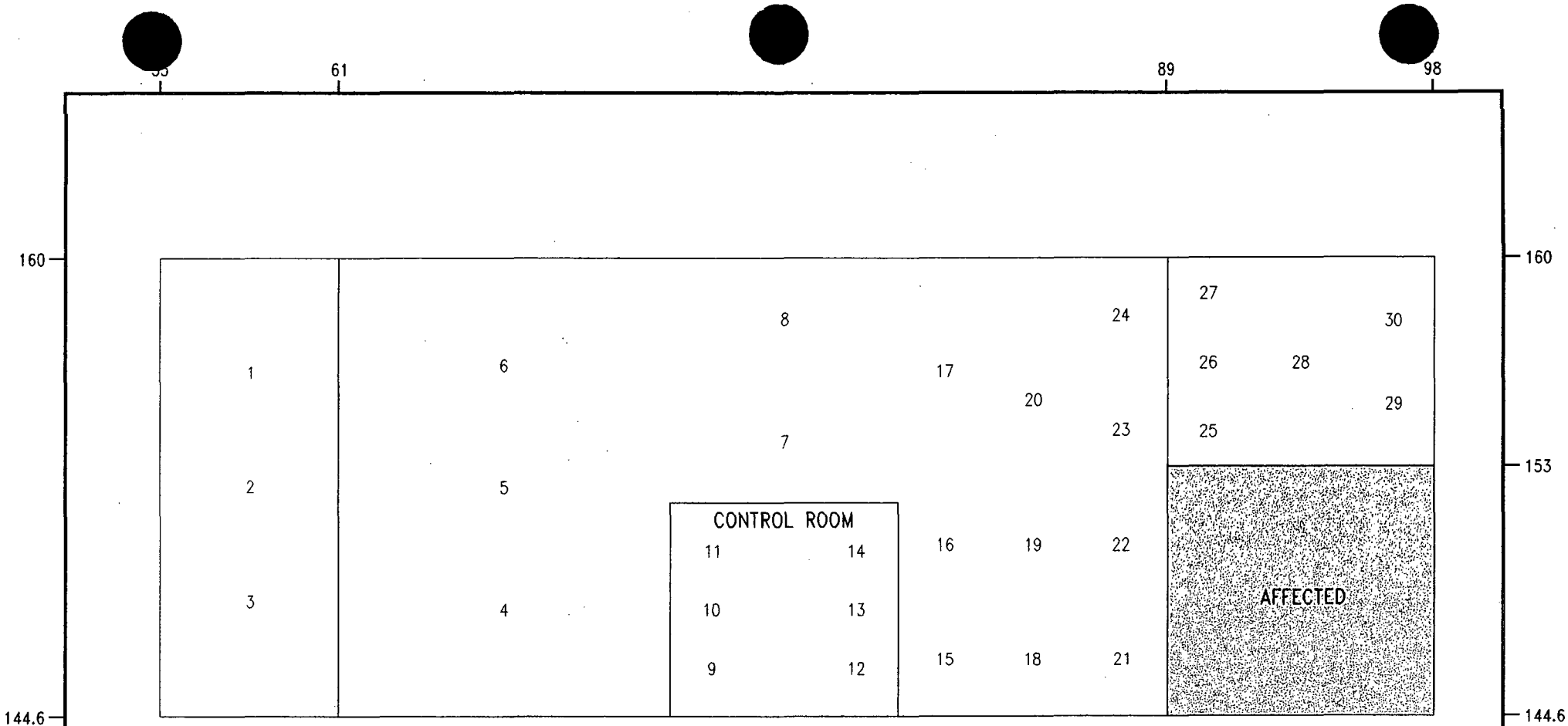

NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

5 0 5
SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
TiO2 BLDG. – INSIDE FLOOR
ALPHA & BETA-GAMMA SURVEY
RANDOM SURVEY LOCATIONS – UNAFFECTED

DRWN. BY	DATE	SCALE:
JE	5-29-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIWAS-5	0

...SUBAREAI\TIO2-BLDG\TIO2-FLOOR

CIMARRON FACILITY

TIO2 BUILDING - INSIDE FLOORS SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	2 cpm	74 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	232 cpm	740 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	0.09 cpm 1.28 cpm	9 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.O. Rogers DATE: 6-15-99

LN #	TIO2 BUILDING INSIDE FLOOR	READING ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA	µR/Hr @ 1 METER
1	Floor	1	10	660	0	2	6
2	Floor	2	20	781	0	9	6
3	Floor	3	0	880	0	0	8
4	Floor	4	20	638	0	2	5
5	Floor	5	0	814	0	0	5
6	Floor	6	20	1265	0	9	6
7	Floor	7	20	561	0	2	6
8	Floor	8	50	792	0	2	6
9	Floor	9	0	50	0	0	5
10	Floor	10	40	198	0	0	5
11	Floor	11	0	363	0	4	5
12	Floor	12	0	88	0	0	5
13	Floor	13	0	275	0	2	5
14	Floor	14	0	0	0	0	5
15	Floor	15	30	1804	0	4	5
16	Floor	16	10	792	2	0	6
17	Floor	17	20	737	2	0	5
18	Floor	18	20	583	0	4	6
19	Floor	19	30	891	0	4	6
20	Floor	20	20	1056	0	0	5
21	Floor	21	30	759	0	0	6
22	Floor	22	60	1056	2	2	6
23	Floor	23	0	1111	0	2	6
24	Floor	24	50	847	2	2	6
25	Floor	25	50	561	0	0	5
26	Floor	26	10	649	2	2	7
27	Floor	27	0	495	0	4	6
28	Floor	28	10	517	0	4	6
29	Floor	29	50	869	0	2	6
30	Floor	30	20	1023	0	0	5

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - INSIDE FLOORS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	10.0	-9.7	93.4
2	20.0	0.3	0.1
3	0.0	-19.7	386.8
4	20.0	0.3	0.1
5	0.0	-19.7	386.8
6	20.0	0.3	0.1
7	20.0	0.3	0.1
8	50.0	30.3	920.1
9	0.0	-19.7	386.8
10	40.0	20.3	413.4
11	0.0	-19.7	386.8
12	0.0	-19.7	386.8
13	0.0	-19.7	386.8
14	0.0	-19.7	386.8
15	30.0	10.3	106.8
16	10.0	-9.7	93.4
17	20.0	0.3	0.1
18	20.0	0.3	0.1
19	30.0	10.3	106.8
20	20.0	0.3	0.1
21	30.0	10.3	106.8
22	60.0	40.3	1626.8
23	0.0	-19.7	386.8
24	50.0	30.3	920.1
25	50.0	30.3	920.1
26	10.0	-9.7	93.4
27	0.0	-19.7	386.8
28	10.0	-9.7	93.4
29	50.0	30.3	920.1
30	20.0	0.3	0.1
TOTAL	590		9896.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **19.67**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **18.47**

2 Std Deviations: **36.95**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **25.40** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: ° **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	30	is (B)	1.697	95%
(df) low value(Y)	28	is (A)	1.701	95%
Desired value(df) (X)	29	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	29	1.699	95%	

PERFORMED BY: K Morgan DATE: 6/14/99

REVIEWED BY: W. A. Rogers DATE: 6-15-99

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06/14/99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - INSIDE FLOORS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	660.0	-43.8	1921.4
2	781.0	77.2	5954.7
3	880.0	176.2	31034.7
4	638.0	-65.8	4334.0
5	814.0	110.2	12136.7
6	1265.0	561.2	314908.0
7	561.0	-142.8	20401.4
8	792.0	88.2	7773.4
9	50.0	-653.8	427498.0
10	198.0	-505.8	255867.4
11	363.0	-340.8	116167.4
12	88.0	-615.8	379250.7
13	275.0	-428.8	183898.0
14	0.0	-703.8	495381.4
15	1804.0	1100.2	1210366.7
16	792.0	88.2	7773.4
17	737.0	33.2	1100.0
18	583.0	-120.8	14600.7
19	891.0	187.2	35031.4
20	1056.0	352.2	124021.4
21	759.0	55.2	3043.4
22	1056.0	352.2	124021.4
23	1111.0	407.2	165784.7
24	847.0	143.2	20496.7
25	561.0	-142.8	20401.4
26	649.0	-54.8	3006.7
27	495.0	-208.8	43611.4
28	517.0	-186.8	34906.7
29	869.0	165.2	27280.0
30	1023.0	319.2	101867.4
TOTAL	21115		4193840.2
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 30

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 703.83

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 380.28

2 Std Deviations: 760.57

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 821.79 DPM /100cm²

GUIDELINE VALUE: 5000 DPM /100cm²

Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	30	is (B)	1.697	95%
(df) low value(Y)	28	is (A)	1.701	95%
Desired value(df) (X)	29	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	29	1.699	95%	

PERFORMED BY: K Morgan DATE: 6/14/99

REVIEWED BY: W. A. Rogers DATE: 6-15-99

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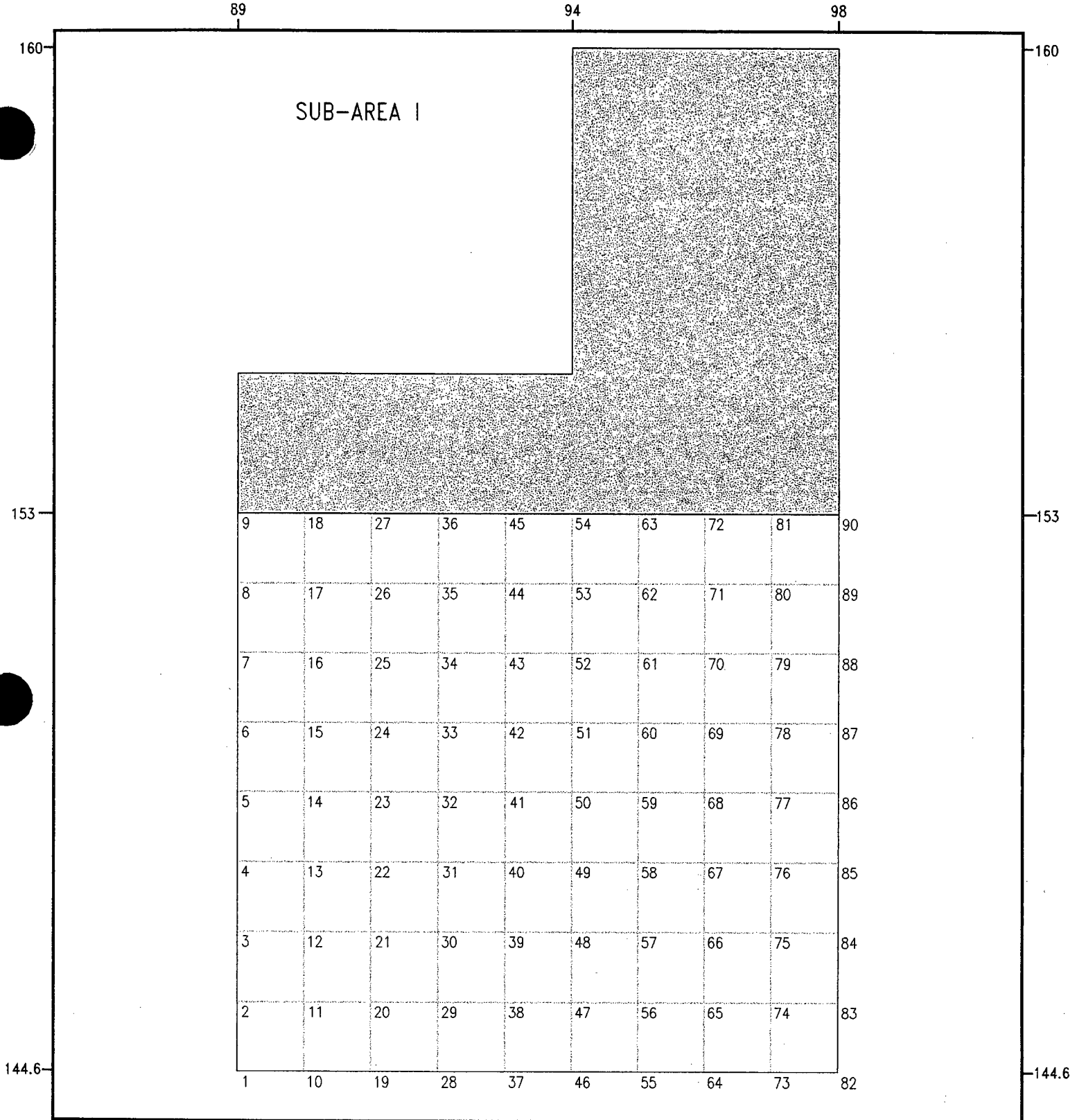

NOTE:

REFER TO DATA TABLES FOR SURVEY RESULTS.

2 0 2

SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
TiO2 BLDG. - AFFECTED SHOP FLOOR
ALPHA & BETA-GAMMA SURVEY LOCATIONS

DRWN. BY	DATE	SCALE:
JE	5-28-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIWAS-4	0

...SUBAREAI\TIO2-BLDG\MAINTENANCE-FLOOR

CIMARRON FACILITY

TIO2 BLDG - MAINTENANCE SHOP FLOOR SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BKG	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	2 cpm	71 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	268 cpm	623 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	TIO2 BUILDING MAINT SHOP FLOOR	READING LOCATION ID	DIRECT		SMEAR	
			ALPHA	BETA	ALPHA	BETA
1	FLOOR	1	250	2520	0	2
2	FLOOR	2	380	3220	4	4
3	FLOOR	3	150	1610	2	0
4	FLOOR	4	120	1820	0	0
5	FLOOR	5	30	710	0	0
6	FLOOR	6	50	1250	0	4
7	FLOOR	7	50	1150	0	0
8	FLOOR	8	250	1100	0	0
9	FLOOR	9	40	1170	0	0
10	FLOOR	10	110	2470	0	0
11	FLOOR	11	70	1880	0	2
12	FLOOR	12	190	2410	0	0
13	FLOOR	13	160	2390	2	0
14	FLOOR	14	50	600	2	2
15	FLOOR	15	50	1140	0	0
16	FLOOR	16	80	1160	2	2
17	FLOOR	17	90	940	0	0
18	FLOOR	18	80	3140	0	0
19	FLOOR	19	20	2780	0	0
20	FLOOR	20	180	1890	0	4
21	FLOOR	21	240	3450	0	2
22	FLOOR	22	120	1980	0	0
23	FLOOR	23	60	980	2	0
24	FLOOR	24	30	860	2	0
25	FLOOR	25	40	1030	0	2
26	FLOOR	26	30	1440	0	2
27	FLOOR	27	40	940	0	12
28	FLOOR	28	140	1060	0	7
29	FLOOR	29	70	1050	4	0
30	FLOOR	30	190	2670	0	12

CIMARRON FACILITY

TIO2 BLDG - MAINTENANCE SHOP FLOOR SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BKG	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	2 cpm	71 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	268 cpm	623 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-18-98

LN #	TIO2 BUILDING MAINT SHOP FLOOR	READING LOCATION ID	DIRECT		SMEAR	
			ALPHA	BETA	ALPHA	BETA
31	FLOOR	31	120	1760	2	0
32	FLOOR	32	40	120	0	0
33	FLOOR	33	20	2050	0	0
34	FLOOR	34	50	1010	0	2
35	FLOOR	35	40	1100	2	0
36	FLOOR	36	70	980	2	0
37	FLOOR	37	40	800	2	2
38	FLOOR	38	60	800	2	0
39	FLOOR	39	60	1130	0	4
40	FLOOR	40	130	1630	0	0
41	FLOOR	41	50	700	0	0
42	FLOOR	42	60	2060	0	2
43	FLOOR	43	N/A	N/A	N/A	N/A
44	FLOOR	44	0	1190	2	0
45	FLOOR	45	80	970	0	0
46	FLOOR	46	N/A	N/A	N/A	N/A
47	FLOOR	47	90	1180	2	4
48	FLOOR	48	70	1010	0	0
49	FLOOR	49	80	1920	0	2
50	FLOOR	50	60	1070	0	0
51	FLOOR	51	110	1440	2	0
52	FLOOR	52	40	980	2	0
53	FLOOR	53	70	1620	0	2
54	FLOOR	54	270	1820	0	0
55	FLOOR	55	N/A	N/A	N/A	N/A
56	FLOOR	56	40	1520	2	0
57	FLOOR	57	40	880	0	2
58	FLOOR	58	50	1170	0	7
59	FLOOR	59	40	1290	0	2
60	FLOOR	60	270	1950	2	2

CIMARRON FACILITY

TIO2 BLDG - MAINTENANCE SHOP FLOOR SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BKG	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	2 cpm	71 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114606	DPM/100cm²	268 cpm	623 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. C. Rogers DATE: 5-18-99

LN #	TIO2 BUILDING MAINT SHOP FLOOR	READING LOCATION ID	DIRECT		SMEAR	
			ALPHA	BETA	ALPHA	BETA
61	FLOOR	61	90	1210	2	2
62	FLOOR	62	60	1350	0	2
63	FLOOR	63	60	1450	0	2
64	FLOOR	64	60	1160	0	0
65	FLOOR	65	30	1510	0	2
66	FLOOR	66	50	1290	0	2
67	FLOOR	67	40	1370	2	0
68	FLOOR	68	20	1040	0	0
69	FLOOR	69	0	1230	0	2
70	FLOOR	70	90	1560	0	0
71	FLOOR	71	60	1230	2	0
72	FLOOR	72	110	1330	2	2
73	FLOOR	73	80	1760	0	2
74	FLOOR	74	50	2050	0	9
75	FLOOR	75	N/A	N/A	N/A	N/A
76	FLOOR	76	70	1250	0	0
77	FLOOR	77	80	1030	4	0
78	FLOOR	78	30	880	0	9
79	FLOOR	79	30	1040	2	2
80	FLOOR	80	140	1010	0	0
81	FLOOR	81	70	1120	0	0
82	FLOOR	82	100	2720	2	4
83	FLOOR	83	N/A	N/A	N/A	N/A
84	FLOOR	84	30	800	0	0
85	FLOOR	85	110	1380	0	2
86	FLOOR	86	210	1190	2	0
87	FLOOR	87	90	1020	4	0
88	FLOOR	88	240	1340	4	6
89	FLOOR	89	60	1390	0	2
90	FLOOR	90	20	650	0	0

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - MAINTENANCE SHOP FLOOR (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	250.0	161.9	26205.9
2	380.0	291.9	85195.3
3	150.0	61.9	3829.4
4	120.0	31.9	1016.5
5	30.0	-58.1	3377.7
6	50.0	-38.1	1453.0
7	50.0	-38.1	1453.0
8	250.0	161.9	26205.9
9	40.0	-48.1	2315.3
10	110.0	21.9	478.8
11	70.0	-18.1	328.2
12	190.0	101.9	10380.0
13	160.0	71.9	5167.1
14	50.0	-38.1	1453.0
15	50.0	-38.1	1453.0
16	80.0	-8.1	65.9
17	90.0	1.9	3.5
18	80.0	-8.1	65.9
19	20.0	-68.1	4640.0
20	180.0	91.9	8442.4
21	240.0	151.9	23068.2
22	120.0	31.9	1016.5
23	60.0	-28.1	790.6
24	30.0	-58.1	3377.7
25	40.0	-48.1	2315.3
26	30.0	-58.1	3377.7
27	40.0	-48.1	2315.3
28	140.0	51.9	2691.8
29	70.0	-18.1	328.2
30	190.0	101.9	10380.0
31	120.0	31.9	1016.5
32	40.0	-48.1	2315.3
33	20.0	-68.1	4640.0
34	50.0	-38.1	1453.0
35	40.0	-48.1	2315.3
36	70.0	-18.1	328.2
37	40.0	-48.1	2315.3
38	60.0	-28.1	790.6
39	60.0	-28.1	790.6
40	130.0	41.9	1754.1
41	50.0	-38.1	1453.0
42	60.0	-28.1	790.6
43	0.0	-88.1	7764.7
44	80.0	-8.1	65.9
45	90.0	1.9	3.5
46	70.0	-18.1	328.2
47	80.0	-8.1	65.9
48	60.0	-28.1	790.6
49	110.0	21.9	478.8
50	40.0	-48.1	2315.3
	2860.0		157132.2
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	7490		422098.8
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **85**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **88.12**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **70.89**

2 Std Deviations: **141.77**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.666**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **100.93** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	84	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	84	1.666	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

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CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - MAINTENANCE SHOP FLOOR (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	70.0	-18.1	328.25
52	270.0	181.9	33081.19
53	40.0	-48.1	2315.31
54	40.0	-48.1	2315.31
55	50.0	-38.1	1452.96
56	40.0	-48.1	2315.31
57	270.0	181.9	33081.19
58	90.0	1.9	3.54
59	60.0	-28.1	790.60
60	60.0	-28.1	790.60
61	60.0	-28.1	790.60
62	30.0	-58.1	3377.66
63	50.0	-38.1	1452.96
64	40.0	-48.1	2315.31
65	20.0	-68.1	4640.01
66	0.0	-88.1	7764.72
67	90.0	1.9	3.54
68	60.0	-28.1	790.60
69	110.0	21.9	478.84
70	80.0	-8.1	65.90
71	50.0	-38.1	1452.96
72	70.0	-18.1	328.25
73	80.0	-8.1	65.90
74	30.0	-58.1	3377.66
75	30.0	-58.1	3377.66
76	140.0	51.9	2691.78
77	70.0	-18.1	328.25
78	100.0	11.9	141.19
79	30.0	-58.1	3377.66
80	110.0	21.9	478.84
81	210.0	121.9	14855.31
82	90.0	1.9	3.54
83	240.0	151.9	23068.25
84	60.0	-28.1	790.60
85	20.0	-68.1	4640.01
86	0.0	0.00	0.00
87	0.0	0.00	0.00
88	0.0	0.00	0.00
89	0.0	0.00	0.00
90	0.0	0.00	0.00
91	0.0	0.00	0.00
92	0.0	0.00	0.00
93	0.0	0.00	0.00
94	0.0	0.00	0.00
95	0.0	0.00	0.00
96	0.0	0.00	0.00
97	0.0	0.00	0.00
98	0.0	0.00	0.00
99	0.0	0.00	0.00
100	0.0	0.00	0.00
	2860.0		157132.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	0.00	0.00
102	0.0	0.00	0.00
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" TIO2 BUILDING - MAINTENANCE SHOP FLOOR (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	2520.0	1092.7	1194006.1
2	3220.0	1792.7	3213794.4
3	1610.0	182.7	33381.4
4	1820.0	392.7	154217.9
5	710.0	-717.3	514510.9
6	1250.0	-177.3	31433.2
7	1150.0	-277.3	76892.0
8	1100.0	-327.3	107121.4
9	1170.0	-257.3	66200.3
10	2470.0	1042.7	1087235.6
11	1880.0	452.7	204942.6
12	2410.0	982.7	965710.9
13	2390.0	962.7	926802.6
14	600.0	-827.3	684415.6
15	1140.0	-287.3	82537.9
16	1160.0	-267.3	71446.1
17	940.0	-487.3	237455.6
18	3140.0	1712.7	2933361.4
19	2780.0	1352.7	1829813.2
20	1890.0	462.7	214096.7
21	3450.0	2022.7	4091339.1
22	1980.0	552.7	305483.8
23	980.0	-447.3	200072.0
24	860.0	-567.3	321822.6
25	1030.0	-397.3	157842.6
26	1440.0	12.7	161.4
27	940.0	-487.3	237455.6
28	1060.0	-367.3	134905.0
29	1050.0	-377.3	142350.9
30	2670.0	1242.7	1544317.9
31	1760.0	332.7	110693.2
32	120.0	-1307.3	1709017.9
33	2050.0	622.7	387762.6
34	1010.0	-417.3	174134.4
35	1100.0	-327.3	107121.4
36	980.0	-447.3	200072.0
37	800.0	-627.3	393497.9
38	800.0	-627.3	393497.9
39	1130.0	-297.3	88383.8
40	1630.0	202.7	41089.7
41	700.0	-727.3	528956.7
42	2060.0	632.7	400316.7
43	1190.0	-237.3	56308.5
44	970.0	-457.3	209117.9
45	1180.0	-247.3	61154.4
46	1010.0	-417.3	174134.4
47	1920.0	492.7	242759.1
48	1070.0	-357.3	127659.1
49	1440.0	12.7	161.4
50	980.0	-447.3	200072.0
	46610.0		5574839.8
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	121320		32945877.6
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 85

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1427.29

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 626.27
2 Std Deviations: 1252.54
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.666

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 1540.45 DPM /100cm²
GUIDELINE VALUE: 5000 DPM /100cm²
Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	84	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	84	1.666	95%

PERFORMED BY: K Morgan DATE: 4/28/99

REVIEWED BY: W.A. Rogers DATE: 4-28-99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - MAINTENANCE SHOP FLOOR (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	1620.0	192.71	37135.56
52	1820.0	392.71	154217.91
53	1520.0	92.71	8594.38
54	880.0	-547.29	299530.85
55	1170.0	-257.29	66200.26
56	1290.0	-137.29	18849.67
57	1950.0	522.71	273221.44
58	1210.0	-217.29	47216.73
59	1350.0	-77.29	5974.38
60	1450.0	22.71	515.56
61	1160.0	-267.29	71446.15
62	1510.0	82.71	6840.26
63	1290.0	-137.29	18849.67
64	1370.0	-57.29	3282.62
65	1040.0	-387.29	149996.73
66	1230.0	-197.29	38924.97
67	1560.0	132.71	17610.85
68	1230.0	-197.29	38924.97
69	1330.0	-97.29	9466.15
70	1760.0	332.71	110693.20
71	2050.0	622.71	387762.62
72	1250.0	-177.29	31433.20
73	1030.0	-397.29	157842.62
74	880.0	-547.29	299530.85
75	1040.0	-387.29	149996.73
76	1010.0	-417.29	174134.38
77	1120.0	-307.29	94429.67
78	2720.0	1292.71	1671088.50
79	800.0	-627.29	393497.91
80	1380.0	-47.29	2236.73
81	1190.0	-237.29	56308.50
82	1020.0	-407.29	165888.50
83	1340.0	-87.29	7620.26
84	1390.0	-37.29	1390.85
85	650.0	-777.29	604186.15
86	0.0	0.00	0.00
87	0.0	0.00	0.00
88	0.0	0.00	0.00
89	0.0	0.00	0.00
90	0.0	0.00	0.00
91	0.0	0.00	0.00
92	0.0	0.00	0.00
93	0.0	0.00	0.00
94	0.0	0.00	0.00
95	0.0	0.00	0.00
96	0.0	0.00	0.00
97	0.0	0.00	0.00
98	0.0	0.00	0.00
99	0.0	0.00	0.00
100	0.0	0.00	0.00
	46610.0		5574839.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	0.00	0.00
102	0.0	0.00	0.00
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION
SUB-AREA "I" AFFECTED AREA
TI0 - 2 FLOOR
HOT SPOT AVERAGING FOR BETA/GAMMA SCAN

ONE METER X ONE METER GRID (10,000 cm ²)

												dpm / 100 cm ²
146	N								146	N		4540
88	E			1610			2410		90	E		3160
												3250
							4540					3810
						3160	5240		3250			3220
						3810	5500		3220			3950
				2510		3950	6580		2870			2870
							4010					4010
												2510
144	N			2520			2470		144	N	TOTAL :	31320
88	E								90	E	AVERAGE :	3480

300 cm ² THE SIZE OF HOT SPOT AREA

$\frac{300}{10000}$

6580 dpm / 100 cm ² MAX BETA READING

% OF THE GRIDDED AREA REPRESENTED BY THE HOTSPOT : 3.0%

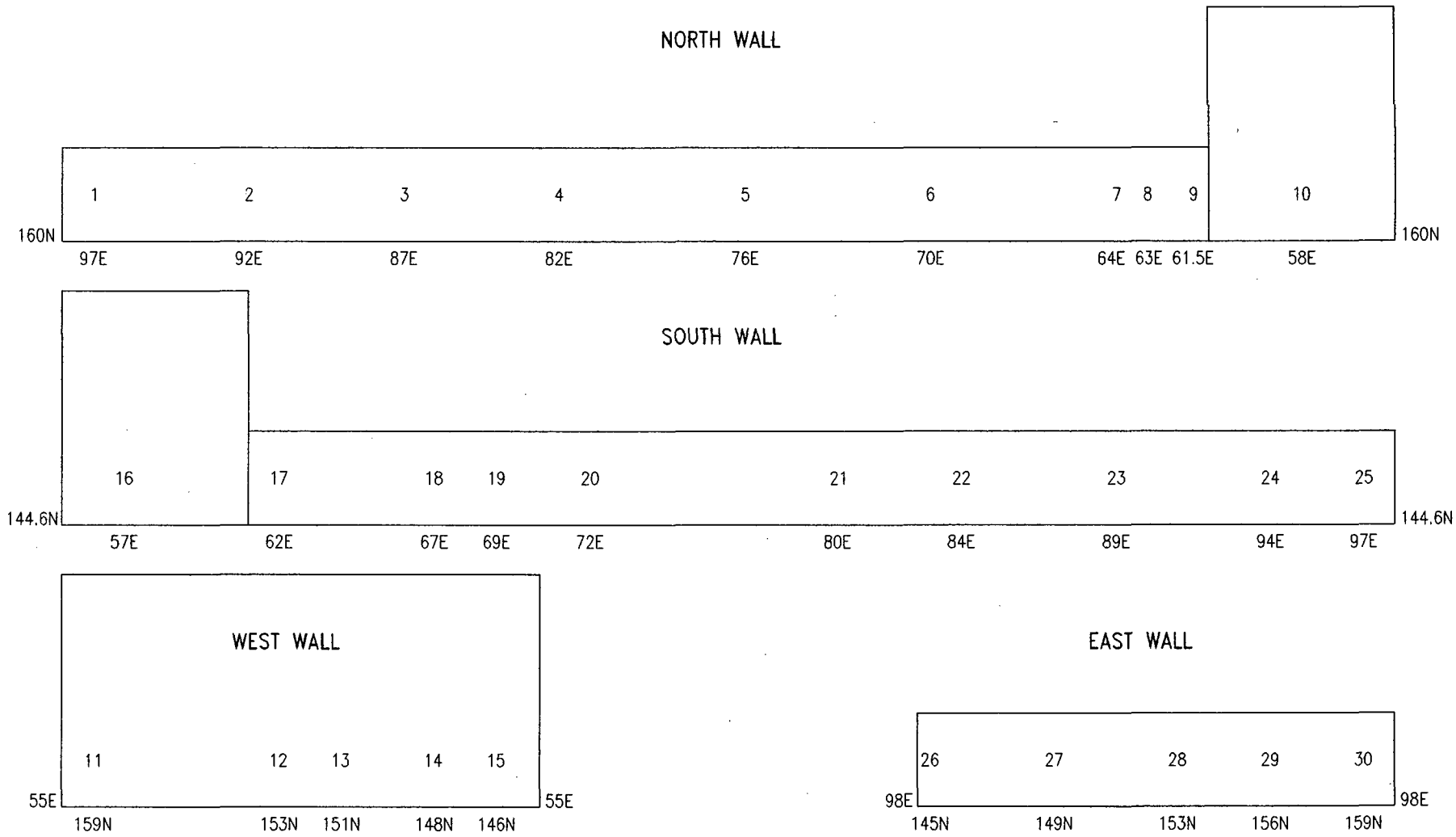
Instrumentation:
Ludlum 2224 S/N 114616 #CI-51
Cal Date: 5-29-98 Cal Due: 9-98
Background/Beta: 146 CP(0.5)Min
Survey Date: 7-20-98

$$Xw = AVG\ [1 - N / 10000] + E\ [N / 10000]$$

AVG = AVERAGE READING OF THE NON - ELEVATED AREAS
E = MAXIMUM READING FROM THE ELEVATED AREAS
N = THE SIZE OF THE ELEVATED AREA

Xw = 3573 dpm / 100 cm ²

Reviewed By: Vmorgan **Date:** 5-3-99



NOTE:
REFER TO DATA TABLES FOR SURVEY RESULTS.

5 0 5
SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
TiO2 BLDG. - OUTSIDE WALLS
ALPHA & BETA-GAMMA SURVEY LOCATIONS

DRWN. BY	DATE	SCALE:
JE	5-28-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIWAS-7	0

...SUBAREAI\TIO2-BLDG\TIO2-OUTSIDE-WALLS

05/13/99

CIMARRON FACILITY

TIO2 BUILDING - OUTSIDE WALLS SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	6 cpm	72 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	288 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	11 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Boyce DATE: 5-18-99

LN #	TIO2 BUILDING OUTSIDE WALLS	READING ID	DIRECT		SMEAR		µR/Hr @ 1 METER
			ALPHA	BETA	ALPHA	BETA	
1	NORTH WALL	1	0	0	2	4	6
2	NORTH WALL	2	30	0	2	2	7
3	NORTH WALL	3	100	0	2	11	9
4	NORTH WALL	4	70	130	10	0	8
5	NORTH WALL	5	120	80	5	4	7
6	NORTH WALL	6	80	0	0	0	6
7	NORTH WALL	7	30	80	0	0	4
8	NORTH WALL	8	60	40	2	7	5
9	NORTH WALL	9	30	0	0	5	5
10	NORTH WALL	10	10	0	2	11	6
11	WEST WALL	11	10	0	0	2	6
12	WEST WALL	12	30	0	0	5	6
13	WEST WALL	13	70	0	2	9	8
14	WEST WALL	14	40	60	0	2	7
15	WEST WALL	15	0	160	0	2	8
16	SOUTH WALL	16	10	210	0	0	9
17	SOUTH WALL	17	80	0	0	2	8
18	SOUTH WALL	18	50	0	2	7	7
19	SOUTH WALL	19	160	0	5	4	7
20	SOUTH WALL	20	10	20	2	2	7
21	SOUTH WALL	21	110	0	5	2	5
22	SOUTH WALL	22	60	0	0	7	7
23	SOUTH WALL	23	110	0	5	4	7
24	SOUTH WALL	24	80	0	4	9	6
25	SOUTH WALL	25	190	30	4	9	5
26	EAST WALL	26	120	530	0	7	7
27	EAST WALL	27	110	0	0	9	5
28	EAST WALL	28	80	0	0	0	5
29	EAST WALL	29	60	0	5	0	5
30	EAST WALL	30	30	0	0	12	4

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - OUTSIDE WALLS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-64.7	4181.8
2	30.0	-34.7	1201.8
3	100.0	35.3	1248.4
4	70.0	5.3	28.4
5	120.0	55.3	3061.8
6	80.0	15.3	235.1
7	30.0	-34.7	1201.8
8	60.0	-4.7	21.8
9	30.0	-34.7	1201.8
10	10.0	-54.7	2988.4
11	10.0	-54.7	2988.4
12	30.0	-34.7	1201.8
13	70.0	5.3	28.4
14	40.0	-24.7	608.4
15	0.0	-64.7	4181.8
16	10.0	-54.7	2988.4
17	80.0	15.3	235.1
18	50.0	-14.7	215.1
19	160.0	95.3	9088.4
20	10.0	-54.7	2988.4
21	110.0	45.3	2055.1
22	60.0	-4.7	21.8
23	110.0	45.3	2055.1
24	80.0	15.3	235.1
25	190.0	125.3	15708.4
26	120.0	55.3	3061.8
27	110.0	45.3	2055.1
28	80.0	15.3	235.1
29	60.0	-4.7	21.8
30	30.0	-34.7	1201.8
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	1940		66546.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **64.67**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **47.90**

2 Std Deviations: **95.81**

Degree of Freedom(df) = (x) - 1 Data listed on Table B-1

(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **79.53** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

PAGE 1 OF 1 PAGES

A:\T2WLOCMA.WB2

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 BUILDING - OUTSIDE WALLS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-44.7	1995.1
2	0.0	-44.7	1995.1
3	0.0	-44.7	1995.1
4	130.0	85.3	7281.8
5	80.0	35.3	1248.4
6	0.0	-44.7	1995.1
7	80.0	35.3	1248.4
8	40.0	-4.7	21.8
9	0.0	-44.7	1995.1
10	0.0	-44.7	1995.1
11	0.0	-44.7	1995.1
12	0.0	-44.7	1995.1
13	0.0	-44.7	1995.1
14	60.0	15.3	235.1
15	160.0	115.3	13301.8
16	210.0	165.3	27335.1
17	0.0	-44.7	1995.1
18	0.0	-44.7	1995.1
19	0.0	-44.7	1995.1
20	20.0	-24.7	608.4
21	0.0	-44.7	1995.1
22	0.0	-44.7	1995.1
23	0.0	-44.7	1995.1
24	0.0	-44.7	1995.1
25	30.0	-14.7	215.1
26	530.0	485.3	235548.4
27	0.0	-44.7	1995.1
28	0.0	-44.7	1995.1
29	0.0	-44.7	1995.1
30	0.0	-44.7	1995.1
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	1340		326946.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **44.67**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **106.18**

2 Std Deviations: **212.36**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **77.60** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Beach DATE: 6/16/99

REVIEWED BY: W.A. Rogers DATE: 6-16-99

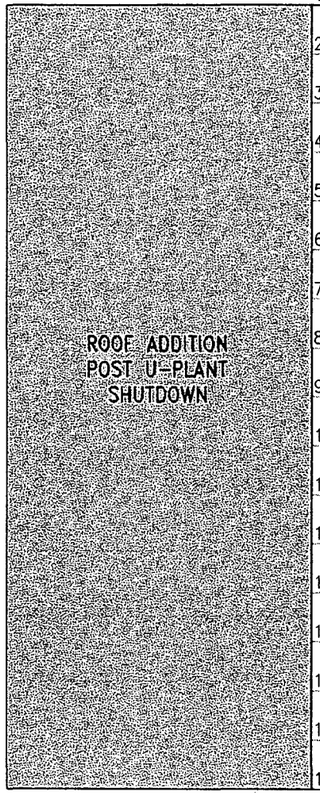
PAGES 1 OF 1 PAGES

A:\T2WLOCMB.WB2

55 61 98

160 160

SUB-AREA I



1	18	35	52	69	86	103	120	137	154	171	188	205	222	239	256	273	290	307	324	341	358	375	392	409	426	443	460	477	494	511	528	545	562	579	596	613	630
2	19	36	53	70	87	104	121	138	155	172	189	206	223	240	257	274	291	308	325	342	359	376	393	410	427	444	461	478	495	512	529	546	563	580	597	614	631
3	20	37	54	71	88	105	122	139	156	173	190	207	224	241	258	275	292	309	326	343	360	377	394	411	428	445	462	479	496	513	530	547	564	581	598	615	632
4	21	38	55	72	89	106	123	140	157	174	191	208	225	242	259	276	293	310	327	344	361	378	395	412	429	446	463	480	497	514	531	548	565	582	599	616	633
5	22	39	56	73	90	107	124	141	158	175	192	209	226	243	260	277	294	311	328	345	362	379	396	413	430	447	464	481	498	515	532	549	566	583	600	617	634
6	23	40	57	74	91	108	125	142	159	176	193	210	227	244	261	278	295	312	329	346	363	380	397	414	431	448	465	482	499	516	533	550	567	584	601	618	635
7	24	41	58	75	92	109	126	143	160	177	194	211	228	245	262	279	296	313	330	347	364	381	398	415	432	449	466	483	500	517	534	551	568	585	602	619	636
8	25	42	59	76	93	110	127	144	161	178	195	212	229	246	263	280	297	314	331	348	365	382	399	416	433	450	467	484	501	518	535	552	569	586	603	620	637
9	26	43	60	77	94	111	128	145	162	179	196	213	230	247	264	281	298	315	332	349	366	383	400	417	434	451	468	485	502	519	536	553	570	587	604	621	638
10	27	44	61	78	95	112	129	146	163	180	197	214	231	248	265	282	299	316	333	350	367	384	401	418	435	452	469	486	503	520	537	554	571	588	605	622	639
11	28	45	62	79	96	113	130	147	164	181	198	215	232	249	266	283	300	317	334	351	368	385	402	419	436	453	470	487	504	521	538	555	572	589	606	623	640
12	29	46	63	80	97	114	131	148	165	182	199	216	233	250	267	284	301	318	335	352	369	386	403	420	437	454	471	488	505	522	539	556	573	590	607	624	641
13	30	47	64	81	98	115	132	149	166	183	200	217	234	251	268	285	302	319	336	353	370	387	404	421	438	455	472	489	506	523	540	557	574	591	608	625	642
14	31	48	65	82	99	116	133	150	167	184	201	218	235	252	269	286	303	320	337	354	371	388	405	422	439	456	473	490	507	524	541	558	575	592	609	626	643
15	32	49	66	83	100	117	134	151	168	185	202	219	236	253	270	287	304	321	338	355	372	389	406	423	440	457	474	491	508	525	542	559	576	593	610	627	644
16	33	50	67	84	101	118	135	152	169	186	203	220	237	254	271	288	305	322	339	356	373	390	407	424	441	458	475	492	509	526	543	560	577	594	611	628	645
17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340	357	374	391	408	425	442	459	476	493	510	527	544	561	578	595	612	629	646

144.6 144.6

NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

3 0 3
SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
TI02 BLDG. - ROOF SURVEY
ALPHA & BETA-GAMMA SURVEY LOCATIONS

DRWN. BY	DATE	SCALE:
JE	5-28-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIWAS-6	REV. 0

...SUBAREAI\TI02-BLDG\TI02-ROOF

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	ROOF	1	140	40	2	7
2	ROOF	2	30	190	0	0
3	ROOF	3	110	0	0	0
4	ROOF	4	150	160	2	0
5	ROOF	5	90	60	2	5
6	ROOF	6	110	20	2	0
7	ROOF	7	90	270	7	2
8	ROOF	8	100	0	4	9
9	ROOF	9	130	370	2	5
10	ROOF	10	170	230	12	4
11	ROOF	11	130	70	2	0
12	ROOF	12	180	440	2	7
13	ROOF	13	140	620	0	0
14	ROOF	14	190	910	2	9
15	ROOF	15	90	640	2	7
16	ROOF	16	140	320	4	4
17	ROOF	17	420	590	0	12
18	ROOF	18	1780	2950	12	9
19	ROOF	19	1080	1270	15	13
20	ROOF	20	910	1000	15	25
21	ROOF	21	370	800	0	0
22	ROOF	22	450	470	7	4
23	ROOF	23	1470	2180	15	1
24	ROOF	24	450	1190	0	14
25	ROOF	25	910	2520	12	11
26	ROOF	26	2460	3380	9	9
27	ROOF	27	900	2380	23	8
28	ROOF	28	700	2100	9	23
29	ROOF	29	490	2920	12	20
30	ROOF	30	310	2000	4	12
31	ROOF	31	1150	1990	4	19
32	ROOF	32	360	1520	9	23
33	ROOF	33	900	2170	23	17
34	ROOF	34	1280	2180	4	2

CIMARRON FACILITY

TiO2 ROOF SURVEY — SUB-AREA "I"

ALPHA AND BETA/GAMMA — AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
35	ROOF	35	1130	2650	12	4
36	ROOF	36	2260	3490	7	4
37	ROOF	37	1330	3080	2	0
38	ROOF	38	300	760	2	5
39	ROOF	39	40	390	2	0
40	ROOF	40	1420	1850	2	9
41	ROOF	41	870	1980	4	0
42	ROOF	42	960	2080	4	0
43	ROOF	43	1840	4640	4	16
44	ROOF	44	170	1390	0	10
45	ROOF	45	100	1300	0	0
46	ROOF	46	320	1440	2	2
47	ROOF	47	130	1310	2	9
48	ROOF	48	150	1200	0	0
49	ROOF	49	210	1110	2	5
50	ROOF	50	360	1290	0	5
51	ROOF	51	470	1060	4	4
52	ROOF	52	940	1160	4	0
53	ROOF	53	330	1300	0	12
54	ROOF	54	220	740	2	0
55	ROOF	55	1060	1710	4	4
56	ROOF	56	550	1420	4	0
57	ROOF	57	640	1190	2	7
58	ROOF	58	410	1220	4	14
59	ROOF	59	570	1320	2	0
60	ROOF	60	1030	3300	4	0
61	ROOF	61	1180	2360	0	5
62	ROOF	62	1570	4410	7	14
63	ROOF	63	1430	3480	7	26
64	ROOF	64	1040	3040	4	2
65	ROOF	65	2130	3700	4	0
66	ROOF	66	1360	2130	2	7
67	ROOF	67	1130	2580	7	0
68	ROOF	68	1220	2360	12	23

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
69	ROOF	69	830	2840	2	17
70	ROOF	70	700	1640	12	13
71	ROOF	71	750	2010	12	13
72	ROOF	72	650	1760	0	12
73	ROOF	73	1070	1900	10	2
74	ROOF	74	1010	1960	10	2
75	ROOF	75	690	1800	7	9
76	ROOF	76	1630	2940	12	6
77	ROOF	77	500	1410	2	5
78	ROOF	78	500	1340	7	2
79	ROOF	79	530	1480	4	4
80	ROOF	80	770	1600	7	19
81	ROOF	81	1380	2810	12	16
82	ROOF	82	1310	4270	4	12
83	ROOF	83	320	2900	7	4
84	ROOF	84	1100	2870	10	2
85	ROOF	85	1350	4030	15	20
86	ROOF	86	1630	2460	7	4
87	ROOF	87	1500	2960	12	18
88	ROOF	88	1070	3290	23	15
89	ROOF	89	1500	2210	23	5
90	ROOF	90	1610	3180	12	16
91	ROOF	91	1110	1940	9	18
92	ROOF	92	1120	2140	12	6
93	ROOF	93	790	1390	2	2
94	ROOF	94	510	1270	9	11
95	ROOF	95	620	1580	4	19
96	ROOF	96	940	1540	4	0
97	ROOF	97	790	1900	4	16
98	ROOF	98	680	1720	0	0
99	ROOF	99	350	1880	10	0
100	ROOF	100	1450	2270	7	4
101	ROOF	101	1490	2840	7	7
102	ROOF	102	1260	4440	2	7

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
103	ROOF	103	1270	4120	4	12
104	ROOF	104	1660	2930	7	23
105	ROOF	105	1070	2810	7	4
106	ROOF	106	1280	2330	17	10
107	ROOF	107	1570	4200	7	4
108	ROOF	108	2040	3470	15	15
109	ROOF	109	1100	3480	4	12
110	ROOF	110	1930	3030	9	6
111	ROOF	111	410	1610	4	0
112	ROOF	112	820	2340	0	5
113	ROOF	113	830	2700	2	5
114	ROOF	114	1020	2570	2	2
115	ROOF	115	1570	3290	7	2
116	ROOF	116	1330	2590	0	5
117	ROOF	117	940	2080	9	6
118	ROOF	118	1320	3010	4	9
119	ROOF	119	2040	5380	4	16
120	ROOF	120	1440	3230	4	2
121	ROOF	121	1400	3020	20	5
122	ROOF	122	120	2450	15	6
123	ROOF	123	1010	2100	0	10
124	ROOF	124	1350	2560	15	0
125	ROOF	125	1420	2380	25	0
126	ROOF	126	1160	3160	7	11
127	ROOF	127	930	2540	2	5
128	ROOF	128	1370	2770	17	13
129	ROOF	129	1200	2950	0	19
130	ROOF	130	1490	3350	7	2
131	ROOF	131	1330	3080	9	16
132	ROOF	132	1820	3950	4	2
133	ROOF	133	1550	3620	23	15
134	ROOF	134	110	1410	2	0
135	ROOF	135	180	3010	0	0
136	ROOF	136	120	3170	7	2

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
137	ROOF	137	1440	2890	2	7
138	ROOF	138	1450	2290	7	9
139	ROOF	139	1420	2170	4	16
140	ROOF	140	490	1880	9	6
141	ROOF	141	1160	2190	4	7
142	ROOF	142	1540	2200	17	1
143	ROOF	143	690	2010	0	0
144	ROOF	144	980	1700	4	2
145	ROOF	145	510	1710	0	0
146	ROOF	146	520	1570	12	9
147	ROOF	147	440	2460	2	17
148	ROOF	148	510	2590	17	3
149	ROOF	149	280	2260	0	0
150	ROOF	150	910	2380	12	16
151	ROOF	151	260	1960	4	0
152	ROOF	152	560	1900	2	7
153	ROOF	153	510	2740	4	2
154	ROOF	154	1350	3450	4	0
155	ROOF	155	1120	1110	0	7
156	ROOF	156	960	1680	9	6
157	ROOF	157	630	1810	2	5
158	ROOF	158	960	1580	2	9
159	ROOF	159	670	1880	0	0
160	ROOF	160	730	1790	2	14
161	ROOF	161	490	1190	2	5
162	ROOF	162	590	1740	2	2
163	ROOF	163	500	1580	0	12
164	ROOF	164	460	1960	2	12
165	ROOF	165	840	2060	12	0
166	ROOF	166	870	2550	0	10
167	ROOF	167	230	2110	0	12
168	ROOF	168	290	1030	0	5
169	ROOF	169	1000	2020	2	9
170	ROOF	170	500	1880	7	2

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
171	ROOF	171	710	3220	7	6
172	ROOF	172	650	1980	4	4
173	ROOF	173	570	2160	10	18
174	ROOF	174	720	2340	4	2
175	ROOF	175	310	2140	0	7
176	ROOF	176	490	2210	12	6
177	ROOF	177	250	1050	2	4
178	ROOF	178	840	2760	2	7
179	ROOF	179	500	2320	4	4
180	ROOF	180	990	3450	5	0
181	ROOF	181	570	3210	2	4
182	ROOF	182	780	3350	4	0
183	ROOF	183	790	3570	7	6
184	ROOF	184	670	3580	2	9
185	ROOF	185	720	2980	2	7
186	ROOF	186	390	2560	2	7
187	ROOF	187	550	2970	0	5
188	ROOF	188	710	3220	0	0
189	ROOF	189	310	2060	2	4
190	ROOF	190	360	2120	10	6
191	ROOF	191	810	2380	0	0
192	ROOF	192	620	2710	4	6
193	ROOF	193	320	2080	0	7
194	ROOF	194	190	2530	2	0
195	ROOF	195	700	3000	0	12
196	ROOF	196	1110	3250	2	9
197	ROOF	197	1420	3510	7	4
198	ROOF	198	630	3410	5	0
199	ROOF	199	1170	3970	4	4
200	ROOF	200	760	3580	4	2
201	ROOF	201	620	3470	4	9
202	ROOF	202	490	3530	2	7
203	ROOF	203	1000	3360	4	9
204	ROOF	204	920	3500	4	14

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
205	ROOF	205	1440	5900	10	13
206	ROOF	206	970	4040	10	8
207	ROOF	207	180	3740	4	4
208	ROOF	208	780	3300	4	0
209	ROOF	209	610	2990	0	5
210	ROOF	210	670	3670	7	6
211	ROOF	211	810	4060	2	14
212	ROOF	212	940	4270	2	19
213	ROOF	213	990	3750	2	7
214	ROOF	214	650	3640	2	23
215	ROOF	215	120	3370	2	2
216	ROOF	216	300	3340	7	1
217	ROOF	217	200	3430	2	4
218	ROOF	218	610	3500	2	0
219	ROOF	219	240	3190	2	9
220	ROOF	220	420	3950	7	18
221	ROOF	221	410	3700	2	0
222	ROOF	222	1190	4080	12	10
223	ROOF	223	1190	3250	2	14
224	ROOF	224	1150	4010	12	13
225	ROOF	225	950	3670	10	6
226	ROOF	226	1190	4020	7	1
227	ROOF	227	980	3410	2	14
228	ROOF	228	1020	3720	4	9
229	ROOF	229	600	4550	2	2
230	ROOF	230	1010	3500	7	1
231	ROOF	231	100	3320	2	0
232	ROOF	232	210	3200	2	0
233	ROOF	233	150	3010	4	4
234	ROOF	234	850	3100	4	11
235	ROOF	235	780	3400	7	20
236	ROOF	236	370	3500	0	9
237	ROOF	237	200	3510	2	2
238	ROOF	238	320	3770	0	0

CIMARRON FACILITY

TiO2 ROOF SURVEY — SUB-AREA "I"

ALPHA AND BETA/GAMMA — AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
239	ROOF	239	890	5030	10	4
240	ROOF	240	820	3970	7	9
241	ROOF	241	640	3540	0	0
242	ROOF	242	800	3060	0	0
243	ROOF	243	220	3410	0	0
244	ROOF	244	440	3410	0	0
245	ROOF	245	220	3230	0	0
246	ROOF	246	1090	3640	10	1
247	ROOF	247	850	3160	4	0
248	ROOF	248	230	3680	2	0
249	ROOF	249	120	3300	2	14
250	ROOF	250	190	3040	2	0
251	ROOF	251	60	3510	0	0
252	ROOF	252	130	3140	2	0
253	ROOF	253	80	2420	2	4
254	ROOF	254	250	4210	0	7
255	ROOF	255	120	3680	2	2
256	ROOF	256	940	4710	4	14
257	ROOF	257	390	3300	0	0
258	ROOF	258	280	3440	2	7
259	ROOF	259	380	3990	4	16
260	ROOF	260	260	3290	2	14
261	ROOF	261	420	3050	2	4
262	ROOF	262	310	3240	10	11
263	ROOF	263	910	3230	4	14
264	ROOF	264	970	2910	4	4
265	ROOF	265	250	4550	2	2
266	ROOF	266	180	4900	5	0
267	ROOF	267	310	3280	2	2
268	ROOF	268	170	3410	2	0
269	ROOF	269	250	3550	7	9
270	ROOF	270	160	4920	0	0
271	ROOF	271	140	4380	2	4
272	ROOF	272	170	3760	2	4

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
273	ROOF	273	250	2210	7	1
274	ROOF	274	140	2620	0	7
275	ROOF	275	500	2430	7	0
276	ROOF	276	1000	2390	10	6
277	ROOF	277	210	1630	2	4
278	ROOF	278	210	2470	7	0
279	ROOF	279	150	1450	0	5
280	ROOF	280	1090	2080	2	9
281	ROOF	281	670	2790	0	5
282	ROOF	282	520	2570	0	9
283	ROOF	283	230	3320	0	7
284	ROOF	284	290	4090	0	2
285	ROOF	285	190	4280	2	0
286	ROOF	286	130	3180	0	0
287	ROOF	287	430	1960	7	4
288	ROOF	288	270	2530	2	14
289	ROOF	289	210	2570	4	16
290	ROOF	290	1600	4890	10	13
291	ROOF	291	1090	2510	7	11
292	ROOF	292	850	2450	0	7
293	ROOF	293	290	3080	0	2
294	ROOF	294	230	2130	0	0
295	ROOF	295	180	2420	2	7
296	ROOF	296	1000	2690	2	4
297	ROOF	297	410	2570	10	0
298	ROOF	298	130	2850	4	14
299	ROOF	299	270	3320	0	5
300	ROOF	300	100	2430	0	5
301	ROOF	301	230	2230	2	0
302	ROOF	302	240	3370	0	0
303	ROOF	303	230	4800	0	2
304	ROOF	304	140	1180	2	2
305	ROOF	305	200	3080	2	0
306	ROOF	306	720	2920	2	2

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
307	ROOF	307	1120	5160	7	16
308	ROOF	308	780	3810	10	1
309	ROOF	309	1010	3900	2	2
310	ROOF	310	1120	3740	10	0
311	ROOF	311	990	3680	2	0
312	ROOF	312	1030	3820	2	7
313	ROOF	313	1070	3150	2	7
314	ROOF	314	960	3680	4	6
315	ROOF	315	1140	3800	2	0
316	ROOF	316	690	3670	0	5
317	ROOF	317	950	3850	0	2
318	ROOF	318	1270	3720	4	0
319	ROOF	319	1610	4060	7	9
320	ROOF	320	1180	3890	4	21
321	ROOF	321	1160	3710	15	0
322	ROOF	322	1290	3690	2	9
323	ROOF	323	730	3980	7	0
324	ROOF	324	550	2090	12	8
325	ROOF	325	360	1220	4	4
326	ROOF	326	710	1820	4	2
327	ROOF	327	860	2190	2	21
328	ROOF	328	940	2150	10	6
329	ROOF	329	870	2390	4	6
330	ROOF	330	680	1970	7	4
331	ROOF	331	400	2090	7	21
332	ROOF	332	630	1380	0	0
333	ROOF	333	520	1380	2	2
334	ROOF	334	510	1330	0	0
335	ROOF	335	640	1150	10	8
336	ROOF	336	430	1280	2	9
337	ROOF	337	500	1610	10	4
338	ROOF	338	610	1640	15	20
339	ROOF	339	130	1370	17	12
340	ROOF	340	240	1510	36	13

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
341	ROOF	341	510	2530	2	2
342	ROOF	342	670	1720	2	0
343	ROOF	343	520	1280	2	0
344	ROOF	344	690	1860	2	0
345	ROOF	345	490	2090	2	2
346	ROOF	346	300	1540	0	0
347	ROOF	347	640	1780	2	0
348	ROOF	348	620	1010	2	0
349	ROOF	349	470	1590	7	6
350	ROOF	350	520	1560	2	4
351	ROOF	351	530	1140	0	0
352	ROOF	352	210	1610	2	0
353	ROOF	353	1130	2350	2	0
354	ROOF	354	160	1760	0	0
355	ROOF	355	150	420	0	5
356	ROOF	356	130	1750	4	2
357	ROOF	357	210	1790	2	0
358	ROOF	358	850	2630	2	9
359	ROOF	359	160	1330	0	5
360	ROOF	360	360	1950	0	5
361	ROOF	361	570	1600	2	2
362	ROOF	362	280	1830	2	2
363	ROOF	363	870	2310	0	2
364	ROOF	364	480	1940	2	2
365	ROOF	365	750	2160	4	0
366	ROOF	366	530	1520	0	7
367	ROOF	367	430	1680	2	0
368	ROOF	368	460	1880	2	0
369	ROOF	369	970	1840	0	2
370	ROOF	370	350	1490	0	0
371	ROOF	371	360	1380	0	2
372	ROOF	372	200	1850	2	7
373	ROOF	373	850	1870	7	13
374	ROOF	374	650	2280	12	0

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
375	ROOF	375	670	2030	0	19
376	ROOF	376	220	1470	12	6
377	ROOF	377	440	1490	2	7
378	ROOF	378	350	1240	2	0
379	ROOF	379	330	1270	0	0
380	ROOF	380	210	940	4	9
381	ROOF	381	230	1210	2	2
382	ROOF	382	450	940	2	2
383	ROOF	383	620	1980	4	6
384	ROOF	384	530	1530	4	0
385	ROOF	385	670	2100	4	6
386	ROOF	386	520	1700	2	7
387	ROOF	387	760	1680	2	9
388	ROOF	388	470	1910	0	2
389	ROOF	389	870	2370	2	0
390	ROOF	390	760	2160	4	2
391	ROOF	391	650	2530	12	6
392	ROOF	392	820	2310	12	6
393	ROOF	393	940	2410	4	14
394	ROOF	394	930	2390	7	6
395	ROOF	395	640	2350	12	3
396	ROOF	396	710	2210	0	2
397	ROOF	397	620	2030	12	6
398	ROOF	398	780	2300	2	2
399	ROOF	399	710	1990	2	2
400	ROOF	400	840	1620	4	4
401	ROOF	401	620	1800	2	0
402	ROOF	402	690	2190	7	2
403	ROOF	403	590	1860	2	11
404	ROOF	404	310	2320	2	4
405	ROOF	405	910	2540	7	4
406	ROOF	406	850	2690	7	2
407	ROOF	407	860	2360	2	7
408	ROOF	408	630	3350	0	12

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
409	ROOF	409	810	2900	10	4
410	ROOF	410	970	2250	4	9
411	ROOF	411	690	2020	10	1
412	ROOF	412	720	1620	7	4
413	ROOF	413	150	2080	10	0
414	ROOF	414	700	2120	0	2
415	ROOF	415	780	2320	12	4
416	ROOF	416	1160	2660	7	2
417	ROOF	417	970	3250	7	2
418	ROOF	418	1060	2340	4	0
419	ROOF	419	800	3000	4	7
420	ROOF	420	1500	3450	7	6
421	ROOF	421	860	2680	7	0
422	ROOF	422	780	2760	0	5
423	ROOF	423	640	2360	2	2
424	ROOF	424	830	2510	0	7
425	ROOF	425	640	3200	10	16
426	ROOF	426	1130	3300	20	3
427	ROOF	427	1540	3260	7	6
428	ROOF	428	1020	2330	7	13
429	ROOF	429	900	2460	4	2
430	ROOF	430	650	2300	10	4
431	ROOF	431	1100	2750	2	4
432	ROOF	432	430	2050	12	20
433	ROOF	433	1370	2750	4	9
434	ROOF	434	1150	2860	12	6
435	ROOF	435	1350	2930	4	0
436	ROOF	436	1850	3850	2	7
437	ROOF	437	960	3080	0	0
438	ROOF	438	520	2880	4	2
439	ROOF	439	930	2920	4	4
440	ROOF	440	1160	2620	4	0
441	ROOF	441	940	2240	7	4
442	ROOF	442	930	3240	7	0

CIMARRON FACILITY

TiO2 ROOF SURVEY — SUB-AREA "I"

ALPHA AND BETA/GAMMA — AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
443	ROOF	443	1460	3620	7	0
444	ROOF	444	1450	3600	4	9
445	ROOF	445	1250	2790	2	4
446	ROOF	446	1540	2740	7	9
447	ROOF	447	1240	3210	2	0
448	ROOF	448	660	2920	10	8
449	ROOF	449	1320	2790	10	13
450	ROOF	450	1130	2790	2	4
451	ROOF	451	470	1690	7	2
452	ROOF	452	460	2150	2	7
453	ROOF	453	320	1870	4	0
454	ROOF	454	230	1970	0	12
455	ROOF	455	340	1990	4	4
456	ROOF	456	20	900	4	0
457	ROOF	457	1160	2350	4	0
458	ROOF	458	660	2710	12	6
459	ROOF	459	490	2250	4	7
460	ROOF	460	870	3830	4	7
461	ROOF	461	910	2340	2	9
462	ROOF	462	970	2940	2	2
463	ROOF	463	1220	3180	2	0
464	ROOF	464	1090	2440	2	2
465	ROOF	465	1000	2700	2	0
466	ROOF	466	1430	2660	0	7
467	ROOF	467	470	1770	2	4
468	ROOF	468	550	2090	0	0
469	ROOF	469	370	2080	2	2
470	ROOF	470	360	1340	0	5
471	ROOF	471	240	1760	2	2
472	ROOF	472	510	2120	4	0
473	ROOF	473	110	2010	0	9
474	ROOF	474	200	2290	2	4
475	ROOF	475	350	2630	4	7
476	ROOF	476	260	2880	10	16

CIMARRON FACILITY

TiO2 ROOF SURVEY — SUB-AREA "I"
ALPHA AND BETA/GAMMA — AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
477	ROOF	477	730	3130	0	0
478	ROOF	478	1160	2430	4	0
479	ROOF	479	950	2910	0	9
480	ROOF	480	1130	3240	4	0
481	ROOF	481	650	3200	10	6
482	ROOF	482	570	2620	2	7
483	ROOF	483	580	2330	4	0
484	ROOF	484	770	2630	2	2
485	ROOF	485	210	1990	2	2
486	ROOF	486	420	2420	2	0
487	ROOF	487	1130	2040	0	0
488	ROOF	488	260	2470	0	0
489	ROOF	489	180	2460	0	0
490	ROOF	490	220	2190	2	0
491	ROOF	491	150	2280	0	0
492	ROOF	492	250	2270	0	0
493	ROOF	493	450	2850	0	11
494	ROOF	494	850	3460	7	16
495	ROOF	495	960	2420	10	13
496	ROOF	496	1050	2640	12	6
497	ROOF	497	710	2620	2	2
498	ROOF	498	900	3150	12	11
499	ROOF	499	980	3380	0	0
500	ROOF	500	800	2530	4	4
501	ROOF	501	700	2540	0	0
502	ROOF	502	450	2780	0	0
503	ROOF	503	270	2470	0	2
504	ROOF	504	540	2630	4	2
505	ROOF	505	250	2830	0	2
506	ROOF	506	340	3360	10	6
507	ROOF	507	390	3140	0	2
508	ROOF	508	440	3380	0	5
509	ROOF	509	390	3600	4	4
510	ROOF	510	360	3520	2	4

CIMARRON FACILITY

TiO2 ROOF SURVEY — SUB-AREA "I"

ALPHA AND BETA/GAMMA — AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
511	ROOF	511	1280	2940	4	4
512	ROOF	512	1130	1970	2	9
513	ROOF	513	860	2540	4	0
514	ROOF	514	1310	2610	10	0
515	ROOF	515	690	2810	0	0
516	ROOF	516	1380	2950	15	8
517	ROOF	517	700	2310	2	4
518	ROOF	518	650	2780	7	2
519	ROOF	519	360	3460	4	0
520	ROOF	520	300	2320	0	5
521	ROOF	521	410	2600	4	4
522	ROOF	522	370	2740	4	2
523	ROOF	523	650	2990	4	2
524	ROOF	524	750	3440	7	0
525	ROOF	525	750	3650	2	9
526	ROOF	526	430	3350	7	13
527	ROOF	527	580	4000	2	2
528	ROOF	528	560	2950	0	7
529	ROOF	529	640	2600	0	2
530	ROOF	530	1020	2810	15	0
531	ROOF	531	990	2820	4	9
532	ROOF	532	830	2930	2	14
533	ROOF	533	640	2840	2	2
534	ROOF	534	790	2190	0	0
535	ROOF	535	800	3180	2	4
536	ROOF	536	600	2670	0	2
537	ROOF	537	520	2610	2	7
538	ROOF	538	250	2680	0	16
539	ROOF	539	210	2670	0	0
540	ROOF	540	190	2660	4	0
541	ROOF	541	390	2390	0	2
542	ROOF	542	310	2550	10	0
543	ROOF	543	660	2500	4	0
544	ROOF	544	690	3670	2	0

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT		SMEAR	
			ALPHA	BETA	ALPHA	BETA
545	ROOF	545	700	3970	7	4
546	ROOF	546	1050	3190	10	6
547	ROOF	547	560	2810	0	5
548	ROOF	548	750	3010	12	4
549	ROOF	549	630	2830	0	0
550	ROOF	550	720	3030	2	7
551	ROOF	551	730	3330	2	2
552	ROOF	552	1130	3640	7	11
553	ROOF	553	380	2620	0	2
554	ROOF	554	370	2330	0	0
555	ROOF	555	160	2550	2	0
556	ROOF	556	280	2560	2	7
557	ROOF	557	120	2410	4	0
558	ROOF	558	260	2480	0	0
559	ROOF	559	180	2270	0	7
560	ROOF	560	620	2970	0	9
561	ROOF	561	440	3080	0	0
562	ROOF	562	500	2140	2	0
563	ROOF	563	380	2080	0	0
564	ROOF	564	320	1790	0	9
565	ROOF	565	150	2680	0	0
566	ROOF	566	340	2010	2	9
567	ROOF	567	210	2030	0	0
568	ROOF	568	180	2240	0	2
569	ROOF	569	670	2310	4	0
570	ROOF	570	800	2340	4	9
571	ROOF	571	420	2560	2	4
572	ROOF	572	1180	3390	0	0
573	ROOF	573	420	2670	4	2
574	ROOF	574	370	2560	2	2
575	ROOF	575	400	2190	2	11
576	ROOF	576	440	2490	2	9
577	ROOF	577	590	2560	2	7
578	ROOF	578	900	3380	4	0

CIMARRON FACILITY

TiO2 ROOF SURVEY — SUB-AREA "I"

ALPHA AND BETA/GAMMA — AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
579	ROOF	579	760	3030	2	2
580	ROOF	580	160	2000	0	7
581	ROOF	581	340	2020	2	11
582	ROOF	582	550	2340	4	0
583	ROOF	583	580	2390	0	2
584	ROOF	584	830	2110	10	4
585	ROOF	585	530	2260	2	0
586	ROOF	586	820	2870	4	2
587	ROOF	587	600	2320	0	2
588	ROOF	588	550	2600	2	0
589	ROOF	589	750	2750	0	2
590	ROOF	590	190	2270	2	4
591	ROOF	591	500	2360	4	4
592	ROOF	592	890	2640	4	7
593	ROOF	593	570	2300	10	8
594	ROOF	594	880	2800	4	0
595	ROOF	595	480	2720	4	2
596	ROOF	596	860	2410	0	5
597	ROOF	597	1120	2490	7	9
598	ROOF	598	1010	2710	7	9
599	ROOF	599	760	2200	4	14
600	ROOF	600	950	2670	0	0
601	ROOF	601	980	2450	2	0
602	ROOF	602	560	2030	2	2
603	ROOF	603	740	2440	7	0
604	ROOF	604	860	2480	0	5
605	ROOF	605	1040	2460	0	7
606	ROOF	606	1190	2490	0	0
607	ROOF	607	1230	2770	0	0
608	ROOF	608	1280	2930	2	4
609	ROOF	609	1480	3220	0	0
610	ROOF	610	1060	2650	2	11
611	ROOF	611	830	2410	2	0
612	ROOF	612	700	2940	2	2

CIMARRON FACILITY

TiO2 ROOF SURVEY **SUB-AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	2 cpm	72 DPM
BETA DIRECT LUDLUM 2224 43-89 PROBE	114616	DPM/100cm²	268 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers **DATE:** 5-24-99

LN #	TIO2 BUILDING ROOF SURVEY	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
613	ROOF	613	580	2080	4	7
614	ROOF	614	1050	3100	2	4
615	ROOF	615	1040	2670	4	0
616	ROOF	616	740	2600	7	4
617	ROOF	617	1190	2910	0	2
618	ROOF	618	940	2330	2	11
619	ROOF	619	810	2340	0	0
620	ROOF	620	1070	2810	4	2
621	ROOF	621	1020	2510	2	4
622	ROOF	622	1050	2940	2	4
623	ROOF	623	580	2600	2	4
624	ROOF	624	1120	3410	4	7
625	ROOF	625	890	2650	0	5
626	ROOF	626	1140	3280	4	2
627	ROOF	627	540	2590	0	7
628	ROOF	628	740	2660	7	4
629	ROOF	629	390	2350	7	4
630	ROOF	630	840	1610	10	4
631	ROOF	631	1190	1780	7	4
632	ROOF	632	700	1530	4	4
633	ROOF	633	1070	2100	4	0
634	ROOF	634	860	1360	10	6
635	ROOF	635	890	1600	2	0
636	ROOF	636	890	1880	10	8
637	ROOF	637	820	1880	10	6
638	ROOF	638	1350	2920	7	9
639	ROOF	639	1800	3120	12	4
640	ROOF	640	840	2150	7	13
641	ROOF	641	980	1790	4	11
642	ROOF	642	1270	2020	4	7
643	ROOF	643	1310	2260	7	0
644	ROOF	644	920	1710	12	8
645	ROOF	645	960	2030	0	5
646	ROOF	646	460	2220	7	16

CIMARRON CORPORATION
SUB - AREA " I " AFFECTED AREA
TI0 - 2 ROOF
HOT SPOT AVERAGING

ONE METER X ONE METER GRID (10,000 cm ²)

								dpm / 100 cm ²
160	N	EDGE OF ROOF			160	N		2580
72	E	2580	5900	3470	74	E		3470
			2830					2830
								4040
			4040					
158	N				158	N	TOTAL :	12920
72	E				74	E	AVERAGE :	3230

100 cm ² THE SIZE OF HOT SPOT AREA

$\frac{100}{10000}$

5900 dpm / 100 cm ² MAX BETA READING

% OF THE GRIDDED AREA REPRESENTED BY THE HOTSPOT : 1.0%

Instrumentation:
Ludlum 2224 S/N 114616 #CI-51
Cal Date: 5-29-98 Cal Due: 9-98
Background/Beta: 146 CP(0.5)Min
Survey Date: 7-16-98

$$Xw = AVG\ [1 - N / 10000] + E\ [N / 10000]$$

AVG = AVERAGE READING OF THE NON - ELEVATED AREAS
E = MAXIMUM READING FROM THE ELEVATED AREAS
N = THE SIZE OF THE ELEVATED AREA

Xw = 3257 dpm / 100 cm ²

Reviewed By: K Morgan **Date:** 5-3-99

CIMARRON CORPORATION
SUB - AREA " I " AFFECTED AREA
TI0 - 2 ROOF
HOT SPOT AVERAGING

ONE METER X ONE METER GRID (10,000 cm ²)

							dpm / 100 cm ²
160	N	EDGE OF ROOF		160	N		2040
74	E	2040	5030 3230	76	E		3230
			3560				3560
							3970
			3970				
158	N			158	N	TOTAL :	12800
74	E			76	E	AVERAGE :	3200

100 cm ² THE SIZE OF HOT SPOT AREA

$\frac{100}{10000}$

5030 dpm / 100 cm ² MAX BETA READING

% OF THE GRIDDED AREA REPRESENTED BY THE HOTSPOT : 1.0%

$$Xw = AVG\ [1 - N / 10000] + E\ [N / 10000]$$

AVG = AVERAGE READING OF THE NON - ELEVATED AREAS

E = MAXIMUM READING FROM THE ELEVATED AREAS

N = THE SIZE OF THE ELEVATED AREA

Instrumentation:

Ludlum 2224 S/N 114616 #CI-51

Cal Date: 5-29-98 Cal Due: 9-98

Background/Beta: 146 CP(0.5)Min

Survey Date: 7-16-98

Xw = 3218 dpm / 100 cm ²

Reviewed By: Morgan **Date:** 5-3-99

CIMARRON CORPORATION
SUB - AREA " I " AFFECTED AREA
TI0 - 2 ROOF
HOT SPOT AVERAGING

ONE METER X ONE METER GRID (10,000 cm ²)

								dpm / 100 cm ²
160	N	EDGE OF ROOF			160	N		3770
78	E	3770	5160	2520	80	E		2690
			2690					2520
								3810
			3810					
158	N				158	N	TOTAL :	12790
78	E				80	E	AVERAGE :	3198

100 cm ² THE SIZE OF HOT SPOT AREA

$\frac{100}{10000}$

5160 dpm / 100 cm ² MAX BETA READING

% OF THE GRIDDED AREA REPRESENTED BY THE HOTSPOT : 1.0%

Instrumentation:
Ludlum 2224 S/N 114616 #CI-51
Cal Date: 5-29-98 Cal Due: 9-98
Background/Beta: 146 CP(0.5)Min
Survey Date: 7-20-98

$$Xw = AVG\ [1 - N / 10000] + E\ [N / 10000]$$

AVG = AVERAGE READING OF THE NON - ELEVATED AREAS
E = MAXIMUM READING FROM THE ELEVATED AREAS
N = THE SIZE OF THE ELEVATED AREA

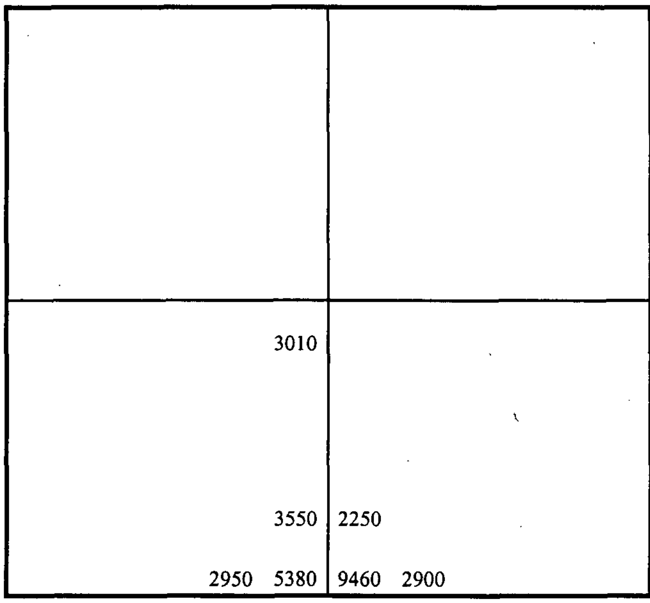
Xw = 3217 dpm / 100 cm ²

Reviewed By: VMorgan **Date:** 5-3-99

CIMARRON CORPORATION
SUB - AREA " I " AFFECTED AREA
TI0 - 2 ROOF
HOT SPOT AVERAGING

ONE METER X ONE METER GRID (10,000 cm ²)

146 N — 146 N
66 E — 68 E



144.6 N — 144.6 N
66 E — 68 E

EDGE OF ROOF

dpm / 100 cm ²
3010
3550
2250
2900
2950
TOTAL : 14660
AVERAGE : 2932

200 cm ² THE SIZE OF HOT SPOT AREA $\frac{200}{10000}$

9460 dpm / 100 cm ² MAX BETA READING

% OF THE GRIDDED AREA REPRESENTED BY THE HOTSPOT : 2.0%

$$Xw = AVG\ [\,1 - N / 10000\,] + E\ [\,N / 10000\,]$$

AVG = AVERAGE READING OF THE NON - ELEVATED AREAS
E = MAXIMUM READING FROM THE ELEVATED AREAS
N = THE SIZE OF THE ELEVATED AREA

Instrumentation:
Ludlum 2224 S/N 114616 #CI-51
Cal Date: 5-29-98 Cal Due: 9-98
Background/Beta: 146 CP(0.5)Min
Survey Date: 7-16-98

Xw = 3063 dpm / 100 cm ²

Reviewed By: K Morgan **Date:** 5-3-99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	140.0	-575.2	330909.9
2	30.0	-685.2	469564.4
3	110.0	-605.2	366324.8
4	150.0	-565.2	319504.9
5	90.0	-625.2	390934.7
6	110.0	-605.2	366324.8
7	90.0	-625.2	390934.7
8	100.0	-615.2	378529.7
9	130.0	-585.2	342514.8
10	170.0	-545.2	297295.0
11	130.0	-585.2	342514.8
12	180.0	-535.2	286490.1
13	140.0	-575.2	330909.9
14	190.0	-525.2	275885.1
15	90.0	-625.2	390934.7
16	140.0	-575.2	330909.9
17	420.0	-295.2	87171.2
18	1780.0	1064.8	1133697.5
19	1080.0	364.8	133044.3
20	910.0	194.8	37928.5
21	370.0	-345.2	119196.0
22	450.0	-265.2	70356.3
23	1470.0	754.8	569651.1
24	450.0	-265.2	70356.3
25	910.0	194.8	37928.5
26	2460.0	1744.8	3044160.7
27	900.0	184.8	34133.4
28	700.0	-15.2	232.5
29	490.0	-225.2	50736.5
30	310.0	-405.2	164225.7
31	1150.0	434.8	189009.6
32	360.0	-355.2	126200.9
33	900.0	184.8	34133.4
34	1280.0	564.8	318945.2
35	1130.0	414.8	172019.5
36	2260.0	1544.8	2386259.7
37	1330.0	614.8	377920.4
38	300.0	-415.2	172430.6
39	40.0	-675.2	455959.4
40	1420.0	704.8	496675.8
41	870.0	154.8	23948.3
42	960.0	244.8	59903.7
43	1840.0	1124.8	1265067.8
44	170.0	-545.2	297295.0
45	100.0	-615.2	378529.7
46	320.0	-395.2	156220.7
47	130.0	-585.2	342514.8
48	150.0	-565.2	319504.9
49	210.0	-505.2	255275.2
50	360.0	-355.2	126200.9
	48040.0		12080165.1
	55290.0		20273173.8
	33130.0		4100350.9
	32140.0		6770441.3
	19770.0		10875968.9
	34870.0		5730089.0
	27380.0		4708199.2
	47500.0		8563232.6
	31120.0		6713146.6
	31230.0		4447692.1
	27620.0		5277280.3
	43990.0		6083654.4
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	462050		114740710.4
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **646**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **715.25**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **421.77**
2 Std Deviations: **843.55**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.645**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **742.55** DPM/100cm²
GUIDELINE VALUE: **5000** DPM/100cm²
Acceptable Level: **5000.0** DPM/100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	645	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	645	1.645	95%	

PERFORMED BY: K Morgan DATE: 6/17/99

REVIEWED BY: W. A. Boyer DATE: 6-17-99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	470.0	-245.25	60146.42
52	940.0	224.75	50513.61
53	330.0	-385.25	148415.77
54	220.0	-495.25	245270.26
55	1060.0	344.75	118854.16
56	550.0	-165.25	27306.80
57	640.0	-75.25	5662.21
58	410.0	-305.25	93176.14
59	570.0	-145.25	21096.89
60	1030.0	314.75	99069.02
61	1180.0	464.75	215994.72
62	1570.0	854.75	730601.53
63	1430.0	714.75	510870.88
64	1040.0	324.75	105464.07
65	2130.0	1414.75	2001524.13
66	1360.0	644.75	415705.56
67	1130.0	414.75	172019.49
68	1220.0	504.75	254774.91
69	830.0	114.75	13168.10
70	700.0	-15.25	232.49
71	750.0	34.75	1207.72
72	650.0	-65.25	4257.26
73	1070.0	354.75	125849.21
74	1010.0	294.75	86878.93
75	690.0	-25.25	637.45
76	1630.0	914.75	836771.81
77	500.0	-215.25	46331.56
78	500.0	-215.25	46331.56
79	530.0	-185.25	34316.70
80	770.0	54.75	2997.82
81	1380.0	664.75	441895.65
82	1310.0	594.75	353730.32
83	320.0	-395.25	156220.73
84	1100.0	384.75	148034.35
85	1350.0	634.75	402910.51
86	1630.0	914.75	836771.81
87	1500.0	784.75	615836.21
88	1070.0	354.75	125849.21
89	1500.0	784.75	615836.21
90	1610.0	894.75	800581.72
91	1110.0	394.75	155829.40
92	1120.0	404.75	163824.44
93	790.0	74.75	5587.91
94	510.0	-205.25	42126.61
95	620.0	-95.25	9072.12
96	940.0	224.75	50513.61
97	790.0	74.75	5587.91
98	680.0	-35.25	1242.40
99	350.0	-365.25	133405.87
100	1450.0	734.75	539860.97
	48040.0		12080165.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	1490.0	774.75	600241.16
102	1260.0	544.75	296755.09
103	1270.0	554.75	307750.14
104	1660.0	944.75	892556.95
105	1070.0	354.75	125849.21
106	1280.0	564.75	318945.19
107	1570.0	854.75	730601.53
108	2040.0	1324.75	1754968.71
109	1100.0	384.75	148034.35
110	1930.0	1214.75	1475623.20
111	410.0	-305.25	93176.14
112	820.0	104.75	10973.05
113	830.0	114.75	13168.10
114	1020.0	304.75	92873.98
115	1570.0	854.75	730601.53
116	1330.0	614.75	377920.42
117	940.0	224.75	50513.61
118	1320.0	604.75	365725.37
119	2040.0	1324.75	1754968.71
120	1440.0	724.75	525265.93
121	1400.0	684.75	468885.74
122	120.0	-595.25	354319.80
123	1010.0	294.75	86878.93
124	1350.0	634.75	402910.51
125	1420.0	704.75	496675.84
126	1160.0	444.75	197804.63
127	930.0	214.75	46118.56
128	1370.0	654.75	428700.60
129	1200.0	484.75	234984.81
130	1490.0	774.75	600241.16
131	1330.0	614.75	377920.42
132	1820.0	1104.75	1220477.69
133	1550.0	834.75	696811.44
134	110.0	-605.25	366324.75
135	180.0	-535.25	286490.08
136	120.0	-595.25	354319.80
137	1440.0	724.75	525265.93
138	1450.0	734.75	539860.97
139	1420.0	704.75	496675.84
140	490.0	-225.25	50736.52
141	1160.0	444.75	197804.63
142	1540.0	824.75	680216.39
143	690.0	-25.25	637.45
144	980.0	264.75	70093.79
145	510.0	-205.25	42126.61
146	520.0	-195.25	38121.66
147	440.0	-275.25	75761.28
148	510.0	-205.25	42126.61
149	280.0	-435.25	189440.54
150	910.0	194.75	37928.47
	55290.0		20273173.8
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	260.0	-455.25	207250.45
152	560.0	-155.25	24101.84
153	510.0	-205.25	42126.61
154	1350.0	634.75	402910.51
155	1120.0	404.75	163824.44
156	960.0	244.75	59903.70
157	630.0	-85.25	7267.17
158	960.0	244.75	59903.70
159	670.0	-45.25	2047.35
160	730.0	14.75	217.63
161	490.0	-225.25	50736.52
162	590.0	-125.25	15686.98
163	500.0	-215.25	46331.56
164	460.0	-255.25	65151.38
165	840.0	124.75	15563.14
166	870.0	154.75	23948.28
167	230.0	-485.25	235465.31
168	290.0	-425.25	180835.59
169	1000.0	284.75	81083.88
170	500.0	-215.25	46331.56
171	710.0	-5.25	27.54
172	650.0	-65.25	4257.26
173	570.0	-145.25	21096.89
174	720.0	4.75	22.58
175	310.0	-405.25	164225.68
176	490.0	-225.25	50736.52
177	250.0	-465.25	216455.40
178	840.0	124.75	15563.14
179	500.0	-215.25	46331.56
180	990.0	274.75	75488.84
181	570.0	-145.25	21096.89
182	780.0	64.75	4192.86
183	790.0	74.75	5587.91
184	670.0	-45.25	2047.35
185	720.0	4.75	22.58
186	390.0	-325.25	105786.05
187	550.0	-165.25	27306.80
188	710.0	-5.25	27.54
189	310.0	-405.25	164225.68
190	360.0	-355.25	126200.91
191	810.0	94.75	8978.00
192	620.0	-95.25	9072.12
193	320.0	-395.25	156220.73
194	190.0	-525.25	275885.12
195	700.0	-15.25	232.49
196	1110.0	394.75	155829.40
197	1420.0	704.75	496675.84
198	630.0	-85.25	7267.17
199	1170.0	454.75	206799.67
200	760.0	44.75	2002.77
	33130.0		4100350.9
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	620.0	-95.25	9072.12
202	490.0	-225.25	50736.52
203	1000.0	284.75	81083.88
204	920.0	204.75	41923.51
205	1440.0	724.75	525265.93
206	970.0	254.75	64898.75
207	180.0	-535.25	286490.08
208	780.0	64.75	4192.86
209	610.0	-105.25	11077.07
210	670.0	-45.25	2047.35
211	810.0	94.75	8978.00
212	940.0	224.75	50513.61
213	990.0	274.75	75488.84
214	650.0	-65.25	4257.26
215	120.0	-595.25	354319.80
216	300.0	-415.25	172430.63
217	200.0	-515.25	265480.17
218	610.0	-105.25	11077.07
219	240.0	-475.25	225860.36
220	420.0	-295.25	87171.19
221	410.0	-305.25	93176.14
222	1190.0	474.75	225389.77
223	1190.0	474.75	225389.77
224	1150.0	434.75	189009.58
225	950.0	234.75	55108.65
226	1190.0	474.75	225389.77
227	980.0	264.75	70093.79
228	1020.0	304.75	92873.98
229	600.0	-115.25	13282.03
230	1010.0	294.75	86878.93
231	100.0	-615.25	378529.71
232	210.0	-505.25	255275.22
233	150.0	-565.25	319504.94
234	850.0	134.75	18158.19
235	780.0	64.75	4192.86
236	370.0	-345.25	119195.96
237	200.0	-515.25	265480.17
238	320.0	-395.25	156220.73
239	890.0	174.75	30538.37
240	820.0	104.75	10973.05
241	640.0	-75.25	5662.21
242	800.0	84.75	7182.96
243	220.0	-495.25	245270.26
244	440.0	-275.25	75761.28
245	220.0	-495.25	245270.26
246	1090.0	374.75	140439.30
247	850.0	134.75	18158.19
248	230.0	-485.25	235465.31
249	120.0	-595.25	354319.80
250	190.0	-525.25	275885.12
	32140.0		6770441.3
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	60.0	-655.25	429349.52
252	130.0	-585.25	342514.84
253	80.0	-635.25	403539.61
254	250.0	-465.25	216455.40
255	120.0	-595.25	354319.80
256	940.0	224.75	50513.61
257	390.0	-325.25	105786.05
258	280.0	-435.25	189440.54
259	380.0	-335.25	112391.01
260	260.0	-455.25	207250.45
261	420.0	-295.25	87171.19
262	310.0	-405.25	164225.68
263	910.0	194.75	37928.47
264	970.0	254.75	64898.75
265	250.0	-465.25	216455.40
266	180.0	-535.25	286490.08
267	310.0	-405.25	164225.68
268	170.0	-545.25	297295.03
269	250.0	-465.25	216455.40
270	160.0	-555.25	308299.98
271	140.0	-575.25	330909.89
272	170.0	-545.25	297295.03
273	250.0	-465.25	216455.40
274	140.0	-575.25	330909.89
275	500.0	-215.25	46331.56
276	1000.0	284.75	81083.88
277	210.0	-505.25	255275.22
278	210.0	-505.25	255275.22
279	150.0	-565.25	319504.94
280	1090.0	374.75	140439.30
281	670.0	-45.25	2047.35
282	520.0	-195.25	38121.66
283	230.0	-485.25	235465.31
284	290.0	-425.25	180835.59
285	190.0	-525.25	275885.12
286	130.0	-585.25	342514.84
287	430.0	-285.25	81366.24
288	270.0	-445.25	198245.49
289	210.0	-505.25	255275.22
290	1600.0	884.75	782786.67
291	1090.0	374.75	140439.30
292	850.0	134.75	18158.19
293	290.0	-425.25	180835.59
294	230.0	-485.25	235465.31
295	180.0	-535.25	286490.08
296	1000.0	284.75	81083.88
297	410.0	-305.25	93176.14
298	130.0	-585.25	342514.84
299	270.0	-445.25	198245.49
300	100.0	-615.25	378529.71
	19770.0		10875968.9
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	230.0	-485.25	235465.31
302	240.0	-475.25	225860.36
303	230.0	-485.25	235465.31
304	140.0	-575.25	330909.89
305	200.0	-515.25	265480.17
306	720.0	4.75	22.58
307	1120.0	404.75	163824.44
308	780.0	64.75	4192.86
309	1010.0	294.75	86878.93
310	1120.0	404.75	163824.44
311	990.0	274.75	75488.84
312	1030.0	314.75	99069.02
313	1070.0	354.75	125849.21
314	960.0	244.75	59903.70
315	1140.0	424.75	180414.54
316	690.0	-25.25	637.45
317	950.0	234.75	55108.65
318	1270.0	554.75	307750.14
319	1610.0	894.75	800581.72
320	1180.0	464.75	215994.72
321	1160.0	444.75	197804.63
322	1290.0	574.75	330340.23
323	730.0	14.75	217.63
324	550.0	-165.25	27306.80
325	360.0	-355.25	126200.91
326	710.0	-5.25	27.54
327	860.0	144.75	20953.23
328	940.0	224.75	50513.61
329	870.0	154.75	23948.28
330	680.0	-35.25	1242.40
331	400.0	-315.25	99381.10
332	630.0	-85.25	7267.17
333	520.0	-195.25	38121.66
334	510.0	-205.25	42126.61
335	640.0	-75.25	5662.21
336	430.0	-285.25	81366.24
337	500.0	-215.25	46331.56
338	610.0	-105.25	11077.07
339	130.0	-585.25	342514.84
340	240.0	-475.25	225860.36
341	510.0	-205.25	42126.61
342	670.0	-45.25	2047.35
343	520.0	-195.25	38121.66
344	690.0	-25.25	637.45
345	490.0	-225.25	50736.52
346	300.0	-415.25	172430.63
347	640.0	-75.25	5662.21
348	620.0	-95.25	9072.12
349	470.0	-245.25	60146.42
350	520.0	-195.25	38121.66
	34870.0		5730089.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
351	530.0	-185.25	34316.70
352	210.0	-505.25	255275.22
353	1130.0	414.75	172019.49
354	160.0	-555.25	308299.98
355	150.0	-565.25	319504.94
356	130.0	-585.25	342514.84
357	210.0	-505.25	255275.22
358	850.0	134.75	18158.19
359	160.0	-555.25	308299.98
360	360.0	-355.25	126200.91
361	570.0	-145.25	21096.89
362	280.0	-435.25	189440.54
363	870.0	154.75	23948.28
364	480.0	-235.25	55341.47
365	750.0	34.75	1207.72
366	530.0	-185.25	34316.70
367	430.0	-285.25	81366.24
368	460.0	-255.25	65151.38
369	970.0	254.75	64898.75
370	350.0	-365.25	133405.87
371	360.0	-355.25	126200.91
372	200.0	-515.25	265480.17
373	850.0	134.75	18158.19
374	650.0	-65.25	4257.26
375	670.0	-45.25	2047.35
376	220.0	-495.25	245270.26
377	440.0	-275.25	75761.28
378	350.0	-365.25	133405.87
379	330.0	-385.25	148415.77
380	210.0	-505.25	255275.22
381	230.0	-485.25	235465.31
382	450.0	-265.25	70356.33
383	620.0	-95.25	9072.12
384	530.0	-185.25	34316.70
385	670.0	-45.25	2047.35
386	520.0	-195.25	38121.66
387	760.0	44.75	2002.77
388	470.0	-245.25	60146.42
389	870.0	154.75	23948.28
390	760.0	44.75	2002.77
391	650.0	-65.25	4257.26
392	820.0	104.75	10973.05
393	940.0	224.75	50513.61
394	930.0	214.75	46118.56
395	640.0	-75.25	5662.21
396	710.0	-5.25	27.54
397	620.0	-95.25	9072.12
398	780.0	64.75	4192.86
399	710.0	-5.25	27.54
400	840.0	124.75	15563.14
	27380.0		4708199.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	620.0	-95.25	9072.12
402	690.0	-25.25	637.45
403	590.0	-125.25	15686.98
404	310.0	-405.25	164225.68
405	910.0	194.75	37928.47
406	850.0	134.75	18158.19
407	860.0	144.75	20953.23
408	630.0	-85.25	7267.17
409	810.0	94.75	8978.00
410	970.0	254.75	64898.75
411	690.0	-25.25	637.45
412	720.0	4.75	22.58
413	150.0	-565.25	319504.94
414	700.0	-15.25	232.49
415	780.0	64.75	4192.86
416	1160.0	444.75	197804.63
417	970.0	254.75	64898.75
418	1060.0	344.75	118854.16
419	800.0	84.75	7182.96
420	1500.0	784.75	615836.21
421	860.0	144.75	20953.23
422	780.0	64.75	4192.86
423	640.0	-75.25	5662.21
424	830.0	114.75	13168.10
425	640.0	-75.25	5662.21
426	1130.0	414.75	172019.49
427	1540.0	824.75	680216.39
428	1020.0	304.75	92873.98
429	900.0	184.75	34133.42
430	650.0	-65.25	4257.26
431	1100.0	384.75	148034.35
432	430.0	-285.25	81366.24
433	1370.0	654.75	428700.60
434	1150.0	434.75	189009.58
435	1350.0	634.75	402910.51
436	1850.0	1134.75	1287662.83
437	960.0	244.75	59903.70
438	520.0	-195.25	38121.66
439	930.0	214.75	46118.56
440	1160.0	444.75	197804.63
441	940.0	224.75	50513.61
442	930.0	214.75	46118.56
443	1460.0	744.75	554656.02
444	1450.0	734.75	539860.97
445	1250.0	534.75	285960.05
446	1540.0	824.75	680216.39
447	1240.0	524.75	275365.00
448	660.0	-55.25	3052.31
449	1320.0	604.75	365725.37
450	1130.0	414.75	172019.49
	47500.0		8563232.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
451	470.0	-245.25	60146.42
452	460.0	-255.25	65151.38
453	320.0	-395.25	156220.73
454	230.0	-485.25	235465.31
455	340.0	-375.25	140810.82
456	20.0	-695.25	483369.33
457	1160.0	444.75	197804.63
458	660.0	-55.25	3052.31
459	490.0	-225.25	50736.52
460	870.0	154.75	23948.28
461	910.0	194.75	37928.47
462	970.0	254.75	64898.75
463	1220.0	504.75	254774.91
464	1090.0	374.75	140439.30
465	1000.0	284.75	81083.88
466	1430.0	714.75	510870.88
467	470.0	-245.25	60146.42
468	550.0	-165.25	27306.80
469	370.0	-345.25	119195.96
470	360.0	-355.25	126200.91
471	240.0	-475.25	225860.36
472	510.0	-205.25	42126.61
473	110.0	-605.25	366324.75
474	200.0	-515.25	265480.17
475	350.0	-365.25	133405.87
476	260.0	-455.25	207250.45
477	730.0	14.75	217.63
478	1160.0	444.75	197804.63
479	950.0	234.75	55108.65
480	1130.0	414.75	172019.49
481	650.0	-65.25	4257.26
482	570.0	-145.25	21096.89
483	580.0	-135.25	18291.93
484	770.0	54.75	2997.82
485	210.0	-505.25	255275.22
486	420.0	-295.25	87171.19
487	1130.0	414.75	172019.49
488	260.0	-455.25	207250.45
489	180.0	-535.25	286490.08
490	220.0	-495.25	245270.26
491	150.0	-565.25	319504.94
492	250.0	-465.25	216455.40
493	450.0	-265.25	70356.33
494	850.0	134.75	18158.19
495	960.0	244.75	59903.70
496	1050.0	334.75	112059.12
497	710.0	-5.25	27.54
498	900.0	184.75	34133.42
499	980.0	264.75	70093.79
500	800.0	84.75	7182.96
	31120.0		6713146.6
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
501	700.0	-15.25	232.49
502	450.0	-265.25	70356.33
503	270.0	-445.25	198245.49
504	540.0	-175.25	30711.75
505	250.0	-465.25	216455.40
506	340.0	-375.25	140810.82
507	390.0	-325.25	105786.05
508	440.0	-275.25	75761.28
509	390.0	-325.25	105786.05
510	360.0	-355.25	126200.91
511	1280.0	564.75	318945.19
512	1130.0	414.75	172019.49
513	860.0	144.75	20953.23
514	1310.0	594.75	353730.32
515	690.0	-25.25	637.45
516	1380.0	664.75	441895.65
517	700.0	-15.25	232.49
518	650.0	-65.25	4257.26
519	360.0	-355.25	126200.91
520	300.0	-415.25	172430.63
521	410.0	-305.25	93176.14
522	370.0	-345.25	119195.96
523	650.0	-65.25	4257.26
524	750.0	34.75	1207.72
525	750.0	34.75	1207.72
526	430.0	-285.25	81366.24
527	580.0	-135.25	18291.93
528	560.0	-155.25	24101.84
529	640.0	-75.25	5662.21
530	1020.0	304.75	92873.98
531	990.0	274.75	75488.84
532	830.0	114.75	13168.10
533	640.0	-75.25	5662.21
534	790.0	74.75	5587.91
535	800.0	84.75	7182.96
536	600.0	-115.25	13282.03
537	520.0	-195.25	38121.66
538	250.0	-465.25	216455.40
539	210.0	-505.25	255275.22
540	190.0	-525.25	275885.12
541	390.0	-325.25	105786.05
542	310.0	-405.25	164225.68
543	660.0	-55.25	3052.31
544	690.0	-25.25	637.45
545	700.0	-15.25	232.49
546	1050.0	334.75	112059.12
547	560.0	-155.25	24101.84
548	750.0	34.75	1207.72
549	630.0	-85.25	7267.17
550	720.0	4.75	22.58
	31230.0		4447692.1
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
551	730.0	14.75	217.63
552	1130.0	414.75	172019.49
553	380.0	-335.25	112391.01
554	370.0	-345.25	119195.96
555	160.0	-555.25	308299.98
556	280.0	-435.25	189440.54
557	120.0	-595.25	354319.80
558	260.0	-455.25	207250.45
559	180.0	-535.25	286490.08
560	620.0	-95.25	9072.12
561	440.0	-275.25	75761.28
562	500.0	-215.25	46331.56
563	380.0	-335.25	112391.01
564	320.0	-395.25	156220.73
565	150.0	-565.25	319504.94
566	340.0	-375.25	140810.82
567	210.0	-505.25	255275.22
568	180.0	-535.25	286490.08
569	670.0	-45.25	2047.35
570	800.0	84.75	7182.96
571	420.0	-295.25	87171.19
572	1180.0	464.75	215994.72
573	420.0	-295.25	87171.19
574	370.0	-345.25	119195.96
575	400.0	-315.25	99381.10
576	440.0	-275.25	75761.28
577	590.0	-125.25	15686.98
578	900.0	184.75	34133.42
579	760.0	44.75	2002.77
580	160.0	-555.25	308299.98
581	340.0	-375.25	140810.82
582	550.0	-165.25	27306.80
583	580.0	-135.25	18291.93
584	830.0	114.75	13168.10
585	530.0	-185.25	34316.70
586	820.0	104.75	10973.05
587	600.0	-115.25	13282.03
588	550.0	-165.25	27306.80
589	750.0	34.75	1207.72
590	190.0	-525.25	275885.12
591	500.0	-215.25	46331.56
592	890.0	174.75	30538.37
593	570.0	-145.25	21096.89
594	880.0	164.75	27143.33
595	480.0	-235.25	55341.47
596	860.0	144.75	20953.23
597	1120.0	404.75	163824.44
598	1010.0	294.75	86878.93
599	760.0	44.75	2002.77
600	950.0	234.75	55108.65
	27620.0		5277280.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
601	980.0	264.75	70093.79
602	560.0	-155.25	24101.84
603	740.0	24.75	612.68
604	860.0	144.75	20953.23
605	1040.0	324.75	105464.07
606	1190.0	474.75	225389.77
607	1230.0	514.75	264969.95
608	1280.0	564.75	318945.19
609	1480.0	764.75	584846.11
610	1060.0	344.75	118854.16
611	830.0	114.75	13168.10
612	700.0	-15.25	232.49
613	580.0	-135.25	18291.93
614	1050.0	334.75	112059.12
615	1040.0	324.75	105464.07
616	740.0	24.75	612.68
617	1190.0	474.75	225389.77
618	940.0	224.75	50513.61
619	810.0	94.75	8978.00
620	1070.0	354.75	125849.21
621	1020.0	304.75	92873.98
622	1050.0	334.75	112059.12
623	580.0	-135.25	18291.93
624	1120.0	404.75	163824.44
625	890.0	174.75	30538.37
626	1140.0	424.75	180414.54
627	540.0	-175.25	30711.75
628	740.0	24.75	612.68
629	390.0	-325.25	105786.05
630	840.0	124.75	15563.14
631	1190.0	474.75	225389.77
632	700.0	-15.25	232.49
633	1070.0	354.75	125849.21
634	860.0	144.75	20953.23
635	890.0	174.75	30538.37
636	890.0	174.75	30538.37
637	820.0	104.75	10973.05
638	1350.0	634.75	402910.51
639	1800.0	1084.75	1176687.60
640	840.0	124.75	15563.14
641	980.0	264.75	70093.79
642	1270.0	554.75	307750.14
643	1310.0	594.75	353730.32
644	920.0	204.75	41923.51
645	960.0	244.75	59903.70
646	460.0	-255.25	65151.38
647	0.0	0.00	0.00
648	0.0	0.00	0.00
649	0.0	0.00	0.00
650	0.0	0.00	0.00
	43990.0		6083654.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	40.0	-2489.89	6199560.4
2	190.0	-2339.89	5475092.9
3	0.0	-2529.89	6400351.7
4	160.0	-2369.89	5616386.4
5	60.0	-2469.89	6100364.7
6	20.0	-2509.89	6299556.0
7	270.0	-2259.89	5107110.2
8	0.0	-2529.89	6400351.7
9	370.0	-2159.89	4665131.9
10	230.0	-2299.89	5289501.6
11	70.0	-2459.89	6051066.9
12	440.0	-2089.89	4367647.1
13	620.0	-1909.89	3647686.1
14	910.0	-1619.89	2624048.9
15	640.0	-1889.89	3571690.4
16	320.0	-2209.89	4883621.1
17	590.0	-1939.89	3763179.6
18	2950.0	420.11	176491.0
19	1270.0	-1259.89	1587326.9
20	1000.0	-1529.89	2340568.4
21	800.0	-1729.89	2992525.1
22	470.0	-2059.89	4243153.6
23	2180.0	-349.89	122424.2
24	1190.0	-1339.89	1795309.6
25	2520.0	-9.89	97.8
26	3380.0	850.11	722684.2
27	2380.0	-149.89	22467.5
28	2100.0	-429.89	184806.8
29	2920.0	390.11	152184.5
30	2000.0	-529.89	280785.2
31	1990.0	-539.89	291483.0
32	1520.0	-1009.89	1019881.1
33	2170.0	-359.89	129522.0
34	2180.0	-349.89	122424.2
35	2650.0	120.11	14426.0
36	3490.0	960.11	921808.1
37	3080.0	550.11	302619.2
38	760.0	-1769.89	3132516.4
39	390.0	-2139.89	4579136.2
40	1850.0	-679.89	462252.6
41	1980.0	-549.89	302380.8
42	2080.0	-449.89	202402.5
43	4640.0	2110.11	4452557.3
44	1390.0	-1139.89	1299353.0
45	1300.0	-1229.89	1512633.4
46	1440.0	-1089.89	1187863.8
47	1310.0	-1219.89	1488135.6
48	1200.0	-1329.89	1768611.8
49	1110.0	-1419.89	2016092.3
50	1290.0	-1239.89	1537331.3
	109770.0		44036674.9
	138270.0		32698451.4
	121690.0		28547058.2
	181190.0		72887752.9
	156780.0		54585362.8
	128420.0		63233416.7
	90520.0		36275603.1
	134910.0		13710723.2
	122600.0		15101955.4
	145270.0		16719568.4
	125920.0		7473674.9
	111060.0		11807647.6
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	1634310		524904492.4
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **646**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **2529.89**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **902.11**

2 Std Deviations: **1804.22**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.645**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **2588.28** DPM/100cm²

GUIDELINE VALUE: **5000** DPM/100cm²

Acceptable Level: **5000.0** DPM/100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	645	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	645	1.645	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	1060.0	-1469.89	2160581.44
52	1160.0	-1369.89	1876603.11
53	1300.0	-1229.89	1512633.45
54	740.0	-1789.89	3203712.09
55	1710.0	-819.89	672222.30
56	1420.0	-1109.89	1231859.45
57	1190.0	-1339.89	1795309.61
58	1220.0	-1309.89	1715816.11
59	1320.0	-1209.89	1463837.78
60	3300.0	770.11	593066.88
61	2360.0	-169.89	28863.17
62	4410.0	1880.11	3534807.44
63	3480.0	950.11	902705.89
64	3040.0	510.11	260210.54
65	3700.0	1170.11	1369153.57
66	2130.0	-399.89	159913.32
67	2580.0	50.11	2510.85
68	2360.0	-169.89	28863.17
69	2840.0	310.11	96167.19
70	1640.0	-889.89	791907.13
71	2010.0	-519.89	270287.32
72	1760.0	-769.89	592733.14
73	1900.0	-629.89	396763.48
74	1960.0	-569.89	324776.48
75	1800.0	-729.89	532741.81
76	2940.0	410.11	168188.87
77	1410.0	-1119.89	1254157.29
78	1340.0	-1189.89	1415842.12
79	1480.0	-1049.89	1102272.46
80	1600.0	-929.89	864698.46
81	2810.0	280.11	78460.69
82	4270.0	1740.11	3027977.10
83	2900.0	370.11	136980.20
84	2870.0	340.11	115673.70
85	4030.0	1500.11	2250325.09
86	2460.0	-69.89	4884.84
87	2960.0	430.11	184993.20
88	3290.0	760.11	577764.72
89	2210.0	-319.89	102330.66
90	3180.0	650.11	422640.88
91	1940.0	-589.89	347972.15
92	2140.0	-389.89	152015.49
93	1390.0	-1139.89	1299352.95
94	1270.0	-1259.89	1587326.95
95	1580.0	-949.89	902294.13
96	1540.0	-989.89	979885.46
97	1900.0	-629.89	396763.48
98	1720.0	-809.89	655924.47
99	1880.0	-649.89	422359.14
100	2270.0	-259.89	67543.66
	109770.0		44036674.9
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	2840.0	310.11	96167.19
102	4440.0	1910.11	3648513.94
103	4120.0	1590.11	2528444.59
104	2930.0	400.11	160086.70
105	2810.0	280.11	78460.69
106	2330.0	-199.89	39956.67
107	4200.0	1670.11	2789261.93
108	3470.0	940.11	883803.73
109	3480.0	950.11	902705.89
110	3030.0	500.11	250108.37
111	1610.0	-919.89	846200.63
112	2340.0	-189.89	36058.84
113	2700.0	170.11	28936.85
114	2570.0	40.11	1608.68
115	3290.0	760.11	577764.72
116	2590.0	60.11	3613.01
117	2080.0	-449.89	202402.49
118	3010.0	480.11	230504.04
119	5380.0	2850.11	8123117.66
120	3230.0	700.11	490151.71
121	3020.0	490.11	240206.20
122	2450.0	-79.89	6382.67
123	2100.0	-429.89	184806.82
124	2560.0	30.11	906.51
125	2380.0	-149.89	22467.50
126	3160.0	630.11	397036.54
127	2540.0	10.11	102.18
128	2770.0	240.11	57652.02
129	2950.0	420.11	176491.03
130	3350.0	820.11	672577.72
131	3080.0	550.11	302619.21
132	3950.0	1420.11	2016707.75
133	3620.0	1090.11	1188336.23
134	1410.0	-1119.89	1254157.29
135	3010.0	480.11	230504.04
136	3170.0	640.11	409738.71
137	2890.0	360.11	129678.03
138	2290.0	-239.89	57548.00
139	2170.0	-359.89	129521.99
140	1880.0	-649.89	422359.14
141	2190.0	-339.89	115526.33
142	2200.0	-329.89	108828.49
143	2010.0	-519.89	270287.32
144	1700.0	-829.89	688720.14
145	1710.0	-819.89	672222.30
146	1570.0	-959.89	921391.96
147	2460.0	-69.89	4884.84
148	2590.0	60.11	3613.01
149	2260.0	-269.89	72841.50
150	2380.0	-149.89	22467.50
	138270.0		32698451.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	1960.0	-569.89	324776.48
152	1900.0	-629.89	396763.48
153	2740.0	210.11	44145.52
154	3450.0	920.11	846599.39
155	1110.0	-1419.89	2016092.27
156	1680.0	-849.89	722315.80
157	1810.0	-719.89	518243.97
158	1580.0	-949.89	902294.13
159	1880.0	-649.89	422359.14
160	1790.0	-739.89	547439.64
161	1190.0	-1339.89	1795309.61
162	1740.0	-789.89	623928.80
163	1580.0	-949.89	902294.13
164	1960.0	-569.89	324776.48
165	2060.0	-469.89	220798.15
166	2550.0	20.11	404.35
167	2110.0	-419.89	176308.99
168	1030.0	-1499.89	2249674.93
169	2020.0	-509.89	259989.49
170	1880.0	-649.89	422359.14
171	3220.0	690.11	476249.55
172	1980.0	-549.89	302380.82
173	2160.0	-369.89	136819.83
174	2340.0	-189.89	36058.84
175	2140.0	-389.89	152015.49
176	2210.0	-319.89	102330.66
177	1050.0	-1479.89	2190079.27
178	2760.0	230.11	52949.86
179	2320.0	-209.89	44054.50
180	3450.0	920.11	846599.39
181	3210.0	680.11	462547.38
182	3350.0	820.11	672577.72
183	3570.0	1040.11	1081825.40
184	3580.0	1050.11	1102727.57
185	2980.0	450.11	202597.53
186	2560.0	30.11	906.51
187	2970.0	440.11	193695.37
188	3220.0	690.11	476249.55
189	2060.0	-469.89	220798.15
190	2120.0	-409.89	168011.16
191	2380.0	-149.89	22467.50
192	2710.0	180.11	32439.02
193	2080.0	-449.89	202402.49
194	2530.0	0.11	0.01
195	3000.0	470.11	221001.87
196	3250.0	720.11	518556.05
197	3510.0	980.11	960612.40
198	3410.0	880.11	774590.72
199	3970.0	1440.11	2073912.09
200	3580.0	1050.11	1102727.57
	121690.0		28547058.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	3470.0	940.11	883803.73
202	3530.0	1000.11	1000216.73
203	3360.0	830.11	689079.89
204	3500.0	970.11	941110.23
205	5900.0	3370.11	11357630.35
206	4040.0	1510.11	2280427.26
207	3740.0	1210.11	1464362.24
208	3300.0	770.11	593066.88
209	2990.0	460.11	211699.70
210	3670.0	1140.11	1299847.07
211	4060.0	1530.11	2341231.59
212	4270.0	1740.11	3027977.10
213	3750.0	1220.11	1488664.41
214	3640.0	1110.11	1232340.57
215	3370.0	840.11	705782.06
216	3340.0	810.11	656275.55
217	3430.0	900.11	810195.06
218	3500.0	970.11	941110.23
219	3190.0	660.11	435743.05
220	3950.0	1420.11	2016707.75
221	3700.0	1170.11	1369153.57
222	4080.0	1550.11	2402835.93
223	3250.0	720.11	518556.05
224	4010.0	1480.11	2190720.75
225	3670.0	1140.11	1299847.07
226	4020.0	1490.11	2220422.92
227	3410.0	880.11	774590.72
228	3720.0	1190.11	1416357.91
229	4550.0	2020.11	4080837.78
230	3500.0	970.11	941110.23
231	3320.0	790.11	624271.22
232	3200.0	670.11	449045.21
233	3010.0	480.11	230504.04
234	3100.0	570.11	325023.54
235	3400.0	870.11	757088.56
236	3500.0	970.11	941110.23
237	3510.0	980.11	960612.40
238	3770.0	1240.11	1537868.74
239	5030.0	2500.11	6250541.81
240	3970.0	1440.11	2073912.09
241	3540.0	1010.11	1020318.90
242	3060.0	530.11	281014.87
243	3410.0	880.11	774590.72
244	3410.0	880.11	774590.72
245	3230.0	700.11	490151.71
246	3640.0	1110.11	1232340.57
247	3160.0	630.11	397036.54
248	3680.0	1150.11	1322749.24
249	3300.0	770.11	593066.88
250	3040.0	510.11	260210.54
	181190.0		72887752.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	3510.0	980.11	960612.40
252	3140.0	610.11	372232.21
253	2420.0	-109.89	12076.17
254	4210.0	1680.11	2822764.10
255	3680.0	1150.11	1322749.24
256	4710.0	2180.11	4752872.46
257	3300.0	770.11	593066.88
258	3440.0	910.11	828297.23
259	3990.0	1460.11	2131916.42
260	3290.0	760.11	577764.72
261	3050.0	520.11	270512.71
262	3240.0	710.11	504253.88
263	3230.0	700.11	490151.71
264	2910.0	380.11	144482.36
265	4550.0	2020.11	4080837.78
266	4900.0	2370.11	5617413.63
267	3280.0	750.11	562662.55
268	3410.0	880.11	774590.72
269	3550.0	1020.11	1040621.06
270	4920.0	2390.11	5712617.97
271	4380.0	1850.11	3422900.94
272	3760.0	1230.11	1513166.58
273	2210.0	-319.89	102330.66
274	2620.0	90.11	8119.52
275	2430.0	-99.89	9978.34
276	2390.0	-139.89	19569.67
277	1630.0	-899.89	809804.97
278	2470.0	-59.89	3587.01
279	1450.0	-1079.89	1166165.96
280	2080.0	-449.89	202402.49
281	2790.0	260.11	67656.36
282	2570.0	40.11	1608.68
283	3320.0	790.11	624271.22
284	4090.0	1560.11	2433938.09
285	4280.0	1750.11	3062879.27
286	3180.0	650.11	422640.88
287	1960.0	-569.89	324776.48
288	2530.0	0.11	0.01
289	2570.0	40.11	1608.68
290	4890.0	2360.11	5570111.47
291	2510.0	-19.89	395.68
292	2450.0	-79.89	6382.67
293	3080.0	550.11	302619.21
294	2130.0	-399.89	159913.32
295	2420.0	-109.89	12076.17
296	2690.0	160.11	25634.69
297	2570.0	40.11	1608.68
298	2850.0	320.11	102469.36
299	3320.0	790.11	624271.22
300	2430.0	-99.89	9978.34
	156780.0		54585362.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	2230.0	-299.89	89935.00
302	3370.0	840.11	705782.06
303	4800.0	2270.11	5153391.96
304	1180.0	-1349.89	1822207.44
305	3080.0	550.11	302619.21
306	2920.0	390.11	152184.53
307	5160.0	2630.11	6917469.98
308	3810.0	1280.11	1638677.41
309	3900.0	1370.11	1877196.92
310	3740.0	1210.11	1464362.24
311	3680.0	1150.11	1322749.24
312	3820.0	1290.11	1664379.58
313	3150.0	620.11	384534.38
314	3680.0	1150.11	1322749.24
315	3800.0	1270.11	1613175.24
316	3670.0	1140.11	1299847.07
317	3850.0	1320.11	1742686.08
318	3720.0	1190.11	1416357.91
319	4060.0	1530.11	2341231.59
320	3890.0	1360.11	1849894.75
321	3710.0	1180.11	1392655.74
322	3690.0	1160.11	1345851.40
323	3980.0	1450.11	2102814.25
324	2090.0	-439.89	193504.66
325	1220.0	-1309.89	1715816.11
326	1820.0	-709.89	503946.14
327	2190.0	-339.89	115526.33
328	2150.0	-379.89	144317.66
329	2390.0	-139.89	19569.67
330	1970.0	-559.89	313478.65
331	2090.0	-439.89	193504.66
332	1380.0	-1149.89	1322250.79
333	1380.0	-1149.89	1322250.79
334	1330.0	-1199.89	1439739.95
335	1150.0	-1379.89	1904100.94
336	1280.0	-1249.89	1562229.11
337	1610.0	-919.89	846200.63
338	1640.0	-889.89	791907.13
339	1370.0	-1159.89	1345348.62
340	1510.0	-1019.89	1040178.96
341	2530.0	0.11	0.01
342	1720.0	-809.89	655924.47
343	1280.0	-1249.89	1562229.11
344	1860.0	-669.89	448754.81
345	2090.0	-439.89	193504.66
346	1540.0	-989.89	979885.46
347	1780.0	-749.89	562337.47
348	1010.0	-1519.89	2310070.60
349	1590.0	-939.89	883396.30
350	1560.0	-969.89	940689.80
	128420.0		63233416.7
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
351	1140.0	-1389.89	1931798.77
352	1610.0	-919.89	846200.63
353	2350.0	-179.89	32361.00
354	1760.0	-769.89	592733.14
355	420.0	-2109.89	4451642.74
356	1750.0	-779.89	608230.97
357	1790.0	-739.89	547439.64
358	2630.0	100.11	10021.68
359	1330.0	-1199.89	1439739.95
360	1950.0	-579.89	336274.32
361	1600.0	-929.89	864698.46
362	1830.0	-699.89	489848.31
363	2310.0	-219.89	48352.33
364	1940.0	-589.89	347972.15
365	2160.0	-369.89	136819.83
366	1520.0	-1009.89	1019881.13
367	1680.0	-849.89	722315.80
368	1880.0	-649.89	422359.14
369	1840.0	-689.89	475950.48
370	1490.0	-1039.89	1081374.62
371	1380.0	-1149.89	1322250.79
372	1850.0	-679.89	462252.64
373	1870.0	-659.89	435456.98
374	2280.0	-249.89	62445.83
375	2030.0	-499.89	249891.65
376	1470.0	-1059.89	1123370.29
377	1490.0	-1039.89	1081374.62
378	1240.0	-1289.89	1663820.45
379	1270.0	-1259.89	1587326.95
380	940.0	-1589.89	2527755.43
381	1210.0	-1319.89	1742113.94
382	940.0	-1589.89	2527755.43
383	1980.0	-549.89	302380.82
384	1530.0	-999.89	999783.29
385	2100.0	-429.89	184806.82
386	1700.0	-829.89	688720.14
387	1680.0	-849.89	722315.80
388	1910.0	-619.89	384265.65
389	2370.0	-159.89	25565.34
390	2160.0	-369.89	136819.83
391	2530.0	0.11	0.01
392	2310.0	-219.89	48352.33
393	2410.0	-119.89	14374.01
394	2390.0	-139.89	19569.67
395	2350.0	-179.89	32361.00
396	2210.0	-319.89	102330.66
397	2030.0	-499.89	249891.65
398	2300.0	-229.89	52850.17
399	1990.0	-539.89	291482.98
400	1620.0	-909.89	827902.80
	90520.0		36275603.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	1800.0	-729.89	532741.81
402	2190.0	-339.89	115526.33
403	1860.0	-669.89	448754.81
404	2320.0	-209.89	44054.50
405	2540.0	10.11	102.18
406	2690.0	160.11	25634.69
407	2360.0	-169.89	28863.17
408	3350.0	820.11	672577.72
409	2900.0	370.11	136980.20
410	2250.0	-279.89	78339.33
411	2020.0	-509.89	259989.49
412	1620.0	-909.89	827902.80
413	2080.0	-449.89	202402.49
414	2120.0	-409.89	168011.16
415	2320.0	-209.89	44054.50
416	2660.0	130.11	16928.19
417	3250.0	720.11	518556.05
418	2340.0	-189.89	36058.84
419	3000.0	470.11	221001.87
420	3450.0	920.11	846599.39
421	2680.0	150.11	22532.52
422	2760.0	230.11	52949.86
423	2360.0	-169.89	28863.17
424	2510.0	-19.89	395.68
425	3200.0	670.11	449045.21
426	3300.0	770.11	593066.88
427	3260.0	730.11	533058.22
428	2330.0	-199.89	39956.67
429	2460.0	-69.89	4884.84
430	2300.0	-229.89	52850.17
431	2750.0	220.11	48447.69
432	2050.0	-479.89	230295.99
433	2750.0	220.11	48447.69
434	2860.0	330.11	108971.53
435	2930.0	400.11	160086.70
436	3850.0	1320.11	1742686.08
437	3080.0	550.11	302619.21
438	2880.0	350.11	122575.86
439	2920.0	390.11	152184.53
440	2620.0	90.11	8119.52
441	2240.0	-289.89	84037.16
442	3240.0	710.11	504253.88
443	3620.0	1090.11	1188336.23
444	3600.0	1070.11	1145131.90
445	2790.0	260.11	67656.36
446	2740.0	210.11	44145.52
447	3210.0	680.11	462547.38
448	2920.0	390.11	152184.53
449	2790.0	260.11	67656.36
450	2790.0	260.11	67656.36
	134910.0		13710723.2
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
451	1690.0	-839.89	705417.97
452	2150.0	-379.89	144317.66
453	1870.0	-659.89	435456.98
454	1970.0	-559.89	313478.65
455	1990.0	-539.89	291482.98
456	900.0	-1629.89	2656546.76
457	2350.0	-179.89	32361.00
458	2710.0	180.11	32439.02
459	2250.0	-279.89	78339.33
460	3830.0	1300.11	1690281.75
461	2340.0	-189.89	36058.84
462	2940.0	410.11	168188.87
463	3180.0	650.11	422640.88
464	2440.0	-89.89	8080.51
465	2700.0	170.11	28936.85
466	2660.0	130.11	16928.19
467	1770.0	-759.89	577435.31
468	2090.0	-439.89	193504.66
469	2080.0	-449.89	202402.49
470	1340.0	-1189.89	1415842.12
471	1760.0	-769.89	592733.14
472	2120.0	-409.89	168011.16
473	2010.0	-519.89	270287.32
474	2290.0	-239.89	57548.00
475	2630.0	100.11	10021.68
476	2880.0	350.11	122575.86
477	3130.0	600.11	360130.04
478	2430.0	-99.89	9978.34
479	2910.0	380.11	144482.36
480	3240.0	710.11	504253.88
481	3200.0	670.11	449045.21
482	2620.0	90.11	8119.52
483	2330.0	-199.89	39956.67
484	2630.0	100.11	10021.68
485	1990.0	-539.89	291482.98
486	2420.0	-109.89	12076.17
487	2040.0	-489.89	239993.82
488	2470.0	-59.89	3587.01
489	2460.0	-69.89	4884.84
490	2190.0	-339.89	115526.33
491	2280.0	-249.89	62445.83
492	2270.0	-259.89	67543.66
493	2850.0	320.11	102469.36
494	3460.0	930.11	865101.56
495	2420.0	-109.89	12076.17
496	2640.0	110.11	12123.85
497	2620.0	90.11	8119.52
498	3150.0	620.11	384534.38
499	3380.0	850.11	722684.22
500	2530.0	0.11	0.01
	122600.0		15101955.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
501	2540.0	10.11	102.18
502	2780.0	250.11	62554.19
503	2470.0	-59.89	3587.01
504	2630.0	100.11	10021.68
505	2830.0	300.11	90065.03
506	3360.0	830.11	689079.89
507	3140.0	610.11	372232.21
508	3380.0	850.11	722684.22
509	3600.0	1070.11	1145131.90
510	3520.0	990.11	980314.56
511	2940.0	410.11	168188.87
512	1970.0	-559.89	313478.65
513	2540.0	10.11	102.18
514	2610.0	80.11	6417.35
515	2810.0	280.11	78460.69
516	2950.0	420.11	176491.03
517	2310.0	-219.89	48352.33
518	2780.0	250.11	62554.19
519	3460.0	930.11	865101.56
520	2320.0	-209.89	44054.50
521	2600.0	70.11	4915.18
522	2740.0	210.11	44145.52
523	2990.0	460.11	211699.70
524	3440.0	910.11	828297.23
525	3650.0	1120.11	1254642.74
526	3350.0	820.11	672577.72
527	4000.0	1470.11	2161218.59
528	2950.0	420.11	176491.03
529	2600.0	70.11	4915.18
530	2810.0	280.11	78460.69
531	2820.0	290.11	84162.86
532	2930.0	400.11	160086.70
533	2840.0	310.11	96167.19
534	2190.0	-339.89	115526.33
535	3180.0	650.11	422640.88
536	2670.0	140.11	19630.35
537	2610.0	80.11	6417.35
538	2680.0	150.11	22532.52
539	2670.0	140.11	19630.35
540	2660.0	130.11	16928.19
541	2390.0	-139.89	19569.67
542	2550.0	20.11	404.35
543	2500.0	-29.89	893.51
544	3670.0	1140.11	1299847.07
545	3970.0	1440.11	2073912.09
546	3190.0	660.11	435743.05
547	2810.0	280.11	78460.69
548	3010.0	480.11	230504.04
549	2830.0	300.11	90065.03
550	3030.0	500.11	250108.37
	145270.0		16719568.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

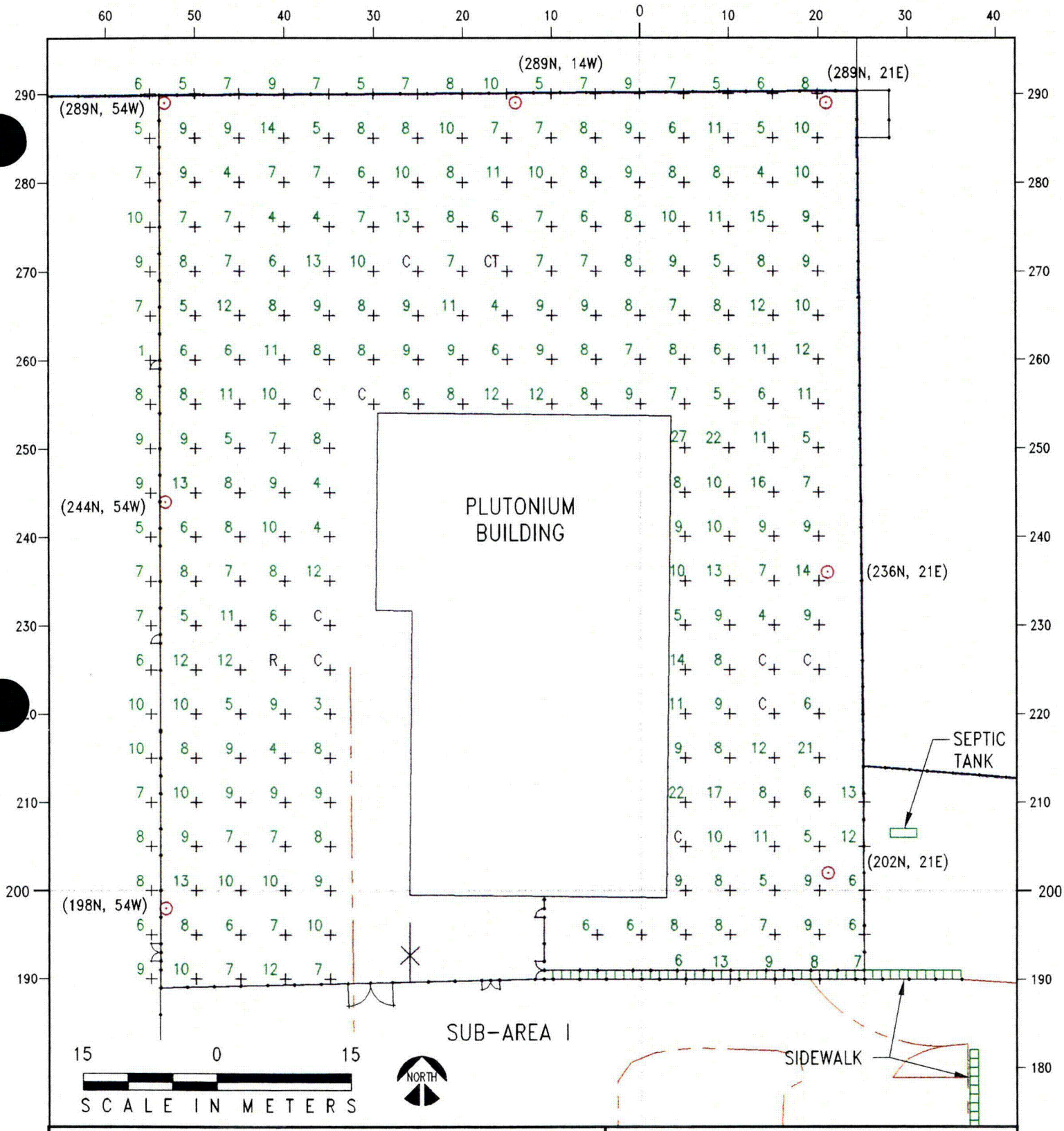
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" TIO2 ROOF SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
551	3330.0	800.11	640173.39
552	3640.0	1110.11	1232340.57
553	2620.0	90.11	8119.52
554	2330.0	-199.89	39956.67
555	2550.0	20.11	404.35
556	2560.0	30.11	906.51
557	2410.0	-119.89	14374.01
558	2480.0	-49.89	2489.18
559	2270.0	-259.89	67543.66
560	2970.0	440.11	193695.37
561	3080.0	550.11	302619.21
562	2140.0	-389.89	152015.49
563	2080.0	-449.89	202402.49
564	1790.0	-739.89	547439.64
565	2680.0	150.11	22532.52
566	2010.0	-519.89	270287.32
567	2030.0	-499.89	249891.65
568	2240.0	-289.89	84037.16
569	2310.0	-219.89	48352.33
570	2340.0	-189.89	36058.84
571	2560.0	30.11	906.51
572	3390.0	860.11	739786.39
573	2670.0	140.11	19630.35
574	2560.0	30.11	906.51
575	2190.0	-339.89	115526.33
576	2490.0	-39.89	1591.34
577	2560.0	30.11	906.51
578	3380.0	850.11	722684.22
579	3030.0	500.11	250108.37
580	2000.0	-529.89	280785.15
581	2020.0	-509.89	259989.49
582	2340.0	-189.89	36058.84
583	2390.0	-139.89	19569.67
584	2110.0	-419.89	176308.99
585	2260.0	-269.89	72841.50
586	2870.0	340.11	115673.70
587	2320.0	-209.89	44054.50
588	2600.0	70.11	4915.18
589	2750.0	220.11	48447.69
590	2270.0	-259.89	67543.66
591	2360.0	-169.89	28863.17
592	2640.0	110.11	12123.85
593	2300.0	-229.89	52850.17
594	2800.0	270.11	72958.53
595	2720.0	190.11	36141.19
596	2410.0	-119.89	14374.01
597	2490.0	-39.89	1591.34
598	2710.0	180.11	32439.02
599	2200.0	-329.89	108828.49
600	2670.0	140.11	19630.35
	125920.0		7473674.9
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
601	2450.0	-79.89	6382.67
602	2030.0	-499.89	249891.65
603	2440.0	-89.89	8080.51
604	2480.0	-49.89	2489.18
605	2460.0	-69.89	4884.84
606	2490.0	-39.89	1591.34
607	2770.0	240.11	57652.02
608	2930.0	400.11	160086.70
609	3220.0	690.11	476249.55
610	2650.0	120.11	14426.02
611	2410.0	-119.89	14374.01
612	2940.0	410.11	168188.87
613	2080.0	-449.89	202402.49
614	3100.0	570.11	325023.54
615	2670.0	140.11	19630.35
616	2600.0	70.11	4915.18
617	2910.0	380.11	144482.36
618	2330.0	-199.89	39956.67
619	2340.0	-189.89	36058.84
620	2810.0	280.11	78460.69
621	2510.0	-19.89	395.68
622	2940.0	410.11	168188.87
623	2600.0	70.11	4915.18
624	3410.0	880.11	774590.72
625	2650.0	120.11	14426.02
626	3280.0	750.11	562662.55
627	2590.0	60.11	3613.01
628	2660.0	130.11	16928.19
629	2350.0	-179.89	32361.00
630	1610.0	-919.89	846200.63
631	1780.0	-749.89	562337.47
632	1530.0	-999.89	999783.29
633	2100.0	-429.89	184806.82
634	1360.0	-1169.89	1368646.45
635	1600.0	-929.89	864698.46
636	1880.0	-649.89	422359.14
637	1880.0	-649.89	422359.14
638	2920.0	390.11	152184.53
639	3120.0	590.11	348227.88
640	2150.0	-379.89	144317.66
641	1790.0	-739.89	547439.64
642	2020.0	-509.89	259989.49
643	2260.0	-269.89	72841.50
644	1710.0	-819.89	672222.30
645	2030.0	-499.89	249891.65
646	2220.0	-309.89	96032.83
647	0.0	0.00	0.00
648	0.0	0.00	0.00
649	0.0	0.00	0.00
650	0.0	0.00	0.00
	111060.0		11807647.6
	Sum(n)		Sum(n-N)²



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6+ URANIUM, 1 - 30 pCi/g U

45+ URANIUM, > 30 pCi/g U

C+ CONCRETE- NO SAMPLE

CT+ COOLING TOWER

○ LIGHT POLE PLUTONIUM YARD

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
AFFECTED AREA - PU PLANT YARD
SOIL SAMPLE RESULTS - SURFACE

DRWN. BY	DATE	SCALE:
JE	4-19-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUSS-0	0

...\SUBAREAI\PU-YARD-SURFACE\99POSIPUSS

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
1	55	W	-	190	N	6492	6	6	9	1
2	55	W	-	195	N	6058	7	6	6	1
3	55	W	-	200	N	6830	7	6	8	1
4	55	W	-	205	N	7566	7	7	8	2
5	55	W	-	210	N	7242	7	7	7	2
6	55	W	-	215	N	7190	6	6	10	1
7	55	W	-	220	N	7376	7	7	10	1
8	55	W	-	225	N	8064	7	7	6	2
9	55	W	-	230	N	7368	7	7	7	1
10	55	W	-	235	N	7786	8	7	7	1
11	55	W	-	240	N	7428	9	8	5	2
12	55	W	-	245	N	6994	7	6	9	1
13	55	W	-	250	N	6312	8	7	9	1
14	55	W	-	255	N	6378	7	7	8	2
15	55	W	-	260	N	6116	7	7	11	1
16	55	W	-	265	N	6170	8	7	7	1
17	55	W	-	270	N	5812	7	7	9	1
18	55	W	-	275	N	5906	7	7	10	1
19	55	W	-	280	N	6336	7	7	7	1
20	55	W	-	285	N	6130	7	7	5	1
21	55	W	-	290	N	5738	7	6	6	1
22	50	W	-	190	N	5492	6	6	10	1
23	50	W	-	195	N	6368	7	7	8	1
24	50	W	-	200	N	7082	7	7	13	1
25	50	W	-	205	N	7566	8	8	9	2
26	50	W	-	210	N	7978	9	8	10	2
27	50	W	-	215	N	7516	8	8	8	2
28	50	W	-	220	N	7224	8	7	10	1
29	50	W	-	225	N	7828	8	8	12	1
30	50	W	-	230	N	7718	9	8	5	2

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. a. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
31	50	W	-	235	N	7800	8	7	8	2
32	50	W	-	240	N	6820	7	7	6	2
33	50	W	-	245	N	7480	8	8	13	1
34	50	W	-	250	N	6826	7	7	9	1
35	50	W	-	255	N	7312	8	7	8	1
36	50	W	-	260	N	7680	8	7	6	2
37	50	W	-	265	N	8250	9	8	5	1
38	50	W	-	270	N	5856	7	7	8	1
39	50	W	-	275	N	6168	7	7	7	1
40	50	W	-	280	N	6194	7	7	9	1
41	50	W	-	285	N	5764	7	7	9	1
42	50	W	-	290	N	5860	7	6	5	1
43	45	W	-	190	N	5276	7	7	7	1
44	45	W	-	195	N	7178	8	7	6	1
45	45	W	-	200	N	7636	8	6	10	1
46	45	W	-	205	N	5734	6	6	7	1
47	45	W	-	210	N	6160	6	7	9	2
48	45	W	-	215	N	7082	8	7	9	2
49	45	W	-	220	N	7824	7	6	5	1
50	45	W	-	225	N	7080	7	7	12	2
51	45	W	-	230	N	5964	7	7	11	1
52	45	W	-	235	N	6206	7	6	7	1
53	45	W	-	240	N	6126	7	7	8	1
54	45	W	-	245	N	7976	7	6	8	1
55	45	W	-	250	N	8958	8	8	5	1
56	45	W	-	255	N	8696	8	7	11	2
57	45	W	-	260	N	7480	7	8	6	1
58	45	W	-	265	N	7038	7	6	12	1
59	45	W	-	270	N	5976	6	6	7	2
60	45	W	-	275	N	7656	8	6	7	2

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
61	45	W	-	280	N	7286	7	7	4	1
62	45	W	-	285	N	6208	7	7	9	1
63	45	W	-	290	N	6112	7	7	7	2
64	40	W	-	190	N	7296	8	7	12	1
65	40	W	-	195	N	7114	7	7	7	2
66	40	W	-	200	N	5628	6	6	10	2
67	40	W	-	205	N	5264	7	6	7	1
68	40	W	-	210	N	6320	8	7	9	1
69	40	W	-	215	N	5436	6	6	4	2
70	40	W	-	220	N	5376	7	6	9	1
71	40	W	-	225	N	4758	6	6	ROCK	ROCK
72	40	W	-	230	N	5674	6	6	6	1
73	40	W	-	235	N	5570	7	6	8	1
74	40	W	-	240	N	5402	6	6	10	1
75	40	W	-	245	N	5544	7	6	9	1
76	40	W	-	250	N	6006	7	6	7	1
77	40	W	-	255	N	5980	7	7	10	1
78	40	W	-	260	N	5662	7	7	11	1
79	40	W	-	265	N	6026	7	7	8	2
80	40	W	-	270	N	5320	7	7	6	2
81	40	W	-	275	N	6700	7	7	4	2
82	40	W	-	280	N	7192	8	7	7	2
83	40	W	-	285	N	6656	7	7	14	1
84	40	W	-	290	N	7318	8	7	9	1
85	35	W	-	190	N	6558	8	7	7	1
86	35	W	-	195	N	6542	7	7	10	1
87	35	W	-	200	N	6462	7	6	9	2
88	35	W	-	205	N	6602	7	7	8	2
89	35	W	-	210	N	6502	7	7	9	2
90	35	W	-	215	N	6120	7	6	8	2

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
91	35	W	-	220	N	6038	7	7	3	2
92	35	W	-	225	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
93	35	W	-	230	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
94	35	W	-	235	N	6096	7	7	12	1
95	35	W	-	240	N	5970	6	6	4	1
96	35	W	-	245	N	6180	7	7	4	1
97	35	W	-	250	N	6026	7	7	8	1
98	35	W	-	255	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
99	35	W	-	260	N	6764	7	7	8	2
100	35	W	-	265	N	6542	7	6	9	1
101	35	W	-	270	N	5900	7	6	13	3
102	35	W	-	275	N	6338	7	7	4	1
103	35	W	-	280	N	6466	7	7	7	1
104	35	W	-	285	N	7034	8	7	5	1
105	35	W	-	290	N	7498	7	7	7	1
106	30	W	-	255	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
107	30	W	-	260	N	6272	8	8	8	1
108	30	W	-	265	N	6072	8	7	8	1
109	30	W	-	270	N	5828	7	7	10	2
110	30	W	-	275	N	7024	7	7	7	1
111	30	W	-	280	N	7090	7	7	6	2
112	30	W	-	285	N	7110	8	7	8	1
113	30	W	-	290	N	7336	8	7	5	1
114	25	W	-	255	N	6488	7	7	6	1
115	25	W	-	260	N	7584	7	8	9	1
116	25	W	-	265	N	5936	7	7	9	2
117	25	W	-	270	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
118	25	W	-	275	N	7124	7	7	13	1
119	25	W	-	280	N	7888	8	7	10	2
120	25	W	-	285	N	7276	7	7	8	2

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
121	25	W	-	290	N	7160	7	7	7	2
122	20	W	-	255	N	5112	6	5	8	1
123	20	W	-	260	N	7126	8	7	9	2
124	20	W	-	265	N	6142	7	6	11	2
125	20	W	-	270	N	4418	5	4	7	1
126	20	W	-	275	N	5226	6	6	8	1
127	20	W	-	280	N	6010	7	7	8	1
128	20	W	-	285	N	7178	8	7	10	1
129	20	W	-	290	N	6332	7	7	8	2
130	15	W	-	255	N	7436	8	8	12	1
131	15	W	-	260	N	7176	8	7	6	1
132	15	W	-	265	N	6604	7	7	4	2
133	15	W	-	270	N	COOLING TOWER	COOLING TOWER	COOLING TOWER	COOLING TOWER	COOLING TOWER
134	15	W	-	275	N	6008	6	6	6	1
135	15	W	-	280	N	6844	8	7	11	1
136	15	W	-	285	N	7184	7	7	7	1
137	15	W	-	290	N	8050	8	8	10	1
138	10	W	-	255	N	8378	8	8	12	1
139	10	W	-	260	N	8494	9	8	9	1
140	10	W	-	265	N	7398	8	7	9	1
141	10	W	-	270	N	7346	8	7	7	2
142	10	W	-	275	N	7004	7	7	7	1
143	10	W	-	280	N	7414	8	7	10	1
144	10	W	-	285	N	7586	8	7	7	1
145	10	W	-	290	N	8178	9	7	5	1
146	5	W	-	195	N	8912	9	8	6	1
147	5	W	-	255	N	6936	7	7	8	1
148	5	W	-	260	N	7464	8	7	8	1
149	5	W	-	265	N	7706	8	8	9	1
150	5	W	-	270	N	7418	8	7	7	1

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
151	5	W	-	275	N	7306	7	7	6	1
152	5	W	-	280	N	7642	8	8	8	1
153	5	W	-	285	N	7822	9	8	8	2
154	5	W	-	290	N	7884	8	7	7	1
155	0	E	-	195	N	8762	9	9	6	1
156	0	E	-	255	N	7600	8	7	9	1
157	0	E	-	260	N	8160	8	8	7	1
158	0	E	-	265	N	7390	8	7	8	1
159	0	E	-	270	N	8106	8	7	8	1
160	0	E	-	275	N	7878	8	8	8	1
161	0	E	-	280	N	7882	8	8	9	1
162	0	E	-	285	N	8560	8	8	9	2
163	0	E	-	290	N	7704	7	7	9	2
164	5	E	-	190	N	6074	7	7	6	1
165	5	E	-	195	N	8796	9	8	8	1
166	5	E	-	200	N	8840	9	8	9	1
167	5	E	-	205	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
168	5	E	-	210	N	9628	10	9	22	1
169	5	E	-	215	N	9088	9	8	9	1
170	5	E	-	220	N	8516	9	8	11	1
171	5	E	-	225	N	8710	9	8	14	1
172	5	E	-	230	N	9642	10	8	5	1
173	5	E	-	235	N	8734	9	9	10	1
174	5	E	-	240	N	8730	9	8	9	1
175	5	E	-	245	N	9058	10	8	8	1
176	5	E	-	250	N	10470	10	9	27	1
177	5	E	-	255	N	8390	8	8	7	1
178	5	E	-	260	N	8008	8	8	8	2
179	5	E	-	265	N	8304	8	7	7	1
180	5	E	-	270	N	7934	9	8	9	1

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. a. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
181	5	E	-	275	N	8546	8	8	10	1
182	5	E	-	280	N	7712	8	8	8	1
183	5	E	-	285	N	7858	7	7	6	2
184	5	E	-	290	N	6592	8	7	7	2
185	10	E	-	190	N	6766	7	6	13	1
186	10	E	-	195	N	8636	8	7	8	1
187	10	E	-	200	N	8782	9	9	8	2
188	10	E	-	205	N	9142	10	8	10	1
189	10	E	-	210	N	9042	9	8	17	2
190	10	E	-	215	N	9234	10	9	8	2
191	10	E	-	220	N	8970	9	9	9	2
192	10	E	-	225	N	8980	9	8	8	1
193	10	E	-	230	N	9374	9	9	9	2
194	10	E	-	235	N	9132	9	8	13	1
195	10	E	-	240	N	9080	8	8	10	1
196	10	E	-	245	N	8792	8	8	10	1
197	10	E	-	250	N	9434	10	9	22	1
198	10	E	-	255	N	8330	9	8	5	2
199	10	E	-	260	N	8482	9	8	6	2
200	10	E	-	265	N	8158	9	7	8	2
201	10	E	-	270	N	7846	8	8	5	2
202	10	E	-	275	N	8428	8	9	11	2
203	10	E	-	280	N	8120	8	8	8	1
204	10	E	-	285	N	8544	8	8	11	1
205	10	E	-	290	N	6306	7	7	5	2
206	15	E	-	190	N	6334	7	7	9	1
207	15	E	-	195	N	8828	8	7	7	2
208	15	E	-	200	N	8972	9	8	5	1
209	15	E	-	205	N	8270	8	9	11	1
210	15	E	-	210	N	8284	9	8	8	2

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
211	15	E	-	215	N	8668	9	8	12	1
212	15	E	-	220	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
213	15	E	-	225	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
214	15	E	-	230	N	5336	7	6	4	2
215	15	E	-	235	N	8498	9	8	7	2
216	15	E	-	240	N	8892	10	9	9	1
217	15	E	-	245	N	8810	10	9	16	1
218	15	E	-	250	N	8894	9	9	11	2
219	15	E	-	255	N	8622	10	9	6	2
220	15	E	-	260	N	8678	9	8	11	2
221	15	E	-	265	N	8122	8	8	12	1
222	15	E	-	270	N	8540	9	8	8	1
223	15	E	-	275	N	8490	8	8	15	2
224	15	E	-	280	N	8034	9	8	4	1
225	15	E	-	285	N	7514	8	7	5	1
226	15	E	-	290	N	5936	7	7	6	1
227	20	E	-	190	N	5070	7	6	8	1
228	20	E	-	195	N	8030	8	8	9	2
229	20	E	-	200	N	8410	9	7	9	2
230	20	E	-	205	N	8074	8	9	5	2
231	20	E	-	210	N	7930	10	9	6	2
232	20	E	-	215	N	8658	9	8	21	2
233	20	E	-	220	N	6222	7	7	6	1
234	20	E	-	225	N	CONCRETE	CONCRETE	CONCRETE	CONCRETE	CONCRETE
235	20	E	-	230	N	6866	7	7	9	1
236	20	E	-	235	N	7812	8	8	14	2
237	20	E	-	240	N	8356	9	8	9	1
238	20	E	-	245	N	8514	9	8	7	2
239	20	E	-	250	N	8020	8	8	5	2
240	20	E	-	255	N	8222	8	8	11	2

CIMARRON FACILITY

SUB AREA "I" PHASE II
PLUTONIUM PLANT YARD

AFFECTED SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6850	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

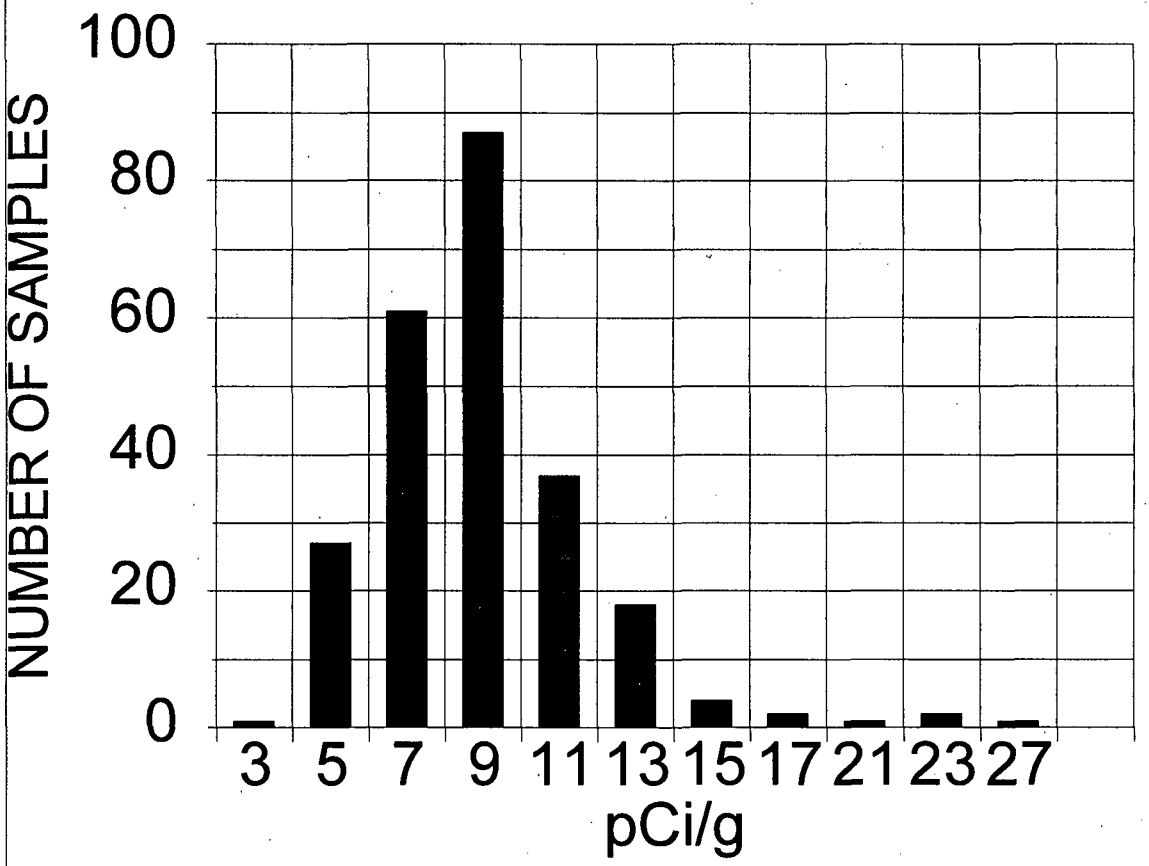
LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
241	20	E	-	260	N	8240	8	7	12	1
242	20	E	-	265	N	8274	8	8	10	2
243	20	E	-	270	N	8342	9	8	9	2
244	20	E	-	275	N	8236	8	8	9	1
245	20	E	-	280	N	7722	8	8	10	1
246	20	E	-	285	N	6434	7	7	10	1
247	20	E	-	290	N	5544	6	6	8	1
248	25	E	-	190	N	5022	7	7	7	1
249	25	E	-	195	N	6066	7	7	6	1
250	25	E	-	200	N	5960	7	7	6	1
251	25	E	-	205	N	6430	7	7	12	1
252	25	E	-	210	N	6042	7	7	13	1

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
CIMARRON SOIL COUNTER SURFACE
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

URANIUM SAMPLE DATA

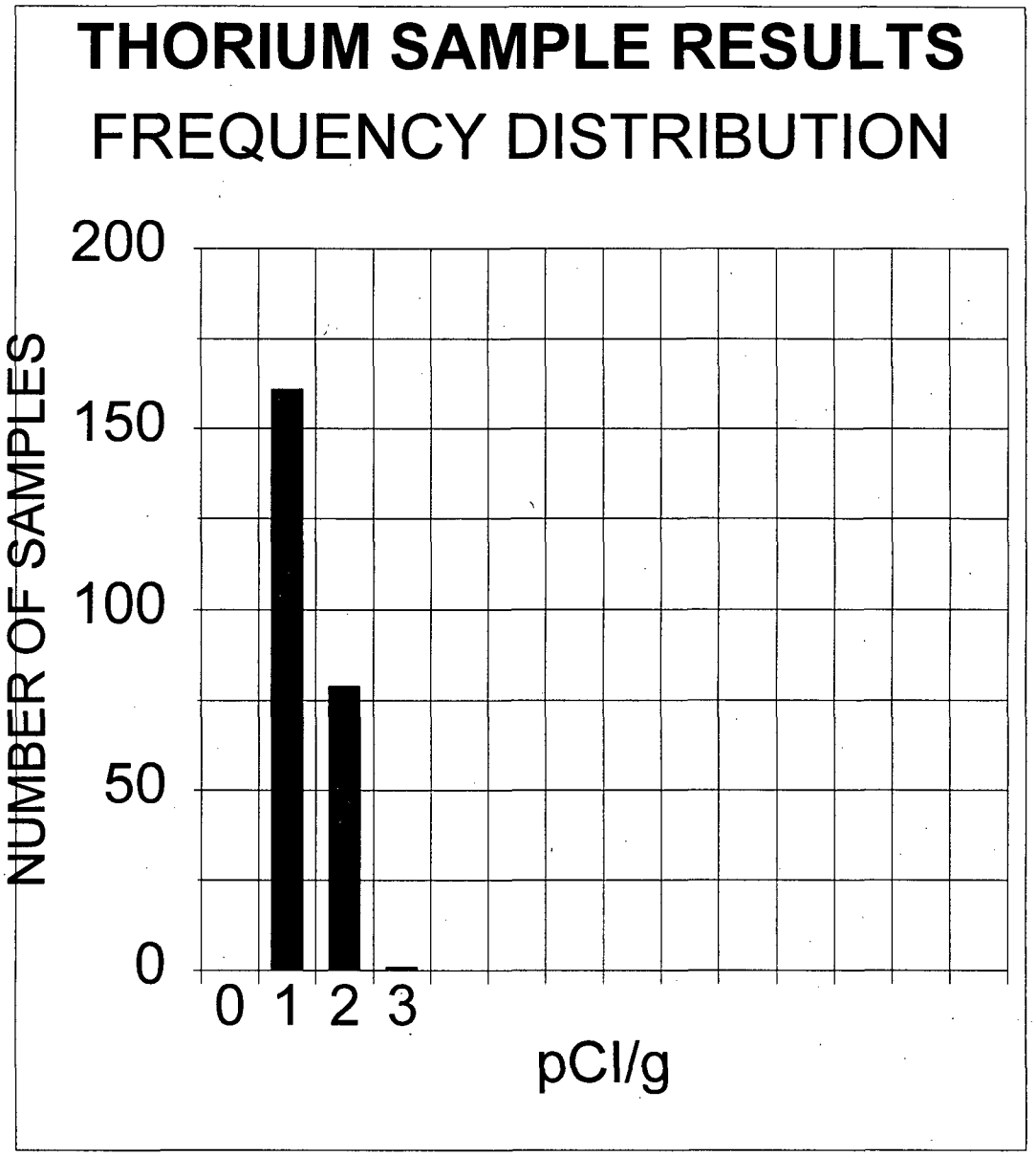
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	241
AVERAGE SAMPLE	8.5
MINIMUM SAMPLE	3.0
MAXIMUM SAMPLE	27.0
STANDARD DEVIATION	3.0

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
CIMARRON SOIL COUNTER SURFACE
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED

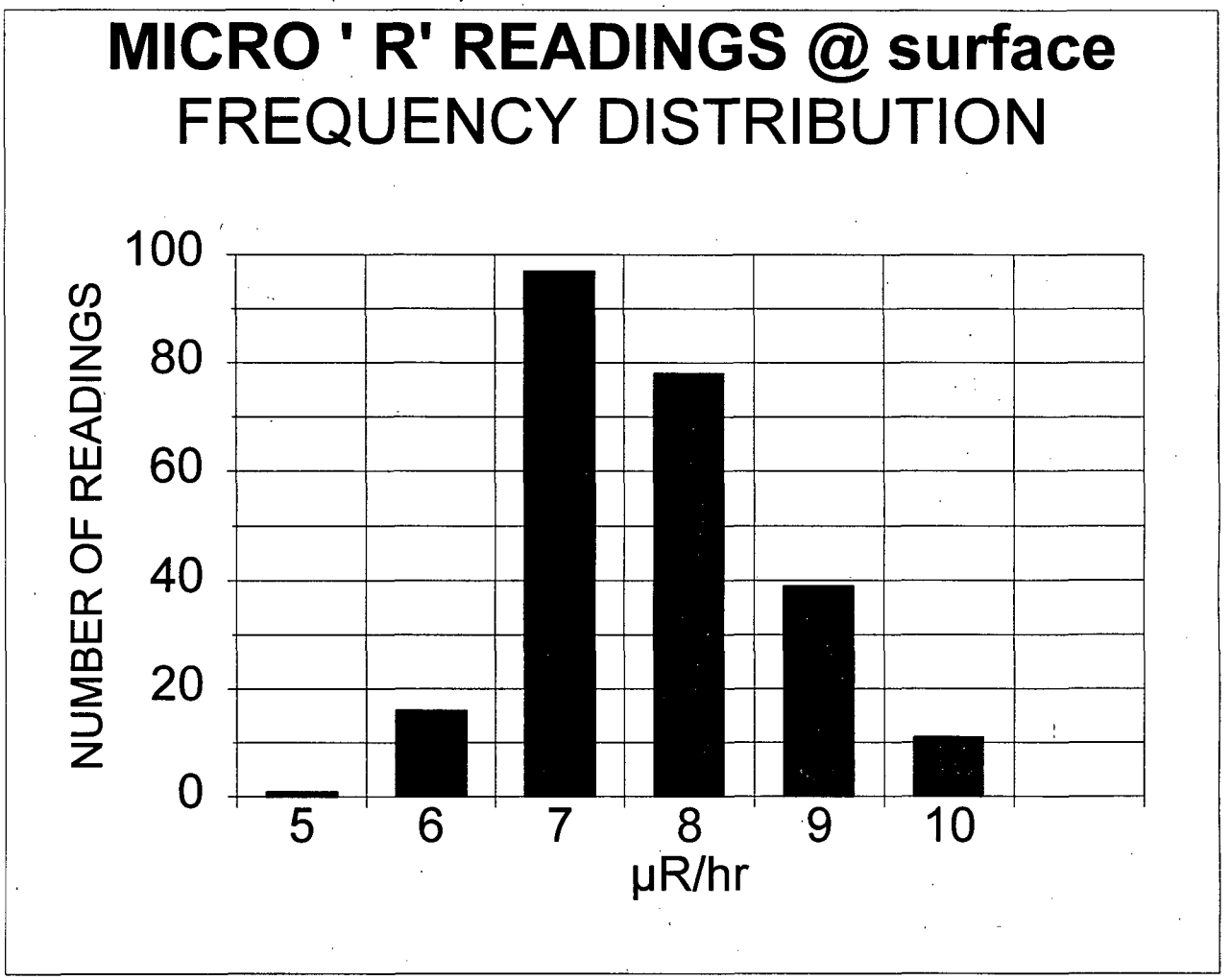
MARCH, 1999



NUMBER OF SAMPLES	241
AVERAGE SAMPLE	1.3
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	3.0
STANDARD DEVIATION	0.5

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
MICRO-R METER READINGS AT SURFACE - AFFECTED - SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 111299
RESULTS IN µR/hr

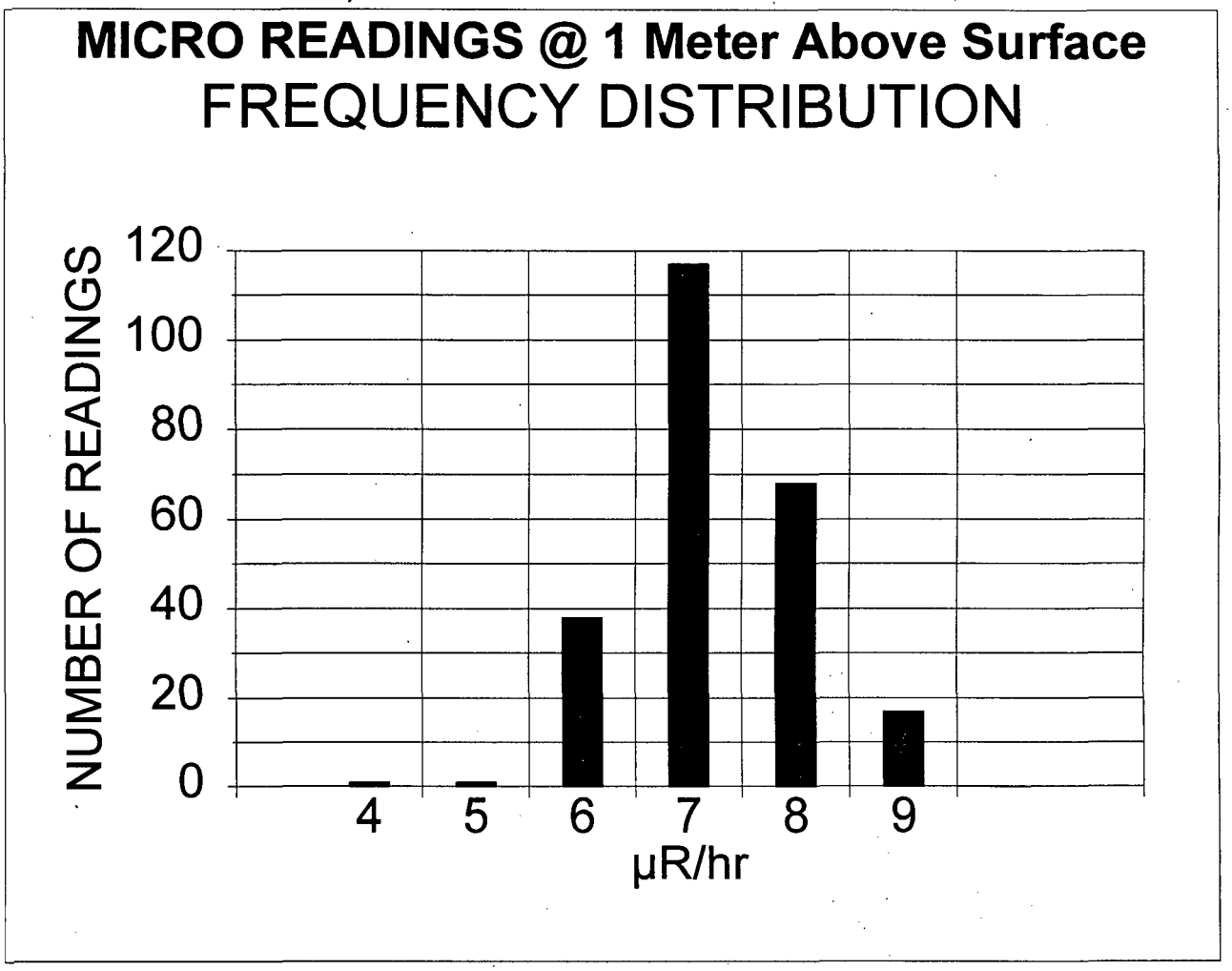
MARCH, 1999



NUMBER OF READINGS	242
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	10
STANDARD DEVIATION	1.0

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 111299 - AFFECTED
RESULTS IN µR/hr

MARCH, 1999



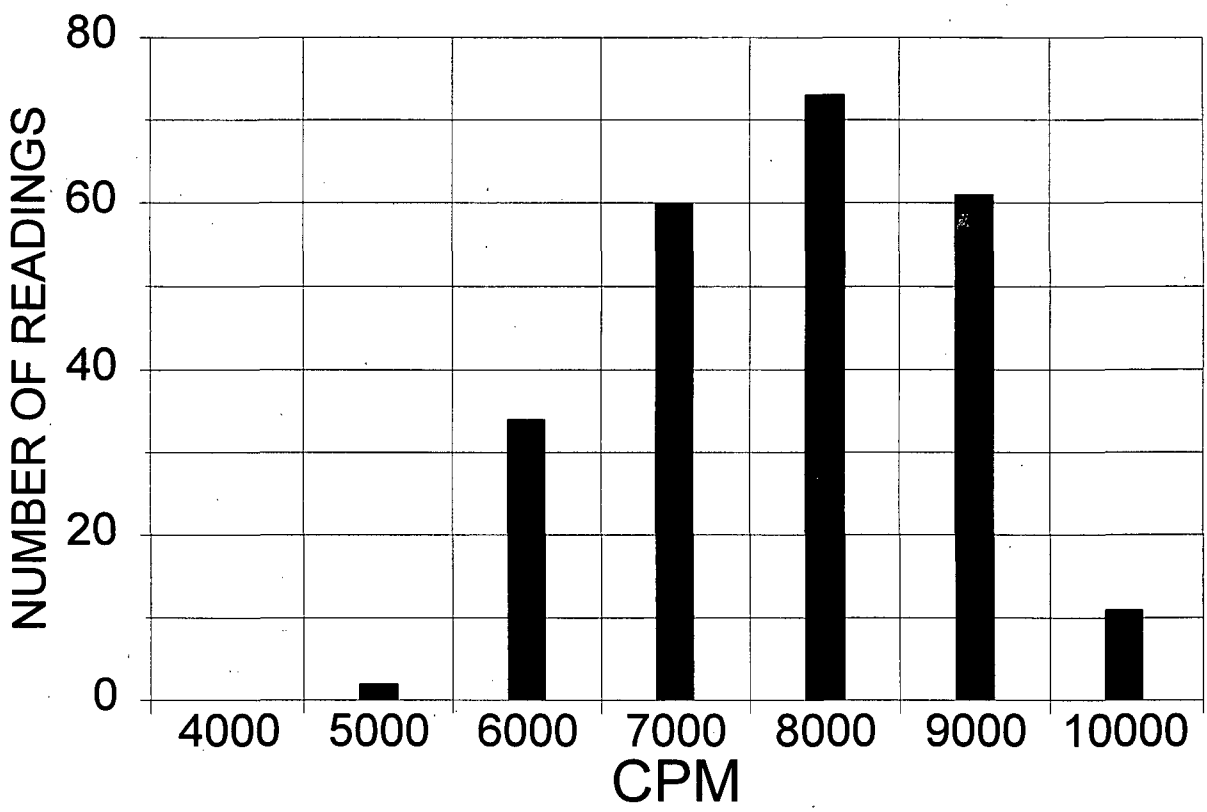
NUMBER OF READINGS	242
AVERAGE READING	7
MINIMUM READING	4
MAXIMUM READING	9
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
3" NaI DETECTOR AFFECTED - SURFACE
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 97264 (UNSHIELDED)
BACKGROUND AVERAGE: 6850 CPM

MARCH, 1999

3" NaI DETECTOR READINGS

FREQUENCY DISTRIBUTION



NUMBER OF READINGS	242
AVERAGE READING	7260
MINIMUM READING	4418
MAXIMUM READING	10470
STANDARD DEVIATION	1153

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	9.0	0.5	0.2
2	6.0	-2.5	6.4
3	8.0	-0.5	0.3
4	8.0	-0.5	0.3
5	7.0	-1.5	2.4
6	10.0	1.5	2.1
7	10.0	1.5	2.1
8	6.0	-2.5	6.4
9	7.0	-1.5	2.4
10	7.0	-1.5	2.4
11	5.0	-3.5	12.5
12	9.0	0.5	0.2
13	9.0	0.5	0.2
14	8.0	-0.5	0.3
15	11.0	2.5	6.1
16	7.0	-1.5	2.4
17	9.0	0.5	0.2
18	10.0	1.5	2.1
19	7.0	-1.5	2.4
20	5.0	-3.5	12.5
21	6.0	-2.5	6.4
22	10.0	1.5	2.1
23	8.0	-0.5	0.3
24	13.0	4.5	19.9
25	9.0	0.5	0.2
26	10.0	1.5	2.1
27	8.0	-0.5	0.3
28	10.0	1.5	2.1
29	12.0	3.5	12.0
30	5.0	-3.5	12.5
31	8.0	-0.5	0.3
32	6.0	-2.5	6.4
33	13.0	4.5	19.9
34	9.0	0.5	0.2
35	8.0	-0.5	0.3
36	6.0	-2.5	6.4
37	5.0	-3.5	12.5
38	8.0	-0.5	0.3
39	7.0	-1.5	2.4
40	9.0	0.5	0.2
41	9.0	0.5	0.2
42	5.0	-3.5	12.5
43	7.0	-1.5	2.4
44	6.0	-2.5	6.4
45	10.0	1.5	2.1
46	7.0	-1.5	2.4
47	9.0	0.5	0.2
48	9.0	0.5	0.2
49	5.0	-3.5	12.5
50	12.0	3.5	12.0
	397.0		338.5
	401.0		188.3
	476.0		971.0
	376.0		508.4
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	2057		2228.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **241**

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **8.54**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **3.05**

2 Std Deviations: **6.09**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.654**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **8.86** pCi/gU TOTAL U

GUIDELINE VALUE: **30** pCi/gU TOTAL U

Acceptable Level: **34.0** pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	240	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	240	1.654	95%

PERFORMED BY: Marty Hoth DATE: 4-7-99

REVIEWED BY: W. A. Rogers DATE: 4-7-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
51	11.0	2.51	6.28
52	7.0	-1.49	2.23
53	8.0	-0.49	0.24
54	8.0	-0.49	0.24
55	5.0	-3.49	12.21
56	11.0	2.51	6.28
57	6.0	-2.49	6.22
58	12.0	3.51	12.29
59	7.0	-1.49	2.23
60	7.0	-1.49	2.23
61	4.0	-4.49	20.19
62	9.0	0.51	0.26
63	7.0	-1.49	2.23
64	12.0	3.51	12.29
65	7.0	-1.49	2.23
66	10.0	1.51	2.27
67	7.0	-1.49	2.23
68	9.0	0.51	0.26
69	4.0	-4.49	20.19
70	9.0	0.51	0.26
71	6.0	-2.49	6.22
72	8.0	-0.49	0.24
73	10.0	1.51	2.27
74	9.0	0.51	0.26
75	7.0	-1.49	2.23
76	10.0	1.51	2.27
77	11.0	2.51	6.28
78	8.0	-0.49	0.24
79	6.0	-2.49	6.22
80	4.0	-4.49	20.19
81	7.0	-1.49	2.23
82	14.0	5.51	30.32
83	9.0	0.51	0.26
84	7.0	-1.49	2.23
85	10.0	1.51	2.27
86	9.0	0.51	0.26
87	8.0	-0.49	0.24
88	9.0	0.51	0.26
89	8.0	-0.49	0.24
90	3.0	-5.49	30.18
91	12.0	3.51	12.29
92	4.0	-4.49	20.19
93	4.0	-4.49	20.19
94	8.0	-0.49	0.24
95	8.0	-0.49	0.24
96	9.0	0.51	0.26
97	13.0	4.51	20.31
98	4.0	-4.49	20.19
99	7.0	-1.49	2.23
100	5.0	-3.49	12.21
	397.0		336.2
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
101	7.0	-1.49	2.23
102	8.0	-0.49	0.24
103	8.0	-0.49	0.24
104	10.0	1.51	2.27
105	7.0	-1.49	2.23
106	6.0	-2.49	6.22
107	8.0	-0.49	0.24
108	5.0	-3.49	12.21
109	6.0	-2.49	6.22
110	9.0	0.51	0.26
111	9.0	0.51	0.26
112	13.0	4.51	20.31
113	10.0	1.51	2.27
114	8.0	-0.49	0.24
115	7.0	-1.49	2.23
116	8.0	-0.49	0.24
117	9.0	0.51	0.26
118	11.0	2.51	6.28
119	7.0	-1.49	2.23
120	8.0	-0.49	0.24
121	8.0	-0.49	0.24
122	10.0	1.51	2.27
123	8.0	-0.49	0.24
124	12.0	3.51	12.29
125	6.0	-2.49	6.22
126	4.0	-4.49	20.19
127	6.0	-2.49	6.22
128	11.0	2.51	6.28
129	7.0	-1.49	2.23
130	10.0	1.51	2.27
131	12.0	3.51	12.29
132	9.0	0.51	0.26
133	9.0	0.51	0.26
134	7.0	-1.49	2.23
135	7.0	-1.49	2.23
136	10.0	1.51	2.27
137	7.0	-1.49	2.23
138	5.0	-3.49	12.21
139	6.0	-2.49	6.22
140	8.0	-0.49	0.24
141	8.0	-0.49	0.24
142	9.0	0.51	0.26
143	7.0	-1.49	2.23
144	6.0	-2.49	6.22
145	8.0	-0.49	0.24
146	8.0	-0.49	0.24
147	7.0	-1.49	2.23
148	6.0	-2.49	6.22
149	9.0	0.51	0.26
150	7.0	-1.49	2.23
	401.0		186.2
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
151	8.0	-0.49	0.24
152	8.0	-0.49	0.24
153	8.0	-0.49	0.24
154	9.0	0.51	0.26
155	9.0	0.51	0.26
156	9.0	0.51	0.26
157	6.0	-2.49	6.22
158	8.0	-0.49	0.24
159	9.0	0.51	0.26
160	22.0	13.51	182.42
161	9.0	0.51	0.26
162	11.0	2.51	6.28
163	14.0	5.51	30.32
164	5.0	-3.49	12.21
165	10.0	1.51	2.27
166	9.0	0.51	0.26
167	8.0	-0.49	0.24
168	27.0	18.51	342.48
169	7.0	-1.49	2.23
170	8.0	-0.49	0.24
171	7.0	-1.49	2.23
172	9.0	0.51	0.26
173	10.0	1.51	2.27
174	8.0	-0.49	0.24
175	6.0	-2.49	6.22
176	7.0	-1.49	2.23
177	13.0	4.51	20.31
178	8.0	-0.49	0.24
179	8.0	-0.49	0.24
180	10.0	1.51	2.27
181	17.0	8.51	72.36
182	8.0	-0.49	0.24
183	9.0	0.51	0.26
184	8.0	-0.49	0.24
185	9.0	0.51	0.26
186	13.0	4.51	20.31
187	10.0	1.51	2.27
188	10.0	1.51	2.27
189	22.0	13.51	182.42
190	5.0	-3.49	12.21
191	6.0	-2.49	6.22
192	8.0	-0.49	0.24
193	5.0	-3.49	12.21
194	11.0	2.51	6.28
195	8.0	-0.49	0.24
196	11.0	2.51	6.28
197	5.0	-3.49	12.21
198	9.0	0.51	0.26
199	7.0	-1.49	2.23
200	5.0	-3.49	12.21
	476.0		975.1
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
201	11.0	2.51	6.28
202	8.0	-0.49	0.24
203	12.0	3.51	12.29
204	4.0	-4.49	20.19
205	7.0	-1.49	2.23
206	9.0	0.51	0.26
207	16.0	7.51	56.34
208	11.0	2.51	6.28
209	6.0	-2.49	6.22
210	11.0	2.51	6.28
211	12.0	3.51	12.29
212	8.0	-0.49	0.24
213	15.0	6.51	42.33
214	4.0	-4.49	20.19
215	5.0	-3.49	12.21
216	6.0	-2.49	6.22
217	8.0	-0.49	0.24
218	9.0	0.51	0.26
219	9.0	0.51	0.26
220	5.0	-3.49	12.21
221	6.0	-2.49	6.22
222	21.0	12.51	156.41
223	6.0	-2.49	6.22
224	9.0	0.51	0.26
225	14.0	5.51	30.32
226	9.0	0.51	0.26
227	7.0	-1.49	2.23
228	5.0	-3.49	12.21
229	11.0	2.51	6.28
230	12.0	3.51	12.29
231	10.0	1.51	2.27
232	9.0	0.51	0.26
233	9.0	0.51	0.26
234	10.0	1.51	2.27
235	10.0	1.51	2.27
236	8.0	-0.49	0.24
237	7.0	-1.49	2.23
238	6.0	-2.49	6.22
239	6.0	-2.49	6.22
240	12.0	3.51	12.29
241	13.0	4.51	20.31
242	0.0	0.00	0.00
243	0.0	0.00	0.00
244	0.0	0.00	0.00
245	0.0	0.00	0.00
246	0.0	0.00	0.00
247	0.0	0.00	0.00
248	0.0	0.00	0.00
249	0.0	0.00	0.00
250	0.0	0.00	0.00
	376.0		510.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
1	1.0	-0.34	0.11
2	1.0	-0.34	0.11
3	1.0	-0.34	0.11
4	2.0	0.66	0.44
5	2.0	0.66	0.44
6	1.0	-0.34	0.11
7	1.0	-0.34	0.11
8	2.0	0.66	0.44
9	1.0	-0.34	0.11
10	1.0	-0.34	0.11
11	2.0	0.66	0.44
12	1.0	-0.34	0.11
13	1.0	-0.34	0.11
14	2.0	0.66	0.44
15	1.0	-0.34	0.11
16	1.0	-0.34	0.11
17	1.0	-0.34	0.11
18	1.0	-0.34	0.11
19	1.0	-0.34	0.11
20	1.0	-0.34	0.11
21	1.0	-0.34	0.11
22	1.0	-0.34	0.11
23	1.0	-0.34	0.11
24	1.0	-0.34	0.11
25	2.0	0.66	0.44
26	2.0	0.66	0.44
27	2.0	0.66	0.44
28	1.0	-0.34	0.11
29	1.0	-0.34	0.11
30	2.0	0.66	0.44
31	2.0	0.66	0.44
32	2.0	0.66	0.44
33	1.0	-0.34	0.11
34	1.0	-0.34	0.11
35	1.0	-0.34	0.11
36	2.0	0.66	0.44
37	1.0	-0.34	0.11
38	1.0	-0.34	0.11
39	1.0	-0.34	0.11
40	1.0	-0.34	0.11
41	1.0	-0.34	0.11
42	1.0	-0.34	0.11
43	1.0	-0.34	0.11
44	1.0	-0.34	0.11
45	1.0	-0.34	0.11
46	1.0	-0.34	0.11
47	2.0	0.66	0.44
48	2.0	0.66	0.44
49	1.0	-0.34	0.11
50	2.0	0.66	0.44
	69		13.876
	62		9.582
	67		11.221
	59		10.532
	0		0.000
	0		0.000
	322.0		55.776
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 241

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.34

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 0.48
2 Std Deviations: 0.96
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.654

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.39 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	240	is calculated as follow:		
EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]				
The (df) value for (X)	240	1.654	95%	

PERFORMED BY: Mickey Hobbs DATE: 4-7-99

REVIEWED BY: W. A. Rogers DATE: 4-7-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
51	1.0	-0.34	0.11
52	1.0	-0.34	0.11
53	1.0	-0.34	0.11
54	1.0	-0.34	0.11
55	1.0	-0.34	0.11
56	2.0	0.66	0.44
57	1.0	-0.34	0.11
58	1.0	-0.34	0.11
59	2.0	0.66	0.44
60	2.0	0.66	0.44
61	1.0	-0.34	0.11
62	1.0	-0.34	0.11
63	2.0	0.66	0.44
64	1.0	-0.34	0.11
65	2.0	0.66	0.44
66	2.0	0.66	0.44
67	1.0	-0.34	0.11
68	1.0	-0.34	0.11
69	2.0	0.66	0.44
70	1.0	-0.34	0.11
71	1.0	-0.34	0.11
72	1.0	-0.34	0.11
73	1.0	-0.34	0.11
74	1.0	-0.34	0.11
75	1.0	-0.34	0.11
76	1.0	-0.34	0.11
77	1.0	-0.34	0.11
78	2.0	0.66	0.44
79	2.0	0.66	0.44
80	2.0	0.66	0.44
81	2.0	0.66	0.44
82	1.0	-0.34	0.11
83	1.0	-0.34	0.11
84	1.0	-0.34	0.11
85	1.0	-0.34	0.11
86	2.0	0.66	0.44
87	2.0	0.66	0.44
88	2.0	0.66	0.44
89	2.0	0.66	0.44
90	2.0	0.66	0.44
91	1.0	-0.34	0.11
92	1.0	-0.34	0.11
93	1.0	-0.34	0.11
94	1.0	-0.34	0.11
95	2.0	0.66	0.44
96	1.0	-0.34	0.11
97	3.0	1.66	2.77
98	1.0	-0.34	0.11
99	1.0	-0.34	0.11
100	1.0	-0.34	0.11
	69		13.876
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
101	1.0	-0.34	0.11
102	1.0	-0.34	0.11
103	1.0	-0.34	0.11
104	2.0	0.66	0.44
105	1.0	-0.34	0.11
106	2.0	0.66	0.44
107	1.0	-0.34	0.11
108	1.0	-0.34	0.11
109	1.0	-0.34	0.11
110	1.0	-0.34	0.11
111	2.0	0.66	0.44
112	1.0	-0.34	0.11
113	2.0	0.66	0.44
114	2.0	0.66	0.44
115	2.0	0.66	0.44
116	1.0	-0.34	0.11
117	2.0	0.66	0.44
118	2.0	0.66	0.44
119	1.0	-0.34	0.11
120	1.0	-0.34	0.11
121	1.0	-0.34	0.11
122	1.0	-0.34	0.11
123	2.0	0.66	0.44
124	1.0	-0.34	0.11
125	1.0	-0.34	0.11
126	2.0	0.66	0.44
127	1.0	-0.34	0.11
128	1.0	-0.34	0.11
129	1.0	-0.34	0.11
130	1.0	-0.34	0.11
131	1.0	-0.34	0.11
132	1.0	-0.34	0.11
133	1.0	-0.34	0.11
134	2.0	0.66	0.44
135	1.0	-0.34	0.11
136	1.0	-0.34	0.11
137	1.0	-0.34	0.11
138	1.0	-0.34	0.11
139	1.0	-0.34	0.11
140	1.0	-0.34	0.11
141	1.0	-0.34	0.11
142	1.0	-0.34	0.11
143	1.0	-0.34	0.11
144	1.0	-0.34	0.11
145	1.0	-0.34	0.11
146	2.0	0.66	0.44
147	1.0	-0.34	0.11
148	1.0	-0.34	0.11
149	1.0	-0.34	0.11
150	1.0	-0.34	0.11
	62		9.582
	Sum(n)		Sum(n-N)²

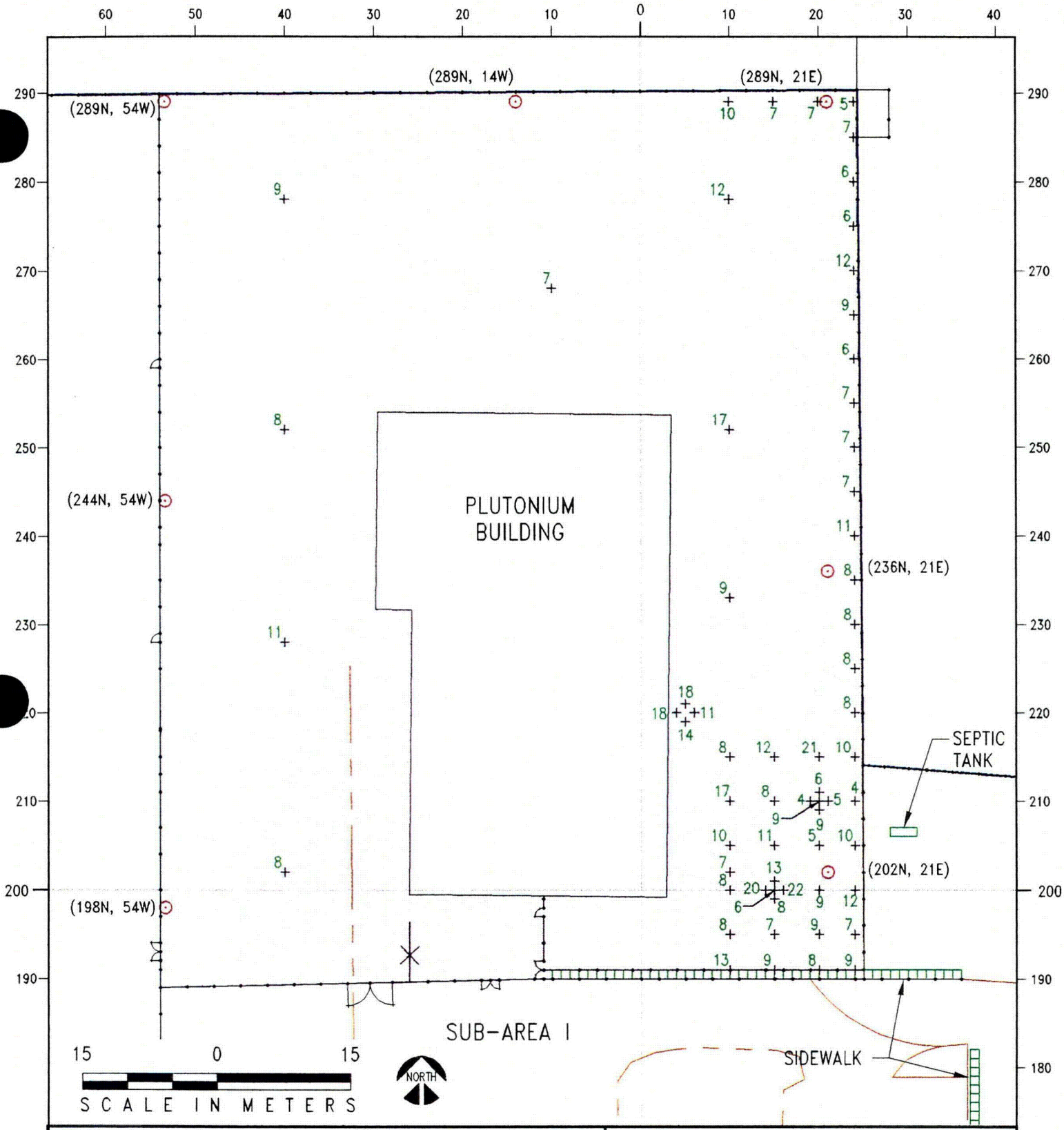
CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
151	1.0	-0.34	0.11
152	1.0	-0.34	0.11
153	1.0	-0.34	0.11
154	1.0	-0.34	0.11
155	2.0	0.66	0.44
156	2.0	0.66	0.44
157	1.0	-0.34	0.11
158	1.0	-0.34	0.11
159	1.0	-0.34	0.11
160	1.0	-0.34	0.11
161	1.0	-0.34	0.11
162	1.0	-0.34	0.11
163	1.0	-0.34	0.11
164	1.0	-0.34	0.11
165	1.0	-0.34	0.11
166	1.0	-0.34	0.11
167	1.0	-0.34	0.11
168	1.0	-0.34	0.11
169	1.0	-0.34	0.11
170	2.0	0.66	0.44
171	1.0	-0.34	0.11
172	1.0	-0.34	0.11
173	1.0	-0.34	0.11
174	1.0	-0.34	0.11
175	2.0	0.66	0.44
176	2.0	0.66	0.44
177	1.0	-0.34	0.11
178	1.0	-0.34	0.11
179	2.0	0.66	0.44
180	1.0	-0.34	0.11
181	2.0	0.66	0.44
182	2.0	0.66	0.44
183	2.0	0.66	0.44
184	1.0	-0.34	0.11
185	2.0	0.66	0.44
186	1.0	-0.34	0.11
187	1.0	-0.34	0.11
188	1.0	-0.34	0.11
189	1.0	-0.34	0.11
190	2.0	0.66	0.44
191	2.0	0.66	0.44
192	2.0	0.66	0.44
193	2.0	0.66	0.44
194	2.0	0.66	0.44
195	1.0	-0.34	0.11
196	1.0	-0.34	0.11
197	2.0	0.66	0.44
198	1.0	-0.34	0.11
199	2.0	0.66	0.44
200	1.0	-0.34	0.11
	67		11.221
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
201	1.0	-0.34	0.11
202	2.0	0.66	0.44
203	1.0	-0.34	0.11
204	2.0	0.66	0.44
205	2.0	0.66	0.44
206	1.0	-0.34	0.11
207	1.0	-0.34	0.11
208	2.0	0.66	0.44
209	2.0	0.66	0.44
210	2.0	0.66	0.44
211	1.0	-0.34	0.11
212	1.0	-0.34	0.11
213	2.0	0.66	0.44
214	1.0	-0.34	0.11
215	1.0	-0.34	0.11
216	1.0	-0.34	0.11
217	1.0	-0.34	0.11
218	2.0	0.66	0.44
219	2.0	0.66	0.44
220	2.0	0.66	0.44
221	2.0	0.66	0.44
222	2.0	0.66	0.44
223	1.0	-0.34	0.11
224	1.0	-0.34	0.11
225	2.0	0.66	0.44
226	1.0	-0.34	0.11
227	2.0	0.66	0.44
228	2.0	0.66	0.44
229	2.0	0.66	0.44
230	1.0	-0.34	0.11
231	2.0	0.66	0.44
232	2.0	0.66	0.44
233	1.0	-0.34	0.11
234	1.0	-0.34	0.11
235	1.0	-0.34	0.11
236	1.0	-0.34	0.11
237	1.0	-0.34	0.11
238	1.0	-0.34	0.11
239	1.0	-0.34	0.11
240	1.0	-0.34	0.11
241	1.0	-0.34	0.11
242	0.0	0.00	0.00
243	0.0	0.00	0.00
244	0.0	0.00	0.00
245	0.0	0.00	0.00
246	0.0	0.00	0.00
247	0.0	0.00	0.00
248	0.0	0.00	0.00
249	0.0	0.00	0.00
250	0.0	0.00	0.00
	59		10.532
	Sum(n)		Sum(n-N)²



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6+ URANIUM, 1 – 30 pCi/g U

45+ URANIUM, > 30 pCi/g U

R+ HIT ROCK– NO SAMPLE

○ LIGHT POLE PLUTONIUM YARD

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

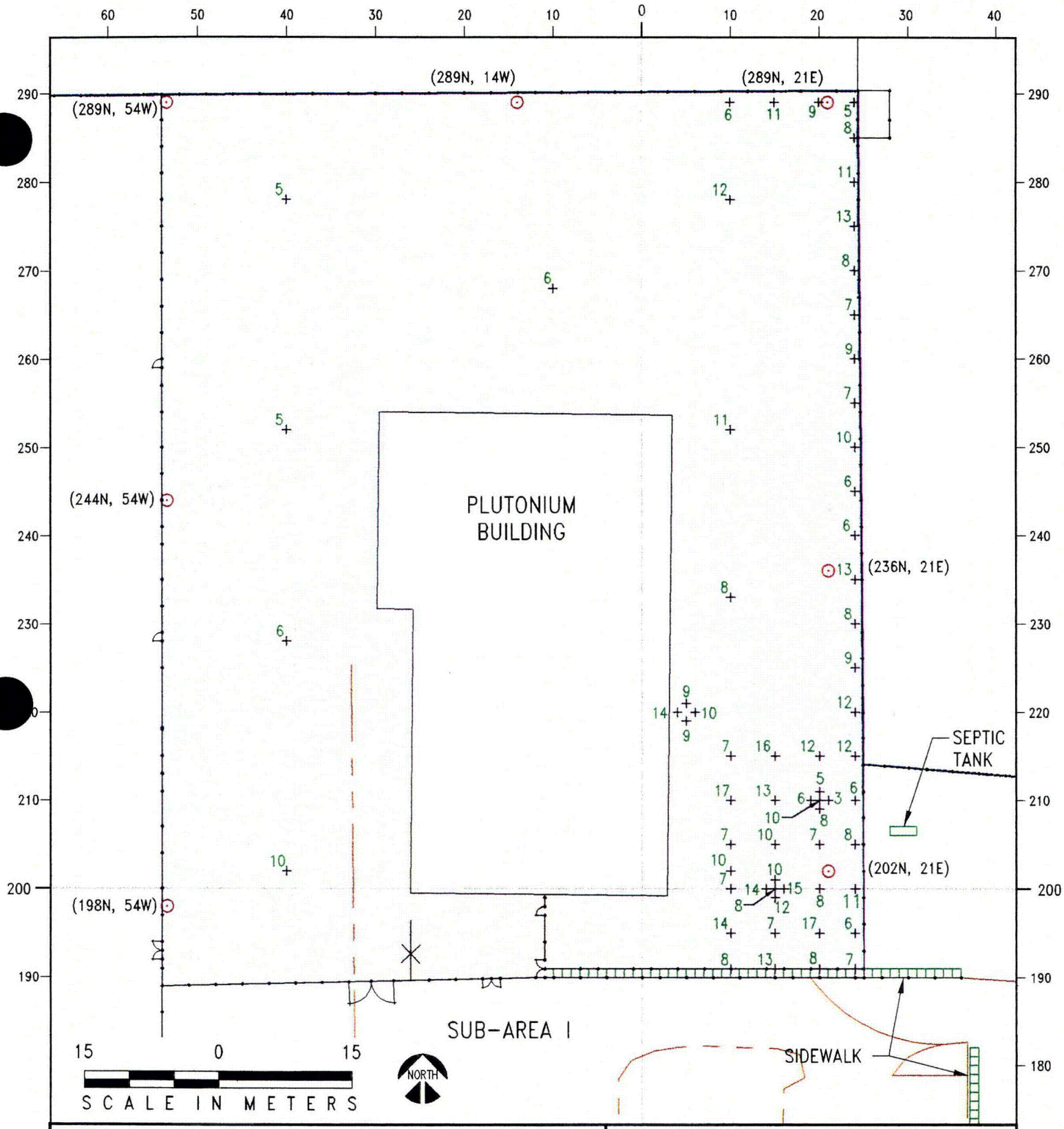
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED AREA – PU PLANT YARD
SOIL SAMPLE RESULTS – DEPTH
SOIL SAMPLE ALIQUOT: 0–6"

DRWN. BY	DATE	SCALE:
JE	4–19–99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUSS–1	0

...\SUBAREAI\PU-YARD-DEPTH\99POSIPUSS-Depth



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6+ URANIUM, 1 - 30 pCi/g U

45+ URANIUM, > 30 pCi/g U

R+ HIT ROCK- NO SAMPLE

○ LIGHT POLE PLUTONIUM YARD

CIMARRON CORPORATION

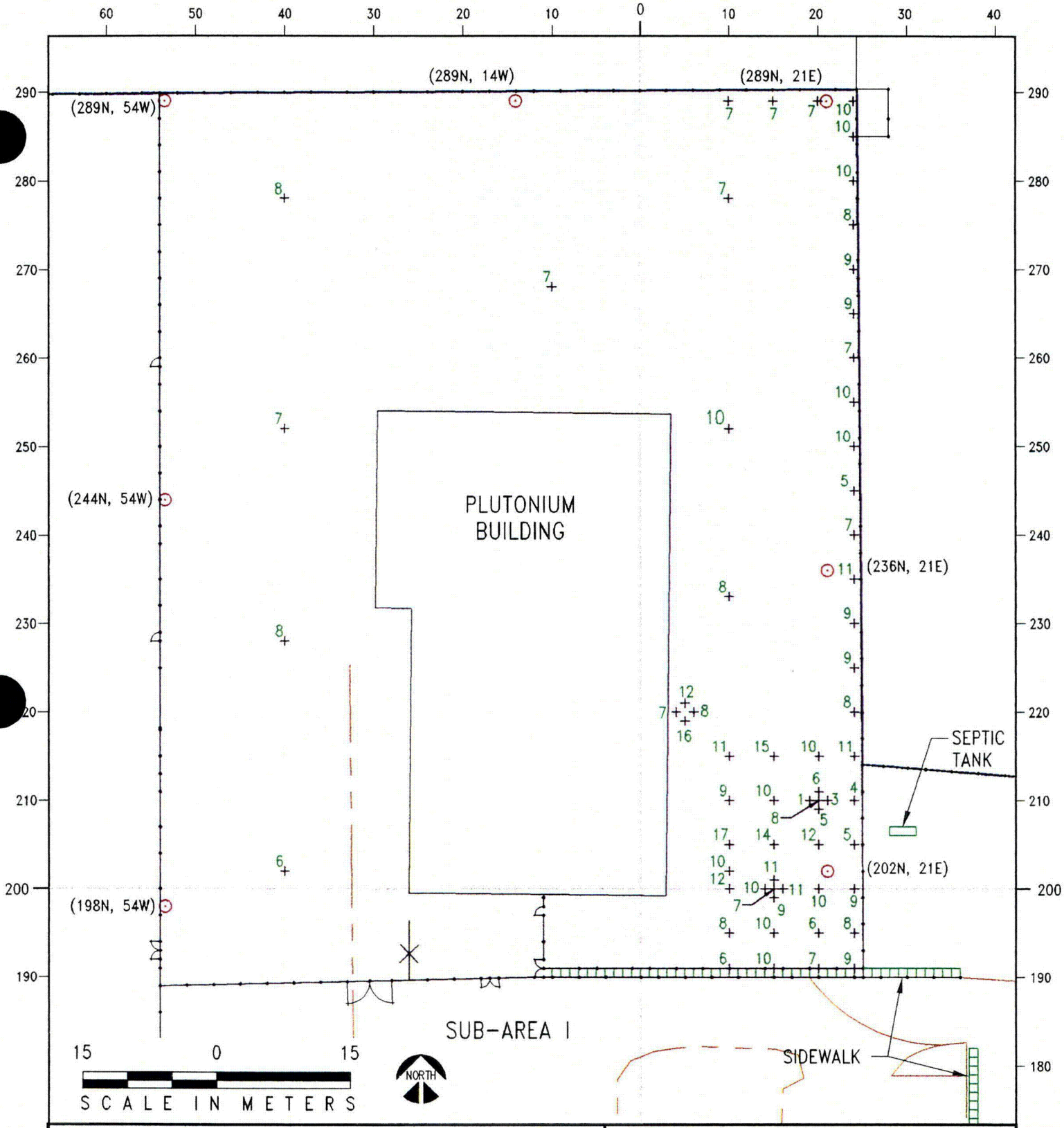
CIMARRON FACILITY
PHASE II - SUB-AREA I
AFFECTED AREA - PU PLANT YARD
SOIL SAMPLE RESULTS - DEPTH
SOIL SAMPLE ALIQUOT: 6"-1'

DRWN. BY	DATE	SCALE:
JE	4-19-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUSS-2	0

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

...\SUBAREAI\PU-YARD-DEPTH\99POSIPUSS-Depth



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6+ URANIUM, 1 – 30 pCi/g U

45+ URANIUM, > 30 pCi/g U

R+ HIT ROCK– NO SAMPLE

○ LIGHT POLE PLUTONIUM YARD

CIMARRON CORPORATION

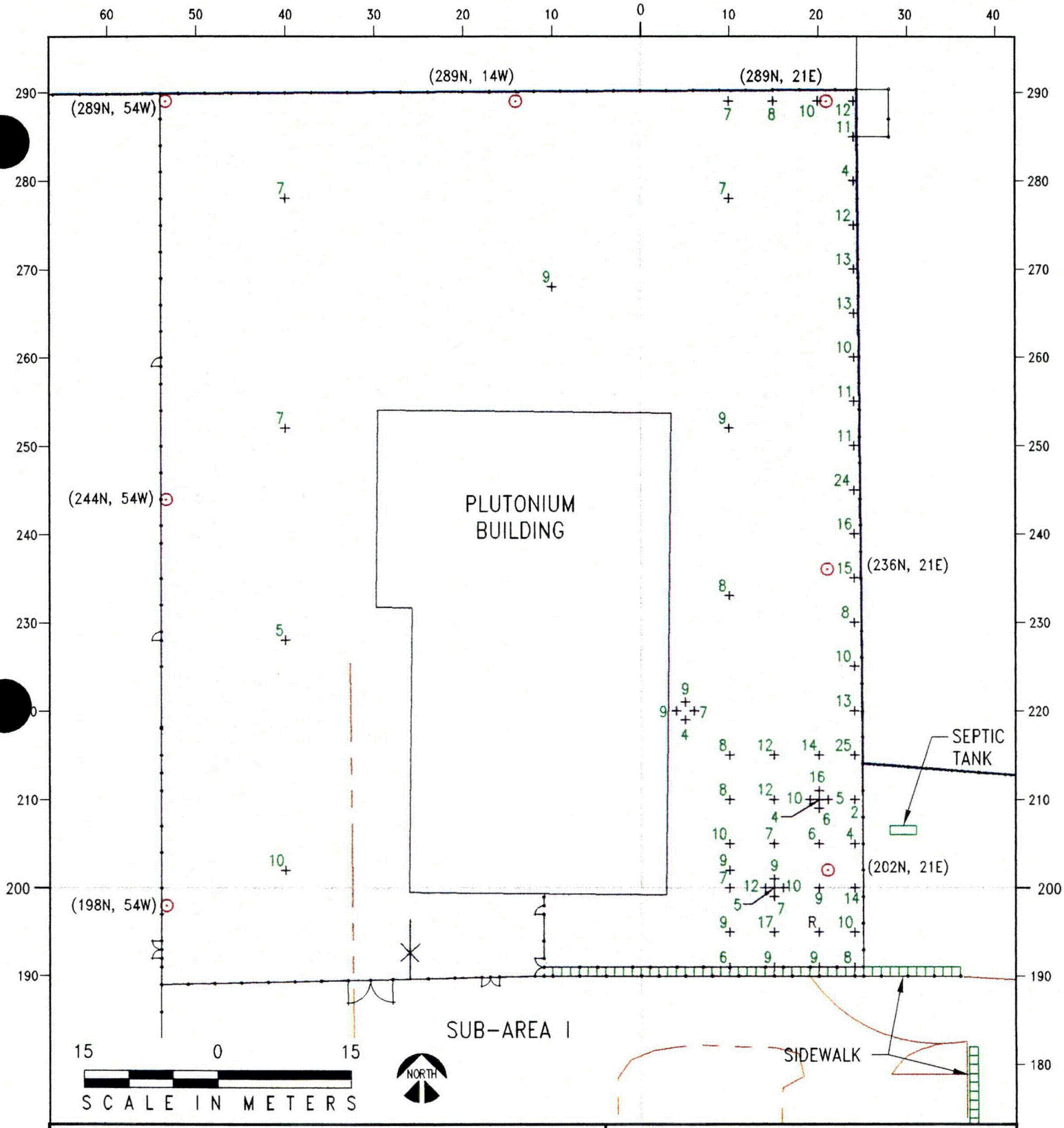
CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED AREA – PU PLANT YARD
SOIL SAMPLE RESULTS – DEPTH
SOIL SAMPLE ALIQUOT: 1'–2'

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	4–19–99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUSS–3	0

...\SUBAREAI\PU-YARD-DEPTH\99POSIPUSS-Depth



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6+ URANIUM, 1 – 30 pCi/g U

45+ URANIUM, > 30 pCi/g U

R+ HIT ROCK– NO SAMPLE

○ LIGHT POLE PLUTONIUM YARD

CIMARRON CORPORATION

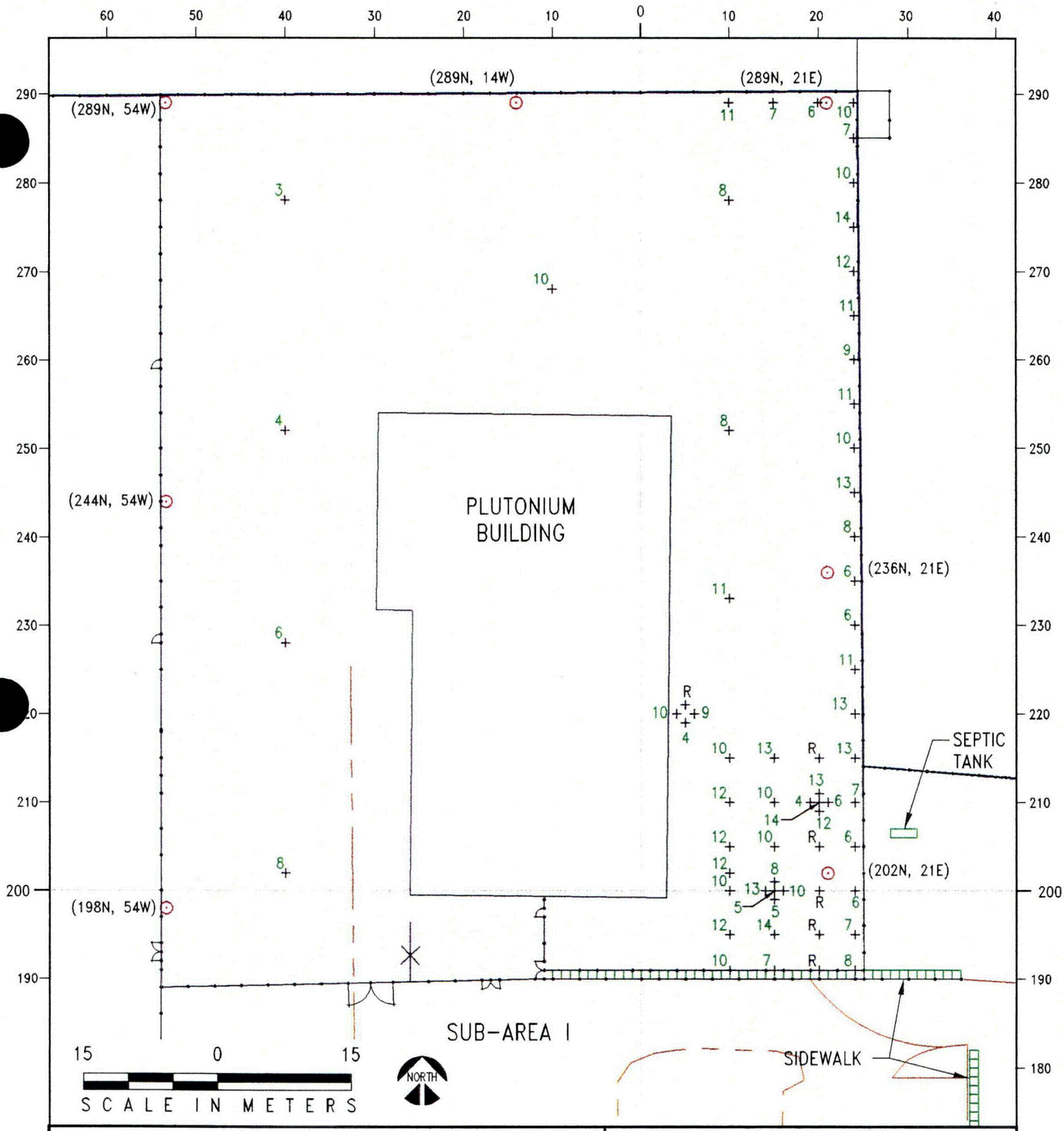
CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED AREA – PU PLANT YARD
SOIL SAMPLE RESULTS – DEPTH
SOIL SAMPLE ALIQUOT: 2'-3'

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	4-19-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUSS-4	0

...\SUBAREAI\PU-YARD-DEPTH\99POSIPUSS-Depth



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6 + URANIUM, 1 – 30 pCi/g U

45 + URANIUM, > 30 pCi/g U

R + HIT ROCK– NO SAMPLE

○ LIGHT POLE PLUTONIUM YARD

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED AREA – PU PLANT YARD
SOIL SAMPLE RESULTS – DEPTH
SOIL SAMPLE ALIQUOT: 3'-4'

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	4-19-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIPUSS-5	REV. 0

...\SUBAREAI\PU-YARD-DEPTH\99POSIPUSS-Depth

CIMARRON FACILITY

PHASE II - SUB-AREA "I" PLUTONIUM PLANT YARD - AFFECTED - DEPTH

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6020	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 4-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	pCi/g 0- 6" Total- U	0- 6" Th (Nat)	6"- 1' Total- U	6"- 1' Th (Nat)	1'- 2' Total- U	1'- 2' Th (Nat)	2' 3' Total- U	2' 3' Th (Nat)	3' 4' Total- U	3' 4' Th (Nat)
1	40	W	-	202	N	5376	6	5	8	1	10	1	6	1	10	1	8	2
2	40	W	-	228	N	4608	6	6	11	1	6	1	8	1	5	1	6	1
3	40	W	-	252	N	5836	7	7	8	1	5	1	7	1	7	1	4	1
4	40	W	-	278	N	6958	7	7	9	1	5	1	8	1	7	2	3	1
5	10	W	-	268	N	7314	8	7	7	1	6	1	7	2	9	1	10	1
6	4	E	-	220	N	8086	9	9	18	1	14	1	7	1	9	1	10	1
7	5	E	-	219	N	9494	11	9	14	2	9	1	16	1	4	1	4	2
8	5	E	-	221	N	9102	9	8	18	2	9	1	12	1	9	1	ROCK	ROCK
9	6	E	-	220	N	7192	8	8	11	1	10	2	8	2	7	2	9	1
10	10	E	-	191	N	5788	7	6	13	1	8	1	6	2	6	2	10	2
11	10	E	-	195	N	7408	8	9	8	1	14	1	8	2	9	2	12	2
12	10	E	-	200	N	8314	9	9	8	2	7	2	12	2	7	2	10	2
13	10	E	-	202	N	8812	9	9	7	2	10	1	10	1	9	2	12	1
14	10	E	-	205	N	8258	10	9	10	1	7	2	17	2	10	1	12	2
15	10	E	-	210	N	7930	10	9	17	2	17	1	9	1	8	2	12	1
16	10	E	-	215	N	8168	9	9	8	2	7	2	11	2	8	1	10	1
17	10	E	-	233	N	9434	9	9	9	1	8	2	8	2	8	1	11	1
18	10	E	-	252	N	9132	9	8	17	1	11	2	10	1	9	2	8	1
19	10	E	-	278	N	8396	8	8	12	1	12	2	7	2	7	1	8	2
20	10	E	-	289	N	6138	8	7	10	1	6	2	7	2	7	2	11	2
21	14	E	-	200	N	8000	9	8	20	2	14	1	10	2	12	1	13	1
22	15	E	-	191	N	6048	7	7	9	1	13	1	10	2	9	1	7	2
23	15	E	-	195	N	7352	8	9	7	2	7	2	10	2	17	1	14	2
24	15	E	-	199	N	7338	8	8	8	1	12	1	9	1	7	1	5	1
25	15	E	-	200	N	7590	10	10	6	2	8	1	7	1	5	1	5	1
26	15	E	-	201	N	7312	9	8	13	1	10	1	11	2	9	2	8	2
27	15	E	-	205	N	7184	9	8	11	1	10	2	14	2	7	2	10	2

CIMARRON FACILITY

PHASE II - SUB-AREA "I" PLUTONIUM PLANT YARD - AFFECTED - DEPTH

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6020	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 4-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	pCi/g 0- 6" Total- U	0- 6" Th (Nat)	6"- 1' Total- U	6"- 1' Th (Nat)	1'- 2' Total- U	1'- 2' Th (Nat)	2' 3' Total- U	2' 3' Th (Nat)	3' 4' Total- U	3' 4' Th (Nat)
28	15	E	-	210	N	7718	9	9	8	2	13	2	10	1	12	2	10	1
29	15	E	-	215	N	7770	9	9	12	1	16	1	15	2	12	2	13	1
30	15	E	-	289	N	5916	7	8	7	2	11	2	7	2	8	2	7	2
31	16	E	-	200	N	7176	9	9	22	1	15	1	11	1	10	1	10	1
32	19	E	-	210	N	7036	8	8	4	2	6	1	1	2	10	2	4	2
33	20	E	-	191	N	5686	7	7	8	1	8	1	7	2	9	2	ROCK	ROCK
34	20	E	-	195	N	7266	8	8	9	2	17	1	6	2	ROCK	ROCK	ROCK	ROCK
35	20	E	-	200	N	7264	9	9	9	2	8	2	10	2	9	2	ROCK	ROCK
36	20	E	-	205	N	7386	9	10	5	2	7	2	12	1	6	1	ROCK	ROCK
37	20	E	-	209	N	7528	9	8	9	1	8	1	5	1	6	1	12	1
38	20	E	-	210	N	7930	10	9	9	1	10	1	8	1	4	1	14	2
39	20	E	-	211	N	6866	8	8	6	1	5	1	6	1	16	1	13	1
40	20	E	-	215	N	7608	8	8	21	2	12	2	10	2	14	1	ROCK	ROCK
41	20	E	-	289	N	5404	7	7	7	1	9	1	7	2	10	1	6	2
42	21	E	-	210	N	7594	8	8	5	1	3	2	3	2	5	1	6	1
43	24	E	-	191	N	6306	7	7	9	1	7	1	9	2	8	2	8	2
44	24	E	-	195	N	6346	7	7	7	1	6	1	8	2	10	2	7	2
45	24	E	-	200	N	6382	8	7	12	2	11	2	9	2	14	2	6	2
46	24	E	-	205	N	7038	9	9	10	1	8	1	5	1	4	1	6	1
47	24	E	-	210	N	8424	10	12	4	1	6	1	4	1	2	1	7	1
48	24	E	-	215	N	5032	8	8	10	1	12	2	11	2	25	1	13	2
49	24	E	-	220	N	5752	7	8	8	2	12	1	8	2	13	2	13	2
50	24	E	-	225	N	6678	8	7	8	1	9	1	9	1	10	2	11	2

CIMARRON FACILITY

PHASE II - SUB-AREA "I" PLUTONIUM PLANT YARD - AFFECTED - DEPTH

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	6020	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. a. Bryce DATE: 4-19-99

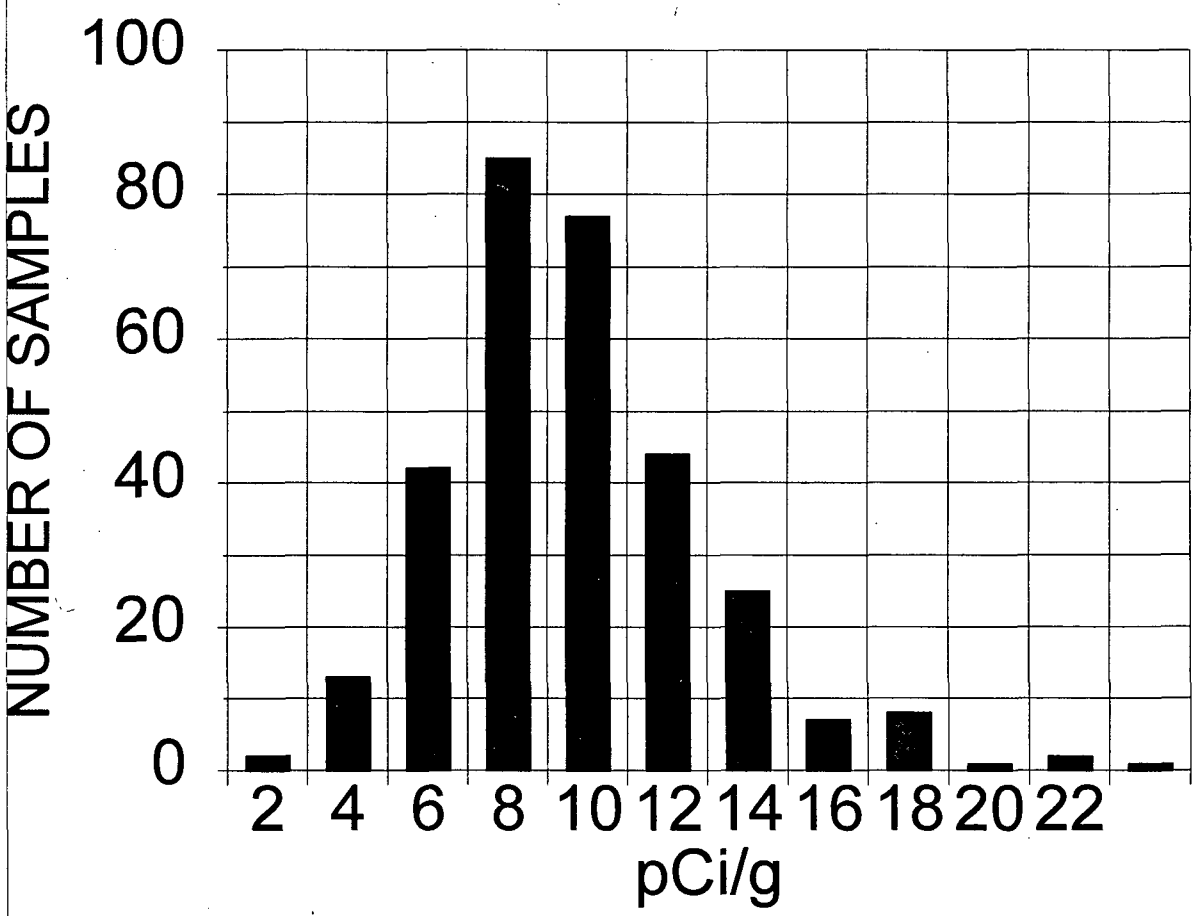
LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	pCi/g 0- 6" Total- U	0- 6" Th (Nat)	6"- 1' Total- U	6"- 1' Th (Nat)	1'- 2' Total- U	1'- 2' Th (Nat)	2' 3' Total- U	2' 3' Th (Nat)	3' 4' Total- U	3' 4' Th (Nat)
51	24	E	-	230	N	6484	8	7	8	1	8	1	9	2	8	2	6	2
52	24	E	-	235	N	6182	7	8	8	1	13	1	11	2	15	2	6	2
53	24	E	-	240	N	6304	7	9	11	2	6	2	7	2	16	2	8	1
54	24	E	-	245	N	6350	8	8	7	1	6	1	5	1	24	2	13	2
55	24	E	-	250	N	6420	8	7	7	1	10	1	10	2	11	2	10	2
56	24	E	-	255	N	5056	8	7	7	1	7	1	10	1	11	1	11	2
57	24	E	-	260	N	7080	9	8	6	1	9	2	7	2	10	2	9	2
58	24	E	-	265	N	6822	9	8	9	1	7	1	9	2	13	1	11	2
59	24	E	-	270	N	7008	8	9	12	2	8	2	9	2	13	1	12	2
60	24	E	-	275	N	6762	9	7	6	2	13	1	8	1	12	1	14	2
61	24	E	-	280	N	6562	9	8	6	1	11	2	10	1	4	2	10	1
62	24	E	-	285	N	5484	7	8	7	1	8	1	10	2	11	2	7	1
63	24	E	-	289	N	5528	7	7	5	1	5	1	10	1	12	2	10	1

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
CIMARRON SOIL COUNTER
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

URANIUM SAMPLE DATA

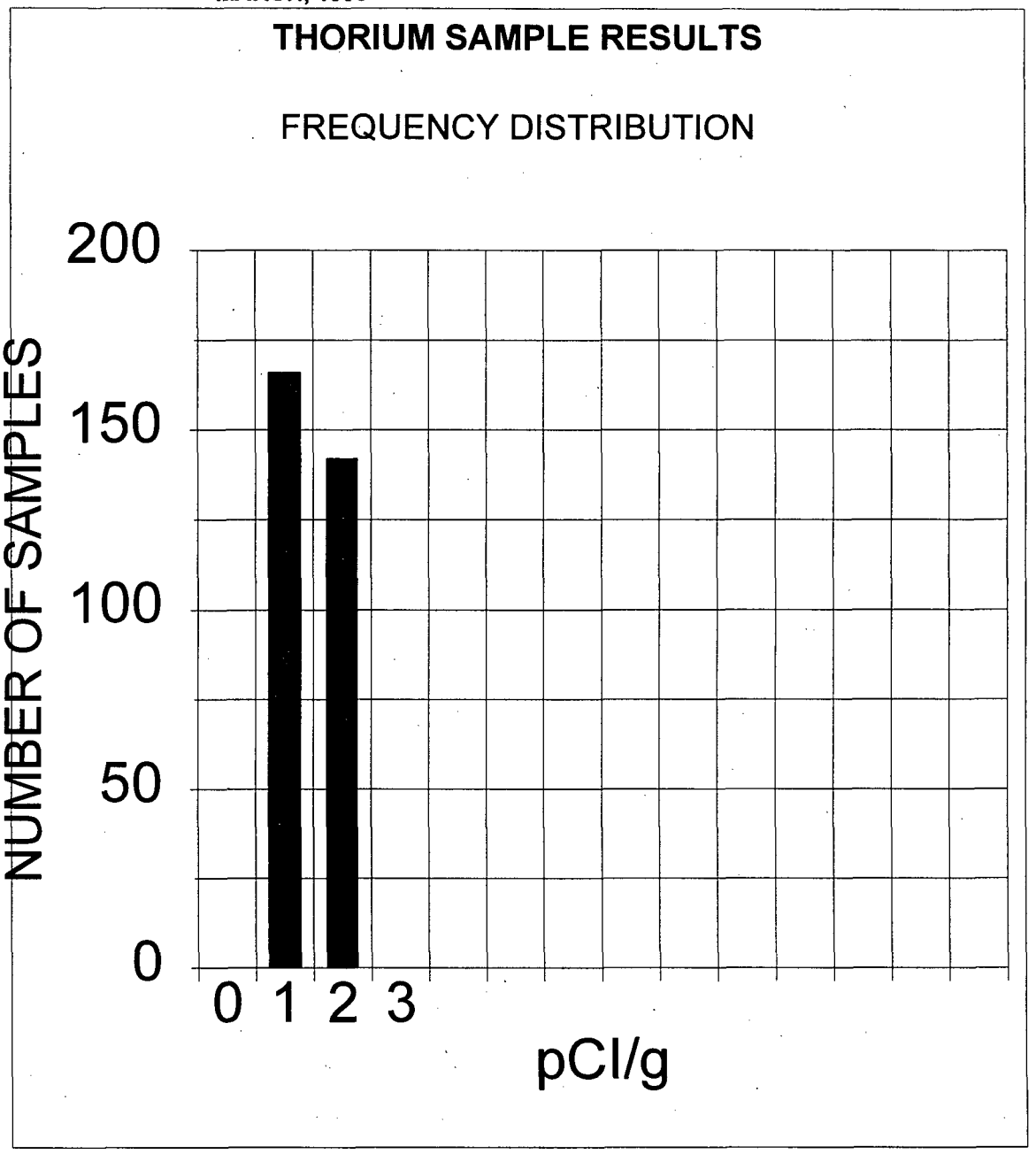
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	308
AVERAGE SAMPLE	9.3
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	25.0
STANDARD DEVIATION	3.5

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
CIMARRON SOIL COUNTER
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED

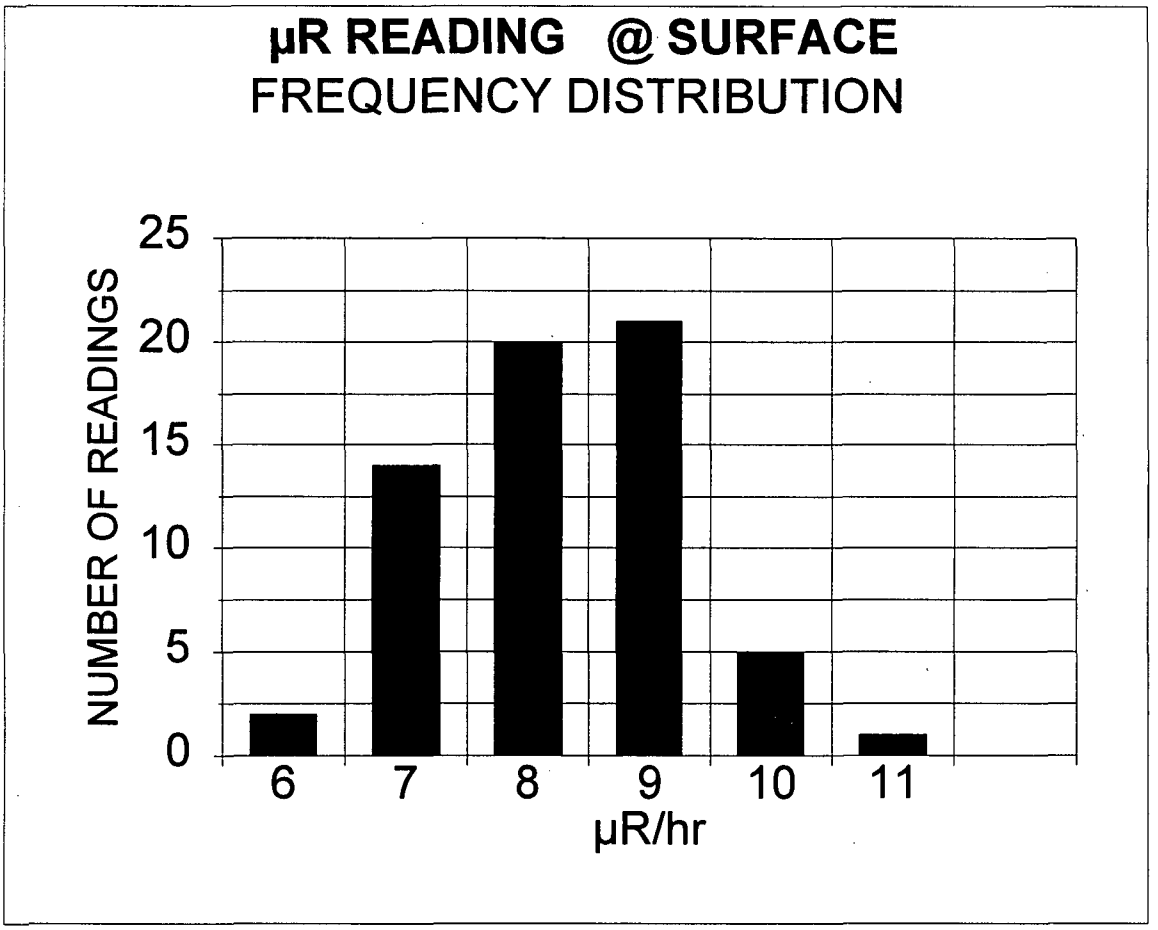
MARCH, 1999



NUMBER OF SAMPLES	308
AVERAGE SAMPLE	1.5
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	2.0
STANDARD DEVIATION	0.5

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
MICRO-R METER READINGS AT SURFACE - AFFECTED - DEPTH
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 111299
RESULTS IN µR/hr

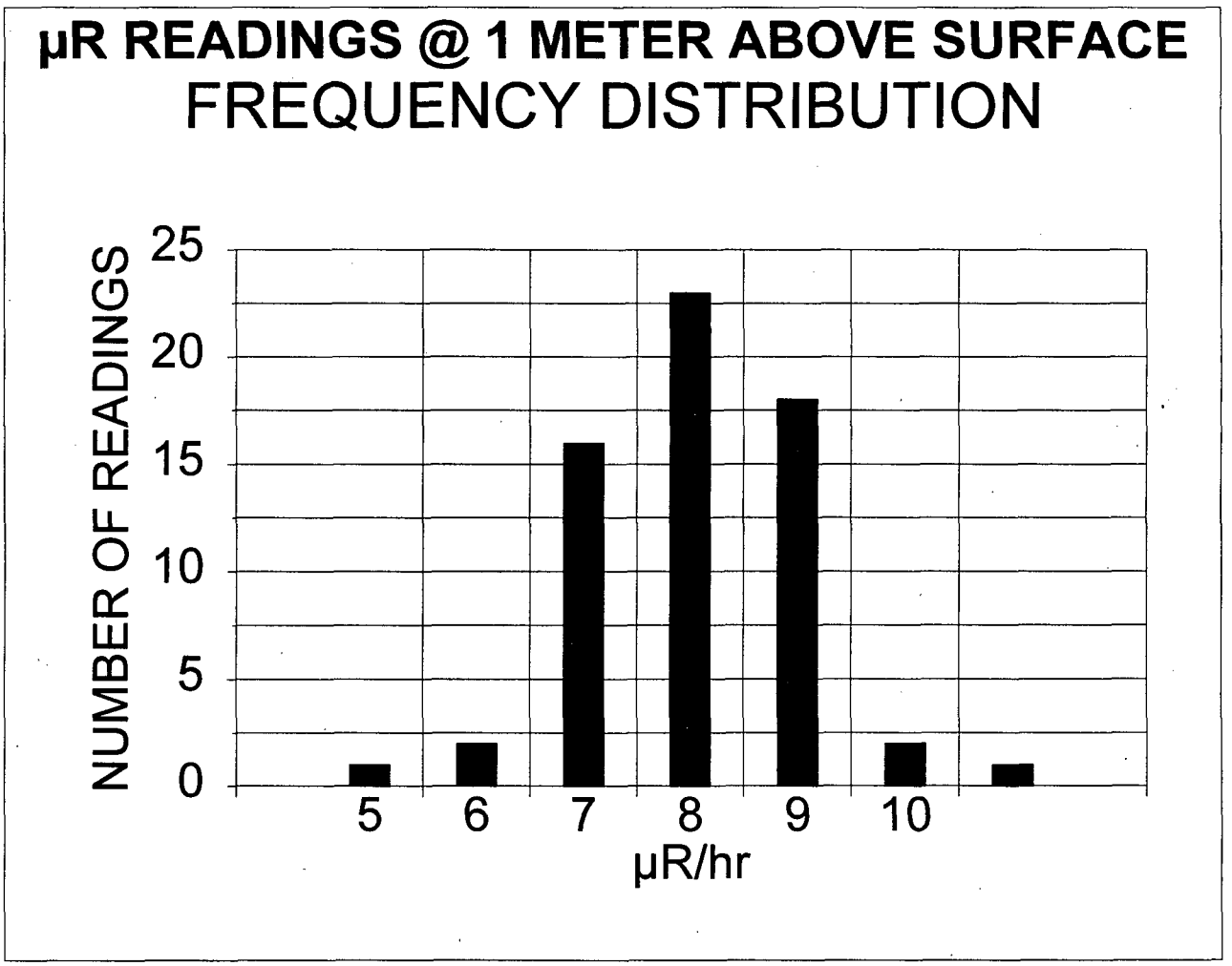
MARCH, 1999



NUMBER OF READINGS	63
AVERAGE READING	8
MINIMUM READING	6
MAXIMUM READING	11
STANDARD DEVIATION	1.0

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE -
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 111299 AFFECTED - DEPTH
RESULTS IN µR/hr

MARCH, 1999

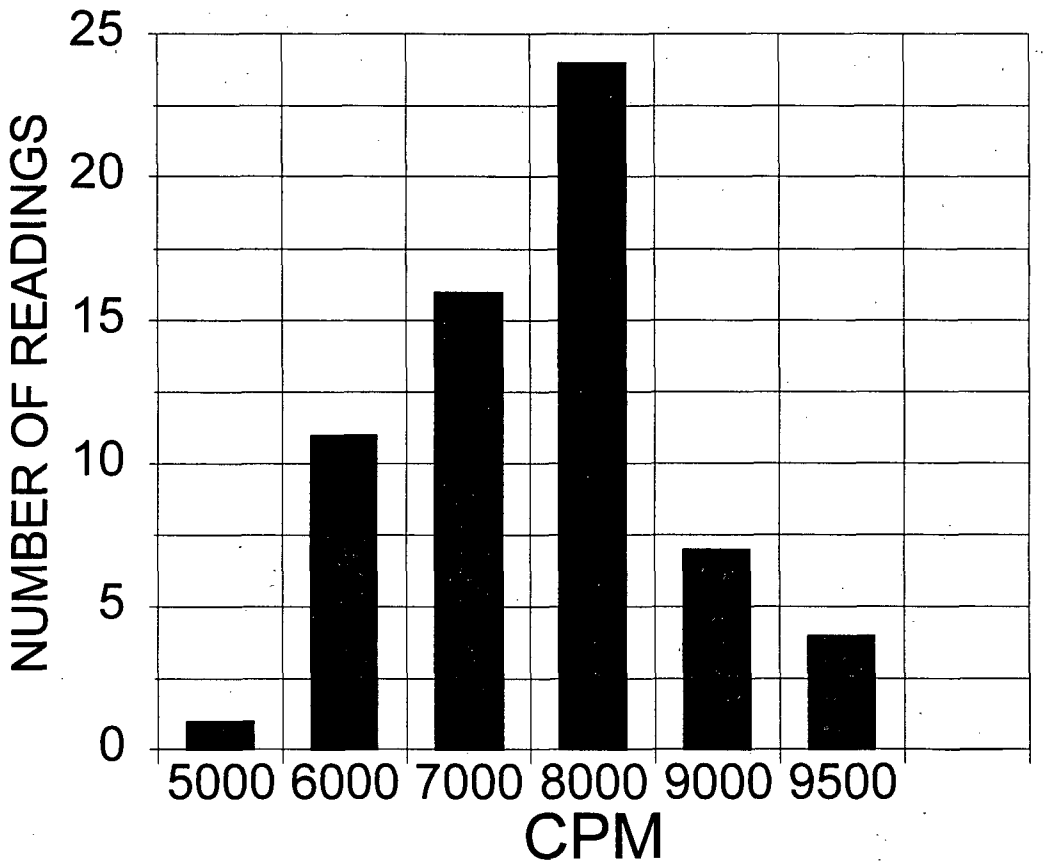


NUMBER OF READINGS	63
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	12
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" PLUTONIUM PLANT YARD
3" NaI DETECTOR AFFECTED - DEPTH
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 97264 (UNSHIELDED)
BACKGROUND AVERAGE: 6020 CPM

MARCH, 1999

3" NaI DETECTOR READINGS
FREQUENCY DISTRIBUTION



NUMBER OF READINGS	63
AVERAGE READING	7027
MINIMUM READING	4608
MAXIMUM READING	9494
STANDARD DEVIATION	1100

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	8.0	-1.3	1.7
2	11.0	1.7	2.9
3	8.0	-1.3	1.7
4	9.0	-0.3	0.1
5	7.0	-2.3	5.3
6	18.0	8.7	75.7
7	14.0	4.7	22.1
8	18.0	8.7	75.7
9	11.0	1.7	2.9
10	13.0	3.7	13.7
11	8.0	-1.3	1.7
12	8.0	-1.3	1.7
13	7.0	-2.3	5.3
14	10.0	0.7	0.5
15	17.0	7.7	59.3
16	8.0	-1.3	1.7
17	9.0	-0.3	0.1
18	17.0	7.7	59.3
19	12.0	2.7	7.3
20	10.0	0.7	0.5
21	20.0	10.7	114.5
22	9.0	-0.3	0.1
23	7.0	-2.3	5.3
24	8.0	-1.3	1.7
25	6.0	-3.3	10.9
26	13.0	3.7	13.7
27	11.0	1.7	2.9
28	8.0	-1.3	1.7
29	12.0	2.7	7.3
30	7.0	-2.3	5.3
31	22.0	12.7	161.3
32	4.0	-5.3	28.1
33	8.0	-1.3	1.7
34	9.0	-0.3	0.1
35	9.0	-0.3	0.1
36	5.0	-4.3	18.5
37	9.0	-0.3	0.1
38	9.0	-0.3	0.1
39	6.0	-3.3	10.9
40	21.0	11.7	136.9
41	7.0	-2.3	5.3
42	5.0	-4.3	18.5
43	9.0	-0.3	0.1
44	7.0	-2.3	5.3
45	12.0	2.7	7.3
46	10.0	0.7	0.5
47	4.0	-5.3	28.1
48	10.0	0.7	0.5
49	8.0	-1.3	1.7
50	8.0	-1.3	1.7
	463.0		515.7
	444.0		380.0
	410.0		404.4
	504.0		1004.2
	453.0		451.7
	84.0		41.5
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	2864		3726.5
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 308

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 9.30

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 3.48

2 Std Deviations: 6.97

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.652

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 9.63 pCi/gU TOTAL U

GUIDELINE VALUE: 30 pCi/gU TOTAL U

Acceptable Level: 34.0 pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	307	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	307	1.652	95%

PERFORMED BY: Mickey Hobbs DATE: 4-6-99

REVIEWED BY: W.A. Rogers DATE: 4-6-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
51	8.0	-1.30	1.69
52	8.0	-1.30	1.69
53	11.0	1.70	2.89
54	7.0	-2.30	5.28
55	7.0	-2.30	5.28
56	7.0	-2.30	5.28
57	6.0	-3.30	10.88
58	9.0	-0.30	0.09
59	12.0	2.70	7.30
60	6.0	-3.30	10.88
61	6.0	-3.30	10.88
62	7.0	-2.30	5.28
63	5.0	-4.30	18.48
64	10.0	0.70	0.49
65	6.0	-3.30	10.88
66	5.0	-4.30	18.48
67	5.0	-4.30	18.48
68	6.0	-3.30	10.88
69	14.0	4.70	22.10
70	9.0	-0.30	0.09
71	9.0	-0.30	0.09
72	10.0	0.70	0.49
73	8.0	-1.30	1.69
74	14.0	4.70	22.10
75	7.0	-2.30	5.28
76	10.0	0.70	0.49
77	7.0	-2.30	5.28
78	17.0	7.70	59.31
79	7.0	-2.30	5.28
80	8.0	-1.30	1.69
81	11.0	1.70	2.89
82	12.0	2.70	7.30
83	6.0	-3.30	10.88
84	14.0	4.70	22.10
85	13.0	3.70	13.70
86	7.0	-2.30	5.28
87	12.0	2.70	7.30
88	8.0	-1.30	1.69
89	10.0	0.70	0.49
90	10.0	0.70	0.49
91	13.0	3.70	13.70
92	16.0	6.70	44.91
93	11.0	1.70	2.89
94	15.0	5.70	32.50
95	6.0	-3.30	10.88
96	8.0	-1.30	1.69
97	17.0	7.70	59.31
98	8.0	-1.30	1.69
99	7.0	-2.30	5.28
100	8.0	-1.30	1.69
	463.0		515.7
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
101	10.0	0.70	0.49
102	5.0	-4.30	18.48
103	12.0	2.70	7.30
104	9.0	-0.30	0.09
105	3.0	-6.30	39.67
106	7.0	-2.30	5.28
107	6.0	-3.30	10.88
108	11.0	1.70	2.89
109	8.0	-1.30	1.69
110	6.0	-3.30	10.88
111	12.0	2.70	7.30
112	12.0	2.70	7.30
113	9.0	-0.30	0.09
114	8.0	-1.30	1.69
115	13.0	3.70	13.70
116	6.0	-3.30	10.88
117	6.0	-3.30	10.88
118	10.0	0.70	0.49
119	7.0	-2.30	5.28
120	9.0	-0.30	0.09
121	7.0	-2.30	5.28
122	8.0	-1.30	1.69
123	13.0	3.70	13.70
124	11.0	1.70	2.89
125	8.0	-1.30	1.69
126	5.0	-4.30	18.48
127	6.0	-3.30	10.88
128	8.0	-1.30	1.69
129	7.0	-2.30	5.28
130	8.0	-1.30	1.69
131	7.0	-2.30	5.28
132	7.0	-2.30	5.28
133	16.0	6.70	44.91
134	12.0	2.70	7.30
135	8.0	-1.30	1.69
136	6.0	-3.30	10.88
137	8.0	-1.30	1.69
138	12.0	2.70	7.30
139	10.0	0.70	0.49
140	17.0	7.70	59.31
141	9.0	-0.30	0.09
142	11.0	1.70	2.89
143	8.0	-1.30	1.69
144	10.0	0.70	0.49
145	7.0	-2.30	5.28
146	7.0	-2.30	5.28
147	10.0	0.70	0.49
148	10.0	0.70	0.49
149	10.0	0.70	0.49
150	9.0	-0.30	0.09
	444.0		380.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
151	7.0	-2.30	5.28
152	11.0	1.70	2.89
153	14.0	4.70	22.10
154	10.0	0.70	0.49
155	15.0	5.70	32.50
156	7.0	-2.30	5.28
157	11.0	1.70	2.89
158	1.0	-8.30	68.87
159	7.0	-2.30	5.28
160	6.0	-3.30	10.88
161	10.0	0.70	0.49
162	12.0	2.70	7.30
163	5.0	-4.30	18.48
164	8.0	-1.30	1.69
165	6.0	-3.30	10.88
166	10.0	0.70	0.49
167	7.0	-2.30	5.28
168	3.0	-6.30	39.67
169	9.0	-0.30	0.09
170	8.0	-1.30	1.69
171	9.0	-0.30	0.09
172	5.0	-4.30	18.48
173	4.0	-5.30	28.08
174	11.0	1.70	2.89
175	8.0	-1.30	1.69
176	9.0	-0.30	0.09
177	9.0	-0.30	0.09
178	11.0	1.70	2.89
179	7.0	-2.30	5.28
180	5.0	-4.30	18.48
181	10.0	0.70	0.49
182	10.0	0.70	0.49
183	7.0	-2.30	5.28
184	9.0	-0.30	0.09
185	9.0	-0.30	0.09
186	8.0	-1.30	1.69
187	10.0	0.70	0.49
188	10.0	0.70	0.49
189	10.0	0.70	0.49
190	10.0	0.70	0.49
191	5.0	-4.30	18.48
192	7.0	-2.30	5.28
193	7.0	-2.30	5.28
194	9.0	-0.30	0.09
195	9.0	-0.30	0.09
196	4.0	-5.30	28.08
197	9.0	-0.30	0.09
198	7.0	-2.30	5.28
199	6.0	-3.30	10.88
200	9.0	-0.30	0.09
	410.0		404.4
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
201	7.0	-2.30	5.28
202	9.0	-0.30	0.09
203	10.0	0.70	0.49
204	8.0	-1.30	1.69
205	8.0	-1.30	1.69
206	8.0	-1.30	1.69
207	9.0	-0.30	0.09
208	7.0	-2.30	5.28
209	7.0	-2.30	5.28
210	12.0	2.70	7.30
211	9.0	-0.30	0.09
212	17.0	7.70	59.31
213	7.0	-2.30	5.28
214	5.0	-4.30	18.48
215	9.0	-0.30	0.09
216	7.0	-2.30	5.28
217	12.0	2.70	7.30
218	12.0	2.70	7.30
219	8.0	-1.30	1.69
220	10.0	0.70	0.49
221	10.0	0.70	0.49
222	9.0	-0.30	0.09
223	9.0	-0.30	0.09
224	6.0	-3.30	10.88
225	6.0	-3.30	10.88
226	4.0	-5.30	28.08
227	16.0	6.70	44.91
228	14.0	4.70	22.10
229	10.0	0.70	0.49
230	5.0	-4.30	18.48
231	8.0	-1.30	1.69
232	10.0	0.70	0.49
233	14.0	4.70	22.10
234	4.0	-5.30	28.08
235	2.0	-7.30	53.27
236	25.0	15.70	246.53
237	13.0	3.70	13.70
238	10.0	0.70	0.49
239	8.0	-1.30	1.69
240	15.0	5.70	32.50
241	16.0	6.70	44.91
242	24.0	14.70	216.13
243	11.0	1.70	2.89
244	11.0	1.70	2.89
245	10.0	0.70	0.49
246	13.0	3.70	13.70
247	13.0	3.70	13.70
248	12.0	2.70	7.30
249	4.0	-5.30	28.08
250	11.0	1.70	2.89
	504.0		1004.2
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
251	12.0	2.70	7.30
252	8.0	-1.30	1.69
253	6.0	-3.30	10.88
254	4.0	-5.30	28.08
255	3.0	-6.30	39.67
256	10.0	0.70	0.49
257	10.0	0.70	0.49
258	4.0	-5.30	28.08
259	9.0	-0.30	0.09
260	10.0	0.70	0.49
261	12.0	2.70	7.30
262	10.0	0.70	0.49
263	12.0	2.70	7.30
264	12.0	2.70	7.30
265	12.0	2.70	7.30
266	10.0	0.70	0.49
267	11.0	1.70	2.89
268	8.0	-1.30	1.69
269	8.0	-1.30	1.69
270	11.0	1.70	2.89
271	13.0	3.70	13.70
272	7.0	-2.30	5.28
273	14.0	4.70	22.10
274	5.0	-4.30	18.48
275	5.0	-4.30	18.48
276	8.0	-1.30	1.69
277	10.0	0.70	0.49
278	10.0	0.70	0.49
279	13.0	3.70	13.70
280	7.0	-2.30	5.28
281	10.0	0.70	0.49
282	4.0	-5.30	28.08
283	12.0	2.70	7.30
284	14.0	4.70	22.10
285	13.0	3.70	13.70
286	6.0	-3.30	10.88
287	6.0	-3.30	10.88
288	8.0	-1.30	1.69
289	7.0	-2.30	5.28
290	6.0	-3.30	10.88
291	6.0	-3.30	10.88
292	7.0	-2.30	5.28
293	13.0	3.70	13.70
294	13.0	3.70	13.70
295	11.0	1.70	2.89
296	6.0	-3.30	10.88
297	6.0	-3.30	10.88
298	8.0	-1.30	1.69
299	13.0	3.70	13.70
300	10.0	0.70	0.49
	453.0		451.7
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
301	11.0	1.70	2.89
302	9.0	-0.30	0.09
303	11.0	1.70	2.89
304	12.0	2.70	7.30
305	14.0	4.70	22.10
306	10.0	0.70	0.49
307	7.0	-2.30	5.28
308	10.0	0.70	0.49
309	0.0	0.00	0.00
310	0.0	0.00	0.00
311	0.0	0.00	0.00
312	0.0	0.00	0.00
313	0.0	0.00	0.00
314	0.0	0.00	0.00
315	0.0	0.00	0.00
316	0.0	0.00	0.00
317	0.0	0.00	0.00
318	0.0	0.00	0.00
319	0.0	0.00	0.00
320	0.0	0.00	0.00
321	0.0	0.00	0.00
322	0.0	0.00	0.00
323	0.0	0.00	0.00
324	0.0	0.00	0.00
325	0.0	0.00	0.00
326	0.0	0.00	0.00
327	0.0	0.00	0.00
328	0.0	0.00	0.00
329	0.0	0.00	0.00
330	0.0	0.00	0.00
331	0.0	0.00	0.00
332	0.0	0.00	0.00
333	0.0	0.00	0.00
334	0.0	0.00	0.00
335	0.0	0.00	0.00
336	0.0	0.00	0.00
337	0.0	0.00	0.00
338	0.0	0.00	0.00
339	0.0	0.00	0.00
340	0.0	0.00	0.00
341	0.0	0.00	0.00
342	0.0	0.00	0.00
343	0.0	0.00	0.00
344	0.0	0.00	0.00
345	0.0	0.00	0.00
346	0.0	0.00	0.00
347	0.0	0.00	0.00
348	0.0	0.00	0.00
349	0.0	0.00	0.00
350	0.0	0.00	0.00
	84.0		41.5
	Sum(n)		Sum(n-N)²

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TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g Th (NAT)

Number	n	(n-N)	$(n-N)^2$
1	1.0	-0.46	0.21
2	1.0	-0.46	0.21
3	1.0	-0.46	0.21
4	1.0	-0.46	0.21
5	1.0	-0.46	0.21
6	1.0	-0.46	0.21
7	2.0	0.54	0.29
8	2.0	0.54	0.29
9	1.0	-0.46	0.21
10	1.0	-0.46	0.21
11	1.0	-0.46	0.21
12	2.0	0.54	0.29
13	2.0	0.54	0.29
14	1.0	-0.46	0.21
15	2.0	0.54	0.29
16	2.0	0.54	0.29
17	1.0	-0.46	0.21
18	1.0	-0.46	0.21
19	1.0	-0.46	0.21
20	1.0	-0.46	0.21
21	2.0	0.54	0.29
22	1.0	-0.46	0.21
23	2.0	0.54	0.29
24	1.0	-0.46	0.21
25	2.0	0.54	0.29
26	1.0	-0.46	0.21
27	1.0	-0.46	0.21
28	2.0	0.54	0.29
29	1.0	-0.46	0.21
30	2.0	0.54	0.29
31	1.0	-0.46	0.21
32	2.0	0.54	0.29
33	1.0	-0.46	0.21
34	2.0	0.54	0.29
35	2.0	0.54	0.29
36	2.0	0.54	0.29
37	1.0	-0.46	0.21
38	1.0	-0.46	0.21
39	1.0	-0.46	0.21
40	2.0	0.54	0.29
41	1.0	-0.46	0.21
42	1.0	-0.46	0.21
43	1.0	-0.46	0.21
44	1.0	-0.46	0.21
45	2.0	0.54	0.29
46	1.0	-0.46	0.21
47	1.0	-0.46	0.21
48	1.0	-0.46	0.21
49	2.0	0.54	0.29
50	1.0	-0.46	0.21
	67		11.953
	71		12.264
	78		12.810
	76		12.654
	77		12.732
	13		2.090
	450.0		76.532
	Sum(n)		$Sum(n-N)^2$

No. of Samples (x) : 308

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.46

Standard Deviation (Sd) = SQRT $[(n-N)^2 \div (x - 1)]$

Standard Deviation: 0.50
2 Std Deviations: 1.00
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.652

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.51 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	307	is calculated as follow:		
EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]				
The (df) value for (X)	307	1.652	95%	

PERFORMED BY: [illegible] DATE: 4-5-99

REVIEWED BY: W.a. Rogers DATE: 4-6-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
51	1.0	-0.46	0.21
52	1.0	-0.46	0.21
53	2.0	0.54	0.29
54	1.0	-0.46	0.21
55	1.0	-0.46	0.21
56	1.0	-0.46	0.21
57	1.0	-0.46	0.21
58	1.0	-0.46	0.21
59	2.0	0.54	0.29
60	2.0	0.54	0.29
61	1.0	-0.46	0.21
62	1.0	-0.46	0.21
63	1.0	-0.46	0.21
64	1.0	-0.46	0.21
65	1.0	-0.46	0.21
66	1.0	-0.46	0.21
67	1.0	-0.46	0.21
68	1.0	-0.46	0.21
69	1.0	-0.46	0.21
70	1.0	-0.46	0.21
71	1.0	-0.46	0.21
72	2.0	0.54	0.29
73	1.0	-0.46	0.21
74	1.0	-0.46	0.21
75	2.0	0.54	0.29
76	1.0	-0.46	0.21
77	2.0	0.54	0.29
78	1.0	-0.46	0.21
79	2.0	0.54	0.29
80	2.0	0.54	0.29
81	2.0	0.54	0.29
82	2.0	0.54	0.29
83	2.0	0.54	0.29
84	1.0	-0.46	0.21
85	1.0	-0.46	0.21
86	2.0	0.54	0.29
87	1.0	-0.46	0.21
88	1.0	-0.46	0.21
89	1.0	-0.46	0.21
90	2.0	0.54	0.29
91	2.0	0.54	0.29
92	1.0	-0.46	0.21
93	2.0	0.54	0.29
94	1.0	-0.46	0.21
95	1.0	-0.46	0.21
96	1.0	-0.46	0.21
97	1.0	-0.46	0.21
98	2.0	0.54	0.29
99	2.0	0.54	0.29
100	1.0	-0.46	0.21
	67		11.953
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
101	1.0	-0.46	0.21
102	1.0	-0.46	0.21
103	2.0	0.54	0.29
104	1.0	-0.46	0.21
105	2.0	0.54	0.29
106	1.0	-0.46	0.21
107	1.0	-0.46	0.21
108	2.0	0.54	0.29
109	1.0	-0.46	0.21
110	1.0	-0.46	0.21
111	2.0	0.54	0.29
112	1.0	-0.46	0.21
113	1.0	-0.46	0.21
114	1.0	-0.46	0.21
115	1.0	-0.46	0.21
116	2.0	0.54	0.29
117	1.0	-0.46	0.21
118	1.0	-0.46	0.21
119	1.0	-0.46	0.21
120	2.0	0.54	0.29
121	1.0	-0.46	0.21
122	2.0	0.54	0.29
123	1.0	-0.46	0.21
124	2.0	0.54	0.29
125	1.0	-0.46	0.21
126	1.0	-0.46	0.21
127	1.0	-0.46	0.21
128	1.0	-0.46	0.21
129	1.0	-0.46	0.21
130	1.0	-0.46	0.21
131	2.0	0.54	0.29
132	1.0	-0.46	0.21
133	1.0	-0.46	0.21
134	1.0	-0.46	0.21
135	2.0	0.54	0.29
136	2.0	0.54	0.29
137	2.0	0.54	0.29
138	2.0	0.54	0.29
139	1.0	-0.46	0.21
140	2.0	0.54	0.29
141	1.0	-0.46	0.21
142	2.0	0.54	0.29
143	2.0	0.54	0.29
144	1.0	-0.46	0.21
145	2.0	0.54	0.29
146	2.0	0.54	0.29
147	2.0	0.54	0.29
148	2.0	0.54	0.29
149	2.0	0.54	0.29
150	1.0	-0.46	0.21
	71		12.264
	Sum(n)		Sum(n-N)²

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TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
151	1.0	-0.46	0.21
152	2.0	0.54	0.29
153	2.0	0.54	0.29
154	1.0	-0.46	0.21
155	2.0	0.54	0.29
156	2.0	0.54	0.29
157	1.0	-0.46	0.21
158	2.0	0.54	0.29
159	2.0	0.54	0.29
160	2.0	0.54	0.29
161	2.0	0.54	0.29
162	1.0	-0.46	0.21
163	1.0	-0.46	0.21
164	1.0	-0.46	0.21
165	1.0	-0.46	0.21
166	2.0	0.54	0.29
167	2.0	0.54	0.29
168	2.0	0.54	0.29
169	2.0	0.54	0.29
170	2.0	0.54	0.29
171	2.0	0.54	0.29
172	1.0	-0.46	0.21
173	1.0	-0.46	0.21
174	2.0	0.54	0.29
175	2.0	0.54	0.29
176	1.0	-0.46	0.21
177	2.0	0.54	0.29
178	2.0	0.54	0.29
179	2.0	0.54	0.29
180	1.0	-0.46	0.21
181	2.0	0.54	0.29
182	1.0	-0.46	0.21
183	2.0	0.54	0.29
184	2.0	0.54	0.29
185	2.0	0.54	0.29
186	1.0	-0.46	0.21
187	1.0	-0.46	0.21
188	2.0	0.54	0.29
189	1.0	-0.46	0.21
190	1.0	-0.46	0.21
191	1.0	-0.46	0.21
192	1.0	-0.46	0.21
193	2.0	0.54	0.29
194	1.0	-0.46	0.21
195	1.0	-0.46	0.21
196	1.0	-0.46	0.21
197	1.0	-0.46	0.21
198	2.0	0.54	0.29
199	2.0	0.54	0.29
200	2.0	0.54	0.29
	78		12.810
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
201	2.0	0.54	0.29
202	2.0	0.54	0.29
203	1.0	-0.46	0.21
204	2.0	0.54	0.29
205	1.0	-0.46	0.21
206	1.0	-0.46	0.21
207	2.0	0.54	0.29
208	1.0	-0.46	0.21
209	2.0	0.54	0.29
210	1.0	-0.46	0.21
211	1.0	-0.46	0.21
212	1.0	-0.46	0.21
213	1.0	-0.46	0.21
214	1.0	-0.46	0.21
215	2.0	0.54	0.29
216	2.0	0.54	0.29
217	2.0	0.54	0.29
218	2.0	0.54	0.29
219	2.0	0.54	0.29
220	1.0	-0.46	0.21
221	2.0	0.54	0.29
222	2.0	0.54	0.29
223	2.0	0.54	0.29
224	1.0	-0.46	0.21
225	1.0	-0.46	0.21
226	1.0	-0.46	0.21
227	1.0	-0.46	0.21
228	1.0	-0.46	0.21
229	1.0	-0.46	0.21
230	1.0	-0.46	0.21
231	2.0	0.54	0.29
232	2.0	0.54	0.29
233	2.0	0.54	0.29
234	1.0	-0.46	0.21
235	1.0	-0.46	0.21
236	1.0	-0.46	0.21
237	2.0	0.54	0.29
238	2.0	0.54	0.29
239	2.0	0.54	0.29
240	2.0	0.54	0.29
241	2.0	0.54	0.29
242	2.0	0.54	0.29
243	2.0	0.54	0.29
244	1.0	-0.46	0.21
245	2.0	0.54	0.29
246	1.0	-0.46	0.21
247	1.0	-0.46	0.21
248	1.0	-0.46	0.21
249	2.0	0.54	0.29
250	2.0	0.54	0.29
	76		12.654
	Sum(n)		Sum(n-N)²

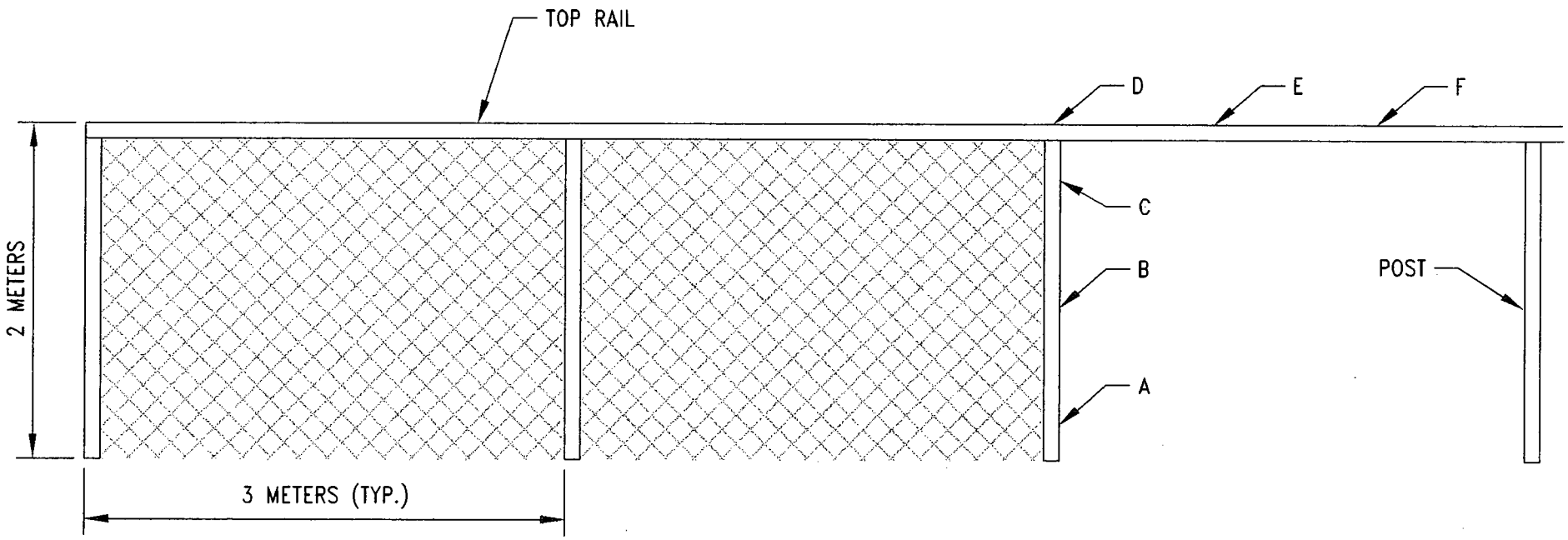
CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PLUTONIUM PLANT YARD (AFFECTED) DEPTH

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
251	2.0	0.54	0.29
252	2.0	0.54	0.29
253	1.0	-0.46	0.21
254	1.0	-0.46	0.21
255	1.0	-0.46	0.21
256	1.0	-0.46	0.21
257	1.0	-0.46	0.21
258	2.0	0.54	0.29
259	1.0	-0.46	0.21
260	2.0	0.54	0.29
261	2.0	0.54	0.29
262	2.0	0.54	0.29
263	1.0	-0.46	0.21
264	2.0	0.54	0.29
265	1.0	-0.46	0.21
266	1.0	-0.46	0.21
267	1.0	-0.46	0.21
268	1.0	-0.46	0.21
269	2.0	0.54	0.29
270	2.0	0.54	0.29
271	1.0	-0.46	0.21
272	2.0	0.54	0.29
273	2.0	0.54	0.29
274	1.0	-0.46	0.21
275	1.0	-0.46	0.21
276	2.0	0.54	0.29
277	2.0	0.54	0.29
278	1.0	-0.46	0.21
279	1.0	-0.46	0.21
280	2.0	0.54	0.29
281	1.0	-0.46	0.21
282	2.0	0.54	0.29
283	1.0	-0.46	0.21
284	2.0	0.54	0.29
285	1.0	-0.46	0.21
286	2.0	0.54	0.29
287	1.0	-0.46	0.21
288	2.0	0.54	0.29
289	2.0	0.54	0.29
290	2.0	0.54	0.29
291	1.0	-0.46	0.21
292	1.0	-0.46	0.21
293	2.0	0.54	0.29
294	2.0	0.54	0.29
295	2.0	0.54	0.29
296	2.0	0.54	0.29
297	2.0	0.54	0.29
298	1.0	-0.46	0.21
299	2.0	0.54	0.29
300	2.0	0.54	0.29
	77		12.732
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
301	2.0	0.54	0.29
302	2.0	0.54	0.29
303	2.0	0.54	0.29
304	2.0	0.54	0.29
305	2.0	0.54	0.29
306	1.0	-0.46	0.21
307	1.0	-0.46	0.21
308	1.0	-0.46	0.21
309	0.0	0.00	0.00
310	0.0	0.00	0.00
311	0.0	0.00	0.00
312	0.0	0.00	0.00
313	0.0	0.00	0.00
314	0.0	0.00	0.00
315	0.0	0.00	0.00
316	0.0	0.00	0.00
317	0.0	0.00	0.00
318	0.0	0.00	0.00
319	0.0	0.00	0.00
320	0.0	0.00	0.00
321	0.0	0.00	0.00
322	0.0	0.00	0.00
323	0.0	0.00	0.00
324	0.0	0.00	0.00
325	0.0	0.00	0.00
326	0.0	0.00	0.00
327	0.0	0.00	0.00
328	0.0	0.00	0.00
329	0.0	0.00	0.00
330	0.0	0.00	0.00
331	0.0	0.00	0.00
332	0.0	0.00	0.00
333	0.0	0.00	0.00
334	0.0	0.00	0.00
335	0.0	0.00	0.00
336	0.0	0.00	0.00
337	0.0	0.00	0.00
338	0.0	0.00	0.00
339	0.0	0.00	0.00
340	0.0	0.00	0.00
341	0.0	0.00	0.00
342	0.0	0.00	0.00
343	0.0	0.00	0.00
344	0.0	0.00	0.00
345	0.0	0.00	0.00
346	0.0	0.00	0.00
347	0.0	0.00	0.00
348	0.0	0.00	0.00
349	0.0	0.00	0.00
350	0.0	0.00	0.00
	13		2.090
	Sum(n)		Sum(n-N)²



CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
TYPICAL SURVEY PATTERN OF FENCING

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY JE	DATE 5-22-99	SCALE: NONE
JOB NO.	DRAWING NO. FNC-SURVEY	REV. 0

...SUBAREA1\FEATURES\FNC-SURVEY

SUB-AREA E

SUB-AREA H

SUB-AREA I

PLUTONIUM BUILDING

PAVED AREA

GRAVEL DRIVE

GRASS

ELEVATED LOCATION IN UNAFFECTED AREA

SEPTIC TANK

LIGHT POLE

(290N, 54W) (290N, 43W) (290N, 30W) (290N, 17W) (290N, 6W) (290N, 6E) (290N, 15E) (290N, 25E) (290N, 28E)

(289N, 54W) (289N, 14W) (289N, 21E)

(287N, 25E) (285N, 28E) (285N, 25E)

(281N, 54W) (269N, 54W) (259N, 54W) (250N, 54W) (244N, 54W) (239N, 54W) (228N, 54W) (218N, 54W) (204N, 54W) (198N, 54W) (193N, 54W) (189N, 54W) (189N, 45W) (189N, 33W) (189N, 28W) (189N, 21W) (189N, 12W) (190N, 10W) (190N, 2E) (190N, 15E) (190N, 25E) (190N, 33E)

(271N, 25E) (260N, 25E) (248N, 25E) (236N, 21E) (235N, 25E) (223N, 25E) (214N, 25E) (202N, 25E) (202N, 21E) (193N, 25E)

(199N, 11W) (194N, 11W) (191N, -7E) (191N, 7E) (191N, 22E)

LEGEND:

PU YARD FENCE

10 0 10

SCALE IN METERS

NORTH

	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
PU YARD - AFFECTED FENCES

DRWN. BY	DATE	SCALE:
JE	6-1-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUS-1	0

...SUBAREAI\FEATURES\FNC-PU-YARD

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	54	W	-	189	N	1A	99	897	0	0
2	54	W	-	189	N	1B	44	1196	0	0
3	54	W	-	189	N	1C	165	874	0	0
4	54	W	-	189	N	1D	187	1978	0	0
5	54	W	-	189	N	1E	209	2001	4	24
6	54	W	-	189	N	1F	187	2047	4	0
7	54	W	-	191	N	1A	143	874	0	3
8	54	W	-	191	N	1B	231	1196	0	5
9	54	W	-	191	N	1C	220	1840	2	3
10	54	W	-	191	N	1D	198	1564	4	7
11	54	W	-	191	N	1E	176	1702	0	8
12	54	W	-	191	N	1F	77	1104	0	3
13	54	W	-	192	N	1A	165	184	0	0
14	54	W	-	192	N	1B	132	644	0	3
15	54	W	-	192	N	1C	121	552	2	0
16	54	W	-	192	N	1A	121	1012	0	0
17	54	W	-	192	N	1B	121	0	2	0
18	54	W	-	192	N	1C	242	1058	2	0
19	54	W	-	192	N	1D	242	1158	2	3
20	54	W	-	192	N	1E	165	1242	4	0
21	54	W	-	192	N	1F	242	1311	2	0
22	54	W	-	193	N	1A	121	713	0	0
23	54	W	-	193	N	1B	143	782	0	0
24	54	W	-	193	N	1C	77	460	2	0
25	54	W	-	193	N	1A	187	736	0	0
26	54	W	-	193	N	1B	165	483	0	8
27	54	W	-	193	N	1C	165	1426	0	0
28	54	W	-	193	N	1D	253	1219	0	0
29	54	W	-	193	N	1E	99	1748	0	3
30	54	W	-	193	N	1F	220	1081	0	8

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	54	W	-	194	N	1A	286	529	4	0
32	54	W	-	194	N	1B	462	1357	2	0
33	54	W	-	194	N	1C	341	1081	2	0
34	54	W	-	194	N	1D	264	1817	2	10
35	54	W	-	194	N	1E	363	805	0	8
36	54	W	-	194	N	1F	407	414	0	0
37	54	W	-	197	N	1A	429	989	4	0
38	54	W	-	197	N	1B	418	667	2	10
39	54	W	-	197	N	1C	528	1265	2	0
40	54	W	-	197	N	1D	275	1564	0	0
41	54	W	-	197	N	1E	550	1173	4	0
42	54	W	-	197	N	1F	275	1863	0	5
43	54	W	-	200	N	1A	308	943	0	5
44	54	W	-	200	N	1B	407	1587	0	3
45	54	W	-	200	N	1C	781	2047	2	0
46	54	W	-	200	N	1D	407	1035	4	0
47	54	W	-	200	N	1E	363	2760	2	0
48	54	W	-	200	N	1F	495	1656	0	0
49	54	W	-	204	N	1A	264	759	2	0
50	54	W	-	204	N	1B	506	1518	2	0
51	54	W	-	204	N	1C	715	1495	4	7
52	54	W	-	204	N	1D	506	1564	7	12
53	54	W	-	204	N	1E	561	1748	2	0
54	54	W	-	204	N	1F	429	2668	0	10
55	54	W	-	207	N	1A	352	1035	2	0
56	54	W	-	207	N	1B	440	943	2	5
57	54	W	-	207	N	1C	594	736	7	0
58	54	W	-	207	N	1D	484	1242	7	7
59	54	W	-	207	N	1E	517	2162	4	2
60	54	W	-	207	N	1F	649	1725	2	12

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Boyer DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
61	54	W	-	211	N	1A	264	989	2	0
62	54	W	-	211	N	1B	539	713	2	5
63	54	W	-	211	N	1C	616	1541	0	3
64	54	W	-	211	N	1D	330	1173	4	2
65	54	W	-	211	N	1E	539	1909	2	0
66	54	W	-	211	N	1F	440	1196	7	5
67	54	W	-	213	N	1A	451	667	2	0
68	54	W	-	213	N	1B	748	322	2	5
69	54	W	-	213	N	1C	704	575	7	0
70	54	W	-	213	N	1D	418	874	2	3
71	54	W	-	213	N	1E	484	575	4	5
72	54	W	-	213	N	1F	473	759	10	0
73	54	W	-	215	N	1A	176	575	4	0
74	54	W	-	215	N	1B	297	345	4	10
75	54	W	-	215	N	1C	396	1426	4	0
76	54	W	-	215	N	1D	440	897	12	0
77	54	W	-	215	N	1E	627	897	2	3
78	54	W	-	215	N	1F	308	897	7	10
79	54	W	-	218	N	1A	286	874	0	0
80	54	W	-	218	N	1B	374	506	2	5
81	54	W	-	218	N	1C	1001	92	0	10
82	54	W	-	218	N	1D	396	966	7	5
83	54	W	-	218	N	1E	308	1081	4	0
84	54	W	-	218	N	1F	297	1150	4	10
85	54	W	-	218	N	1A	374	575	2	0
86	54	W	-	222	N	1B	330	345	4	0
87	54	W	-	222	N	1C	495	782	4	0
88	54	W	-	222	N	1D	462	920	0	3
89	54	W	-	222	N	1E	275	1656	4	2
90	54	W	-	222	N	1F	495	989	0	10

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Bogen DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
91	54	W	-	225	N	1A	396	759	2	0
92	54	W	-	225	N	1B	418	759	0	0
93	54	W	-	225	N	1C	297	1403	2	10
94	54	W	-	225	N	1D	242	897	4	15
95	54	W	-	225	N	1E	231	805	4	0
96	54	W	-	225	N	1F	528	1633	0	0
97	54	W	-	228	N	1A	187	92	0	5
98	54	W	-	228	N	1B	121	826	2	0
99	54	W	-	228	N	1C	319	437	0	0
100	54	W	-	228	N	1A	330	345	0	0
101	54	W	-	228	N	1B	297	506	2	5
102	54	W	-	228	N	1C	319	920	2	3
103	54	W	-	228	N	1D	77	0	0	0
104	54	W	-	228	N	1E	308	1516	2	0
105	54	W	-	228	N	1F	176	1725	0	0
106	54	W	-	229	N	1A	319	0	2	0
107	54	W	-	229	N	1B	231	598	2	0
108	54	W	-	229	N	1C	220	299	0	0
109	54	W	-	229	N	1A	363	1081	2	3
110	54	W	-	229	N	1B	209	184	2	3
111	54	W	-	229	N	1C	286	966	4	2
112	54	W	-	229	N	1D	429	1725	4	0
113	54	W	-	229	N	1E	306	1173	2	0
114	54	W	-	229	N	1F	242	1196	0	0
115	54	W	-	232	N	1A	275	874	0	0
116	54	W	-	232	N	1B	425	322	0	3
117	54	W	-	232	N	1C	231	1150	0	0
118	54	W	-	232	N	1D	374	828	4	2
119	54	W	-	232	N	1E	770	943	0	0
120	54	W	-	232	N	1F	352	1035	2	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
121	54	W	-	235	N	1A	429	92	0	5
122	54	W	-	235	N	1B	297	1219	0	0
123	54	W	-	235	N	1C	440	1081	0	0
124	54	W	-	235	N	1D	308	115	2	0
125	54	W	-	235	N	1E	286	1150	0	5
126	54	W	-	235	N	1F	319	1150	2	0
127	54	W	-	239	N	1A	264	368	2	0
128	54	W	-	239	N	1B	253	253	4	5
129	54	W	-	239	N	1C	275	184	2	5
130	54	W	-	239	N	1D	231	1541	2	0
131	54	W	-	239	N	1E	297	1311	0	0
132	54	W	-	239	N	1F	341	1495	0	8
133	54	W	-	241	N	1A	352	322	2	3
134	54	W	-	241	N	1B	605	690	0	0
135	54	W	-	241	N	1C	275	690	0	0
136	54	W	-	241	N	1D	330	1610	0	8
137	54	W	-	241	N	1E	286	759	4	2
138	54	W	-	241	N	1F	242	1242	0	0
139	54	W	-	244	N	1A	132	460	2	0
140	54	W	-	244	N	1B	132	805	0	0
141	54	W	-	244	N	1C	407	460	4	0
142	54	W	-	244	N	1D	253	253	0	3
143	54	W	-	244	N	1E	407	1058	2	0
144	54	W	-	244	N	1F	385	1035	0	0
145	54	W	-	247	N	1A	253	552	0	0
146	54	W	-	247	N	1B	209	391	0	3
147	54	W	-	247	N	1C	352	230	2	0
148	54	W	-	247	N	1D	825	1012	2	0
149	54	W	-	247	N	1E	286	782	2	10
150	54	W	-	247	N	1F	473	1219	0	8

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
151	54	W	-	250	N	1A	198	920	2	0
152	54	W	-	250	N	1B	253	161	0	0
153	54	W	-	250	N	1C	286	460	0	3
154	54	W	-	250	N	1D	385	1104	0	5
155	54	W	-	250	N	1E	363	989	0	0
156	54	W	-	250	N	1F	638	1380	0	3
157	54	W	-	254	N	1A	220	345	0	10
158	54	W	-	254	N	1B	297	437	0	0
159	54	W	-	254	N	1C	451	207	0	0
160	54	W	-	254	N	1D	264	1242	0	3
161	54	W	-	254	N	1E	363	1104	0	5
162	54	W	-	254	N	1F	297	828	0	3
163	54	W	-	257	N	1A	165	299	2	5
164	54	W	-	257	N	1B	220	138	0	5
165	54	W	-	257	N	1C	341	1035	0	3
166	54	W	-	257	N	1D	264	667	2	3
167	54	W	-	257	N	1E	264	828	2	10
168	54	W	-	257	N	1F	286	1242	7	2
169	54	W	-	259	N	1A	143	115	0	3
170	54	W	-	259	N	1B	418	0	0	5
171	54	W	-	259	N	1C	165	184	0	5
172	54	W	-	259	N	1A	341	46	2	0
173	54	W	-	259	N	1B	297	276	2	0
174	54	W	-	259	N	1C	319	805	0	3
175	54	W	-	259	N	1D	143	0	0	0
176	54	W	-	259	N	1E	319	897	2	5
177	54	W	-	259	N	1F	308	1426	0	8
178	54	W	-	260	N	1A	132	437	0	3
179	54	W	-	260	N	1B	352	0	2	0
180	54	W	-	260	N	1C	264	575	0	8

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
181	54	W	-	260	N	1A	187	115	2	0
182	54	W	-	260	N	1B	132	0	4	0
183	54	W	-	260	N	1C	253	92	0	0
184	54	W	-	260	N	1D	473	552	4	7
185	54	W	-	260	N	1E	715	1127	4	2
186	54	W	-	260	N	1F	517	1104	0	8
187	54	W	-	263	N	1A	407	345	2	0
188	54	W	-	263	N	1B	385	299	0	0
189	54	W	-	263	N	1C	374	391	0	8
190	54	W	-	263	N	1D	319	1495	2	0
191	54	W	-	263	N	1E	275	575	4	0
192	54	W	-	263	N	1F	275	759	10	0
193	54	W	-	266	N	1A	418	92	0	5
194	54	W	-	266	N	1B	429	23	0	0
195	54	W	-	266	N	1C	506	621	2	0
196	54	W	-	266	N	1D	220	1173	15	0
197	54	W	-	266	N	1E	220	0	2	5
198	54	W	-	266	N	1F	330	828	0	0
199	54	W	-	269	N	1A	286	138	0	8
200	54	W	-	269	N	1B	671	0	0	0
201	54	W	-	269	N	1C	594	253	0	3
202	54	W	-	269	N	1D	308	1012	0	0
203	54	W	-	269	N	1E	616	759	0	5
204	54	W	-	269	N	1F	231	667	0	8
205	54	W	-	272	N	1A	319	299	0	0
206	54	W	-	272	N	1B	330	92	0	3
207	54	W	-	272	N	1C	814	759	0	5
208	54	W	-	272	N	1D	253	575	0	0
209	54	W	-	272	N	1E	583	736	7	0
210	54	W	-	272	N	1F	275	1242	7	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Agera DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
211	54	W	-	275	N	1A	231	0	0	0
212	54	W	-	275	N	1B	220	0	4	5
213	54	W	-	275	N	1C	363	483	0	3
214	54	W	-	275	N	1D	374	1104	0	5
215	54	W	-	275	N	1E	770	805	4	5
216	54	W	-	275	N	1F	407	1173	2	8
217	54	W	-	278	N	1A	275	0	0	5
218	54	W	-	278	N	1B	363	1288	0	3
219	54	W	-	278	N	1C	517	161	2	3
220	54	W	-	278	N	1D	264	1081	0	0
221	54	W	-	278	N	1E	847	0	0	5
222	54	W	-	278	N	1F	308	920	0	0
223	54	W	-	281	N	1A	253	161	0	10
224	54	W	-	281	N	1B	231	0	2	0
225	54	W	-	281	N	1C	484	368	2	3
226	54	W	-	281	N	1D	330	621	4	0
227	54	W	-	281	N	1E	253	414	4	7
228	54	W	-	281	N	1F	286	759	0	0
229	54	W	-	284	N	1A	429	345	0	3
230	54	W	-	284	N	1B	583	0	0	0
231	54	W	-	284	N	1C	242	230	2	5
232	54	W	-	284	N	1D	352	897	0	0
233	54	W	-	284	N	1E	275	851	7	5
234	54	W	-	284	N	1F	286	667	0	5
235	54	W	-	287	N	1A	132	460	2	0
236	54	W	-	287	N	1B	154	0	2	3
237	54	W	-	287	N	1C	242	575	0	3
238	54	W	-	287	N	1D	352	690	0	13
239	54	W	-	287	N	1E	231	782	2	3
240	54	W	-	287	N	1F	275	713	4	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
241	54	W	-	290	N	1A	240	0	0	0
242	54	W	-	290	N	1B	468	0	0	0
243	54	W	-	290	N	1C	312	23	0	0
244	54	W	-	290	N	1D	276	828	2	5
245	54	W	-	290	N	1E	456	1127	9	19
246	54	W	-	290	N	1F	264	1173	0	5
247	52	W	-	290	N	1A	348	529	0	5
248	52	W	-	290	N	1B	672	0	0	0
249	52	W	-	290	N	1C	396	759	0	0
250	52	W	-	290	N	1D	348	161	5	0
251	52	W	-	290	N	1E	396	943	2	3
252	52	W	-	290	N	1F	312	69	4	7
253	49	W	-	290	N	1A	408	92	2	3
254	49	W	-	290	N	1B	660	874	0	5
255	49	W	-	290	N	1C	516	414	7	2
256	49	W	-	290	N	1D	300	713	2	0
257	49	W	-	290	N	1E	288	1127	7	14
258	49	W	-	290	N	1F	240	1196	0	0
259	46	W	-	290	N	1A	300	322	7	2
260	46	W	-	290	N	1B	264	184	2	3
261	46	W	-	290	N	1C	300	759	2	15
262	46	W	-	290	N	1D	276	667	2	5
263	46	W	-	290	N	1E	228	621	4	2
264	46	W	-	290	N	1F	252	483	0	3
265	43	W	-	290	N	1A	504	437	0	0
266	43	W	-	290	N	1B	612	782	2	0
267	43	W	-	290	N	1C	492	713	0	3
268	43	W	-	290	N	1D	300	943	2	0
269	43	W	-	290	N	1E	276	437	2	3
270	43	W	-	290	N	1F	360	966	0	3

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. E. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
271	40	W	-	290	N	1A	180	115	2	0
272	40	W	-	290	N	1B	312	368	2	7
273	40	W	-	290	N	1C	372	1012	2	0
274	40	W	-	290	N	1D	348	1104	0	5
275	40	W	-	290	N	1E	384	1288	2	7
276	40	W	-	290	N	1F	420	621	2	7
277	37	W	-	290	N	1A	336	368	0	0
278	37	W	-	290	N	1B	348	46	0	3
279	37	W	-	290	N	1C	552	184	2	0
280	37	W	-	290	N	1D	336	1127	2	0
281	37	W	-	290	N	1E	408	1196	2	5
282	37	W	-	290	N	1F	456	1196	0	3
283	33	W	-	290	N	1A	336	3174	2	0
284	33	W	-	290	N	1B	804	736	2	3
285	33	W	-	290	N	1C	672	713	2	3
286	33	W	-	290	N	1D	552	621	2	7
287	33	W	-	290	N	1E	576	1449	0	3
288	33	W	-	290	N	1F	636	1334	2	7
289	30	W	-	290	N	1A	456	460	0	3
290	30	W	-	290	N	1B	384	322	0	3
291	30	W	-	290	N	1C	540	828	0	0
292	30	W	-	290	N	1D	624	1380	7	2
293	30	W	-	290	N	1E	468	1541	0	3
294	30	W	-	290	N	1F	540	1817	0	10
295	27	W	-	290	N	1A	348	46	2	0
296	27	W	-	290	N	1B	264	92	0	3
297	27	W	-	290	N	1C	456	1242	0	0
298	27	W	-	290	N	1D	456	2070	7	5
299	27	W	-	290	N	1E	504	1334	7	0
300	27	W	-	290	N	1F	408	1748	2	10

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-98

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
301	24	W	-	290	N	1A	156	0	0	0
302	24	W	-	290	N	1B	120	207	5	0
303	24	W	-	290	N	1C	156	506	0	3
304	24	W	-	290	N	1D	456	2139	2	5
305	24	W	-	290	N	1E	396	851	2	0
306	24	W	-	290	N	1F	396	2024	4	2
307	20	W	-	290	N	1A	324	414	0	0
308	20	W	-	290	N	1B	348	1265	0	3
309	20	W	-	290	N	1C	348	713	4	5
310	20	W	-	290	N	1D	396	1495	7	0
311	20	W	-	290	N	1E	512	2392	0	3
312	20	W	-	290	N	1F	528	1909	5	0
313	17	W	-	290	N	1A	384	736	4	2
314	17	W	-	290	N	1B	456	460	4	7
315	17	W	-	290	N	1C	636	897	2	0
316	17	W	-	290	N	1D	492	2070	0	0
317	17	W	-	290	N	1E	600	1587	4	9
318	17	W	-	290	N	1F	384	1265	2	2
319	14	W	-	290	N	1A	360	1242	0	0
320	14	W	-	290	N	1B	612	943	2	4
321	14	W	-	290	N	1C	816	1081	0	0
322	14	W	-	290	N	1D	528	1311	4	0
323	14	W	-	290	N	1E	576	1886	7	4
324	14	W	-	290	N	1F	828	1610	0	9
325	12	W	-	290	N	1A	552	1702	2	4
326	12	W	-	290	N	1B	684	1771	7	0
327	12	W	-	290	N	1C	972	1840	0	0
328	12	W	-	290	N	1D	492	139	4	9
329	12	W	-	290	N	1E	492	1863	4	0
330	12	W	-	290	N	1F	468	2116	2	2

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
331	9	W	-	290	N	1A	852	1472	0	2
332	9	W	-	290	N	1B	852	1403	2	2
333	9	W	-	290	N	1C	1008	966	2	0
334	9	W	-	290	N	1D	528	2070	0	0
335	9	W	-	290	N	1E	444	1794	7	0
336	9	W	-	290	N	1F	288	1219	4	9
337	6	W	-	290	N	1A	708	828	0	2
338	6	W	-	290	N	1B	1284	1702	4	4
339	6	W	-	290	N	1C	1404	1804	0	2
340	6	W	-	290	N	1D	348	2254	7	2
341	6	W	-	290	N	1E	396	1541	4	9
342	6	W	-	290	N	1F	300	736	0	0
343	3	W	-	290	N	1A	204	207	0	5
344	3	W	-	290	N	1B	360	483	2	7
345	3	W	-	290	N	1C	288	437	4	7
346	3	W	-	290	N	1D	900	1380	4	11
347	3	W	-	290	N	1E	1008	2139	9	23
348	3	W	-	290	N	1F	852	2369	2	12
349	0	E	-	290	N	1A	780	322	4	11
350	0	E	-	290	N	1B	1248	1702	4	0
351	0	E	-	290	N	1C	1152	1587	10	0
352	0	E	-	290	N	1D	504	2139	12	4
353	0	E	-	290	N	1E	420	1748	0	9
354	0	E	-	290	N	1F	492	1426	7	0
355	3	E	-	290	N	1A	564	1012	0	0
356	3	E	-	290	N	1B	672	644	4	9
357	3	E	-	290	N	1C	480	1472	7	9
358	3	E	-	290	N	1D	552	2185	2	7
359	3	E	-	290	N	1E	660	2507	0	9
360	3	E	-	290	N	1F	516	1840	4	4

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
361	6	E	-	290	N	1A	588	575	7	0
362	6	E	-	290	N	1B	576	1242	9	9
363	6	E	-	290	N	1C	552	1219	7	2
364	6	E	-	290	N	1D	396	1196	4	0
365	6	E	-	290	N	1E	492	1725	7	6
366	6	E	-	290	N	1F	432	1426	4	0
367	9	E	-	290	N	1A	600	736	0	0
368	9	E	-	290	N	1B	624	1012	7	2
369	9	E	-	290	N	1C	684	851	4	4
370	9	E	-	290	N	1D	432	1955	7	6
371	9	E	-	290	N	1E	684	943	9	9
372	9	E	-	290	N	1F	432	1817	7	0
373	12	E	-	290	N	1A	816	1058	2	0
374	12	E	-	290	N	1B	936	920	4	0
375	12	E	-	290	N	1C	828	1863	0	0
376	12	E	-	290	N	1D	588	1955	4	16
377	12	E	-	290	N	1E	336	667	2	0
378	12	E	-	290	N	1F	288	2231	2	2
379	15	E	-	290	N	1A	564	161	4	2
380	15	E	-	290	N	1B	768	989	4	7
381	15	E	-	290	N	1C	408	1541	4	2
382	15	E	-	290	N	1D	348	1909	4	7
383	15	E	-	290	N	1E	552	1357	2	9
384	15	E	-	290	N	1F	576	1633	0	0
385	18	E	-	290	N	1A	240	506	0	5
386	18	E	-	290	N	1B	444	782	2	0
387	18	E	-	290	N	1C	624	299	0	0
388	18	E	-	290	N	1D	528	1495	0	3
389	18	E	-	290	N	1E	372	1633	2	3
390	18	E	-	290	N	1F	216	1081	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
391	22	E	-	290	N	1A	420	575	0	5
392	22	E	-	290	N	1B	432	1035	0	0
393	22	E	-	290	N	1C	792	828	2	0
394	22	E	-	290	N	1D	240	1863	0	0
395	22	E	-	290	N	1E	300	1196	2	3
396	22	E	-	290	N	1F	336	2323	0	3
397	25	E	-	290	N	1A	204	253	2	0
398	25	E	-	290	N	1B	180	0	0	0
399	25	E	-	290	N	1C	108	598	2	0
400	25	E	-	290	N	1D	2808	3703	0	8
401	25	E	-	290	N	1E	2292	4209	2	0
402	25	E	-	290	N	1F	2496	4117	4	0
403	28	E	-	290	N	1A	96	69	2	3
404	28	E	-	290	N	1B	204	690	0	5
405	28	E	-	290	N	1C	216	644	0	5
406	51	W	-	189	N	1A	143	644	0	3
407	51	W	-	189	N	1B	209	713	0	0
408	51	W	-	189	N	1C	176	621	0	0
409	51	W	-	189	N	1D	264	1012	2	15
410	51	W	-	189	N	1E	319	1380	0	0
411	51	W	-	189	N	1F	352	1426	2	3
412	48	W	-	189	N	1A	165	713	0	3
413	48	W	-	189	N	1B	132	782	0	0
414	48	W	-	189	N	1C	143	736	0	3
415	48	W	-	189	N	1D	330	1081	2	7
416	48	W	-	189	N	1E	308	414	7	0
417	48	W	-	189	N	1F	539	1035	0	3
418	45	W	-	189	N	1A	187	92	0	0
419	45	W	-	189	N	1B	121	0	0	0
420	45	W	-	189	N	1C	132	0	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
421	45	W	-	189	N	1D	429	138	0	0
422	45	W	-	189	N	1E	374	23	0	0
423	45	W	-	189	N	1F	341	0	2	0
424	42	W	-	189	N	1A	121	0	2	0
425	42	W	-	189	N	1B	154	253	0	0
426	42	W	-	189	N	1C	176	621	0	0
427	42	W	-	189	N	1D	495	1817	2	3
428	42	W	-	189	N	1E	352	1909	0	5
429	42	W	-	189	N	1F	297	1932	0	3
430	39	W	-	189	N	1A	220	437	2	0
431	39	W	-	189	N	1B	176	598	0	0
432	39	W	-	189	N	1C	187	92	2	0
433	39	W	-	189	N	1D	308	1840	0	0
434	39	W	-	189	N	1E	198	1081	0	0
435	39	W	-	189	N	1F	286	1840	0	0
436	36	W	-	189	N	1A	209	1081	0	3
437	36	W	-	189	N	1B	121	483	4	2
438	36	W	-	189	N	1C	132	690	2	5
439	36	W	-	189	N	1D	231	1058	0	0
440	36	W	-	189	N	1E	187	1265	2	0
441	36	W	-	189	N	1F	154	1012	0	0
442	33	W	-	189	N	1A	165	598	5	0
443	33	W	-	189	N	1B	88	621	2	0
444	33	W	-	189	N	1C	154	253	0	0
445	33	W	-	189	N	1A	44	322	2	0
446	33	W	-	189	N	1B	132	92	0	0
447	33	W	-	189	N	1C	110	483	0	0
448	33	W	-	189	N	1D	110	1035	0	0
449	33	W	-	189	N	1E	143	1242	0	3
450	33	W	-	189	N	1F	121	897	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
451	31	W	-	189	N	1A	132	184	2	0
452	31	W	-	189	N	1B	143	92	0	10
453	31	W	-	189	N	1C	88	1150	0	5
454	31	W	-	189	N	1A	198	184	0	3
455	31	W	-	189	N	1B	121	253	0	0
456	31	W	-	189	N	1C	165	184	0	0
457	31	W	-	189	N	1D	77	161	0	3
458	31	W	-	189	N	1E	121	506	0	0
459	31	W	-	189	N	1F	99	368	0	3
460	28	W	-	189	N	1A	154	483	0	3
461	28	W	-	189	N	1B	99	276	0	0
462	28	W	-	189	N	1C	110	759	0	0
463	28	W	-	189	N	1A	99	0	0	0
464	28	W	-	189	N	1B	44	0	0	0
465	28	W	-	189	N	1C	110	276	4	2
466	28	W	-	189	N	1D	99	1081	0	0
467	28	W	-	189	N	1E	165	1610	2	0
468	28	W	-	189	N	1F	209	1357	0	0
469	24	W	-	189	N	1A	176	1035	0	5
470	24	W	-	189	N	1B	110	483	0	0
471	24	W	-	189	N	1C	176	736	0	0
472	24	W	-	189	N	1D	187	828	5	0
473	24	W	-	189	N	1E	187	1081	0	3
474	24	W	-	189	N	1F	264	897	2	3
475	21	W	-	189	N	1A	77	805	0	8
476	21	W	-	189	N	1B	121	598	2	0
477	21	W	-	189	N	1C	132	391	2	3
478	21	W	-	189	N	1D	176	874	0	0
479	21	W	-	189	N	1E	154	1242	2	5
480	21	W	-	189	N	1F	374	1587	2	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
481	18	W	-	189	N	1A	99	552	0	0
482	18	W	-	189	N	1B	55	276	0	5
483	18	W	-	189	N	1C	88	299	0	0
484	18	W	-	189	N	1A	858	1150	5	0
485	18	W	-	189	N	1B	1001	1012	0	0
486	18	W	-	189	N	1C	539	2024	0	3
487	18	W	-	189	N	1D	759	1127	2	0
488	18	W	-	189	N	1E	297	943	2	0
489	18	W	-	189	N	1F	220	857	0	8
490	17	W	-	189	N	1A	187	1472	2	3
491	17	W	-	189	N	1B	484	1150	0	0
492	17	W	-	189	N	1C	715	805	0	8
493	17	W	-	189	N	1A	99	0	0	5
494	17	W	-	189	N	1B	88	184	2	3
495	17	W	-	189	N	1C	77	437	5	0
496	17	W	-	189	N	1A	187	506	0	3
497	17	W	-	189	N	1B	110	299	0	5
498	17	W	-	189	N	1C	77	621	0	0
499	17	W	-	189	N	1D	308	828	0	0
500	17	W	-	189	N	1E	341	989	0	3
501	17	W	-	189	N	1F	286	1564	0	0
502	16	W	-	189	N	1A	121	667	0	0
503	16	W	-	189	N	1B	110	276	0	0
504	16	W	-	189	N	1C	77	667	0	0
505	16	W	-	189	N	1A	33	46	0	0
506	16	W	-	189	N	1B	55	207	4	5
507	16	W	-	189	N	1C	88	0	0	0
508	16	W	-	189	N	1D	539	1817	2	0
509	16	W	-	189	N	1E	616	1679	2	0
510	16	W	-	189	N	1F	682	1058	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
511	12	W	-	189	N	1A	44	138	5	0
512	12	W	-	189	N	1B	66	161	0	12
513	12	W	-	189	N	1C	88	0	0	5
514	12	W	-	189	N	1D	110	782	0	0
515	12	W	-	189	N	1E	33	554	2	0
516	12	W	-	189	N	1F	176	46	0	3
517	10	W	-	190	N	1A	132	0	0	0
518	10	W	-	190	N	1B	44	0	2	5
519	10	W	-	190	N	1C	77	0	0	3
520	10	W	-	190	N	1D	154	1794	0	3
521	10	W	-	190	N	1E	154	0	0	3
522	10	W	-	190	N	1F	110	1748	2	0
523	7	W	-	191	N	1A	66	161	0	0
524	7	W	-	191	N	1B	132	184	2	0
525	7	W	-	191	N	1C	110	506	2	0
526	7	W	-	191	N	1D	165	1150	10	2
527	7	W	-	191	N	1E	396	1219	2	7
528	7	W	-	191	N	1F	429	1288	2	10
529	5	W	-	191	N	1A	77	138	0	0
530	5	W	-	191	N	1B	66	0	2	12
531	5	W	-	191	N	1C	66	92	0	0
532	5	W	-	191	N	1D	429	1242	2	12
533	5	W	-	191	N	1E	253	1265	0	8
534	5	W	-	191	N	1F	385	1173	4	22
535	1	W	-	191	N	1A	99	460	5	0
536	1	W	-	191	N	1B	121	230	10	0
537	1	W	-	191	N	1C	187	207	0	3
538	1	W	-	191	N	1D	231	1403	4	5
539	1	W	-	191	N	1E	154	1495	2	0
540	1	W	-	191	N	1F	187	828	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Boyer DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
541	1	E	-	191	N	1A	198	0	2	3
542	1	E	-	191	N	1B	216	0	2	3
543	1	E	-	191	N	1C	204	46	5	0
544	1	E	-	191	N	1D	168	1403	2	0
545	1	E	-	191	N	1E	108	828	2	5
546	1	E	-	191	N	1F	240	1403	2	0
547	4	E	-	191	N	1A	108	46	2	0
548	4	E	-	191	N	1B	168	138	0	3
549	4	E	-	191	N	1C	288	690	2	0
550	4	E	-	191	N	1D	192	299	0	0
551	4	E	-	191	N	1E	180	1403	0	10
552	4	E	-	191	N	1F	108	874	0	10
553	7	E	-	191	N	1A	240	0	0	5
554	7	E	-	191	N	1B	108	23	5	0
555	7	E	-	191	N	1C	228	437	0	0
556	7	E	-	191	N	1D	192	1150	2	5
557	7	E	-	191	N	1E	156	1150	0	0
558	7	E	-	191	N	1F	192	690	2	0
559	10	E	-	191	N	1A	180	0	0	0
560	10	E	-	191	N	1B	180	483	0	5
561	10	E	-	191	N	1C	240	920	2	5
562	10	E	-	191	N	1D	336	667	0	0
563	10	E	-	191	N	1E	372	1863	2	0
564	10	E	-	191	N	1F	276	1449	0	0
565	14	E	-	191	N	1A	168	207	0	0
566	14	E	-	191	N	1B	240	0	0	0
567	14	E	-	191	N	1C	264	644	0	0
568	14	E	-	191	N	1D	396	1564	0	0
569	14	E	-	191	N	1E	324	1518	2	3
570	14	E	-	191	N	1F	396	1104	2	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
571	16	E	-	191	N	1A	132	115	2	0
572	16	E	-	191	N	1B	180	276	0	0
573	16	E	-	191	N	1C	288	782	0	5
574	16	E	-	191	N	1D	228	1725	0	0
575	16	E	-	191	N	1E	204	1265	2	3
576	16	E	-	191	N	1F	228	1311	2	0
577	19	E	-	191	N	1A	204	575	4	2
578	19	E	-	191	N	1B	192	391	0	0
579	19	E	-	191	N	1C	312	0	0	5
580	19	E	-	191	N	1D	360	943	0	10
581	19	E	-	191	N	1E	216	874	2	5
582	19	E	-	191	N	1F	132	1196	0	2
583	22	E	-	191	N	1A	108	161	5	0
584	22	E	-	191	N	1B	180	322	0	0
585	22	E	-	191	N	1C	144	0	0	3
586	22	E	-	191	N	1D	252	1265	4	7
587	22	E	-	191	N	1E	408	874	0	10
588	22	E	-	191	N	1F	480	1242	2	0
589	11	W	-	190	N	1A	143	0	0	3
590	11	W	-	190	N	1B	44	0	4	7
591	11	W	-	190	N	1C	110	805	0	3
592	11	W	-	190	N	1A	55	0	2	3
593	11	W	-	190	N	1B	132	0	0	5
594	11	W	-	190	N	1C	55	0	2	3
595	11	W	-	190	N	1D	121	184	2	0
596	11	W	-	190	N	1E	297	989	2	0
597	11	W	-	190	N	1F	187	1886	0	0
598	11	W	-	191	N	1A	55	0	0	0
599	11	W	-	191	N	1B	176	897	0	3
600	11	W	-	191	N	1C	88	115	2	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
601	11	W	-	191	N	1A	77	0	0	0
602	11	W	-	191	N	1B	55	0	0	0
603	11	W	-	191	N	1C	165	0	10	0
604	11	W	-	191	N	1D	110	506	2	0
605	11	W	-	191	N	1E	220	667	2	5
606	11	W	-	191	N	1F	77	1219	0	0
607	11	W	-	192	N	1A	121	230	0	0
608	11	W	-	192	N	1B	121	575	2	0
609	11	W	-	192	N	1C	88	0	0	0
610	11	W	-	192	N	1A	198	92	7	0
611	11	W	-	192	N	1B	121	0	0	0
612	11	W	-	192	N	1C	121	345	0	0
613	11	W	-	192	N	1D	319	1150	0	0
614	11	W	-	192	N	1E	264	1610	4	0
615	11	W	-	192	N	1F	99	1265	0	0
616	11	W	-	194	N	1A	55	782	2	0
617	11	W	-	194	N	1B	121	460	0	3
618	11	W	-	194	N	1C	132	782	2	0
619	11	W	-	194	N	1D	132	1012	0	0
620	11	W	-	194	N	1E	220	1794	0	0
621	11	W	-	194	N	1F	220	1127	0	5
622	11	W	-	197	N	1A	0	414	2	0
623	11	W	-	19	N	1B	44	184	0	0
624	11	W	-	197	N	1C	44	207	0	0
625	11	W	-	197	N	1A	550	1196	2	5
626	11	W	-	197	N	1B	121	230	0	3
627	11	W	-	197	N	1C	528	943	2	0
628	11	W	-	197	N	1D	473	1196	0	0
629	11	W	-	197	N	1E	418	920	2	0
630	11	W	-	197	N	1F	319	2369	2	0

05/19/99

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
631	11	W	-	198	N	1A	242	0	0	3
632	11	W	-	198	N	1B	187	598	2	7
633	11	W	-	198	N	1C	209	736	0	0
634	11	W	-	198	N	1A	187	460	0	0
635	11	W	-	198	N	1B	176	437	2	0
636	11	W	-	198	N	1C	110	161	0	0
637	11	W	-	198	N	1D	154	943	0	3
638	11	W	-	199	N	1A	165	161	0	3
639	11	W	-	199	N	1B	220	644	0	5
640	11	W	-	199	N	1C	198	1058	0	5
641	10	W	-	190	N	1A	48	0	0	0
642	10	W	-	190	N	1B	60	0	0	0
643	10	W	-	190	N	1C	24	207	0	0
644	10	W	-	190	N	1D	220	1495	0	0
645	10	W	-	190	N	1E	132	805	4	0
646	10	W	-	190	N	1F	132	1012	0	3
647	7	W	-	190	N	1A	72	0	2	0
648	7	W	-	190	N	1B	0	0	2	0
649	7	W	-	190	N	1C	132	0	4	2
650	7	W	-	190	N	1D	252	644	2	7
651	7	W	-	190	N	1E	180	879	0	0
652	7	W	-	190	N	1F	180	828	4	0
653	4	W	-	190	N	1A	120	368	0	0
654	4	W	-	190	N	1B	48	0	0	0
655	4	W	-	190	N	1C	48	46	2	0
656	4	W	-	190	N	1D	156	1104	0	0
657	4	W	-	190	N	1E	108	1012	0	5
658	4	W	-	190	N	1F	84	1150	7	5
659	0	E	-	190	N	1A	48	0	2	7
660	0	E	-	190	N	1B	60	299	2	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
661	0	E	-	190	N	1C	156	207	4	5
662	0	E	-	190	N	1D	204	1219	9	2
663	0	E	-	190	N	1E	156	851	0	0
664	0	E	-	190	N	1F	156	1403	4	0
665	2	E	-	190	N	1A	108	322	2	0
666	2	E	-	190	N	1B	132	184	0	0
667	2	E	-	190	N	1C	228	230	0	0
668	2	E	-	190	N	1D	180	69	0	0
669	2	E	-	190	N	1E	240	1541	2	5
670	2	E	-	190	N	1F	228	621	2	5
671	5	E	-	190	N	1A	132	46	2	0
672	5	E	-	190	N	1B	180	0	0	3
673	5	E	-	190	N	1C	228	644	2	3
674	5	E	-	190	N	1D	276	1334	0	3
675	5	E	-	190	N	1E	204	1541	0	0
676	5	E	-	190	N	1F	108	690	4	5
677	8	E	-	190	N	1A	132	0	0	5
678	8	E	-	190	N	1B	132	69	2	0
679	8	E	-	190	N	1C	192	92	0	0
680	8	E	-	190	N	1D	264	1173	2	5
681	8	E	-	190	N	1E	180	989	0	0
682	8	E	-	190	N	1F	144	1334	4	7
683	11	E	-	190	N	1A	84	69	2	0
684	11	E	-	190	N	1B	96	46	0	0
685	11	E	-	190	N	1C	132	115	4	2
686	11	E	-	190	N	1D	180	1288	0	0
687	11	E	-	190	N	1E	204	828	0	0
688	11	E	-	190	N	1F	288	897	2	5
689	15	E	-	190	N	1A	132	0	0	5
690	15	E	-	190	N	1B	132	69	2	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
691	15	E	-	190	N	1C	192	92	0	0
692	15	E	-	190	N	1D	264	1173	2	5
693	15	E	-	190	N	1E	180	989	0	0
694	15	E	-	190	N	1F	144	1334	4	7
695	11	E	-	190	N	1A	84	69	2	0
696	11	E	-	190	N	1B	96	46	0	0
697	11	E	-	190	N	1C	132	115	4	2
698	11	E	-	190	N	1D	180	1288	0	0
699	11	E	-	190	N	1E	204	828	0	0
700	11	E	-	190	N	1F	288	897	2	5
701	15	E	-	190	N	1A	108	0	2	0
702	15	E	-	190	N	1B	48	0	2	0
703	15	E	-	190	N	1C	132	0	2	7
704	15	E	-	190	N	1D	180	874	7	5
705	15	E	-	190	N	1E	216	1679	1	19
706	15	E	-	190	N	1F	96	1679	4	7
707	17	E	-	190	N	1A	156	437	0	5
708	17	E	-	190	N	1B	180	0	0	0
709	17	E	-	190	N	1C	96	0	2	0
710	17	E	-	190	N	1D	204	1311	0	12
711	17	E	-	190	N	1E	60	1656	2	0
712	17	E	-	190	N	1F	120	1150	0	0
713	20	E	-	190	N	1A	120	368	0	0
714	20	E	-	190	N	1B	60	0	0	0
715	20	E	-	190	N	1C	144	23	0	0
716	20	E	-	190	N	1D	152	1242	0	0
717	20	E	-	190	N	1E	164	690	2	0
718	20	E	-	190	N	1F	144	1150	0	3
719	24	E	-	190	N	1A	48	368	4	0
720	24	E	-	190	N	1B	72	529	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
721	24	E	-	190	N	1C	192	0	0	0
722	24	E	-	190	N	1D	120	1334	0	0
723	24	E	-	190	N	1E	144	598	2	3
724	24	E	-	190	N	1F	84	1174	0	5
725	27	E	-	190	N	1A	108	69	2	0
726	27	E	-	190	N	1B	132	46	0	3
727	27	E	-	190	N	1C	96	184	2	0
728	27	E	-	190	N	1D	132	943	0	0
729	27	E	-	190	N	1E	96	1449	0	3
730	27	E	-	190	N	1F	156	1564	0	3
731	30	E	-	190	N	1A	108	299	0	0
732	30	E	-	190	N	1B	168	437	2	3
733	30	E	-	190	N	1C	144	0	2	0
734	30	E	-	190	N	1D	108	1587	0	3
735	30	E	-	190	N	1E	144	1541	0	0
736	30	E	-	190	N	1F	144	1196	4	10
737	33	E	-	190	N	1A	132	391	0	0
738	33	E	-	190	N	1B	84	874	0	3
739	33	E	-	190	N	1C	204	0	0	0
740	33	E	-	190	N	1D	264	1679	4	0
741	33	E	-	190	N	1E	180	1219	2	0
742	33	E	-	190	N	1F	180	1012	0	5
743	36	E	-	190	N	1A	144	506	4	0
744	36	E	-	190	N	1B	180	644	0	0
745	36	E	-	190	N	1C	240	1012	0	0
746	25	E	-	190	N	1A	110	46	0	10
747	25	E	-	190	N	1B	132	0	2	3
748	25	E	-	190	N	1C	165	0	0	5
749	25	E	-	190	N	1D	264	989	2	3
750	25	E	-	190	N	1E	220	736	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
751	25	E	-	190	N	1F	187	644	0	0
752	25	E	-	193	N	1A	22	230	2	0
753	25	E	-	193	N	1B	44	230	2	0
754	25	E	-	193	N	1C	110	69	2	0
755	25	E	-	193	N	1D	231	1702	10	9
756	25	E	-	193	N	1E	275	1288	2	8
757	25	E	-	193	N	1F	165	989	0	3
758	25	E	-	196	N	1A	154	46	0	0
759	25	E	-	196	N	1B	187	32	0	0
760	25	E	-	196	N	1C	165	138	0	3
761	25	E	-	196	N	1D	165	1196	7	14
762	25	E	-	196	N	1E	154	1656	15	11
763	25	E	-	196	N	1F	121	1058	4	15
764	25	E	-	199	N	1A	132	207	0	0
765	25	E	-	199	N	1B	132	0	0	5
766	25	E	-	199	N	1C	143	0	0	3
767	25	E	-	199	N	1D	165	1242	2	5
768	25	E	-	199	N	1E	154	1058	2	10
769	25	E	-	199	N	1F	77	1610	0	5
770	25	E	-	202	N	1A	55	115	0	0
771	25	E	-	202	N	1B	143	0	4	10
772	25	E	-	202	N	1C	176	23	0	3
773	25	E	-	202	N	1D	154	1748	4	7
774	25	E	-	202	N	1E	176	1656	0	3
775	25	E	-	202	N	1F	396	1127	4	0
776	25	E	-	205	N	1A	165	299	0	0
777	25	E	-	205	N	1B	286	0	0	3
778	25	E	-	205	N	1C	297	46	2	3
779	25	E	-	205	N	1D	418	874	2	3
780	25	E	-	205	N	1E	275	1265	2	5

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
781	25	E	-	205	N	1F	275	1196	0	8
782	25	E	-	208	N	1A	341	598	0	3
783	25	E	-	208	N	1B	737	943	2	0
784	25	E	-	208	N	1C	909	1587	0	0
785	25	E	-	208	N	1D	605	598	2	0
786	25	E	-	208	N	1E	495	1334	2	0
787	25	E	-	208	N	1F	242	966	0	0
788	25	E	-	211	N	1A	440	1081	0	0
789	25	E	-	211	N	1B	748	1196	0	3
790	25	E	-	211	N	1C	968	2001	4	2
791	25	E	-	211	N	1D	341	1127	0	0
792	25	E	-	211	N	1E	330	1656	0	0
793	25	E	-	211	N	1F	286	1334	2	3
794	25	E	-	214	N	1A	275	598	0	8
795	25	E	-	214	N	1B	176	1012	0	8
796	25	E	-	214	N	1C	330	2254	0	3
797	25	E	-	214	N	1D	352	1587	0	5
798	25	E	-	214	N	1E	242	1472	0	10
799	25	E	-	214	N	1F	330	1840	0	10
800	25	E	-	217	N	1A	253	0	0	0
801	25	E	-	217	N	1B	473	920	0	0
802	25	E	-	217	N	1C	825	1357	0	8
803	25	E	-	217	N	1D	132	943	4	0
804	25	E	-	217	N	1E	187	1125	0	5
805	25	E	-	217	N	1F	198	690	4	0
806	25	E	-	220	N	1A	429	299	2	8
807	25	E	-	220	N	1B	429	506	4	10
808	25	E	-	220	N	1C	363	690	2	0
809	25	E	-	220	N	1D	407	1495	4	2
810	25	E	-	220	N	1E	330	1242	2	8

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
811	25	E	-	220	N	1F	253	1219	0	3
812	25	E	-	223	N	1A	88	437	0	0
813	25	E	-	223	N	1B	143	0	0	0
814	25	E	-	223	N	1C	220	966	2	15
815	25	E	-	223	N	1D	264	1794	2	0
816	25	E	-	223	N	1E	165	1219	0	0
817	25	E	-	223	N	1F	275	1541	0	0
818	25	E	-	226	N	1A	308	596	0	0
819	25	E	-	226	N	1B	286	713	2	0
820	25	E	-	226	N	1C	429	345	2	0
821	25	E	-	226	N	1D	407	1564	4	5
822	25	E	-	226	N	1E	297	943	0	3
823	25	E	-	226	N	1F	253	1127	0	8
824	25	E	-	229	N	1A	264	1058	0	0
825	25	E	-	229	N	1B	451	782	2	0
826	25	E	-	229	N	1C	759	368	0	0
827	25	E	-	229	N	1D	297	736	2	0
828	25	E	-	229	N	1E	484	1886	4	12
829	25	E	-	229	N	1F	363	1357	0	0
830	25	E	-	226	N	1A	143	115	0	0
831	25	E	-	232	N	1B	132	828	2	0
832	25	E	-	232	N	1C	143	1058	2	0
833	25	E	-	232	N	1D	352	1909	0	3
834	25	E	-	232	N	1E	286	1127	0	8
835	25	E	-	232	N	1F	440	713	2	0
836	25	E	-	235	N	1A	187	0	0	0
837	25	E	-	235	N	1B	242	437	0	5
838	25	E	-	235	N	1C	264	276	2	7
839	25	E	-	235	N	1D	330	1380	2	0
840	25	E	-	235	N	1E	330	1449	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. G. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
841	25	E	-	235	N	1F	264	1357	5	0
842	25	E	-	238	N	1A	209	0	0	0
843	25	E	-	238	N	1B	385	598	5	0
844	25	E	-	238	N	1C	264	1150	2	0
845	25	E	-	238	N	1D	385	1311	7	5
846	25	E	-	238	N	1E	176	713	2	5
847	25	E	-	238	N	1F	396	2001	5	2
848	25	E	-	241	N	1A	682	1771	2	0
849	25	E	-	241	N	1B	1034	1127	0	0
850	25	E	-	241	N	1C	891	1886	0	0
851	25	E	-	241	N	1D	682	1748	5	0
852	25	E	-	241	N	1E	187	1564	0	0
853	25	E	-	241	N	1F	363	1656	0	3
854	25	E	-	244	N	1A	863	299	2	0
855	25	E	-	244	N	1B	913	1334	2	7
856	25	E	-	244	N	1C	649	1265	2	3
857	25	E	-	244	N	1D	363	1311	2	5
858	25	E	-	244	N	1E	242	1426	0	0
859	25	E	-	244	N	1F	330	1288	0	5
860	25	E	-	248	N	1A	88	276	2	0
861	25	E	-	248	N	1B	330	851	0	0
862	25	E	-	248	N	1C	220	851	0	0
863	25	E	-	248	N	1D	264	1541	2	3
864	25	E	-	248	N	1E	297	667	0	3
865	25	E	-	248	N	1F	187	598	5	0
866	25	E	-	251	N	1A	187	0	0	8
867	25	E	-	251	N	1B	198	230	0	3
868	25	E	-	251	N	1C	187	851	0	3
869	25	E	-	251	N	1D	242	1357	2	0
870	25	E	-	251	N	1E	330	1758	0	3

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
871	25	E	-	251	N	1F	429	1311	5	0
872	25	E	-	254	N	1A	209	828	0	3
873	25	E	-	254	N	1B	341	713	7	0
874	25	E	-	254	N	1C	209	368	0	0
875	25	E	-	254	N	1D	297	1610	0	0
876	25	E	-	254	N	1E	220	1380	2	0
877	25	E	-	254	N	1F	275	1449	2	0
878	25	E	-	257	N	1A	759	759	2	0
879	25	E	-	257	N	1B	704	966	0	8
880	25	E	-	257	N	1C	880	1932	5	0
881	25	E	-	257	N	1D	462	874	0	8
882	25	E	-	257	N	1E	231	1173	5	0
883	25	E	-	257	N	1F	154	1150	0	0
884	25	E	-	260	N	1A	209	598	0	5
885	25	E	-	260	N	1B	209	368	2	3
886	25	E	-	260	N	1C	330	1196	2	0
887	25	E	-	260	N	1D	374	851	0	0
888	25	E	-	260	N	1E	341	1426	0	0
889	25	E	-	260	N	1F	275	1081	0	3
890	25	E	-	263	N	1A	165	0	0	0
891	25	E	-	263	N	1B	902	0	5	0
892	25	E	-	263	N	1C	418	0	2	0
893	25	E	-	263	N	1D	198	161	0	5
894	25	E	-	263	N	1E	330	345	2	0
895	25	E	-	263	N	1F	341	0	0	8
896	25	E	-	267	N	1A	99	0	0	3
897	25	E	-	267	N	1B	319	0	5	0
898	25	E	-	267	N	1C	231	0	5	2
899	25	E	-	267	N	1D	198	322	5	2
900	25	E	-	267	N	1E	275	414	10	2

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: 5-24-99 W. G. Bryan DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
901	25	E	-	267	N	1F	286	322	0	12
902	25	E	-	269	N	1A	198	0	0	8
903	25	E	-	269	N	1B	352	0	2	5
904	25	E	-	269	N	1C	132	0	5	0
905	25	E	-	269	N	1D	286	989	5	0
906	25	E	-	269	N	1E	418	0	0	0
907	25	E	-	269	N	1F	198	0	2	0
908	25	E	-	271	N	1A	176	0	2	0
909	25	E	-	271	N	1B	231	0	2	0
910	25	E	-	271	N	1C	220	0	2	0
911	25	E	-	271	N	1D	297	0	0	0
912	25	E	-	271	N	1E	352	0	5	2
913	25	E	-	271	N	1F	286	253	0	5
914	25	E	-	275	N	1A	198	0	0	0
915	25	E	-	275	N	1B	121	0	0	3
916	25	E	-	275	N	1C	132	0	0	3
917	25	E	-	275	N	1D	209	0	2	0
918	25	E	-	275	N	1E	319	184	2	10
919	25	E	-	275	N	1F	372	0	2	5
920	25	E	-	278	N	1A	198	0	2	0
921	25	E	-	278	N	1B	220	0	0	3
922	25	E	-	278	N	1C	253	0	0	0
923	25	E	-	278	N	1D	330	288	2	0
924	25	E	-	278	N	1E	352	46	2	10
925	25	E	-	278	N	1F	275	207	0	0
926	25	E	-	281	N	1A	121	0	0	3
927	25	E	-	281	N	1B	165	0	0	0
928	25	E	-	281	N	1C	132	0	0	0
929	25	E	-	281	N	1D	297	0	10	0
930	25	E	-	281	N	1E	418	0	0	0

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Bogue DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
931	25	E	-	281	N	1F	418	253	0	3
932	25	E	-	284	N	1A	198	0	2	0
933	25	E	-	284	N	1B	143	0	0	0
934	25	E	-	284	N	1C	165	0	0	5
935	25	E	-	284	N	1D	385	0	5	0
936	25	E	-	285	N	1A	352	0	2	0
937	25	E	-	285	N	1B	396	0	2	0
938	25	E	-	285	N	1C	286	0	0	3
939	25	E	-	285	N	1D	462	0	0	3
940	25	E	-	285	N	1E	275	0	0	8
941	25	E	-	285	N	1F	275	0	0	0
942	25	E	-	287	N	1A	286	0	0	3
943	25	E	-	287	N	1B	473	0	7	0
944	25	E	-	287	N	1C	385	0	0	0
945	25	E	-	287	N	1D	462	0	0	3
946	25	E	-	287	N	1E	891	0	2	3
947	25	E	-	287	N	1F	176	0	5	0
948	28	E	-	285	N	1A	132	0	2	0
949	28	E	-	285	N	1B	110	0	0	3
950	28	E	-	285	N	1C	154	0	0	8
951	28	E	-	285	N	1D	1749	2714	2	0
952	28	E	-	285	N	1E	1133	2047	7	7
953	28	E	-	285	N	1F	2046	2530	12	9
954	28	E	-	285	N	1D	286	0	0	0
955	28	E	-	285	N	1E	66	0	0	0
956	28	E	-	285	N	1F	99	206	0	0
957	28	E	-	287	N	1A	286	0	0	0
958	28	E	-	287	N	1B	143	0	0	3
959	28	E	-	287	N	1C	154	0	2	5
960	28	E	-	287	N	1D	1342	2277	2	3

CIMARRON FACILITY

PLUTONIUM YARD FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED

PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	448 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
961	28	E	-	287	N	1E	1364	2208	5	2
962	28	E	-	287	N	1F	1859	2323	2	5

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	99.0	-218.1	47563.0
2	44.0	-273.1	74577.8
3	165.0	-152.1	23131.2
4	187.0	-130.1	16923.3
5	209.0	-108.1	11683.3
6	187.0	-130.1	16923.3
7	143.0	-174.1	30307.1
8	231.0	-86.1	7411.4
9	220.0	-97.1	9426.4
10	198.0	-119.1	14182.3
11	176.0	-141.1	19906.2
12	77.0	-240.1	57642.9
13	165.0	-152.1	23131.2
14	132.0	-185.1	34258.1
15	121.0	-196.1	38451.1
16	121.0	-196.1	38451.1
17	121.0	-196.1	38451.1
18	242.0	-75.1	5638.4
19	242.0	-75.1	5638.4
20	165.0	-152.1	23131.2
21	242.0	-75.1	5638.4
22	121.0	-196.1	38451.1
23	143.0	-174.1	30307.1
24	77.0	-240.1	57642.9
25	187.0	-130.1	16923.3
26	165.0	-152.1	23131.2
27	165.0	-152.1	23131.2
28	253.0	-64.1	4107.5
29	99.0	-218.1	47563.0
30	220.0	-97.1	9426.4
31	286.0	-31.1	966.6
32	462.0	144.9	20999.1
33	341.0	23.9	571.7
34	264.0	-53.1	2818.5
35	363.0	45.9	2107.8
36	407.0	89.9	8083.9
37	429.0	111.9	12524.0
38	418.0	100.9	10182.9
39	528.0	210.9	44483.3
40	275.0	-42.1	1771.5
41	550.0	232.9	54247.3
42	275.0	-42.1	1771.5
43	308.0	-9.1	82.6
44	407.0	89.9	8083.9
45	781.0	463.9	215213.0
46	407.0	89.9	8083.9
47	363.0	45.9	2107.8
48	495.0	177.9	31652.2
49	264.0	-53.1	2818.5
50	506.0	188.9	35687.2
	21659.0		1994418.8
	16153.0		890823.2
	16148.0		836081.1
	18432.0		1461132.8
	20760.0		1387620.5
	28520.0		7453945.1
	27756.0		9987657.7
	15039.0		9709526.4
	10956.0		2662701.4
	9238.0		1942182.6
	10487.0		1074558.3
	8453.0		1834917.9
	8004.0		1423429.2
	7075.0		1670930.3
	13999.0		2131264.3
	17314.0		1946718.6
	17506.0		2314778.3
	13968.0		973460.9
	10527.0		10398609.1
	0.0		0.0
total	305040		63352164.3
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 962

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 317.09

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 256.76

2 Std Deviations: 513.51

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.645

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 330.71 DPM /100cm²

GUIDELINE VALUE: 5000 DPM /100cm²

Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	961	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	961	1.645	95%	

PERFORMED BY: K Morgan DATE: 6/15/99

REVIEWED BY: W. A. Boyer DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	715.0	397.91	158332.85
52	506.0	188.91	35687.22
53	561.0	243.91	59492.38
54	429.0	111.91	12523.98
55	352.0	34.91	1218.75
56	440.0	122.91	15107.02
57	594.0	276.91	76679.48
58	484.0	166.91	27859.15
59	517.0	199.91	39964.25
60	649.0	331.91	110164.65
61	264.0	-53.09	2818.48
62	539.0	221.91	49244.32
63	616.0	298.91	89347.55
64	330.0	12.91	166.68
65	539.0	221.91	49244.32
66	440.0	122.91	15107.02
67	451.0	133.91	17932.05
68	748.0	430.91	185683.95
69	704.0	386.91	149699.81
70	418.0	100.91	10182.95
71	484.0	166.91	27859.15
72	473.0	155.91	24308.12
73	176.0	-141.09	19906.22
74	297.0	-20.09	403.58
75	396.0	78.91	6226.88
76	440.0	122.91	15107.02
77	627.0	309.91	96044.58
78	308.0	-9.09	82.62
79	286.0	-31.09	966.55
80	374.0	56.91	3238.82
81	1001.0	683.91	467733.71
82	396.0	78.91	6226.88
83	308.0	-9.09	82.62
84	297.0	-20.09	403.58
85	374.0	56.91	3238.82
86	330.0	12.91	166.68
87	495.0	177.91	31652.18
88	462.0	144.91	20999.08
89	275.0	-42.09	1771.52
90	495.0	177.91	31652.18
91	396.0	78.91	6226.88
92	418.0	100.91	10182.95
93	297.0	-20.09	403.58
94	242.0	-75.09	5638.42
95	231.0	-86.09	7411.38
96	528.0	210.91	44483.28
97	187.0	-130.09	16923.25
98	121.0	-196.09	38451.05
99	319.0	1.91	3.65
100	330.0	12.91	166.68
	21659.0		1994418.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	297.0	-20.09	403.58
102	319.0	1.91	3.65
103	77.0	-240.09	57642.92
104	308.0	-9.09	82.62
105	176.0	-141.09	19906.22
106	319.0	1.91	3.65
107	231.0	-86.09	7411.38
108	220.0	-97.09	9426.35
109	363.0	45.91	2107.78
110	209.0	-108.09	11683.32
111	286.0	-31.09	966.55
112	429.0	111.91	12523.98
113	306.0	-11.09	122.97
114	242.0	-75.09	5638.42
115	275.0	-42.09	1771.52
116	425.0	107.91	11644.70
117	231.0	-86.09	7411.38
118	374.0	56.91	3238.82
119	770.0	452.91	205128.01
120	352.0	34.91	1218.75
121	429.0	111.91	12523.98
122	297.0	-20.09	403.58
123	440.0	122.91	15107.02
124	308.0	-9.09	82.62
125	286.0	-31.09	966.55
126	319.0	1.91	3.65
127	264.0	-53.09	2818.48
128	253.0	-64.09	4107.45
129	275.0	-42.09	1771.52
130	231.0	-86.09	7411.38
131	297.0	-20.09	403.58
132	341.0	23.91	571.72
133	352.0	34.91	1218.75
134	605.0	287.91	82892.52
135	275.0	-42.09	1771.52
136	330.0	12.91	166.68
137	286.0	-31.09	966.55
138	242.0	-75.09	5638.42
139	132.0	-185.09	34258.08
140	132.0	-185.09	34258.08
141	407.0	89.91	8083.92
142	253.0	-64.09	4107.45
143	407.0	89.91	8083.92
144	385.0	67.91	4611.85
145	253.0	-64.09	4107.45
146	209.0	-108.09	11683.32
147	352.0	34.91	1218.75
148	825.0	507.91	257973.18
149	286.0	-31.09	966.55
150	473.0	155.91	24308.12
	16153.0		890823.2
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	198.0	-119.09	14182.28
152	253.0	-64.09	4107.45
153	286.0	-31.09	966.55
154	385.0	67.91	4611.85
155	363.0	45.91	2107.78
156	638.0	320.91	102983.62
157	220.0	-97.09	9426.35
158	297.0	-20.09	403.58
159	451.0	133.91	17932.05
160	264.0	-53.09	2818.48
161	363.0	45.91	2107.78
162	297.0	-20.09	403.58
163	165.0	-152.09	23131.18
164	220.0	-97.09	9426.35
165	341.0	23.91	571.72
166	264.0	-53.09	2818.48
167	264.0	-53.09	2818.48
168	286.0	-31.09	966.55
169	143.0	-174.09	30307.12
170	418.0	100.91	10182.95
171	165.0	-152.09	23131.18
172	341.0	23.91	571.72
173	297.0	-20.09	403.58
174	319.0	1.91	3.65
175	143.0	-174.09	30307.12
176	319.0	1.91	3.65
177	308.0	-9.09	82.62
178	132.0	-185.09	34258.08
179	352.0	34.91	1218.75
180	264.0	-53.09	2818.48
181	187.0	-130.09	16923.25
182	132.0	-185.09	34258.08
183	253.0	-64.09	4107.45
184	473.0	155.91	24308.12
185	715.0	397.91	158332.85
186	517.0	199.91	39964.25
187	407.0	89.91	8083.92
188	385.0	67.91	4611.85
189	374.0	56.91	3238.82
190	319.0	1.91	3.65
191	275.0	-42.09	1771.52
192	275.0	-42.09	1771.52
193	418.0	100.91	10182.95
194	429.0	111.91	12523.98
195	506.0	188.91	35687.22
196	220.0	-97.09	9426.35
197	220.0	-97.09	9426.35
198	330.0	12.91	166.68
199	286.0	-31.09	966.55
200	671.0	353.91	125252.71
	16148.0		836081.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	594.0	276.91	76679.48
202	308.0	-9.09	82.62
203	616.0	298.91	89347.55
204	231.0	-86.09	7411.38
205	319.0	1.91	3.65
206	330.0	12.91	166.68
207	814.0	496.91	246920.15
208	253.0	-64.09	4107.45
209	583.0	265.91	70708.45
210	275.0	-42.09	1771.52
211	231.0	-86.09	7411.38
212	220.0	-97.09	9426.35
213	363.0	45.91	2107.78
214	374.0	56.91	3238.82
215	770.0	452.91	205128.01
216	407.0	89.91	8083.92
217	275.0	-42.09	1771.52
218	363.0	45.91	2107.78
219	517.0	199.91	39964.25
220	264.0	-53.09	2818.48
221	847.0	529.91	280805.25
222	308.0	-9.09	82.62
223	253.0	-64.09	4107.45
224	231.0	-86.09	7411.38
225	484.0	166.91	27859.15
226	330.0	12.91	166.68
227	253.0	-64.09	4107.45
228	286.0	-31.09	966.55
229	429.0	111.91	12523.98
230	583.0	265.91	70708.45
231	242.0	-75.09	5638.42
232	352.0	34.91	1218.75
233	275.0	-42.09	1771.52
234	286.0	-31.09	966.55
235	132.0	-185.09	34258.08
236	154.0	-163.09	26598.15
237	242.0	-75.09	5638.42
238	352.0	34.91	1218.75
239	231.0	-86.09	7411.38
240	275.0	-42.09	1771.52
241	240.0	-77.09	5942.78
242	468.0	150.91	22774.01
243	312.0	-5.09	25.90
244	276.0	-41.09	1688.34
245	456.0	138.91	19296.16
246	264.0	-53.09	2818.48
247	348.0	30.91	955.47
248	672.0	354.91	125961.54
249	396.0	78.91	6226.88
250	348.0	30.91	955.47
	18432.0		1461132.8
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	396.0	78.91	6226.88
252	312.0	-5.09	25.90
253	408.0	90.91	8264.74
254	660.0	342.91	117587.68
255	516.0	198.91	39565.43
256	300.0	-17.09	292.05
257	288.0	-29.09	846.19
258	240.0	-77.09	5942.78
259	300.0	-17.09	292.05
260	264.0	-53.09	2818.48
261	300.0	-17.09	292.05
262	276.0	-41.09	1688.34
263	228.0	-89.09	7936.92
264	252.0	-65.09	4236.63
265	504.0	186.91	34935.57
266	612.0	294.91	86972.26
267	492.0	174.91	30593.72
268	300.0	-17.09	292.05
269	276.0	-41.09	1688.34
270	360.0	42.91	1841.32
271	180.0	-137.09	18793.50
272	312.0	-5.09	25.90
273	372.0	54.91	3015.17
274	348.0	30.91	955.47
275	384.0	66.91	4477.03
276	420.0	102.91	10590.59
277	336.0	18.91	357.61
278	348.0	30.91	955.47
279	552.0	234.91	55182.99
280	336.0	18.91	357.61
281	408.0	90.91	8264.74
282	456.0	138.91	19296.16
283	336.0	18.91	357.61
284	804.0	486.91	237081.94
285	672.0	354.91	125961.54
286	552.0	234.91	55182.99
287	576.0	258.91	67034.70
288	636.0	318.91	101703.97
289	456.0	138.91	19296.16
290	384.0	66.91	4477.03
291	540.0	222.91	49689.14
292	624.0	306.91	94194.12
293	468.0	150.91	22774.01
294	540.0	222.91	49689.14
295	348.0	30.91	955.47
296	264.0	-53.09	2818.48
297	456.0	138.91	19296.16
298	456.0	138.91	19296.16
299	504.0	186.91	34935.57
300	408.0	90.91	8264.74
	20760.0		1387620.5
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	156.0	-161.09	25949.79
302	120.0	-197.09	38844.23
303	156.0	-161.09	25949.79
304	456.0	138.91	19296.16
305	396.0	78.91	6226.88
306	396.0	78.91	6226.88
307	324.0	6.91	47.76
308	348.0	30.91	955.47
309	348.0	30.91	955.47
310	396.0	78.91	6226.88
311	512.0	194.91	37990.14
312	528.0	210.91	44483.28
313	384.0	66.91	4477.03
314	456.0	138.91	19296.16
315	636.0	318.91	101703.97
316	492.0	174.91	30593.72
317	600.0	282.91	80038.41
318	384.0	66.91	4477.03
319	360.0	42.91	1841.32
320	612.0	294.91	86972.26
321	816.0	498.91	248911.79
322	528.0	210.91	44483.28
323	576.0	258.91	67034.70
324	828.0	510.91	261029.64
325	552.0	234.91	55182.99
326	684.0	366.91	134623.39
327	972.0	654.91	428907.90
328	492.0	174.91	30593.72
329	492.0	174.91	30593.72
330	468.0	150.91	22774.01
331	852.0	534.91	286129.35
332	852.0	534.91	286129.35
333	1008.0	690.91	477357.46
334	528.0	210.91	44483.28
335	444.0	126.91	16106.30
336	288.0	-29.09	846.19
337	708.0	390.91	152811.10
338	1284.0	966.91	934916.11
339	1404.0	1086.91	1181374.66
340	348.0	30.91	955.47
341	396.0	78.91	6226.88
342	300.0	-17.09	292.05
343	204.0	-113.09	12789.21
344	360.0	42.91	1841.32
345	288.0	-29.09	846.19
346	900.0	582.91	339784.77
347	1008.0	690.91	477357.46
348	852.0	534.91	286129.35
349	780.0	462.91	214286.23
350	1248.0	930.91	866594.55
	28520.0		7453945.1
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
351	1152.0	834.91	697075.71
352	504.0	186.91	34935.57
353	420.0	102.91	10590.59
354	492.0	174.91	30593.72
355	564.0	246.91	60964.85
356	672.0	354.91	125961.54
357	480.0	162.91	26539.86
358	552.0	234.91	55182.99
359	660.0	342.91	117587.68
360	516.0	198.91	39565.43
361	588.0	270.91	73392.55
362	576.0	258.91	67034.70
363	552.0	234.91	55182.99
364	396.0	78.91	6226.88
365	492.0	174.91	30593.72
366	432.0	114.91	13204.45
367	600.0	282.91	80038.41
368	624.0	306.91	94194.12
369	684.0	366.91	134623.39
370	432.0	114.91	13204.45
371	684.0	366.91	134623.39
372	432.0	114.91	13204.45
373	816.0	498.91	248911.79
374	936.0	618.91	383050.33
375	828.0	510.91	261029.64
376	588.0	270.91	73392.55
377	336.0	18.91	357.61
378	288.0	-29.09	846.19
379	564.0	246.91	60964.85
380	768.0	450.91	203320.37
381	408.0	90.91	8264.74
382	348.0	30.91	955.47
383	552.0	234.91	55182.99
384	576.0	258.91	67034.70
385	240.0	-77.09	5942.78
386	444.0	126.91	16106.30
387	624.0	306.91	94194.12
388	528.0	210.91	44483.28
389	372.0	54.91	3015.17
390	216.0	-101.09	10219.07
391	420.0	102.91	10590.59
392	432.0	114.91	13204.45
393	792.0	474.91	225540.08
394	240.0	-77.09	5942.78
395	300.0	-17.09	292.05
396	336.0	18.91	357.61
397	204.0	-113.09	12789.21
398	180.0	-137.09	18793.50
399	108.0	-209.09	43718.38
400	2808.0	2490.91	6204635.63
	27756.0		9987657.7
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	2292.0	1974.91	3900271.89
402	2496.0	2178.91	4747651.42
403	96.0	-221.09	48880.52
404	204.0	-113.09	12789.21
405	216.0	-101.09	10219.07
406	143.0	-174.09	30307.12
407	209.0	-108.09	11683.32
408	176.0	-141.09	19906.22
409	264.0	-53.09	2818.48
410	319.0	1.91	3.65
411	352.0	34.91	1218.75
412	165.0	-152.09	23131.18
413	132.0	-185.09	34258.08
414	143.0	-174.09	30307.12
415	330.0	12.91	166.68
416	308.0	-9.09	82.62
417	539.0	221.91	49244.32
418	187.0	-130.09	16923.25
419	121.0	-196.09	38451.05
420	132.0	-185.09	34258.08
421	429.0	111.91	12523.98
422	374.0	56.91	3238.82
423	341.0	23.91	571.72
424	121.0	-196.09	38451.05
425	154.0	-163.09	26598.15
426	176.0	-141.09	19906.22
427	495.0	177.91	31652.18
428	352.0	34.91	1218.75
429	297.0	-20.09	403.58
430	220.0	-97.09	9426.35
431	176.0	-141.09	19906.22
432	187.0	-130.09	16923.25
433	308.0	-9.09	82.62
434	198.0	-119.09	14182.28
435	286.0	-31.09	966.55
436	209.0	-108.09	11683.32
437	121.0	-196.09	38451.05
438	132.0	-185.09	34258.08
439	231.0	-86.09	7411.38
440	187.0	-130.09	16923.25
441	154.0	-163.09	26598.15
442	165.0	-152.09	23131.18
443	88.0	-229.09	52481.95
444	154.0	-163.09	26598.15
445	44.0	-273.09	74577.82
446	132.0	-185.09	34258.08
447	110.0	-207.09	42886.02
448	110.0	-207.09	42886.02
449	143.0	-174.09	30307.12
450	121.0	-196.09	38451.05
	15039.0		9709526.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
451	132.0	-185.09	34258.08
452	143.0	-174.09	30307.12
453	88.0	-229.09	52481.95
454	198.0	-119.09	14182.28
455	121.0	-196.09	38451.05
456	165.0	-152.09	23131.18
457	77.0	-240.09	57642.92
458	121.0	-196.09	38451.05
459	99.0	-218.09	47562.99
460	154.0	-163.09	26598.15
461	99.0	-218.09	47562.99
462	110.0	-207.09	42886.02
463	99.0	-218.09	47562.99
464	44.0	-273.09	74577.82
465	110.0	-207.09	42886.02
466	99.0	-218.09	47562.99
467	165.0	-152.09	23131.18
468	209.0	-108.09	11683.32
469	176.0	-141.09	19906.22
470	110.0	-207.09	42886.02
471	176.0	-141.09	19906.22
472	187.0	-130.09	16923.25
473	187.0	-130.09	16923.25
474	264.0	-53.09	2818.48
475	77.0	-240.09	57642.92
476	121.0	-196.09	38451.05
477	132.0	-185.09	34258.08
478	176.0	-141.09	19906.22
479	154.0	-163.09	26598.15
480	374.0	56.91	3238.82
481	99.0	-218.09	47562.99
482	55.0	-262.09	68690.85
483	88.0	-229.09	52481.95
484	858.0	540.91	292584.28
485	1001.0	683.91	467733.71
486	539.0	221.91	49244.32
487	759.0	441.91	195284.98
488	297.0	-20.09	403.58
489	220.0	-97.09	9426.35
490	187.0	-130.09	16923.25
491	484.0	166.91	27859.15
492	715.0	397.91	158332.85
493	99.0	-218.09	47562.99
494	88.0	-229.09	52481.95
495	77.0	-240.09	57642.92
496	187.0	-130.09	16923.25
497	110.0	-207.09	42886.02
498	77.0	-240.09	57642.92
499	308.0	-9.09	82.62
500	341.0	23.91	571.72
	10956.0		2662701.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
501	286.0	-31.09	966.55
502	121.0	-196.09	38451.05
503	110.0	-207.09	42886.02
504	77.0	-240.09	57642.92
505	33.0	-284.09	80706.79
506	55.0	-262.09	68690.85
507	88.0	-229.09	52481.95
508	539.0	221.91	49244.32
509	616.0	298.91	89347.55
510	682.0	364.91	133159.75
511	44.0	-273.09	74577.82
512	66.0	-251.09	63045.89
513	88.0	-229.09	52481.95
514	110.0	-207.09	42886.02
515	33.0	-284.09	80706.79
516	176.0	-141.09	19906.22
517	132.0	-185.09	34258.08
518	44.0	-273.09	74577.82
519	77.0	-240.09	57642.92
520	154.0	-163.09	26598.15
521	154.0	-163.09	26598.15
522	110.0	-207.09	42886.02
523	66.0	-251.09	63045.89
524	132.0	-185.09	34258.08
525	110.0	-207.09	42886.02
526	165.0	-152.09	23131.18
527	396.0	78.91	6226.88
528	429.0	111.91	12523.98
529	77.0	-240.09	57642.92
530	66.0	-251.09	63045.89
531	66.0	-251.09	63045.89
532	429.0	111.91	12523.98
533	253.0	-64.09	4107.45
534	385.0	67.91	4611.85
535	99.0	-218.09	47562.99
536	121.0	-196.09	38451.05
537	187.0	-130.09	16923.25
538	231.0	-86.09	7411.38
539	154.0	-163.09	26598.15
540	187.0	-130.09	16923.25
541	198.0	-119.09	14182.28
542	216.0	-101.09	10219.07
543	204.0	-113.09	12789.21
544	168.0	-149.09	22227.65
545	108.0	-209.09	43718.38
546	240.0	-77.09	5942.78
547	108.0	-209.09	43718.38
548	168.0	-149.09	22227.65
549	288.0	-29.09	846.19
550	192.0	-125.09	15647.36
	9238.0		1942182.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
551	180.0	-137.1	18793.50
552	108.0	-209.1	43718.38
553	240.0	-77.1	5942.78
554	108.0	-209.1	43718.38
555	228.0	-89.1	7936.92
556	192.0	-125.1	15647.36
557	156.0	-161.1	25949.79
558	192.0	-125.1	15647.36
559	180.0	-137.1	18793.50
560	180.0	-137.1	18793.50
561	240.0	-77.1	5942.78
562	336.0	18.9	357.61
563	372.0	54.9	3015.17
564	276.0	-41.1	1688.34
565	168.0	-149.1	22227.65
566	240.0	-77.1	5942.78
567	264.0	-53.1	2818.48
568	396.0	78.9	6226.88
569	324.0	6.9	47.76
570	396.0	78.9	6226.88
571	132.0	-185.1	34258.08
572	180.0	-137.1	18793.50
573	288.0	-29.1	846.19
574	228.0	-89.1	7936.92
575	204.0	-113.1	12789.21
576	228.0	-89.1	7936.92
577	204.0	-113.1	12789.21
578	192.0	-125.1	15647.36
579	312.0	-5.1	25.90
580	360.0	42.9	1841.32
581	216.0	-101.1	10219.07
582	132.0	-185.1	34258.08
583	108.0	-209.1	43718.38
584	180.0	-137.1	18793.50
585	144.0	-173.1	29959.94
586	252.0	-65.1	4236.63
587	408.0	90.9	8264.74
588	480.0	162.9	26539.86
589	143.0	-174.1	30307.12
590	44.0	-273.1	74577.82
591	110.0	-207.1	42886.02
592	55.0	-262.1	68690.85
593	132.0	-185.1	34258.08
594	55.0	-262.1	68690.85
595	121.0	-196.1	38451.05
596	297.0	-20.1	403.58
597	187.0	-130.1	16923.25
598	55.0	-262.1	68690.85
599	176.0	-141.1	19906.22
600	88.0	-229.1	52481.95
	10487.0		1074558.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
601	77.0	-240.09	57642.92
602	55.0	-262.09	68690.85
603	165.0	-152.09	23131.18
604	110.0	-207.09	42886.02
605	220.0	-97.09	9426.35
606	77.0	-240.09	57642.92
607	121.0	-196.09	38451.05
608	121.0	-196.09	38451.05
609	88.0	-229.09	52481.95
610	198.0	-119.09	14182.28
611	121.0	-196.09	38451.05
612	121.0	-196.09	38451.05
613	319.0	1.91	3.65
614	264.0	-53.09	2818.48
615	99.0	-218.09	47562.99
616	55.0	-262.09	68690.85
617	121.0	-196.09	38451.05
618	132.0	-185.09	34258.08
619	132.0	-185.09	34258.08
620	220.0	-97.09	9426.35
621	220.0	-97.09	9426.35
622	0.0	-317.09	100545.69
623	44.0	-273.09	74577.82
624	44.0	-273.09	74577.82
625	550.0	232.91	54247.35
626	121.0	-196.09	38451.05
627	528.0	210.91	44483.28
628	473.0	155.91	24308.12
629	418.0	100.91	10182.95
630	319.0	1.91	3.65
631	242.0	-75.09	5638.42
632	187.0	-130.09	16923.25
633	209.0	-108.09	11683.32
634	187.0	-130.09	16923.25
635	176.0	-141.09	19906.22
636	110.0	-207.09	42886.02
637	154.0	-163.09	26598.15
638	165.0	-152.09	23131.18
639	220.0	-97.09	9426.35
640	198.0	-119.09	14182.28
641	48.0	-269.09	72409.10
642	60.0	-257.09	66094.96
643	24.0	-293.09	85901.39
644	220.0	-97.09	9426.35
645	132.0	-185.09	34258.08
646	132.0	-185.09	34258.08
647	72.0	-245.09	60068.81
648	0.0	-317.09	100545.69
649	132.0	-185.09	34258.08
650	252.0	-65.09	4236.63
	8453.0		1834917.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
651	180.0	-137.09	18793.50
652	180.0	-137.09	18793.50
653	120.0	-197.09	38844.23
654	48.0	-269.09	72409.10
655	48.0	-269.09	72409.10
656	156.0	-161.09	25949.79
657	108.0	-209.09	43718.38
658	84.0	-233.09	54330.67
659	48.0	-269.09	72409.10
660	60.0	-257.09	66094.96
661	156.0	-161.09	25949.79
662	204.0	-113.09	12789.21
663	156.0	-161.09	25949.79
664	156.0	-161.09	25949.79
665	108.0	-209.09	43718.38
666	132.0	-185.09	34258.08
667	228.0	-89.09	7936.92
668	180.0	-137.09	18793.50
669	240.0	-77.09	5942.78
670	228.0	-89.09	7936.92
671	132.0	-185.09	34258.08
672	180.0	-137.09	18793.50
673	228.0	-89.09	7936.92
674	276.0	-41.09	1688.34
675	204.0	-113.09	12789.21
676	108.0	-209.09	43718.38
677	132.0	-185.09	34258.08
678	132.0	-185.09	34258.08
679	192.0	-125.09	15647.36
680	264.0	-53.09	2818.48
681	180.0	-137.09	18793.50
682	144.0	-173.09	29959.94
683	84.0	-233.09	54330.67
684	96.0	-221.09	48880.52
685	132.0	-185.09	34258.08
686	180.0	-137.09	18793.50
687	204.0	-113.09	12789.21
688	288.0	-29.09	846.19
689	132.0	-185.09	34258.08
690	132.0	-185.09	34258.08
691	192.0	-125.09	15647.36
692	264.0	-53.09	2818.48
693	180.0	-137.09	18793.50
694	144.0	-173.09	29959.94
695	84.0	-233.09	54330.67
696	96.0	-221.09	48880.52
697	132.0	-185.09	34258.08
698	180.0	-137.09	18793.50
699	204.0	-113.09	12789.21
700	288.0	-29.09	846.19
	8004.0		1423429.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
701	108.0	-209.09	43718.38
702	48.0	-269.09	72409.10
703	132.0	-185.09	34258.08
704	180.0	-137.09	18793.50
705	216.0	-101.09	10219.07
706	96.0	-221.09	48880.52
707	156.0	-161.09	25949.79
708	180.0	-137.09	18793.50
709	96.0	-221.09	48880.52
710	204.0	-113.09	12789.21
711	60.0	-257.09	66094.96
712	120.0	-197.09	38844.23
713	120.0	-197.09	38844.23
714	60.0	-257.09	66094.96
715	144.0	-173.09	29959.94
716	152.0	-165.09	27254.51
717	164.0	-153.09	23436.36
718	144.0	-173.09	29959.94
719	48.0	-269.09	72409.10
720	72.0	-245.09	60068.81
721	192.0	-125.09	15647.36
722	120.0	-197.09	38844.23
723	144.0	-173.09	29959.94
724	84.0	-233.09	54330.67
725	108.0	-209.09	43718.38
726	132.0	-185.09	34258.08
727	96.0	-221.09	48880.52
728	132.0	-185.09	34258.08
729	96.0	-221.09	48880.52
730	156.0	-161.09	25949.79
731	108.0	-209.09	43718.38
732	168.0	-149.09	22227.65
733	144.0	-173.09	29959.94
734	108.0	-209.09	43718.38
735	144.0	-173.09	29959.94
736	144.0	-173.09	29959.94
737	132.0	-185.09	34258.08
738	84.0	-233.09	54330.67
739	204.0	-113.09	12789.21
740	264.0	-53.09	2818.48
741	180.0	-137.09	18793.50
742	180.0	-137.09	18793.50
743	144.0	-173.09	29959.94
744	180.0	-137.09	18793.50
745	240.0	-77.09	5942.78
746	110.0	-207.09	42886.02
747	132.0	-185.09	34258.08
748	165.0	-152.09	23131.18
749	264.0	-53.09	2818.48
750	220.0	-97.09	9426.35
	7075.0		1670930.3
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
751	187.0	-130.09	16923.25
752	22.0	-295.09	87077.75
753	44.0	-273.09	74577.82
754	110.0	-207.09	42886.02
755	231.0	-86.09	7411.38
756	275.0	-42.09	1771.52
757	165.0	-152.09	23131.18
758	154.0	-163.09	26598.15
759	187.0	-130.09	16923.25
760	165.0	-152.09	23131.18
761	165.0	-152.09	23131.18
762	154.0	-163.09	26598.15
763	121.0	-196.09	38451.05
764	132.0	-185.09	34258.08
765	132.0	-185.09	34258.08
766	143.0	-174.09	30307.12
767	165.0	-152.09	23131.18
768	154.0	-163.09	26598.15
769	77.0	-240.09	57642.92
770	55.0	-262.09	68690.85
771	143.0	-174.09	30307.12
772	176.0	-141.09	19906.22
773	154.0	-163.09	26598.15
774	176.0	-141.09	19906.22
775	396.0	78.91	6226.88
776	165.0	-152.09	23131.18
777	286.0	-31.09	966.55
778	297.0	-20.09	403.58
779	418.0	100.91	10182.95
780	275.0	-42.09	1771.52
781	275.0	-42.09	1771.52
782	341.0	23.91	571.72
783	737.0	419.91	176324.91
784	909.0	591.91	350358.16
785	605.0	287.91	82892.52
786	495.0	177.91	31652.18
787	242.0	-75.09	5638.42
788	440.0	122.91	15107.02
789	748.0	430.91	185683.95
790	968.0	650.91	423684.61
791	341.0	23.91	571.72
792	330.0	12.91	166.68
793	286.0	-31.09	966.55
794	275.0	-42.09	1771.52
795	176.0	-141.09	19906.22
796	330.0	12.91	166.68
797	352.0	34.91	1218.75
798	242.0	-75.09	5638.42
799	330.0	12.91	166.68
800	253.0	-64.09	4107.45
	13999.0		2131264.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
801	473.0	155.91	24308.12
802	825.0	507.91	257973.18
803	132.0	-185.09	34258.08
804	187.0	-130.09	16923.25
805	198.0	-119.09	14182.28
806	429.0	111.91	12523.98
807	429.0	111.91	12523.98
808	363.0	45.91	2107.78
809	407.0	89.91	8083.92
810	330.0	12.91	166.68
811	253.0	-64.09	4107.45
812	88.0	-229.09	52481.95
813	143.0	-174.09	30307.12
814	220.0	-97.09	9426.35
815	264.0	-53.09	2818.48
816	165.0	-152.09	23131.18
817	275.0	-42.09	1771.52
818	308.0	-9.09	82.62
819	286.0	-31.09	966.55
820	429.0	111.91	12523.98
821	407.0	89.91	8083.92
822	297.0	-20.09	403.58
823	253.0	-64.09	4107.45
824	264.0	-53.09	2818.48
825	451.0	133.91	17932.05
826	759.0	441.91	195284.98
827	297.0	-20.09	403.58
828	484.0	166.91	27859.15
829	363.0	45.91	2107.78
830	143.0	-174.09	30307.12
831	132.0	-185.09	34258.08
832	143.0	-174.09	30307.12
833	352.0	34.91	1218.75
834	286.0	-31.09	966.55
835	440.0	122.91	15107.02
836	187.0	-130.09	16923.25
837	242.0	-75.09	5638.42
838	264.0	-53.09	2818.48
839	330.0	12.91	166.68
840	330.0	12.91	166.68
841	264.0	-53.09	2818.48
842	209.0	-108.09	11683.32
843	385.0	67.91	4611.85
844	264.0	-53.09	2818.48
845	385.0	67.91	4611.85
846	176.0	-141.09	19906.22
847	396.0	78.91	6226.88
848	682.0	364.91	133159.75
849	1034.0	716.91	513960.81
850	891.0	573.91	329373.38
	17314.0		1946718.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
851	682.0	364.91	133159.75
852	187.0	-130.09	16923.25
853	363.0	45.91	2107.78
854	863.0	545.91	298018.39
855	913.0	595.91	355109.45
856	649.0	331.91	110164.65
857	363.0	45.91	2107.78
858	242.0	-75.09	5638.42
859	330.0	12.91	166.68
860	88.0	-229.09	52481.95
861	330.0	12.91	166.68
862	220.0	-97.09	9426.35
863	264.0	-53.09	2818.48
864	297.0	-20.09	403.58
865	187.0	-130.09	16923.25
866	187.0	-130.09	16923.25
867	198.0	-119.09	14182.28
868	187.0	-130.09	16923.25
869	242.0	-75.09	5638.42
870	330.0	12.91	166.68
871	429.0	111.91	12523.98
872	209.0	-108.09	11683.32
873	341.0	23.91	571.72
874	209.0	-108.09	11683.32
875	297.0	-20.09	403.58
876	220.0	-97.09	9426.35
877	275.0	-42.09	1771.52
878	759.0	441.91	195284.98
879	704.0	386.91	149699.81
880	880.0	562.91	316868.35
881	462.0	144.91	20999.08
882	231.0	-86.09	7411.38
883	154.0	-163.09	26598.15
884	209.0	-108.09	11683.32
885	209.0	-108.09	11683.32
886	330.0	12.91	166.68
887	374.0	56.91	3238.82
888	341.0	23.91	571.72
889	275.0	-42.09	1771.52
890	165.0	-152.09	23131.18
891	902.0	584.91	342120.41
892	418.0	100.91	10182.95
893	198.0	-119.09	14182.28
894	330.0	12.91	166.68
895	341.0	23.91	571.72
896	99.0	-218.09	47562.99
897	319.0	1.91	3.65
898	231.0	-86.09	7411.38
899	198.0	-119.09	14182.28
900	275.0	-42.09	1771.52
	17506.0		2314778.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
901	286.0	-31.09	966.55
902	198.0	-119.09	14182.28
903	352.0	34.91	1218.75
904	132.0	-185.09	34258.08
905	286.0	-31.09	966.55
906	418.0	100.91	10182.95
907	198.0	-119.09	14182.28
908	176.0	-141.09	19906.22
909	231.0	-86.09	7411.38
910	220.0	-97.09	9426.35
911	297.0	-20.09	403.58
912	352.0	34.91	1218.75
913	286.0	-31.09	966.55
914	198.0	-119.09	14182.28
915	121.0	-196.09	38451.05
916	132.0	-185.09	34258.08
917	209.0	-108.09	11683.32
918	319.0	1.91	3.65
919	372.0	54.91	3015.17
920	198.0	-119.09	14182.28
921	220.0	-97.09	9426.35
922	253.0	-64.09	4107.45
923	330.0	12.91	166.68
924	352.0	34.91	1218.75
925	275.0	-42.09	1771.52
926	121.0	-196.09	38451.05
927	165.0	-152.09	23131.18
928	132.0	-185.09	34258.08
929	297.0	-20.09	403.58
930	418.0	100.91	10182.95
931	418.0	100.91	10182.95
932	198.0	-119.09	14182.28
933	143.0	-174.09	30307.12
934	165.0	-152.09	23131.18
935	385.0	67.91	4611.85
936	352.0	34.91	1218.75
937	396.0	78.91	6226.88
938	286.0	-31.09	966.55
939	462.0	144.91	20999.08
940	275.0	-42.09	1771.52
941	275.0	-42.09	1771.52
942	286.0	-31.09	966.55
943	473.0	155.91	24308.12
944	385.0	67.91	4611.85
945	462.0	144.91	20999.08
946	891.0	573.91	329373.38
947	176.0	-141.09	19906.22
948	132.0	-185.09	34258.08
949	110.0	-207.09	42886.02
950	154.0	-163.09	26598.15
	13968.0		973460.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
951	1749.0	1431.91	2050367.97
952	1133.0	815.91	665710.11
953	2046.0	1728.91	2989131.87
954	286.0	-31.09	966.55
955	66.0	-251.09	63045.89
956	99.0	-218.09	47562.99
957	286.0	-31.09	966.55
958	143.0	-174.09	30307.12
959	154.0	-163.09	26598.15
960	1342.0	1024.91	1050441.74
961	1364.0	1046.91	1096021.81
962	1859.0	1541.91	2377488.31
963	0.0	0.00	0.00
964	0.0	0.00	0.00
965	0.0	0.00	0.00
966	0.0	0.00	0.00
967	0.0	0.00	0.00
968	0.0	0.00	0.00
969	0.0	0.00	0.00
970	0.0	0.00	0.00
971	0.0	0.00	0.00
972	0.0	0.00	0.00
973	0.0	0.00	0.00
974	0.0	0.00	0.00
975	0.0	0.00	0.00
976	0.0	0.00	0.00
977	0.0	0.00	0.00
978	0.0	0.00	0.00
979	0.0	0.00	0.00
980	0.0	0.00	0.00
981	0.0	0.00	0.00
982	0.0	0.00	0.00
983	0.0	0.00	0.00
984	0.0	0.00	0.00
985	0.0	0.00	0.00
986	0.0	0.00	0.00
987	0.0	0.00	0.00
988	0.0	0.00	0.00
989	0.0	0.00	0.00
990	0.0	0.00	0.00
991	0.0	0.00	0.00
992	0.0	0.00	0.00
993	0.0	0.00	0.00
994	0.0	0.00	0.00
995	0.0	0.00	0.00
996	0.0	0.00	0.00
997	0.0	0.00	0.00
998	0.0	0.00	0.00
999	0.0	0.00	0.00
1000	0.0	0.00	0.00
	10527.0		10398609.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
1001	0.0	0.00	0.00
1002	0.0	0.00	0.00
1003	0.0	0.00	0.00
1004	0.0	0.00	0.00
1005	0.0	0.00	0.00
1006	0.0	0.00	0.00
1007	0.0	0.00	0.00
1008	0.0	0.00	0.00
1009	0.0	0.00	0.00
1010	0.0	0.00	0.00
1011	0.0	0.00	0.00
1012	0.0	0.00	0.00
1013	0.0	0.00	0.00
1014	0.0	0.00	0.00
1015	0.0	0.00	0.00
1016	0.0	0.00	0.00
1017	0.0	0.00	0.00
1018	0.0	0.00	0.00
1019	0.0	0.00	0.00
1020	0.0	0.00	0.00
1021	0.0	0.00	0.00
1022	0.0	0.00	0.00
1023	0.0	0.00	0.00
1024	0.0	0.00	0.00
1025	0.0	0.00	0.00
1026	0.0	0.00	0.00
1027	0.0	0.00	0.00
1028	0.0	0.00	0.00
1029	0.0	0.00	0.00
1030	0.0	0.00	0.00
1031	0.0	0.00	0.00
1032	0.0	0.00	0.00
1033	0.0	0.00	0.00
1034	0.0	0.00	0.00
1035	0.0	0.00	0.00
1036	0.0	0.00	0.00
1037	0.0	0.00	0.00
1038	0.0	0.00	0.00
1039	0.0	0.00	0.00
1040	0.0	0.00	0.00
1041	0.0	0.00	0.00
1042	0.0	0.00	0.00
1043	0.0	0.00	0.00
1044	0.0	0.00	0.00
1045	0.0	0.00	0.00
1046	0.0	0.00	0.00
1047	0.0	0.00	0.00
1048	0.0	0.00	0.00
1049	0.0	0.00	0.00
1050	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	897.0	96.6	9332.5
2	1196.0	395.6	156503.3
3	874.0	73.6	5417.7
4	1978.0	1177.6	1386753.5
5	2001.0	1200.6	1441452.3
6	2047.0	1246.6	1554024.0
7	874.0	73.6	5417.7
8	1196.0	395.6	156503.3
9	1840.0	1039.6	1080778.5
10	1564.0	763.6	583092.6
11	1702.0	901.6	812891.6
12	1104.0	303.6	92176.0
13	184.0	-616.4	379942.8
14	644.0	-156.4	24459.4
15	552.0	-248.4	61700.1
16	1012.0	211.6	44776.7
17	0.0	-800.4	640632.2
18	1058.0	257.6	66360.3
19	1158.0	357.6	127881.3
20	1242.0	441.6	195015.0
21	1311.0	510.6	260717.5
22	713.0	-87.4	7637.9
23	782.0	-18.4	338.4
24	460.0	-340.4	115868.8
25	736.0	-64.4	4146.7
26	483.0	-317.4	100739.6
27	1426.0	625.6	391381.6
28	1219.0	418.6	175230.1
29	1748.0	947.6	897955.2
30	1081.0	280.6	78739.2
31	529.0	-271.4	73655.3
32	1357.0	556.6	309809.1
33	1081.0	280.6	78739.2
34	1817.0	1016.6	1033485.7
35	805.0	4.6	21.2
36	414.0	-386.4	149301.1
37	989.0	188.6	35571.8
38	667.0	-133.4	17794.2
39	1265.0	464.6	215857.8
40	1564.0	763.6	583092.6
41	1173.0	372.6	138834.5
42	1863.0	1062.6	1129129.4
43	943.0	142.6	20336.2
44	1587.0	786.6	618747.4
45	2047.0	1246.6	1554024.0
46	1035.0	234.6	55039.5
47	2760.0	1959.6	3840051.7
48	1656.0	855.6	732059.9
49	759.0	-41.4	1713.5
50	1518.0	717.6	514956.9
	49540.0		15357705.0
	40570.0		11272033.5
	27876.0		13172402.0
	26542.0		11709597.9
	42274.0		17890379.3
	65262.0		34403794.3
	65711.0		36934930.6
	44091.0		37201330.8
	35012.0		11515230.4
	31098.0		19923600.6
	34339.0		17262377.1
	30636.0		16801369.6
	30388.0		15493699.5
	34685.0		17834975.8
	44928.0		21513368.6
	49124.0		15624357.7
	42146.0		16717910.4
	2542.0		29333988.4
	14305.0		18243947.8
	0.0		0.0
total	769980		400167085.9
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 962

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 800.40

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 645.30

2 Std Deviations: 1290.59

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.645

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 834.62 DPM /100cm²

GUIDELINE VALUE: 5000 DPM /100cm²

Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	961	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	961	1.645	95%

PERFORMED BY: K Morgan DATE: 6/15/99

REVIEWED BY: W.a. Rogers DATE: 6-16-99

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CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	1495.0	694.6	482476.09
52	1564.0	763.6	583092.58
53	1748.0	947.6	897955.22
54	2668.0	1867.6	3487948.40
55	1035.0	234.6	55039.50
56	943.0	142.6	20336.18
57	736.0	-64.4	4146.72
58	1242.0	441.6	195014.97
59	2162.0	1361.6	1853968.15
60	1725.0	924.6	854894.39
61	989.0	188.6	35571.84
62	713.0	-87.4	7637.89
63	1541.0	740.6	548495.75
64	1173.0	372.6	138834.48
65	1909.0	1108.6	1229005.02
66	1196.0	395.6	156503.31
67	667.0	-133.4	17794.23
68	322.0	-478.4	228861.79
69	575.0	-225.4	50802.91
70	874.0	73.6	5417.69
71	575.0	-225.4	50802.91
72	759.0	-41.4	1713.55
73	575.0	-225.4	50802.91
74	345.0	-455.4	207384.62
75	1426.0	625.6	391381.60
76	897.0	96.6	9332.52
77	897.0	96.6	9332.52
78	897.0	96.6	9332.52
79	874.0	73.6	5417.69
80	506.0	-294.4	86668.42
81	92.0	-708.4	501823.49
82	966.0	165.6	27425.01
83	1081.0	280.6	78739.16
84	1150.0	349.6	122223.65
85	575.0	-225.4	50802.91
86	345.0	-455.4	207384.62
87	782.0	-18.4	338.38
88	920.0	119.6	14305.35
89	1656.0	855.6	732059.90
90	989.0	188.6	35571.84
91	759.0	-41.4	1713.55
92	759.0	-41.4	1713.55
93	1403.0	602.6	363132.77
94	897.0	96.6	9332.52
95	805.0	4.6	21.21
96	1633.0	832.6	693231.07
97	92.0	-708.4	501823.49
98	826.0	25.6	655.62
99	437.0	-363.4	132055.93
100	345.0	-455.4	207384.62
	49540.0		15357705.0
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	506.0	-294.4	86668.42
102	920.0	119.6	14305.35
103	0.0	-800.4	640632.17
104	1516.0	715.6	512090.50
105	1725.0	924.6	854894.39
106	0.0	-800.4	640632.17
107	598.0	-202.4	40963.74
108	299.0	-501.4	251396.96
109	1081.0	280.6	78739.16
110	184.0	-616.4	379942.81
111	966.0	165.6	27425.01
112	1725.0	924.6	854894.39
113	1173.0	372.6	138834.48
114	1196.0	395.6	156503.31
115	874.0	73.6	5417.69
116	322.0	-478.4	228861.79
117	1150.0	349.6	122223.65
118	828.0	27.6	762.04
119	943.0	142.6	20336.18
120	1035.0	234.6	55039.50
121	92.0	-708.4	501823.49
122	1219.0	418.6	175230.14
123	1081.0	280.6	78739.16
124	115.0	-685.4	469766.32
125	1150.0	349.6	122223.65
126	1150.0	349.6	122223.65
127	368.0	-432.4	186965.45
128	253.0	-547.4	299641.30
129	184.0	-616.4	379942.81
130	1541.0	740.6	548495.75
131	1311.0	510.6	260717.46
132	1495.0	694.6	482476.09
133	322.0	-478.4	228861.79
134	690.0	-110.4	12187.06
135	690.0	-110.4	12187.06
136	1610.0	809.6	655460.24
137	759.0	-41.4	1713.55
138	1242.0	441.6	195014.97
139	460.0	-340.4	115868.76
140	805.0	4.6	21.21
141	460.0	-340.4	115868.76
142	253.0	-547.4	299641.30
143	1058.0	257.6	66360.33
144	1035.0	234.6	55039.50
145	552.0	-248.4	61700.08
146	391.0	-409.4	167604.27
147	230.0	-570.4	325350.47
148	1012.0	211.6	44776.67
149	782.0	-18.4	338.38
150	1219.0	418.6	175230.14
	40570.0		11272033.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	920.0	119.6	14305.35
152	161.0	-639.4	408825.98
153	460.0	-340.4	115868.76
154	1104.0	303.6	92175.99
155	989.0	188.6	35571.84
156	1380.0	579.6	335941.94
157	345.0	-455.4	207384.62
158	437.0	-363.4	132055.93
159	207.0	-593.4	352117.64
160	1242.0	441.6	195014.97
161	1104.0	303.6	92175.99
162	828.0	27.6	762.04
163	299.0	-501.4	251396.96
164	138.0	-662.4	438767.15
165	1035.0	234.6	55039.50
166	667.0	-133.4	17794.23
167	828.0	27.6	762.04
168	1242.0	441.6	195014.97
169	115.0	-685.4	469766.32
170	0.0	-800.4	640632.17
171	184.0	-616.4	379942.81
172	46.0	-754.4	569111.83
173	276.0	-524.4	274990.13
174	805.0	4.6	21.21
175	0.0	-800.4	640632.17
176	897.0	96.6	9332.52
177	1426.0	625.6	391381.60
178	437.0	-363.4	132055.93
179	0.0	-800.4	640632.17
180	575.0	-225.4	50802.91
181	115.0	-685.4	469766.32
182	0.0	-800.4	640632.17
183	92.0	-708.4	501823.49
184	552.0	-248.4	61700.08
185	1127.0	326.6	106670.82
186	1104.0	303.6	92175.99
187	345.0	-455.4	207384.62
188	299.0	-501.4	251396.96
189	391.0	-409.4	167604.27
190	1495.0	694.6	482476.09
191	575.0	-225.4	50802.91
192	759.0	-41.4	1713.55
193	92.0	-708.4	501823.49
194	23.0	-777.4	604343.00
195	621.0	-179.4	32182.57
196	1173.0	372.6	138834.48
197	0.0	-800.4	640632.17
198	828.0	27.6	762.04
199	138.0	-662.4	438767.15
200	0.0	-800.4	640632.17
	27876.0		13172402.0
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	253.0	-547.4	299641.30
202	1012.0	211.6	44776.67
203	759.0	-41.4	1713.55
204	667.0	-133.4	17794.23
205	299.0	-501.4	251396.96
206	92.0	-708.4	501823.49
207	759.0	-41.4	1713.55
208	575.0	-225.4	50802.91
209	736.0	-64.4	4146.72
210	1242.0	441.6	195014.97
211	0.0	-800.4	640632.17
212	0.0	-800.4	640632.17
213	483.0	-317.4	100739.59
214	1104.0	303.6	92175.99
215	805.0	4.6	21.21
216	1173.0	372.6	138834.48
217	0.0	-800.4	640632.17
218	1288.0	487.6	237758.63
219	161.0	-639.4	408825.98
220	1081.0	280.6	78739.16
221	0.0	-800.4	640632.17
222	920.0	119.6	14305.35
223	161.0	-639.4	408825.98
224	0.0	-800.4	640632.17
225	368.0	-432.4	186965.45
226	621.0	-179.4	32182.57
227	414.0	-386.4	149301.10
228	759.0	-41.4	1713.55
229	345.0	-455.4	207384.62
230	0.0	-800.4	640632.17
231	230.0	-570.4	325350.47
232	897.0	96.6	9332.52
233	851.0	50.6	2560.86
234	667.0	-133.4	17794.23
235	460.0	-340.4	115868.76
236	0.0	-800.4	640632.17
237	575.0	-225.4	50802.91
238	690.0	-110.4	12187.06
239	782.0	-18.4	338.38
240	713.0	-87.4	7637.89
241	0.0	-800.4	640632.17
242	0.0	-800.4	640632.17
243	23.0	-777.4	604343.00
244	828.0	27.6	762.04
245	1127.0	326.6	106670.82
246	1173.0	372.6	138834.48
247	529.0	-271.4	73655.25
248	0.0	-800.4	640632.17
249	759.0	-41.4	1713.55
250	161.0	-639.4	408825.98
	26542.0		11709597.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	943.0	142.6	20336.18
252	69.0	-731.4	534938.66
253	92.0	-708.4	501823.49
254	874.0	73.6	5417.69
255	414.0	-386.4	149301.10
256	713.0	-87.4	7637.89
257	1127.0	326.6	106670.82
258	1196.0	395.6	156503.31
259	322.0	-478.4	228861.79
260	184.0	-616.4	379942.81
261	759.0	-41.4	1713.55
262	667.0	-133.4	17794.23
263	621.0	-179.4	32182.57
264	483.0	-317.4	100739.59
265	437.0	-363.4	132055.93
266	782.0	-18.4	338.38
267	713.0	-87.4	7637.89
268	943.0	142.6	20336.18
269	437.0	-363.4	132055.93
270	966.0	165.6	27425.01
271	115.0	-685.4	469766.32
272	368.0	-432.4	186965.45
273	1012.0	211.6	44776.67
274	1104.0	303.6	92175.99
275	1288.0	487.6	237758.63
276	621.0	-179.4	32182.57
277	368.0	-432.4	186965.45
278	46.0	-754.4	569111.83
279	184.0	-616.4	379942.81
280	1127.0	326.6	106670.82
281	1196.0	395.6	156503.31
282	1196.0	395.6	156503.31
283	3174.0	2373.6	5634000.65
284	736.0	-64.4	4146.72
285	713.0	-87.4	7637.89
286	621.0	-179.4	32182.57
287	1449.0	648.6	420688.43
288	1334.0	533.6	284734.28
289	460.0	-340.4	115868.76
290	322.0	-478.4	228861.79
291	828.0	27.6	762.04
292	1380.0	579.6	335941.94
293	1541.0	740.6	548495.75
294	1817.0	1016.6	1033485.70
295	46.0	-754.4	569111.83
296	92.0	-708.4	501823.49
297	1242.0	441.6	195014.97
298	2070.0	1269.6	1611896.83
299	1334.0	533.6	284734.28
300	1748.0	947.6	897955.22
	42274.0		17890379.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	0.0	-800.4	640632.17
302	207.0	-593.4	352117.64
303	506.0	-294.4	86668.42
304	2139.0	1338.6	1791863.32
305	851.0	50.6	2560.86
306	2024.0	1223.6	1497209.17
307	414.0	-386.4	149301.10
308	1265.0	464.6	215857.80
309	713.0	-87.4	7637.89
310	1495.0	694.6	482476.09
311	2392.0	1591.6	2533206.44
312	1909.0	1108.6	1229005.02
313	736.0	-64.4	4146.72
314	460.0	-340.4	115868.76
315	897.0	96.6	9332.52
316	2070.0	1269.6	1611896.83
317	1587.0	786.6	618747.41
318	1265.0	464.6	215857.80
319	1242.0	441.6	195014.97
320	943.0	142.6	20336.18
321	1081.0	280.6	78739.16
322	1311.0	510.6	260717.46
323	1886.0	1085.6	1178538.19
324	1610.0	809.6	655460.24
325	1702.0	901.6	812891.56
326	1771.0	970.6	942074.05
327	1840.0	1039.6	1080778.53
328	139.0	-661.4	437443.36
329	1863.0	1062.6	1129129.36
330	2116.0	1315.6	1730816.49
331	1472.0	671.6	451053.26
332	1403.0	602.6	363132.77
333	966.0	165.6	27425.01
334	2070.0	1269.6	1611896.83
335	1794.0	993.6	987250.88
336	1219.0	418.6	175230.14
337	828.0	27.6	762.04
338	1702.0	901.6	812891.56
339	1804.0	1003.6	1007222.98
340	2254.0	1453.6	2112967.47
341	1541.0	740.6	548495.75
342	736.0	-64.4	4146.72
343	207.0	-593.4	352117.64
344	483.0	-317.4	100739.59
345	437.0	-363.4	132055.93
346	1380.0	579.6	335941.94
347	2139.0	1338.6	1791863.32
348	2369.0	1568.6	2460521.61
349	322.0	-478.4	228861.79
350	1702.0	901.6	812891.56
	65262.0		34403794.3
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
351	1587.0	786.6	618747.41
352	2139.0	1338.6	1791863.32
353	1748.0	947.6	897955.22
354	1426.0	625.6	391381.60
355	1012.0	211.6	44776.67
356	644.0	-156.4	24459.40
357	1472.0	671.6	451053.26
358	2185.0	1384.6	1917130.98
359	2507.0	1706.6	2912500.59
360	1840.0	1039.6	1080778.53
361	575.0	-225.4	50802.91
362	1242.0	441.6	195014.97
363	1219.0	418.6	175230.14
364	1196.0	395.6	156503.31
365	1725.0	924.6	854894.39
366	1426.0	625.6	391381.60
367	736.0	-64.4	4146.72
368	1012.0	211.6	44776.67
369	851.0	50.6	2560.86
370	1955.0	1154.6	1333112.68
371	943.0	142.6	20336.18
372	1817.0	1016.6	1033485.70
373	1058.0	257.6	66360.33
374	920.0	119.6	14305.35
375	1863.0	1062.6	1129129.36
376	1955.0	1154.6	1333112.68
377	667.0	-133.4	17794.23
378	2231.0	1430.6	2046630.64
379	161.0	-639.4	408825.98
380	989.0	188.6	35571.84
381	1541.0	740.6	548495.75
382	1909.0	1108.6	1229005.02
383	1357.0	556.6	309809.11
384	1633.0	832.6	693231.07
385	506.0	-294.4	86668.42
386	782.0	-18.4	338.38
387	299.0	-501.4	251396.96
388	1495.0	694.6	482476.09
389	1633.0	832.6	693231.07
390	1081.0	280.6	78739.16
391	575.0	-225.4	50802.91
392	1035.0	234.6	55039.50
393	828.0	27.6	762.04
394	1863.0	1062.6	1129129.36
395	1196.0	395.6	156503.31
396	2323.0	1522.6	2318325.95
397	253.0	-547.4	299641.30
398	0.0	-800.4	640632.17
399	598.0	-202.4	40963.74
400	3703.0	2902.6	8425115.73
	65711.0		36934930.6
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	4209.0	3408.6	11618587.98
402	4117.0	3316.6	10999868.66
403	69.0	-731.4	534938.66
404	690.0	-110.4	12187.06
405	644.0	-156.4	24459.40
406	644.0	-156.4	24459.40
407	713.0	-87.4	7637.89
408	621.0	-179.4	32182.57
409	1012.0	211.6	44776.67
410	1380.0	579.6	335941.94
411	1426.0	625.6	391381.60
412	713.0	-87.4	7637.89
413	782.0	-18.4	338.38
414	736.0	-64.4	4146.72
415	1081.0	280.6	78739.16
416	414.0	-386.4	149301.10
417	1035.0	234.6	55039.50
418	92.0	-708.4	501823.49
419	0.0	-800.4	640632.17
420	0.0	-800.4	640632.17
421	138.0	-662.4	438767.15
422	23.0	-777.4	604343.00
423	0.0	-800.4	640632.17
424	0.0	-800.4	640632.17
425	253.0	-547.4	299641.30
426	621.0	-179.4	32182.57
427	1817.0	1016.6	1033485.70
428	1909.0	1108.6	1229005.02
429	1932.0	1131.6	1280529.85
430	437.0	-363.4	132055.93
431	598.0	-202.4	40963.74
432	92.0	-708.4	501823.49
433	1840.0	1039.6	1080778.53
434	1081.0	280.6	78739.16
435	1840.0	1039.6	1080778.53
436	1081.0	280.6	78739.16
437	483.0	-317.4	100739.59
438	690.0	-110.4	12187.06
439	1058.0	257.6	66360.33
440	1265.0	464.6	215857.80
441	1012.0	211.6	44776.67
442	598.0	-202.4	40963.74
443	621.0	-179.4	32182.57
444	253.0	-547.4	299641.30
445	322.0	-478.4	228861.79
446	92.0	-708.4	501823.49
447	483.0	-317.4	100739.59
448	1035.0	234.6	55039.50
449	1242.0	441.6	195014.97
450	897.0	96.6	9332.52
	44091.0		37201330.8
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
451	184.0	-616.4	379942.81
452	92.0	-708.4	501823.49
453	1150.0	349.6	122223.65
454	184.0	-616.4	379942.81
455	253.0	-547.4	299641.30
456	184.0	-616.4	379942.81
457	161.0	-639.4	408825.98
458	506.0	-294.4	86668.42
459	368.0	-432.4	186965.45
460	483.0	-317.4	100739.59
461	276.0	-524.4	274990.13
462	759.0	-41.4	1713.55
463	0.0	-800.4	640632.17
464	0.0	-800.4	640632.17
465	276.0	-524.4	274990.13
466	1081.0	280.6	78739.16
467	1610.0	809.6	655460.24
468	1357.0	556.6	309809.11
469	1035.0	234.6	55039.50
470	483.0	-317.4	100739.59
471	736.0	-64.4	4146.72
472	828.0	27.6	762.04
473	1081.0	280.6	78739.16
474	897.0	96.6	9332.52
475	805.0	4.6	21.21
476	598.0	-202.4	40963.74
477	391.0	-409.4	167604.27
478	874.0	73.6	5417.69
479	1242.0	441.6	195014.97
480	1587.0	786.6	618747.41
481	552.0	-248.4	61700.08
482	276.0	-524.4	274990.13
483	299.0	-501.4	251396.96
484	1150.0	349.6	122223.65
485	1012.0	211.6	44776.67
486	2024.0	1223.6	1497209.17
487	1127.0	326.6	106670.82
488	943.0	142.6	20336.18
489	857.0	56.6	3204.12
490	1472.0	671.6	451053.26
491	1150.0	349.6	122223.65
492	805.0	4.6	21.21
493	0.0	-800.4	640632.17
494	184.0	-616.4	379942.81
495	437.0	-363.4	132055.93
496	506.0	-294.4	86668.42
497	299.0	-501.4	251396.96
498	621.0	-179.4	32182.57
499	828.0	27.6	762.04
500	989.0	188.6	35571.84
	35012.0		11515230.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
501	1564.0	763.6	583092.58
502	667.0	-133.4	17794.23
503	276.0	-524.4	274990.13
504	667.0	-133.4	17794.23
505	46.0	-754.4	569111.83
506	207.0	-593.4	352117.64
507	0.0	-800.4	640632.17
508	1817.0	1016.6	1033485.70
509	1679.0	878.6	771946.73
510	1058.0	257.6	66360.33
511	138.0	-662.4	438767.15
512	161.0	-639.4	408825.98
513	0.0	-800.4	640632.17
514	782.0	-18.4	338.38
515	554.0	-246.4	60710.50
516	46.0	-754.4	569111.83
517	0.0	-800.4	640632.17
518	0.0	-800.4	640632.17
519	0.0	-800.4	640632.17
520	1794.0	993.6	987250.88
521	0.0	-800.4	640632.17
522	1748.0	947.6	897955.22
523	161.0	-639.4	408825.98
524	184.0	-616.4	379942.81
525	506.0	-294.4	86668.42
526	1150.0	349.6	122223.65
527	1219.0	418.6	175230.14
528	1288.0	487.6	237758.63
529	138.0	-662.4	438767.15
530	0.0	-800.4	640632.17
531	92.0	-708.4	501823.49
532	1242.0	441.6	195014.97
533	1265.0	464.6	215857.80
534	1173.0	372.6	138834.48
535	460.0	-340.4	115868.76
536	230.0	-570.4	325350.47
537	207.0	-593.4	352117.64
538	1403.0	602.6	363132.77
539	1495.0	694.6	482476.09
540	828.0	27.6	762.04
541	0.0	-800.4	640632.17
542	0.0	-800.4	640632.17
543	46.0	-754.4	569111.83
544	1403.0	602.6	363132.77
545	828.0	27.6	762.04
546	1403.0	602.6	363132.77
547	46.0	-754.4	569111.83
548	138.0	-662.4	438767.15
549	690.0	-110.4	12187.06
550	299.0	-501.4	251396.96
	31098.0		19923600.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
551	1403.0	602.6	363132.77
552	874.0	73.6	5417.69
553	0.0	-800.4	640632.17
554	23.0	-777.4	604343.00
555	437.0	-363.4	132055.93
556	1150.0	349.6	122223.65
557	1150.0	349.6	122223.65
558	690.0	-110.4	12187.06
559	0.0	-800.4	640632.17
560	483.0	-317.4	100739.59
561	920.0	119.6	14305.35
562	667.0	-133.4	17794.23
563	1863.0	1062.6	1129129.36
564	1449.0	648.6	420688.43
565	207.0	-593.4	352117.64
566	0.0	-800.4	640632.17
567	644.0	-156.4	24459.40
568	1564.0	763.6	583092.58
569	1518.0	717.6	514956.92
570	1104.0	303.6	92175.99
571	115.0	-685.4	469766.32
572	276.0	-524.4	274990.13
573	782.0	-18.4	338.38
574	1725.0	924.6	854894.39
575	1265.0	464.6	215857.80
576	1311.0	510.6	260717.46
577	575.0	-225.4	50802.91
578	391.0	-409.4	167604.27
579	0.0	-800.4	640632.17
580	943.0	142.6	20336.18
581	874.0	73.6	5417.69
582	1196.0	395.6	156503.31
583	161.0	-639.4	408825.98
584	322.0	-478.4	228861.79
585	0.0	-800.4	640632.17
586	1265.0	464.6	215857.80
587	874.0	73.6	5417.69
588	1242.0	441.6	195014.97
589	0.0	-800.4	640632.17
590	0.0	-800.4	640632.17
591	805.0	4.6	21.21
592	0.0	-800.4	640632.17
593	0.0	-800.4	640632.17
594	0.0	-800.4	640632.17
595	184.0	-616.4	379942.81
596	989.0	188.6	35571.84
597	1886.0	1085.6	1178538.19
598	0.0	-800.4	640632.17
599	897.0	96.6	9332.52
600	115.0	-685.4	469766.32
	34339.0		17262377.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
601	0.0	-800.4	640632.17
602	0.0	-800.4	640632.17
603	0.0	-800.4	640632.17
604	506.0	-294.4	86668.42
605	667.0	-133.4	17794.23
606	1219.0	418.6	175230.14
607	230.0	-570.4	325350.47
608	575.0	-225.4	50802.91
609	0.0	-800.4	640632.17
610	92.0	-708.4	501823.49
611	0.0	-800.4	640632.17
612	345.0	-455.4	207384.62
613	1150.0	349.6	122223.65
614	1610.0	809.6	655460.24
615	1265.0	464.6	215857.80
616	782.0	-18.4	338.38
617	460.0	-340.4	115868.76
618	782.0	-18.4	338.38
619	1012.0	211.6	44776.67
620	1794.0	993.6	987250.88
621	1127.0	326.6	106670.82
622	414.0	-386.4	149301.10
623	184.0	-616.4	379942.81
624	207.0	-593.4	352117.64
625	1196.0	395.6	156503.31
626	230.0	-570.4	325350.47
627	943.0	142.6	20336.18
628	1196.0	395.6	156503.31
629	920.0	119.6	14305.35
630	2369.0	1568.6	2460521.61
631	0.0	-800.4	640632.17
632	598.0	-202.4	40963.74
633	736.0	-64.4	4146.72
634	460.0	-340.4	115868.76
635	437.0	-363.4	132055.93
636	161.0	-639.4	408825.98
637	943.0	142.6	20336.18
638	161.0	-639.4	408825.98
639	644.0	-156.4	24459.40
640	1058.0	257.6	66360.33
641	0.0	-800.4	640632.17
642	0.0	-800.4	640632.17
643	207.0	-593.4	352117.64
644	1495.0	694.6	482476.09
645	805.0	4.6	21.21
646	1012.0	211.6	44776.67
647	0.0	-800.4	640632.17
648	0.0	-800.4	640632.17
649	0.0	-800.4	640632.17
650	644.0	-156.4	24459.40
	30636.0		16801369.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
651	879.0	78.6	6178.74
652	828.0	27.6	762.04
653	368.0	-432.4	186965.45
654	0.0	-800.4	640632.17
655	46.0	-754.4	569111.83
656	1104.0	303.6	92175.99
657	1012.0	211.6	44776.67
658	1150.0	349.6	122223.65
659	0.0	-800.4	640632.17
660	299.0	-501.4	251396.96
661	207.0	-593.4	352117.64
662	1219.0	418.6	175230.14
663	851.0	50.6	2560.86
664	1403.0	602.6	363132.77
665	322.0	-478.4	228861.79
666	184.0	-616.4	379942.81
667	230.0	-570.4	325350.47
668	69.0	-731.4	534938.66
669	1541.0	740.6	548495.75
670	621.0	-179.4	32182.57
671	46.0	-754.4	569111.83
672	0.0	-800.4	640632.17
673	644.0	-156.4	24459.40
674	1334.0	533.6	284734.28
675	1541.0	740.6	548495.75
676	690.0	-110.4	12187.06
677	0.0	-800.4	640632.17
678	69.0	-731.4	534938.66
679	92.0	-708.4	501823.49
680	1173.0	372.6	138834.48
681	989.0	188.6	35571.84
682	1334.0	533.6	284734.28
683	69.0	-731.4	534938.66
684	46.0	-754.4	569111.83
685	115.0	-685.4	469766.32
686	1288.0	487.6	237758.63
687	828.0	27.6	762.04
688	897.0	96.6	9332.52
689	0.0	-800.4	640632.17
690	69.0	-731.4	534938.66
691	92.0	-708.4	501823.49
692	1173.0	372.6	138834.48
693	989.0	188.6	35571.84
694	1334.0	533.6	284734.28
695	69.0	-731.4	534938.66
696	46.0	-754.4	569111.83
697	115.0	-685.4	469766.32
698	1288.0	487.6	237758.63
699	828.0	27.6	762.04
700	897.0	96.6	9332.52
	30388.0		15493699.5
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
701	0.0	-800.4	640632.17
702	0.0	-800.4	640632.17
703	0.0	-800.4	640632.17
704	874.0	73.6	5417.69
705	1679.0	878.6	771946.73
706	1679.0	878.6	771946.73
707	437.0	-363.4	132055.93
708	0.0	-800.4	640632.17
709	0.0	-800.4	640632.17
710	1311.0	510.6	260717.46
711	1656.0	855.6	732059.90
712	1150.0	349.6	122223.65
713	368.0	-432.4	186965.45
714	0.0	-800.4	640632.17
715	23.0	-777.4	604343.00
716	1242.0	441.6	195014.97
717	690.0	-110.4	12187.06
718	1150.0	349.6	122223.65
719	368.0	-432.4	186965.45
720	529.0	-271.4	73655.25
721	0.0	-800.4	640632.17
722	1334.0	533.6	284734.28
723	598.0	-202.4	40963.74
724	1174.0	373.6	139580.69
725	69.0	-731.4	534938.66
726	46.0	-754.4	569111.83
727	184.0	-616.4	379942.81
728	943.0	142.6	20336.18
729	1449.0	648.6	420688.43
730	1564.0	763.6	583092.58
731	299.0	-501.4	251396.96
732	437.0	-363.4	132055.93
733	0.0	-800.4	640632.17
734	1587.0	786.6	618747.41
735	1541.0	740.6	548495.75
736	1196.0	395.6	156503.31
737	391.0	-409.4	167604.27
738	874.0	73.6	5417.69
739	0.0	-800.4	640632.17
740	1679.0	878.6	771946.73
741	1219.0	418.6	175230.14
742	1012.0	211.6	44776.67
743	506.0	-294.4	86668.42
744	644.0	-156.4	24459.40
745	1012.0	211.6	44776.67
746	46.0	-754.4	569111.83
747	0.0	-800.4	640632.17
748	0.0	-800.4	640632.17
749	989.0	188.6	35571.84
750	736.0	-64.4	4146.72
	34685.0		17834975.8
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
751	644.0	-156.4	24459.40
752	230.0	-570.4	325350.47
753	230.0	-570.4	325350.47
754	69.0	-731.4	534938.66
755	1702.0	901.6	812891.56
756	1288.0	487.6	237758.63
757	989.0	188.6	35571.84
758	46.0	-754.4	569111.83
759	32.0	-768.4	590430.89
760	138.0	-662.4	438767.15
761	1196.0	395.6	156503.31
762	1656.0	855.6	732059.90
763	1058.0	257.6	66360.33
764	207.0	-593.4	352117.64
765	0.0	-800.4	640632.17
766	0.0	-800.4	640632.17
767	1242.0	441.6	195014.97
768	1058.0	257.6	66360.33
769	1610.0	809.6	655460.24
770	115.0	-685.4	469766.32
771	0.0	-800.4	640632.17
772	23.0	-777.4	604343.00
773	1748.0	947.6	897955.22
774	1656.0	855.6	732059.90
775	1127.0	326.6	106670.82
776	299.0	-501.4	251396.96
777	0.0	-800.4	640632.17
778	46.0	-754.4	569111.83
779	874.0	73.6	5417.69
780	1265.0	464.6	215857.80
781	1196.0	395.6	156503.31
782	598.0	-202.4	40963.74
783	943.0	142.6	20336.18
784	1587.0	786.6	618747.41
785	598.0	-202.4	40963.74
786	1334.0	533.6	284734.28
787	966.0	165.6	27425.01
788	1081.0	280.6	78739.16
789	1196.0	395.6	156503.31
790	2001.0	1200.6	1441452.34
791	1127.0	326.6	106670.82
792	1656.0	855.6	732059.90
793	1334.0	533.6	284734.28
794	598.0	-202.4	40963.74
795	1012.0	211.6	44776.67
796	2254.0	1453.6	2112967.47
797	1587.0	786.6	618747.41
798	1472.0	671.6	451053.26
799	1840.0	1039.6	1080778.53
800	0.0	-800.4	640632.17
	44928.0		21513368.6
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
801	920.0	119.6	14305.35
802	1357.0	556.6	309809.11
803	943.0	142.6	20336.18
804	1125.0	324.6	105368.40
805	690.0	-110.4	12187.06
806	299.0	-501.4	251396.96
807	506.0	-294.4	86668.42
808	690.0	-110.4	12187.06
809	1495.0	694.6	482476.09
810	1242.0	441.6	195014.97
811	1219.0	418.6	175230.14
812	437.0	-363.4	132055.93
813	0.0	-800.4	640632.17
814	966.0	165.6	27425.01
815	1794.0	993.6	987250.88
816	1219.0	418.6	175230.14
817	1541.0	740.6	548495.75
818	596.0	-204.4	41777.32
819	713.0	-87.4	7637.89
820	345.0	-455.4	207384.62
821	1564.0	763.6	583092.58
822	943.0	142.6	20336.18
823	1127.0	326.6	106670.82
824	1058.0	257.6	66360.33
825	782.0	-18.4	338.38
826	368.0	-432.4	186965.45
827	736.0	-64.4	4146.72
828	1886.0	1085.6	1178538.19
829	1357.0	556.6	309809.11
830	115.0	-685.4	469766.32
831	828.0	27.6	762.04
832	1058.0	257.6	66360.33
833	1909.0	1108.6	1229005.02
834	1127.0	326.6	106670.82
835	713.0	-87.4	7637.89
836	0.0	-800.4	640632.17
837	437.0	-363.4	132055.93
838	276.0	-524.4	274990.13
839	1380.0	579.6	335941.94
840	1449.0	648.6	420688.43
841	1357.0	556.6	309809.11
842	0.0	-800.4	640632.17
843	598.0	-202.4	40963.74
844	1150.0	349.6	122223.65
845	1311.0	510.6	260717.46
846	713.0	-87.4	7637.89
847	2001.0	1200.6	1441452.34
848	1771.0	970.6	942074.05
849	1127.0	326.6	106670.82
850	1886.0	1085.6	1178538.19
	49124.0		15624357.7
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
851	1748.0	947.6	897955.22
852	1564.0	763.6	583092.58
853	1656.0	855.6	732059.90
854	299.0	-501.4	251396.96
855	1334.0	533.6	284734.28
856	1265.0	464.6	215857.80
857	1311.0	510.6	260717.46
858	1426.0	625.6	391381.60
859	1288.0	487.6	237758.63
860	276.0	-524.4	274990.13
861	851.0	50.6	2560.86
862	851.0	50.6	2560.86
863	1541.0	740.6	548495.75
864	667.0	-133.4	17794.23
865	598.0	-202.4	40963.74
866	0.0	-800.4	640632.17
867	230.0	-570.4	325350.47
868	851.0	50.6	2560.86
869	1357.0	556.6	309809.11
870	1758.0	957.6	917007.32
871	1311.0	510.6	260717.46
872	828.0	27.6	762.04
873	713.0	-87.4	7637.89
874	368.0	-432.4	186965.45
875	1610.0	809.6	655460.24
876	1380.0	579.6	335941.94
877	1449.0	648.6	420688.43
878	759.0	-41.4	1713.55
879	966.0	165.6	27425.01
880	1932.0	1131.6	1280529.85
881	874.0	73.6	5417.69
882	1173.0	372.6	138834.48
883	1150.0	349.6	122223.65
884	598.0	-202.4	40963.74
885	368.0	-432.4	186965.45
886	1196.0	395.6	156503.31
887	851.0	50.6	2560.86
888	1426.0	625.6	391381.60
889	1081.0	280.6	78739.16
890	0.0	-800.4	640632.17
891	0.0	-800.4	640632.17
892	0.0	-800.4	640632.17
893	161.0	-639.4	408825.98
894	345.0	-455.4	207384.62
895	0.0	-800.4	640632.17
896	0.0	-800.4	640632.17
897	0.0	-800.4	640632.17
898	0.0	-800.4	640632.17
899	322.0	-478.4	228861.79
900	414.0	-386.4	149301.10
	42146.0		16717910.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
901	322.0	-478.4	228861.79
902	0.0	-800.4	640632.17
903	0.0	-800.4	640632.17
904	0.0	-800.4	640632.17
905	989.0	188.6	35571.84
906	0.0	-800.4	640632.17
907	0.0	-800.4	640632.17
908	0.0	-800.4	640632.17
909	0.0	-800.4	640632.17
910	0.0	-800.4	640632.17
911	0.0	-800.4	640632.17
912	0.0	-800.4	640632.17
913	253.0	-547.4	299641.30
914	0.0	-800.4	640632.17
915	0.0	-800.4	640632.17
916	0.0	-800.4	640632.17
917	0.0	-800.4	640632.17
918	184.0	-616.4	379942.81
919	0.0	-800.4	640632.17
920	0.0	-800.4	640632.17
921	0.0	-800.4	640632.17
922	0.0	-800.4	640632.17
923	288.0	-512.4	262548.65
924	46.0	-754.4	569111.83
925	207.0	-593.4	352117.64
926	0.0	-800.4	640632.17
927	0.0	-800.4	640632.17
928	0.0	-800.4	640632.17
929	0.0	-800.4	640632.17
930	0.0	-800.4	640632.17
931	253.0	-547.4	299641.30
932	0.0	-800.4	640632.17
933	0.0	-800.4	640632.17
934	0.0	-800.4	640632.17
935	0.0	-800.4	640632.17
936	0.0	-800.4	640632.17
937	0.0	-800.4	640632.17
938	0.0	-800.4	640632.17
939	0.0	-800.4	640632.17
940	0.0	-800.4	640632.17
941	0.0	-800.4	640632.17
942	0.0	-800.4	640632.17
943	0.0	-800.4	640632.17
944	0.0	-800.4	640632.17
945	0.0	-800.4	640632.17
946	0.0	-800.4	640632.17
947	0.0	-800.4	640632.17
948	0.0	-800.4	640632.17
949	0.0	-800.4	640632.17
950	0.0	-800.4	640632.17
	2542.0		29333988.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

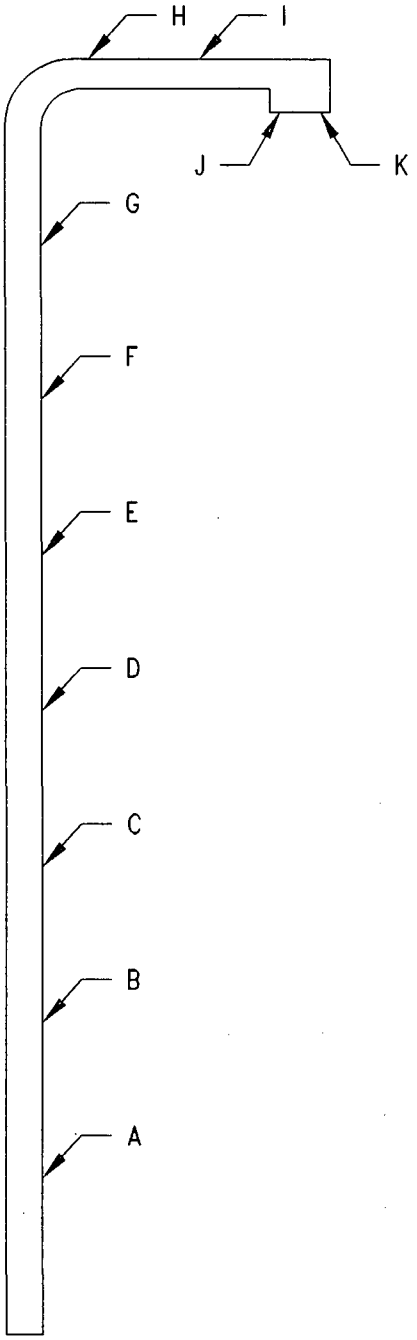
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PLUTONIUM YARD FENCE SURVEY (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
951	2714.0	1913.6	3661884.06
952	2047.0	1246.6	1554024.00
953	2530.0	1729.6	2991533.42
954	0.0	-800.4	640632.17
955	0.0	-800.4	640632.17
956	206.0	-594.4	353305.43
957	0.0	-800.4	640632.17
958	0.0	-800.4	640632.17
959	0.0	-800.4	640632.17
960	2277.0	1476.6	2180362.30
961	2208.0	1407.6	1981351.81
962	2323.0	1522.6	2318325.95
963	0.0	0.00	0.00
964	0.0	0.00	0.00
965	0.0	0.00	0.00
966	0.0	0.00	0.00
967	0.0	0.00	0.00
968	0.0	0.00	0.00
969	0.0	0.00	0.00
970	0.0	0.00	0.00
971	0.0	0.00	0.00
972	0.0	0.00	0.00
973	0.0	0.00	0.00
974	0.0	0.00	0.00
975	0.0	0.00	0.00
976	0.0	0.00	0.00
977	0.0	0.00	0.00
978	0.0	0.00	0.00
979	0.0	0.00	0.00
980	0.0	0.00	0.00
981	0.0	0.00	0.00
982	0.0	0.00	0.00
983	0.0	0.00	0.00
984	0.0	0.00	0.00
985	0.0	0.00	0.00
986	0.0	0.00	0.00
987	0.0	0.00	0.00
988	0.0	0.00	0.00
989	0.0	0.00	0.00
990	0.0	0.00	0.00
991	0.0	0.00	0.00
992	0.0	0.00	0.00
993	0.0	0.00	0.00
994	0.0	0.00	0.00
995	0.0	0.00	0.00
996	0.0	0.00	0.00
997	0.0	0.00	0.00
998	0.0	0.00	0.00
999	0.0	0.00	0.00
1000	0.0	0.00	0.00
	14305.0		18243947.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
1001	0.0	0.00	0.00
1002	0.0	0.00	0.00
1003	0.0	0.00	0.00
1004	0.0	0.00	0.00
1005	0.0	0.00	0.00
1006	0.0	0.00	0.00
1007	0.0	0.00	0.00
1008	0.0	0.00	0.00
1009	0.0	0.00	0.00
1010	0.0	0.00	0.00
1011	0.0	0.00	0.00
1012	0.0	0.00	0.00
1013	0.0	0.00	0.00
1014	0.0	0.00	0.00
1015	0.0	0.00	0.00
1016	0.0	0.00	0.00
1017	0.0	0.00	0.00
1018	0.0	0.00	0.00
1019	0.0	0.00	0.00
1020	0.0	0.00	0.00
1021	0.0	0.00	0.00
1022	0.0	0.00	0.00
1023	0.0	0.00	0.00
1024	0.0	0.00	0.00
1025	0.0	0.00	0.00
1026	0.0	0.00	0.00
1027	0.0	0.00	0.00
1028	0.0	0.00	0.00
1029	0.0	0.00	0.00
1030	0.0	0.00	0.00
1031	0.0	0.00	0.00
1032	0.0	0.00	0.00
1033	0.0	0.00	0.00
1034	0.0	0.00	0.00
1035	0.0	0.00	0.00
1036	0.0	0.00	0.00
1037	0.0	0.00	0.00
1038	0.0	0.00	0.00
1039	0.0	0.00	0.00
1040	0.0	0.00	0.00
1041	0.0	0.00	0.00
1042	0.0	0.00	0.00
1043	0.0	0.00	0.00
1044	0.0	0.00	0.00
1045	0.0	0.00	0.00
1046	0.0	0.00	0.00
1047	0.0	0.00	0.00
1048	0.0	0.00	0.00
1049	0.0	0.00	0.00
1050	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)



TYPICAL SURVEY PATTERN
OF PU YARD LIGHT POLE

NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

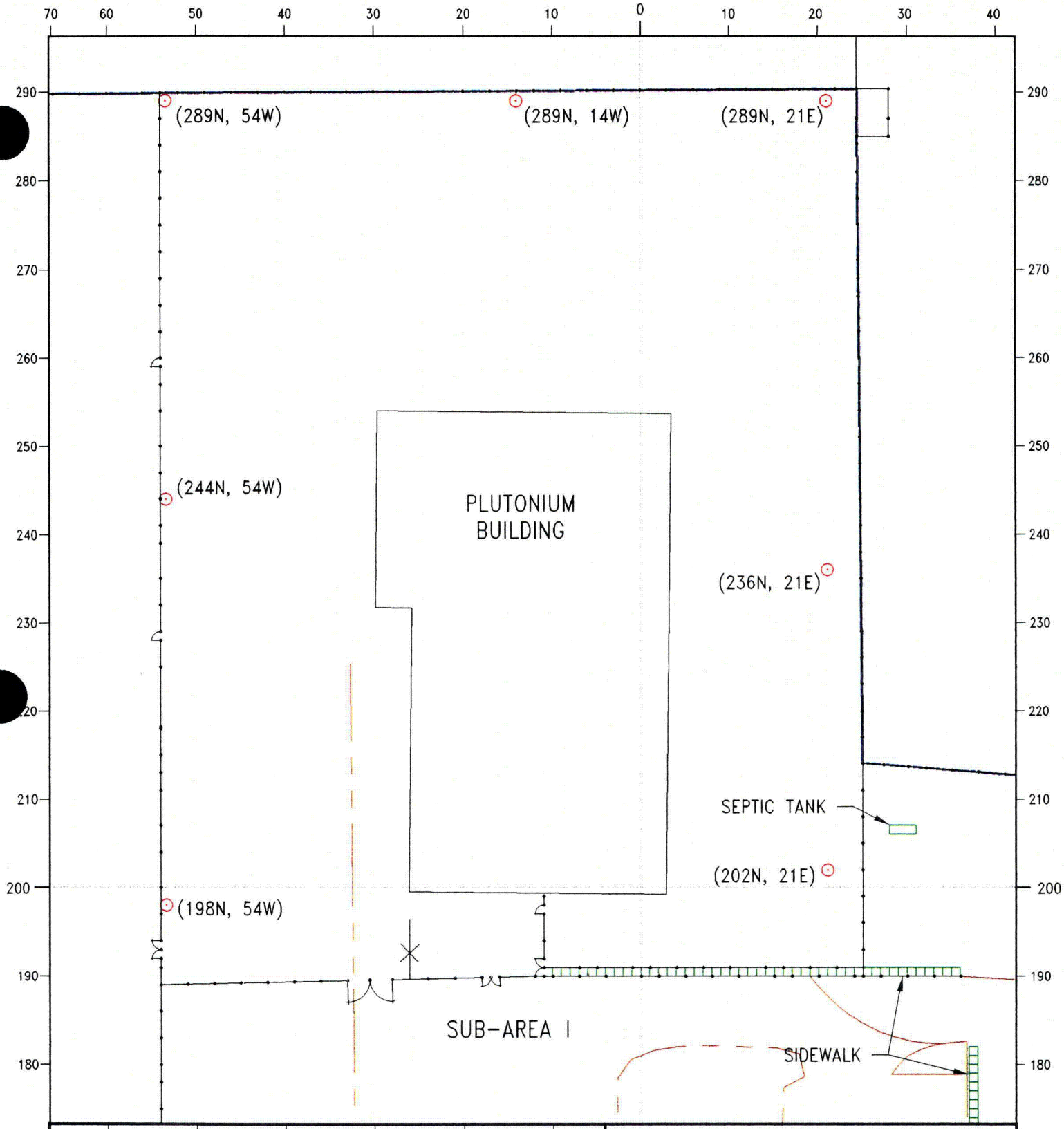
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATIONS
LIGHT POLES IN PU YARD

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-22-99	NONE

JOB NO.	DRAWING NO.	REV.
	LITEPOLES-PU-YARD	0

...SUBAREAI\FEATURES\LITEPOLES-PU-YARD



NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

LEGEND:
○ LIGHT POLE

15 0 15
SCALE IN METERS

NORTH

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
PU PLANT YARD - LIGHT POLES

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	6-7-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIPUS-2	0

...\SUBAREAI\FEATURES\LITEPOLES-PU-YARD1

CIMARRON FACILITY

PU YARD LIGHTS

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	134 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	312 cpm	606 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01 20438	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.d. Rogers DATE: 5-24-99

LN #	PU YARD LIGHTS				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	54	W	198	N	1A	0	825	0	5
2	54	W	198	N	1B	40	0	0	5
3	54	W	198	N	1C	80	0	2	5
4	54	W	198	N	1D	60	450	2	2
5	54	W	198	N	1E	30	0	0	0
6	54	W	198	N	1F	70	420	0	7
7	54	W	198	N	1G	100	435	0	2
8	54	W	198	N	1H	288	598	0	0
9	54	W	198	N	1I	84	621	0	10
10	54	W	198	N	1J	60	322	0	0
11	54	W	198	N	1K	48	943	0	2
12	54	W	244	N	2A	100	1275	0	0
13	54	W	244	N	2B	50	0	0	5
14	54	W	244	N	2C	40	0	2	0
15	54	W	244	N	2D	30	0	0	2
16	54	W	244	N	2E	30	240	0	2
17	54	W	244	N	2F	120	255	4	9
18	54	W	244	N	2G	10	0	0	5
19	54	W	244	N	2H	168	1127	2	2
20	54	W	244	N	2I	156	1196	0	0
21	54	W	244	N	2J	144	1587	2	0
22	54	W	244	N	2K	0	1242	2	0
23	54	W	289	N	3A	120	1350	0	2
24	54	W	289	N	3B	90	0	0	0
25	54	W	289	N	3C	60	0	4	5
26	54	W	289	N	3D	50	0	0	5
27	54	W	289	N	3E	80	0	7	2
28	54	W	289	N	3F	130	255	0	2
29	54	W	289	N	3G	160	115	0	0
30	54	W	289	N	3H	96	667	2	2

CIMARRON FACILITY

PU YARD LIGHTS

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	134 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	312 cpm	606 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01 20438	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	PU YARD LIGHTS				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	54	W	289	N	3I	372	1012	2	0
32	54	W	289	N	3J	0	0	0	5
33	54	W	289	N	3K	156	0	0	2
34	14	W	289	N	4A	60	465	2	0
35	14	W	289	N	4B	70	0	7	0
36	14	W	289	N	4C	110	0	0	0
37	14	W	289	N	4D	180	660	0	7
38	14	W	289	N	4E	200	165	7	0
39	14	W	289	N	4F	320	285	0	2
40	14	W	289	N	4G	240	345	0	0
41	14	W	289	N	4H	348	161	0	2
42	14	W	289	N	4I	324	1035	2	2
43	14	W	289	N	4J	252	1541	0	0
44	14	W	289	N	4K	72	0	2	12
45	21	E	289	N	5A	30	720	0	0
46	21	E	289	N	5B	100	0	0	5
47	21	E	289	N	5C	50	0	2	0
48	21	E	289	N	5E	20	0	2	2
49	21	E	289	N	5D	40	0	0	10
50	21	E	289	N	5F	130	0	2	2
51	21	E	289	N	5G	160	0	0	0
52	21	E	289	N	5H	252	506	0	0
53	21	E	289	N	5I	264	506	2	0
54	21	E	289	N	5J	240	2587	2	2
55	21	E	289	N	5K	156	230	4	0
56	21	E	236	N	6A	60	675	0	0
57	21	E	236	N	6B	10	180	4	0
58	21	E	236	N	6C	20	15	4	5
59	21	E	236	N	6D	10	0	0	0
60	21	E	236	N	6E	50	0	2	0

CIMARRON FACILITY

PU YARD LIGHTS

SUB AREA "I"

ALPHA AND BETA/GAMMA AFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	134 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	312 cpm	606 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01 20438	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	PU YARD LIGHTS				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
61	21	E	236	N	6F	0	285	0	2
62	21	E	236	N	6G	60	0	2	0
63	21	E	236	N	6H	324	230	2	10
64	21	E	236	N	6I	252	1058	2	0
65	21	E	236	N	6J	288	1587	0	0
66	21	E	236	N	6K	336	69	2	0
67	21	E	202	N	7A	30	1275	0	2
68	21	E	202	N	7B	10	0	2	0
69	21	E	202	N	7C	40	0	0	0
70	21	E	202	N	7D	80	0	2	0
71	21	E	202	N	7E	50	0	0	0
72	21	E	202	N	7F	80	0	0	0
73	21	E	202	N	7G	110	0	0	0
74	21	E	202	N	7H	144	253	0	2
75	21	E	202	N	7I	192	506	2	0
76	21	E	202	N	7J	360	1104	4	7
77	21	E	202	N	7K	264	1610	2	2

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PU YARD LIGHTS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-122.2	14934.7
2	40.0	-82.2	6758.1
3	80.0	-42.2	1781.5
4	60.0	-62.2	3869.8
5	30.0	-92.2	8502.3
6	70.0	-52.2	2725.7
7	100.0	-22.2	493.2
8	288.0	165.8	27487.1
9	84.0	-38.2	1459.8
10	60.0	-62.2	3869.8
11	48.0	-74.2	5506.8
12	100.0	-22.2	493.2
13	50.0	-72.2	5214.0
14	40.0	-82.2	6758.1
15	30.0	-92.2	8502.3
16	30.0	-92.2	8502.3
17	120.0	-2.2	4.9
18	10.0	-112.2	12590.6
19	168.0	45.8	2096.9
20	156.0	33.8	1141.9
21	144.0	21.8	474.9
22	0.0	-122.2	14934.7
23	120.0	-2.2	4.9
24	90.0	-32.2	1037.3
25	60.0	-62.2	3869.8
26	50.0	-72.2	5214.0
27	80.0	-42.2	1781.5
28	130.0	7.8	60.7
29	160.0	37.8	1428.3
30	96.0	-26.2	686.8
31	372.0	249.8	62396.1
32	0.0	-122.2	14934.7
33	156.0	33.8	1141.9
34	60.0	-62.2	3869.8
35	70.0	-52.2	2725.7
36	110.0	-12.2	149.0
37	180.0	57.8	3339.9
38	200.0	77.8	6051.6
39	320.0	197.8	39121.8
40	240.0	117.8	13875.0
41	348.0	225.8	50982.1
42	324.0	201.8	40720.1
43	252.0	129.8	16846.0
44	72.0	-50.2	2520.8
45	30.0	-92.2	8502.3
46	100.0	-22.2	493.2
47	50.0	-72.2	5214.0
48	20.0	-102.2	10446.4
49	40.0	-82.2	6758.1
50	130.0	7.8	60.7
	3842.0		366445.4
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	9410		808780.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 77

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 122.21

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 103.16
2 Std Deviations: 206.32
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.668

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 141.81 DPM /100cm²
GUIDELINE VALUE: 5000 DPM /100cm²
Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	60	is (B)	1.671	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	76	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	76	1.668	95%	

PERFORMED BY: Leslie Booth DATE: 6/15/99

REVIEWED BY: W.A. Rogers DATE: 6-16-99

A:\PUYLTACM.WB2

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PU YARD LIGHTS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	160.0	37.8	1428.25
52	252.0	129.8	16846.02
53	264.0	141.8	20105.03
54	240.0	117.8	13875.00
55	156.0	33.8	1141.91
56	60.0	-62.2	3869.81
57	10.0	-112.2	12590.59
58	20.0	-102.2	10446.43
59	10.0	-112.2	12590.59
60	50.0	-72.2	5213.97
61	0.0	-122.2	14934.74
62	60.0	-62.2	3869.81
63	324.0	201.8	40720.10
64	252.0	129.8	16846.02
65	288.0	165.8	27487.06
66	336.0	213.8	45707.11
67	30.0	-92.2	8502.28
68	10.0	-112.2	12590.59
69	40.0	-82.2	6758.12
70	80.0	-42.2	1781.50
71	50.0	-72.2	5213.97
72	80.0	-42.2	1781.50
73	110.0	-12.2	149.03
74	144.0	21.8	474.90
75	192.0	69.8	4870.95
76	360.0	237.8	56545.13
77	264.0	141.8	20105.03
78	0.0	0.00	0.00
79	0.0	0.00	0.00
80	0.0	0.00	0.00
81	0.0	0.00	0.00
82	0.0	0.00	0.00
83	0.0	0.00	0.00
84	0.0	0.00	0.00
85	0.0	0.00	0.00
86	0.0	0.00	0.00
87	0.0	0.00	0.00
88	0.0	0.00	0.00
89	0.0	0.00	0.00
90	0.0	0.00	0.00
91	0.0	0.00	0.00
92	0.0	0.00	0.00
93	0.0	0.00	0.00
94	0.0	0.00	0.00
95	0.0	0.00	0.00
96	0.0	0.00	0.00
97	0.0	0.00	0.00
98	0.0	0.00	0.00
99	0.0	0.00	0.00
100	0.0	0.00	0.00
	3842.0		366445.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	0.00	0.00
102	0.0	0.00	0.00
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PU YARD LIGHTS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	825.0	396.6	157279.2
2	0.0	-428.4	183539.9
3	0.0	-428.4	183539.9
4	450.0	21.6	465.9
5	0.0	-428.4	183539.9
6	420.0	-8.4	70.8
7	435.0	6.6	43.4
8	598.0	169.6	28758.9
9	621.0	192.6	37088.8
10	322.0	-106.4	11324.3
11	943.0	514.6	264797.1
12	1275.0	846.6	716705.2
13	0.0	-428.4	183539.9
14	0.0	-428.4	183539.9
15	0.0	-428.4	183539.9
16	240.0	-188.4	35500.4
17	255.0	-173.4	30073.0
18	0.0	-428.4	183539.9
19	1127.0	698.6	488020.2
20	1196.0	767.6	589185.8
21	1587.0	1158.6	1342317.8
22	1242.0	813.6	661919.6
23	1350.0	921.6	849317.8
24	0.0	-428.4	183539.9
25	0.0	-428.4	183539.9
26	0.0	-428.4	183539.9
27	0.0	-428.4	183539.9
28	255.0	-173.4	30073.0
29	115.0	-313.4	98229.3
30	667.0	238.6	56922.5
31	1012.0	583.6	340570.8
32	0.0	-428.4	183539.9
33	0.0	-428.4	183539.9
34	465.0	36.6	1338.4
35	0.0	-428.4	183539.9
36	0.0	-428.4	183539.9
37	660.0	231.6	53631.3
38	165.0	-263.4	69387.8
39	285.0	-143.4	20568.0
40	345.0	-83.4	6958.2
41	161.0	-267.4	71511.1
42	1035.0	606.6	367944.7
43	1541.0	1112.6	1237844.1
44	0.0	-428.4	183539.9
45	720.0	291.6	85021.5
46	0.0	-428.4	183539.9
47	0.0	-428.4	183539.9
48	0.0	-428.4	183539.9
49	0.0	-428.4	183539.9
50	0.0	-428.4	183539.9
	12676.0		11373581.8
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	32988		22880788.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **77**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **428.42**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **548.69**
2 Std Deviations: **1097.38**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.668**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **532.68** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	60	is (B)	1.671	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	76	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	76	1.668	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W. A. Pogue DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

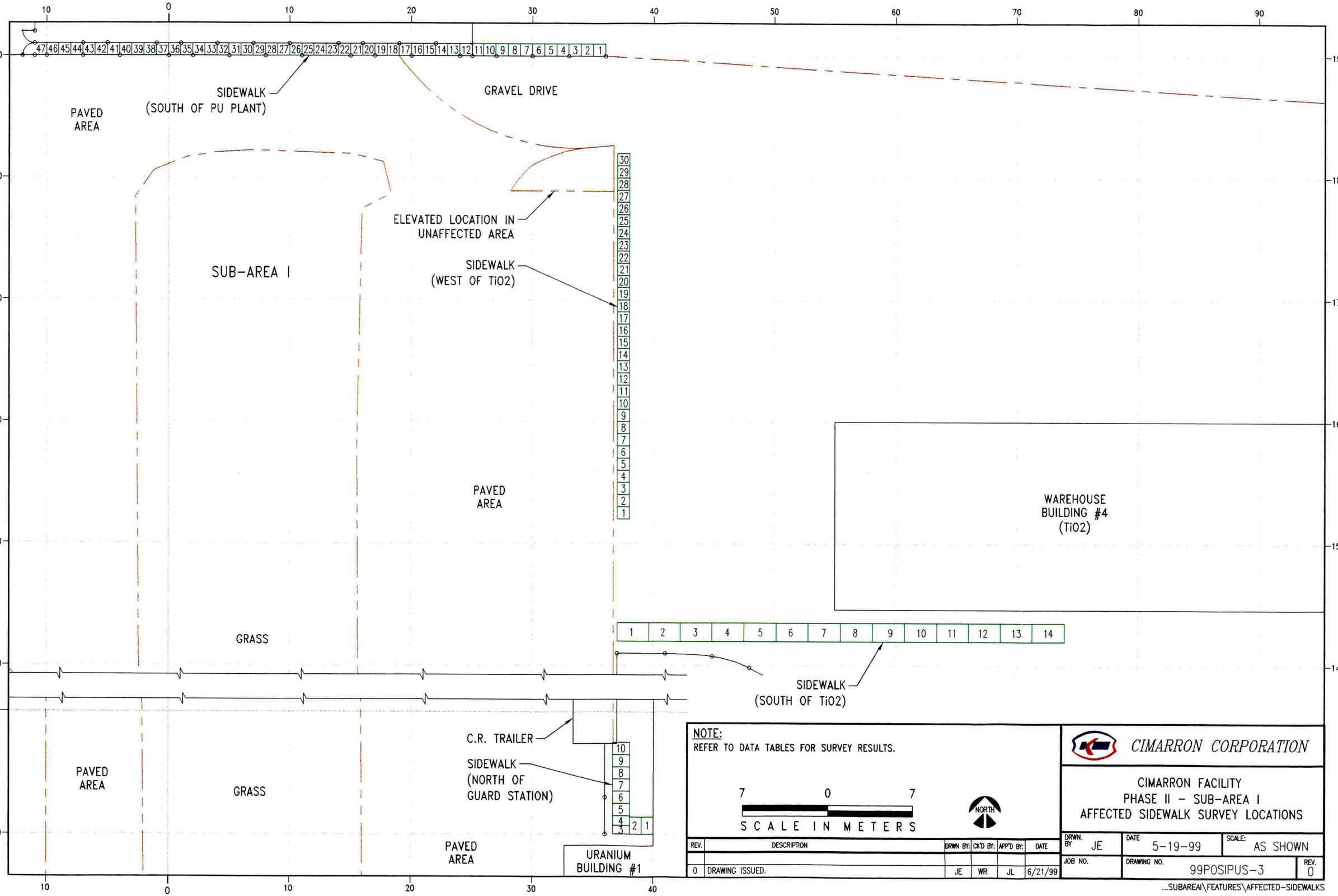
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" PU YARD LIGHTS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	0.0	-428.4	183539.91
52	506.0	77.6	6019.34
53	506.0	77.6	6019.34
54	2587.0	2158.6	4659486.68
55	230.0	-198.4	39368.74
56	675.0	246.6	60803.87
57	180.0	-248.4	61710.30
58	15.0	-413.4	170912.45
59	0.0	-428.4	183539.91
60	0.0	-428.4	183539.91
61	285.0	-143.4	20568.03
62	0.0	-428.4	183539.91
63	230.0	-198.4	39368.74
64	1058.0	629.6	396376.54
65	1587.0	1158.6	1342317.85
66	69.0	-359.4	129179.56
67	1275.0	846.6	716705.17
68	0.0	-428.4	183539.91
69	0.0	-428.4	183539.91
70	0.0	-428.4	183539.91
71	0.0	-428.4	183539.91
72	0.0	-428.4	183539.91
73	0.0	-428.4	183539.91
74	253.0	-175.4	30770.63
75	506.0	77.6	6019.34
76	1104.0	675.6	456414.30
77	1610.0	1181.6	1396141.73
78	0.0	0.00	0.00
79	0.0	0.00	0.00
80	0.0	0.00	0.00
81	0.0	0.00	0.00
82	0.0	0.00	0.00
83	0.0	0.00	0.00
84	0.0	0.00	0.00
85	0.0	0.00	0.00
86	0.0	0.00	0.00
87	0.0	0.00	0.00
88	0.0	0.00	0.00
89	0.0	0.00	0.00
90	0.0	0.00	0.00
91	0.0	0.00	0.00
92	0.0	0.00	0.00
93	0.0	0.00	0.00
94	0.0	0.00	0.00
95	0.0	0.00	0.00
96	0.0	0.00	0.00
97	0.0	0.00	0.00
98	0.0	0.00	0.00
99	0.0	0.00	0.00
100	0.0	0.00	0.00
	12676.0		11373581.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	0.00	0.00
102	0.0	0.00	0.00
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²



NOTE:
REFER TO DATA TABLES FOR SURVEY RESULTS.

7 0 7
SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED SIDEWALK SURVEY LOCATIONS

DRWN. BY	DATE	SCALE:
JE	5-19-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIPUS-3	REV. 0

...SUBAREAI\FEATURES\AFFECTED-SIDEWALKS

CIMARRON FACILITY

SIDEWALKS **SUB AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED - PHASE II**

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	4 cpm	72 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	288 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	11 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Royer **DATE:** 6-16-99

LN #	AFFECTED AREA SIDEWALKS	READING ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA	µR/Hr @ 1 METER
1	N.of GUARD STATION	1	190	750	0	0	6
2	N.of GUARD STATION	2	90	1160	0	0	6
3	N.of GUARD STATION	3	0	870	0	0	5
4	N.of GUARD STATION	4	70	1040	0	0	6
5	N.of GUARD STATION	5	100	1180	0	2	7
6	N.of GUARD STATION	6	90	1050	0	2	8
7	N.of GUARD STATION	7	120	1190	2	4	8
8	N.of GUARD STATION	8	100	950	0	0	7
9	N.of GUARD STATION	9	80	1220	0	0	7
10	N.of GUARD STATION	10	70	1190	0	0	7
11	WEST of TIO2	1	50	1330	0	7	9
12	WEST of TIO2	2	60	1110	0	0	8
13	WEST of TIO2	3	50	950	0	0	9
14	WEST of TIO2	4	50	910	0	0	9
15	WEST of TIO2	5	70	1400	0	7	8
16	WEST of TIO2	6	300	700	0	0	8
17	WEST of TIO2	7	50	940	2	0	8
18	WEST of TIO2	8	40	980	0	2	9
19	WEST of TIO2	9	10	1080	0	2	9
20	WEST of TIO2	10	60	1050	0	0	7
21	WEST of TIO2	11	50	1050	2	0	9
22	WEST of TIO2	12	60	1160	2	2	9
23	WEST of TIO2	13	90	840	2	0	10
24	WEST of TIO2	14	30	1120	0	7	9
25	WEST of TIO2	15	60	1380	0	2	10
26	WEST of TIO2	16	20	1270	0	0	10
27	WEST of TIO2	17	70	1050	0	2	10
28	WEST of TIO2	18	40	1280	0	2	9
29	WEST of TIO2	19	40	1230	0	0	9
30	WEST of TIO2	20	70	1330	0	0	9

CIMARRON FACILITY

SIDEWALKS **SUB AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED - PHASE II**

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	4 cpm	72 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	288 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	11 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers **DATE:** 6-16-99

LN #	AFFECTED AREA SIDEWALKS	READING ID	DIRECT		SMEAR		µR/Hr @ 1 METER
			ALPHA	BETA	ALPHA	BETA	
31	WEST of TIO2	21	70	1170	0	0	9
32	WEST of TIO2	22	40	870	0	0	9
33	WEST of TIO2	23	50	1020	2	0	9
34	WEST of TIO2	24	80	1210	5	4	9
35	WEST of TIO2	25	20	1110	2	2	10
36	WEST of TIO2	26	60	1220	2	9	9
37	WEST of TIO2	27	30	1160	0	2	10
38	WEST of TIO2	28	20	1610	0	0	10
39	WEST of TIO2	29	40	1180	2	0	10
40	WEST of TIO2	30	40	1270	5	2	9
41	WEST of TIO2	31	20	1310	2	4	9
42	SOUTH of PU	1	30	1000	0	0	10
43	SOUTH of PU	2	20	1110	0	9	9
44	SOUTH of PU	3	40	1200	0	0	9
45	SOUTH of PU	4	0	1050	0	0	9
46	SOUTH of PU	5	20	1010	5	0	10
47	SOUTH of PU	6	30	1100	0	9	10
48	SOUTH of PU	7	20	1120	0	7	10
49	SOUTH of PU	8	50	1180	0	0	9
50	SOUTH of PU	9	20	1040	0	0	10
51	SOUTH of PU	10	40	970	0	0	10
52	SOUTH of PU	11	40	1230	2	2	10
53	SOUTH of PU	12	60	1350	2	0	8
54	SOUTH of PU	13	40	930	7	2	10
55	SOUTH of PU	14	70	1010	0	0	9
56	SOUTH of PU	15	90	980	2	0	10
57	SOUTH of PU	16	30	890	2	2	9
58	SOUTH of PU	17	10	1180	5	4	9
59	SOUTH of PU	18	60	1140	0	5	10
60	SOUTH of PU	19	50	800	2	2	9

CIMARRON FACILITY

SIDEWALKS **SUB AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED - PHASE II**

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	4 cpm	72 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	288 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	11 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Bozen **DATE:** 6-16-99

LN #	AFFECTED AREA SIDEWALKS	READING ID	DIRECT		SMEAR		µR/Hr @ 1 METER
			ALPHA	BETA	ALPHA	BETA	
61	SOUTH of PU	20	90	980	0	0	9
62	SOUTH of PU	21	30	1020	0	0	9
63	SOUTH of PU	22	70	1150	0	0	8
64	SOUTH of PU	23	60	1210	0	0	10
65	SOUTH of PU	24	60	1170	0	0	9
66	SOUTH of PU	25	10	900	0	5	10
67	SOUTH of PU	26	30	1100	0	2	10
68	SOUTH of PU	27	30	1040	0	2	9
69	SOUTH of PU	28	50	1150	0	0	9
70	SOUTH of PU	29	70	1080	0	2	8
71	SOUTH of PU	30	30	1210	0	0	9
72	SOUTH of PU	31	60	1150	0	0	10
73	SOUTH of PU	32	10	1070	0	7	9
74	SOUTH of PU	33	70	1390	2	0	10
75	SOUTH of PU	34	20	1190	0	0	9
76	SOUTH of PU	35	60	1300	0	2	9
77	SOUTH of PU	36	50	1120	0	0	9
78	SOUTH of PU	37	100	1010	0	9	9
79	SOUTH of PU	38	40	1280	5	2	10
80	SOUTH of PU	39	70	920	0	2	9
81	SOUTH of PU	40	50	980	2	2	9
82	SOUTH of PU	41	110	1050	0	0	9
83	SOUTH of PU	42	30	1210	0	0	10
84	SOUTH of PU	43	40	1070	0	0	9
85	SOUTH of PU	44	90	1050	2	0	9
86	SOUTH of PU	45	50	1300	0	0	10
87	SOUTH of PU	46	40	970	0	0	9
88	SOUTH of PU	47	40	920	2	7	9
89	SOUTH of TIO2	1	70	744	2	2	6
90	SOUTH of TIO2	2	70	876	0	2	7

CIMARRON FACILITY

SIDEWALKS **SUB AREA "I"**

ALPHA AND BETA/GAMMA **AFFECTED - PHASE II**

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
ALPHA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	4 cpm	72 DPM
BETA DIRECT LUDLUM 2224 - 43-89 PROBE	114616	DPM/100cm²	288 cpm	542 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	11 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers **DATE:** 6-16-99

LN #	AFFECTED AREA SIDEWALKS	READING ID	DIRECT		SMEAR		µR/Hr @ 1 METER
			ALPHA	BETA	ALPHA	BETA	
91	SOUTH of TIO2	3	50	624	0	0	7
92	SOUTH of TIO2	4	30	996	0	5	6
93	SOUTH of TIO2	5	40	1128	0	0	6
94	SOUTH of TIO2	6	60	1032	0	0	6
95	SOUTH of TIO2	7	80	720	0	0	5
96	SOUTH of TIO2	8	60	876	2	0	6
97	SOUTH of TIO2	9	30	816	0	5	6
98	SOUTH of TIO2	10	20	732	0	0	7
99	SOUTH of TIO2	11	30	1044	0	2	6
100	SOUTH of TIO2	12	50	1128	0	5	7
101	SOUTH of TIO2	13	80	888	0	0	5
102	SOUTH of TIO2	14	50	1032	0	0	7

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" SIDEWALKS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	190	135.6	18384.2
2	90	35.6	1266.5
3	0	-54.4	2960.6
4	70	15.6	243.0
5	100	45.6	2078.3
6	90	35.6	1266.5
7	120	65.6	4301.8
8	100	45.6	2078.3
9	80	25.6	654.8
10	70	15.6	243.0
11	50	-4.4	19.5
12	60	5.6	31.2
13	50	-4.4	19.5
14	50	-4.4	19.5
15	70	15.6	243.0
16	300	245.6	60313.6
17	50	-4.4	19.5
18	40	-14.4	207.7
19	10	-44.4	1972.4
20	60	5.6	31.2
21	50	-4.4	19.5
22	60	5.6	31.2
23	90	35.6	1266.5
24	30	-24.4	595.9
25	60	5.6	31.2
26	20	-34.4	1184.2
27	70	15.6	243.0
28	40	-14.4	207.7
29	40	-14.4	207.7
30	70	15.6	243.0
31	70	15.6	243.0
32	40	-14.4	207.7
33	50	-4.4	19.5
34	80	25.6	654.8
35	20	-34.4	1184.2
36	60	5.6	31.2
37	30	-24.4	595.9
38	20	-34.4	1184.2
39	40	-14.4	207.7
40	40	-14.4	207.7
41	20	-34.4	1184.2
42	30	-24.4	595.9
43	20	-34.4	1184.2
44	40	-14.4	207.7
45	0	-54.4	2960.6
46	20	-34.4	1184.2
47	30	-24.4	595.9
48	20	-34.4	1184.2
49	50	-4.4	19.5
50	20	-34.4	1184.2
	2540.0		27020.2
	130.0		674.2
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	5550		142914.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **102**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **54.41**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **37.62**

2 Std Deviations: **75.23**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.662**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **60.60** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	101	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	101	1.662	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W.A. Boyer DATE: 6-16-99

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CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" SIDEWALKS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	40	-14.4	207.70
52	40	-14.4	207.70
53	60	5.6	31.23
54	40	-14.4	207.70
55	70	15.6	242.99
56	90	35.6	1266.52
57	30	-24.4	595.93
58	10	-44.4	1972.40
59	60	5.6	31.23
60	50	-4.4	19.46
61	90	35.6	1266.52
62	30	-24.4	595.93
63	70	15.6	242.99
64	60	5.6	31.23
65	60	5.6	31.23
66	10	-44.4	1972.40
67	30	-24.4	595.93
68	30	-24.4	595.93
69	50	-4.4	19.46
70	70	15.6	242.99
71	30	-24.4	595.93
72	60	5.6	31.23
73	10	-44.4	1972.40
74	70	15.6	242.99
75	20	-34.4	1184.17
76	60	5.6	31.23
77	50	-4.4	19.46
78	100	45.6	2078.29
79	40	-14.4	207.70
80	70	15.6	242.99
81	50	-4.4	19.46
82	110	55.6	3090.05
83	30	-24.4	595.93
84	40	-14.4	207.70
85	90	35.6	1266.52
86	50	-4.4	19.46
87	40	-14.4	207.70
88	40	-14.4	207.70
89	70	15.6	242.99
90	70	15.6	242.99
91	50	-4.4	19.46
92	30	-24.4	595.93
93	40	-14.4	207.70
94	60	5.6	31.23
95	80	25.6	654.76
96	60	5.6	31.23
97	30	-24.4	595.93
98	20	-34.4	1184.17
99	30	-24.4	595.93
100	50	-4.4	19.46
	2540.0		27020.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	80	25.6	654.76
102	50	-4.4	19.46
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	130.0		674.2
	Sum(n)		Sum(n-N)²

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" SIDEWALKS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	750	-326.5	106621.5
2	1160	83.5	6967.3
3	870	-206.5	42654.4
4	1040	-36.5	1334.4
5	1180	103.5	10706.2
6	1050	-26.5	703.8
7	1190	113.5	12875.6
8	950	-126.5	16009.7
9	1220	143.5	20583.8
10	1190	113.5	12875.6
11	1330	253.5	64247.3
12	1110	33.5	1120.3
13	950	-126.5	16009.7
14	910	-166.5	27732.0
15	1400	323.5	104633.2
16	700	-376.5	141774.4
17	940	-136.5	18640.3
18	980	-96.5	9317.9
19	1080	3.5	12.0
20	1050	-26.5	703.8
21	1050	-26.5	703.8
22	1160	83.5	6967.3
23	840	-236.5	55946.2
24	1120	43.5	1889.7
25	1380	303.5	92094.4
26	1270	193.5	37430.9
27	1050	-26.5	703.8
28	1280	203.5	41400.3
29	1230	153.5	23553.2
30	1330	253.5	64247.3
31	1170	93.5	8736.8
32	870	-206.5	42654.4
33	1020	-56.5	3195.6
34	1210	133.5	17814.4
35	1110	33.5	1120.3
36	1220	143.5	20583.8
37	1160	83.5	6967.3
38	1610	533.5	284590.9
39	1180	103.5	10706.2
40	1270	193.5	37430.9
41	1310	233.5	54508.5
42	1000	-76.5	5856.8
43	1110	33.5	1120.3
44	1200	123.5	15245.0
45	1050	-26.5	703.8
46	1010	-66.5	4426.2
47	1100	23.5	550.9
48	1120	43.5	1889.7
49	1180	103.5	10706.2
50	1040	-36.5	1334.4
	52186.0		1449039.0
	1920.0		37526.2
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
TOTAL	109806		2957167.4
	Sum(n)		Sum(n-N)²

: No. of Samples (x) : **102**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **1076.53**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **171.11**

2 Std Deviations: **342.22**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.662**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **1104.69** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	101	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	101	1.662	95%	

PERFORMED BY: Nellie Booth DATE: 6/15/99

REVIEWED BY: Wm. Rogers DATE: 6-16-99

A:\SIDWLKCB.WB2

CIMARRON CORPORATION - CIMARRON FACILITY **BETA DIRECT**

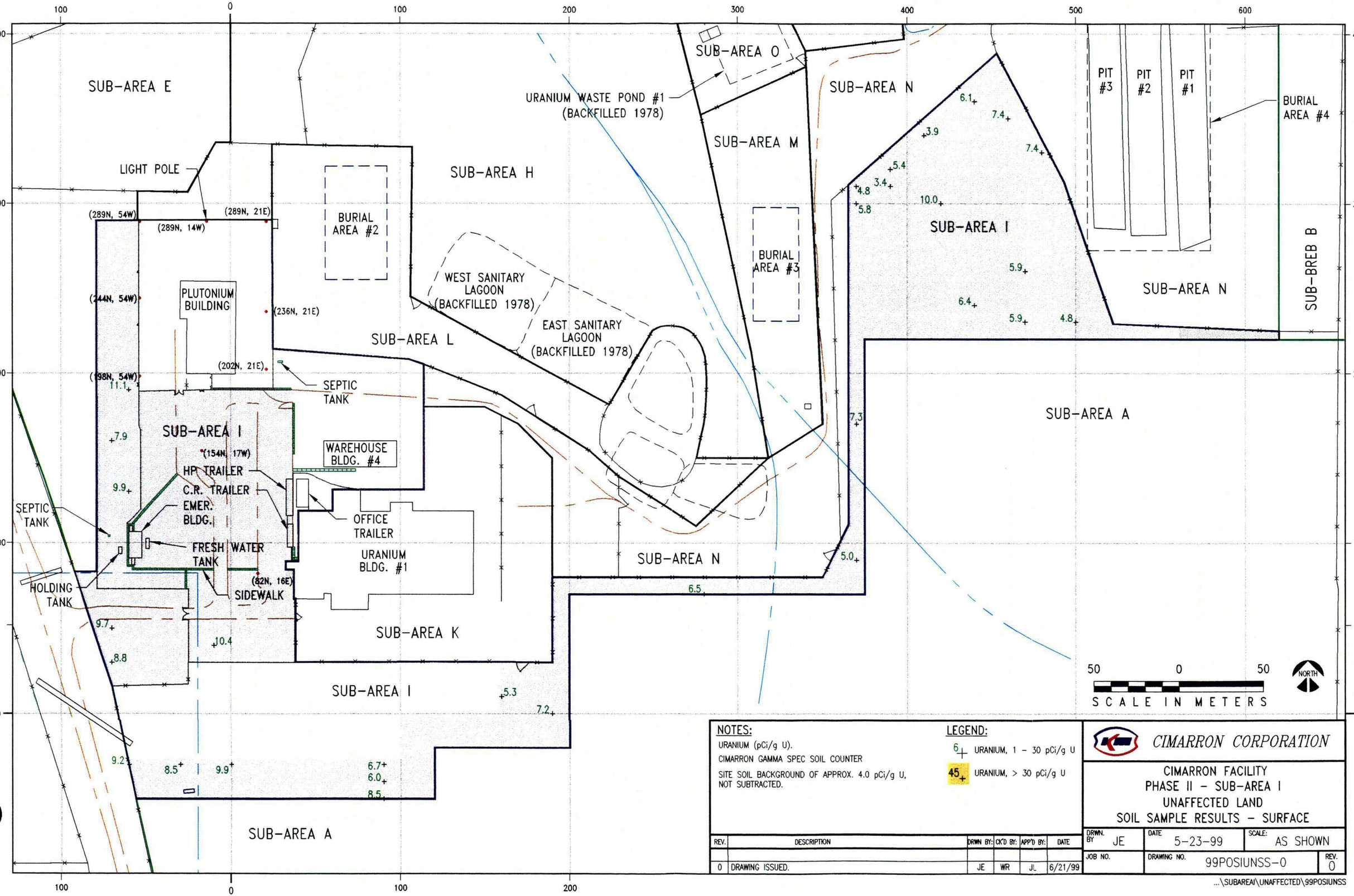
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" SIDEWALKS (AFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	970	-106.5	11348.52
52	1230	153.5	23553.22
53	1350	273.5	74786.16
54	930	-146.5	21470.87
55	1010	-66.5	4426.16
56	980	-96.5	9317.93
57	890	-186.5	34793.22
58	1180	103.5	10706.16
59	1140	63.5	4028.52
60	800	-276.5	76468.52
61	980	-96.5	9317.93
62	1020	-56.5	3195.57
63	1150	73.5	5397.93
64	1210	133.5	17814.40
65	1170	93.5	8736.75
66	900	-176.5	31162.63
67	1100	23.5	550.87
68	1040	-36.5	1334.40
69	1150	73.5	5397.93
70	1080	3.5	12.04
71	1210	133.5	17814.40
72	1150	73.5	5397.93
73	1070	-6.5	42.63
74	1390	313.5	98263.81
75	1190	113.5	12875.57
76	1300	223.5	49939.10
77	1120	43.5	1889.69
78	1010	-66.5	4426.16
79	1280	203.5	41400.28
80	920	-156.5	24501.46
81	980	-96.5	9317.93
82	1050	-26.5	703.81
83	1210	133.5	17814.40
84	1070	-6.5	42.63
85	1050	-26.5	703.81
86	1300	223.5	49939.10
87	970	-106.5	11348.52
88	920	-156.5	24501.46
89	744	-332.5	110575.81
90	876	-200.5	40212.04
91	624	-452.5	204782.87
92	996	-80.5	6484.99
93	1128	51.5	2649.22
94	1032	-44.5	1982.87
95	720	-356.5	127113.22
96	876	-200.5	40212.04
97	816	-260.5	67875.57
98	732	-344.5	118700.52
99	1044	-32.5	1058.16
100	1128	51.5	2649.22
	52186.0		1449039.0
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	888	-188.5	35543.34
102	1032	-44.5	1982.87
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	1920.0		37526.2
	Sum(n)		Sum(n-N)²



NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6+ URANIUM, 1 - 30 pCi/g U

45+ URANIUM, > 30 pCi/g U

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
UNAFFECTED LAND
SOIL SAMPLE RESULTS - SURFACE

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIUNSS-0	REV. 0

...\SUBAREAI\UNAFFECTED\99POSIUNSS

CIMARRON FACILITY

SUB AREA "I" PHASE II

UNAFFECTED LAND SURFACE

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7578	N/A
CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1.5	5 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

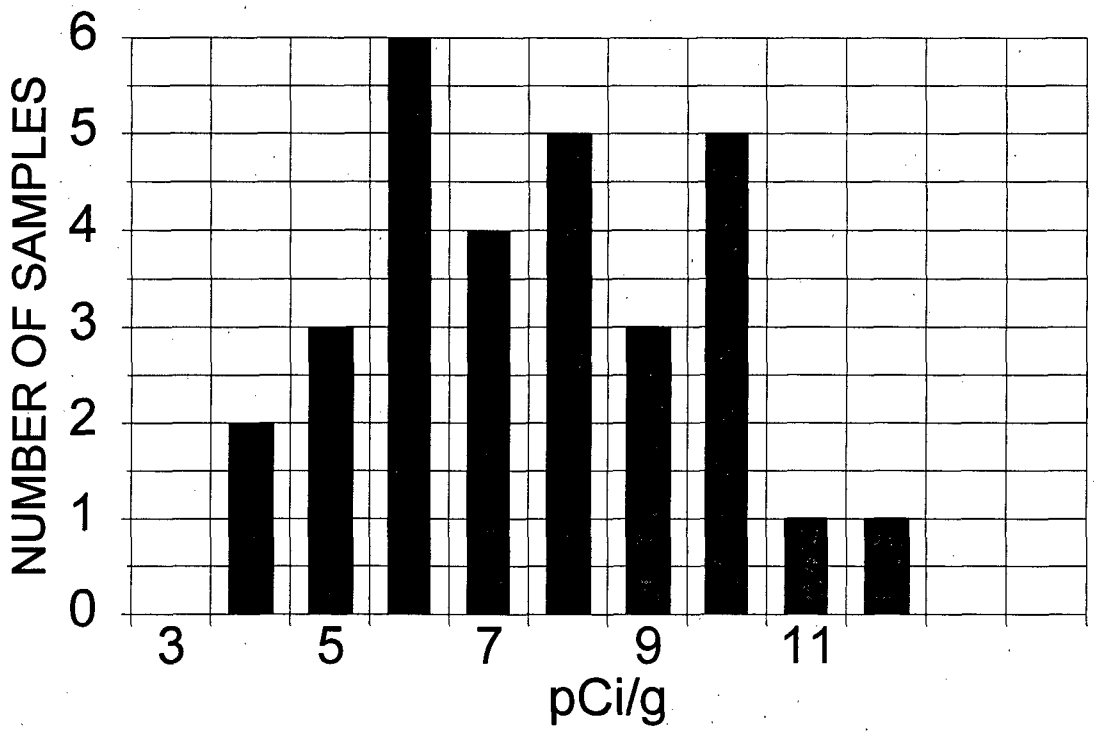
LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
1	70	W		30	N	7544	7	6	8.8	1.5
2	70	W		50	N	7730	8	8	9.7	1.5
3	70	W		160	N	9322	10	8	7.9	1.7
4	60	W		30	S	7688	10	10	9.2	1.4
5	60	W		130	N	8446	9	8	9.9	1.5
6	60	W		190	N	9674	10	9	11.1	1.7
7	30	W		30	S	8758	10	10	8.5	1.2
8	10	W		40	N	8702	9	8	10.4	1.4
9	0	E		30	S	9696	10	10	9.9	1.7
10	90	E		30	S	8478	8	8	6.7	1.5
11	90	E		40	S	9020	8	8	6.0	1.6
12	90	E		50	S	8652	9	8	8.5	1.7
13	160	E		10	N	5676	5	6	5.3	0.9
14	190	E		0	N	6780	7	8	7.2	1.0
15	280	E		70	N	7532	8	8	6.5	1.2
16	370	E		90	N	7578	7	8	5.0	1.2
17	370	E		170	N	6544	6	7	7.3	0.8
18	370	E		300	N	7840	8	8	5.8	1.3
19	370	E		310	N	8204	10	9	4.8	1.3
20	390	E		310	N	6830	7	7	3.4	1.0
21	390	E		320	N	6606	7	7	5.4	0.8
22	410	E		340	N	7792	8	7	3.9	1.3
23	420	E		300	N	8080	8	8	10.0	1.6
24	440	E		240	N	7506	8	7	6.4	1.3
25	440	E		360	N	7950	8	8	6.1	1.4
26	460	E		350	N	8410	9	8	7.4	1.4
27	470	E		230	N	6198	5	6	5.9	0.8
28	470	E		260	N	7296	8	8	5.9	1.0
29	480	E		330	N	8498	9	9	7.4	1.4
30	500	E		230	N	7270	7	7	4.8	1.1

PHASE II SUB-AREA "I" UNAFECTED LAND
CIMARRON SOIL COUNTER
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

URANIUM SAMPLE DATA

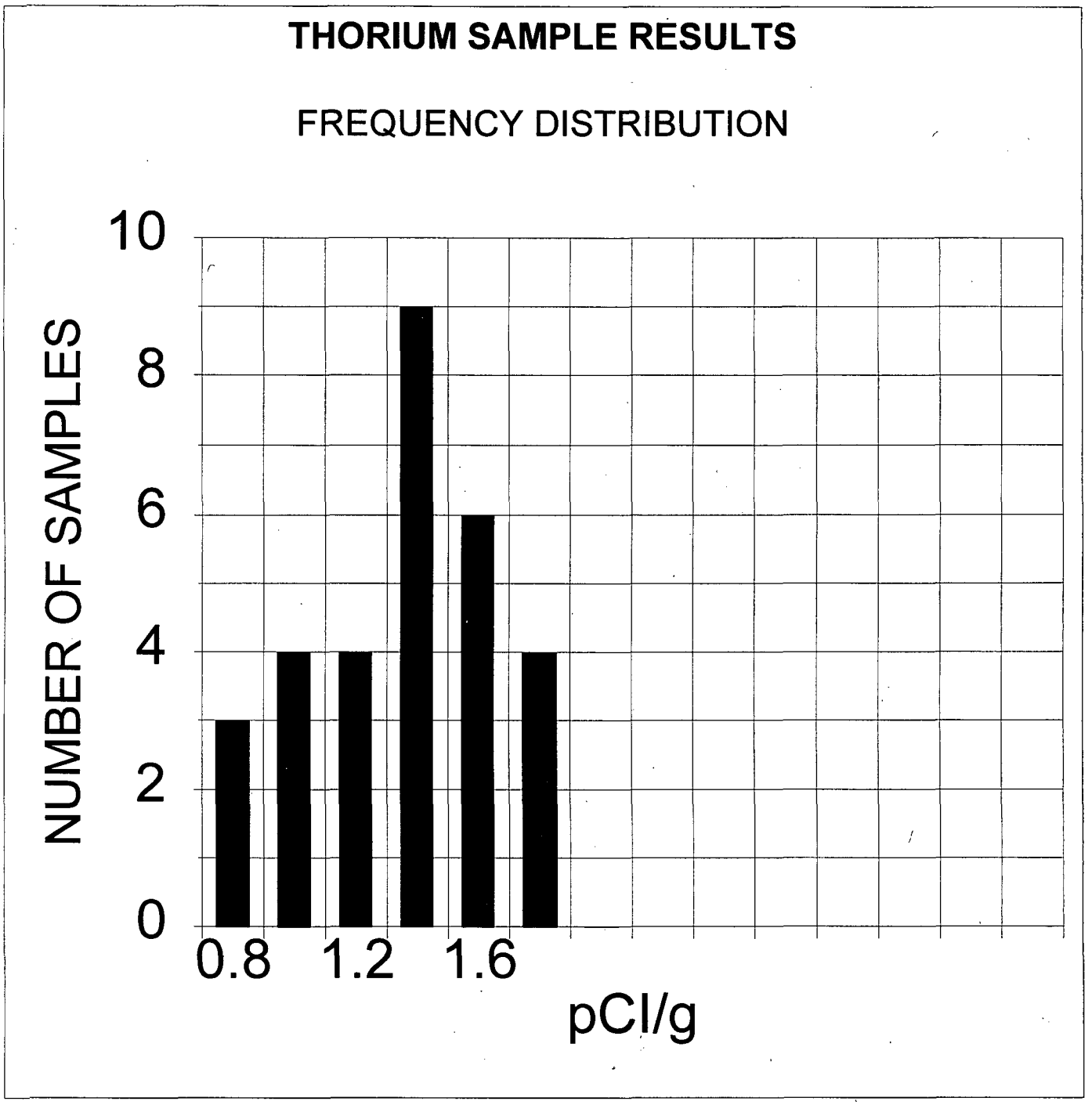
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	30
AVERAGE SAMPLE	7.2
MINIMUM SAMPLE	3.4
MAXIMUM SAMPLE	11.1
STANDARD DEVIATION	2.0

PHASE II SUB-AREA "I" UNAFFECTED LAND
CIMARRON SOIL COUNTER
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1 pCi/g NOT SUBTRACTED

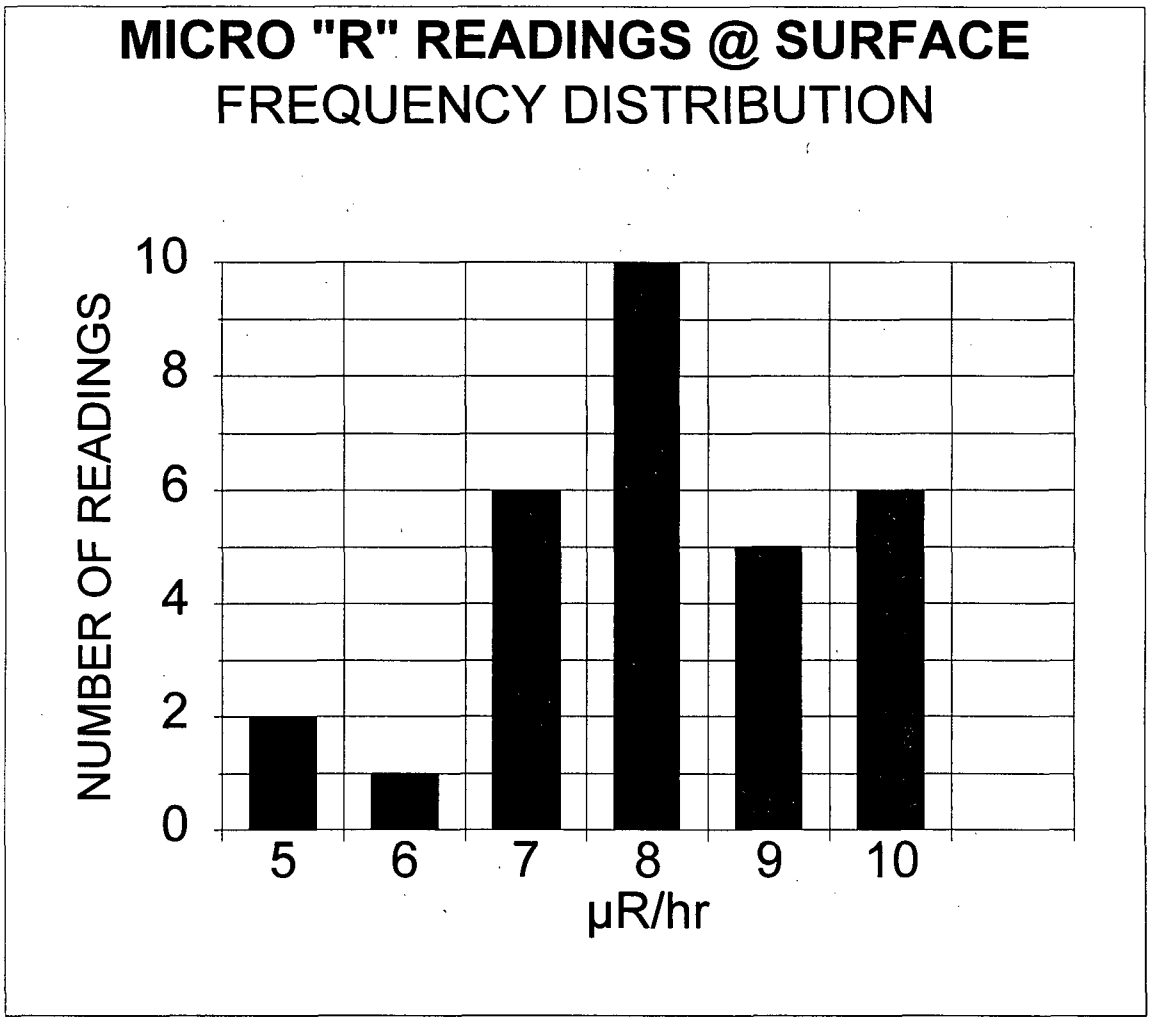
MARCH, 1999



NUMBER OF SAMPLES	30
AVERAGE SAMPLE	1.3
MINIMUM SAMPLE	0.8
MAXIMUM SAMPLE	1.7
STANDARD DEVIATION	0.3

PHASE II SUB-AREA "I" UNAFFECTED LAND
MICRO-R METER READINGS @ SURFACE - UNAFFECTED -SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 111299
RESULTS IN µR/hr

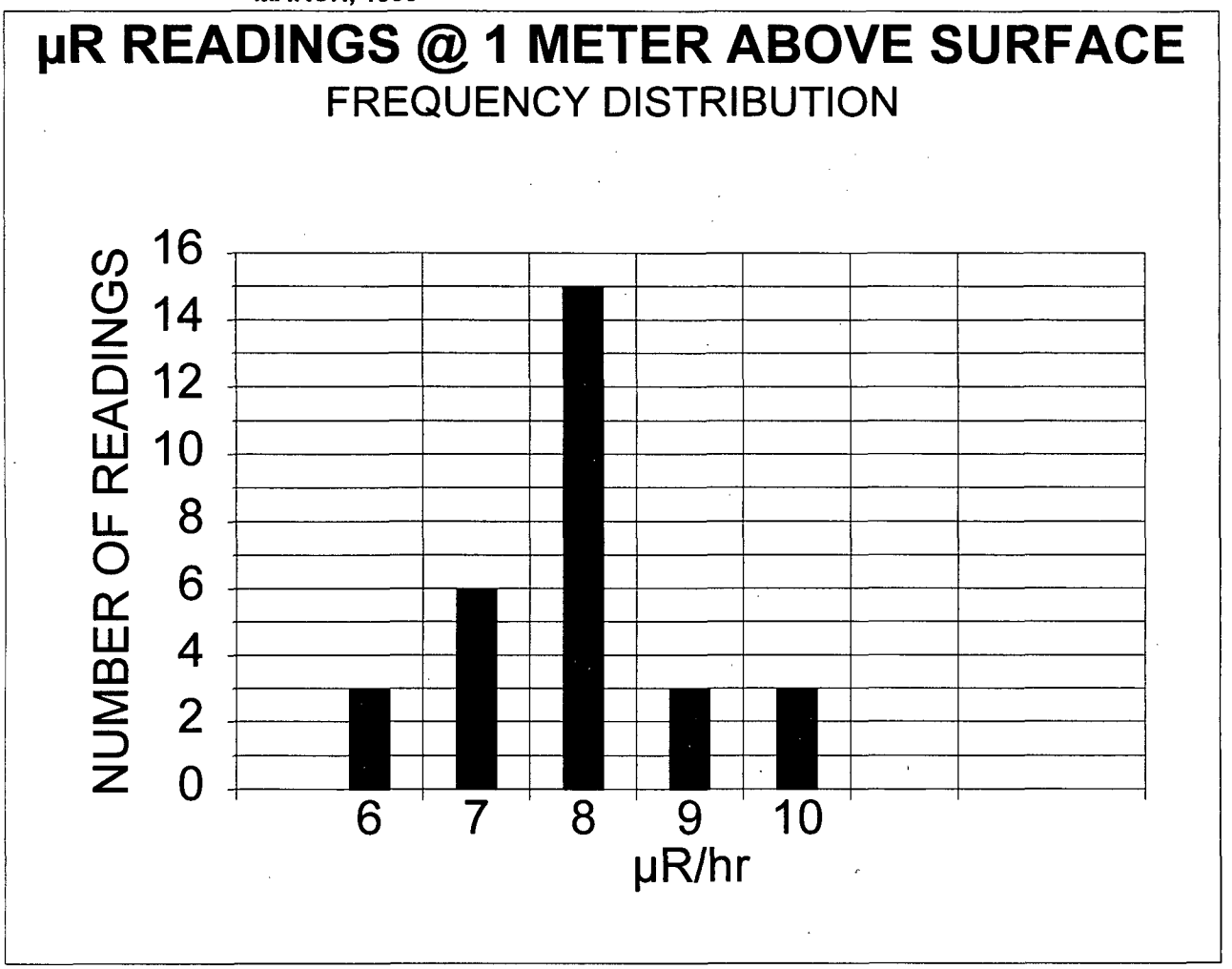
MARCH, 1999



NUMBER OF READINGS	30
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	10
STANDARD DEVIATION	1.4

PHASE II SUB-AREA "I" UNAFFECTED LAND
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
SITE BACKGROUND OF 7-10 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 111299 -UNAFFECTED - SURFACE
RESULTS IN µR/hr

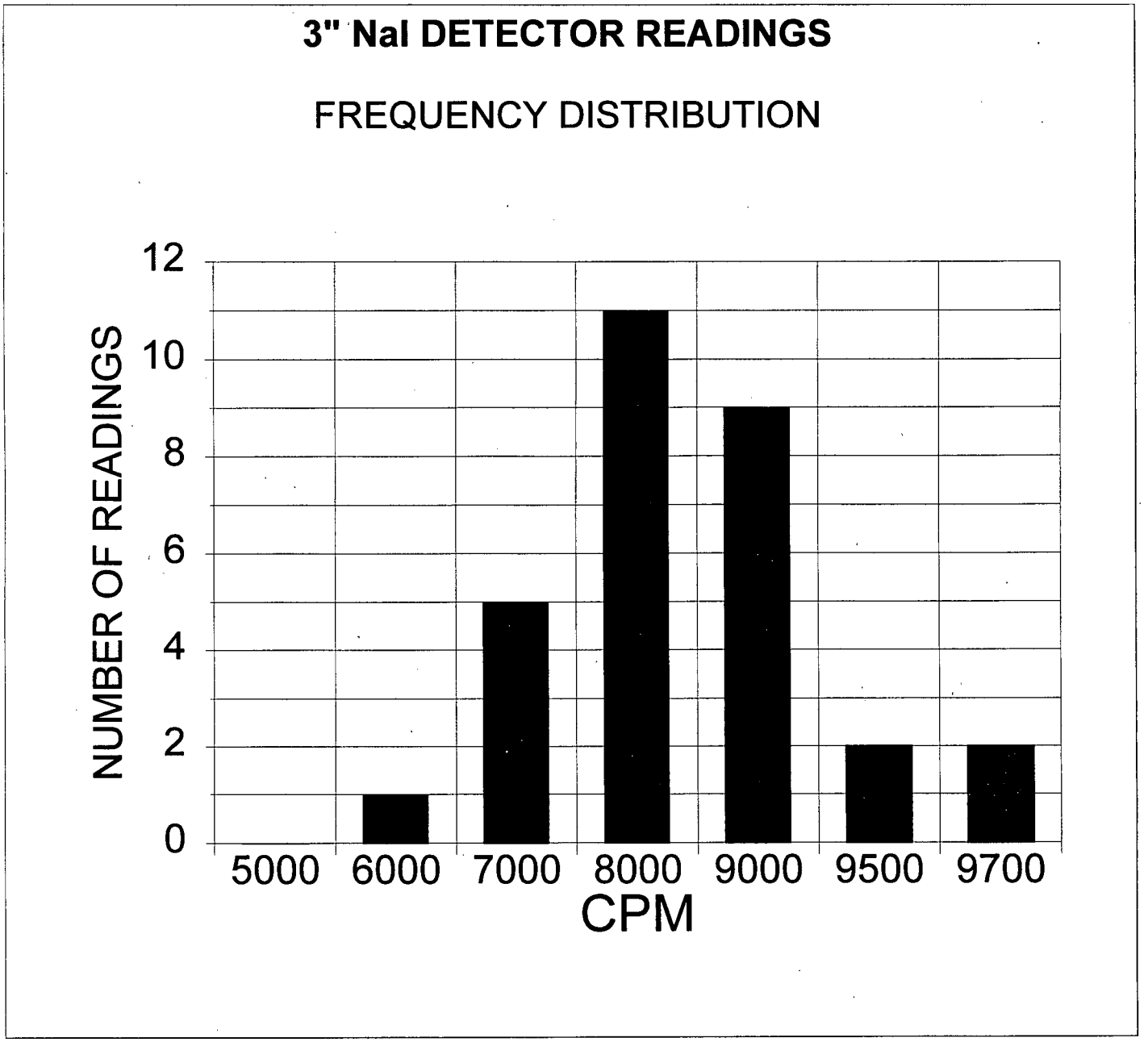
MARCH, 1999



NUMBER OF READINGS	30
AVERAGE READING	8
MINIMUM READING	6
MAXIMUM READING	10
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" UNAFFECTED LAND
3" NaI DETECTOR UNAFFECTED - SURFACE
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 97264 (UNSHIELDED)
BACKGROUND AVERAGE: 7578 CPM

MARCH, 1999



NUMBER OF READINGS	30
AVERAGE READING	7877
MINIMUM READING	5676
MAXIMUM READING	9696
STANDARD DEVIATION	968

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

U

AREA "I" (UNAFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	8.8	1.6	2.7
2	9.7	2.5	6.4
3	7.9	0.7	0.5
4	9.2	2.0	4.1
5	9.9	2.7	7.5
6	11.1	3.9	15.4
7	8.5	1.3	1.8
8	10.4	3.2	10.4
9	9.9	2.7	7.5
10	6.7	-0.5	0.2
11	6.0	-1.2	1.4
12	8.5	1.3	1.8
13	5.3	-1.9	3.5
14	7.2	0.0	0.0
15	6.5	-0.7	0.4
16	5.0	-2.2	4.7
17	7.3	0.1	0.0
18	5.8	-1.4	1.9
19	4.8	-2.4	5.6
20	3.4	-3.8	14.2
21	5.4	-1.8	3.1
22	3.9	-3.3	10.7
23	10.0	2.8	8.0
24	6.4	-0.8	0.6
25	6.1	-1.1	1.1
26	7.4	0.2	0.1
27	5.9	-1.3	1.6
28	5.9	-1.3	1.6
29	7.4	0.2	0.1
30	4.8	-2.4	5.6
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	215.1		122.5
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 30

COUNT TIME: 15 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 7.17

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 2.06

2 Std Deviations: 4.11

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 7.81 pCi/gU TOTAL U

GUIDELINE VALUE: 30 pCi/gU TOTAL U

Acceptable Level: 34.0 pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Booth DATE: 5/18/99

REVIEWED BY: W. A. Rogers DATE: 5-18-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" (UNAFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
1	1.5	0.19	0.04
2	1.5	0.19	0.04
3	1.7	0.39	0.15
4	1.4	0.09	0.01
5	1.5	0.19	0.04
6	1.7	0.39	0.15
7	1.2	-0.11	0.01
8	1.4	0.09	0.01
9	1.7	0.39	0.15
10	1.5	0.19	0.04
11	1.6	0.29	0.09
12	1.7	0.39	0.15
13	0.9	-0.41	0.17
14	1.0	-0.31	0.09
15	1.2	-0.11	0.01
16	1.2	-0.11	0.01
17	0.8	-0.51	0.26
18	1.3	-0.01	0.00
19	1.3	-0.01	0.00
20	1.0	-0.31	0.09
21	0.8	-0.51	0.26
22	1.3	-0.01	0.00
23	1.6	0.29	0.09
24	1.3	-0.01	0.00
25	1.4	0.09	0.01
26	1.4	0.09	0.01
27	0.8	-0.51	0.26
28	1.0	-0.31	0.09
29	1.4	0.09	0.01
30	1.1	-0.21	0.04
31	0.0	0.00	0.00
32	0.0	0.00	0.00
33	0.0	0.00	0.00
34	0.0	0.00	0.00
35	0.0	0.00	0.00
36	0.0	0.00	0.00
37	0.0	0.00	0.00
38	0.0	0.00	0.00
39	0.0	0.00	0.00
40	0.0	0.00	0.00
41	0.0	0.00	0.00
42	0.0	0.00	0.00
43	0.0	0.00	0.00
44	0.0	0.00	0.00
45	0.0	0.00	0.00
46	0.0	0.00	0.00
47	0.0	0.00	0.00
48	0.0	0.00	0.00
49	0.0	0.00	0.00
50	0.0	0.00	0.00
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	39.2		2.279
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 30

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.31

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 0.28
2 Std Deviations: 0.56
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.39 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
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17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

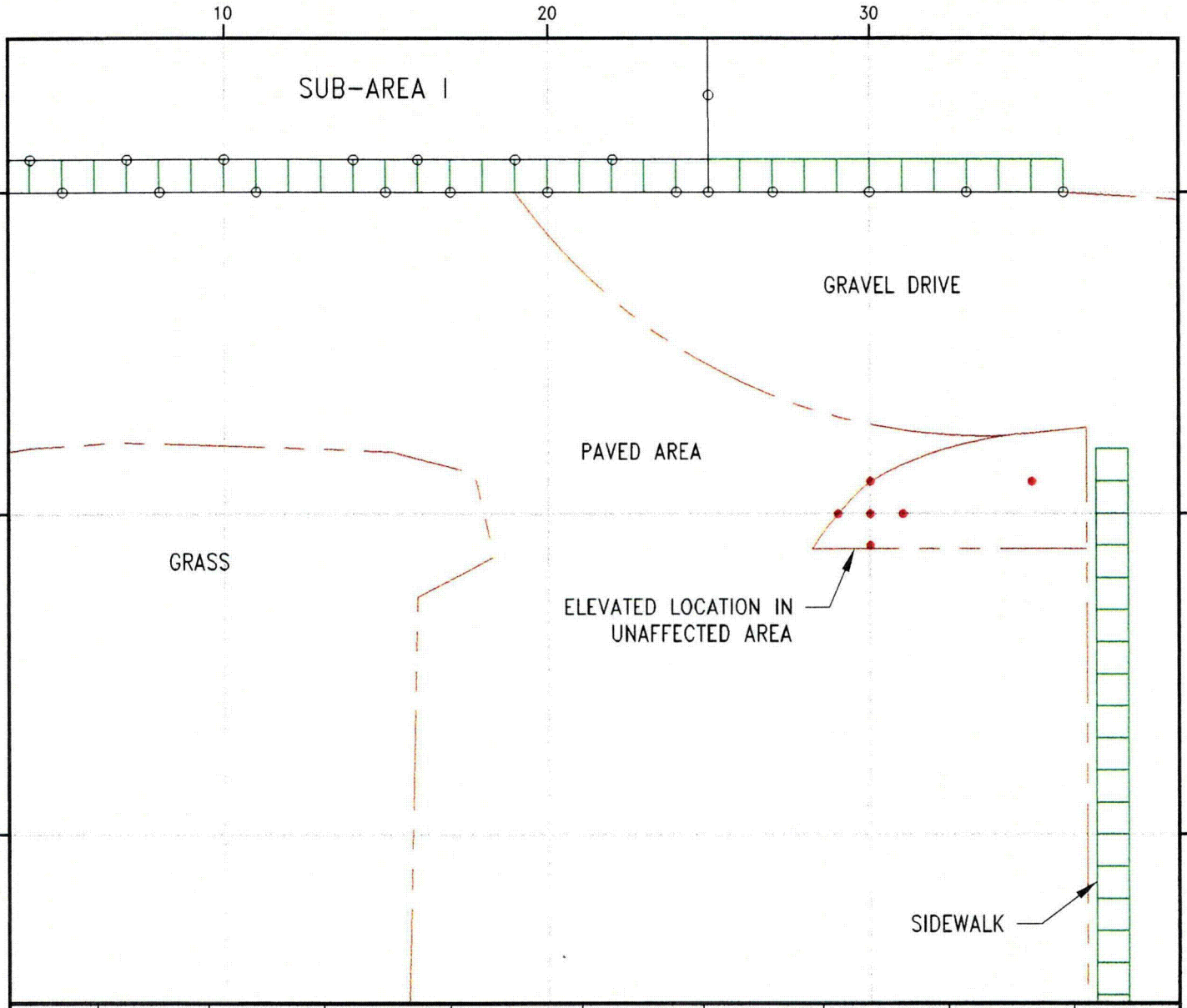
(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Dellwin Grant DATE: 4/12/99

REVIEWED BY: W.A. Rogers DATE: 4-15-99



EASTING	NORTHING	URANIUM 3" DET. SHIELDED	URANIUM SURFACE MICRO-R/Hr	URANIUM 1 METER MICRO-R/Hr	URANIUM 0 - 6" pCi/g	URANIUM 6" - 1' pCi/g	URANIUM 1' - 2' pCi/g	URANIUM 2' - 3' pCi/g	URANIUM 3' - 4' pCi/g
30	180	2910	8	8	22	19	11	8	9
29	180	2370	9	8	11	8	5	8	5
30	179	2660	9	9	15	16	7	7	5
30	181	2360	9	9	5	16	9	4	3
31	180	3690	9	9	27	20	20	9	9
35	181	3720	9	9	34	26	18	10	10

NOTES:

MICRO-R/Hr (μR/Hr)
INSTRUMENT: LUDLUM MICRO-R METER
SERIAL NO: 111299
MODEL NO: 19
BACKGROUND: 9 μR/Hr.

URANIUM (pCi/g U).
CIMARRON GAMMA SPEC SOIL COUNTER
NOTE: 4pCi/g BACKGROUND, NOT SUBTRACTED.

LUDLUM 2220, SHIELDED 3"x 1/2" NaI DETECTOR.
SERIAL NO: 50058
BACKGROUND: 2450 CPM

5 0 5
SCALE IN METERS

NORTH

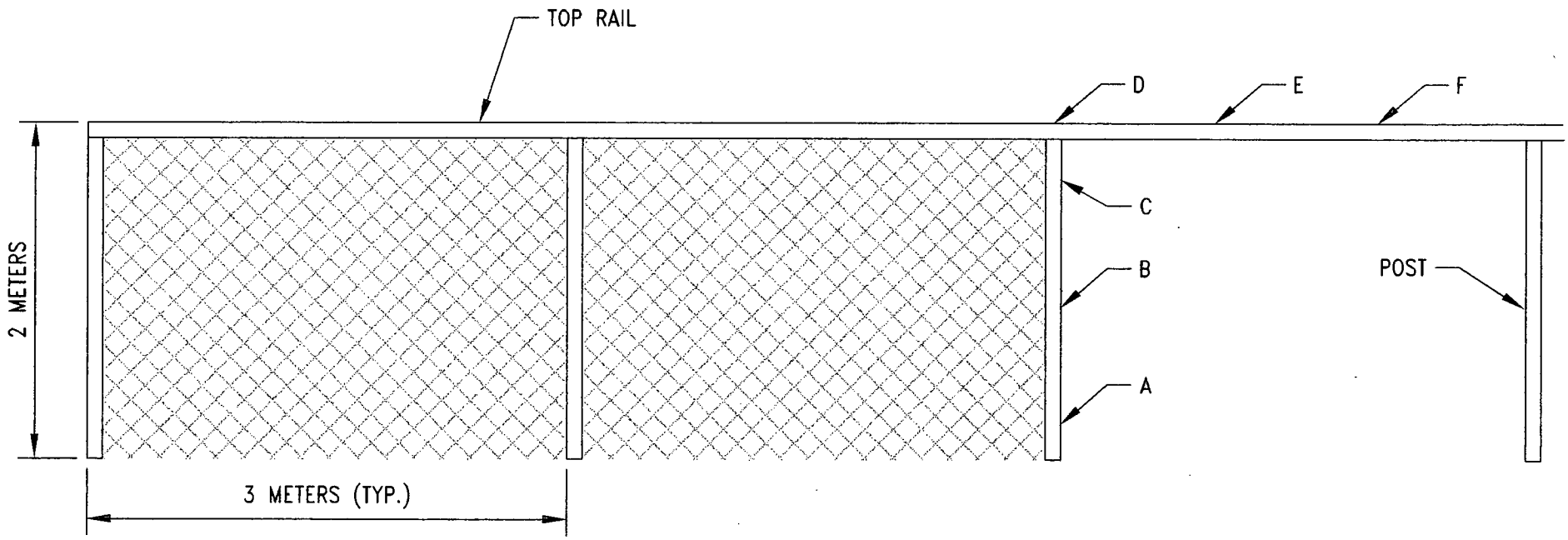
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
ELEVATED LOCATION IN UNAFFECTED AREA

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-18-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIUNSS-1	REV. 0

...SUBAREAI\FEATURES\UNAFFECTED-LAND



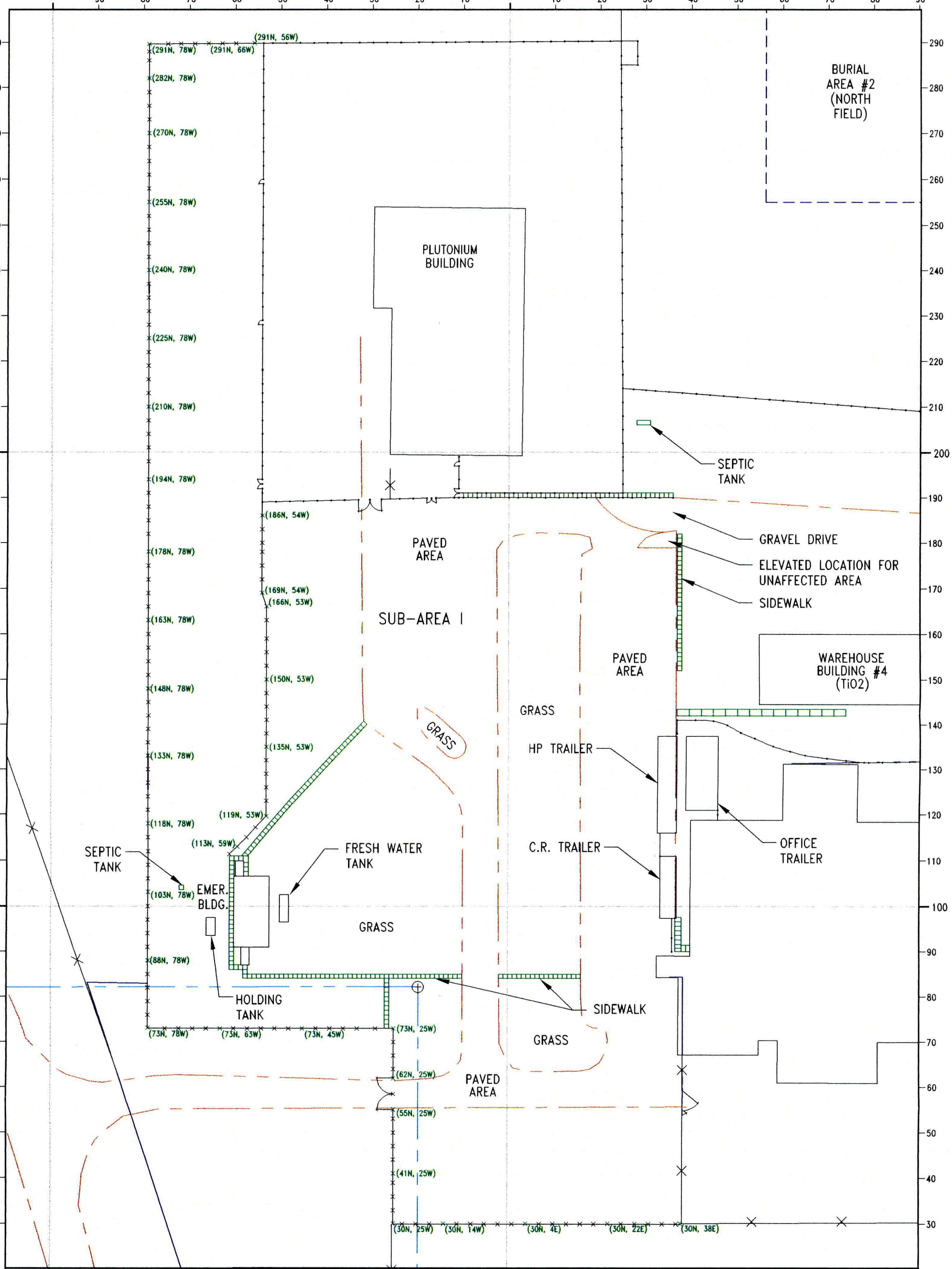
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
TYPICAL SURVEY PATTERN OF FENCING

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY JE	DATE 5-22-99	SCALE: NONE
JOB NO.	DRAWING NO. FNC-SURVEY	REV. 0

...SUBAREAI\FEATURES\FNC-SURVEY



CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
UNAFFECTED FENCES

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	6-1-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIUNS-1	REV. 0

...SUBAREAI\FEATURES\FNC-UNAFFECTED

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	38	E	-	30	N	1C	385	897	0	3
2	38	E	-	30	N	1D	154	874	2	0
3	37	E	-	30	N	1B	165	460	0	0
4	37	E	-	30	N	1E	165	529	0	7
5	34	E	-	30	N	1A	220	460	0	7
6	34	E	-	30	N	1F	264	374	0	0
7	31	E	-	30	N	1A	220	69	2	0
8	31	E	-	30	N	1F	154	759	0	10
9	28	E	-	30	N	1C	198	322	2	0
10	28	E	-	30	N	1E	242	621	0	5
11	25	E	-	30	N	1C	275	23	2	0
12	25	E	-	30	N	1D	176	598	4	2
13	22	E	-	30	N	1B	198	828	0	0
14	22	E	-	30	N	1E	308	23	2	2
15	19	E	-	30	N	1A	99	667	2	0
16	19	E	-	30	N	1F	198	437	7	16
17	16	E	-	30	N	1C	165	644	0	0
18	16	E	-	30	N	1D	121	345	0	7
19	13	E	-	30	N	1B	286	874	2	5
20	13	E	-	30	N	1E	143	46	2	7
21	10	E	-	30	N	1B	220	23	0	3
22	10	E	-	30	N	1E	330	437	2	0
23	7	E	-	30	N	1C	308	529	2	0
24	7	E	-	30	N	1D	231	46	0	7
25	4	E	-	30	N	1A	198	437	2	0
26	4	E	-	30	N	1F	286	0	0	0
27	1	E	-	30	N	1B	165	667	2	5
28	1	E	-	30	N	1D	198	115	2	0
29	2	W	-	30	N	1C	198	943	0	5
30	2	W	-	30	N	1E	242	0	0	3

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	5	W	-	30	N	1B	209	0	0	0
32	5	W	-	30	N	1F	187	575	0	7
33	8	W	-	30	N	1A	209	69	2	0
34	8	W	-	30	N	1D	242	552	2	0
35	11	W	-	30	N	1C	308	575	0	3
36	11	W	-	30	N	1E	209	598	7	0
37	14	W	-	30	N	1A	319	575	0	0
38	14	W	-	30	N	1D	286	552	2	12
39	17	W	-	30	N	1C	220	161	0	3
40	17	W	-	30	N	1E	473	782	0	10
41	20	W	-	30	N	1B	88	483	2	0
42	20	W	-	30	N	1F	187	276	7	3
43	23	W	-	30	N	1B	198	115	0	0
44	23	W	-	30	N	1D	209	0	2	0
45	25	W	-	30	N	1B	121	828	0	7
46	25	W	-	30	N	1D	220	207	0	0
47	25	W	-	33	N	1C	55	828	0	7
48	25	W	-	33	N	1E	66	322	7	2
49	25	W	-	36	N	1A	187	322	2	5
50	25	W	-	36	N	1F	0	644	2	0
51	25	W	-	39	N	1B	0	460	0	0
52	25	W	-	39	N	1D	22	989	2	3
53	25	W	-	41	N	1C	437	460	0	3
54	25	W	-	41	N	1F	33	1081	0	3
55	25	W	-	44	N	1A	99	828	2	0
56	25	W	-	44	N	1E	0	1104	0	0
57	25	W	-	47	N	1B	209	943	0	0
58	25	W	-	47	N	1D	66	1081	0	0
59	25	W	-	50	N	1C	352	460	0	3
60	25	W	-	50	N	1E	99	276	2	2

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
61	25	W	-	53	N	1A	11	483	2	2
62	25	W	-	53	N	1F	22	690	0	0
63	25	W	-	55	N	1B	0	23	4	0
64	25	W	-	55	N	1E	5	161	0	0
65	25	W	-	58	N	1A	286	1242	0	0
66	25	W	-	58	N	1D	165	0	0	0
67	25	W	-	62	N	1C	198	644	2	0
68	25	W	-	62	N	1F	154	1196	0	0
69	25	W	-	64	N	1B	242	414	0	3
70	25	W	-	64	N	1D	0	1058	2	19
71	25	W	-	67	N	1C	220	575	2	0
72	25	W	-	67	N	1E	11	1035	2	2
73	25	W	-	70	N	1A	88	437	2	5
74	25	W	-	70	N	1E	44	759	4	2
75	25	W	-	73	N	1B	220	1219	2	0
76	25	W	-	73	N	1D	319	552	4	0
77	29	W	-	73	N	1A	121	644	0	0
78	29	W	-	73	N	1F	88	874	0	3
79	33	W	-	73	N	1C	143	759	2	10
80	33	W	-	73	N	1E	0	989	2	2
81	36	W	-	73	N	1B	55	299	0	5
82	36	W	-	73	N	1D	198	759	0	3
83	39	W	-	73	N	1A	176	345	0	0
84	39	W	-	73	N	1D	44	828	2	2
85	42	W	-	73	N	1C	154	874	4	5
86	42	W	-	73	N	1E	99	1196	0	3
87	45	W	-	73	N	1B	0	736	0	7
88	45	W	-	73	N	1F	88	896	0	0
89	48	W	-	73	N	1A	99	598	0	0
90	48	W	-	73	N	1E	77	184	0	7

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
91	51	W	-	73	N	1B	88	759	0	0
92	51	W	-	73	N	1E	165	437	2	0
93	54	W	-	73	N	1C	187	506	0	5
94	54	W	-	73	N	1D	198	1242	2	5
95	57	W	-	73	N	1C	77	1132	2	2
96	57	W	-	73	N	1F	99	0	0	5
97	60	W	-	73	N	1A	88	828	0	3
98	60	W	-	73	N	1D	88	989	0	0
99	63	W	-	73	N	1B	77	782	0	5
100	63	W	-	73	N	1F	88	897	4	0
101	66	W	-	73	N	1C	33	667	0	5
102	66	W	-	73	N	1F	0	598	2	5
103	69	W	-	73	N	1B	44	552	2	0
104	69	W	-	73	N	1E	77	1173	0	0
105	72	W	-	73	N	1A	33	598	0	5
106	72	W	-	73	N	1D	77	1127	2	5
107	75	W	-	73	N	1C	99	437	0	0
108	75	W	-	73	N	1E	275	1219	2	0
109	78	W	-	73	N	1B	99	782	0	0
110	78	W	-	73	N	1E	0	575	2	2
111	78	W	-	76	N	1C	143	138	2	4
112	78	W	-	76	N	1D	99	1219	12	16
113	78	W	-	79	N	1A	66	644	0	2
114	78	W	-	79	N	1F	264	1242	10	4
115	78	W	-	82	N	1B	165	253	7	0
116	78	W	-	82	N	1D	132	1012	2	21
117	78	W	-	85	N	1B	33	667	0	2
118	78	W	-	85	N	1F	44	805	2	2
119	78	W	-	88	N	1A	132	782	0	0
120	78	W	-	88	N	1E	154	897	7	19

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
121	78	W	-	91	N	1C	66	644	2	7
122	78	W	-	91	N	1F	33	1311	0	10
123	78	W	-	94	N	1B	231	1058	0	2
124	78	W	-	94	N	1E	187	1179	2	2
125	78	W	-	97	N	1A	165	1035	0	0
126	78	W	-	97	N	1E	33	1035	0	0
127	78	W	-	100	N	1B	198	805	2	0
128	78	W	-	100	N	1D	0	713	0	0
129	78	W	-	103	N	1B	231	460	0	7
130	78	W	-	103	N	1F	9	575	2	0
131	78	W	-	106	N	1C	9	690	2	2
132	78	W	-	106	N	1F	33	1219	4	4
133	78	W	-	109	N	1A	44	851	0	2
134	78	W	-	109	N	1D	9	851	7	21
135	78	W	-	112	N	1C	143	1058	2	0
136	78	W	-	112	N	1E	187	201	2	14
137	78	W	-	115	N	1B	220	1058	0	0
138	78	W	-	115	N	1F	264	1219	0	7
139	78	W	-	118	N	1A	66	782	0	0
140	78	W	-	118	N	1D	99	1242	4	9
141	78	W	-	121	N	1B	209	1219	2	5
142	78	W	-	121	N	1F	198	1081	2	5
143	78	W	-	124	N	1A	187	966	0	0
144	78	W	-	124	N	1D	0	1196	2	7
145	78	W	-	127	N	1A	0	1242	0	0
146	78	W	-	127	N	1D	165	1219	2	5
147	78	W	-	130	N	1B	286	92	0	0
148	78	W	-	130	N	1D	33	1541	5	2
149	78	W	-	133	N	1B	154	966	2	2
150	78	W	-	133	N	1E	88	1150	4	7

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
151	78	W	-	136	N	1B	286	828	0	0
152	78	W	-	136	N	1F	88	483	2	5
153	78	W	-	139	N	1C	44	1150	2	2
154	78	W	-	139	N	1D	165	1058	0	0
155	78	W	-	142	N	1C	154	644	0	2
156	78	W	-	142	N	1F	88	598	2	9
157	78	W	-	145	N	1A	231	368	0	0
158	78	W	-	145	N	1D	297	713	5	2
159	78	W	-	148	N	1A	264	1058	4	4
160	78	W	-	148	N	1E	341	1242	2	17
161	78	W	-	151	N	1C	253	989	0	0
162	78	W	-	151	N	1D	165	1058	0	0
163	78	W	-	154	N	1C	132	828	2	0
164	78	W	-	154	N	1D	88	828	4	12
165	78	W	-	157	N	1C	22	598	7	0
166	78	W	-	157	N	1F	154	1012	4	7
167	78	W	-	160	N	1A	121	713	2	0
168	78	W	-	160	N	1F	154	690	4	4
169	78	W	-	163	N	1A	88	598	0	0
170	78	W	-	163	N	1D	88	598	15	13
171	78	W	-	166	N	1B	55	414	0	0
172	78	W	-	166	N	1E	88	552	0	2
173	78	W	-	169	N	1A	77	138	0	0
174	78	W	-	169	N	1D	33	437	0	7
175	78	W	-	172	N	1C	77	345	5	0
176	78	W	-	172	N	1D	88	1242	0	12
177	78	W	-	175	N	1C	0	437	2	2
178	78	W	-	175	N	1E	242	230	10	0
179	78	W	-	178	N	1C	99	529	0	2
180	78	W	-	178	N	1D	55	920	2	5

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
181	78	W	-	182	N	1B	143	391	0	2
182	78	W	-	182	N	1E	77	1127	2	12
183	78	W	-	185	N	1A	66	0	2	0
184	78	W	-	185	N	1D	176	207	2	19
185	78	W	-	188	N	1B	286	230	0	2
186	78	W	-	188	N	1E	44	644	2	5
187	78	W	-	191	N	1C	11	1081	2	0
188	78	W	-	191	N	1D	55	644	0	2
189	78	W	-	194	N	1A	44	575	2	7
190	78	W	-	194	N	1F	33	690	2	0
191	78	W	-	198	N	1B	44	0	0	0
192	78	W	-	198	N	1E	0	782	2	0
193	78	W	-	201	N	1B	198	207	0	0
194	78	W	-	201	N	1D	0	644	7	0
195	78	W	-	204	N	1A	0	161	0	0
196	78	W	-	204	N	1D	0	1242	0	5
197	78	W	-	207	N	1A	0	276	0	2
198	78	W	-	207	N	1D	22	506	0	5
199	78	W	-	210	N	1B	77	161	2	7
200	78	W	-	210	N	1F	77	345	2	0
201	78	W	-	213	N	1B	88	1242	0	2
202	78	W	-	213	N	1E	55	414	0	7
203	78	W	-	216	N	1B	242	1012	0	0
204	78	W	-	216	N	1D	88	805	4	7
205	78	W	-	219	N	1C	66	0	2	2
206	78	W	-	219	N	1D	44	736	4	9
207	78	W	-	222	N	1A	66	552	0	0
208	78	W	-	222	N	1F	209	1242	7	4
209	78	W	-	225	N	1A	154	1219	0	0
210	78	W	-	225	N	1F	319	851	2	7

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
211	78	W	-	228	N	1C	253	1081	2	0
212	78	W	-	228	N	1E	99	230	0	5
213	78	W	-	231	N	1C	11	322	0	0
214	78	W	-	231	N	1D	0	1242	10	4
215	78	W	-	234	N	1B	77	322	2	0
216	78	W	-	234	N	1F	187	1081	2	0
217	78	W	-	237	N	1B	132	437	0	2
218	78	W	-	237	N	1F	121	920	0	0
219	78	W	-	240	N	1A	44	989	0	0
220	78	W	-	240	N	1D	22	414	4	5
221	78	W	-	243	N	1B	66	161	0	0
222	78	W	-	243	N	1E	22	851	10	0
223	78	W	-	246	N	1B	44	966	1	3
224	78	W	-	246	N	1F	77	437	0	29
225	78	W	-	249	N	1C	66	460	2	0
226	78	W	-	249	N	1E	0	552	4	7
227	78	W	-	252	N	1B	11	552	2	0
228	78	W	-	252	N	1F	0	828	0	3
229	78	W	-	255	N	1A	22	575	2	0
230	78	W	-	255	N	1D	0	276	2	5
231	78	W	-	258	N	1C	0	1012	2	0
232	78	W	-	258	N	1D	11	621	4	0
233	78	W	-	261	N	1A	0	598	0	7
234	78	W	-	261	N	1F	253	414	4	2
235	78	W	-	264	N	1B	66	276	0	3
236	78	W	-	264	N	1E	0	1229	2	2
237	78	W	-	267	N	1C	11	943	0	0
238	78	W	-	267	N	1D	110	805	4	14
239	78	W	-	270	N	1B	88	529	0	5
240	78	W	-	270	N	1D	66	115	2	0

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
241	78	W	-	273	N	1B	22	414	0	3
242	78	W	-	273	N	1F	110	299	4	0
243	78	W	-	276	N	1A	220	506	0	10
244	78	W	-	276	N	1F	253	575	0	3
245	78	W	-	279	N	1A	110	1242	2	0
246	78	W	-	279	N	1F	77	0	0	3
247	78	W	-	282	N	1B	0	299	0	0
248	78	W	-	282	N	1F	55	782	2	2
249	78	W	-	286	N	1C	22	598	0	7
250	78	W	-	286	N	1E	22	483	0	0
251	78	W	-	289	N	1C	198	69	0	3
252	78	W	-	289	N	1E	121	1196	2	5
253	78	W	-	291	N	1B	121	759	4	9
254	78	W	-	291	N	1E	77	276	7	2
255	75	W	-	291	N	1A	44	1242	0	0
256	75	W	-	291	N	1E	33	667	7	14
257	72	W	-	291	N	1C	154	575	0	3
258	72	W	-	291	N	1F	66	92	0	0
259	69	W	-	291	N	1B	22	851	0	0
260	69	W	-	291	N	1D	22	230	5	0
261	66	W	-	291	N	1C	11	736	2	0
262	66	W	-	291	N	1F	33	575	7	17
263	63	W	-	291	N	1A	11	161	0	0
264	63	W	-	291	N	1D	0	989	7	17
265	60	W	-	291	N	1B	33	368	0	0
266	60	W	-	291	N	1F	0	391	2	5
267	58	W	-	291	N	1C	0	115	0	3
268	58	W	-	291	N	1D	0	138	7	4
269	61	W	-	112	N	1B	220	713	0	2
270	61	W	-	112	N	1E	132	1058	2	2

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
271	59	W	-	113	N	1A	88	506	0	0
272	59	W	-	113	N	1E	22	598	1	5
273	57	W	-	115	N	1B	55	552	0	5
274	57	W	-	115	N	1F	0	943	0	2
275	55	W	-	117	N	1C	11	184	2	7
276	55	W	-	117	N	1D	22	368	2	2
277	53	W	-	119	N	1C	0	644	0	0
278	53	W	-	119	N	1F	66	552	2	0
279	53	W	-	123	N	1A	11	1150	0	0
280	53	W	-	123	N	1D	110	1012	4	4
281	53	W	-	126	N	1B	0	23	0	2
282	53	W	-	126	N	1E	33	736	0	0
283	53	W	-	129	N	1A	0	736	0	10
284	53	W	-	129	N	1D	33	644	2	0
285	53	W	-	132	N	1C	121	782	7	0
286	53	W	-	132	N	1F	11	322	2	0
287	53	W	-	135	N	1B	0	299	0	0
288	53	W	-	135	N	1D	55	368	4	7
289	53	W	-	138	N	1A	0	437	0	0
290	53	W	-	138	N	1E	66	667	2	7
291	53	W	-	141	N	1A	11	644	0	0
292	53	W	-	141	N	1D	231	943	0	5
293	53	W	-	144	N	1B	319	759	0	2
294	53	W	-	144	N	1E	110	1081	0	0
295	53	W	-	147	N	1A	55	23	5	2
296	53	W	-	147	N	1F	110	989	2	2
297	53	W	-	150	N	1C	66	874	2	2
298	53	W	-	150	N	1E	88	460	0	2
299	53	W	-	153	N	1B	176	805	0	7
300	53	W	-	153	N	1D	88	1035	0	5

CIMARRON FACILITY

FENCE SURVEY

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	125 DPM
BETA DIRECT LUDLUM 2220 43-68 PROBE	50064	DPM/100cm²	408 cpm	625 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W.a. Agee DATE: 5-24-99

LN #	GRID LOCATION					READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
301	53	W	-	156	N	1B	242	759	5	0
302	53	W	-	156	N	1E	77	851	0	5
303	53	W	-	159	N	1A	44	736	0	2
304	53	W	-	159	N	1E	110	391	2	0
305	53	W	-	163	N	1B	209	299	2	2
306	53	W	-	163	N	1F	88	299	0	0
307	53	W	-	166	N	1B	11	552	0	5
308	53	W	-	166	N	1F	154	851	2	7
309	54	W	-	169	N	1C	99	0	0	7
310	54	W	-	169	N	1F	88	897	0	2
311	54	W	-	172	N	1C	77	552	0	2
312	54	W	-	172	N	1D	77	667	2	7
313	54	W	-	175	N	1A	0	1150	2	0
314	54	W	-	175	N	1D	55	368	2	0
315	54	W	-	178	N	1B	33	460	0	5
316	54	W	-	178	N	1E	99	1035	0	2
317	54	W	-	180	N	1C	154	161	2	0
318	54	W	-	180	N	1D	143	966	2	2
319	54	W	-	183	N	1B	33	598	2	0
320	54	W	-	183	N	1E	0	828	2	5
321	54	W	-	186	N	1A	0	627	2	0
322	54	W	-	186	N	1F	44	598	0	0

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" FENCE SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	385.0	272.0	73987.4
2	154.0	41.0	1681.5
3	165.0	52.0	2704.6
4	165.0	52.0	2704.6
5	220.0	107.0	11450.3
6	264.0	151.0	22802.9
7	220.0	107.0	11450.3
8	154.0	41.0	1681.5
9	198.0	85.0	7226.1
10	242.0	129.0	16642.6
11	275.0	162.0	26246.0
12	176.0	63.0	3969.8
13	198.0	85.0	7226.1
14	308.0	195.0	38027.4
15	99.0	-14.0	195.8
16	198.0	85.0	7226.1
17	165.0	52.0	2704.6
18	121.0	8.0	64.1
19	286.0	173.0	29931.1
20	143.0	30.0	900.4
21	220.0	107.0	11450.3
22	330.0	217.0	47091.7
23	308.0	195.0	38027.4
24	231.0	118.0	13925.5
25	198.0	85.0	7226.1
26	286.0	173.0	29931.1
27	165.0	52.0	2704.6
28	198.0	85.0	7226.1
29	198.0	85.0	7226.1
30	242.0	129.0	16642.6
31	209.0	96.0	9217.2
32	187.0	74.0	5476.9
33	209.0	96.0	9217.2
34	242.0	129.0	16642.6
35	308.0	195.0	38027.4
36	209.0	96.0	9217.2
37	319.0	206.0	42438.6
38	286.0	173.0	29931.1
39	220.0	107.0	11450.3
40	473.0	360.0	129604.5
41	88.0	-25.0	624.7
42	187.0	74.0	5476.9
43	198.0	85.0	7226.1
44	209.0	96.0	9217.2
45	121.0	8.0	64.1
46	220.0	107.0	11450.3
47	55.0	-58.0	3363.3
48	66.0	-47.0	2208.4
49	187.0	74.0	5476.9
50	0.0	-113.0	12767.6
	5799.0		480458.9
	5516.0		361164.3
	5390.0		400406.8
	4081.0		379809.5
	3256.0		363332.3
	1837.0		110046.9
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	36384		2904592.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **322**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **112.99**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **95.12**
2 Std Deviations: **190.25**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.649**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **121.73** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.645	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	321	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	321	1.649	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" FENCE SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	0.0	-113.0	12767.60
52	22.0	-91.0	8279.87
53	437.0	324.0	104980.02
54	33.0	-80.0	6399.01
55	99.0	-14.0	195.83
56	0.0	-113.0	12767.60
57	209.0	96.0	9217.19
58	66.0	-47.0	2208.42
59	352.0	239.0	57123.97
60	99.0	-14.0	195.83
61	11.0	-102.0	10402.73
62	22.0	-91.0	8279.87
63	0.0	-113.0	12767.60
64	5.0	-108.0	11662.66
65	286.0	173.0	29931.15
66	165.0	52.0	2704.65
67	198.0	85.0	7226.06
68	154.0	41.0	1681.51
69	242.0	129.0	16642.60
70	0.0	-113.0	12767.60
71	220.0	107.0	11450.33
72	11.0	-102.0	10402.73
73	88.0	-25.0	624.69
74	44.0	-69.0	4760.14
75	220.0	107.0	11450.33
76	319.0	206.0	42438.56
77	121.0	8.0	64.10
78	88.0	-25.0	624.69
79	143.0	30.0	900.37
80	0.0	-113.0	12767.60
81	55.0	-58.0	3363.28
82	198.0	85.0	7226.06
83	176.0	63.0	3969.78
84	44.0	-69.0	4760.14
85	154.0	41.0	1681.51
86	99.0	-14.0	195.83
87	0.0	-113.0	12767.60
88	88.0	-25.0	624.69
89	99.0	-14.0	195.83
90	77.0	-36.0	1295.55
91	88.0	-25.0	624.69
92	165.0	52.0	2704.65
93	187.0	74.0	5476.92
94	198.0	85.0	7226.06
95	77.0	-36.0	1295.55
96	99.0	-14.0	195.83
97	88.0	-25.0	624.69
98	88.0	-25.0	624.69
99	77.0	-36.0	1295.55
100	88.0	-25.0	624.69
	5799.0		480458.9
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	33.0	-80.0	6399.01
102	0.0	-113.0	12767.60
103	44.0	-69.0	4760.14
104	77.0	-36.0	1295.55
105	33.0	-80.0	6399.01
106	77.0	-36.0	1295.55
107	99.0	-14.0	195.83
108	275.0	162.0	26246.01
109	99.0	-14.0	195.83
110	0.0	-113.0	12767.60
111	143.0	30.0	900.37
112	99.0	-14.0	195.83
113	66.0	-47.0	2208.42
114	264.0	151.0	22802.88
115	165.0	52.0	2704.65
116	132.0	19.0	361.24
117	33.0	-80.0	6399.01
118	44.0	-69.0	4760.14
119	132.0	19.0	361.24
120	154.0	41.0	1681.51
121	66.0	-47.0	2208.42
122	33.0	-80.0	6399.01
123	231.0	118.0	13925.47
124	187.0	74.0	5476.92
125	165.0	52.0	2704.65
126	33.0	-80.0	6399.01
127	198.0	85.0	7226.06
128	0.0	-113.0	12767.60
129	231.0	118.0	13925.47
130	9.0	-104.0	10814.71
131	9.0	-104.0	10814.71
132	33.0	-80.0	6399.01
133	44.0	-69.0	4760.14
134	9.0	-104.0	10814.71
135	143.0	30.0	900.37
136	187.0	74.0	5476.92
137	220.0	107.0	11450.33
138	264.0	151.0	22802.88
139	66.0	-47.0	2208.42
140	99.0	-14.0	195.83
141	209.0	96.0	9217.19
142	198.0	85.0	7226.06
143	187.0	74.0	5476.92
144	0.0	-113.0	12767.60
145	0.0	-113.0	12767.60
146	165.0	52.0	2704.65
147	286.0	173.0	29931.15
148	33.0	-80.0	6399.01
149	154.0	41.0	1681.51
150	88.0	-25.0	624.69
	5516.0		361164.3
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" FENCE SURVEY (UNAFFECTED)
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	286.0	173.0	29931.15
152	88.0	-25.0	624.69
153	44.0	-69.0	4760.14
154	165.0	52.0	2704.65
155	154.0	41.0	1681.51
156	88.0	-25.0	624.69
157	231.0	118.0	13925.47
158	297.0	184.0	33858.29
159	264.0	151.0	22802.88
160	341.0	228.0	51986.83
161	253.0	140.0	19601.74
162	165.0	52.0	2704.65
163	132.0	19.0	361.24
164	88.0	-25.0	624.69
165	22.0	-91.0	8279.87
166	154.0	41.0	1681.51
167	121.0	8.0	64.10
168	154.0	41.0	1681.51
169	88.0	-25.0	624.69
170	88.0	-25.0	624.69
171	55.0	-58.0	3363.28
172	88.0	-25.0	624.69
173	77.0	-36.0	1295.55
174	33.0	-80.0	6399.01
175	77.0	-36.0	1295.55
176	88.0	-25.0	624.69
177	0.0	-113.0	12767.60
178	242.0	129.0	16642.60
179	99.0	-14.0	195.83
180	55.0	-58.0	3363.28
181	143.0	30.0	900.37
182	77.0	-36.0	1295.55
183	66.0	-47.0	2208.42
184	176.0	63.0	3969.78
185	286.0	173.0	29931.15
186	44.0	-69.0	4760.14
187	11.0	-102.0	10402.73
188	55.0	-58.0	3363.28
189	44.0	-69.0	4760.14
190	33.0	-80.0	6399.01
191	44.0	-69.0	4760.14
192	0.0	-113.0	12767.60
193	198.0	85.0	7226.06
194	0.0	-113.0	12767.60
195	0.0	-113.0	12767.60
196	0.0	-113.0	12767.60
197	0.0	-113.0	12767.60
198	22.0	-91.0	8279.87
199	77.0	-36.0	1295.55
200	77.0	-36.0	1295.55
	5390.0		400406.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	88.0	-25.0	624.69
202	55.0	-58.0	3363.28
203	242.0	129.0	16642.60
204	88.0	-25.0	624.69
205	66.0	-47.0	2208.42
206	44.0	-69.0	4760.14
207	66.0	-47.0	2208.42
208	209.0	96.0	9217.19
209	154.0	41.0	1681.51
210	319.0	206.0	42438.56
211	253.0	140.0	19601.74
212	99.0	-14.0	195.83
213	11.0	-102.0	10402.73
214	0.0	-113.0	12767.60
215	77.0	-36.0	1295.55
216	187.0	74.0	5476.92
217	132.0	19.0	361.24
218	121.0	8.0	64.10
219	44.0	-69.0	4760.14
220	22.0	-91.0	8279.87
221	66.0	-47.0	2208.42
222	22.0	-91.0	8279.87
223	44.0	-69.0	4760.14
224	77.0	-36.0	1295.55
225	66.0	-47.0	2208.42
226	0.0	-113.0	12767.60
227	11.0	-102.0	10402.73
228	0.0	-113.0	12767.60
229	22.0	-91.0	8279.87
230	0.0	-113.0	12767.60
231	0.0	-113.0	12767.60
232	11.0	-102.0	10402.73
233	0.0	-113.0	12767.60
234	253.0	140.0	19601.74
235	66.0	-47.0	2208.42
236	0.0	-113.0	12767.60
237	11.0	-102.0	10402.73
238	110.0	-3.0	8.96
239	88.0	-25.0	624.69
240	66.0	-47.0	2208.42
241	22.0	-91.0	8279.87
242	110.0	-3.0	8.96
243	220.0	107.0	11450.33
244	253.0	140.0	19601.74
245	110.0	-3.0	8.96
246	77.0	-36.0	1295.55
247	0.0	-113.0	12767.60
248	55.0	-58.0	3363.28
249	22.0	-91.0	8279.87
250	22.0	-91.0	8279.87
	4081.0		379809.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" FENCE SURVEY (UNAFFECTED)
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	198.0	85.0	7226.06
252	121.0	8.0	64.10
253	121.0	8.0	64.10
254	77.0	-36.0	1295.55
255	44.0	-69.0	4760.14
256	33.0	-80.0	6399.01
257	154.0	41.0	1681.51
258	66.0	-47.0	2208.42
259	22.0	-91.0	8279.87
260	22.0	-91.0	8279.87
261	11.0	-102.0	10402.73
262	33.0	-80.0	6399.01
263	11.0	-102.0	10402.73
264	0.0	-113.0	12767.60
265	33.0	-80.0	6399.01
266	0.0	-113.0	12767.60
267	0.0	-113.0	12767.60
268	0.0	-113.0	12767.60
269	220.0	107.0	11450.33
270	132.0	19.0	361.24
271	88.0	-25.0	624.69
272	22.0	-91.0	8279.87
273	55.0	-58.0	3363.28
274	0.0	-113.0	12767.60
275	11.0	-102.0	10402.73
276	22.0	-91.0	8279.87
277	0.0	-113.0	12767.60
278	66.0	-47.0	2208.42
279	11.0	-102.0	10402.73
280	110.0	-3.0	8.96
281	0.0	-113.0	12767.60
282	33.0	-80.0	6399.01
283	0.0	-113.0	12767.60
284	33.0	-80.0	6399.01
285	121.0	8.0	64.10
286	11.0	-102.0	10402.73
287	0.0	-113.0	12767.60
288	55.0	-58.0	3363.28
289	0.0	-113.0	12767.60
290	66.0	-47.0	2208.42
291	11.0	-102.0	10402.73
292	231.0	118.0	13925.47
293	319.0	206.0	42438.56
294	110.0	-3.0	8.96
295	55.0	-58.0	3363.28
296	110.0	-3.0	8.96
297	66.0	-47.0	2208.42
298	88.0	-25.0	624.69
299	176.0	63.0	3969.78
300	88.0	-25.0	624.69
	3256.0		363332.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	242.0	129.0	16642.60
302	77.0	-36.0	1295.55
303	44.0	-69.0	4760.14
304	110.0	-3.0	8.96
305	209.0	96.0	9217.19
306	88.0	-25.0	624.69
307	11.0	-102.0	10402.73
308	154.0	41.0	1681.51
309	99.0	-14.0	195.83
310	88.0	-25.0	624.69
311	77.0	-36.0	1295.55
312	77.0	-36.0	1295.55
313	0.0	-113.0	12767.60
314	55.0	-58.0	3363.28
315	33.0	-80.0	6399.01
316	99.0	-14.0	195.83
317	154.0	41.0	1681.51
318	143.0	30.0	900.37
319	33.0	-80.0	6399.01
320	0.0	-113.0	12767.60
321	0.0	-113.0	12767.60
322	44.0	-69.0	4760.14
323	0.0	0.00	0.00
324	0.0	0.00	0.00
325	0.0	0.00	0.00
326	0.0	0.00	0.00
327	0.0	0.00	0.00
328	0.0	0.00	0.00
329	0.0	0.00	0.00
330	0.0	0.00	0.00
331	0.0	0.00	0.00
332	0.0	0.00	0.00
333	0.0	0.00	0.00
334	0.0	0.00	0.00
335	0.0	0.00	0.00
336	0.0	0.00	0.00
337	0.0	0.00	0.00
338	0.0	0.00	0.00
339	0.0	0.00	0.00
340	0.0	0.00	0.00
341	0.0	0.00	0.00
342	0.0	0.00	0.00
343	0.0	0.00	0.00
344	0.0	0.00	0.00
345	0.0	0.00	0.00
346	0.0	0.00	0.00
347	0.0	0.00	0.00
348	0.0	0.00	0.00
349	0.0	0.00	0.00
350	0.0	0.00	0.00
	1837.0		110046.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" FENCE SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	897.0	248.0	61499.4
2	874.0	225.0	50620.8
3	460.0	-189.0	35724.5
4	529.0	-120.0	14402.2
5	460.0	-189.0	35724.5
6	374.0	-275.0	75630.1
7	69.0	-580.0	336410.8
8	759.0	110.0	12098.0
9	322.0	-327.0	106935.1
10	621.0	-28.0	784.5
11	23.0	-626.0	391887.7
12	598.0	-51.0	2602.0
13	828.0	179.0	32037.7
14	23.0	-626.0	391887.7
15	667.0	18.0	323.7
16	437.0	-212.0	44948.0
17	644.0	-5.0	25.1
18	345.0	-304.0	92421.7
19	874.0	225.0	50620.8
20	46.0	-603.0	363620.2
21	23.0	-626.0	391887.7
22	437.0	-212.0	44948.0
23	529.0	-120.0	14402.2
24	46.0	-603.0	363620.2
25	437.0	-212.0	44948.0
26	0.0	-649.0	421213.1
27	667.0	18.0	323.7
28	115.0	-534.0	285166.0
29	943.0	294.0	86430.5
30	0.0	-649.0	421213.1
31	0.0	-649.0	421213.1
32	575.0	-74.0	5477.4
33	69.0	-580.0	336410.8
34	552.0	-97.0	9410.8
35	575.0	-74.0	5477.4
36	598.0	-51.0	2602.0
37	575.0	-74.0	5477.4
38	552.0	-97.0	9410.8
39	161.0	-488.0	238153.1
40	782.0	133.0	17686.5
41	483.0	-166.0	27559.1
42	276.0	-373.0	139136.0
43	115.0	-534.0	285166.0
44	0.0	-649.0	421213.1
45	828.0	179.0	32037.7
46	207.0	-442.0	195372.2
47	828.0	179.0	32037.7
48	322.0	-327.0	106935.1
49	322.0	-327.0	106935.1
50	644.0	-5.0	25.1
	35723.0		5945364.0
	44045.0		8177858.9
	31211.0		5693152.1
	32509.0		6000683.9
	30337.0		5537918.4
	13645.0		1805738.8
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	208981		39732809.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **322**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **649.01**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **351.82**
2 Std Deviations: **703.64**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.649**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **681.33** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.645	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	321	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	321	1.649	95%	

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W. C. Rogers DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" FENCE SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	460.0	-189.0	35724.52
52	989.0	340.0	115593.66
53	460.0	-189.0	35724.52
54	1081.0	432.0	186615.95
55	828.0	179.0	32037.66
56	1104.0	455.0	207016.52
57	943.0	294.0	86430.52
58	1081.0	432.0	186615.95
59	460.0	-189.0	35724.52
60	276.0	-373.0	139135.95
61	483.0	-166.0	27559.09
62	690.0	41.0	1680.24
63	23.0	-626.0	391887.66
64	161.0	-488.0	238153.09
65	1242.0	593.0	351637.95
66	0.0	-649.0	421213.09
67	644.0	-5.0	25.09
68	1196.0	547.0	299198.81
69	414.0	-235.0	55229.38
70	1058.0	409.0	167273.38
71	575.0	-74.0	5477.38
72	1035.0	386.0	148988.81
73	437.0	-212.0	44947.95
74	759.0	110.0	12097.95
75	1219.0	570.0	324889.38
76	552.0	-97.0	9410.81
77	644.0	-5.0	25.09
78	874.0	225.0	50620.81
79	759.0	110.0	12097.95
80	989.0	340.0	115593.66
81	299.0	-350.0	122506.52
82	759.0	110.0	12097.95
83	345.0	-304.0	92421.66
84	828.0	179.0	32037.66
85	874.0	225.0	50620.81
86	1196.0	547.0	299198.81
87	736.0	87.0	7567.38
88	896.0	247.0	61004.40
89	598.0	-51.0	2601.95
90	184.0	-465.0	216233.66
91	759.0	110.0	12097.95
92	437.0	-212.0	44947.95
93	506.0	-143.0	20451.66
94	1242.0	593.0	351637.95
95	1132.0	483.0	233280.00
96	0.0	-649.0	421213.09
97	828.0	179.0	32037.66
98	989.0	340.0	115593.66
99	782.0	133.0	17686.52
100	897.0	248.0	61499.38
	35723.0		5945364.0
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	667.0	18.0	323.66
102	598.0	-51.0	2601.95
103	552.0	-97.0	9410.81
104	1173.0	524.0	274566.24
105	598.0	-51.0	2601.95
106	1127.0	478.0	228475.09
107	437.0	-212.0	44947.95
108	1219.0	570.0	324889.38
109	782.0	133.0	17686.52
110	575.0	-74.0	5477.38
111	138.0	-511.0	261130.52
112	1219.0	570.0	324889.38
113	644.0	-5.0	25.09
114	1242.0	593.0	351637.95
115	253.0	-396.0	156823.38
116	1012.0	363.0	131762.24
117	667.0	18.0	323.66
118	805.0	156.0	24333.09
119	782.0	133.0	17686.52
120	897.0	248.0	61499.38
121	644.0	-5.0	25.09
122	1311.0	662.0	438231.66
123	1058.0	409.0	167273.38
124	1179.0	530.0	280890.12
125	1035.0	386.0	148988.81
126	1035.0	386.0	148988.81
127	805.0	156.0	24333.09
128	713.0	64.0	4094.81
129	460.0	-189.0	35724.52
130	575.0	-74.0	5477.38
131	690.0	41.0	1680.24
132	1219.0	570.0	324889.38
133	851.0	202.0	40800.24
134	851.0	202.0	40800.24
135	1058.0	409.0	167273.38
136	201.0	-448.0	200712.35
137	1058.0	409.0	167273.38
138	1219.0	570.0	324889.38
139	782.0	133.0	17686.52
140	1242.0	593.0	351637.95
141	1219.0	570.0	324889.38
142	1081.0	432.0	186615.95
143	966.0	317.0	100483.09
144	1196.0	547.0	299198.81
145	1242.0	593.0	351637.95
146	1219.0	570.0	324889.38
147	92.0	-557.0	310259.38
148	1541.0	892.0	795647.38
149	966.0	317.0	100483.09
150	1150.0	501.0	250991.66
	44045.0		8177858.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" FENCE SURVEY (UNAFFECTED)
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	828.0	179.0	32037.66
152	483.0	-166.0	27559.09
153	1150.0	501.0	250991.66
154	1058.0	409.0	167273.38
155	644.0	-5.0	25.09
156	598.0	-51.0	2601.95
157	368.0	-281.0	78966.24
158	713.0	64.0	4094.81
159	1058.0	409.0	167273.38
160	1242.0	593.0	351637.95
161	989.0	340.0	115593.66
162	1058.0	409.0	167273.38
163	828.0	179.0	32037.66
164	828.0	179.0	32037.66
165	598.0	-51.0	2601.95
166	1012.0	363.0	131762.24
167	713.0	64.0	4094.81
168	690.0	41.0	1680.24
169	598.0	-51.0	2601.95
170	598.0	-51.0	2601.95
171	414.0	-235.0	55229.38
172	552.0	-97.0	9410.81
173	138.0	-511.0	261130.52
174	437.0	-212.0	44947.95
175	345.0	-304.0	92421.66
176	1242.0	593.0	351637.95
177	437.0	-212.0	44947.95
178	230.0	-419.0	175568.81
179	529.0	-120.0	14402.24
180	920.0	271.0	73435.95
181	391.0	-258.0	66568.81
182	1127.0	478.0	228475.09
183	0.0	-649.0	421213.09
184	207.0	-442.0	195372.24
185	230.0	-419.0	175568.81
186	644.0	-5.0	25.09
187	1081.0	432.0	186615.95
188	644.0	-5.0	25.09
189	575.0	-74.0	5477.38
190	690.0	41.0	1680.24
191	0.0	-649.0	421213.09
192	782.0	133.0	17686.52
193	207.0	-442.0	195372.24
194	644.0	-5.0	25.09
195	161.0	-488.0	238153.09
196	1242.0	593.0	351637.95
197	276.0	-373.0	139135.95
198	506.0	-143.0	20451.66
199	161.0	-488.0	238153.09
200	345.0	-304.0	92421.66
	31211.0		5693152.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	1242.0	593.0	351637.95
202	414.0	-235.0	55229.38
203	1012.0	363.0	131762.24
204	805.0	156.0	24333.09
205	0.0	-649.0	421213.09
206	736.0	87.0	7567.38
207	552.0	-97.0	9410.81
208	1242.0	593.0	351637.95
209	1219.0	570.0	324889.38
210	851.0	202.0	40800.24
211	1081.0	432.0	186615.95
212	230.0	-419.0	175568.81
213	322.0	-327.0	106935.09
214	1242.0	593.0	351637.95
215	322.0	-327.0	106935.09
216	1081.0	432.0	186615.95
217	437.0	-212.0	44947.95
218	920.0	271.0	73435.95
219	989.0	340.0	115593.66
220	414.0	-235.0	55229.38
221	161.0	-488.0	238153.09
222	851.0	202.0	40800.24
223	966.0	317.0	100483.09
224	437.0	-212.0	44947.95
225	460.0	-189.0	35724.52
226	552.0	-97.0	9410.81
227	552.0	-97.0	9410.81
228	828.0	179.0	32037.66
229	575.0	-74.0	5477.38
230	276.0	-373.0	139135.95
231	1012.0	363.0	131762.24
232	621.0	-28.0	784.52
233	598.0	-51.0	2601.95
234	414.0	-235.0	55229.38
235	276.0	-373.0	139135.95
236	1229.0	580.0	336389.19
237	943.0	294.0	86430.52
238	805.0	156.0	24333.09
239	529.0	-120.0	14402.24
240	115.0	-534.0	285165.95
241	414.0	-235.0	55229.38
242	299.0	-350.0	122506.52
243	506.0	-143.0	20451.66
244	575.0	-74.0	5477.38
245	1242.0	593.0	351637.95
246	0.0	-649.0	421213.09
247	299.0	-350.0	122506.52
248	782.0	133.0	17686.52
249	598.0	-51.0	2601.95
250	483.0	-166.0	27559.09
	32509.0		6000683.9
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

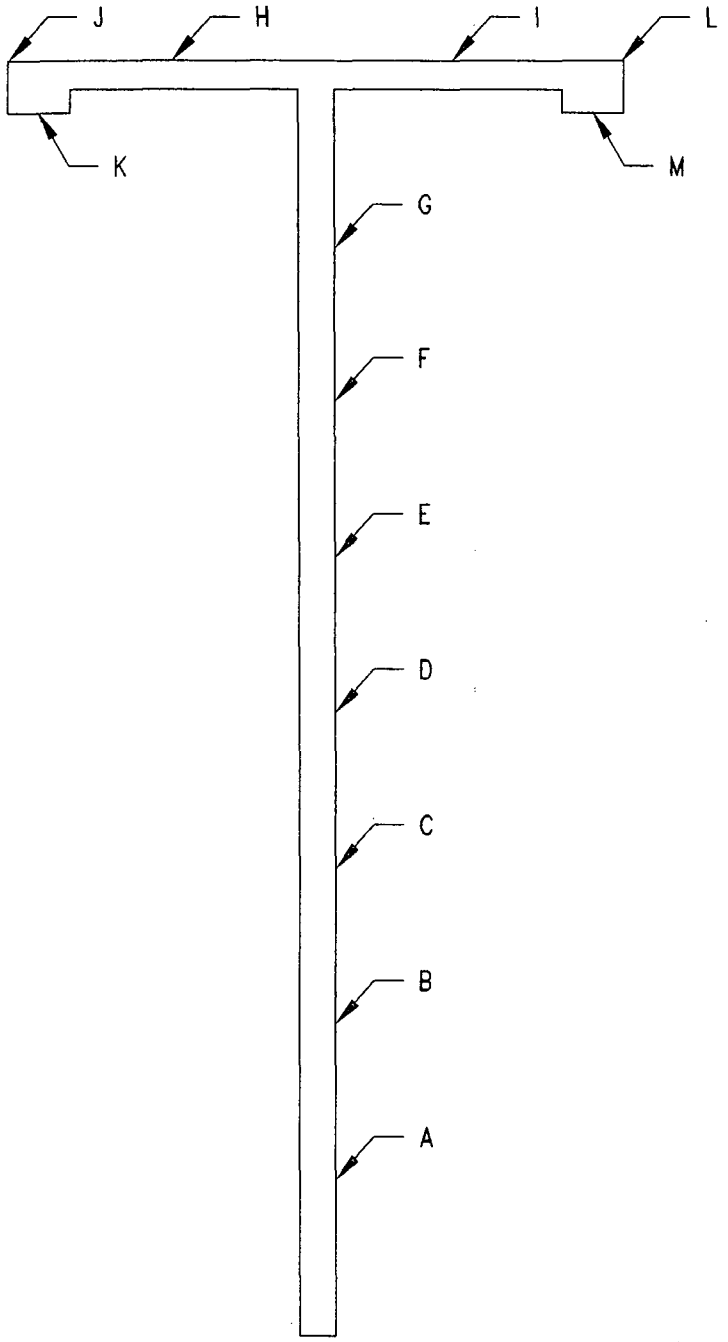
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" FENCE SURVEY (UNAFFECTED)

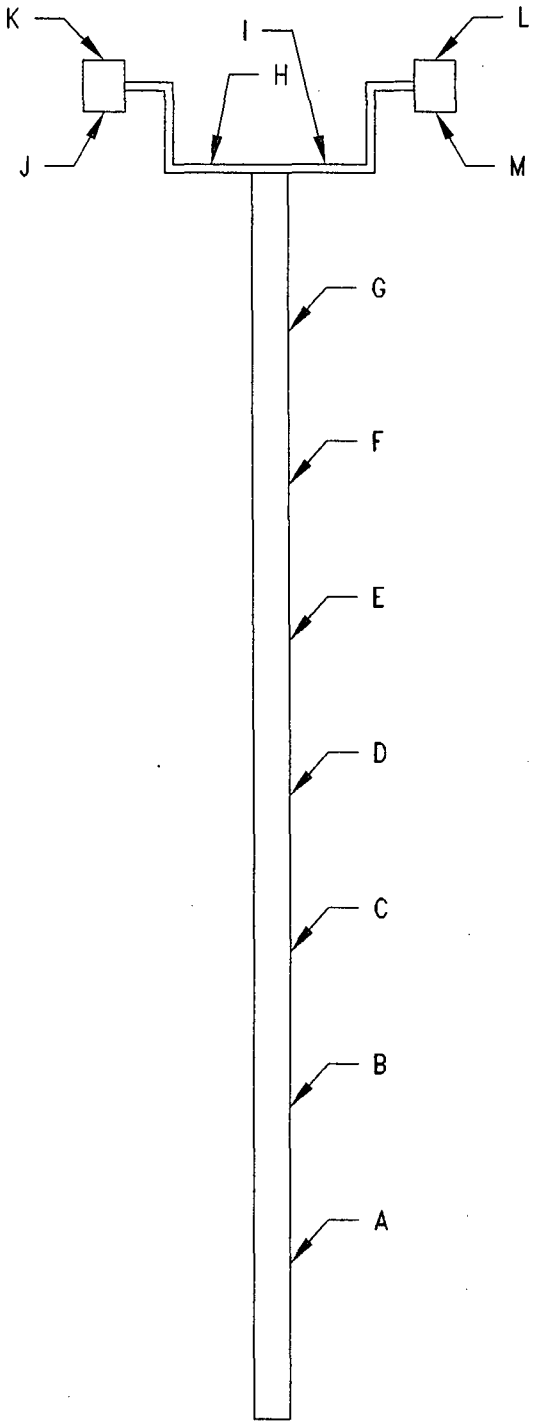
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	69.0	-580.0	336410.81
252	1196.0	547.0	299198.81
253	759.0	110.0	12097.95
254	276.0	-373.0	139135.95
255	1242.0	593.0	351637.95
256	667.0	18.0	323.66
257	575.0	-74.0	5477.38
258	92.0	-557.0	310259.38
259	851.0	202.0	40800.24
260	230.0	-419.0	175568.81
261	736.0	87.0	7567.38
262	575.0	-74.0	5477.38
263	161.0	-488.0	238153.09
264	989.0	340.0	115593.66
265	368.0	-281.0	78966.24
266	391.0	-258.0	66568.81
267	115.0	-534.0	285165.95
268	138.0	-511.0	261130.52
269	713.0	64.0	4094.81
270	1058.0	409.0	167273.38
271	506.0	-143.0	20451.66
272	598.0	-51.0	2601.95
273	552.0	-97.0	9410.81
274	943.0	294.0	86430.52
275	184.0	-465.0	216233.66
276	368.0	-281.0	78966.24
277	644.0	-5.0	25.09
278	552.0	-97.0	9410.81
279	1150.0	501.0	250991.66
280	1012.0	363.0	131762.24
281	23.0	-626.0	391887.66
282	736.0	87.0	7567.38
283	736.0	87.0	7567.38
284	644.0	-5.0	25.09
285	782.0	133.0	17686.52
286	322.0	-327.0	106935.09
287	299.0	-350.0	122506.52
288	368.0	-281.0	78966.24
289	437.0	-212.0	44947.95
290	667.0	18.0	323.66
291	644.0	-5.0	25.09
292	943.0	294.0	86430.52
293	759.0	110.0	12097.95
294	1081.0	432.0	186615.95
295	23.0	-626.0	391887.66
296	989.0	340.0	115593.66
297	874.0	225.0	50620.81
298	460.0	-189.0	35724.52
299	805.0	156.0	24333.09
300	1035.0	386.0	148988.81
	30337.0		5537918.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	759.0	110.0	12097.95
302	851.0	202.0	40800.24
303	736.0	87.0	7567.38
304	391.0	-258.0	66568.81
305	299.0	-350.0	122506.52
306	299.0	-350.0	122506.52
307	552.0	-97.0	9410.81
308	851.0	202.0	40800.24
309	0.0	-649.0	421213.09
310	897.0	248.0	61499.38
311	552.0	-97.0	9410.81
312	667.0	18.0	323.66
313	1150.0	501.0	250991.66
314	368.0	-281.0	78966.24
315	460.0	-189.0	35724.52
316	1035.0	386.0	148988.81
317	161.0	-488.0	238153.09
318	966.0	317.0	100483.09
319	598.0	-51.0	2601.95
320	828.0	179.0	32037.66
321	627.0	-22.0	484.41
322	598.0	-51.0	2601.95
323	0.0	0.00	0.00
324	0.0	0.00	0.00
325	0.0	0.00	0.00
326	0.0	0.00	0.00
327	0.0	0.00	0.00
328	0.0	0.00	0.00
329	0.0	0.00	0.00
330	0.0	0.00	0.00
331	0.0	0.00	0.00
332	0.0	0.00	0.00
333	0.0	0.00	0.00
334	0.0	0.00	0.00
335	0.0	0.00	0.00
336	0.0	0.00	0.00
337	0.0	0.00	0.00
338	0.0	0.00	0.00
339	0.0	0.00	0.00
340	0.0	0.00	0.00
341	0.0	0.00	0.00
342	0.0	0.00	0.00
343	0.0	0.00	0.00
344	0.0	0.00	0.00
345	0.0	0.00	0.00
346	0.0	0.00	0.00
347	0.0	0.00	0.00
348	0.0	0.00	0.00
349	0.0	0.00	0.00
350	0.0	0.00	0.00
	13645.0		1805738.8
	Sum(n)		Sum(n-N)²



LIGHT POLE
(17W, 154N)



LIGHT POLE
(16E, 82N)

NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

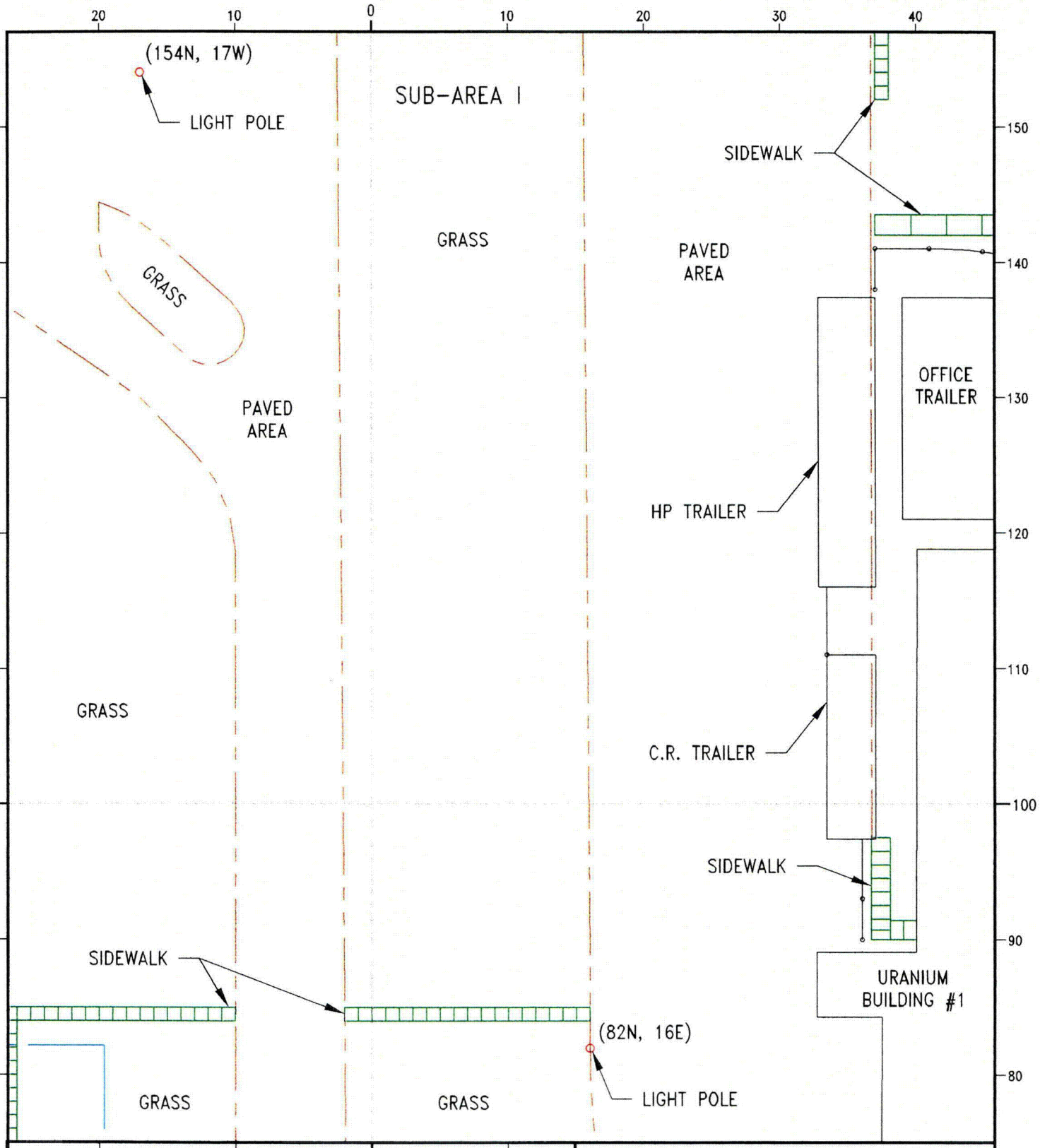
CIMARRON FACILITY
PHASE II – SUB-AREA I
SURVEY PATTERN LOCATIONS
LIGHT POLES IN PARKING LOT

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-22-99	NONE

JOB NO.	DRAWING NO.	REV.
	LITEPOLES-PARKING	0

...SUBAREAI\FEATURES\LITEPOLES-PARKING



10 0 10

SCALE IN METERS

NORTH

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
PARKING LOT - LIGHT POLE LOCATIONS

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	6-5-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIUNS-2	0

...SUBAREAI\FEATURES\LITEPOLES-PARKING1

CIMARRON FACILITY

PARKING LOT LIGHTS

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-4 PROBE	37807	DPM/100cm²	6 cpm	134 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	50064	DPM/100cm²	312 cpm	606 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01 20438	ALPHA - DPM/100cm² BETA - DPM/100 cm²	0.3 cpm 2.0 cpm	12 DPM/100cm² 18 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	PARKING LOT LIGHTS				READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	17	W	154	N	1A	30	570	0	0
2	17	W	154	N	1B	130	0	7	0
3	17	W	154	N	1C	90	15	0	0
4	17	W	154	N	1D	60	240	2	0
5	17	W	154	N	1E	60	0	4	5
6	17	W	154	N	1F	90	165	4	0
7	17	W	154	N	1G	40	135	2	5
8	17	W	154	N	1H	228	1058	0	0
9	17	W	154	N	1I	360	1012	0	5
10	17	W	154	N	1J	72	644	2	0
11	17	W	154	N	1K	36	506	0	0
12	17	W	154	N	1L	96	989	7	4
13	17	W	154	N	1M	12	299	0	5
14	16	E	82	N	3A	10	990	2	0
15	16	E	82	N	3B	820	960	2	0
16	16	E	82	N	3C	540	795	0	0
17	16	E	82	N	3D	400	1230	2	5
18	16	E	82	N	3E	360	840	2	2
19	16	E	82	N	3F	470	625	0	5
20	16	E	82	N	3G	480	645	0	5
21	16	E	82	N	3H	396	966	0	2
22	16	E	82	N	3I	732	1242	2	10
23	16	E	82	N	3J	48	0	0	19
24	16	E	82	N	3K	216	840	2	0
25	16	E	82	N	3L	180	483	2	0
26	16	E	82	N	3M	96	435	0	2

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PARKING LOT LIGHTS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	30.0	-202.8	41115.4
2	130.0	-102.8	10561.5
3	90.0	-142.8	20383.1
4	60.0	-172.8	29849.2
5	60.0	-172.8	29849.2
6	90.0	-142.8	20383.1
7	40.0	-192.8	37160.0
8	228.0	-4.8	22.7
9	360.0	127.2	16187.7
10	72.0	-160.8	25846.7
11	36.0	-196.8	38718.1
12	96.0	-136.8	18705.8
13	12.0	-220.8	48739.1
14	10.0	-222.8	49626.1
15	820.0	587.2	344840.0
16	540.0	307.2	94390.7
17	400.0	167.2	27966.1
18	360.0	127.2	16187.7
19	470.0	237.2	56278.4
20	480.0	247.2	61123.1
21	396.0	163.2	26644.3
22	732.0	499.2	249231.4
23	48.0	-184.8	34139.7
24	216.0	-16.8	281.2
25	180.0	-52.8	2784.6
26	96.0	-136.8	18705.8
27	0.0	0.0	0.0
28	0.0	0.0	0.0
29	0.0	0.0	0.0
30	0.0	0.0	0.0
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	6052		1319720.6
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **26**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **232.77**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **229.76**
2 Std Deviations: **459.52**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.708**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **309.73** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	27	is (B)	1.703	95%
(df) low value(Y)	25	is (A)	1.708	95%
Desired value(df) (X)	25	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	25	1.708	95%

PERFORMED BY: Mackey Hall DATE: 5-18-99

REVIEWED BY: W. O. Rogers DATE: 5-18-99

Tuesday, June 15, 1999

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" PARKING LOT LIGHTS (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	570.0	-33.2	1104.3
2	0.0	-603.2	363887.4
3	15.0	-588.2	346015.4
4	240.0	-363.2	131936.6
5	0.0	-603.2	363887.4
6	165.0	-438.2	192046.2
7	135.0	-468.2	219240.1
8	1058.0	454.8	206815.1
9	1012.0	408.8	167092.3
10	644.0	40.8	1662.1
11	506.0	-97.2	9453.8
12	989.0	385.8	148817.9
13	299.0	-304.2	92556.4
14	990.0	386.8	149590.4
15	960.0	356.8	127284.3
16	795.0	191.8	36775.4
17	1230.0	626.8	392839.7
18	840.0	236.8	56059.7
19	625.0	21.8	473.9
20	645.0	41.8	1744.7
21	966.0	362.8	131601.5
22	1242.0	638.8	408026.1
23	0.0	-603.2	363887.4
24	840.0	236.8	56059.7
25	483.0	-120.2	14455.4
26	435.0	-168.2	28301.6
27	0.0	0.0	0.0
28	0.0	0.0	0.0
29	0.0	0.0	0.0
30	0.0	0.0	0.0
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0	.	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	15684		4011614.6
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **26**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) + (x)
Sample Mean (N) : **603.23**

Standard Deviation (Sd) = SQRT [(n-N)² + (x - 1)]

Standard Deviation: **400.58**
2 Std Deviations: **801.16**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.708**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **737.41** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	27	is (B)	1.703	95%
(df) low value(Y)	25	is (A)	1.708	95%
Desired value(df) (X)	25	is calculated as follow:		

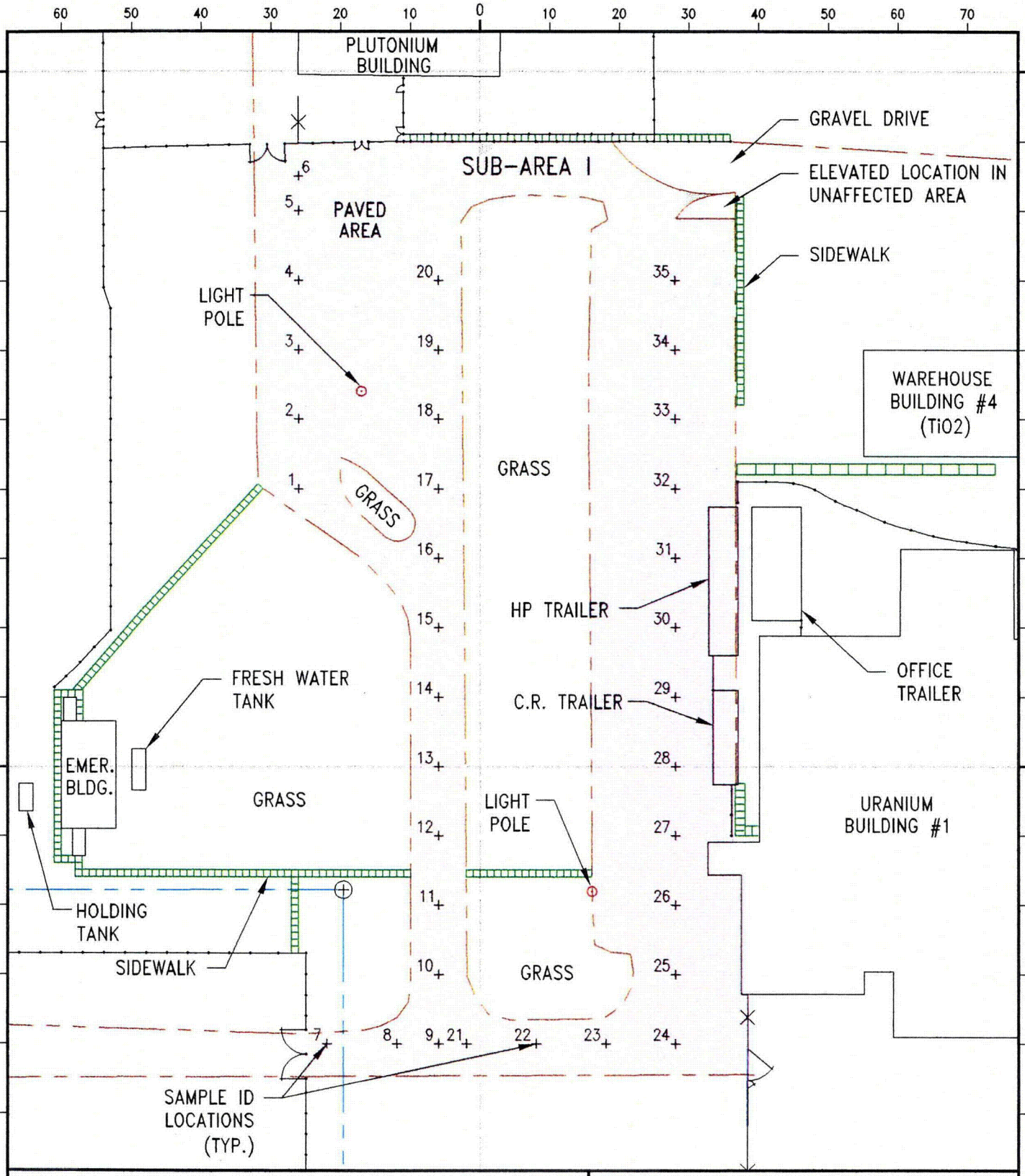
EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	25	1.708	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

A:\PARLTBCM.WB2



NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

LEGEND:
UNAFFECTED BLACKTOP

20 0 20
SCALE IN METERS

NORTH

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
UNAFFECTED AREA BLACKTOP (PARKING LOT)
SURVEY LOCATIONS

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	6-5-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIUNS-3	0

...SUBAREAI\FEATURES\BLACKTOP-UNAFFECTED

05/24/99

CIMARRON FACILITY

SUB AREA "I" PHASE II UNAFFECTED BLACKTOP (PARKING LOT) SURVEY

ALPHA AND BETA/GAMMA , AND µR/Hr

INSTRUMENTS	S/N	RESULTS IN	BKG	MDA
LUDLUM MICRO-R METER - MODEL 19	138420	Micro-R/Hr	9	2
LUDLUM 3 " DETECTOR 3 X ½ NaI	48395	CPM	1400	N/A
ALPHA DIRECT LUDLUM 2224 - 43-4 PROBE	37807	DPM/100cm²	4 cpm	134 DPM
BETA DIRECT LUDLUM 2224 - 43-68 PROBE	50064	DPM/100cm²	320 cpm	606 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 2 cpm	12 dpm/100cm² 18 dpm/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	UNAFFECTED AREA SIDEWALK	3" DETECT CPM	µR SURF	µR/hR @ ONE METER	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	26 W 140 N	2080	9	10	12	460	2	0
2	26 W 150 N	2000	8	8	24	370	0	0
3	26 W 160 N	2110	8	8	36	300	0	0
4	26 W 170 N	2050	6	6	0	530	2	0
5	26 W 180 N	2120	7	7	24	330	2	0
6	26 W 185 N	1830	8	7	36	620	0	5
7	22 W 60 N	1600	6	8	24	630	0	2
8	12 W 60 N	1630	7	7	12	500	0	2
9	6 W 60 N	2070	7	7	60	120	0	0
10	6 W 70 N	2090	8	8	0	610	0	0
11	6 W 80 N	2100	9	9	36	430	2	7
12	6 W 90 N	2070	8	9	36	440	0	2
13	6 W 100 N	1980	8	8	12	270	0	0
14	6 W 110 N	2090	7	7	0	570	0	0
15	6 W 120 N	1920	8	9	24	660	2	5
16	6 W 130 N	2460	8	8	24	390	0	0
17	6 W 140 N	2230	8	8	36	320	2	0
18	6 W 150 N	2100	9	9	36	440	0	0
19	6 W 160 N	2090	9	9	0	470	4	0
20	6 W 170 N	2170	8	8	60	430	0	0
21	2 W 60 N	1890	7	7	24	360	0	0
22	8 E 60 N	1460	7	7	0	290	0	7
23	18 E 60 N	1830	6	6	12	340	0	2
24	28 E 60 N	1320	7	7	36	80	0	0
25	28 E 70 N	1780	7	7	0	560	2	0
26	28 E 80 N	1830	6	6	12	360	0	0
27	28 E 90 N	1790	7	6	0	450	0	5
28	28 E 100 N	1690	7	7	0	260	0	0
29	28 E 110 N	1750	6	6	24	570	2	0
30	28 E 120 N	2040	7	7	12	350	0	0
31	28 E 130 N	2240	8	8	24	450	0	0
32	28 E 140 N	2060	8	8	24	550	0	0
33	28 E 150 N	2310	8	9	24	680	0	0
34	28 E 160 N	2370	8	8	72	450	2	0
35	28 E 170 N	2480	9	9	12	350	2	0

08/15/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" UNAFFECTED AREA BLACKTOP PARKING LOT SURVEY

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	12.0	-9.9	98.9
2	24.0	2.1	4.2
3	36.0	14.1	197.6
4	0.0	-21.9	481.5
5	24.0	2.1	4.2
6	36.0	14.1	197.6
7	24.0	2.1	4.2
8	12.0	-9.9	98.9
9	60.0	38.1	1448.3
10	0.0	-21.9	481.5
11	36.0	14.1	197.6
12	36.0	14.1	197.6
13	12.0	-9.9	98.9
14	0.0	-21.9	481.5
15	24.0	2.1	4.2
16	24.0	2.1	4.2
17	36.0	14.1	197.6
18	36.0	14.1	197.6
19	0.0	-21.9	481.5
20	60.0	38.1	1448.3
21	24.0	2.1	4.2
22	0.0	-21.9	481.5
23	12.0	-9.9	98.9
24	36.0	14.1	197.6
25	0.0	-21.9	481.5
26	12.0	-9.9	98.9
27	0.0	-21.9	481.5
28	0.0	-21.9	481.5
29	24.0	2.1	4.2
30	12.0	-9.9	98.9
31	24.0	2.1	4.2
32	24.0	2.1	4.2
33	24.0	2.1	4.2
34	72.0	50.1	2505.7
35	12.0	-9.9	98.9
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	768		11371.9
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **35**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **21.94**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **18.29**

2 Std Deviations: **36.58**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.692**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **27.17** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	30	is (A)	1.697	95%
Desired value(df) (X)	34	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	34	1.692	95%

PERFORMED BY: Debbie Beck DATE: 6/15/99

REVIEWED BY: W.A. Rogers DATE: 6-16-99

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04/27/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" UNAFFECTED AREA BLACKTOP PARKING LOT SURVEY

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	460.0	31.7	1005.8
2	370.0	-58.3	3397.2
3	300.0	-128.3	16457.2
4	530.0	101.7	10345.8
5	330.0	-98.3	9660.1
6	620.0	191.7	36754.4
7	630.0	201.7	40688.7
8	500.0	71.7	5142.9
9	120.0	-308.3	95040.1
10	610.0	181.7	33020.1
11	430.0	1.7	2.9
12	440.0	11.7	137.2
13	270.0	-158.3	25054.4
14	570.0	141.7	20082.9
15	660.0	231.7	53691.5
16	390.0	-38.3	1465.8
17	320.0	-108.3	11725.8
18	440.0	11.7	137.2
19	470.0	41.7	1740.1
20	430.0	1.7	2.9
21	360.0	-68.3	4662.9
22	290.0	-138.3	19122.9
23	340.0	-88.3	7794.4
24	80.0	-348.3	121302.9
25	560.0	131.7	17348.7
26	360.0	-68.3	4662.9
27	450.0	21.7	471.5
28	260.0	-168.3	28320.1
29	570.0	141.7	20082.9
30	350.0	-78.3	6128.7
31	450.0	21.7	471.5
32	550.0	121.7	14814.4
33	680.0	251.7	63360.1
34	450.0	21.7	471.5
35	350.0	-78.3	6128.7
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	14990		680697.1
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **35**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **428.29**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **141.49**

2 Std Deviations: **282.99**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.692**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **468.75** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	30	is (A)	1.697	95%
Desired value(df) (X)	34	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	34	1.692	95%

PERFORMED BY: Mackey Hoch DATE: 4-27-99

REVIEWED BY: W. a. Rogers DATE: 4-27-99

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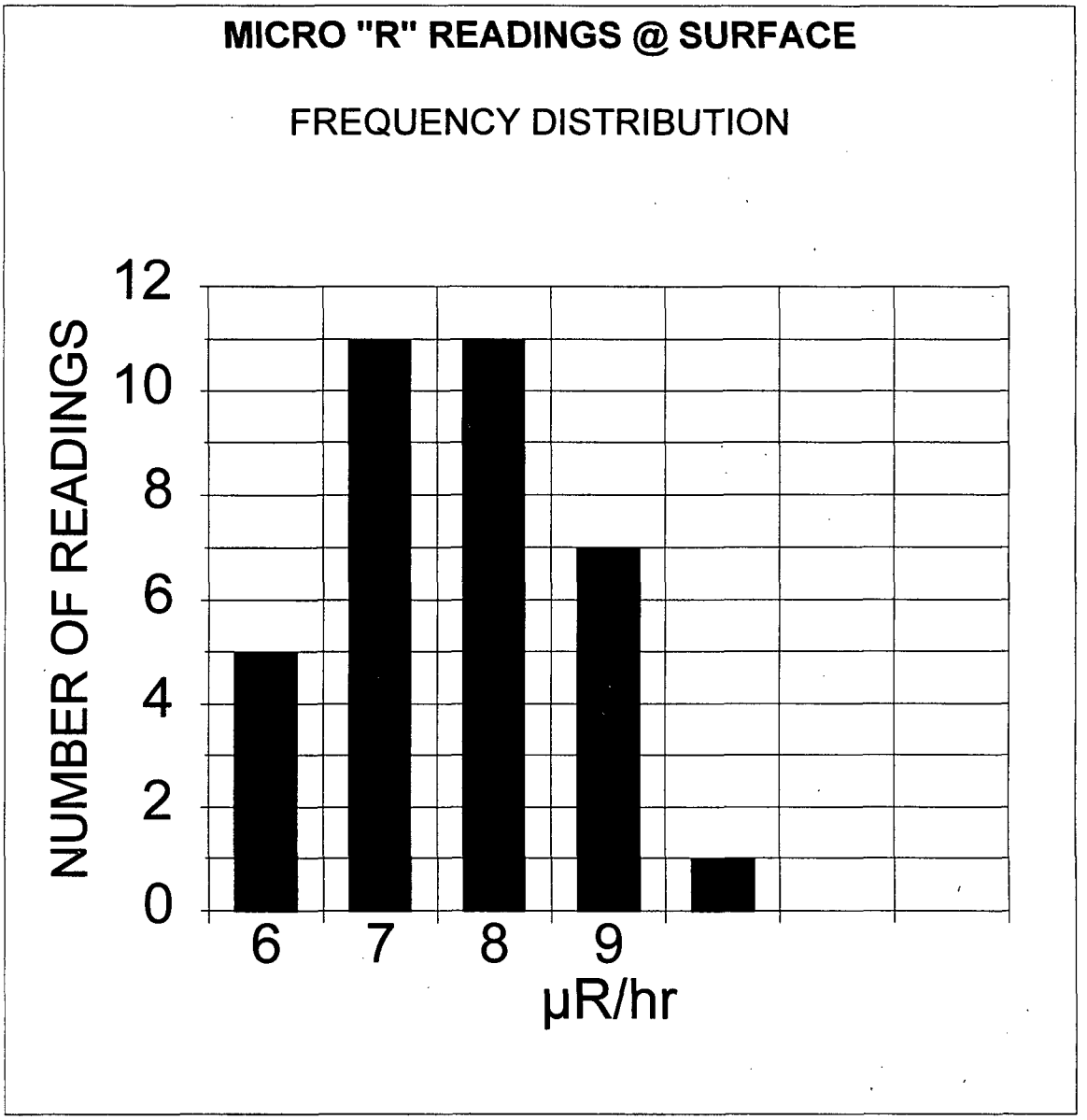
PHASE II SUB-AREA "I" BLACKTOP PARKING LOT
MICRO-R METER READINGS AT SURFACE - UNAFFECTED - SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 138420
RESULTS IN µR/hr

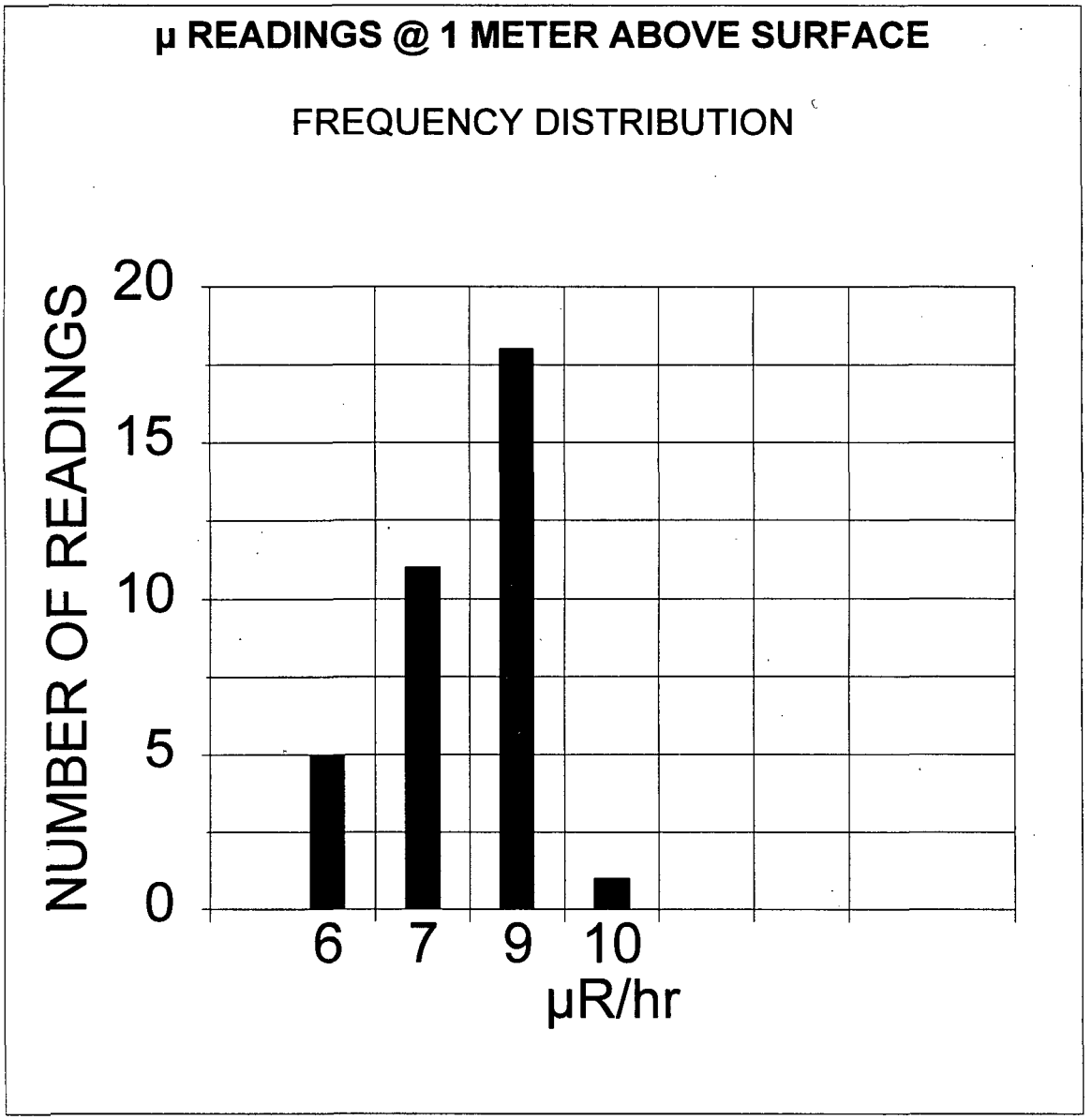
MAY, 1998



NUMBER OF READINGS	35
AVERAGE READING	8
MINIMUM READING	6
MAXIMUM READING	9
STANDARD DEVIATION	0.9

PHASE II SUB-AREA "I" BLACKTOP PARKING LOT
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
LUDLUM MODEL 19 S/N 138420
RESULTS IN µR/hr UNAFFECTED - SURFACE

MAY, 1998



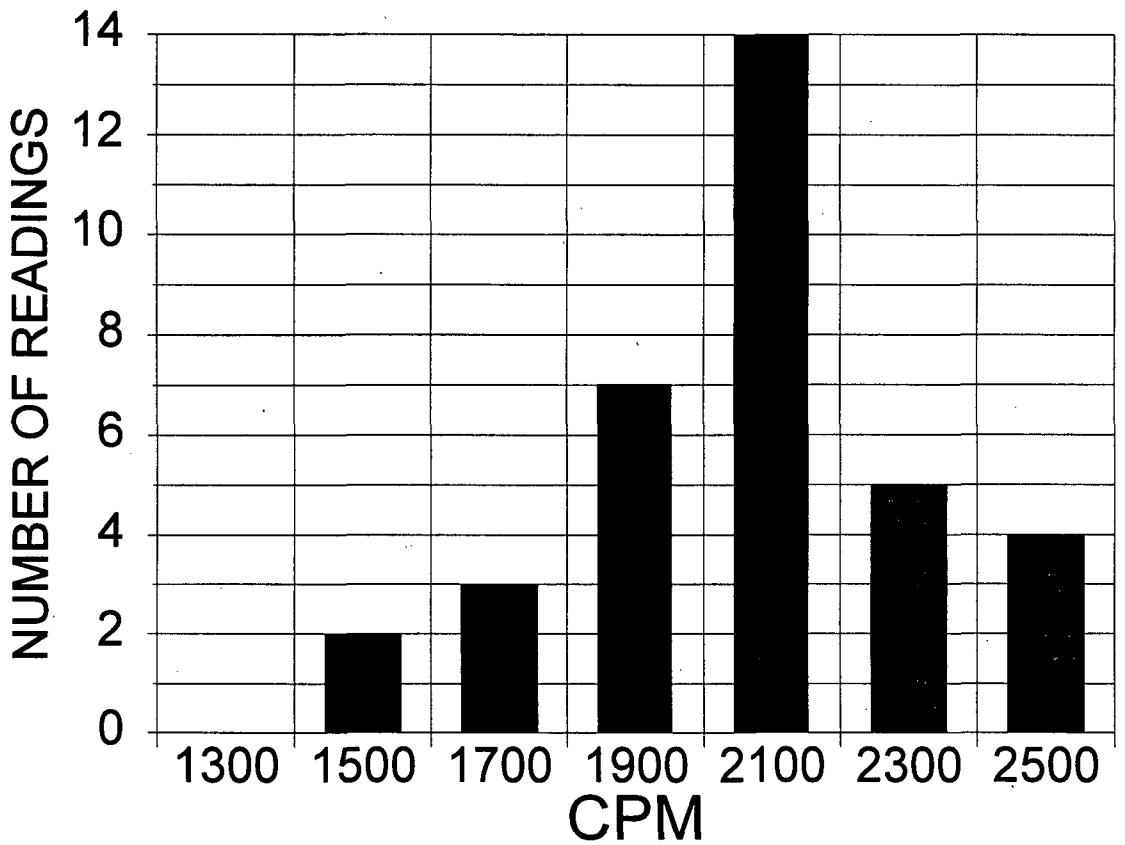
NUMBER OF READINGS	35
AVERAGE READING	8
MINIMUM READING	6
MAXIMUM READING	10
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" BLACKTOP PARKING LOT
3" NaI DETECTOR (SHIELDED) UNAFFECTED - SURFACE
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 48395
BACKGROUND AVERAGE: 1400 CPM

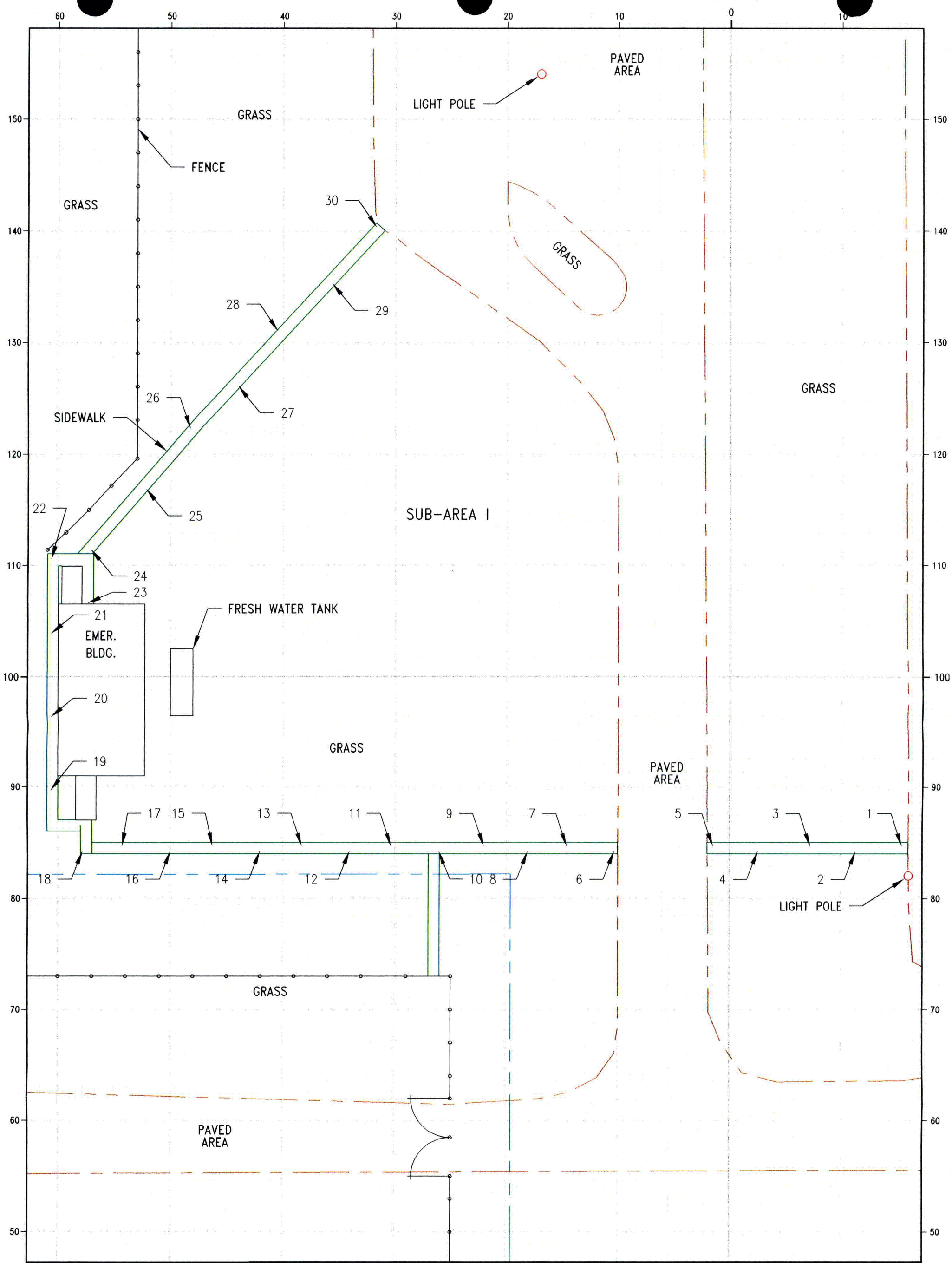
MAY, 1998

3" NaI DETECTOR READINGS

FREQUENCY DISTRIBUTION



NUMBER OF READINGS	35
AVERAGE READING	1989
MINIMUM READING	1320
MAXIMUM READING	2480
STANDARD DEVIATION	257



NOTE:
REFER TO DATA TABLE FOR SURVEY RESULTS.

8 0 8
SCALE IN METERS

NORTH

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
UNAFFECTED SIDEWALK SURVEY LOCATIONS

DRWN. BY	DATE	SCALE:
JE	5-20-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIUNS-4	0

...SUBAREAI\FEATURES\UNAFFECTED-SIDEWALKS

05/20/99

CIMARRON FACILITY

EMERGENCY BUILDING SUB AREA "I" PHASE II UNAFFECTED ALPHA AND BETA/GAMMA , AND µR/Hr SIDEWALK SURVEY

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA /BETA DIRECT LUDLUM 2224 - 43-89 PR	114616	dpm/100cm²	ALPHA 2 cpm BETA 288 cpm	72 dpm/100cm² 542 dpm/100cm²
LUDLUM MICRO R METER MODEL 19	138420	µR/hR	9	2
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01 20438	ALPHA - dpm/100cm² BETA - dpm/100 cm²	.3 cpm 2.0 cpm	12 dpm/100cm² 18 dpm/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	UNAFFECTED AREA SIDEWALK	µR/hR @ ONE METER	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	SIDEWALK 1	9	70	830	0	0
2	SIDEWALK 2	9	50	730	0	0
3	SIDEWALK 3	10	70	790	2	0
4	SIDEWALK 4	9	70	780	0	0
5	SIDEWALK 5	10	20	900	0	0
6	SIDEWALK 6	9	70	850	0	2
7	SIDEWALK 7	10	30	870	0	2
8	SIDEWALK 8	10	90	1050	0	0
9	SIDEWALK 9	11	80	880	0	0
10	SIDEWALK 10	11	90	780	0	5
11	SIDEWALK 11	10	80	960	0	2
12	SIDEWALK 12	11	70	1040	0	5
13	SIDEWALK 13	10	70	870	0	5
14	SIDEWALK 14	11	100	970	2	0
15	SIDEWALK 15	11	60	930	10	0
16	SIDEWALK 16	10	0	780	0	0
17	SIDEWALK 17	9	110	980	0	5
18	SIDEWALK 18	10	70	740	0	2
19	SIDEWALK 19	9	60	1160	5	4
20	SIDEWALK 20	8	90	1180	0	2
21	SIDEWALK 21	9	100	1080	0	0
22	SIDEWALK 22	10	50	960	0	2
23	SIDEWALK 23	9	40	950	0	2
24	SIDEWALK 24	10	130	1000	0	2
25	SIDEWALK 25	9	60	810	2	0
26	SIDEWALK 26	11	120	970	0	0
27	SIDEWALK 27	10	30	990	5	0
28	SIDEWALK 28	11	80	890	0	0
29	SIDEWALK 29	11	140	970	2	0
30	SIDEWALK 30	11	80	1080	2	2

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" UNAFFECTED AREA SIDEWALK SURVEY

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	70.0	-2.7	7.1
2	50.0	-22.7	513.8
3	70.0	-2.7	7.1
4	70.0	-2.7	7.1
5	20.0	-52.7	2773.8
6	70.0	-2.7	7.1
7	30.0	-42.7	1820.4
8	90.0	17.3	300.4
9	80.0	7.3	53.8
10	90.0	17.3	300.4
11	80.0	7.3	53.8
12	70.0	-2.7	7.1
13	70.0	-2.7	7.1
14	100.0	27.3	747.1
15	60.0	-12.7	160.4
16	0.0	-72.7	5280.4
17	110.0	37.3	1393.8
18	70.0	-2.7	7.1
19	60.0	-12.7	160.4
20	90.0	17.3	300.4
21	100.0	27.3	747.1
22	50.0	-22.7	513.8
23	40.0	-32.7	1067.1
24	130.0	57.3	3287.1
25	60.0	-12.7	160.4
26	120.0	47.3	2240.4
27	30.0	-42.7	1820.4
28	80.0	7.3	53.8
29	140.0	67.3	4533.8
30	80.0	7.3	53.8
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	2180		28386.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 30

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 72.67

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 31.29

2 Std Deviations: 62.57

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 82.37 DPM /100cm²

GUIDELINE VALUE: 5000 DPM /100cm²

Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Beach DATE: 6/15/99

REVIEWED BY: W.C. Rogers DATE: 6-16-99

04/27/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" UNAFFECTED AREA SIDEWALK SURVEY

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	830.0	-95.7	9152.1
2	730.0	-195.7	38285.4
3	790.0	-135.7	18405.4
4	780.0	-145.7	21218.8
5	900.0	-25.7	658.8
6	850.0	-75.7	5725.4
7	870.0	-55.7	3098.8
8	1050.0	124.3	15458.8
9	880.0	-45.7	2085.4
10	780.0	-145.7	21218.8
11	960.0	34.3	1178.8
12	1040.0	114.3	13072.1
13	870.0	-55.7	3098.8
14	970.0	44.3	1965.4
15	930.0	4.3	18.8
16	780.0	-145.7	21218.8
17	980.0	54.3	2952.1
18	740.0	-185.7	34472.1
19	1160.0	234.3	54912.1
20	1180.0	254.3	64685.4
21	1080.0	154.3	23818.8
22	960.0	34.3	1178.8
23	950.0	24.3	592.1
24	1000.0	74.3	5525.4
25	810.0	-115.7	13378.8
26	970.0	44.3	1965.4
27	990.0	64.3	4138.8
28	890.0	-35.7	1272.1
29	970.0	44.3	1965.4
30	1080.0	154.3	23818.8
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	27770		410536.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **925.67**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **118.98**

2 Std Deviations: **237.96**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **962.57** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Mustafa Hadi DATE: 4-27-99

REVIEWED BY: W. a. Rogers DATE: 4-27-99

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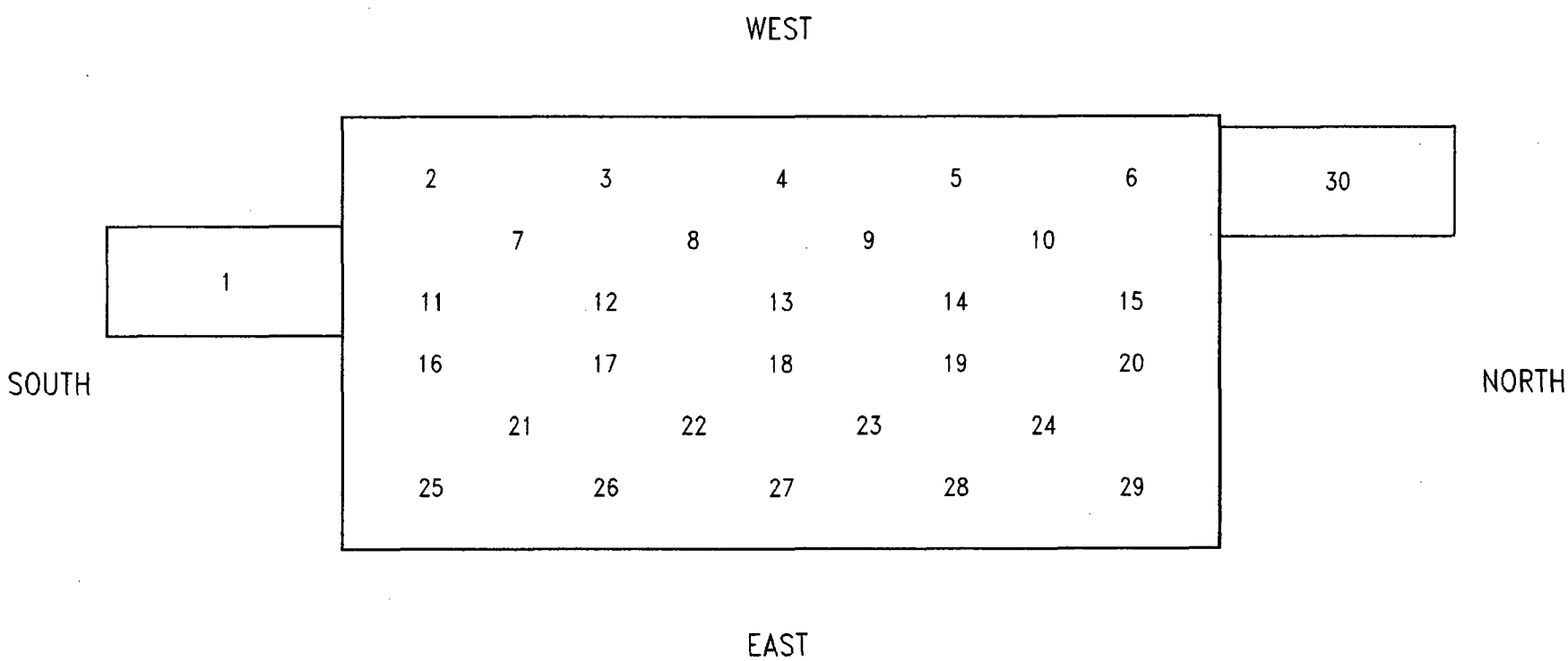

NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

3 0 3

SCALE IN METERS

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING CEILING

DRWN. BY	DATE	SCALE:
JE	5-22-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-1	0

...SUBAREAI\EMER-BLDG\EMER-CEILING

05/20/99

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	270 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING CEILING	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	CEILING	1	2	99	0	1
2	CEILING	2	0	0	0	1
3	CEILING	3	9	18	0	0
4	CEILING	4	0	0	0	1
5	CEILING	5	18	90	2	0
6	CEILING	6	0	0	4	0
7	CEILING	7	27	0	0	4
8	CEILING	8	0	0	0	0
9	CEILING	9	0	9	0	0
10	CEILING	10	9	63	0	1
11	CEILING	11	0	0	0	0
12	CEILING	12	18	27	2	6
13	CEILING	13	9	63	0	1
14	CEILING	14	18	9	0	1
15	CEILING	15	0	0	2	0
16	CEILING	16	18	0	0	1
17	CEILING	17	27	0	0	4
18	CEILING	18	18	0	2	0
19	CEILING	19	0	18	0	0
20	CEILING	20	0	0	0	4
21	CEILING	21	36	0	0	0
22	CEILING	22	9	0	0	6
23	CEILING	23	18	36	0	0
24	CEILING	24	18	0	0	1
25	CEILING	25	18	0	0	0
26	CEILING	26	18	288	0	1
27	CEILING	27	9	0	0	11
28	CEILING	28	9	0	0	0
29	CEILING	29	18	9	0	0
30	CEILING	30	0	0	2	9

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING CEILING SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	2.0	-8.9	78.6
2	0.0	-10.9	118.1
3	9.0	-1.9	3.5
4	0.0	-10.9	118.1
5	18.0	7.1	50.9
6	0.0	-10.9	118.1
7	27.0	16.1	260.3
8	0.0	-10.9	118.1
9	0.0	-10.9	118.1
10	9.0	-1.9	3.5
11	0.0	-10.9	118.1
12	18.0	7.1	50.9
13	9.0	-1.9	3.5
14	18.0	7.1	50.9
15	0.0	-10.9	118.1
16	18.0	7.1	50.9
17	27.0	16.1	260.3
18	18.0	7.1	50.9
19	0.0	-10.9	118.1
20	0.0	-10.9	118.1
21	36.0	25.1	631.7
22	9.0	-1.9	3.5
23	18.0	7.1	50.9
24	18.0	7.1	50.9
25	18.0	7.1	50.9
26	18.0	7.1	50.9
27	9.0	-1.9	3.5
28	9.0	-1.9	3.5
29	18.0	7.1	50.9
30	0.0	-10.9	118.1
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	326		2941.5
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **10.87**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **10.07**
2 Std Deviations: **20.14**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **13.99** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W.C. Rogers DATE: 6-16-99

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06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING CEILING SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	99.0	74.7	5580.1
2	0.0	-24.3	590.5
3	18.0	-6.3	39.7
4	0.0	-24.3	590.5
5	90.0	65.7	4316.5
6	0.0	-24.3	590.5
7	0.0	-24.3	590.5
8	0.0	-24.3	590.5
9	9.0	-15.3	234.1
10	63.0	38.7	1497.7
11	0.0	-24.3	590.5
12	27.0	2.7	7.3
13	63.0	38.7	1497.7
14	9.0	-15.3	234.1
15	0.0	-24.3	590.5
16	0.0	-24.3	590.5
17	0.0	-24.3	590.5
18	0.0	-24.3	590.5
19	18.0	-6.3	39.7
20	0.0	-24.3	590.5
21	0.0	-24.3	590.5
22	0.0	-24.3	590.5
23	36.0	11.7	136.9
24	0.0	-24.3	590.5
25	0.0	-24.3	590.5
26	288.0	263.7	69537.7
27	0.0	-24.3	590.5
28	0.0	-24.3	590.5
29	9.0	-15.3	234.1
30	0.0	-24.3	590.5
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	729		93984.3
	Sum(n)		Sum(n-N)²

No. of Samples (x): **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N): **24.30**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **56.93**
2 Std Deviations: **113.86**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **41.96** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	29	1.699	95%	

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W.C. Rogers DATE: 6-16-99

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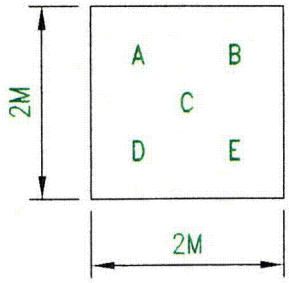
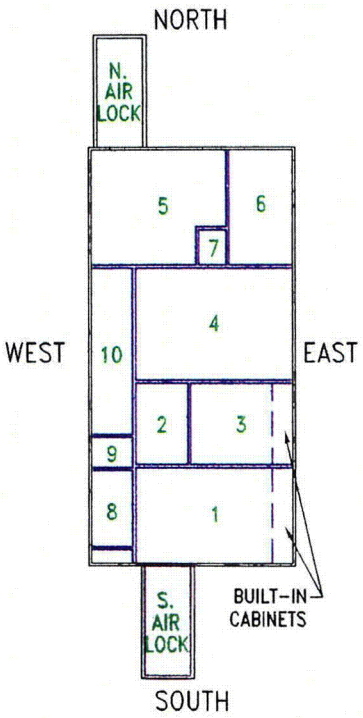
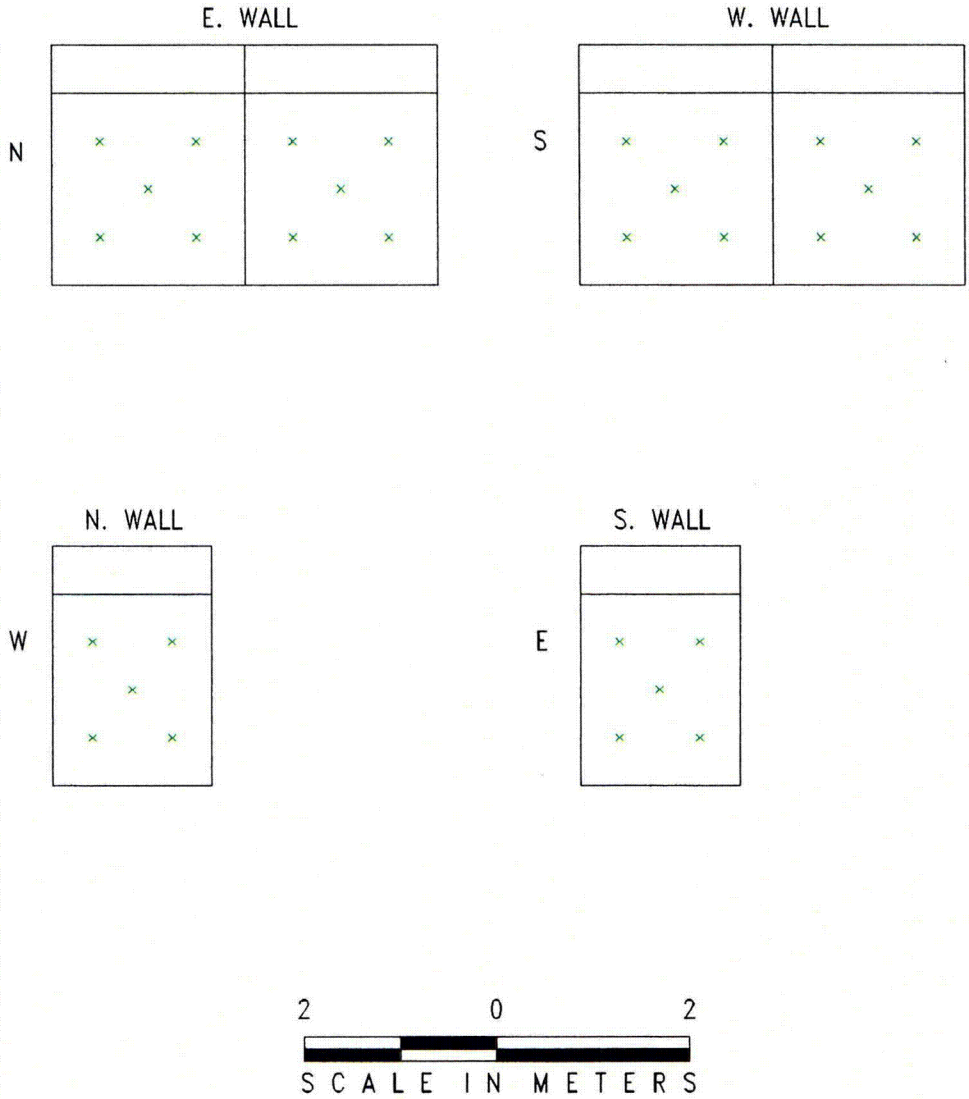


TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

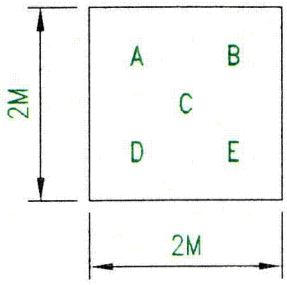
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - S. AIR LOCK

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

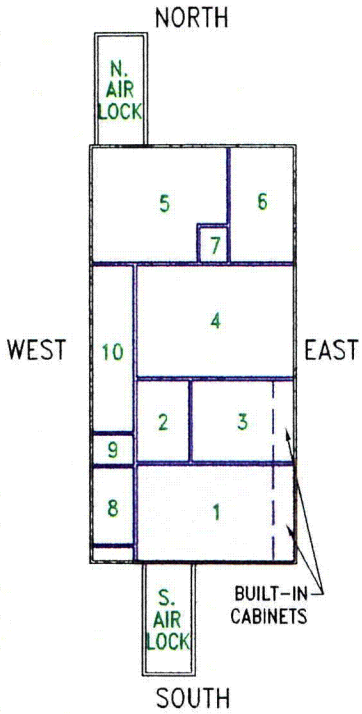
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-2	0

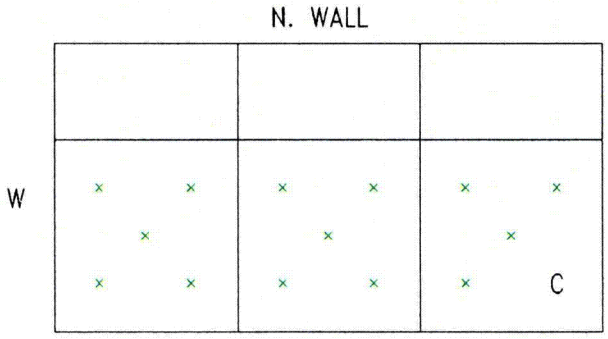
...SUBAREAI\EMER-BLDG\EMER-S-AIRLOCK

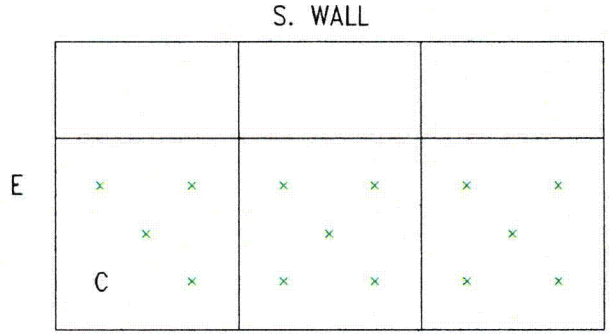


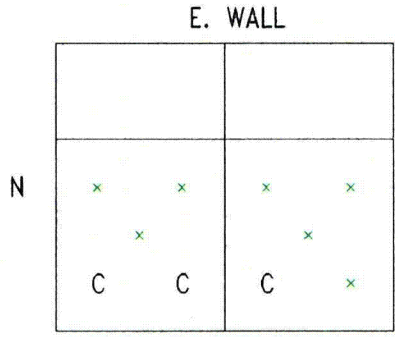
TYPICAL GRID ALIGNMENT

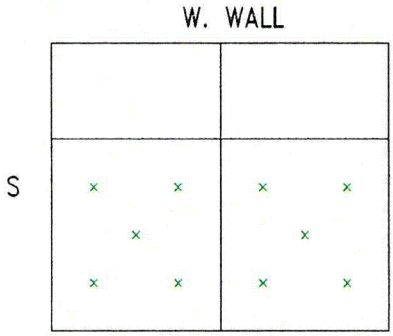


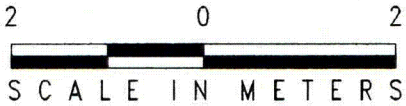
EMERGENCY BUILDING
ROOM LOCATION MAP











NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

C - CABINET SURVEY DATA IN E.B. FIXTURES TABLES.

CIMARRON CORPORATION

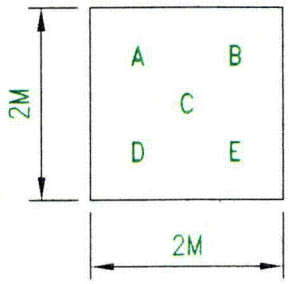
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #1

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

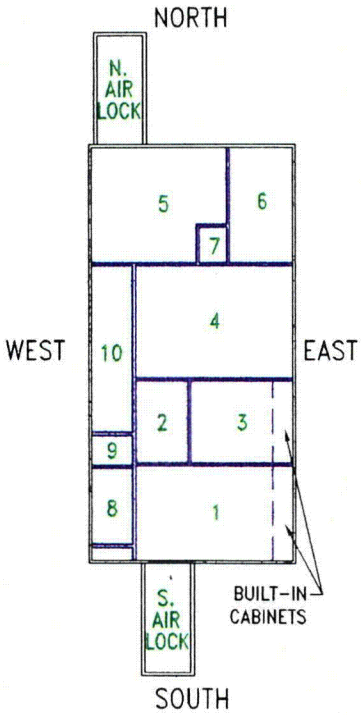
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-3	0

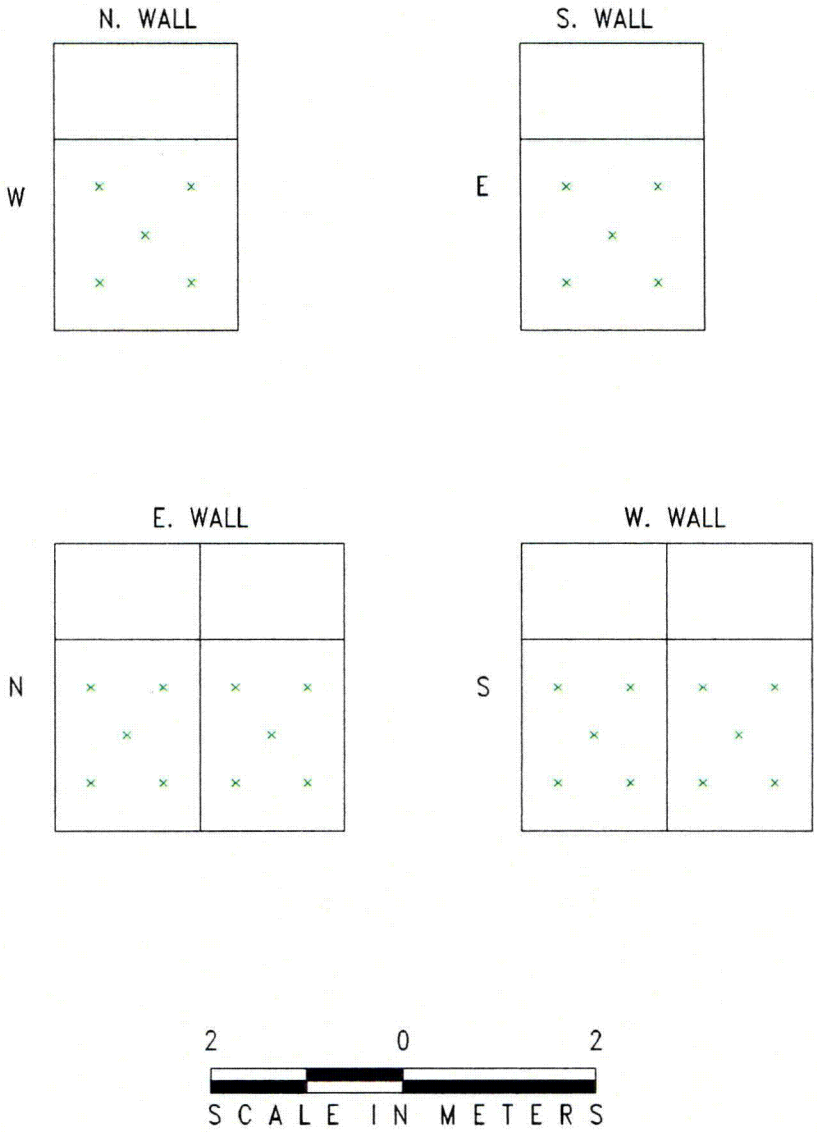
...SUBAREAI\EMER-BLDG\EMER-ROOM-1



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

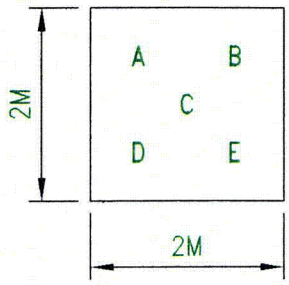
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #2

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

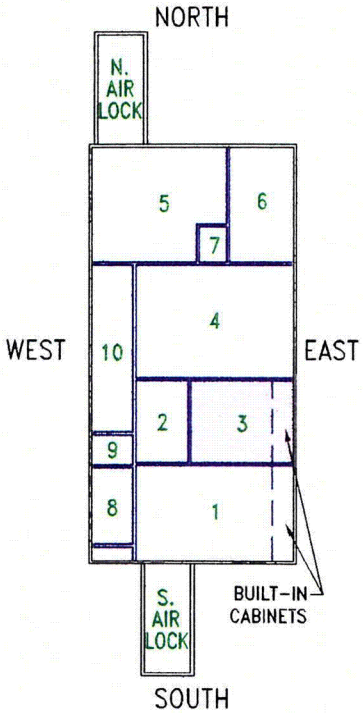
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-4	0

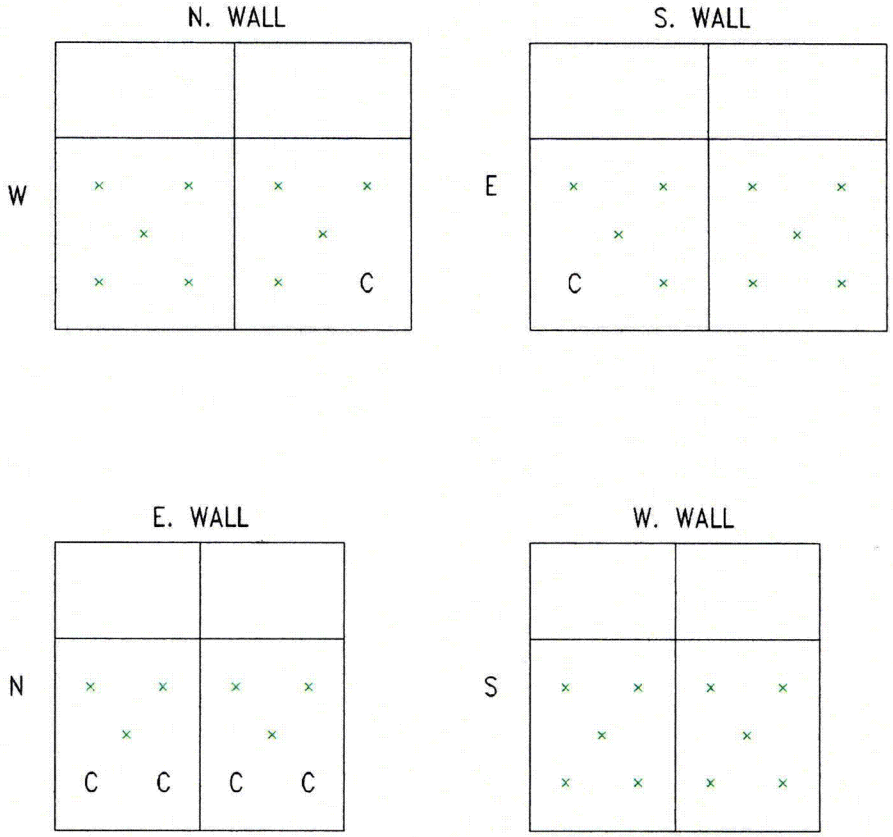
...SUBAREAI\EMER-BLDG\EMER-ROOM-2



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

C - CABINET SURVEY DATA IN E.B. FIXTURES TABLES.

CIMARRON CORPORATION

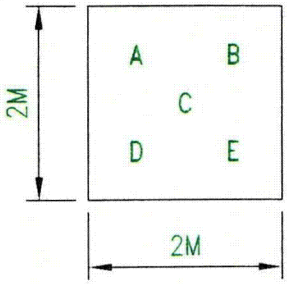
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #3

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

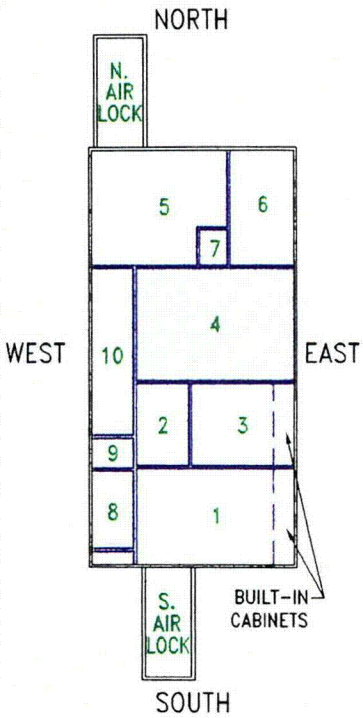
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-5	0

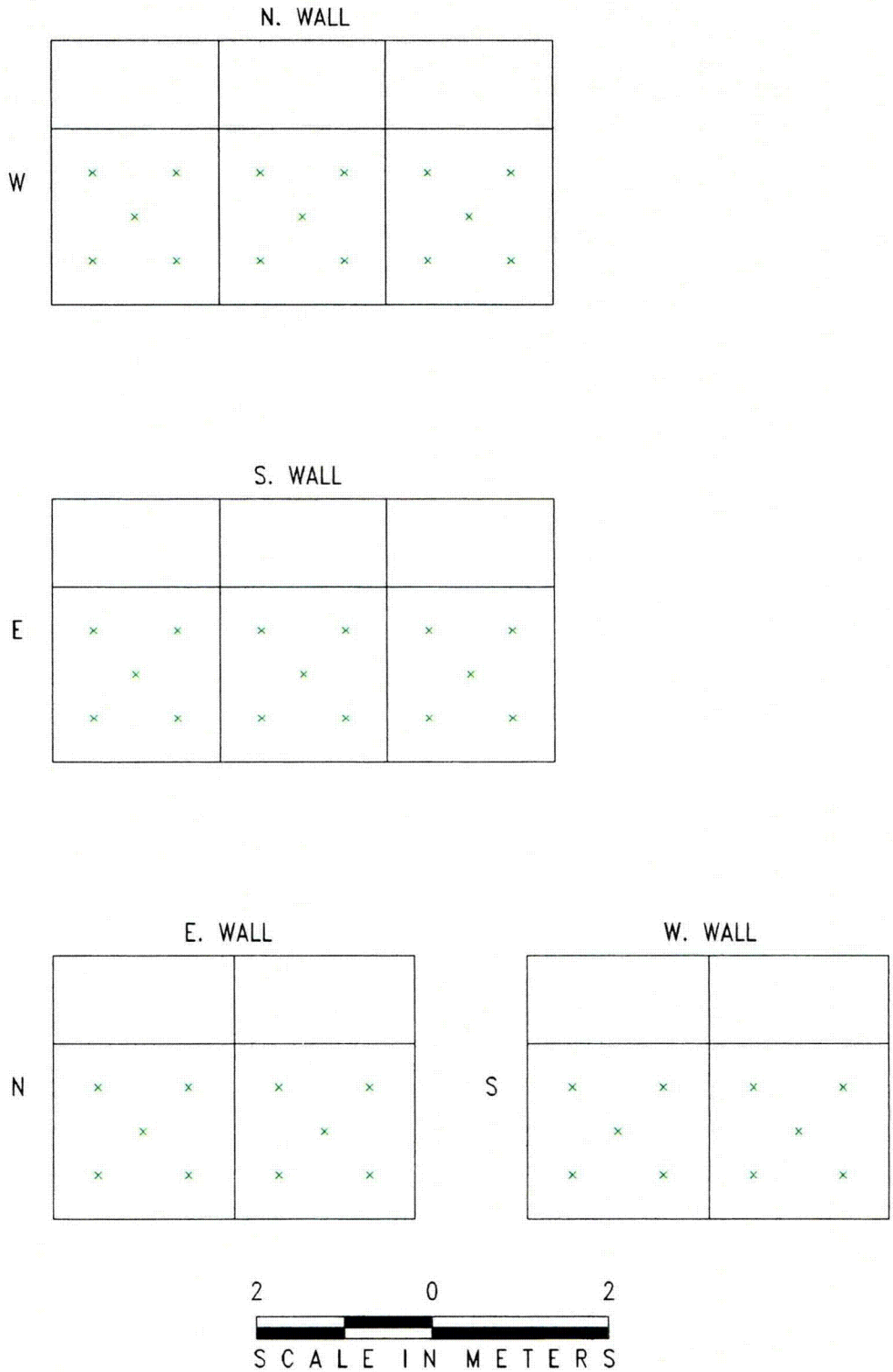
...SUBAREA1\EMER-BLDG\EMER-ROOM-3



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

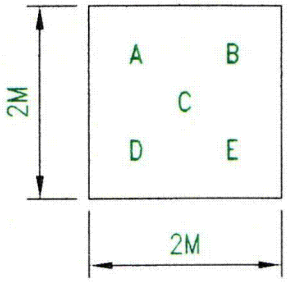
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #4

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

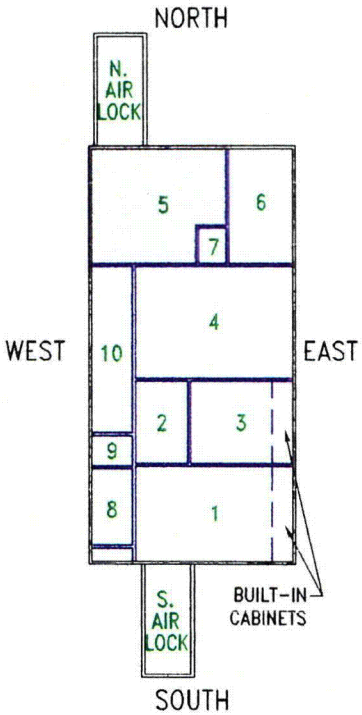
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-6	0

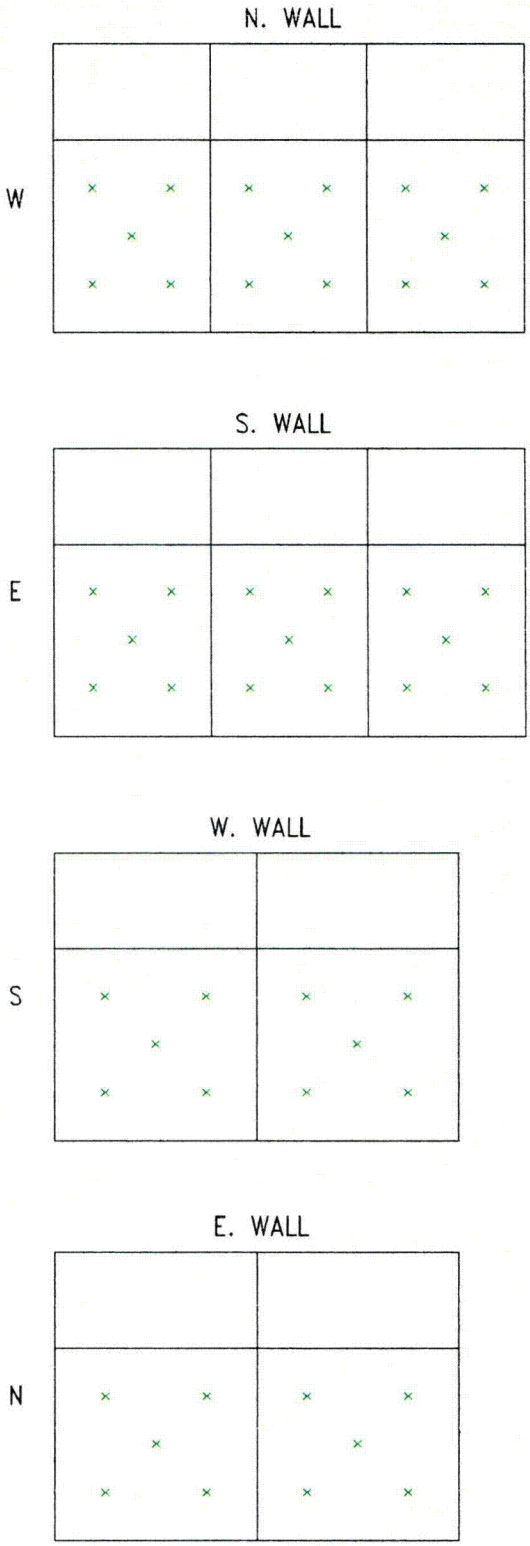
...SUBAREAI\EMER-BLDG\EMER-ROOM-4



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



2 0 2
SCALE IN METERS

NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

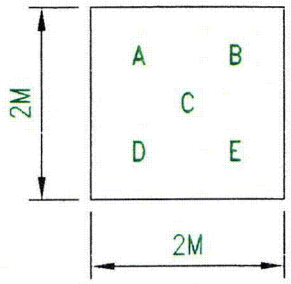
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #5

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

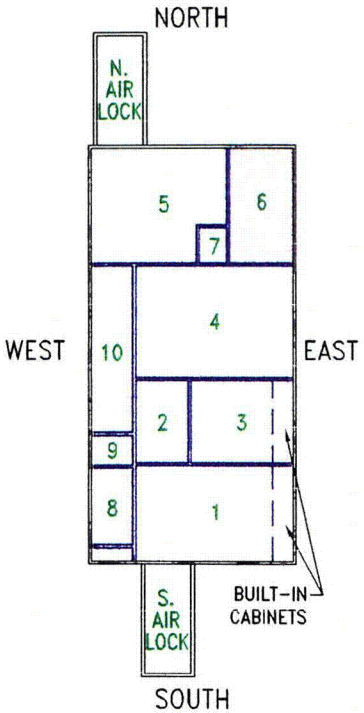
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-7	0

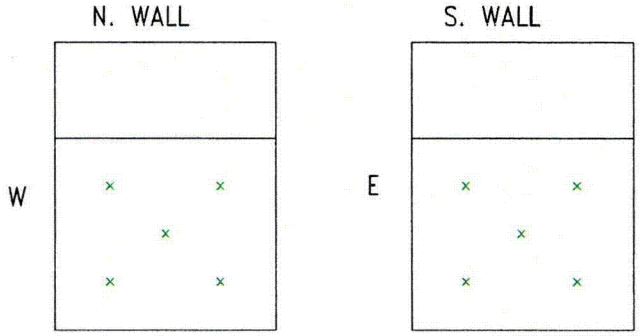
...SUBAREAI\EMER-BLDG\EMER-ROOM-5

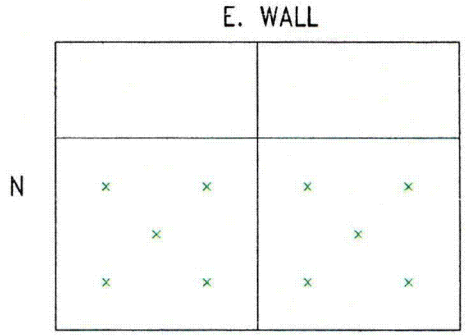


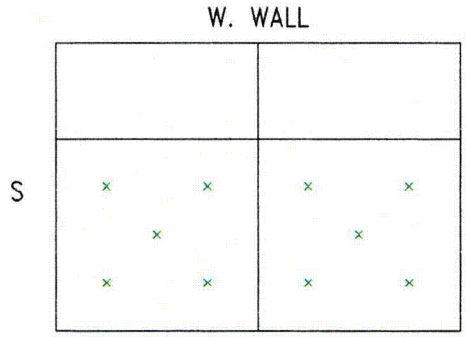
TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP







2 0 2

SCALE IN METERS

NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

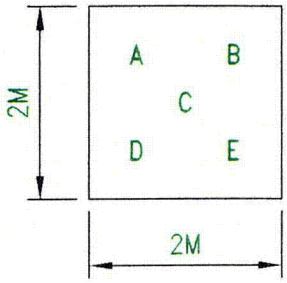
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #6

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

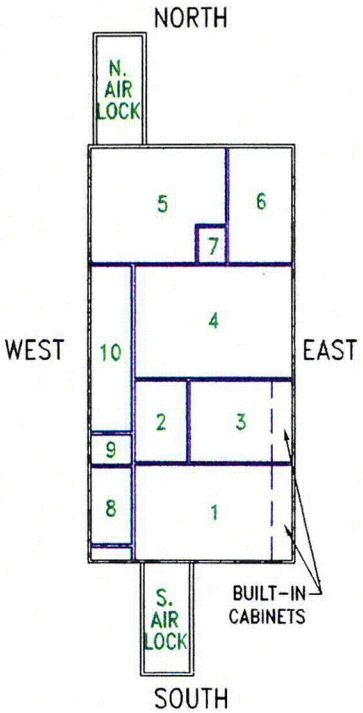
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-8	0

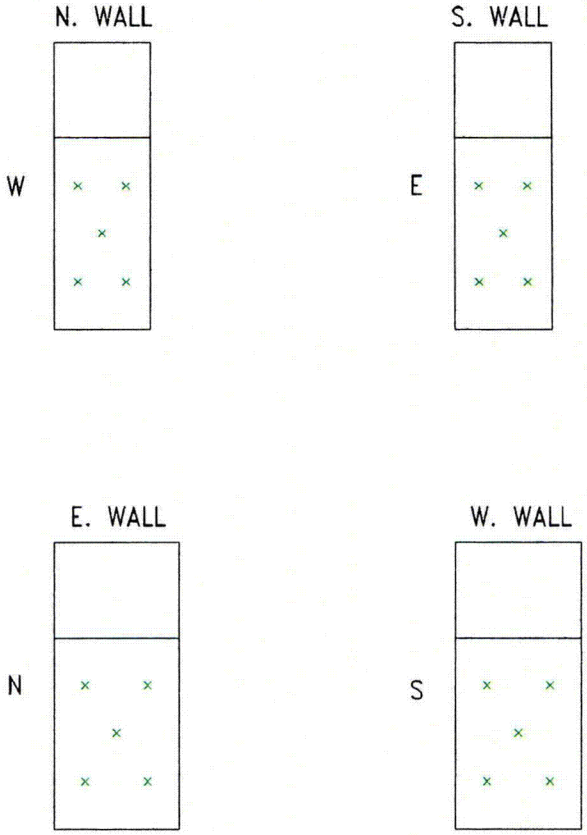
...SUBAREAI\EMER-BLDG\EMER-ROOM-6



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



2 0 2

SCALE IN METERS

NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

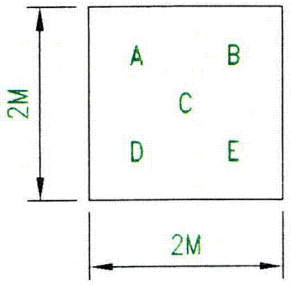
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #7

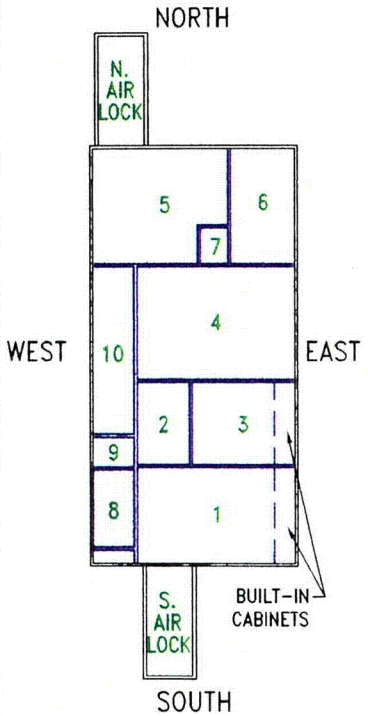
REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIEMS-9	REV. 0

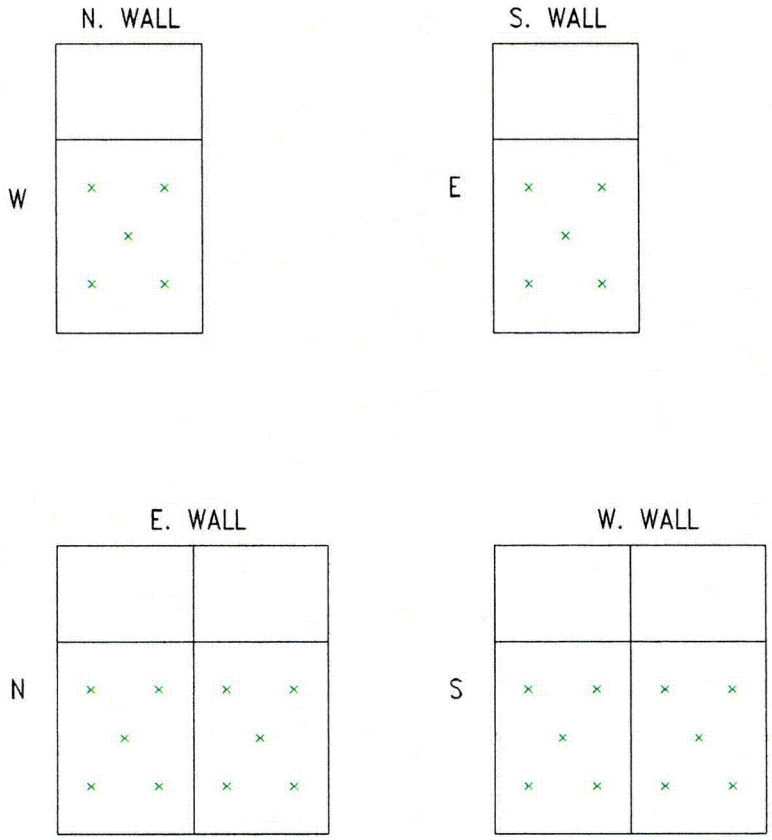
...SUBAREAI\EMER-BLDG\EMER-ROOM-7



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



2 0 2

SCALE IN METERS

NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

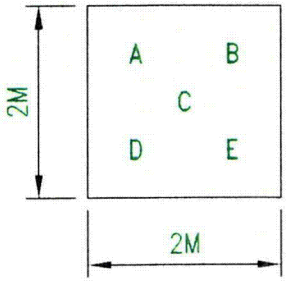
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #8

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

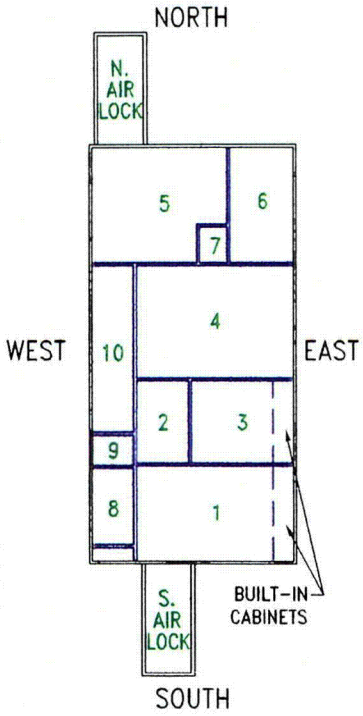
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-10	0

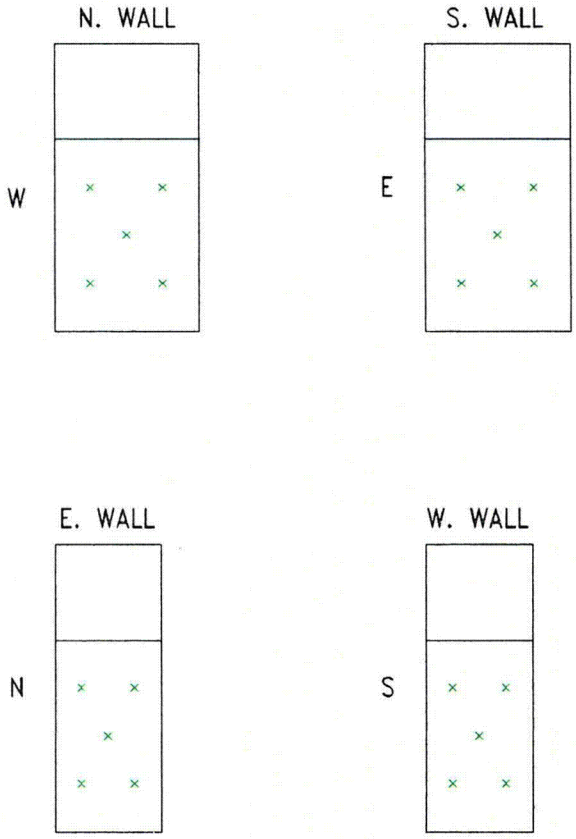
...SUBAREAI\EMER-BLDG\EMER-ROOM-8



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



2 0 2

SCALE IN METERS

NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

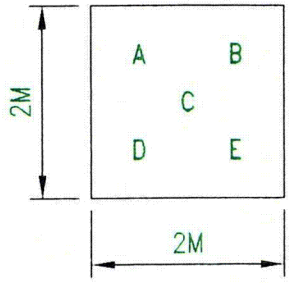
CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #9

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

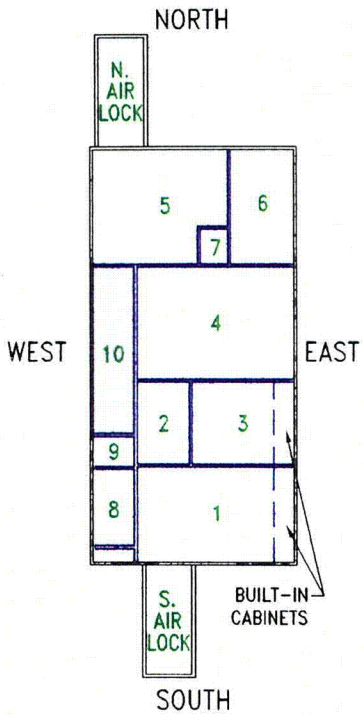
DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-11	0

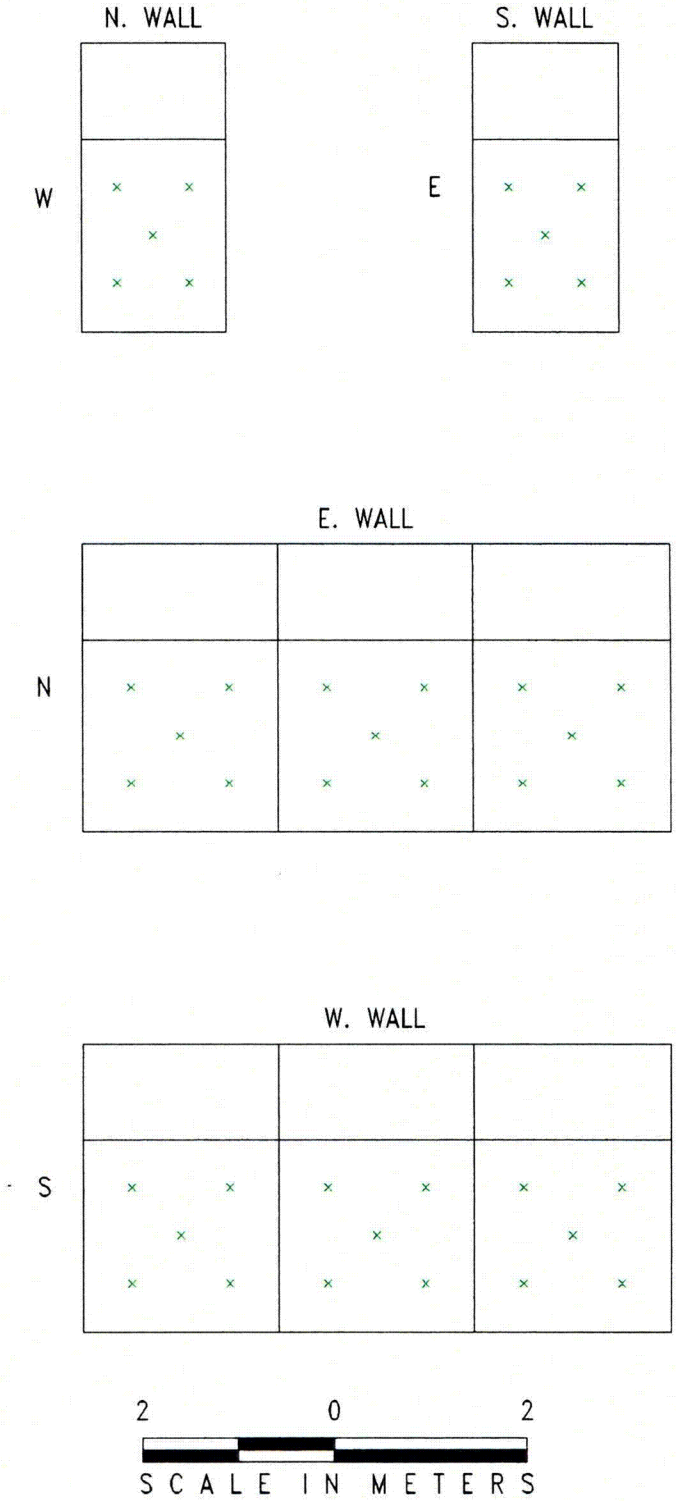
...SUBAREA1\EMER-BLDG\EMER-ROOM-9



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

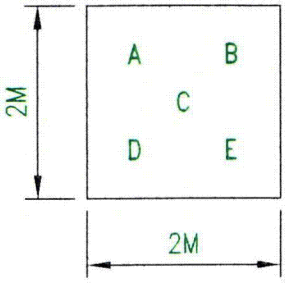
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - ROOM #10

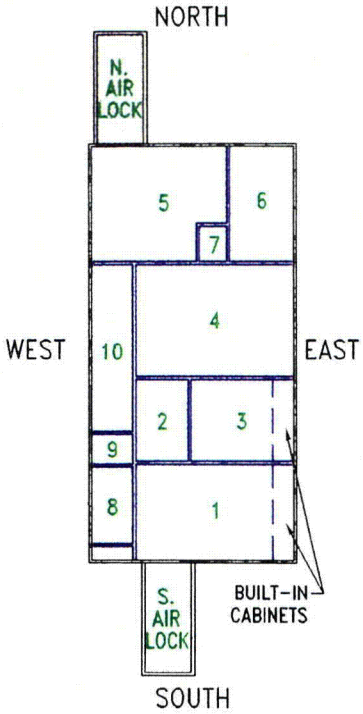
REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN
JOB NO.	DRAWING NO. 99POSIEMS-12	REV. 0

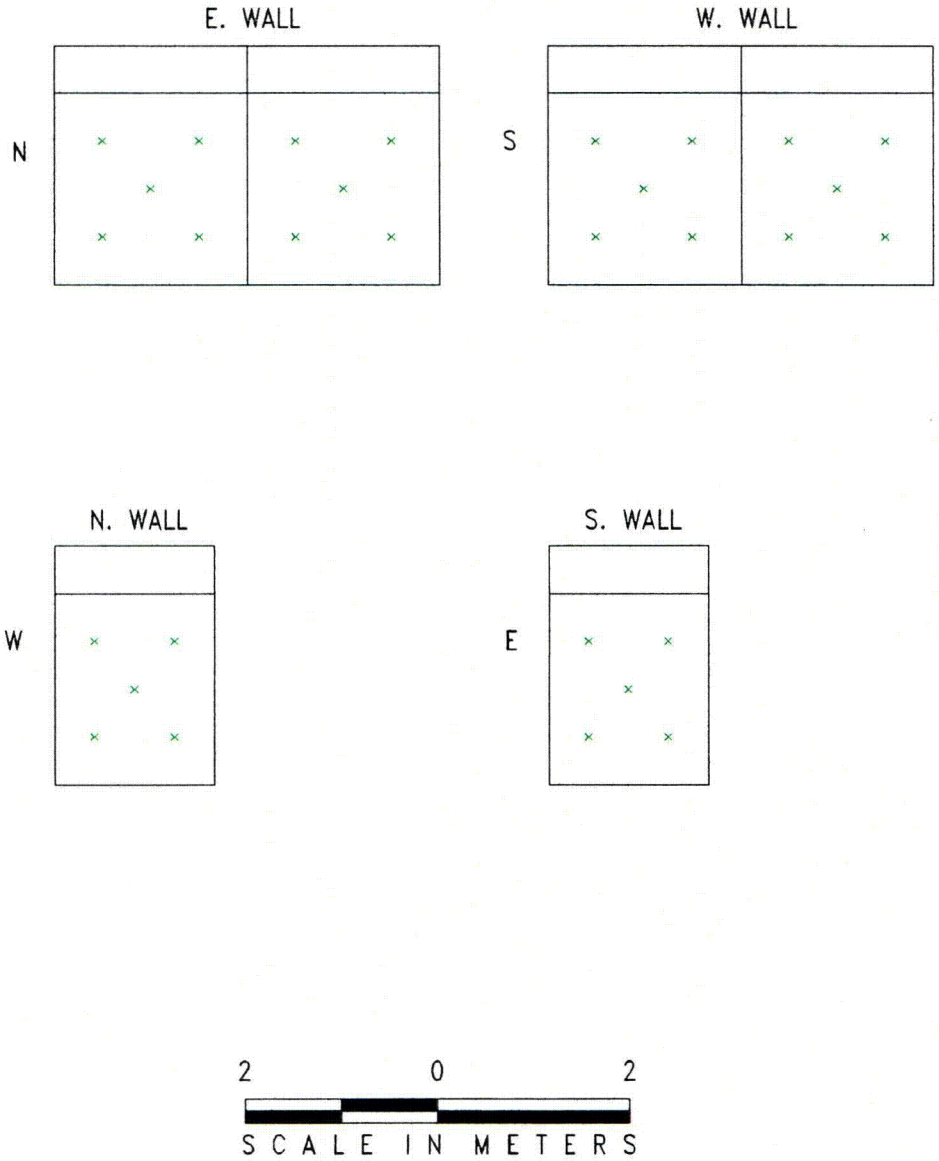
...SUBAREAI\EMER-BLDG\EMER-ROOM-10



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING
ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING - N. AIR LOCK

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-13	0

...SUBAREAI\EMER-BLDG\EMER-N-AIRLOCK

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	**SOUTH AIR LOCK NORTH WALL**	1A	0	0	2	1
2	SOUTH AIR LOCK NORTH WALL	1B	9	0	0	0
3	SOUTH AIR LOCK NORTH WALL	1C	0	0	0	1
4	SOUTH AIR LOCK NORTH WALL	1D	0	0	2	1
5	SOUTH AIR LOCK NORTH WALL	1E	0	0	2	0
6	**SOUTH AIR LOCK SOUTH WALL**	1A	0	0	0	4
7	SOUTH AIR LOCK SOUTH WALL	1B	0	0	0	1
8	SOUTH AIR LOCK SOUTH WALL	1C	27	0	2	1
9	SOUTH AIR LOCK SOUTH WALL	1D	0	0	0	4
10	SOUTH AIR LOCK SOUTH WALL	1E	0	0	0	1
11	**SOUTH AIR LOCK EAST WALL**	1A	0	0	0	0
12	SOUTH AIR LOCK EAST WALL	1B	9	0	0	4
13	SOUTH AIR LOCK EAST WALL	1C	0	0	4	1
14	SOUTH AIR LOCK EAST WALL	1D	0	0	0	0
15	SOUTH AIR LOCK EAST WALL	1E	0	0	0	0
16	SOUTH AIR LOCK EAST WALL	2A	0	0	0	4
17	SOUTH AIR LOCK EAST WALL	2B	0	0	4	0
18	SOUTH AIR LOCK EAST WALL	2C	0	0	0	1
19	SOUTH AIR LOCK EAST WALL	2D	9	0	2	0
20	SOUTH AIR LOCK EAST WALL	2E	27	0	0	1
21	**SOUTH AIR LOCK WEST WALL**	1A	27	0	0	0
22	SOUTH AIR LOCK WEST WALL	1B	0	0	4	4
23	SOUTH AIR LOCK WEST WALL	1C	0	0	2	1
24	SOUTH AIR LOCK WEST WALL	1D	0	0	2	1
25	SOUTH AIR LOCK WEST WALL	1E	0	0	2	4
26	SOUTH AIR LOCK WEST WALL	2A	18	0	0	1
27	SOUTH AIR LOCK WEST WALL	2B	0	0	2	6
28	SOUTH AIR LOCK WEST WALL	2C	0	0	0	0
29	SOUTH AIR LOCK WEST WALL	2D	18	0	2	0
30	SOUTH AIR LOCK WEST WALL	2E	0	0	0	1

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	**ROOM NO. ONE NORTH WALL**	1A	9	0	0	4
32	ROOM NO. ONE NORTH WALL	1B	9	0	2	0
33	ROOM NO. ONE NORTH WALL	1C	18	0	0	0
34	ROOM NO. ONE NORTH WALL	1D	27	170	0	6
35	ROOM NO. ONE NORTH WALL	1E	0	120	0	1
36	ROOM NO. ONE NORTH WALL	2A	18	0	0	1
37	ROOM NO. ONE NORTH WALL	2B	9	0	2	0
38	ROOM NO. ONE NORTH WALL	2C	0	80	2	0
39	ROOM NO. ONE NORTH WALL	2D	0	120	0	4
40	ROOM NO. ONE NORTH WALL	2E	27	0	0	4
41	ROOM NO. ONE NORTH WALL	3A	0	150	2	0
42	ROOM NO. ONE NORTH WALL	3B	0	50	2	0
43	ROOM NO. ONE NORTH WALL	3C	0	0	0	0
44	ROOM NO. ONE NORTH WALL	3D	0	30	0	4
45	**ROOM NO. ONE SOUTH WALL**	1A	18	0	2	0
46	ROOM NO. ONE SOUTH WALL	1B	9	0	0	1
47	ROOM NO. ONE SOUTH WALL	1C	45	0	0	1
48	ROOM NO. ONE SOUTH WALL	1E	9	0	2	4
49	ROOM NO. ONE SOUTH WALL	2A	9	0	7	1
50	ROOM NO. ONE SOUTH WALL	2B	9	0	0	0
51	ROOM NO. ONE SOUTH WALL	2C	9	0	0	1
52	ROOM NO. ONE SOUTH WALL	2D	0	100	0	6
53	ROOM NO. ONE SOUTH WALL	2E	9	10	2	0
54	ROOM NO. ONE SOUTH WALL	3A	36	0	0	6
55	ROOM NO. ONE SOUTH WALL	3B	27	0	0	0
56	ROOM NO. ONE SOUTH WALL	3C	9	0	0	4
57	ROOM NO. ONE SOUTH WALL	3D	9	0	0	0
58	ROOM NO. ONE SOUTH WALL	3E	18	10	0	1
59	**ROOM NO. ONE EAST WALL**	1A	0	40	2	1
60	ROOM NO. ONE EAST WALL	1B	18	0	2	0

CIMARRON FACILITY

EMERGENCY BUILDING
ALPHA AND BETA/GAMMA

SUB AREA "I"
UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
61	ROOM NO. ONE EAST WALL	1C	18	0	0	0
62	ROOM NO. ONE EAST WALL	2A	0	0	0	0
63	ROOM NO. ONE EAST WALL	2B	0	40	0	6
64	ROOM NO. ONE EAST WALL	2C	0	0	0	4
65	ROOM NO. ONE EAST WALL	2E	27	0	0	0
66	**ROOM NO. ONE WEST WALL**	1A	0	0	2	0
67	ROOM NO. ONE WEST WALL	1B	36	0	0	4
68	ROOM NO. ONE WEST WALL	1C	9	0	2	1
69	ROOM NO. ONE WEST WALL	1D	0	0	0	0
70	ROOM NO. ONE WEST WALL	1E	9	0	0	4
71	ROOM NO. ONE WEST WALL	2A	27	0	0	1
72	ROOM NO. ONE WEST WALL	2B	9	0	0	0
73	ROOM NO. ONE WEST WALL	2C	0	0	0	0
74	ROOM NO. ONE WEST WALL	2D	0	0	0	0
75	ROOM NO. ONE WEST WALL	2E	0	0	0	0
76	**ROOM NO. TWO NORTH WALL**	1A	0	0	0	6
77	ROOM NO. TWO NORTH WALL	1B	0	0	0	1
78	ROOM NO. TWO NORTH WALL	1C	9	0	2	6
79	ROOM NO. TWO NORTH WALL	1D	0	0	0	0
80	ROOM NO. TWO NORTH WALL	1E	0	0	0	0
81	**ROOM NO. TWO SOUTH WALL**	1A	45	0	0	6
82	ROOM NO. TWO SOUTH WALL	1B	0	0	0	1
83	ROOM NO. TWO SOUTH WALL	1C	9	0	0	0
84	ROOM NO. TWO SOUTH WALL	1D	9	0	4	1
85	ROOM NO. TWO SOUTH WALL	1E	0	0	0	0
86	**ROOM NO. TWO EAST WALL**	1A	9	0	2	4
87	ROOM NO. TWO EAST WALL	1B	18	0	2	1
88	ROOM NO. TWO EAST WALL	1C	9	0	0	0
89	ROOM NO. TWO EAST WALL	1D	9	0	0	6
90	ROOM NO. TWO EAST WALL	1E	81	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING SUB AREA "I"

ALPHA AND BETA/GAMMA **UNAFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.A. Rogers **DATE:** 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
91	ROOM NO. TWO EAST WALL	2A	0	0	2	0
92	ROOM NO. TWO EAST WALL	2B	9	0	0	6
93	ROOM NO. TWO EAST WALL	2C	18	0	2	0
94	ROOM NO. TWO EAST WALL	2D	0	0	0	0
95	ROOM NO. TWO EAST WALL	2E	0	0	0	0
96	**ROOM NO. TWO WEST WALL**	1A	0	0	0	1
97	ROOM NO. TWO WEST WALL	1B	0	0	2	0
98	ROOM NO. TWO WEST WALL	1C	0	0	2	0
99	ROOM NO. TWO WEST WALL	1D	0	0	2	0
100	ROOM NO. TWO WEST WALL	1E	9	0	2	1
101	ROOM NO. TWO WEST WALL	2A	0	0	2	1
102	ROOM NO. TWO WEST WALL	2B	0	0	0	0
103	ROOM NO. TWO WEST WALL	2C	0	0	2	1
104	ROOM NO. TWO WEST WALL	2D	9	0	0	1
105	ROOM NO. TWO WEST WALL	2E	0	0	0	1
106	**ROOM NO. THREE NORTH WALL**	1A	0	0	2	0
107	ROOM NO. THREE NORTH WALL	1B	0	0	0	0
108	ROOM NO. THREE NORTH WALL	1C	9	0	5	0
109	ROOM NO. THREE NORTH WALL	1D	9	0	0	0
110	ROOM NO. THREE NORTH WALL	1E	18	0	0	1
111	ROOM NO. THREE NORTH WALL	2A	9	0	0	0
112	ROOM NO. THREE NORTH WALL	2B	18	0	0	1
113	ROOM NO. THREE NORTH WALL	2C	0	0	0	1
114	ROOM NO. THREE NORTH WALL	2D	0	0	0	1
115	**ROOM NO. THREE SOUTH WALL**	1A	0	0	5	4
116	ROOM NO. THREE SOUTH WALL	1B	18	0	2	0
117	ROOM NO. THREE SOUTH WALL	1C	0	0	2	0
118	ROOM NO. THREE SOUTH WALL	1E	9	0	2	0
119	ROOM NO. THREE SOUTH WALL	2A	18	0	0	6
120	ROOM NO. THREE SOUTH WALL	2B	36	0	0	4

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
121	ROOM NO. THREE SOUTH WALL	2C	0	0	0	0
122	ROOM NO. THREE SOUTH WALL	2D	36	0	0	0
123	ROOM NO. THREE SOUTH WALL	2E	9	0	0	0
124	**ROOM NO. THREE EAST WALL**	1A	0	0	2	0
125	ROOM NO. THREE EAST WALL	1B	0	0	2	1
126	ROOM NO. THREE EAST WALL	1C	0	0	0	4
127	ROOM NO. THREE EAST WALL	2A	0	0	0	1
128	ROOM NO. THREE EAST WALL	2B	0	0	0	1
129	ROOM NO. THREE EAST WALL	2C	0	0	0	0
130	**ROOM NO. THREE WEST WALL**	1A	36	0	0	0
131	ROOM NO. THREE WEST WALL	1B	0	0	0	0
132	ROOM NO. THREE WEST WALL	1C	0	0	7	0
133	ROOM NO. THREE WEST WALL	1D	0	0	0	4
134	ROOM NO. THREE WEST WALL	1E	18	0	5	0
135	ROOM NO. THREE WEST WALL	2A	18	0	0	1
136	ROOM NO. THREE WEST WALL	2B	18	0	0	4
137	ROOM NO. THREE WEST WALL	2C	18	0	2	0
138	ROOM NO. THREE WEST WALL	2D	9	0	0	0
139	ROOM NO. THREE WEST WALL	2E	27	0	0	0
140	**ROOM NO. FOUR NORTH WALL**	1A	9	0	0	0
141	ROOM NO. FOUR NORTH WALL	1B	27	0	0	1
142	ROOM NO. FOUR NORTH WALL	1C	18	0	0	0
143	ROOM NO. FOUR NORTH WALL	1D	0	0	0	0
144	ROOM NO. FOUR NORTH WALL	1E	0	0	0	0
145	ROOM NO. FOUR NORTH WALL	2A	18	0	0	0
146	ROOM NO. FOUR NORTH WALL	2B	0	0	0	0
147	ROOM NO. FOUR NORTH WALL	2C	9	0	0	0
148	ROOM NO. FOUR NORTH WALL	2D	0	0	0	8
149	ROOM NO. FOUR NORTH WALL	2E	0	0	0	1
150	ROOM NO. FOUR NORTH WALL	3A	9	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.C. Bryan DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
151	ROOM NO. FOUR NORTH WALL	3B	0	0	2	1
152	ROOM NO. FOUR NORTH WALL	3C	9	0	0	6
153	ROOM NO. FOUR NORTH WALL	3D	0	0	0	0
154	ROOM NO. FOUR NORTH WALL	3E	0	0	0	0
155	**ROOM NO. FOUR SOUTH WALL**	1A	9	0	0	1
156	ROOM NO. FOUR SOUTH WALL	1B	0	0	0	0
157	ROOM NO. FOUR SOUTH WALL	1C	9	0	0	0
158	ROOM NO. FOUR SOUTH WALL	1D	9	0	0	1
159	ROOM NO. FOUR SOUTH WALL	1E	27	0	0	0
160	ROOM NO. FOUR SOUTH WALL	2A	0	0	0	0
161	ROOM NO. FOUR SOUTH WALL	2B	0	0	0	0
162	ROOM NO. FOUR SOUTH WALL	2C	27	0	0	0
163	ROOM NO. FOUR SOUTH WALL	2D	0	0	0	0
164	ROOM NO. FOUR SOUTH WALL	2E	9	0	0	1
165	ROOM NO. FOUR SOUTH WALL	3A	0	0	0	1
166	ROOM NO. FOUR SOUTH WALL	3B	0	0	0	0
167	ROOM NO. FOUR SOUTH WALL	3C	0	0	0	0
168	ROOM NO. FOUR SOUTH WALL	3D	0	0	0	0
169	ROOM NO. FOUR SOUTH WALL	3E	0	0	0	4
170	**ROOM NO. FOUR EAST WALL**	1A	0	0	0	0
171	ROOM NO. FOUR EAST WALL	1B	0	0	2	0
172	ROOM NO. FOUR EAST WALL	1C	0	0	0	0
173	ROOM NO. FOUR EAST WALL	1D	9	0	0	0
174	ROOM NO. FOUR EAST WALL	1E	9	0	0	1
175	ROOM NO. FOUR EAST WALL	2A	0	0	0	0
176	ROOM NO. FOUR EAST WALL	2B	18	0	0	0
177	ROOM NO. FOUR EAST WALL	2C	0	0	0	1
178	ROOM NO. FOUR EAST WALL	2D	9	0	2	0
179	ROOM NO. FOUR EAST WALL	2E	0	0	0	0
180	**ROOM NO. FOUR WEST WALL**	1A	9	0	0	1
181	ROOM NO. FOUR WEST WALL	1B	0	0	0	1
182	ROOM NO. FOUR WEST WALL	1C	9	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING SUB AREA "I"

ALPHA AND BETA/GAMMA **UNAFFECTED PHASE II**

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. Q. Rogers **DATE:** 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
183	ROOM NO. FOUR WEST WALL	1D	18	0	0	1
184	ROOM NO. FOUR WEST WALL	1E	9	0	0	4
185	ROOM NO. FOUR WEST WALL	2A	0	0	0	1
186	ROOM NO. FOUR WEST WALL	2B	9	0	0	0
187	ROOM NO. FOUR WEST WALL	2C	18	0	2	1
188	ROOM NO. FOUR WEST WALL	2D	0	0	0	1
189	ROOM NO. FOUR WEST WALL	2E	18	0	2	1
190	**ROOM NO. FIVE NORTH WALL**	1A	0	0	2	4
191	ROOM NO. FIVE NORTH WALL	1B	0	0	2	0
192	ROOM NO. FIVE NORTH WALL	1C	0	0	2	0
193	ROOM NO. FIVE NORTH WALL	1D	0	0	0	1
194	ROOM NO. FIVE NORTH WALL	1E	27	0	0	4
195	ROOM NO. FIVE NORTH WALL	2A	36	0	0	0
196	ROOM NO. FIVE NORTH WALL	2B	0	0	2	0
197	ROOM NO. FIVE NORTH WALL	2C	0	0	0	4
198	ROOM NO. FIVE NORTH WALL	2D	0	0	4	6
199	ROOM NO. FIVE NORTH WALL	2E	0	0	0	1
200	ROOM NO. FIVE NORTH WALL	3A	56	127	0	4
201	ROOM NO. FIVE NORTH WALL	3B	36	0	0	4
202	ROOM NO. FIVE NORTH WALL	3C	9	236	2	1
203	ROOM NO. FIVE NORTH WALL	3D	18	0	2	0
204	ROOM NO. FIVE NORTH WALL	3E	9	0	0	6
205	**ROOM NO. FIVE SOUTH WALL**	1A	0	0	0	1
206	ROOM NO. FIVE SOUTH WALL	1B	0	0	0	1
207	ROOM NO. FIVE SOUTH WALL	1C	0	0	0	0
208	ROOM NO. FIVE SOUTH WALL	1D	9	0	0	1
209	ROOM NO. FIVE SOUTH WALL	1E	18	0	0	1
210	ROOM NO. FIVE SOUTH WALL	2A	27	0	4	0
211	ROOM NO. FIVE SOUTH WALL	2B	9	0	2	6
212	ROOM NO. FIVE SOUTH WALL	2C	18	0	0	4
213	ROOM NO. FIVE SOUTH WALL	2D	0	0	0	11
214	ROOM NO. FIVE SOUTH WALL	2E	0	0	0	0
215	ROOM NO. FIVE SOUTH WALL	3A	18	0	2	4
216	ROOM NO. FIVE SOUTH WALL	3B	0	0	0	9
217	ROOM NO. FIVE SOUTH WALL	3C	9	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. G. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
218	ROOM NO. FIVE SOUTH WALL	3D	18	0	0	0
219	ROOM NO. FIVE SOUTH WALL	3E	18	0	0	0
220	**ROOM NO. FIVE EAST WALL**	1A	0	0	0	0
221	ROOM NO. FIVE EAST WALL	1B	9	0	0	0
222	ROOM NO. FIVE EAST WALL	1C	9	0	0	1
223	ROOM NO. FIVE EAST WALL	1D	0	0	0	1
224	ROOM NO. FIVE EAST WALL	1E	18	0	2	0
225	ROOM NO. FIVE EAST WALL	2A	0	0	0	1
226	ROOM NO. FIVE EAST WALL	2B	0	0	0	6
227	ROOM NO. FIVE EAST WALL	2C	0	0	0	4
228	ROOM NO. FIVE EAST WALL	2D	0	0	0	0
229	ROOM NO. FIVE EAST WALL	2E	0	0	2	0
230	**ROOM NO. FIVE WEST WALL**	1A	36	0	2	0
231	ROOM NO. FIVE WEST WALL	1B	9	0	2	4
232	ROOM NO. FIVE WEST WALL	1C	0	0	4	1
233	ROOM NO. FIVE WEST WALL	1D	0	0	0	1
234	ROOM NO. FIVE WEST WALL	1E	0	0	0	6
235	ROOM NO. FIVE WEST WALL	2A	0	0	0	0
236	ROOM NO. FIVE WEST WALL	2B	9	0	0	0
237	ROOM NO. FIVE WEST WALL	2C	18	0	2	1
238	ROOM NO. FIVE WEST WALL	2D	27	0	0	0
239	ROOM NO. FIVE WEST WALL	2E	0	0	2	4
240	**ROOM NO. SIX NORTH WALL**	1A	0	45	0	0
241	ROOM NO. SIX NORTH WALL	1B	9	0	0	7
242	ROOM NO. SIX NORTH WALL	1C	0	0	0	2
243	ROOM NO. SIX NORTH WALL	1D	0	0	2	2
244	ROOM NO. SIX NORTH WALL	1E	0	0	2	2
245	ROOM NO. SIX SOUTH WALL	1A	0	0	4	4
246	ROOM NO. SIX SOUTH WALL	1B	0	0	2	0
247	ROOM NO. SIX SOUTH WALL	1C	9	0	0	0
248	ROOM NO. SIX SOUTH WALL	1D	27	0	0	4
249	ROOM NO. SIX SOUTH WALL	1E	0	0	0	0
250	**ROOM NO. SIX EAST WALL**	1A	9	0	2	2
251	ROOM NO. SIX EAST WALL	1B	0	0	2	0
252	ROOM NO. SIX EAST WALL	1C	0	0	0	2

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.G. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
253	ROOM NO. SIX EAST WALL	1D	9	0	2	0
254	ROOM NO. SIX EAST WALL	1E	9	0	0	4
255	ROOM NO. SIX EAST WALL	2A	9	0	0	0
256	ROOM NO. SIX EAST WALL	2B	0	0	4	0
257	ROOM NO. SIX EAST WALL	2C	0	0	0	2
258	ROOM NO. SIX EAST WALL	2D	0	0	0	0
259	ROOM NO. SIX EAST WALL	2E	0	0	0	2
260	**ROOM NO. SIX WEST WALL**	1A	9	135	0	0
261	ROOM NO. SIX WEST WALL	1B	9	360	0	2
262	ROOM NO. SIX WEST WALL	1C	9	135	0	0
263	ROOM NO. SIX WEST WALL	1D	18	180	0	7
264	ROOM NO. SIX WEST WALL	1E	9	234	4	0
265	ROOM NO. SIX WEST WALL	2A	27	306	0	0
266	ROOM NO. SIX WEST WALL	2B	9	216	2	4
267	ROOM NO. SIX WEST WALL	2C	0	279	0	0
268	ROOM NO. SIX WEST WALL	2D	18	171	0	0
269	ROOM NO. SIX WEST WALL	2E	0	378	2	0
270	**ROOM NO. SEVEN NORTH WALL**	1A	0	0	0	2
271	ROOM NO. SEVEN NORTH WALL	1B	9	0	0	2
272	ROOM NO. SEVEN NORTH WALL	1C	27	0	0	0
273	ROOM NO. SEVEN NORTH WALL	1D	9	0	0	0
274	ROOM NO. SEVEN NORTH WALL	1E	18	0	0	0
275	ROOM NO. SEVEN SOUTH WALL	1A	0	0	0	7
276	ROOM NO. SEVEN SOUTH WALL	1B	18	0	2	0
277	ROOM NO. SEVEN SOUTH WALL	1C	0	0	0	0
278	ROOM NO. SEVEN SOUTH WALL	1D	9	0	0	0
279	ROOM NO. SEVEN SOUTH WALL	1E	0	0	0	2
280	ROOM NO. SEVEN EAST WALL	1A	0	0	0	0
281	ROOM NO. SEVEN EAST WALL	1B	9	0	0	2
282	ROOM NO. SEVEN EAST WALL	1C	9	0	0	0
283	ROOM NO. SEVEN EAST WALL	1D	0	0	4	2
284	ROOM NO. SEVEN EAST WALL	1E	18	0	2	4
285	**ROOM NO. SEVEN WEST WALL**	1A	0	0	0	2
286	ROOM NO. SEVEN WEST WALL	1B	0	0	2	0
287	ROOM NO. SEVEN WEST WALL	1C	18	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.a. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
288	ROOM NO. SEVEN WEST WALL	1D	0	0	0	0
289	ROOM NO. SEVEN WEST WALL	1E	0	0	0	4
290	**ROOM NO. EIGHT NORTH WALL**	1A	72	0	0	0
291	ROOM NO. EIGHT NORTH WALL	1B	27	0	0	0
292	ROOM NO. EIGHT NORTH WALL	1C	0	0	0	0
293	ROOM NO. EIGHT NORTH WALL	1D	0	0	2	1
294	ROOM NO. EIGHT NORTH WALL	1E	0	0	2	0
295	**ROOM NO. EIGHT SOUTH WALL**	1A	18	0	2	4
296	ROOM NO. EIGHT SOUTH WALL	1B	0	0	0	0
297	ROOM NO. EIGHT SOUTH WALL	1C	36	0	0	0
298	ROOM NO. EIGHT SOUTH WALL	1D	0	36	2	0
299	ROOM NO. EIGHT SOUTH WALL	1E	0	0	2	0
300	**ROOM NO. EIGHT EAST WALL**	1A	0	0	0	0
301	ROOM NO. EIGHT EAST WALL	1B	0	0	0	0
302	ROOM NO. EIGHT EAST WALL	1C	0	0	0	4
303	ROOM NO. EIGHT EAST WALL	1D	0	0	0	0
304	ROOM NO. EIGHT EAST WALL	1E	0	0	0	0
305	ROOM NO. EIGHT EAST WALL	2A	45	0	0	6
306	ROOM NO. EIGHT EAST WALL	2B	18	0	0	0
307	ROOM NO. EIGHT EAST WALL	2C	0	0	0	4
308	ROOM NO. EIGHT EAST WALL	2D	36	0	2	0
309	ROOM NO. EIGHT EAST WALL	2E	0	0	0	0
310	**ROOM NO. EIGHT WEST WALL**	1A	0	0	0	0
311	ROOM NO. EIGHT WEST WALL	1B	18	0	5	1
312	ROOM NO. EIGHT WEST WALL	1C	0	0	0	0
313	ROOM NO. EIGHT WEST WALL	1D	0	0	0	0
314	ROOM NO. EIGHT WEST WALL	1E	0	0	0	0
315	ROOM NO. EIGHT WEST WALL	2A	0	0	0	4
316	ROOM NO. EIGHT WEST WALL	2B	0	0	2	0
317	ROOM NO. EIGHT WEST WALL	2C	0	0	2	0
318	ROOM NO. EIGHT WEST WALL	2D	9	0	0	1
319	ROOM NO. EIGHT WEST WALL	2E	45	0	0	9
320	**ROOM NO. NINE NORTH WALL**	1A	0	0	0	1
321	ROOM NO. NINE NORTH WALL	1B	0	0	0	0
322	ROOM NO. NINE NORTH WALL	1C	27	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
323	ROOM NO. NINE NORTH WALL	1D	36	0	0	0
324	ROOM NO. NINE NORTH WALL	1E	18	0	2	1
325	**ROOM NO. NINE SOUTH WALL**	1A	9	0	5	1
326	ROOM NO. NINE SOUTH WALL	1B	0	0	0	0
327	ROOM NO. NINE SOUTH WALL	1C	18	0	0	0
328	ROOM NO. NINE SOUTH WALL	1D	36	0	0	1
329	ROOM NO. NINE SOUTH WALL	1E	27	0	0	0
330	**ROOM NO. NINE EAST WALL**	1A	0	0	0	4
331	ROOM NO. NINE EAST WALL	1B	9	0	0	0
332	ROOM NO. NINE EAST WALL	1C	9	0	0	1
333	ROOM NO. NINE EAST WALL	1D	18	0	0	0
334	ROOM NO. NINE EAST WALL	1E	9	0	2	1
335	**ROOM NO. NINE WEST WALL**	1A	18	0	2	4
336	ROOM NO. NINE WEST WALL	1B	18	0	0	1
337	ROOM NO. NINE WEST WALL	1C	36	0	0	4
338	ROOM NO. NINE WEST WALL	1D	27	0	0	0
339	ROOM NO. NINE WEST WALL	1E	0	0	2	4
340	**ROOM NO. TEN NORTH WALL**	1A	9	0	2	9
341	ROOM NO. TEN NORTH WALL	1B	9	0	2	1
342	ROOM NO. TEN NORTH WALL	1C	18	0	2	0
343	ROOM NO. TEN NORTH WALL	1D	18	0	0	4
344	ROOM NO. TEN NORTH WALL	1E	18	0	2	0
345	**ROOM NO. TEN SOUTH WALL**	1A	18	0	0	0
346	ROOM NO. TEN SOUTH WALL	1B	18	0	0	0
347	ROOM NO. TEN SOUTH WALL	1C	18	0	2	6
348	ROOM NO. TEN SOUTH WALL	1D	36	0	0	9
349	ROOM NO. TEN SOUTH WALL	1E	0	0	0	0
350	**ROOM NO.TEN EAST WALL**	1A	36	0	0	1
351	ROOM NO.TEN EAST WALL	1B	45	0	0	4
352	ROOM NO.TEN EAST WALL	1C	27	0	0	0
353	ROOM NO.TEN EAST WALL	1D	27	0	0	0
354	ROOM NO.TEN EAST WALL	1E	0	0	0	4
355	ROOM NO.TEN EAST WALL	2A	18	0	0	4
356	ROOM NO.TEN EAST WALL	2B	27	0	0	0
357	ROOM NO.TEN EAST WALL	2C	9	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
358	ROOM NO.TEN EAST WALL	2D	36	0	0	1
359	ROOM NO.TEN EAST WALL	2E	0	0	2	0
360	ROOM NO.TEN EAST WALL	3A	0	0	0	0
361	ROOM NO.TEN EAST WALL	3B	18	0	5	4
362	ROOM NO.TEN EAST WALL	3C	0	0	2	0
363	ROOM NO.TEN EAST WALL	3D	9	0	2	0
364	ROOM NO.TEN EAST WALL	3E	27	0	2	1
365	**ROOM NO.TEN WEST WALL**	1A	36	0	0	0
366	ROOM NO.TEN WEST WALL	1B	0	0	2	0
367	ROOM NO.TEN WEST WALL	1C	0	0	0	4
368	ROOM NO.TEN WEST WALL	1D	27	0	2	6
369	ROOM NO.TEN WEST WALL	1E	54	0	0	1
370	ROOM NO.TEN WEST WALL	2A	9	0	2	0
371	ROOM NO.TEN WEST WALL	2B	9	0	0	0
372	ROOM NO.TEN WEST WALL	2C	9	0	2	1
373	ROOM NO.TEN WEST WALL	2D	9	0	0	0
374	ROOM NO.TEN WEST WALL	2E	0	0	0	0
375	ROOM NO.TEN WEST WALL	3A	27	0	0	0
376	ROOM NO.TEN WEST WALL	3B	18	0	0	1
377	ROOM NO.TEN WEST WALL	3C	0	0	2	4
378	ROOM NO.TEN WEST WALL	3D	27	0	0	1
379	ROOM NO.TEN WEST WALL	3E	0	0	2	1
380	**NORTH AIRLOCK NORTH WALL**	1A	0	0	4	0
381	NORTH AIRLOCK NORTH WALL	1B	0	0	0	0
382	NORTH AIRLOCK NORTH WALL	1C	0	0	0	0
383	NORTH AIRLOCK NORTH WALL	1D	0	0	2	0
384	NORTH AIRLOCK NORTH WALL	1E	0	0	0	4
385	**NORTH AIRLOCK SOUTH WALL**	1A	0	0	2	0
386	NORTH AIRLOCK SOUTH WALL	1B	0	0	0	0
387	NORTH AIRLOCK SOUTH WALL	1C	0	0	0	2
388	NORTH AIRLOCK SOUTH WALL	1D	0	0	0	0
389	NORTH AIRLOCK SOUTH WALL	1E	0	0	0	0
390	**NORTH AIRLOCK EAST WALL**	1A	0	0	2	14
391	NORTH AIRLOCK EAST WALL	1B	0	0	0	6
392	NORTH AIRLOCK EAST WALL	1C	9	0	2	6

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA

UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	2 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.4 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.C. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING INERTIOR WALLS	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
393	NORTH AIRLOCK EAST WALL	1D	27	0	0	0
394	NORTH AIRLOCK EAST WALL	1E	9	0	2	0
395	NORTH AIRLOCK EAST WALL	2A	18	0	0	2
396	NORTH AIRLOCK EAST WALL	2B	0	0	0	2
397	NORTH AIRLOCK EAST WALL	2C	9	0	0	4
398	NORTH AIRLOCK EAST WALL	2D	0	0	0	0
399	NORTH AIRLOCK EAST WALL	2E	9	0	0	0

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-9.3	86.9
2	9.0	-0.3	0.1
3	0.0	-9.3	86.9
4	0.0	-9.3	86.9
5	0.0	-9.3	86.9
6	0.0	-9.3	86.9
7	0.0	-9.3	86.9
8	27.0	17.7	312.6
9	0.0	-9.3	86.9
10	0.0	-9.3	86.9
11	0.0	-9.3	86.9
12	9.0	-0.3	0.1
13	0.0	-9.3	86.9
14	0.0	-9.3	86.9
15	0.0	-9.3	86.9
16	0.0	-9.3	86.9
17	0.0	-9.3	86.9
18	0.0	-9.3	86.9
19	9.0	-0.3	0.1
20	27.0	17.7	312.6
21	27.0	17.7	312.6
22	0.0	-9.3	86.9
23	0.0	-9.3	86.9
24	0.0	-9.3	86.9
25	0.0	-9.3	86.9
26	18.0	8.7	75.3
27	0.0	-9.3	86.9
28	0.0	-9.3	86.9
29	18.0	8.7	75.3
30	0.0	-9.3	86.9
31	9.0	-0.3	0.1
32	9.0	-0.3	0.1
33	18.0	8.7	75.3
34	27.0	17.7	312.6
35	0.0	-9.3	86.9
36	18.0	8.7	75.3
37	9.0	-0.3	0.1
38	0.0	-9.3	86.9
39	0.0	-9.3	86.9
40	27.0	17.7	312.6
41	0.0	-9.3	86.9
42	0.0	-9.3	86.9
43	0.0	-9.3	86.9
44	0.0	-9.3	86.9
45	18.0	8.7	75.3
46	9.0	-0.3	0.1
47	45.0	35.7	1273.0
48	9.0	-0.3	0.1
49	9.0	-0.3	0.1
50	9.0	-0.3	0.1
PAGE 2	504.0		9150.3
PAGE 2	432.0		3514.8
PAGE 3	353.0		4130.9
PAGE 3	405.0		2965.1
PAGE 4	432.0		2965.1
PAGE 4	684.0		3514.8
PAGE 5	549.0		4130.9
PAGE 5	0.0		2965.1
total	3719		39069.9
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 399

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 9.32

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 9.91

2 Std Deviations: 19.82

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.649

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 10.14 DPM /100cm²

GUIDELINE VALUE: 5000 DPM /100cm²

Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	398	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)

The (df) value for (X)	398	1.649	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

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06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	9.0	-0.3	0.10
52	0.0	-9.3	86.88
53	9.0	-0.3	0.10
54	36.0	26.7	711.78
55	27.0	17.7	312.55
56	9.0	-0.3	0.10
57	9.0	-0.3	0.10
58	18.0	8.7	75.33
59	0.0	-9.3	86.88
60	18.0	8.7	75.33
61	18.0	8.7	75.33
62	0.0	-9.3	86.88
63	0.0	-9.3	86.88
64	0.0	-9.3	86.88
65	27.0	17.7	312.55
66	0.0	-9.3	86.88
67	36.0	26.7	711.78
68	9.0	-0.3	0.10
69	0.0	-9.3	86.88
70	9.0	-0.3	0.10
71	27.0	17.7	312.55
72	9.0	-0.3	0.10
73	0.0	-9.3	86.88
74	0.0	-9.3	86.88
75	0.0	-9.3	86.88
76	0.0	-9.3	86.88
77	0.0	-9.3	86.88
78	9.0	-0.3	0.10
79	0.0	-9.3	86.88
80	0.0	-9.3	86.88
81	45.0	35.7	1273.01
82	0.0	-9.3	86.88
83	9.0	-0.3	0.10
84	9.0	-0.3	0.10
85	0.0	-9.3	86.88
86	9.0	-0.3	0.10
87	18.0	8.7	75.33
88	9.0	-0.3	0.10
89	9.0	-0.3	0.10
90	81.0	71.7	5137.91
91	0.0	-9.3	86.88
92	9.0	-0.3	0.10
93	18.0	8.7	75.33
94	0.0	-9.3	86.88
95	0.0	-9.3	86.88
96	0.0	-9.3	86.88
97	0.0	-9.3	86.88
98	0.0	-9.3	86.88
99	0.0	-9.3	86.88
100	9.0	-0.3	0.10
	504.0		11148.5
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	-9.3	86.88
102	0.0	-9.3	86.88
103	0.0	-9.3	86.88
104	9.0	-0.3	0.10
105	0.0	-9.3	86.88
106	0.0	-9.3	86.88
107	0.0	-9.3	86.88
108	9.0	-0.3	0.10
109	9.0	-0.3	0.10
110	18.0	8.7	75.33
111	9.0	-0.3	0.10
112	18.0	8.7	75.33
113	0.0	-9.3	86.88
114	0.0	-9.3	86.88
115	0.0	-9.3	86.88
116	18.0	8.7	75.33
117	0.0	-9.3	86.88
118	9.0	-0.3	0.10
119	18.0	8.7	75.33
120	36.0	26.7	711.78
121	0.0	-9.3	86.88
122	36.0	26.7	711.78
123	9.0	-0.3	0.10
124	0.0	-9.3	86.88
125	0.0	-9.3	86.88
126	0.0	-9.3	86.88
127	0.0	-9.3	86.88
128	0.0	-9.3	86.88
129	0.0	-9.3	86.88
130	36.0	26.7	711.78
131	0.0	-9.3	86.88
132	0.0	-9.3	86.88
133	0.0	-9.3	86.88
134	18.0	8.7	75.33
135	18.0	8.7	75.33
136	18.0	8.7	75.33
137	18.0	8.7	75.33
138	9.0	-0.3	0.10
139	27.0	17.7	312.55
140	9.0	-0.3	0.10
141	27.0	17.7	312.55
142	18.0	8.7	75.33
143	0.0	-9.3	86.88
144	0.0	-9.3	86.88
145	18.0	8.7	75.33
146	0.0	-9.3	86.88
147	9.0	-0.3	0.10
148	0.0	-9.3	86.88
149	0.0	-9.3	86.88
150	9.0	-0.3	0.10
	432.0		5686.7
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	0.0	-9.3	86.88
152	9.0	-0.3	0.10
153	0.0	-9.3	86.88
154	0.0	-9.3	86.88
155	9.0	-0.3	0.10
156	0.0	-9.3	86.88
157	9.0	-0.3	0.10
158	9.0	-0.3	0.10
159	27.0	17.7	312.55
160	0.0	-9.3	86.88
161	0.0	-9.3	86.88
162	27.0	17.7	312.55
163	0.0	-9.3	86.88
164	9.0	-0.3	0.10
165	0.0	-9.3	86.88
166	0.0	-9.3	86.88
167	0.0	-9.3	86.88
168	0.0	-9.3	86.88
169	0.0	-9.3	86.88
170	0.0	-9.3	86.88
171	0.0	-9.3	86.88
172	0.0	-9.3	86.88
173	9.0	-0.3	0.10
174	9.0	-0.3	0.10
175	0.0	-9.3	86.88
176	18.0	8.7	75.33
177	0.0	-9.3	86.88
178	9.0	-0.3	0.10
179	0.0	-9.3	86.88
180	9.0	-0.3	0.10
181	0.0	-9.3	86.88
182	9.0	-0.3	0.10
183	18.0	8.7	75.33
184	9.0	-0.3	0.10
185	0.0	-9.3	86.88
186	9.0	-0.3	0.10
187	18.0	8.7	75.33
188	0.0	-9.3	86.88
189	18.0	8.7	75.33
190	0.0	-9.3	86.88
191	0.0	-9.3	86.88
192	0.0	-9.3	86.88
193	0.0	-9.3	86.88
194	27.0	17.7	312.55
195	36.0	26.7	711.78
196	0.0	-9.3	86.88
197	0.0	-9.3	86.88
198	0.0	-9.3	86.88
199	0.0	-9.3	86.88
200	56.0	46.7	2178.95
	353.0		6650.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	36.0	26.7	711.78
202	9.0	-0.3	0.10
203	18.0	8.7	75.33
204	9.0	-0.3	0.10
205	0.0	-9.3	86.88
206	0.0	-9.3	86.88
207	0.0	-9.3	86.88
208	9.0	-0.3	0.10
209	18.0	8.7	75.33
210	27.0	17.7	312.55
211	9.0	-0.3	0.10
212	18.0	8.7	75.33
213	0.0	-9.3	86.88
214	0.0	-9.3	86.88
215	18.0	8.7	75.33
216	0.0	-9.3	86.88
217	9.0	-0.3	0.10
218	18.0	8.7	75.33
219	18.0	8.7	75.33
220	0.0	-9.3	86.88
221	9.0	-0.3	0.10
222	9.0	-0.3	0.10
223	0.0	-9.3	86.88
224	18.0	8.7	75.33
225	0.0	-9.3	86.88
226	0.0	-9.3	86.88
227	0.0	-9.3	86.88
228	0.0	-9.3	86.88
229	0.0	-9.3	86.88
230	36.0	26.7	711.78
231	9.0	-0.3	0.10
232	0.0	-9.3	86.88
233	0.0	-9.3	86.88
234	0.0	-9.3	86.88
235	0.0	-9.3	86.88
236	9.0	-0.3	0.10
237	18.0	8.7	75.33
238	27.0	17.7	312.55
239	0.0	-9.3	86.88
240	0.0	-9.3	86.88
241	9.0	-0.3	0.10
242	0.0	-9.3	86.88
243	0.0	-9.3	86.88
244	0.0	-9.3	86.88
245	0.0	-9.3	86.88
246	0.0	-9.3	86.88
247	9.0	-0.3	0.10
248	27.0	17.7	312.55
249	0.0	-9.3	86.88
250	9.0	-0.3	0.10
	405.0		5137.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
251	0.0	-9.3	86.88
252	0.0	-9.3	86.88
253	9.0	-0.3	0.10
254	9.0	-0.3	0.10
255	9.0	-0.3	0.10
256	0.0	-9.3	86.88
257	0.0	-9.3	86.88
258	0.0	-9.3	86.88
259	0.0	-9.3	86.88
260	9.0	-0.3	0.10
261	9.0	-0.3	0.10
262	9.0	-0.3	0.10
263	18.0	8.7	75.33
264	9.0	-0.3	0.10
265	27.0	17.7	312.55
266	9.0	-0.3	0.10
267	0.0	-9.3	86.88
268	18.0	8.7	75.33
269	0.0	-9.3	86.88
270	0.0	-9.3	86.88
271	9.0	-0.3	0.10
272	27.0	17.7	312.55
273	9.0	-0.3	0.10
274	18.0	8.7	75.33
275	0.0	-9.3	86.88
276	18.0	8.7	75.33
277	0.0	-9.3	86.88
278	9.0	-0.3	0.10
279	0.0	-9.3	86.88
280	0.0	-9.3	86.88
281	9.0	-0.3	0.10
282	9.0	-0.3	0.10
283	0.0	-9.3	86.88
284	18.0	8.7	75.33
285	0.0	-9.3	86.88
286	0.0	-9.3	86.88
287	18.0	8.7	75.33
288	0.0	-9.3	86.88
289	0.0	-9.3	86.88
290	72.0	62.7	3928.68
291	27.0	17.7	312.55
292	0.0	-9.3	86.88
293	0.0	-9.3	86.88
294	0.0	-9.3	86.88
295	18.0	8.7	75.33
296	0.0	-9.3	86.88
297	36.0	26.7	711.78
298	0.0	-9.3	86.88
299	0.0	-9.3	86.88
300	0.0	-9.3	86.88
	432.0		8278.7
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	0.0	-9.3	86.88
302	0.0	-9.3	86.88
303	0.0	-9.3	86.88
304	0.0	-9.3	86.88
305	45.0	35.7	1273.01
306	18.0	8.7	75.33
307	0.0	-9.3	86.88
308	36.0	26.7	711.78
309	0.0	-9.3	86.88
310	0.0	-9.3	86.88
311	18.0	8.7	75.33
312	0.0	-9.3	86.88
313	0.0	-9.3	86.88
314	0.0	-9.3	86.88
315	0.0	-9.3	86.88
316	0.0	-9.3	86.88
317	0.0	-9.3	86.88
318	9.0	-0.3	0.10
319	45.0	35.7	1273.01
320	0.0	-9.3	86.88
321	0.0	-9.3	86.88
322	27.0	17.7	312.55
323	36.0	26.7	711.78
324	18.0	8.7	75.33
325	9.0	-0.3	0.10
326	0.0	-9.3	86.88
327	18.0	8.7	75.33
328	36.0	26.7	711.78
329	27.0	17.7	312.55
330	0.0	-9.3	86.88
331	9.0	-0.3	0.10
332	9.0	-0.3	0.10
333	18.0	8.7	75.33
334	9.0	-0.3	0.10
335	18.0	8.7	75.33
336	18.0	8.7	75.33
337	36.0	26.7	711.78
338	27.0	17.7	312.55
339	0.0	-9.3	86.88
340	9.0	-0.3	0.10
341	9.0	-0.3	0.10
342	18.0	8.7	75.33
343	18.0	8.7	75.33
344	18.0	8.7	75.33
345	18.0	8.7	75.33
346	18.0	8.7	75.33
347	18.0	8.7	75.33
348	36.0	26.7	711.78
349	0.0	-9.3	86.88
350	36.0	26.7	711.78
	684.0		10385.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
351	45.0	35.7	1273.01
352	27.0	17.7	312.55
353	27.0	17.7	312.55
354	0.0	-9.3	86.88
355	18.0	8.7	75.33
356	27.0	17.7	312.55
357	9.0	-0.3	0.10
358	36.0	26.7	711.78
359	0.0	-9.3	86.88
360	0.0	-9.3	86.88
361	18.0	8.7	75.33
362	0.0	-9.3	86.88
363	9.0	-0.3	0.10
364	27.0	17.7	312.55
365	36.0	26.7	711.78
366	0.0	-9.3	86.88
367	0.0	-9.3	86.88
368	27.0	17.7	312.55
369	54.0	44.7	1996.23
370	9.0	-0.3	0.10
371	9.0	-0.3	0.10
372	9.0	-0.3	0.10
373	9.0	-0.3	0.10
374	0.0	-9.3	86.88
375	27.0	17.7	312.55
376	18.0	8.7	75.33
377	0.0	-9.3	86.88
378	27.0	17.7	312.55
379	0.0	-9.3	86.88
380	0.0	-9.3	86.88
381	0.0	-9.3	86.88
382	0.0	-9.3	86.88
383	0.0	-9.3	86.88
384	0.0	-9.3	86.88
385	0.0	-9.3	86.88
386	0.0	-9.3	86.88
387	0.0	-9.3	86.88
388	0.0	-9.3	86.88
389	0.0	-9.3	86.88
390	0.0	-9.3	86.88
391	0.0	-9.3	86.88
392	9.0	-0.3	0.10
393	27.0	17.7	312.55
394	9.0	-0.3	0.10
395	18.0	8.7	75.33
396	0.0	-9.3	86.88
397	9.0	-0.3	0.10
398	0.0	-9.3	86.88
399	9.0	-0.3	0.10
400	0.0	0.00	0.00
	549.0		9493.7
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
401	0.0	0.00	0.00
402	0.0	0.00	0.00
403	0.0	0.00	0.00
404	0.0	0.00	0.00
405	0.0	0.00	0.00
406	0.0	0.00	0.00
407	0.0	0.00	0.00
408	0.0	0.00	0.00
409	0.0	0.00	0.00
410	0.0	0.00	0.00
411	0.0	0.00	0.00
412	0.0	0.00	0.00
413	0.0	0.00	0.00
414	0.0	0.00	0.00
415	0.0	0.00	0.00
416	0.0	0.00	0.00
417	0.0	0.00	0.00
418	0.0	0.00	0.00
419	0.0	0.00	0.00
420	0.0	0.00	0.00
421	0.0	0.00	0.00
422	0.0	0.00	0.00
423	0.0	0.00	0.00
424	0.0	0.00	0.00
425	0.0	0.00	0.00
426	0.0	0.00	0.00
427	0.0	0.00	0.00
428	0.0	0.00	0.00
429	0.0	0.00	0.00
430	0.0	0.00	0.00
431	0.0	0.00	0.00
432	0.0	0.00	0.00
433	0.0	0.00	0.00
434	0.0	0.00	0.00
435	0.0	0.00	0.00
436	0.0	0.00	0.00
437	0.0	0.00	0.00
438	0.0	0.00	0.00
439	0.0	0.00	0.00
440	0.0	0.00	0.00
441	0.0	0.00	0.00
442	0.0	0.00	0.00
443	0.0	0.00	0.00
444	0.0	0.00	0.00
445	0.0	0.00	0.00
446	0.0	0.00	0.00
447	0.0	0.00	0.00
448	0.0	0.00	0.00
449	0.0	0.00	0.00
450	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-9.4	88.7
2	0.0	-9.4	88.7
3	0.0	-9.4	88.7
4	0.0	-9.4	88.7
5	0.0	-9.4	88.7
6	0.0	-9.4	88.7
7	0.0	-9.4	88.7
8	0.0	-9.4	88.7
9	0.0	-9.4	88.7
10	0.0	-9.4	88.7
11	0.0	-9.4	88.7
12	0.0	-9.4	88.7
13	0.0	-9.4	88.7
14	0.0	-9.4	88.7
15	0.0	-9.4	88.7
16	0.0	-9.4	88.7
17	0.0	-9.4	88.7
18	0.0	-9.4	88.7
19	0.0	-9.4	88.7
20	0.0	-9.4	88.7
21	0.0	-9.4	88.7
22	0.0	-9.4	88.7
23	0.0	-9.4	88.7
24	0.0	-9.4	88.7
25	0.0	-9.4	88.7
26	0.0	-9.4	88.7
27	0.0	-9.4	88.7
28	0.0	-9.4	88.7
29	0.0	-9.4	88.7
30	0.0	-9.4	88.7
31	0.0	-9.4	88.7
32	0.0	-9.4	88.7
33	0.0	-9.4	88.7
34	170.0	160.6	25786.4
35	120.0	110.6	12228.3
36	0.0	-9.4	88.7
37	0.0	-9.4	88.7
38	80.0	70.6	4981.7
39	120.0	110.6	12228.3
40	0.0	-9.4	88.7
41	150.0	140.6	19763.1
42	50.0	40.6	1646.9
43	0.0	-9.4	88.7
44	30.0	20.6	423.6
45	0.0	-9.4	88.7
46	0.0	-9.4	88.7
47	0.0	-9.4	88.7
48	0.0	-9.4	88.7
49	0.0	-9.4	88.7
50	0.0	-9.4	88.7
PAGE 2	200.0		14068.0
PAGE 2	0.0		4435.5
PAGE 3	127.0		18172.1
PAGE 3	281.0		56863.2
PAGE 4	2430.0		56863.2
PAGE 4	0.0		4435.5
PAGE 5	0.0		18172.1
PAGE 5	0.0		56863.2
total	3758		310745.6
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 399

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 9.42

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 27.94
2 Std Deviations: 55.88
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.649

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 11.73 DPM /100cm²
GUIDELINE VALUE: 5000 DPM /100cm²
Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	398	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	398	1.649	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	0.0	-9.4	88.71
52	100.0	90.6	8205.00
53	10.0	0.6	0.34
54	0.0	-9.4	88.71
55	0.0	-9.4	88.71
56	0.0	-9.4	88.71
57	0.0	-9.4	88.71
58	10.0	0.6	0.34
59	40.0	30.6	935.23
60	0.0	-9.4	88.71
61	0.0	-9.4	88.71
62	0.0	-9.4	88.71
63	40.0	30.6	935.23
64	0.0	-9.4	88.71
65	0.0	-9.4	88.71
66	0.0	-9.4	88.71
67	0.0	-9.4	88.71
68	0.0	-9.4	88.71
69	0.0	-9.4	88.71
70	0.0	-9.4	88.71
71	0.0	-9.4	88.71
72	0.0	-9.4	88.71
73	0.0	-9.4	88.71
74	0.0	-9.4	88.71
75	0.0	-9.4	88.71
76	0.0	-9.4	88.71
77	0.0	-9.4	88.71
78	0.0	-9.4	88.71
79	0.0	-9.4	88.71
80	0.0	-9.4	88.71
81	0.0	-9.4	88.71
82	0.0	-9.4	88.71
83	0.0	-9.4	88.71
84	0.0	-9.4	88.71
85	0.0	-9.4	88.71
86	0.0	-9.4	88.71
87	0.0	-9.4	88.71
88	0.0	-9.4	88.71
89	0.0	-9.4	88.71
90	0.0	-9.4	88.71
91	0.0	-9.4	88.71
92	0.0	-9.4	88.71
93	0.0	-9.4	88.71
94	0.0	-9.4	88.71
95	0.0	-9.4	88.71
96	0.0	-9.4	88.71
97	0.0	-9.4	88.71
98	0.0	-9.4	88.71
99	0.0	-9.4	88.71
100	0.0	-9.4	88.71
	200.0		14068.0
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	-9.4	88.71
102	0.0	-9.4	88.71
103	0.0	-9.4	88.71
104	0.0	-9.4	88.71
105	0.0	-9.4	88.71
106	0.0	-9.4	88.71
107	0.0	-9.4	88.71
108	0.0	-9.4	88.71
109	0.0	-9.4	88.71
110	0.0	-9.4	88.71
111	0.0	-9.4	88.71
112	0.0	-9.4	88.71
113	0.0	-9.4	88.71
114	0.0	-9.4	88.71
115	0.0	-9.4	88.71
116	0.0	-9.4	88.71
117	0.0	-9.4	88.71
118	0.0	-9.4	88.71
119	0.0	-9.4	88.71
120	0.0	-9.4	88.71
121	0.0	-9.4	88.71
122	0.0	-9.4	88.71
123	0.0	-9.4	88.71
124	0.0	-9.4	88.71
125	0.0	-9.4	88.71
126	0.0	-9.4	88.71
127	0.0	-9.4	88.71
128	0.0	-9.4	88.71
129	0.0	-9.4	88.71
130	0.0	-9.4	88.71
131	0.0	-9.4	88.71
132	0.0	-9.4	88.71
133	0.0	-9.4	88.71
134	0.0	-9.4	88.71
135	0.0	-9.4	88.71
136	0.0	-9.4	88.71
137	0.0	-9.4	88.71
138	0.0	-9.4	88.71
139	0.0	-9.4	88.71
140	0.0	-9.4	88.71
141	0.0	-9.4	88.71
142	0.0	-9.4	88.71
143	0.0	-9.4	88.71
144	0.0	-9.4	88.71
145	0.0	-9.4	88.71
146	0.0	-9.4	88.71
147	0.0	-9.4	88.71
148	0.0	-9.4	88.71
149	0.0	-9.4	88.71
150	0.0	-9.4	88.71
	0.0		4435.5
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	0.0	-9.4	88.71
152	0.0	-9.4	88.71
153	0.0	-9.4	88.71
154	0.0	-9.4	88.71
155	0.0	-9.4	88.71
156	0.0	-9.4	88.71
157	0.0	-9.4	88.71
158	0.0	-9.4	88.71
159	0.0	-9.4	88.71
160	0.0	-9.4	88.71
161	0.0	-9.4	88.71
162	0.0	-9.4	88.71
163	0.0	-9.4	88.71
164	0.0	-9.4	88.71
165	0.0	-9.4	88.71
166	0.0	-9.4	88.71
167	0.0	-9.4	88.71
168	0.0	-9.4	88.71
169	0.0	-9.4	88.71
170	0.0	-9.4	88.71
171	0.0	-9.4	88.71
172	0.0	-9.4	88.71
173	0.0	-9.4	88.71
174	0.0	-9.4	88.71
175	0.0	-9.4	88.71
176	0.0	-9.4	88.71
177	0.0	-9.4	88.71
178	0.0	-9.4	88.71
179	0.0	-9.4	88.71
180	0.0	-9.4	88.71
181	0.0	-9.4	88.71
182	0.0	-9.4	88.71
183	0.0	-9.4	88.71
184	0.0	-9.4	88.71
185	0.0	-9.4	88.71
186	0.0	-9.4	88.71
187	0.0	-9.4	88.71
188	0.0	-9.4	88.71
189	0.0	-9.4	88.71
190	0.0	-9.4	88.71
191	0.0	-9.4	88.71
192	0.0	-9.4	88.71
193	0.0	-9.4	88.71
194	0.0	-9.4	88.71
195	0.0	-9.4	88.71
196	0.0	-9.4	88.71
197	0.0	-9.4	88.71
198	0.0	-9.4	88.71
199	0.0	-9.4	88.71
200	127.0	117.6	13825.40
	127.0		18172.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	0.0	-9.4	88.71
202	236.0	226.6	51339.16
203	0.0	-9.4	88.71
204	0.0	-9.4	88.71
205	0.0	-9.4	88.71
206	0.0	-9.4	88.71
207	0.0	-9.4	88.71
208	0.0	-9.4	88.71
209	0.0	-9.4	88.71
210	0.0	-9.4	88.71
211	0.0	-9.4	88.71
212	0.0	-9.4	88.71
213	0.0	-9.4	88.71
214	0.0	-9.4	88.71
215	0.0	-9.4	88.71
216	0.0	-9.4	88.71
217	0.0	-9.4	88.71
218	0.0	-9.4	88.71
219	0.0	-9.4	88.71
220	0.0	-9.4	88.71
221	0.0	-9.4	88.71
222	0.0	-9.4	88.71
223	0.0	-9.4	88.71
224	0.0	-9.4	88.71
225	0.0	-9.4	88.71
226	0.0	-9.4	88.71
227	0.0	-9.4	88.71
228	0.0	-9.4	88.71
229	0.0	-9.4	88.71
230	0.0	-9.4	88.71
231	0.0	-9.4	88.71
232	0.0	-9.4	88.71
233	0.0	-9.4	88.71
234	0.0	-9.4	88.71
235	0.0	-9.4	88.71
236	0.0	-9.4	88.71
237	0.0	-9.4	88.71
238	0.0	-9.4	88.71
239	0.0	-9.4	88.71
240	45.0	35.6	1266.04
241	0.0	-9.4	88.71
242	0.0	-9.4	88.71
243	0.0	-9.4	88.71
244	0.0	-9.4	88.71
245	0.0	-9.4	88.71
246	0.0	-9.4	88.71
247	0.0	-9.4	88.71
248	0.0	-9.4	88.71
249	0.0	-9.4	88.71
250	0.0	-9.4	88.71
	281.0		56863.2
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)
n = DPM /100cm²

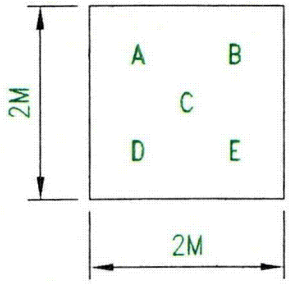
Number	n	(n-N)	(n-N)²
251	0.0	-9.4	88.71
252	0.0	-9.4	88.71
253	0.0	-9.4	88.71
254	0.0	-9.4	88.71
255	0.0	-9.4	88.71
256	0.0	-9.4	88.71
257	0.0	-9.4	88.71
258	0.0	-9.4	88.71
259	0.0	-9.4	88.71
260	135.0	125.6	15770.70
261	360.0	350.6	122907.36
262	135.0	125.6	15770.70
263	180.0	170.6	29098.03
264	234.0	224.6	50436.83
265	306.0	296.6	87960.56
266	216.0	206.6	42675.90
267	279.0	269.6	72674.16
268	171.0	161.6	26108.57
269	378.0	368.6	135852.29
270	0.0	-9.4	88.71
271	0.0	-9.4	88.71
272	0.0	-9.4	88.71
273	0.0	-9.4	88.71
274	0.0	-9.4	88.71
275	0.0	-9.4	88.71
276	0.0	-9.4	88.71
277	0.0	-9.4	88.71
278	0.0	-9.4	88.71
279	0.0	-9.4	88.71
280	0.0	-9.4	88.71
281	0.0	-9.4	88.71
282	0.0	-9.4	88.71
283	0.0	-9.4	88.71
284	0.0	-9.4	88.71
285	0.0	-9.4	88.71
286	0.0	-9.4	88.71
287	0.0	-9.4	88.71
288	0.0	-9.4	88.71
289	0.0	-9.4	88.71
290	0.0	-9.4	88.71
291	0.0	-9.4	88.71
292	0.0	-9.4	88.71
293	0.0	-9.4	88.71
294	0.0	-9.4	88.71
295	0.0	-9.4	88.71
296	0.0	-9.4	88.71
297	0.0	-9.4	88.71
298	36.0	26.6	706.57
299	0.0	-9.4	88.71
300	0.0	-9.4	88.71
	2430.0		603421.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
301	0.0	-9.4	88.71
302	0.0	-9.4	88.71
303	0.0	-9.4	88.71
304	0.0	-9.4	88.71
305	0.0	-9.4	88.71
306	0.0	-9.4	88.71
307	0.0	-9.4	88.71
308	0.0	-9.4	88.71
309	0.0	-9.4	88.71
310	0.0	-9.4	88.71
311	0.0	-9.4	88.71
312	0.0	-9.4	88.71
313	0.0	-9.4	88.71
314	0.0	-9.4	88.71
315	0.0	-9.4	88.71
316	0.0	-9.4	88.71
317	0.0	-9.4	88.71
318	0.0	-9.4	88.71
319	0.0	-9.4	88.71
320	0.0	-9.4	88.71
321	0.0	-9.4	88.71
322	0.0	-9.4	88.71
323	0.0	-9.4	88.71
324	0.0	-9.4	88.71
325	0.0	-9.4	88.71
326	0.0	-9.4	88.71
327	0.0	-9.4	88.71
328	0.0	-9.4	88.71
329	0.0	-9.4	88.71
330	0.0	-9.4	88.71
331	0.0	-9.4	88.71
332	0.0	-9.4	88.71
333	0.0	-9.4	88.71
334	0.0	-9.4	88.71
335	0.0	-9.4	88.71
336	0.0	-9.4	88.71
337	0.0	-9.4	88.71
338	0.0	-9.4	88.71
339	0.0	-9.4	88.71
340	0.0	-9.4	88.71
341	0.0	-9.4	88.71
342	0.0	-9.4	88.71
343	0.0	-9.4	88.71
344	0.0	-9.4	88.71
345	0.0	-9.4	88.71
346	0.0	-9.4	88.71
347	0.0	-9.4	88.71
348	0.0	-9.4	88.71
349	0.0	-9.4	88.71
350	0.0	-9.4	88.71
	0.0		4435.5
	Sum(n)		Sum(n-N)²

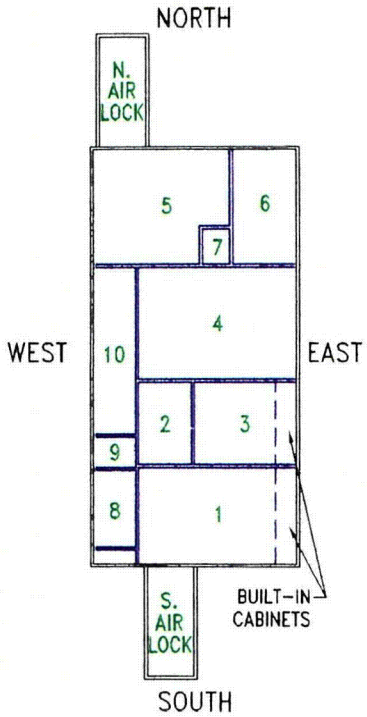
CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING INTERIOR WALLS SURVEY (UNAFFECTED)
n = DPM /100cm²

Number	n	(n-N)	(n-N)²
351	0.0	-9.4	88.71
352	0.0	-9.4	88.71
353	0.0	-9.4	88.71
354	0.0	-9.4	88.71
355	0.0	-9.4	88.71
356	0.0	-9.4	88.71
357	0.0	-9.4	88.71
358	0.0	-9.4	88.71
359	0.0	-9.4	88.71
360	0.0	-9.4	88.71
361	0.0	-9.4	88.71
362	0.0	-9.4	88.71
363	0.0	-9.4	88.71
364	0.0	-9.4	88.71
365	0.0	-9.4	88.71
366	0.0	-9.4	88.71
367	0.0	-9.4	88.71
368	0.0	-9.4	88.71
369	0.0	-9.4	88.71
370	0.0	-9.4	88.71
371	0.0	-9.4	88.71
372	0.0	-9.4	88.71
373	0.0	-9.4	88.71
374	0.0	-9.4	88.71
375	0.0	-9.4	88.71
376	0.0	-9.4	88.71
377	0.0	-9.4	88.71
378	0.0	-9.4	88.71
379	0.0	-9.4	88.71
380	0.0	-9.4	88.71
381	0.0	-9.4	88.71
382	0.0	-9.4	88.71
383	0.0	-9.4	88.71
384	0.0	-9.4	88.71
385	0.0	-9.4	88.71
386	0.0	-9.4	88.71
387	0.0	-9.4	88.71
388	0.0	-9.4	88.71
389	0.0	-9.4	88.71
390	0.0	-9.4	88.71
391	0.0	-9.4	88.71
392	0.0	-9.4	88.71
393	0.0	-9.4	88.71
394	0.0	-9.4	88.71
395	0.0	-9.4	88.71
396	0.0	-9.4	88.71
397	0.0	-9.4	88.71
398	0.0	-9.4	88.71
399	0.0	-9.4	88.71
400	0.0	0.00	0.00
	0.0		4346.7
	Sum(n)		Sum(n-N)²

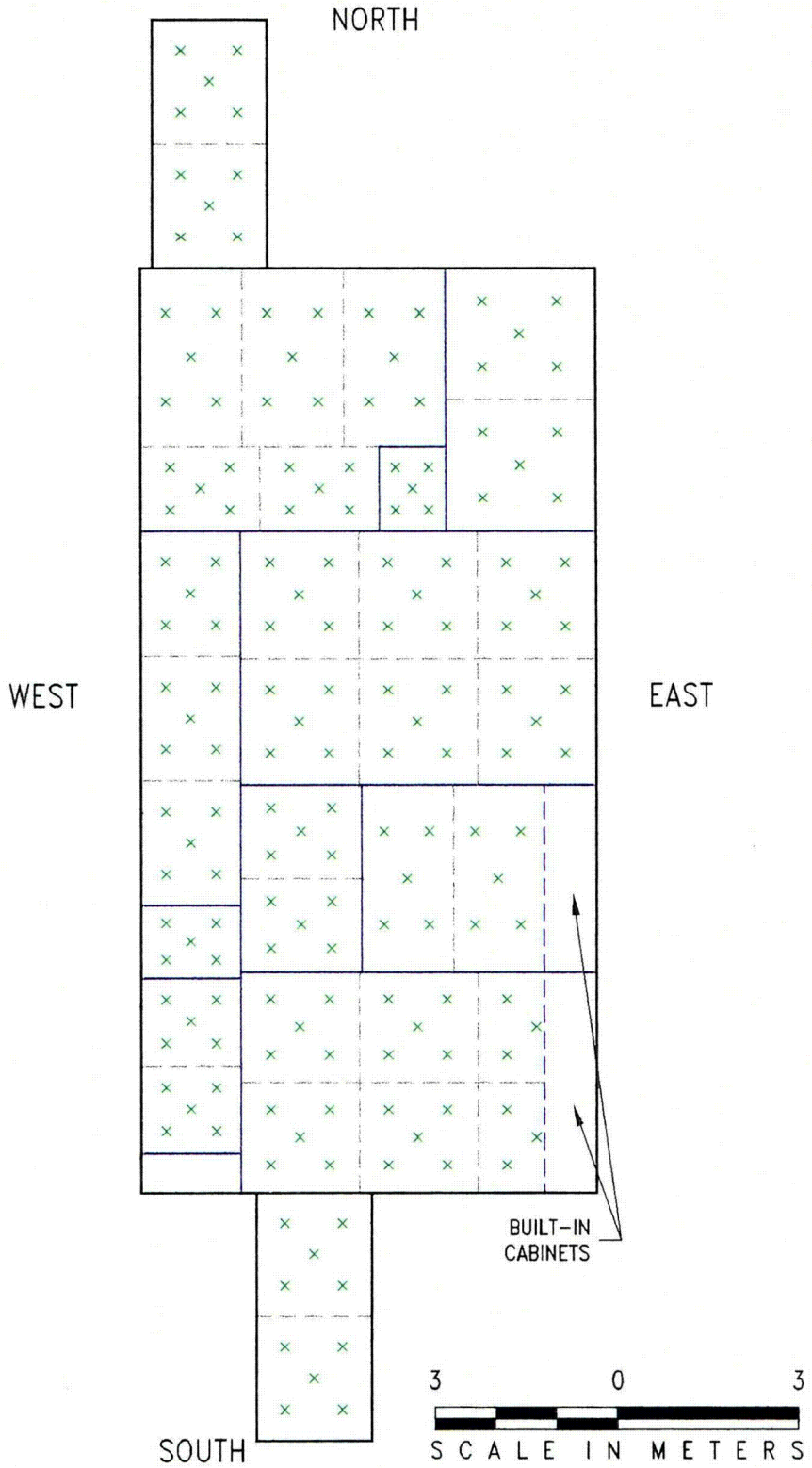
Number	n	(n-N)	(n-N)²
401	0.0	0.00	0.00
402	0.0	0.00	0.00
403	0.0	0.00	0.00
404	0.0	0.00	0.00
405	0.0	0.00	0.00
406	0.0	0.00	0.00
407	0.0	0.00	0.00
408	0.0	0.00	0.00
409	0.0	0.00	0.00
410	0.0	0.00	0.00
411	0.0	0.00	0.00
412	0.0	0.00	0.00
413	0.0	0.00	0.00
414	0.0	0.00	0.00
415	0.0	0.00	0.00
416	0.0	0.00	0.00
417	0.0	0.00	0.00
418	0.0	0.00	0.00
419	0.0	0.00	0.00
420	0.0	0.00	0.00
421	0.0	0.00	0.00
422	0.0	0.00	0.00
423	0.0	0.00	0.00
424	0.0	0.00	0.00
425	0.0	0.00	0.00
426	0.0	0.00	0.00
427	0.0	0.00	0.00
428	0.0	0.00	0.00
429	0.0	0.00	0.00
430	0.0	0.00	0.00
431	0.0	0.00	0.00
432	0.0	0.00	0.00
433	0.0	0.00	0.00
434	0.0	0.00	0.00
435	0.0	0.00	0.00
436	0.0	0.00	0.00
437	0.0	0.00	0.00
438	0.0	0.00	0.00
439	0.0	0.00	0.00
440	0.0	0.00	0.00
441	0.0	0.00	0.00
442	0.0	0.00	0.00
443	0.0	0.00	0.00
444	0.0	0.00	0.00
445	0.0	0.00	0.00
446	0.0	0.00	0.00
447	0.0	0.00	0.00
448	0.0	0.00	0.00
449	0.0	0.00	0.00
450	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²



TYPICAL GRID ALIGNMENT



EMERGENCY BUILDING ROOM LOCATION MAP



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING FLOOR

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

DRWN. BY	DATE	SCALE:
JE	5-22-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-14	0

...SUBAREAI\EMER-BLDG\EMER-FLOOR

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FLOOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	SOUTH AIR LOCK	1A	9	378	2	1
2	SOUTH AIR LOCK	1B	36	414	0	0
3	SOUTH AIR LOCK	1C	0	513	0	0
4	SOUTH AIR LOCK	1D	0	882	0	0
5	SOUTH AIR LOCK	1E	27	396	7	0
6	SOUTH AIR LOCK	2A	0	414	2	0
7	SOUTH AIR LOCK	2B	0	459	0	0
8	SOUTH AIR LOCK	2C	0	576	0	0
9	SOUTH AIR LOCK	2D	0	423	0	1
10	SOUTH AIR LOCK	2E	9	450	0	0
11	ROOM NUMBER ONE	1A	45	150	0	0
12	ROOM NUMBER ONE	1B	27	240	0	0
13	ROOM NUMBER ONE	1C	9	40	0	1
14	ROOM NUMBER ONE	1D	9	30	0	0
15	ROOM NUMBER ONE	1E	9	80	2	0
16	ROOM NUMBER ONE	2A	0	200	0	1
17	ROOM NUMBER ONE	2B	0	50	0	6
18	ROOM NUMBER ONE	2C	0	170	0	1
19	ROOM NUMBER ONE	2D	0	0	0	1
20	ROOM NUMBER ONE	2E	0	240	0	6
21	ROOM NUMBER ONE	3A	0	60	0	9
22	ROOM NUMBER ONE	3C	0	0	0	1
23	ROOM NUMBER ONE	3D	18	210	0	1
24	ROOM NUMBER ONE	4A	0	16	2	0
25	ROOM NUMBER ONE	4B	27	0	0	0
26	ROOM NUMBER ONE	4C	9	120	0	0
27	ROOM NUMBER ONE	4D	9	70	2	1
28	ROOM NUMBER ONE	4E	0	0	4	0
29	ROOM NUMBER ONE	5A	9	160	0	4
30	ROOM NUMBER ONE	5B	0	0	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FLOOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	ROOM NUMBER ONE	5C	18	420	0	1
32	ROOM NUMBER ONE	5D	0	210	0	4
33	ROOM NUMBER ONE	5E	0	180	0	0
34	ROOM NUMBER ONE	6A	18	200	0	0
35	ROOM NUMBER ONE	6C	18	240	2	1
36	ROOM NUMBER ONE	6D	9	210	0	1
37	ROOM NUMBER TWO	1A	0	160	0	4
38	ROOM NUMBER TWO	1B	0	40	4	4
39	ROOM NUMBER TWO	1C	0	160	0	1
40	ROOM NUMBER TWO	1D	0	210	2	6
41	ROOM NUMBER TWO	1E	0	240	2	0
42	ROOM NUMBER TWO	2A	0	150	4	1
43	ROOM NUMBER TWO	2B	0	270	0	6
44	ROOM NUMBER TWO	2C	0	200	0	4
45	ROOM NUMBER TWO	2D	45	400	0	4
46	ROOM NUMBER TWO	2E	0	160	0	0
47	ROOM NUMBER THREE	1A	9	110	2	0
48	ROOM NUMBER THREE	1B	27	280	2	0
49	ROOM NUMBER THREE	1C	0	140	2	1
50	ROOM NUMBER THREE	1D	0	100	2	1
51	ROOM NUMBER THREE	1E	9	250	0	0
52	ROOM NUMBER THREE	2A	9	210	0	0
53	ROOM NUMBER THREE	2B	0	180	0	0
54	ROOM NUMBER THREE	2C	0	390	0	1
55	ROOM NUMBER THREE	2D	18	0	0	6
56	ROOM NUMBER THREE	2E	9	70	0	0
57	ROOM NUMBER FOUR	1A	18	450	0	0
58	ROOM NUMBER FOUR	1B	9	100	0	0
59	ROOM NUMBER FOUR	1C	0	50	0	1
60	ROOM NUMBER FOUR	1D	9	150	5	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FLOOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
61	ROOM NUMBER FOUR	1E	0	0	0	0
62	ROOM NUMBER FOUR	2A	18	450	0	0
63	ROOM NUMBER FOUR	2B	9	150	5	0
64	ROOM NUMBER FOUR	2C	27	320	0	0
65	ROOM NUMBER FOUR	2D	27	310	0	2
66	ROOM NUMBER FOUR	2E	18	360	0	4
67	ROOM NUMBER FOUR	3A	18	350	0	0
68	ROOM NUMBER FOUR	3B	0	100	2	1
69	ROOM NUMBER FOUR	3C	9	310	0	0
70	ROOM NUMBER FOUR	3D	0	50	2	0
71	ROOM NUMBER FOUR	3E	18	170	2	1
72	ROOM NUMBER FOUR	4A	0	200	2	0
73	ROOM NUMBER FOUR	4B	9	310	0	0
74	ROOM NUMBER FOUR	4C	9	120	0	0
75	ROOM NUMBER FOUR	4D	0	70	0	0
76	ROOM NUMBER FOUR	4E	9	150	0	0
77	ROOM NUMBER FOUR	5A	9	200	0	0
78	ROOM NUMBER FOUR	5B	18	370	2	1
79	ROOM NUMBER FOUR	5C	18	370	0	1
80	ROOM NUMBER FOUR	5D	18	350	2	1
81	ROOM NUMBER FOUR	5E	0	50	0	0
82	ROOM NUMBER FOUR	6A	18	320	0	0
83	ROOM NUMBER FOUR	6B	9	170	2	0
84	ROOM NUMBER FOUR	6C	0	380	2	4
85	ROOM NUMBER FOUR	6D	9	150	0	0
86	ROOM NUMBER FOUR	6E	0	50	0	0
87	ROOM NUMBER FIVE	1A	0	297	0	1
88	ROOM NUMBER FIVE	1B	0	0	0	1
89	ROOM NUMBER FIVE	1C	9	360	2	0
90	ROOM NUMBER FIVE	1D	9	0	2	6

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FLOOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
91	ROOM NUMBER FIVE	1E	0	0	0	0
92	ROOM NUMBER FIVE	2A	0	0	0	0
93	ROOM NUMBER FIVE	2B	18	45	0	9
94	ROOM NUMBER FIVE	2C	18	198	0	0
95	ROOM NUMBER FIVE	2D	0	144	4	1
96	ROOM NUMBER FIVE	2E	0	261	0	0
97	ROOM NUMBER FIVE	3A	0	36	4	1
98	ROOM NUMBER FIVE	3B	0	126	0	0
99	ROOM NUMBER FIVE	3C	0	9	0	4
100	ROOM NUMBER FIVE	3D	0	171	0	1
101	ROOM NUMBER FIVE	3E	0	171	0	0
102	ROOM NUMBER FIVE	4A	0	0	0	0
103	ROOM NUMBER FIVE	4B	0	0	0	0
104	ROOM NUMBER FIVE	4C	0	126	4	0
105	ROOM NUMBER FIVE	4D	0	0	2	0
106	ROOM NUMBER FIVE	4E	0	0	2	6
107	ROOM NUMBER FIVE	5A	0	0	0	6
108	ROOM NUMBER FIVE	5B	0	315	0	0
109	ROOM NUMBER FIVE	5C	0	261	0	1
110	ROOM NUMBER FIVE	5D	18	0	2	0
111	ROOM NUMBER FIVE	5E	0	27	2	4
112	ROOM NUMBER SIX	1A	9	135	0	0
113	ROOM NUMBER SIX	1B	9	360	0	2
114	ROOM NUMBER SIX	1C	9	135	0	0
115	ROOM NUMBER SIX	1D	18	180	0	7
116	ROOM NUMBER SIX	1E	9	234	4	0
117	ROOM NUMBER SIX	2A	27	306	0	0
118	ROOM NUMBER SIX	2B	9	216	2	4
119	ROOM NUMBER SIX	2C	0	279	0	0
120	ROOM NUMBER SIX	2D	18	171	0	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FLOOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
121	ROOM NUMBER SIX	2E	0	378	2	0
122	ROOM NUMBER SEVEN	1A	0	18	0	0
123	ROOM NUMBER SEVEN	1B	9	0	0	0
124	ROOM NUMBER SEVEN	1C	54	9	2	4
125	ROOM NUMBER SEVEN	1D	0	180	0	0
126	ROOM NUMBER SEVEN	1E	36	63	2	7
127	ROOM NUMBER EIGHT	1A	0	180	0	6
128	ROOM NUMBER EIGHT	1B	0	135	0	0
129	ROOM NUMBER EIGHT	1C	36	198	0	0
130	ROOM NUMBER EIGHT	1D	9	153	2	0
131	ROOM NUMBER EIGHT	1E	0	333	0	6
132	ROOM NUMBER EIGHT	2A	0	180	2	1
133	ROOM NUMBER EIGHT	2B	0	18	0	0
134	ROOM NUMBER EIGHT	2C	27	288	0	0
135	ROOM NUMBER EIGHT	2D	0	261	0	4
136	ROOM NUMBER EIGHT	2E	0	162	0	0
137	ROOM NUMBER NINE	1A	36	0	0	0
138	ROOM NUMBER NINE	1B	9	198	0	1
139	ROOM NUMBER NINE	1C	18	216	0	0
140	ROOM NUMBER NINE	1D	0	0	2	0
141	ROOM NUMBER NINE	1E	18	207	0	6
142	ROOM NUMBER TEN	1A	0	9	0	4
143	ROOM NUMBER TEN	1B	0	0	0	1
144	ROOM NUMBER TEN	1C	0	63	2	1
145	ROOM NUMBER TEN	1D	0	99	2	0
146	ROOM NUMBER TEN	1E	0	144	0	0
147	ROOM NUMBER TEN	2A	9	207	2	0
148	ROOM NUMBER TEN	2B	0	108	5	0
149	ROOM NUMBER TEN	2C	18	306	0	0
150	ROOM NUMBER TEN	2D	0	117	2	0

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	290 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FLOOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
151	ROOM NUMBER TEN	2E	9	117	0	4
152	ROOM NUMBER TEN	3A	9	198	0	0
153	ROOM NUMBER TEN	3B	0	36	0	0
154	ROOM NUMBER TEN	3C	0	234	0	0
155	ROOM NUMBER TEN	3D	0	27	0	4
156	ROOM NUMBER TEN	3E	0	117	0	6
157	NORTH AIR LOCK	1A	0	891	2	9
158	NORTH AIR LOCK	1B	0	432	2	0
159	NORTH AIR LOCK	1C	18	702	2	0
160	NORTH AIR LOCK	1D	9	504	0	2
161	NORTH AIR LOCK	1E	18	594	0	0
162	NORTH AIR LOCK	2A	0	432	0	0
163	NORTH AIR LOCK	2B	36	729	0	2
164	NORTH AIR LOCK	2C	0	369	0	0
165	NORTH AIR LOCK	2D	18	504	0	4
166	NORTH AIR LOCK	2E	0	747	0	0

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FLOOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	9.0	1.0	1.1
2	36.0	28.0	785.7
3	0.0	-8.0	63.5
4	0.0	-8.0	63.5
5	27.0	19.0	362.1
6	0.0	-8.0	63.5
7	0.0	-8.0	63.5
8	0.0	-8.0	63.5
9	0.0	-8.0	63.5
10	9.0	1.0	1.1
11	45.0	37.0	1371.2
12	27.0	19.0	362.1
13	9.0	1.0	1.1
14	9.0	1.0	1.1
15	9.0	1.0	1.1
16	0.0	-8.0	63.5
17	0.0	-8.0	63.5
18	0.0	-8.0	63.5
19	0.0	-8.0	63.5
20	0.0	-8.0	63.5
21	0.0	-8.0	63.5
22	0.0	-8.0	63.5
23	18.0	10.0	100.6
24	0.0	-8.0	63.5
25	27.0	19.0	362.1
26	9.0	1.0	1.1
27	9.0	1.0	1.1
28	0.0	-8.0	63.5
29	9.0	1.0	1.1
30	0.0	-8.0	63.5
31	18.0	10.0	100.6
32	0.0	-8.0	63.5
33	0.0	-8.0	63.5
34	18.0	10.0	100.6
35	18.0	10.0	100.6
36	9.0	1.0	1.1
37	0.0	-8.0	63.5
38	0.0	-8.0	63.5
39	0.0	-8.0	63.5
40	0.0	-8.0	63.5
41	0.0	-8.0	63.5
42	0.0	-8.0	63.5
43	0.0	-8.0	63.5
44	0.0	-8.0	63.5
45	45.0	37.0	1371.2
46	0.0	-8.0	63.5
47	9.0	1.0	1.1
48	27.0	19.0	362.1
49	0.0	-8.0	63.5
50	0.0	-8.0	63.5
PAGE 2	405.0		3281.3
PAGE 2	405.0		7655.3
PAGE 3	117.0		1662.4
PAGE 3	0.0		0.0
total	1323		19830.8
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **166**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **7.97**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **10.96**

2 Std Deviations: **21.93**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.657**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **9.38** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	165	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	165	1.657	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W.a. Rogers DATE: 6-16-99

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CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA AREA "I" EMERGENCY BUILDING FLOOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	9.0	1.0	1.06
52	9.0	1.0	1.06
53	0.0	-8.0	63.52
54	0.0	-8.0	63.52
55	18.0	10.0	100.60
56	9.0	1.0	1.06
57	18.0	10.0	100.60
58	9.0	1.0	1.06
59	0.0	-8.0	63.52
60	9.0	1.0	1.06
61	0.0	-8.0	63.52
62	18.0	10.0	100.60
63	9.0	1.0	1.06
64	27.0	19.0	362.15
65	27.0	19.0	362.15
66	18.0	10.0	100.60
67	18.0	10.0	100.60
68	0.0	-8.0	63.52
69	9.0	1.0	1.06
70	0.0	-8.0	63.52
71	18.0	10.0	100.60
72	0.0	-8.0	63.52
73	9.0	1.0	1.06
74	9.0	1.0	1.06
75	0.0	-8.0	63.52
76	9.0	1.0	1.06
77	9.0	1.0	1.06
78	18.0	10.0	100.60
79	18.0	10.0	100.60
80	18.0	10.0	100.60
81	0.0	-8.0	63.52
82	18.0	10.0	100.60
83	9.0	1.0	1.06
84	0.0	-8.0	63.52
85	9.0	1.0	1.06
86	0.0	-8.0	63.52
87	0.0	-8.0	63.52
88	0.0	-8.0	63.52
89	9.0	1.0	1.06
90	9.0	1.0	1.06
91	0.0	-8.0	63.52
92	0.0	-8.0	63.52
93	18.0	10.0	100.60
94	18.0	10.0	100.60
95	0.0	-8.0	63.52
96	0.0	-8.0	63.52
97	0.0	-8.0	63.52
98	0.0	-8.0	63.52
99	0.0	-8.0	63.52
100	0.0	-8.0	63.52
	405.0		3281.3
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	-8.0	63.52
102	0.0	-8.0	63.52
103	0.0	-8.0	63.52
104	0.0	-8.0	63.52
105	0.0	-8.0	63.52
106	0.0	-8.0	63.52
107	0.0	-8.0	63.52
108	0.0	-8.0	63.52
109	0.0	-8.0	63.52
110	18.0	10.0	100.60
111	0.0	-8.0	63.52
112	9.0	1.0	1.06
113	9.0	1.0	1.06
114	9.0	1.0	1.06
115	18.0	10.0	100.60
116	9.0	1.0	1.06
117	27.0	19.0	362.15
118	9.0	1.0	1.06
119	0.0	-8.0	63.52
120	18.0	10.0	100.60
121	0.0	-8.0	63.52
122	0.0	-8.0	63.52
123	9.0	1.0	1.06
124	54.0	46.0	2118.77
125	0.0	-8.0	63.52
126	36.0	28.0	785.69
127	0.0	-8.0	63.52
128	0.0	-8.0	63.52
129	36.0	28.0	785.69
130	9.0	1.0	1.06
131	0.0	-8.0	63.52
132	0.0	-8.0	63.52
133	0.0	-8.0	63.52
134	27.0	19.0	362.15
135	0.0	-8.0	63.52
136	0.0	-8.0	63.52
137	36.0	28.0	785.69
138	9.0	1.0	1.06
139	18.0	10.0	100.60
140	0.0	-8.0	63.52
141	18.0	10.0	100.60
142	0.0	-8.0	63.52
143	0.0	-8.0	63.52
144	0.0	-8.0	63.52
145	0.0	-8.0	63.52
146	0.0	-8.0	63.52
147	9.0	1.0	1.06
148	0.0	-8.0	63.52
149	18.0	10.0	100.60
150	0.0	-8.0	63.52
	405.0		7655.3
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FLOOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	9.0	1.0	1.06
152	9.0	1.0	1.06
153	0.0	-8.0	63.52
154	0.0	-8.0	63.52
155	0.0	-8.0	63.52
156	0.0	-8.0	63.52
157	0.0	-8.0	63.52
158	0.0	-8.0	63.52
159	18.0	10.0	100.60
160	9.0	1.0	1.06
161	18.0	10.0	100.60
162	0.0	-8.0	63.52
163	36.0	28.0	785.69
164	0.0	-8.0	63.52
165	18.0	10.0	100.60
166	0.0	-8.0	63.52
167	0.0	0.00	0.00
168	0.0	0.00	0.00
169	0.0	0.00	0.00
170	0.0	0.00	0.00
171	0.0	0.00	0.00
172	0.0	0.00	0.00
173	0.0	0.00	0.00
174	0.0	0.00	0.00
175	0.0	0.00	0.00
176	0.0	0.00	0.00
177	0.0	0.00	0.00
178	0.0	0.00	0.00
179	0.0	0.00	0.00
180	0.0	0.00	0.00
181	0.0	0.00	0.00
182	0.0	0.00	0.00
183	0.0	0.00	0.00
184	0.0	0.00	0.00
185	0.0	0.00	0.00
186	0.0	0.00	0.00
187	0.0	0.00	0.00
188	0.0	0.00	0.00
189	0.0	0.00	0.00
190	0.0	0.00	0.00
191	0.0	0.00	0.00
192	0.0	0.00	0.00
193	0.0	0.00	0.00
194	0.0	0.00	0.00
195	0.0	0.00	0.00
196	0.0	0.00	0.00
197	0.0	0.00	0.00
198	0.0	0.00	0.00
199	0.0	0.00	0.00
200	0.0	0.00	0.00
	117.0		1662.4
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	0.0	0.00	0.00
202	0.0	0.00	0.00
203	0.0	0.00	0.00
204	0.0	0.00	0.00
205	0.0	0.00	0.00
206	0.0	0.00	0.00
207	0.0	0.00	0.00
208	0.0	0.00	0.00
209	0.0	0.00	0.00
210	0.0	0.00	0.00
211	0.0	0.00	0.00
212	0.0	0.00	0.00
213	0.0	0.00	0.00
214	0.0	0.00	0.00
215	0.0	0.00	0.00
216	0.0	0.00	0.00
217	0.0	0.00	0.00
218	0.0	0.00	0.00
219	0.0	0.00	0.00
220	0.0	0.00	0.00
221	0.0	0.00	0.00
222	0.0	0.00	0.00
223	0.0	0.00	0.00
224	0.0	0.00	0.00
225	0.0	0.00	0.00
226	0.0	0.00	0.00
227	0.0	0.00	0.00
228	0.0	0.00	0.00
229	0.0	0.00	0.00
230	0.0	0.00	0.00
231	0.0	0.00	0.00
232	0.0	0.00	0.00
233	0.0	0.00	0.00
234	0.0	0.00	0.00
235	0.0	0.00	0.00
236	0.0	0.00	0.00
237	0.0	0.00	0.00
238	0.0	0.00	0.00
239	0.0	0.00	0.00
240	0.0	0.00	0.00
241	0.0	0.00	0.00
242	0.0	0.00	0.00
243	0.0	0.00	0.00
244	0.0	0.00	0.00
245	0.0	0.00	0.00
246	0.0	0.00	0.00
247	0.0	0.00	0.00
248	0.0	0.00	0.00
249	0.0	0.00	0.00
250	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FLOOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	378.0	173.6	30144.1
2	414.0	209.6	43940.7
3	513.0	308.6	95246.6
4	882.0	677.6	459169.5
5	396.0	191.6	36718.4
6	414.0	209.6	43940.7
7	459.0	254.6	64831.6
8	576.0	371.6	138101.8
9	423.0	218.6	47794.9
10	450.0	245.6	60329.4
11	150.0	-54.4	2957.1
12	240.0	35.6	1268.8
13	40.0	-164.4	27020.6
14	30.0	-174.4	30408.2
15	80.0	-124.4	15470.3
16	200.0	-4.4	19.2
17	50.0	-154.4	23833.0
18	170.0	-34.4	1182.0
19	0.0	-204.4	41771.0
20	240.0	35.6	1268.8
21	60.0	-144.4	20845.4
22	0.0	-204.4	41771.0
23	210.0	5.6	31.6
24	16.0	-188.4	35486.8
25	0.0	-204.4	41771.0
26	120.0	-84.4	7119.9
27	70.0	-134.4	18057.9
28	0.0	-204.4	41771.0
29	160.0	-44.4	1969.5
30	0.0	-204.4	41771.0
31	420.0	215.6	46492.2
32	210.0	5.6	31.6
33	180.0	-24.4	594.4
34	200.0	-4.4	19.2
35	240.0	35.6	1268.8
36	210.0	5.6	31.6
37	160.0	-44.4	1969.5
38	40.0	-164.4	27020.6
39	160.0	-44.4	1969.5
40	210.0	5.6	31.6
41	240.0	35.6	1268.8
42	150.0	-54.4	2957.1
43	270.0	65.6	4306.0
44	200.0	-4.4	19.2
45	400.0	195.6	38267.4
46	160.0	-44.4	1969.5
47	110.0	-94.4	8907.5
48	280.0	75.6	5718.5
49	140.0	-64.4	4144.7
50	100.0	-104.4	10895.1
PAGE 2	9327.0		934442.8
PAGE 2	7146.0		820281.3
PAGE 3	6633.0		1826812.1
PAGE 3	0.0		0.0

No. of Samples (x) : 166

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 204.38

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 176.76

2 Std Deviations: 353.53

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.657

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 227.11 DPM /100cm²

GUIDELINE VALUE: 5000 DPM /100cm²

Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%
Desired value(df) (X)	165	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	165	1.657	95%

PERFORMED BY: Debbie Brock DATE: 6/15/99

REVIEWED BY: W. C. Boyer DATE: 6-16-99

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CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA AREA "I" EMERGENCY BUILDING FLOOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	250.0	45.6	2081.23
52	210.0	5.6	31.59
53	180.0	-24.4	594.36
54	390.0	185.6	34454.96
55	0.0	-204.4	41770.99
56	70.0	-134.4	18057.85
57	450.0	245.6	60329.42
58	100.0	-104.4	10895.08
59	50.0	-154.4	23833.04
60	150.0	-54.4	2957.13
61	0.0	-204.4	41770.99
62	450.0	245.6	60329.42
63	150.0	-54.4	2957.13
64	320.0	115.6	13368.10
65	310.0	105.6	11155.69
66	360.0	155.6	24217.73
67	350.0	145.6	21205.32
68	100.0	-104.4	10895.08
69	310.0	105.6	11155.69
70	50.0	-154.4	23833.04
71	170.0	-34.4	1181.95
72	310.0	105.6	11155.69
73	120.0	-84.4	7119.90
74	200.0	-4.4	19.18
75	70.0	-134.4	18057.85
76	150.0	-54.4	2957.13
77	200.0	-4.4	19.18
78	370.0	165.6	27430.14
79	370.0	165.6	27430.14
80	350.0	145.6	21205.32
81	50.0	-154.4	23833.04
82	320.0	115.6	13368.10
83	170.0	-34.4	1181.95
84	380.0	175.6	30842.55
85	150.0	-54.4	2957.13
86	50.0	-154.4	23833.04
87	297.0	92.6	8578.55
88	0.0	-204.4	41770.99
89	360.0	155.6	24217.73
90	0.0	-204.4	41770.99
91	0.0	-204.4	41770.99
92	0.0	-204.4	41770.99
93	45.0	-159.4	25401.83
94	198.0	-6.4	40.70
95	144.0	-60.4	3645.69
96	261.0	56.6	3205.88
97	36.0	-168.4	28351.66
98	126.0	-78.4	6143.35
99	9.0	-195.4	38173.16
100	171.0	-33.4	1114.19
	9327.0		934442.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	171.0	-33.4	1114.19
102	0.0	-204.4	41770.99
103	0.0	-204.4	41770.99
104	126.0	-78.4	6143.35
105	0.0	-204.4	41770.99
106	0.0	-204.4	41770.99
107	0.0	-204.4	41770.99
108	315.0	110.6	12236.89
109	261.0	56.6	3205.88
110	0.0	-204.4	41770.99
111	27.0	-177.4	31463.49
112	135.0	-69.4	4813.52
113	360.0	155.6	24217.73
114	135.0	-69.4	4813.52
115	180.0	-24.4	594.36
116	234.0	29.6	877.37
117	306.0	101.6	10326.72
118	216.0	11.6	135.04
119	279.0	74.6	5568.22
120	171.0	-33.4	1114.19
121	378.0	173.6	30144.07
122	18.0	-186.4	34737.32
123	0.0	-204.4	41770.99
124	9.0	-195.4	38173.16
125	180.0	-24.4	594.36
126	63.0	-141.4	19988.17
127	180.0	-24.4	594.36
128	135.0	-69.4	4813.52
129	198.0	-6.4	40.70
130	153.0	-51.4	2639.85
131	333.0	128.6	16543.23
132	180.0	-24.4	594.36
133	18.0	-186.4	34737.32
134	288.0	83.6	6992.38
135	261.0	56.6	3205.88
136	162.0	-42.4	1796.02
137	0.0	-204.4	41770.99
138	198.0	-6.4	40.70
139	216.0	11.6	135.04
140	0.0	-204.4	41770.99
141	207.0	2.6	6.87
142	9.0	-195.4	38173.16
143	0.0	-204.4	41770.99
144	63.0	-141.4	19988.17
145	99.0	-105.4	11104.84
146	144.0	-60.4	3645.69
147	207.0	2.6	6.87
148	108.0	-96.4	9289.01
149	306.0	101.6	10326.72
150	117.0	-87.4	7635.18
	7146.0		820281.3
	Sum(n)		Sum(n-N)²

06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FLOOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
151	117.0	-87.4	7635.18
152	198.0	-6.4	40.70
153	36.0	-168.4	28351.66
154	234.0	29.6	877.37
155	27.0	-177.4	31463.49
156	117.0	-87.4	7635.18
157	891.0	686.6	471447.69
158	432.0	227.6	51811.08
159	702.0	497.6	247626.14
160	504.0	299.6	89772.43
161	594.0	389.6	151804.12
162	432.0	227.6	51811.08
163	729.0	524.6	275226.65
164	369.0	164.6	27099.90
165	504.0	299.6	89772.43
166	747.0	542.6	294436.99
167	0.0	0.00	0.00
168	0.0	0.00	0.00
169	0.0	0.00	0.00
170	0.0	0.00	0.00
171	0.0	0.00	0.00
172	0.0	0.00	0.00
173	0.0	0.00	0.00
174	0.0	0.00	0.00
175	0.0	0.00	0.00
176	0.0	0.00	0.00
177	0.0	0.00	0.00
178	0.0	0.00	0.00
179	0.0	0.00	0.00
180	0.0	0.00	0.00
181	0.0	0.00	0.00
182	0.0	0.00	0.00
183	0.0	0.00	0.00
184	0.0	0.00	0.00
185	0.0	0.00	0.00
186	0.0	0.00	0.00
187	0.0	0.00	0.00
188	0.0	0.00	0.00
189	0.0	0.00	0.00
190	0.0	0.00	0.00
191	0.0	0.00	0.00
192	0.0	0.00	0.00
193	0.0	0.00	0.00
194	0.0	0.00	0.00
195	0.0	0.00	0.00
196	0.0	0.00	0.00
197	0.0	0.00	0.00
198	0.0	0.00	0.00
199	0.0	0.00	0.00
200	0.0	0.00	0.00
	6633.0		1826812.1
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
201	0.0	0.00	0.00
202	0.0	0.00	0.00
203	0.0	0.00	0.00
204	0.0	0.00	0.00
205	0.0	0.00	0.00
206	0.0	0.00	0.00
207	0.0	0.00	0.00
208	0.0	0.00	0.00
209	0.0	0.00	0.00
210	0.0	0.00	0.00
211	0.0	0.00	0.00
212	0.0	0.00	0.00
213	0.0	0.00	0.00
214	0.0	0.00	0.00
215	0.0	0.00	0.00
216	0.0	0.00	0.00
217	0.0	0.00	0.00
218	0.0	0.00	0.00
219	0.0	0.00	0.00
220	0.0	0.00	0.00
221	0.0	0.00	0.00
222	0.0	0.00	0.00
223	0.0	0.00	0.00
224	0.0	0.00	0.00
225	0.0	0.00	0.00
226	0.0	0.00	0.00
227	0.0	0.00	0.00
228	0.0	0.00	0.00
229	0.0	0.00	0.00
230	0.0	0.00	0.00
231	0.0	0.00	0.00
232	0.0	0.00	0.00
233	0.0	0.00	0.00
234	0.0	0.00	0.00
235	0.0	0.00	0.00
236	0.0	0.00	0.00
237	0.0	0.00	0.00
238	0.0	0.00	0.00
239	0.0	0.00	0.00
240	0.0	0.00	0.00
241	0.0	0.00	0.00
242	0.0	0.00	0.00
243	0.0	0.00	0.00
244	0.0	0.00	0.00
245	0.0	0.00	0.00
246	0.0	0.00	0.00
247	0.0	0.00	0.00
248	0.0	0.00	0.00
249	0.0	0.00	0.00
250	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON FACILITY

EMERGENCY BUILDING FIXTURES

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	6 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	300 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.6 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.A. Ryan DATE: 5-24-99

LN #	EMERGENCY BUILDING FIXTURES		READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	RM# 1	DOOR# 1	INSIDE	0	0	5	0
2	RM# 1	DOOR# 1	OUTSIDE	0	0	0	0
3	RM# 1	DOOR# 2	INSIDE	0	0	0	0
4	RM# 1	DOOR# 2	OUTSIDE	18	0	0	4
5	RM# 1	DOOR# 3	INSIDE	9	0	0	1
6	RM# 1	DOOR# 3	OUTSIDE	0	0	0	4
7	RM# 1	DOOR# 4	INSIDE	0	0	0	0
8	RM# 1	DOOR# 4	OUTSIDE	0	0	2	0
9	RM# 1	DOOR# 5	INSIDE	0	0	0	4
10	RM# 1	DOOR# 5	OUTSIDE	0	0	2	0
11	RM# 1	DOOR# 6	INSIDE	0	0	2	9
12	RM# 1	DOOR# 6	OUTSIDE	0	0	0	4
13	RM# 1	TOP	1A	0	0	0	0
14	RM# 1	TOP	1B	0	0	5	0
15	RM# 1	TOP	1C	0	0	0	4
16	RM# 1	TOP	1D	27	0	0	7
17	RM# 1	TOP	1E	0	0	0	9
18	RM# 1	TOP	2A	27	0	0	0
19	RM# 1	TOP	2B	18	0	0	1
20	RM# 1	TOP	2C	0	0	0	0
21	RM# 1	TOP	2D	0	0	2	0
22	RM# 1	TOP	2E	0	0	0	7
23	RM# 1	N. WALL	INSIDE 1	9	0	0	4
24	RM# 1	N. WALL	INSIDE 2	0	0	2	1
25	RM# 1	S. WALL	INSIDE 1	18	0	0	0
26	RM# 1	S. WALL	INSIDE 2	9	0	2	0
27	RM# 1	SHELF	1	0	0	0	0
28	RM# 1	SHELF	2	0	0	0	0
29	RM# 1	SHELF	3	0	0	0	4
30	RM# 1	TOP	INSIDE 1	0	0	0	1

CIMARRON FACILITY

EMERGENCY BUILDING FIXTURES

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	6 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	300 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.6 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. a. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FIXTURES		READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
31	RM# 1	TOP	INSIDE 2	0	0	0	0
32	RM# 1	TOP	INSIDE 3	0	0	0	0
33	RM# 1	BOTTOM	INSIDE 1	18	0	0	1
34	RM# 1	BOTTOM	INSIDE 2	18	0	0	0
35	RM# 1	BOTTOM	INSIDE 3	9	0	0	4
36	RM# 1	E. WALL	INSIDE 1	9	0	5	0
37	RM# 1	E. WALL	INSIDE 2	0	0	0	1
38	RM# 1	E. WALL	INSIDE 3	0	0	0	0
39	RM# 1	E. WALL	INSIDE 4	0	0	5	0
40	RM# 3	DOOR# 1	INSIDE	18	0	0	2
41	RM# 3	DOOR# 1	OUTSIDE	36	0	2	0
42	RM# 3	DOOR# 2	INSIDE	9	0	0	0
43	RM# 3	DOOR# 2	OUTSIDE	27	0	0	2
44	RM# 3	DOOR# 3	INSIDE	0	0	2	0
45	RM# 3	DOOR# 3	OUTSIDE	0	0	0	0
46	RM# 3	DOOR# 4	INSIDE	9	0	2	0
47	RM# 3	DOOR# 4	OUTSIDE	0	0	0	0
48	RM# 3	DOOR# 5	INSIDE	9	0	0	4
49	RM# 3	DOOR# 5	OUTSIDE	0	0	0	2
50	RM# 3	DOOR# 6	INSIDE	0	0	0	0
51	RM# 3	DOOR# 6	OUTSIDE	9	0	0	0
52	RM# 3	DOOR# 7	INSIDE	0	0	2	2
53	RM# 3	DOOR# 7	OUTSIDE	9	0	0	0
54	RM# 3	TOP	1A	9	0	0	6
55	RM# 3	TOP	1B	0	0	0	0
56	RM# 3	TOP	1C	18	0	0	4
57	RM# 3	TOP	1D	0	90	2	6
58	RM# 3	TOP	1E	0	0	2	4
59	RM# 3	TOP	2A	0	0	2	2
60	RM# 3	TOP	2B	9	0	2	0

CIMARRON FACILITY

EMERGENCY BUILDING FIXTURES

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	6 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	300 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.6 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.G. Bryan DATE: 5-24-99

LN #	EMERGENCY BUILDING FIXTURES		READING LOCATION ID	DIRECT		SMEAR	
				ALPHA	BETA	ALPHA	BETA
61	RM# 3	TOP	2C	0	9	0	0
62	RM# 3	TOP	2D	27	0	0	0
63	RM# 3	TOP	2E	9	0	0	0
64	RM# 3	N. WALL	INSIDE 1	0	0	2	0
65	RM# 3	N. WALL	INSIDE 2	56	0	2	0
66	RM# 3	S. WALL	INSIDE 1	27	0	0	2
67	RM# 3	S. WALL	INSIDE 2	9	0	2	11
68	RM# 3	SHELF	1	0	0	0	2
69	RM# 3	SHELF	2	0	0	0	2
70	RM# 3	SHELF	3	9	108	0	9
71	RM# 3	TOP	INSIDE 1	0	108	0	2
72	RM# 3	TOP	INSIDE 2	9	0	0	11
73	RM# 3	TOP	INSIDE 3	0	162	0	4
74	RM# 3	BOTTOM	INSIDE 1	9	0	0	2
75	RM# 3	BOTTOM	INSIDE 2	0	0	0	6
76	RM# 3	BOTTOM	INSIDE 3	18	72	2	0
77	RM# 3	E. WALL	INSIDE 1	0	0	0	0
78	RM# 3	E. WALL	INSIDE 2	18	0	0	9
79	RM# 3	E. WALL	INSIDE 3	0	0	2	0
80	RM# 3	E. WALL	INSIDE 4	0	0	0	0
81	CARRIER HEATING SYS		1	0	260	0	0
82	CARRIER HEATING SYS		2	0	0	0	2
83	CARRIER HEATING SYS		3	0	0	0	2
84	CARRIER HEATING SYS		4	0	0	0	7
85	CARRIER HEATING SYS		5	0	0	0	4
86	CARRIER HEATING SYS		6	0	0	0	0
87	CARRIER HEATING SYS		7	0	0	0	2
88	CARRIER HEATING SYS		8	0	0	0	2
89	CARRIER HEATING SYS		9	0	0	0	0
90	CARRIER HEATING SYS		10	0	160	0	0

CIMARRON FACILITY

EMERGENCY BUILDING FIXTURES

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	6 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	300 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.6 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W. A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING FIXTURES	READING LOCATION ID	DIRECT		SMEAR	
			ALPHA	BETA	ALPHA	BETA
91	CARRIER HEATING SYS	11	0	0	2	0
92	CARRIER HEATING SYS	12	0	0	0	2
93	AIR CONDITIONER	1	0	0	0	2
94	AIR CONDITIONER	2	0	0	0	0
95	AIR CONDITIONER	3	0	100	0	14
96	AIR CONDITIONER	4	0	0	0	2
97	AIR CONDITIONER	5	0	0	0	0
98	BATH ROOM SINK	1	0	0	0	0
99	BATH ROOM SINK	2	0	0	0	0
100	BATH ROOM SINK	3	0	0	0	0
101	BATH ROOM SINK	4	0	0	0	4
102	BATH ROOM SINK	5	0	0	0	2
103	BATH ROOM SINK	6	0	0	0	0
104	BATH ROOM SINK	7	0	20	0	0
105	BATHROOM STOOL	1	70	2070	0	0
106	BATHROOM STOOL	2	0	0	0	0
107	BATHROOM STOOL	3	0	0	5	2
108	BATHROOM STOOL	4	0	0	0	0
109	BATHROOM STOOL	5	80	1800	0	0
110	RM# 4 SINK	1	60	1440	0	0
111	RM# 4 SINK	2	0	0	0	2
112	RM# 4 SINK	3	0	1200	0	0
113	RM# 4 SINK	4	0	0	0	2
114	RM# 4 SINK	5	0	0	2	0
115	RM# 4 SINK	6	0	0	2	0
116	RM# 4 SINK	7	0	1800	2	0

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FIXTURES (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-6.5	42.0
2	0.0	-6.5	42.0
3	0.0	-6.5	42.0
4	18.0	11.5	132.6
5	9.0	2.5	6.3
6	0.0	-6.5	42.0
7	0.0	-6.5	42.0
8	0.0	-6.5	42.0
9	0.0	-6.5	42.0
10	0.0	-6.5	42.0
11	0.0	-6.5	42.0
12	0.0	-6.5	42.0
13	0.0	-6.5	42.0
14	0.0	-6.5	42.0
15	0.0	-6.5	42.0
16	27.0	20.5	421.0
17	0.0	-6.5	42.0
18	27.0	20.5	421.0
19	18.0	11.5	132.6
20	0.0	-6.5	42.0
21	0.0	-6.5	42.0
22	0.0	-6.5	42.0
23	9.0	2.5	6.3
24	0.0	-6.5	42.0
25	18.0	11.5	132.6
26	9.0	2.5	6.3
27	0.0	-6.5	42.0
28	0.0	-6.5	42.0
29	0.0	-6.5	42.0
30	0.0	-6.5	42.0
31	0.0	-6.5	42.0
32	0.0	-6.5	42.0
33	18.0	11.5	132.6
34	18.0	11.5	132.6
35	9.0	2.5	6.3
36	9.0	2.5	6.3
37	0.0	-6.5	42.0
38	0.0	-6.5	42.0
39	0.0	-6.5	42.0
40	18.0	11.5	132.6
41	36.0	29.5	871.3
42	9.0	2.5	6.3
43	27.0	20.5	421.0
44	0.0	-6.5	42.0
45	0.0	-6.5	42.0
46	9.0	2.5	6.3
47	0.0	-6.5	42.0
48	9.0	2.5	6.3
49	0.0	-6.5	42.0
50	0.0	-6.5	42.0
	245.0		5219.8
	210.0		12849.7
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	752		22395.0
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **116**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **6.48**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **13.95**

2 Std Deviations: **27.91**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.659**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **8.63** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	115	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	115	1.659	95%

PERFORMED BY: Debbie Booth DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

A:\AREAI\ERFIXACM.WB2

CIMARRON CORPORATION - CIMARRON FACILITY **ALPHA** **DIRECT**

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FIXTURES (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	9.0	2.5	6.34
52	0.0	-6.5	42.03
53	9.0	2.5	6.34
54	9.0	2.5	6.34
55	0.0	-6.5	42.03
56	18.0	11.5	132.65
57	0.0	-6.5	42.03
58	0.0	-6.5	42.03
59	0.0	-6.5	42.03
60	9.0	2.5	6.34
61	0.0	-6.5	42.03
62	27.0	20.5	420.96
63	9.0	2.5	6.34
64	0.0	-6.5	42.03
65	56.0	49.5	2451.96
66	27.0	20.5	420.96
67	9.0	2.5	6.34
68	0.0	-6.5	42.03
69	0.0	-6.5	42.03
70	9.0	2.5	6.34
71	0.0	-6.5	42.03
72	9.0	2.5	6.34
73	0.0	-6.5	42.03
74	9.0	2.5	6.34
75	0.0	-6.5	42.03
76	18.0	11.5	132.65
77	0.0	-6.5	42.03
78	18.0	11.5	132.65
79	0.0	-6.5	42.03
80	0.0	-6.5	42.03
81	0.0	-6.5	42.03
82	0.0	-6.5	42.03
83	0.0	-6.5	42.03
84	0.0	-6.5	42.03
85	0.0	-6.5	42.03
86	0.0	-6.5	42.03
87	0.0	-6.5	42.03
88	0.0	-6.5	42.03
89	0.0	-6.5	42.03
90	0.0	-6.5	42.03
91	0.0	-6.5	42.03
92	0.0	-6.5	42.03
93	0.0	-6.5	42.03
94	0.0	-6.5	42.03
95	0.0	-6.5	42.03
96	0.0	-6.5	42.03
97	0.0	-6.5	42.03
98	0.0	-6.5	42.03
99	0.0	-6.5	42.03
100	0.0	-6.5	42.03
	245.0		5219.8
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	-6.5	42.03
102	0.0	-6.5	42.03
103	0.0	-6.5	42.03
104	0.0	-6.5	42.03
105	70.0	63.5	4034.44
106	0.0	-6.5	42.03
107	0.0	-6.5	42.03
108	0.0	-6.5	42.03
109	80.0	73.5	5404.78
110	60.0	53.5	2864.10
111	0.0	-6.5	42.03
112	0.0	-6.5	42.03
113	0.0	-6.5	42.03
114	0.0	-6.5	42.03
115	0.0	-6.5	42.03
116	0.0	-6.5	42.03
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	210.0		12849.7
	Sum(n)		Sum(n-N)²

06/16/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING FIXTURES (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-81.0	6565.2
2	0.0	-81.0	6565.2
3	0.0	-81.0	6565.2
4	0.0	-81.0	6565.2
5	0.0	-81.0	6565.2
6	0.0	-81.0	6565.2
7	0.0	-81.0	6565.2
8	0.0	-81.0	6565.2
9	0.0	-81.0	6565.2
10	0.0	-81.0	6565.2
11	0.0	-81.0	6565.2
12	0.0	-81.0	6565.2
13	0.0	-81.0	6565.2
14	0.0	-81.0	6565.2
15	0.0	-81.0	6565.2
16	0.0	-81.0	6565.2
17	0.0	-81.0	6565.2
18	0.0	-81.0	6565.2
19	0.0	-81.0	6565.2
20	0.0	-81.0	6565.2
21	0.0	-81.0	6565.2
22	0.0	-81.0	6565.2
23	0.0	-81.0	6565.2
24	0.0	-81.0	6565.2
25	0.0	-81.0	6565.2
26	0.0	-81.0	6565.2
27	0.0	-81.0	6565.2
28	0.0	-81.0	6565.2
29	0.0	-81.0	6565.2
30	0.0	-81.0	6565.2
31	0.0	-81.0	6565.2
32	0.0	-81.0	6565.2
33	0.0	-81.0	6565.2
34	0.0	-81.0	6565.2
35	0.0	-81.0	6565.2
36	0.0	-81.0	6565.2
37	0.0	-81.0	6565.2
38	0.0	-81.0	6565.2
39	0.0	-81.0	6565.2
40	0.0	-81.0	6565.2
41	0.0	-81.0	6565.2
42	0.0	-81.0	6565.2
43	0.0	-81.0	6565.2
44	0.0	-81.0	6565.2
45	0.0	-81.0	6565.2
46	0.0	-81.0	6565.2
47	0.0	-81.0	6565.2
48	0.0	-81.0	6565.2
49	0.0	-81.0	6565.2
50	0.0	-81.0	6565.2
	1069.0		321163.2
	8330.0		13034052.2
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	9399		13683474.9
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **116**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **81.03**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **344.94**
2 Std Deviations: **689.89**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.659**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **134.16** DPM /100cm²
GUIDELINE VALUE: **5000** DPM /100cm²
Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	115	is calculated as follow:		
EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]				
The (df) value for (X)	115	1.659	95%	

PERFORMED BY: Debbie Boots DATE: 6/16/99

REVIEWED BY: W. A. Rogers DATE: 6-16-99

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CIMARRON CORPORATION - CIMARRON FACILITY **BETA** **DIRECT**

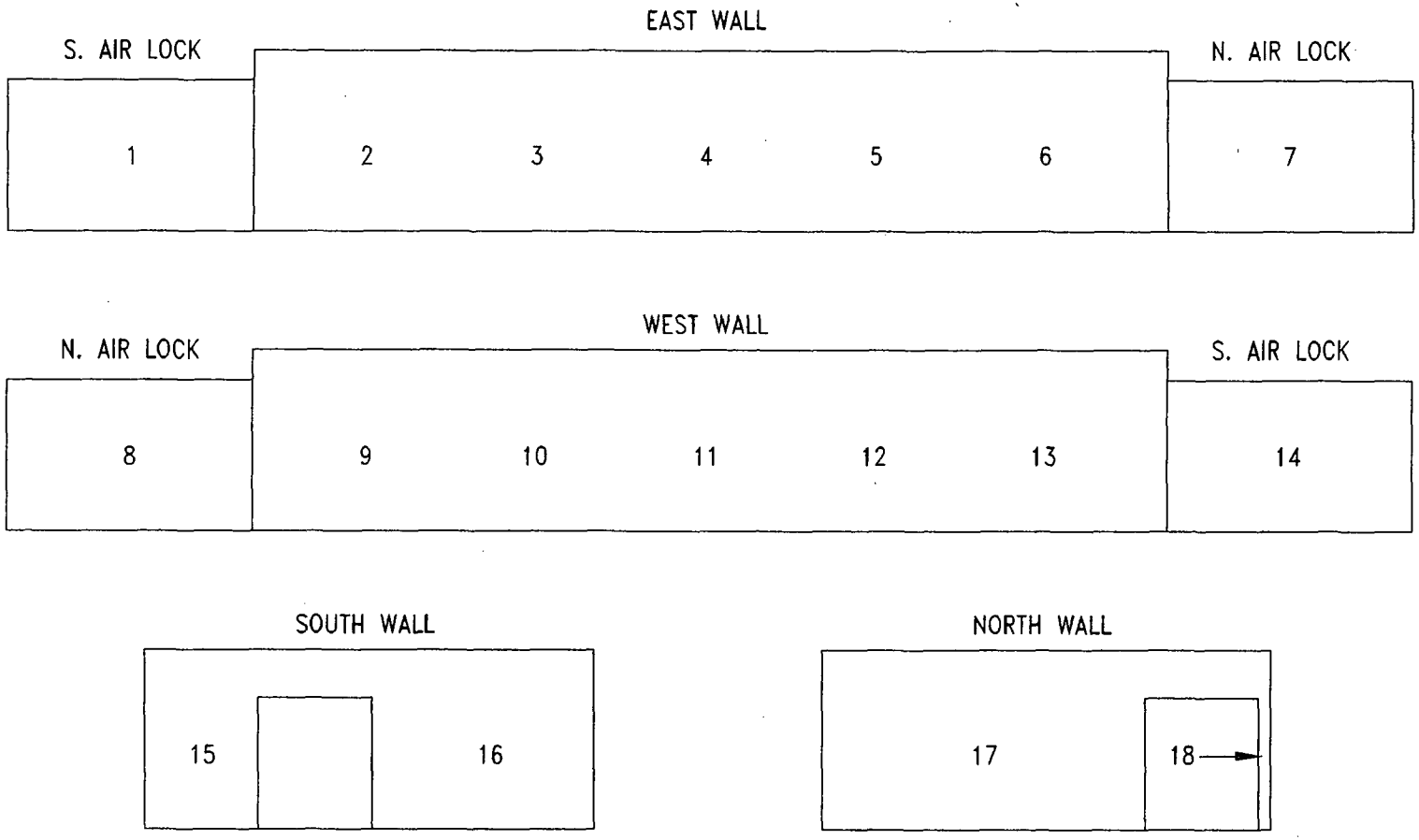
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING FIXTURES (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
51	0.0	-81.0	6565.19
52	0.0	-81.0	6565.19
53	0.0	-81.0	6565.19
54	0.0	-81.0	6565.19
55	0.0	-81.0	6565.19
56	0.0	-81.0	6565.19
57	90.0	9.0	80.54
58	0.0	-81.0	6565.19
59	0.0	-81.0	6565.19
60	0.0	-81.0	6565.19
61	9.0	-72.0	5187.72
62	0.0	-81.0	6565.19
63	0.0	-81.0	6565.19
64	0.0	-81.0	6565.19
65	0.0	-81.0	6565.19
66	0.0	-81.0	6565.19
67	0.0	-81.0	6565.19
68	0.0	-81.0	6565.19
69	0.0	-81.0	6565.19
70	108.0	27.0	727.60
71	108.0	27.0	727.60
72	0.0	-81.0	6565.19
73	162.0	81.0	6556.81
74	0.0	-81.0	6565.19
75	0.0	-81.0	6565.19
76	72.0	-9.0	81.47
77	0.0	-81.0	6565.19
78	0.0	-81.0	6565.19
79	0.0	-81.0	6565.19
80	0.0	-81.0	6565.19
81	260.0	179.0	32031.74
82	0.0	-81.0	6565.19
83	0.0	-81.0	6565.19
84	0.0	-81.0	6565.19
85	0.0	-81.0	6565.19
86	0.0	-81.0	6565.19
87	0.0	-81.0	6565.19
88	0.0	-81.0	6565.19
89	0.0	-81.0	6565.19
90	160.0	79.0	6236.91
91	0.0	-81.0	6565.19
92	0.0	-81.0	6565.19
93	0.0	-81.0	6565.19
94	0.0	-81.0	6565.19
95	100.0	19.0	360.02
96	0.0	-81.0	6565.19
97	0.0	-81.0	6565.19
98	0.0	-81.0	6565.19
99	0.0	-81.0	6565.19
100	0.0	-81.0	6565.19
	1069.0		321163.2
	Sum(n)		Sum(n-N)²

Number	n	(n-N)	(n-N)²
101	0.0	-81.0	6565.19
102	0.0	-81.0	6565.19
103	0.0	-81.0	6565.19
104	20.0	-61.0	3724.16
105	2070.0	1989.0	3956018.12
106	0.0	-81.0	6565.19
107	0.0	-81.0	6565.19
108	0.0	-81.0	6565.19
109	1800.0	1719.0	2954872.09
110	1440.0	1359.0	1846810.71
111	0.0	-81.0	6565.19
112	1200.0	1119.0	1252103.12
113	0.0	-81.0	6565.19
114	0.0	-81.0	6565.19
115	0.0	-81.0	6565.19
116	1800.0	1719.0	2954872.09
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	8330.0		13034052.2
	Sum(n)		Sum(n-N)²



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

3 0 3

SCALE IN METERS

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

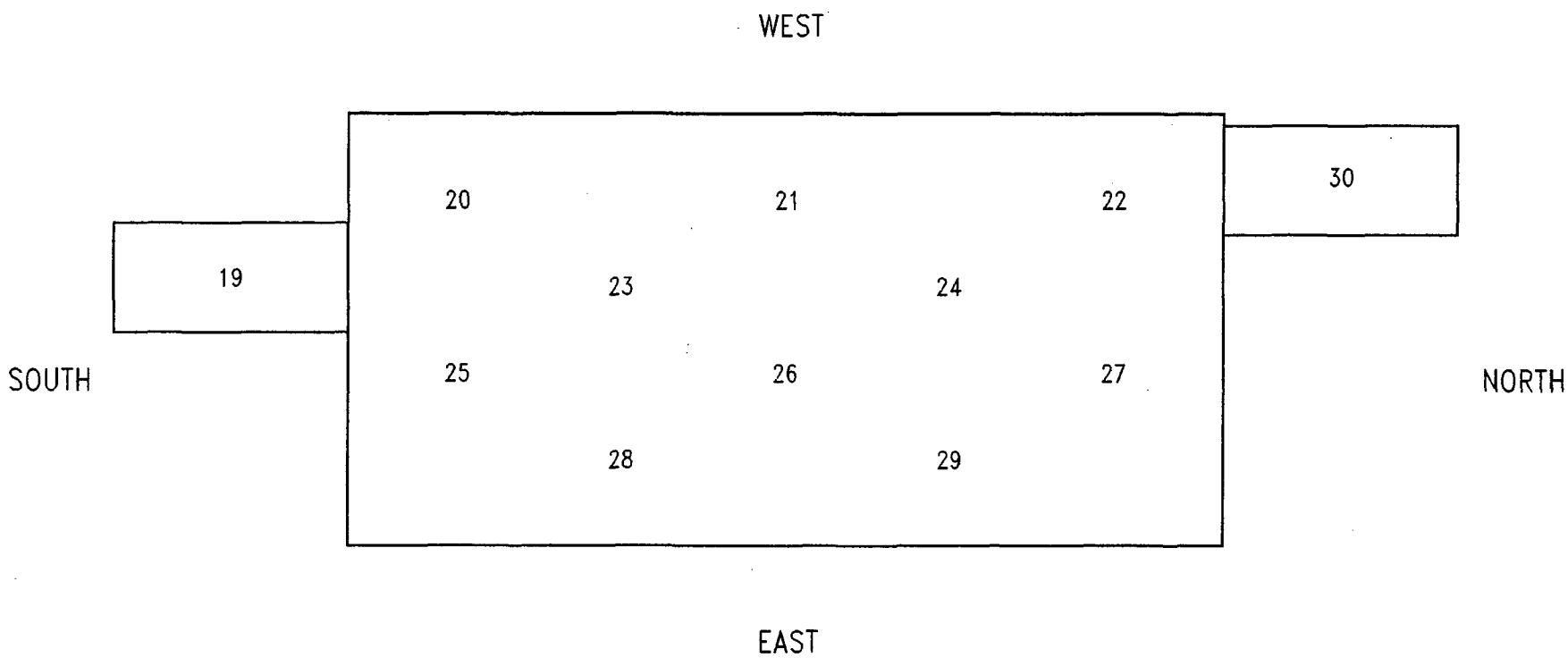
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING EXTERIOR WALLS

DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-15	0

...SUBAREAI\EMER-BLDG\EMER-EXTERIOR



NOTES:

REFER TO DATA TABLE FOR SURVEY RESULTS.

3 0 3

SCALE IN METERS

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
SURVEY PATTERN LOCATION
EMERGENCY BUILDING ROOF

DRWN. BY	DATE	SCALE:
JE	5-23-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSIEMS-16	0

...SUBAREAI\EMER-BLDG\EMER-ROOF

CIMARRON FACILITY

EMERGENCY BUILDING

SUB AREA "I"

ALPHA AND BETA/GAMMA UNAFFECTED PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
ALPHA DIRECT LUDLUM 2220 - 43-68 PROBE	58308	DPM/100cm²	4 cpm	84 DPM
BETA DIRECT LUDLUM 2220 - 43-68 PROBE	58309	DPM/100cm²	276 cpm	502 DPM
ALPHA AND BETA SMEAR TENNELEC LB-5100	CI-01	ALPHA - DPM/100cm² BETA - DPM/100 cm²	.3 cpm 1.3 cpm	11 DPM/100cm² 16 DPM/100cm²

REVIEWED BY: W.A. Rogers DATE: 5-24-99

LN #	EMERGENCY BUILDING EXTERIOR	READING LOCATION ID	DIRECT ALPHA	DIRECT BETA	SMEAR ALPHA	SMEAR BETA
1	EAST WALL	1	72	0	4	0
2	EAST WALL	2	18	0	0	6
3	EAST WALL	3	54	0	0	0
4	EAST WALL	4	63	0	0	4
5	EAST WALL	5	54	0	2	6
6	EAST WALL	6	54	0	0	4
7	EAST WALL	7	36	0	4	6
8	WEST WALL	8	56	0	2	1
9	WEST WALL	9	27	0	0	4
10	WEST WALL	10	45	0	0	0
11	WEST WALL	11	45	0	0	0
12	WEST WALL	12	72	0	7	9
13	WEST WALL	13	90	0	0	0
14	WEST WALL	14	36	0	0	1
15	SOUTH WALL	15	81	0	2	1
16	SOUTH WALL	16	45	0	0	9
17	NORTH WALL	17	81	0	0	9
18	NORTH WALL	18	144	0	2	4
19	ROOF	19	162	171	2	1
20	ROOF	20	81	432	0	4
21	ROOF	21	162	189	2	0
22	ROOF	22	135	144	0	6
23	ROOF	23	144	159	0	4
24	ROOF	24	153	126	0	9
25	ROOF	25	126	216	0	4
26	ROOF	26	45	315	0	0
27	ROOF	27	63	360	0	6
28	ROOF	28	126	167	0	4
29	ROOF	29	162	315	2	4
30	ROOF	30	144	459	0	0

04/22/99

CIMARRON CORPORATION - CIMARRON FACILITY ALPHA DIRECT
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" EMERGENCY BUILDING EXTERIOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	72.0	-13.9	192.3
2	18.0	-67.9	4605.9
3	54.0	-31.9	1015.5
4	63.0	-22.9	522.9
5	54.0	-31.9	1015.5
6	54.0	-31.9	1015.5
7	36.0	-49.9	2486.7
8	56.0	-29.9	892.0
9	27.0	-58.9	3465.3
10	45.0	-40.9	1670.1
11	45.0	-40.9	1670.1
12	72.0	-13.9	192.3
13	90.0	4.1	17.1
14	36.0	-49.9	2486.7
15	81.0	-4.9	23.7
16	45.0	-40.9	1670.1
17	81.0	-4.9	23.7
18	144.0	58.1	3379.5
19	162.0	76.1	5796.3
20	81.0	-4.9	23.7
21	162.0	76.1	5796.3
22	135.0	49.1	2414.1
23	144.0	58.1	3379.5
24	153.0	67.1	4506.9
25	126.0	40.1	1610.7
26	45.0	-40.9	1670.1
27	63.0	-22.9	522.9
28	126.0	40.1	1610.7
29	162.0	76.1	5796.3
30	144.0	58.1	3379.5
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	2576		62851.5
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 30

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 85.87

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 46.55
2 Std Deviations: 93.11
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 100.31 DPM /100cm²
GUIDELINE VALUE: 5000 DPM /100cm²
Acceptable Level: 5000.0 DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Mickey Hodo DATE: 4-22-99

REVIEWED BY: W.a. Rogers DATE: 4-26-99

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06/15/99

CIMARRON CORPORATION - CIMARRON FACILITY BETA DIRECT

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

AREA "I" EMERGENCY BUILDING EXTERIOR SURVEY (UNAFFECTED)

n = DPM /100cm²

Number	n	(n-N)	(n-N)²
1	0.0	-101.8	10356.5
2	0.0	-101.8	10356.5
3	0.0	-101.8	10356.5
4	0.0	-101.8	10356.5
5	0.0	-101.8	10356.5
6	0.0	-101.8	10356.5
7	0.0	-101.8	10356.5
8	0.0	-101.8	10356.5
9	0.0	-101.8	10356.5
10	0.0	-101.8	10356.5
11	0.0	-101.8	10356.5
12	0.0	-101.8	10356.5
13	0.0	-101.8	10356.5
14	0.0	-101.8	10356.5
15	0.0	-101.8	10356.5
16	0.0	-101.8	10356.5
17	0.0	-101.8	10356.5
18	0.0	-101.8	10356.5
19	171.0	69.2	4793.3
20	432.0	330.2	109054.1
21	189.0	87.2	7609.7
22	144.0	42.2	1783.7
23	159.0	57.2	3275.7
24	126.0	24.2	587.3
25	216.0	114.2	13049.3
26	315.0	213.2	45468.5
27	360.0	258.2	66684.5
28	167.0	65.2	4255.4
29	315.0	213.2	45468.5
30	459.0	357.2	127615.7
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
total	3053		616061.4
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **30**

COUNT TIME: 0.5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : **101.77**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **145.75**

2 Std Deviations: **291.50**

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = **1.699**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **146.98** DPM /100cm²

GUIDELINE VALUE: **5000** DPM /100cm²

Acceptable Level: **5000.0** DPM /100cm²

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Debbie Booth DATE: 6/15/99

REVIEWED BY: W.a. Boyce DATE: 6-16-99

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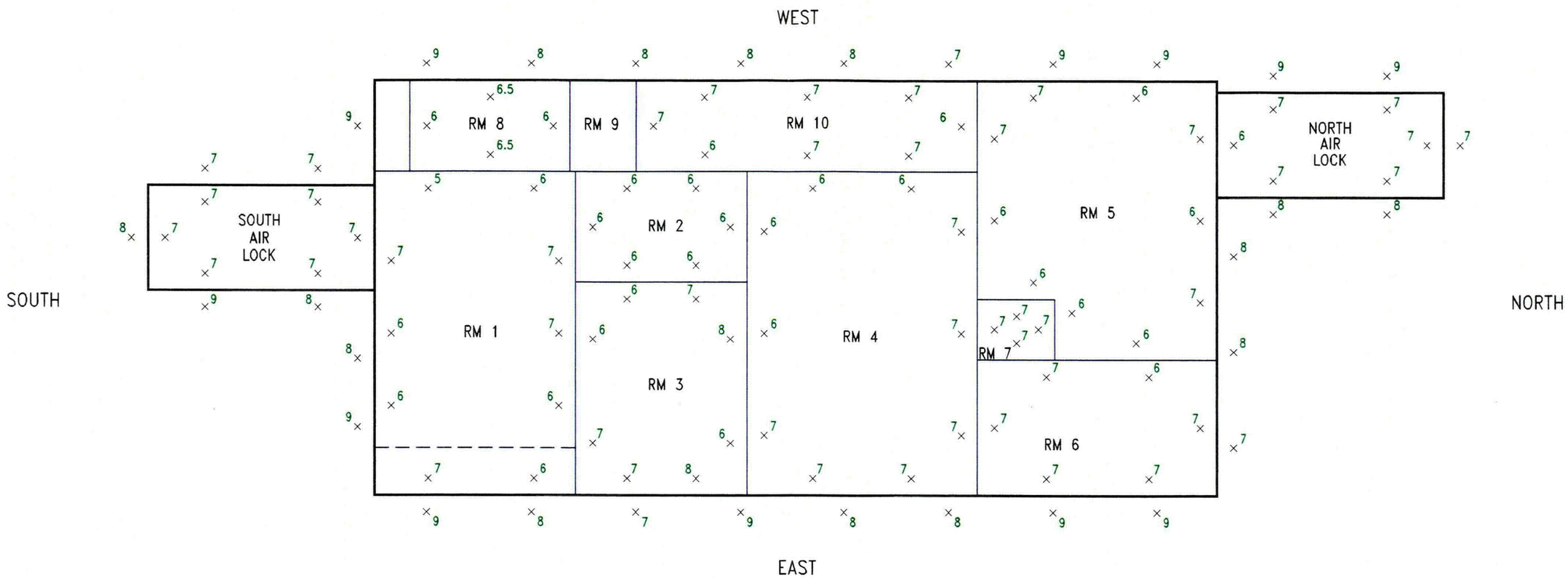


2 0 2

SCALE IN METERS

NOTES:

READINGS ARE IN MICRO-R/HR (μR/Hr)

INSTRUMENT: LUDLUM MICRO-R METER
SERIAL NO: 138420
MODEL NO: 19
BACKGROUND: 9 μR/Hr

MICRO-R READINGS ARE AT 1 METER FROM WALL AND 1 METER FROM FLOOR

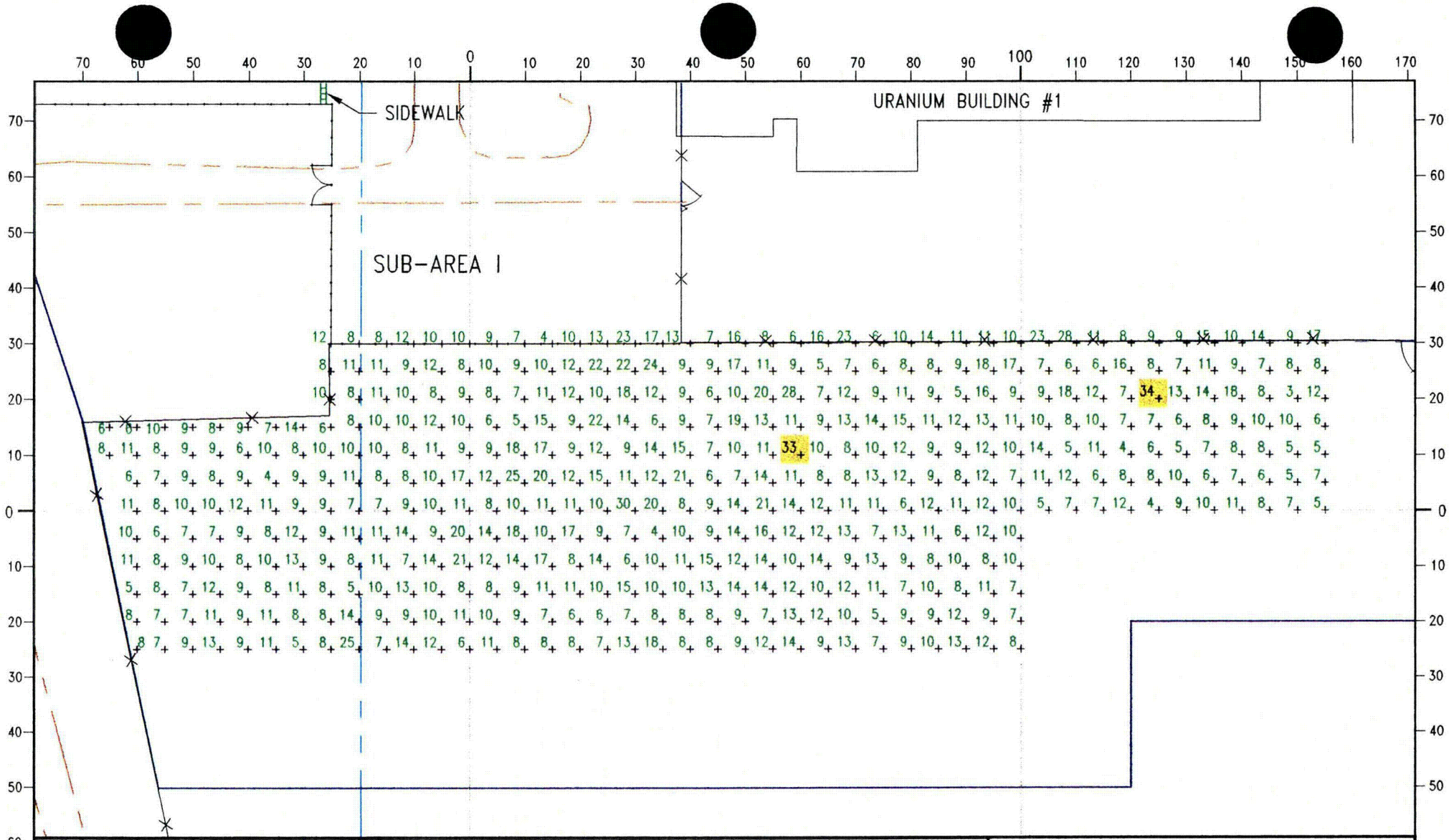
REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II - SUB-AREA I
FINAL MICRO-R SURVEY RESULTS
EMERGENCY BUILDING - INSIDE & OUTSIDE

DRWN. BY	DATE	SCALE:
JE	5-22-99	AS SHOWN
JOB NO.	DRAWING NO.	REV.
	99POSIEMS-17	0

...SUBAREAI\EMER-BLDG\EMER-IN-OUT



NORTH

25 0 25

SCALE IN METERS

NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6_+ URANIUM, 1 – 30 pCi/g U

45_+ URANIUM, > 30 pCi/g U

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED AREA – SOUTH OF URANIUM PLANT YARD
SOIL SAMPLE RESULTS – SURFACE

DRWN. BY	DATE	SCALE:
JE	4-19-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSISS-0	0

...\SUBAREAI\SOUTH-OF-U-PLANT-SURFACE\99POSISS

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
1	65	W	-	0	N	7786	8	8	6	2
2	65	W	-	5	N	8060	9	8	3	1
3	65	W	-	10	N	8162	8	8	8	2
4	65	W	-	15	N	7528	8	8	6	2
5	60	W	-	25	S	8256	9	8	8	1
6	60	W	-	20	S	8016	9	9	8	1
7	60	W	-	15	S	6606	8	7	5	1
8	60	W	-	10	S	8036	9	8	11	1
9	60	W	-	5	S	7726	9	8	10	1
10	60	W	-	0	N	7878	8	8	11	1
11	60	W	-	5	N	7482	9	8	6	1
12	60	W	-	10	N	8968	9	9	11	1
13	60	W	-	15	N	8210	7	7	6	1
14	55	W	-	25	S	8196	9	8	7	1
15	55	W	-	20	S	6882	7	7	7	1
16	55	W	-	15	S	7682	8	8	8	1
17	55	W	-	10	S	7782	8	8	8	1
18	55	W	-	5	S	7670	8	8	6	2
19	55	W	-	0	N	8100	8	8	8	1
20	55	W	-	5	N	8100	9	8	7	1
21	55	W	-	10	N	8350	8	8	8	1
22	55	W	-	15	N	8104	8	8	10	1
23	50	W	-	25	S	7318	8	8	9	1
24	50	W	-	20	S	6812	7	7	7	1
25	50	W	-	15	S	7584	8	8	7	1
26	50	W	-	10	S	8194	8	8	9	2
27	50	W	-	5	S	8096	8	7	7	2
28	50	W	-	0	N	7810	8	8	10	1
29	50	W	-	5	N	8252	8	8	9	1
30	50	W	-	10	N	8112	8	8	9	1

CIMARRON FACILITY

SUB AREA "I" PHASE II **SURFACE**

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - **M/N 19**	**111299**	µr/hr	**9**	**2**
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	**97264**	CPM	**7160**	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	**Total U 4.0** **Th (Nat) 1.5**	**10** **1**

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
31	50	W	-	15	N	7976	8	8	9	2
32	45	W	-	25	S	7970	7	7	13	1
33	45	W	-	20	S	7384	7	7	11	1
34	45	W	-	15	S	8012	8	8	12	1
35	45	W	-	10	S	8030	8	8	10	1
36	45	W	-	5	S	7810	8	8	7	1
37	45	W	-	0	N	7486	7	8	10	1
38	45	W	-	5	N	8242	8	8	8	1
39	45	W	-	10	N	8342	9	8	9	1
40	45	W	-	15	N	8204	9	8	8	1
41	40	W	-	25	S	7336	7	7	9	1
42	40	W	-	20	S	7978	9	8	9	1
43	40	W	-	15	S	8088	9	8	9	1
44	40	W	-	10	S	7406	9	8	8	1
45	40	W	-	5	S	8250	8	8	9	1
46	40	W	-	0	N	7198	8	8	12	1
47	40	W	-	5	N	8436	8	8	9	2
48	40	W	-	10	N	8076	8	8	6	1
49	40	W	-	15	N	8460	8	8	9	1
50	35	W	-	25	S	8518	8	8	11	1
51	35	W	-	20	S	8316	8	8	11	1
52	35	W	-	15	S	7746	8	8	8	1
53	35	W	-	10	S	7838	9	8	10	1
54	35	W	-	5	S	8106	8	8	8	1
55	35	W	-	0	N	8414	9	9	11	1
56	35	W	-	5	N	7978	8	8	4	2
57	35	W	-	10	N	8530	8	8	10	1
58	35	W	-	15	N	6362	7	7	7	1
59	30	W	-	25	S	9028	9	8	5	1
60	30	W	-	20	S	7562	9	9	8	1

CIMARRON FACILITY

SUB AREA "I" PHASE II **SURFACE**

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - **M/N 19**	**111299**	µr/hr	**9**	**2**
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	**97264**	CPM	**7160**	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	**Total U 4.0** **Th (Nat) 1.5**	**10** **1**

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
61	30	W	-	15	S	8066	8	8	11	1
62	30	W	-	10	S	7826	8	8	13	1
63	30	W	-	5	S	7938	8	8	12	1
64	30	W	-	0	N	8286	8	8	9	1
65	30	W	-	5	N	8528	9	9	9	2
66	30	W	-	10	N	7142	8	7	8	1
67	30	W	-	15	N	8054	8	8	14	2
68	25	W	-	25	S	8540	8	8	8	1
69	25	W	-	20	S	8580	8	8	8	1
70	25	W	-	15	S	8352	8	8	8	2
71	25	W	-	10	S	8652	9	8	9	2
72	25	W	-	5	S	8460	8	8	9	2
73	25	W	-	0	N	8480	9	9	9	1
74	25	W	-	5	N	8384	9	9	9	1
75	25	W	-	10	N	6432	7	7	10	1
76	25	W	-	15	N	7396	7	7	6	1
77	25	W	-	20	N	8246	8	8	10	2
78	25	W	-	25	N	9106	8	8	8	2
79	25	W	-	30	N	8064	7	7	12	2
80	20	W	-	25	S	9582	10	9	25	1
81	20	W	-	20	S	9440	10	9	14	2
82	20	W	-	15	S	8960	10	9	5	2
83	20	W	-	10	S	7574	8	8	8	1
84	20	W	-	5	S	8890	8	8	11	2
85	20	W	-	0	N	9054	9	8	7	2
86	20	W	-	5	N	8124	8	8	11	2
87	20	W	-	10	N	7924	8	8	10	1
88	20	W	-	15	N	8656	9	9	8	1
89	20	W	-	20	N	8792	8	8	8	1
90	20	W	-	25	N	8508	9	8	11	1

CIMARRON FACILITY

SUB AREA "I" PHASE II **SURFACE**

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - **M/N 19**	**111299**	µr/hr	**9**	**2**
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	**97264**	CPM	**7160**	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	**Total U 4.0** **Th (Nat) 1.5**	**10** **1**

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
91	20	W	-	30	N	5738	8	8	8	2
92	15	W	-	25	S	8840	8	8	7	1
93	15	W	-	20	S	8812	8	9	9	2
94	15	W	-	15	S	7808	7	7	10	1
95	15	W	-	10	S	8562	9	8	11	1
96	15	W	-	5	S	8670	9	8	11	2
97	15	W	-	0	N	8640	9	8	7	2
98	15	W	-	5	N	8802	9	8	8	2
99	15	W	-	10	N	8916	8	8	10	2
100	15	W	-	15	N	8506	9	8	10	1
101	15	W	-	20	N	8866	8	8	11	2
102	15	W	-	25	N	8610	8	8	11	2
103	15	W	-	30	N	7948	8	8	8	1
104	10	W	-	25	S	10624	10	10	14	2
105	10	W	-	20	S	8996	9	9	9	2
106	10	W	-	15	S	9140	9	8	13	2
107	10	W	-	10	S	8456	8	8	7	2
108	10	W	-	5	S	8534	9	9	14	1
109	10	W	-	0	N	8604	9	9	9	1
110	10	W	-	5	N	8784	9	9	8	1
111	10	W	-	10	N	8706	9	8	8	1
112	10	W	-	15	N	8632	9	8	10	1
113	10	W	-	20	N	7686	8	8	10	1
114	10	W	-	25	N	7962	9	8	9	1
115	10	W	-	30	N	8006	8	7	12	2
116	5	W	-	25	S	9246	8	8	12	2
117	5	W	-	20	S	8476	9	9	10	1
118	5	W	-	15	S	10416	10	9	10	2
119	5	W	-	10	S	8506	10	9	14	1
120	5	W	-	5	S	8798	10	9	9	2

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
121	5	W	-	0	N	8780	10	9	10	2
122	5	W	-	5	N	9516	9	9	10	2
123	5	W	-	10	N	8972	9	8	11	2
124	5	W	-	15	N	8412	8	8	12	2
125	5	W	-	20	N	8382	8	8	8	1
126	5	W	-	25	N	8190	8	8	12	2
127	5	W	-	30	N	8372	9	8	10	2
128	0	E	-	25	S	9320	9	9	6	2
129	0	E	-	20	S	8876	10	9	11	1
130	0	E	-	15	S	8056	9	8	8	1
131	0	E	-	10	S	7660	8	7	21	1
132	0	E	-	5	S	8212	8	8	20	2
133	0	E	-	0	N	6458	8	8	11	1
134	0	E	-	5	N	8346	9	9	17	2
135	0	E	-	10	N	8080	8	7	9	2
136	0	E	-	15	N	8336	8	8	10	2
137	0	E	-	20	N	8654	9	8	9	2
138	0	E	-	25	N	8482	9	8	8	2
139	0	E	-	30	N	8420	8	7	10	1
140	5	E	-	25	S	8860	10	8	11	2
141	5	E	-	20	S	8704	9	9	10	2
142	5	E	-	15	S	8324	9	8	8	2
143	5	E	-	10	S	7618	7	7	12	1
144	5	E	-	5	S	8190	8	8	14	2
145	5	E	-	0	N	7914	8	8	8	2
146	5	E	-	5	N	7474	8	7	12	2
147	5	E	-	10	N	8512	9	8	9	1
148	5	E	-	15	N	7178	8	8	6	1
149	5	E	-	20	N	7256	7	7	8	1
150	5	E	-	25	N	8058	8	8	10	2

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
151	5	E	-	30	N	7922	9	8	9	2
152	10	E	-	25	S	9054	8	8	8	2
153	10	E	-	20	S	8822	8	8	9	1
154	10	E	-	15	S	7760	8	8	9	1
155	10	E	-	10	S	7208	7	7	14	1
156	10	E	-	5	S	7520	7	7	18	1
157	10	E	-	0	N	7708	7	7	10	1
158	10	E	-	5	N	7548	8	8	25	2
159	10	E	-	10	N	8658	9	7	18	1
160	10	E	-	15	N	7722	8	8	5	1
161	10	E	-	20	N	7546	8	8	7	1
162	10	E	-	25	N	7540	8	7	9	1
163	10	E	-	30	N	7314	8	7	7	1
164	15	E	-	25	S	8594	8	8	8	2
165	15	E	-	20	S	8724	9	9	7	2
166	15	E	-	15	S	7612	7	7	11	1
167	15	E	-	10	S	7018	7	7	17	1
168	15	E	-	5	S	6916	8	7	10	2
169	15	E	-	0	N	7434	8	8	11	1
170	15	E	-	5	N	7472	7	8	20	2
171	15	E	-	10	N	7248	8	7	17	1
172	15	E	-	15	N	8234	8	8	15	1
173	15	E	-	20	N	9832	9	8	11	1
174	15	E	-	25	N	7746	9	8	10	2
175	15	E	-	30	N	6774	7	7	4	2
176	20	E	-	25	S	8668	9	9	8	2
177	20	E	-	20	S	8658	9	9	6	2
178	20	E	-	15	S	7242	7	7	11	1
179	20	E	-	10	S	6782	7	7	8	1
180	20	E	-	5	S	7014	7	7	17	1

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
181	20	E	-	0	N	7506	8	8	11	1
182	20	E	-	5	N	6954	8	8	12	1
183	20	E	-	10	N	7078	9	8	9	1
184	20	E	-	15	N	7198	8	8	9	1
185	20	E	-	20	N	8220	9	8	12	1
186	20	E	-	25	N	7954	8	8	12	2
187	20	E	-	30	N	6870	8	7	10	1
188	25	E	-	25	S	8898	9	8	7	1
189	25	E	-	20	S	8900	8	8	6	2
190	25	E	-	15	S	8184	7	8	10	2
191	25	E	-	10	S	6648	7	7	14	1
192	25	E	-	5	S	6778	7	7	9	1
193	25	E	-	0	N	7638	8	7	10	2
194	25	E	-	5	N	7604	8	8	15	1
195	25	E	-	10	N	7006	8	7	12	1
196	25	E	-	15	N	7648	8	7	22	2
197	25	E	-	20	N	9262	9	9	10	2
198	25	E	-	25	N	9710	10	9	22	2
199	25	E	-	30	N	7712	7	8	13	1
200	30	E	-	25	S	9110	9	8	13	1
201	30	E	-	20	S	9110	9	8	7	2
202	30	E	-	15	S	8702	9	8	15	2
203	30	E	-	10	S	7088	8	8	6	1
204	30	E	-	5	S	6348	7	7	7	1
205	30	E	-	0	N	8232	7	8	30	1
206	30	E	-	5	N	7714	8	8	11	2
207	30	E	-	10	N	6832	7	7	9	1
208	30	E	-	15	N	7712	8	8	14	1
209	30	E	-	20	N	8194	9	8	18	1
210	30	E	-	25	N	9020	10	9	22	2

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
211	30	E	-	30	N	8796	8	8	23	1
212	35	E	-	25	S	8408	9	9	18	1
213	35	E	-	20	S	6476	8	7	8	2
214	35	E	-	15	S	8356	9	8	10	2
215	35	E	-	10	S	8880	9	9	10	2
216	35	E	-	5	S	7072	7	7	4	1
217	35	E	-	0	N	8832	9	8	20	2
218	35	E	-	5	N	7692	8	8	12	2
219	35	E	-	10	N	6660	7	7	14	1
220	35	E	-	15	N	7366	8	8	6	1
221	35	E	-	20	N	8000	8	8	12	1
222	35	E	-	25	N	9494	9	8	24	2
223	35	E	-	30	N	8064	8	7	17	1
224	40	E	-	25	S	7966	8	7	8	1
225	40	E	-	20	S	7096	7	7	8	1
226	40	E	-	15	S	8956	8	8	10	2
227	40	E	-	10	S	9340	9	9	11	2
228	40	E	-	5	S	8724	9	8	10	1
229	40	E	-	0	N	7930	8	7	8	1
230	40	E	-	5	N	8938	9	8	21	1
231	40	E	-	10	N	7084	7	7	15	2
232	40	E	-	15	N	7062	8	8	9	1
233	40	E	-	20	N	8562	9	8	9	2
234	40	E	-	25	N	8752	9	8	9	2
235	40	E	-	30	N	7656	8	8	13	1
236	45	E	-	25	S	8628	8	8	8	1
237	45	E	-	20	S	8698	9	8	8	2
238	45	E	-	15	S	7734	9	8	13	1
239	45	E	-	10	S	9036	8	8	15	2
240	45	E	-	5	S	8998	9	8	9	2

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
241	45	E	-	0	N	8530	9	8	9	2
242	45	E	-	5	N	7060	8	8	6	1
243	45	E	-	10	N	6430	7	7	7	1
244	45	E	-	15	N	7928	8	8	7	2
245	45	E	-	20	N	8160	8	8	6	2
246	45	E	-	25	N	8438	9	8	9	2
247	45	E	-	30	N	7706	8	8	7	1
248	50	E	-	25	S	8730	8	8	9	1
249	50	E	-	20	S	8788	9	8	9	2
250	50	E	-	15	S	8958	10	9	14	2
251	50	E	-	10	S	9016	9	9	12	2
252	50	E	-	5	S	9066	9	8	14	1
253	50	E	-	0	N	8842	8	8	14	2
254	50	E	-	5	N	7738	8	7	7	2
255	50	E	-	10	N	7168	8	8	10	1
256	50	E	-	15	N	8306	9	8	19	2
257	50	E	-	20	N	8048	8	8	10	2
258	50	E	-	25	N	8876	8	8	17	1
259	50	E	-	30	N	7624	8	8	16	2
260	55	E	-	25	S	8330	8	8	12	1
261	55	E	-	20	S	7898	8	8	7	2
262	55	E	-	15	S	7778	8	8	14	1
263	55	E	-	10	S	8842	8	8	14	2
264	55	E	-	5	S	8358	9	9	16	2
265	55	E	-	0	N	9510	9	9	21	1
266	55	E	-	5	N	9130	10	10	14	2
267	55	E	-	10	N	7638	8	8	11	1
268	55	E	-	15	N	7930	8	8	13	1
269	55	E	-	20	N	8760	8	8	20	1
270	55	E	-	25	N	8222	9	8	11	2

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 5-19-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
271	55	E	-	30	N	7506	7	7	8	2
272	60	E	-	25	S	8574	8	8	14	1
273	60	E	-	20	S	8314	8	8	13	2
274	60	E	-	15	S	8642	9	9	12	1
275	60	E	-	10	S	8350	8	8	10	1
276	60	E	-	5	S	8346	9	8	12	1
277	60	E	-	0	N	7944	8	9	14	1
278	60	E	-	5	N	9642	9	9	11	2
279	60	E	-	10	N	9664	9	9	33	2
280	60	E	-	15	N	8256	8	8	11	1
281	60	E	-	20	N	8080	9	8	28	1
282	60	E	-	25	N	8182	7	8	9	1
283	60	E	-	30	N	7936	8	8	6	1
284	65	E	-	25	S	8340	8	8	9	2
285	65	E	-	20	S	8316	8	7	12	1
286	65	E	-	15	S	7996	8	8	10	1
287	65	E	-	10	S	8068	8	8	14	1
288	65	E	-	5	S	8606	8	8	12	1
289	65	E	-	0	N	8472	9	9	12	2
290	65	E	-	5	N	8276	8	8	8	2
291	65	E	-	10	N	8622	8	8	10	2
292	65	E	-	15	N	6812	8	8	9	1
293	65	E	-	20	N	7516	8	8	7	1
294	65	E	-	25	N	8042	7	7	5	2
295	65	E	-	30	N	8340	8	8	16	2
296	70	E	-	25	S	8278	9	9	13	1
297	70	E	-	20	S	8340	9	8	10	2
298	70	E	-	15	S	8056	9	8	12	1
299	70	E	-	10	S	8174	9	8	9	2
300	70	E	-	5	S	8442	9	9	13	1

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
301	70	E	-	0	N	8814	9	9	11	1
302	70	E	-	5	N	8304	8	9	8	2
303	70	E	-	10	N	7106	8	8	8	2
304	70	E	-	15	N	6870	8	8	13	1
305	70	E	-	20	N	6888	8	8	12	1
306	70	E	-	25	N	7978	8	8	7	2
307	70	E	-	30	N	7468	7	7	23	2
308	75	E	-	25	S	8182	9	8	7	2
309	75	E	-	20	S	8458	9	9	5	2
310	75	E	-	15	S	8540	8	8	11	2
311	75	E	-	10	S	8506	9	8	13	1
312	75	E	-	5	S	8998	9	9	7	2
313	75	E	-	0	N	8430	8	8	11	1
314	75	E	-	5	N	8718	9	8	13	2
315	75	E	-	10	N	8648	8	8	10	1
316	75	E	-	15	N	7958	8	8	14	2
317	75	E	-	20	N	6968	7	7	9	1
318	75	E	-	25	N	8154	8	8	6	2
319	75	E	-	30	N	7238	8	8	6	1
320	80	E	-	25	S	8186	9	8	9	1
321	80	E	-	20	S	8416	8	8	9	2
322	80	E	-	15	S	8384	8	8	7	2
323	80	E	-	10	S	8340	9	9	9	2
324	80	E	-	5	S	8516	9	8	13	2
325	80	E	-	0	N	8390	8	8	6	2
326	80	E	-	5	N	8576	9	8	12	2
327	80	E	-	10	N	8570	8	8	12	2
328	80	E	-	15	N	6490	8	8	15	1
329	80	E	-	20	N	6748	7	7	11	1
330	80	E	-	25	N	8620	8	8	8	1

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W. a. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
331	80	E	-	30	N	7898	8	8	10	2
332	85	E	-	25	S	8280	8	8	10	2
333	85	E	-	20	S	7938	8	7	9	2
334	85	E	-	15	S	8348	8	8	10	2
335	85	E	-	10	S	8370	8	8	8	2
336	85	E	-	5	S	7972	8	8	11	1
337	85	E	-	0	N	8128	8	8	12	2
338	85	E	-	5	N	8318	8	8	9	2
339	85	E	-	10	N	8342	8	8	9	2
340	85	E	-	15	N	6686	7	7	11	1
341	85	E	-	20	N	7022	7	7	9	1
342	85	E	-	25	N	8390	8	8	8	2
343	85	E	-	30	N	8976	9	9	14	2
344	90	E	-	25	S	7998	7	8	13	1
345	90	E	-	20	S	8070	8	8	12	1
346	90	E	-	15	S	7912	8	8	8	2
347	90	E	-	10	S	8168	8	8	10	1
348	90	E	-	5	S	8164	8	8	6	2
349	90	E	-	0	N	8380	8	8	11	2
350	90	E	-	5	N	8672	8	8	8	1
351	90	E	-	10	N	8296	8	8	9	1
352	90	E	-	15	N	7690	8	8	12	1
353	90	E	-	20	N	6128	7	7	5	1
354	90	E	-	25	N	8450	8	7	9	1
355	90	E	-	30	N	7690	7	7	11	1
356	95	E	-	25	S	8060	8	7	12	1
357	95	E	-	20	S	7640	8	8	9	1
358	95	E	-	15	S	7968	8	8	11	2
359	95	E	-	10	S	7860	8	8	8	2
360	95	E	-	5	S	8094	8	8	12	2

CIMARRON FACILITY

SUB AREA "I" PHASE II **SURFACE**

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - **M/N 19**	**111299**	µr/hr	**9**	**2**
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	**97264**	CPM	**7160**	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	**Total U 4.0** **Th (Nat) 1.5**	**10** **1**

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
361	95	E	-	0	N	8020	8	8	12	1
362	95	E	-	5	N	8670	8	8	12	2
363	95	E	-	10	N	7804	8	8	12	1
364	95	E	-	15	N	8176	8	8	13	2
365	95	E	-	20	N	6876	7	7	16	1
366	95	E	-	25	N	7070	7	7	18	1
367	95	E	-	30	N	7996	8	8	11	2
368	100	E	-	25	S	7440	8	8	8	2
369	100	E	-	20	S	7218	8	7	7	1
370	100	E	-	15	S	7592	8	7	7	1
371	100	E	-	10	S	7758	8	7	10	1
372	100	E	-	5	S	8092	8	8	10	1
373	100	E	-	0	N	8270	8	8	10	2
374	100	E	-	5	N	8076	8	8	7	1
375	100	E	-	10	N	7456	7	7	10	1
376	100	E	-	15	N	7178	7	7	11	1
377	100	E	-	20	N	6687	7	7	9	1
378	100	E	-	25	N	8518	8	8	17	2
379	100	E	-	30	N	7496	8	8	10	1
380	105	E	-	0	N	7690	9	8	5	1
381	105	E	-	5	N	7220	7	7	11	1
382	105	E	-	10	N	7420	8	7	14	1
383	105	E	-	15	N	7958	8	8	10	1
384	105	E	-	20	N	7170	8	8	9	1
385	105	E	-	25	N	6434	7	7	7	1
386	105	E	-	30	N	8040	9	8	23	1
387	110	E	-	0	N	7348	7	7	7	1
388	110	E	-	5	N	6748	7	7	12	1
389	110	E	-	10	N	7150	7	7	5	1
390	110	E	-	15	N	7312	7	7	8	1

CIMARRON FACILITY

SUB AREA "I" PHASE II **SURFACE**

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - **M/N 19**	**111299**	µr/hr	**9**	**2**
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	**97264**	CPM	**7160**	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	**Total U 4.0** **Th (Nat) 1.5**	**10** **1**

BACKGROUND NOT SUBTRACTED

REVIEWED BY: W. A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
391	110	E	-	20	N	7052	7	7	18	1
392	110	E	-	25	N	6146	7	7	6	1
393	110	E	-	30	N	7970	8	8	28	1
394	115	E	-	0	N	6724	7	7	7	1
395	115	E	-	5	N	6912	7	7	6	1
396	115	E	-	10	N	7110	7	7	11	1
397	115	E	-	15	N	6850	7	7	10	1
398	115	E	-	20	N	7460	7	6	12	1
399	115	E	-	25	N	5872	6	6	6	1
400	115	E	-	30	N	7324	7	6	11	1
401	120	E	-	0	N	6336	7	7	12	1
402	120	E	-	5	N	6382	7	7	8	1
403	120	E	-	10	N	6684	7	7	4	1
404	120	E	-	15	N	6456	8	7	7	1
405	120	E	-	20	N	6074	7	6	7	1
406	120	E	-	25	N	6332	7	6	16	1
407	120	E	-	30	N	7042	8	7	8	1
408	125	E	-	0	N	6256	6	6	4	1
409	125	E	-	5	N	6162	6	6	8	1
410	125	E	-	10	N	6676	7	7	6	1
411	125	E	-	15	N	6620	7	7	7	1
412	125	E	-	20	N	7254	7	7	34	1
413	125	E	-	25	N	5706	6	6	8	1
414	125	E	-	30	N	7464	8	7	9	2
415	130	E	-	0	N	6148	7	7	9	1
416	130	E	-	5	N	6424	7	7	10	2
417	130	E	-	10	N	6286	7	7	5	1
418	130	E	-	15	N	6674	8	7	6	1
419	130	E	-	20	N	6712	8	7	13	1
420	130	E	-	25	N	5762	6	6	7	1

CIMARRON FACILITY

SUB AREA "I" PHASE II SURFACE
AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7160	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

BACKGROUND NOT SUBTRACTED
REVIEWED BY: W.A. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
421	130	E	-	30	N	6810	7	7	9	2
422	135	E	-	0	N	6276	7	7	10	1
423	135	E	-	5	N	6620	7	7	6	1
424	135	E	-	10	N	6404	6	6	7	1
425	135	E	-	15	N	6346	6	6	8	1
426	135	E	-	20	N	7256	7	7	14	1
427	135	E	-	25	N	7338	8	8	11	1
428	135	E	-	30	N	6620	7	7	15	1
429	140	E	-	0	N	6568	7	6	11	1
430	140	E	-	5	N	6004	6	5	7	1
431	140	E	-	10	N	5862	6	6	8	1
432	140	E	-	15	N	5682	6	6	9	1
433	140	E	-	20	N	5606	6	6	18	1
434	140	E	-	25	N	6090	6	6	9	1
435	140	E	-	30	N	6124	6	6	10	1
436	145	E	-	0	N	5872	7	6	8	1
437	145	E	-	5	N	5368	6	6	6	1
438	145	E	-	10	N	5334	7	6	8	1
439	145	E	-	15	N	5486	5	5	10	1
440	145	E	-	20	N	5672	5	6	8	1
441	145	E	-	25	N	5932	6	6	7	1
442	145	E	-	30	N	6098	6	6	14	1
443	150	E	-	0	N	5458	6	6	7	1
444	150	E	-	5	N	4980	5	5	5	1
445	150	E	-	10	N	5072	5	5	5	1
446	150	E	-	15	N	5404	5	5	10	1
447	150	E	-	20	N	5234	5	6	3	1
448	150	E	-	25	N	5810	5	6	8	1
449	150	E	-	30	N	6052	5	5	9	1
450	155	E	-	0	N	5250	6	5	5	1

CIMARRON FACILITY

SUB AREA "I" PHASE II **SURFACE**

AFFECTED - SOUTH OF URANIUM PLANT YARD

INSTRUMENTS:	**S/N**	**RESULTS IN**	**BACKGROUND**	**MDA**
LUDLUM MICRO 'R' METER - **M/N 19**	**111299**	µr/hr	**9**	**2**
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	**97264**	CPM	**7160**	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	**Total U 4.0** **Th (Nat) 1.5**	**10** **1**

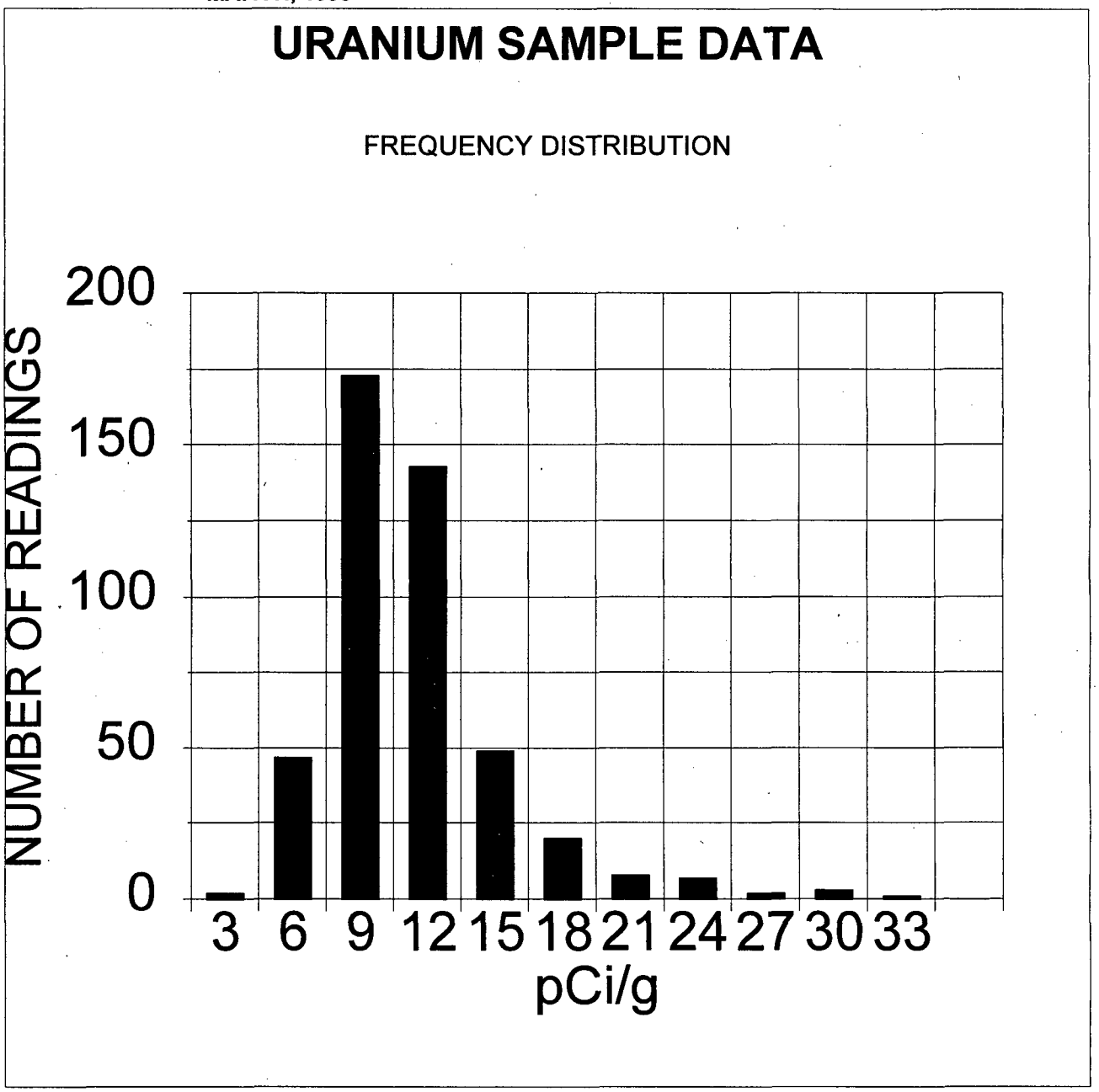
BACKGROUND NOT SUBTRACTED

REVIEWED BY: W.a. Rogers DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	Th (Nat)
451	155	E	-	5	N	5074	5	6	7	1
452	155	E	-	10	N	5206	5	6	5	1
453	155	E	-	15	N	5218	5	5	6	1
454	155	E	-	20	N	5546	5	6	12	1
455	155	E	-	25	N	5462	6	5	8	1
456	155	E	-	30	N	7330	8	8	17	1

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
CIMARRON SOIL COUNTER SURFACE
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

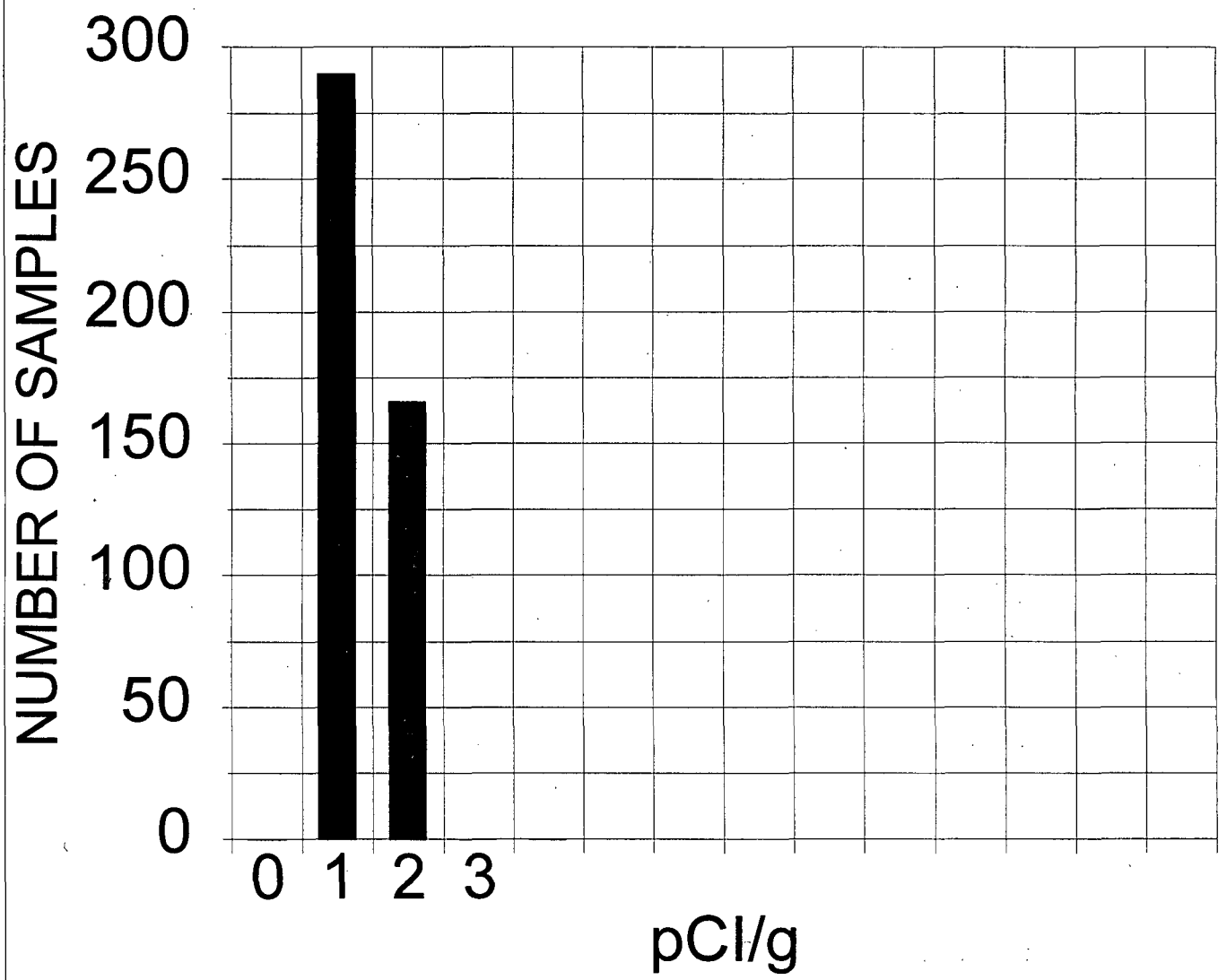


NUMBER OF SAMPLES	456
AVERAGE SAMPLE	10.4
MINIMUM SAMPLE	3.0
MAXIMUM SAMPLE	34.0
STANDARD DEVIATION	4.2

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
CIMARRON SOIL COUNTER SURFACE
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED

MARCH, 1999

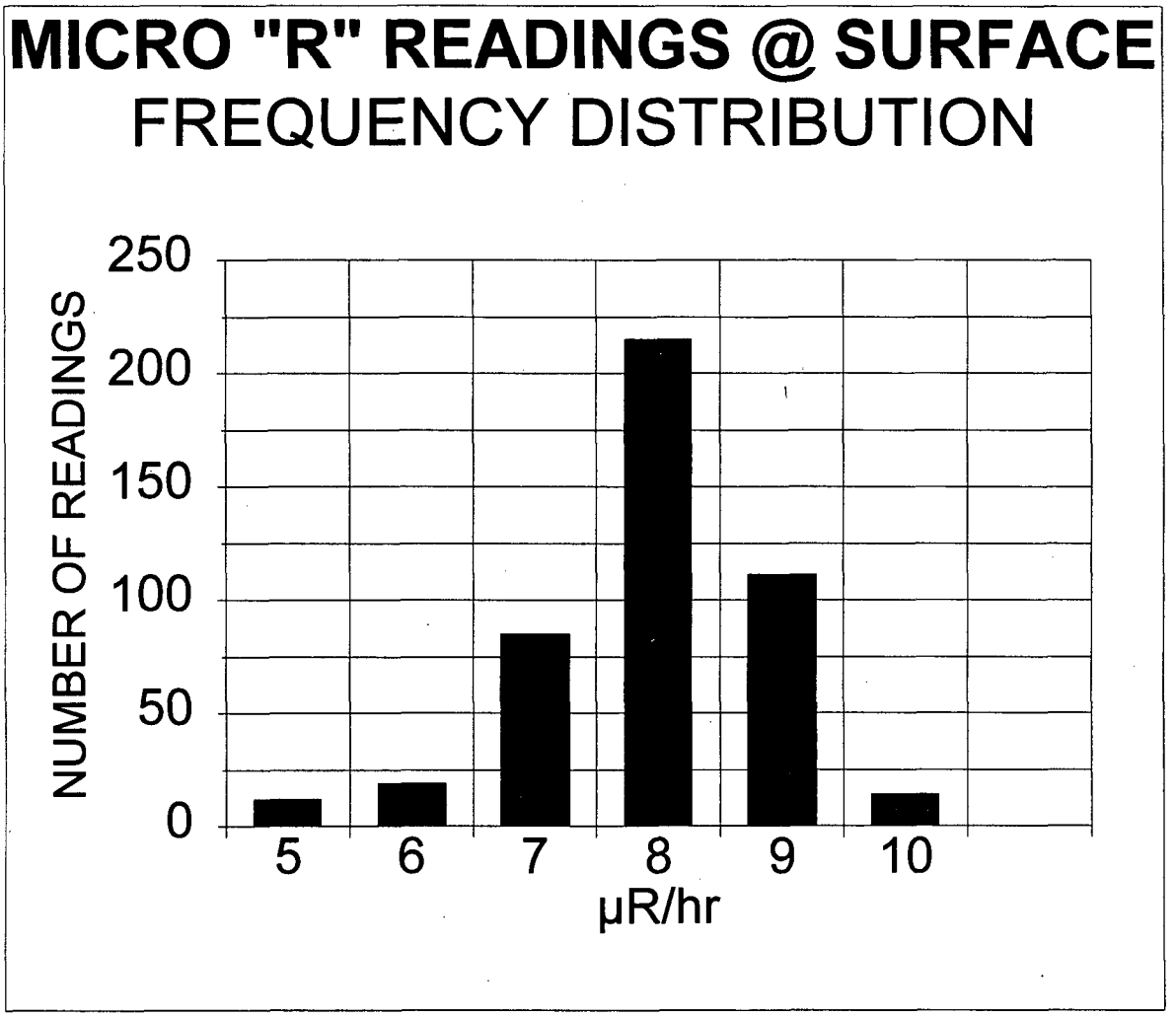
THORIUM SAMPLE RESULTS
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	456
AVERAGE SAMPLE	1.4
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	2.0
STANDARD DEVIATION	0.5

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
MICRO-R METER READINGS AT SURFACE AFFECTED
LUDLUM MODEL 19 S/N 111299 SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
RESULTS IN µR/hr

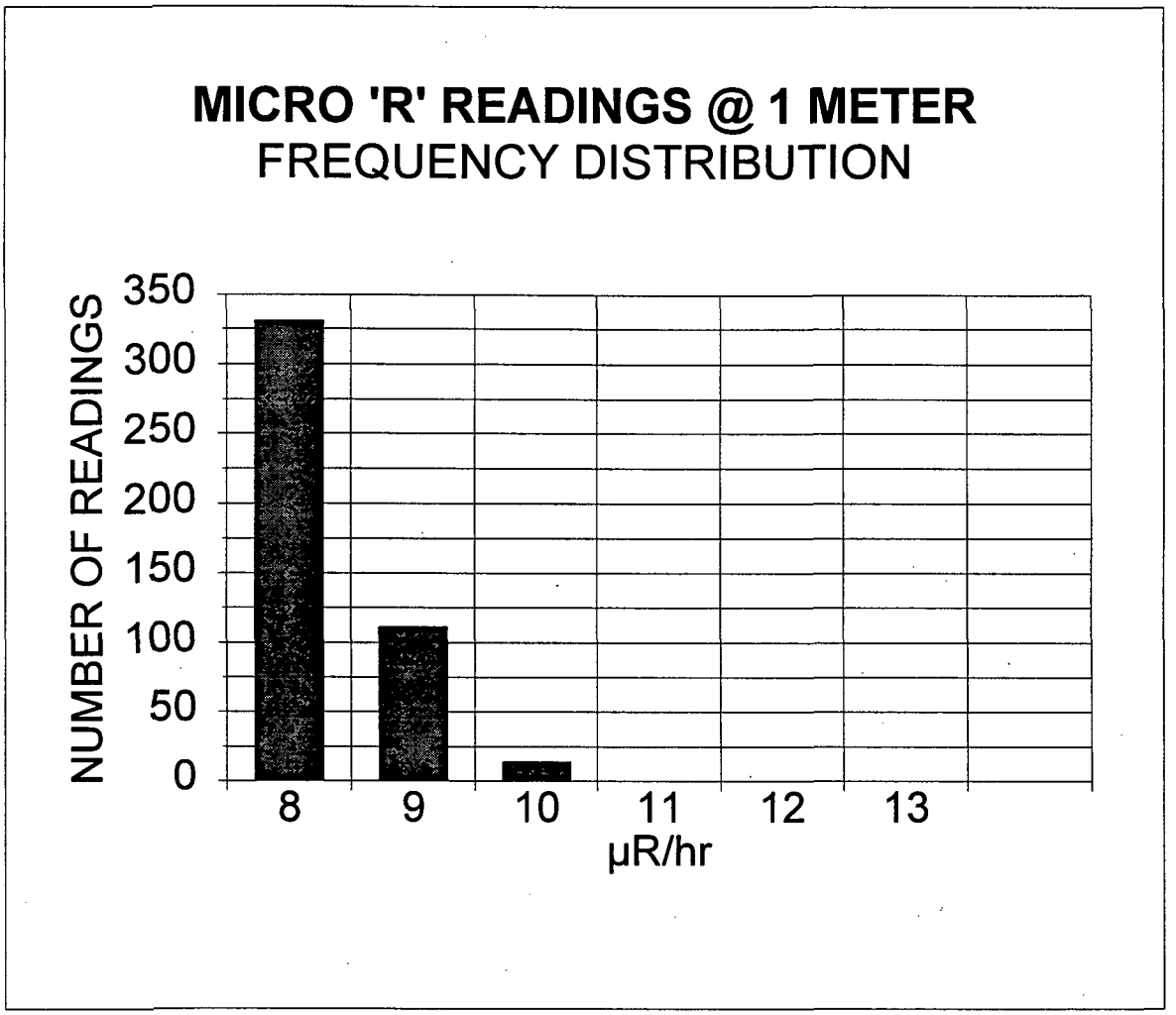
MARCH, 1999



NUMBER OF READINGS	456
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	10
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
LUDLUM MODEL 19 S/N 111299 AFFECTED SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
RESULTS IN µR/hr

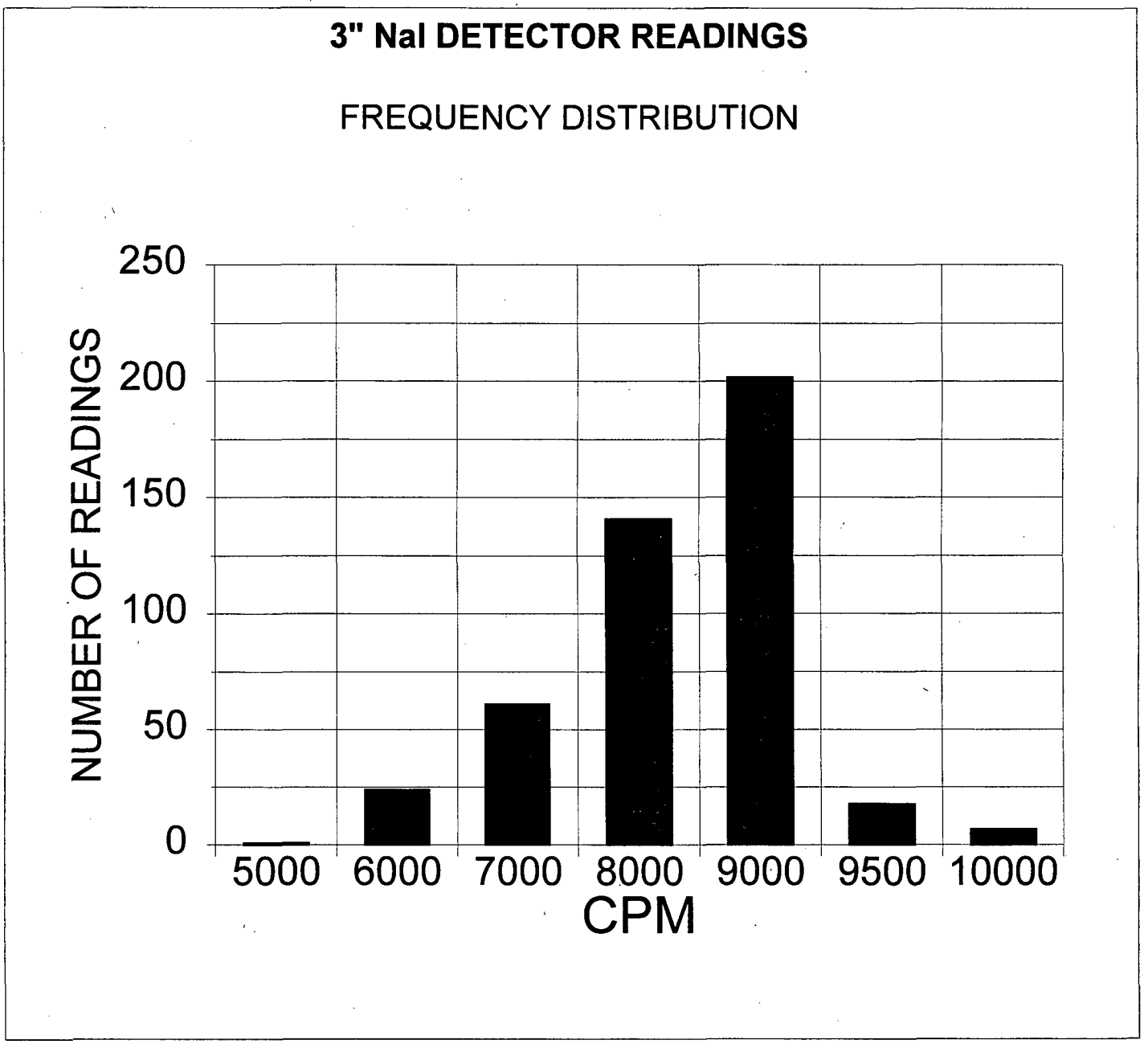
MARCH, 1999



NUMBER OF READINGS	456
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	10
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
3" NaI DETECTOR AFFECTED - SURFACE
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 97264 (UNSHIELDED)
BACKGROUND AVERAGE: 7160 CPM

MARCH, 1999



NUMBER OF READINGS	456
AVERAGE READING	7811
MINIMUM READING	4980
MAXIMUM READING	10624
STANDARD DEVIATION	965

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	6.0	-4.4	19.8
2	3.0	-7.4	55.5
3	8.0	-2.4	6.0
4	6.0	-4.4	19.8
5	8.0	-2.4	6.0
6	8.0	-2.4	6.0
7	5.0	-5.4	29.7
8	11.0	0.6	0.3
9	10.0	-0.4	0.2
10	11.0	0.6	0.3
11	6.0	-4.4	19.8
12	11.0	0.6	0.3
13	6.0	-4.4	19.8
14	7.0	-3.4	11.9
15	7.0	-3.4	11.9
16	8.0	-2.4	6.0
17	8.0	-2.4	6.0
18	6.0	-4.4	19.8
19	8.0	-2.4	6.0
20	7.0	-3.4	11.9
21	8.0	-2.4	6.0
22	10.0	-0.4	0.2
23	9.0	-1.4	2.1
24	7.0	-3.4	11.9
25	7.0	-3.4	11.9
26	9.0	-1.4	2.1
27	7.0	-3.4	11.9
28	10.0	-0.4	0.2
29	9.0	-1.4	2.1
30	9.0	-1.4	2.1
31	9.0	-1.4	2.1
32	13.0	2.6	6.5
33	11.0	0.6	0.3
34	12.0	1.6	2.4
35	10.0	-0.4	0.2
36	7.0	-3.4	11.9
37	10.0	-0.4	0.2
38	8.0	-2.4	6.0
39	9.0	-1.4	2.1
40	8.0	-2.4	6.0
41	9.0	-1.4	2.1
42	9.0	-1.4	2.1
43	9.0	-1.4	2.1
44	8.0	-2.4	6.0
45	9.0	-1.4	2.1
46	12.0	1.6	2.4
47	9.0	-1.4	2.1
48	6.0	-4.4	19.8
49	9.0	-1.4	2.1
50	11.0	0.6	0.3
	473.0		513.4
	529.0		441.0
	577.0		1101.9
	584.0		1570.6
	634.0		1481.6
	503.0		466.4
	534.0		941.4
	453.0		1203.4
	55.0		112.7
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	4765		8218.7
	Sum(n)		Sum(n-N)²

No. of Samples (x) : **456**

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : **10.45**

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: **4.25**
2 Std Deviations: **8.50**
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = **1.645**

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = **10.78** pCi/gU TOTAL U
GUIDELINE VALUE: **30** pCi/gU TOTAL U
Acceptable Level: **34.0** pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	INFINITE	Is (B)	1.645	95%
(df) low value(Y)	400	Is (A)	1.649	95%
Desired value(df) (X)	455	Is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	455	1.645	95%

PERFORMED BY: Mickey Hide DATE: 4-1-99

REVIEWED BY: W. A. Rogers DATE: 4-1-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
51	11.0	0.55	0.30
52	8.0	-2.45	6.00
53	10.0	-0.45	0.20
54	8.0	-2.45	6.00
55	11.0	0.55	0.30
56	4.0	-6.45	41.60
57	10.0	-0.45	0.20
58	7.0	-3.45	11.90
59	5.0	-5.45	29.70
60	8.0	-2.45	6.00
61	11.0	0.55	0.30
62	13.0	2.55	6.50
63	12.0	1.55	2.40
64	9.0	-1.45	2.10
65	9.0	-1.45	2.10
66	8.0	-2.45	6.00
67	14.0	3.55	12.61
68	8.0	-2.45	6.00
69	8.0	-2.45	6.00
70	8.0	-2.45	6.00
71	9.0	-1.45	2.10
72	9.0	-1.45	2.10
73	9.0	-1.45	2.10
74	9.0	-1.45	2.10
75	10.0	-0.45	0.20
76	6.0	-4.45	19.80
77	10.0	-0.45	0.20
78	8.0	-2.45	6.00
79	12.0	1.55	2.40
80	25.0	14.55	211.72
81	14.0	3.55	12.61
82	5.0	-5.45	29.70
83	8.0	-2.45	6.00
84	11.0	0.55	0.30
85	7.0	-3.45	11.90
86	11.0	0.55	0.30
87	10.0	-0.45	0.20
88	8.0	-2.45	6.00
89	8.0	-2.45	6.00
90	11.0	0.55	0.30
91	8.0	-2.45	6.00
92	7.0	-3.45	11.90
93	9.0	-1.45	2.10
94	10.0	-0.45	0.20
95	11.0	0.55	0.30
96	11.0	0.55	0.30
97	7.0	-3.45	11.90
98	8.0	-2.45	6.00
99	10.0	-0.45	0.20
100	10.0	-0.45	0.20
	473.0		513.4
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
101	11.0	0.55	0.30
102	11.0	0.55	0.30
103	8.0	-2.45	6.00
104	14.0	3.55	12.61
105	9.0	-1.45	2.10
106	13.0	2.55	6.50
107	7.0	-3.45	11.90
108	14.0	3.55	12.61
109	9.0	-1.45	2.10
110	8.0	-2.45	6.00
111	8.0	-2.45	6.00
112	10.0	-0.45	0.20
113	10.0	-0.45	0.20
114	9.0	-1.45	2.10
115	12.0	1.55	2.40
116	12.0	1.55	2.40
117	10.0	-0.45	0.20
118	10.0	-0.45	0.20
119	14.0	3.55	12.61
120	9.0	-1.45	2.10
121	10.0	-0.45	0.20
122	10.0	-0.45	0.20
123	11.0	0.55	0.30
124	12.0	1.55	2.40
125	8.0	-2.45	6.00
126	12.0	1.55	2.40
127	10.0	-0.45	0.20
128	6.0	-4.45	19.80
129	11.0	0.55	0.30
130	8.0	-2.45	6.00
131	21.0	10.55	111.31
132	20.0	9.55	91.21
133	11.0	0.55	0.30
134	17.0	6.55	42.91
135	9.0	-1.45	2.10
136	10.0	-0.45	0.20
137	9.0	-1.45	2.10
138	8.0	-2.45	6.00
139	10.0	-0.45	0.20
140	11.0	0.55	0.30
141	10.0	-0.45	0.20
142	8.0	-2.45	6.00
143	12.0	1.55	2.40
144	14.0	3.55	12.61
145	8.0	-2.45	6.00
146	12.0	1.55	2.40
147	9.0	-1.45	2.10
148	6.0	-4.45	19.80
149	8.0	-2.45	6.00
150	10.0	-0.45	0.20
	529.0		441.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
151	9.0	-1.45	2.10
152	8.0	-2.45	6.00
153	9.0	-1.45	2.10
154	9.0	-1.45	2.10
155	14.0	3.55	12.61
156	18.0	7.55	57.01
157	10.0	-0.45	0.20
158	25.0	14.55	211.72
159	18.0	7.55	57.01
160	5.0	-5.45	29.70
161	7.0	-3.45	11.90
162	9.0	-1.45	2.10
163	7.0	-3.45	11.90
164	8.0	-2.45	6.00
165	7.0	-3.45	11.90
166	11.0	0.55	0.30
167	17.0	6.55	42.91
168	10.0	-0.45	0.20
169	11.0	0.55	0.30
170	20.0	9.55	91.21
171	17.0	6.55	42.91
172	15.0	4.55	20.71
173	11.0	0.55	0.30
174	10.0	-0.45	0.20
175	4.0	-6.45	41.60
176	8.0	-2.45	6.00
177	6.0	-4.45	19.80
178	11.0	0.55	0.30
179	8.0	-2.45	6.00
180	17.0	6.55	42.91
181	11.0	0.55	0.30
182	12.0	1.55	2.40
183	9.0	-1.45	2.10
184	9.0	-1.45	2.10
185	12.0	1.55	2.40
186	12.0	1.55	2.40
187	10.0	-0.45	0.20
188	7.0	-3.45	11.90
189	6.0	-4.45	19.80
190	10.0	-0.45	0.20
191	14.0	3.55	12.61
192	9.0	-1.45	2.10
193	10.0	-0.45	0.20
194	15.0	4.55	20.71
195	12.0	1.55	2.40
196	22.0	11.55	133.41
197	10.0	-0.45	0.20
198	22.0	11.55	133.41
199	13.0	2.55	6.50
200	13.0	2.55	6.50
	577.0		1101.9
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
201	7.0	-3.45	11.90
202	15.0	4.55	20.71
203	6.0	-4.45	19.80
204	7.0	-3.45	11.90
205	30.0	19.55	382.22
206	11.0	0.55	0.30
207	9.0	-1.45	2.10
208	14.0	3.55	12.61
209	18.0	7.55	57.01
210	22.0	11.55	133.41
211	23.0	12.55	157.51
212	18.0	7.55	57.01
213	8.0	-2.45	6.00
214	10.0	-0.45	0.20
215	10.0	-0.45	0.20
216	4.0	-6.45	41.60
217	20.0	9.55	91.21
218	12.0	1.55	2.40
219	14.0	3.55	12.61
220	6.0	-4.45	19.80
221	12.0	1.55	2.40
222	24.0	13.55	183.61
223	17.0	6.55	42.91
224	8.0	-2.45	6.00
225	8.0	-2.45	6.00
226	10.0	-0.45	0.20
227	11.0	0.55	0.30
228	10.0	-0.45	0.20
229	8.0	-2.45	6.00
230	21.0	10.55	111.31
231	15.0	4.55	20.71
232	9.0	-1.45	2.10
233	9.0	-1.45	2.10
234	9.0	-1.45	2.10
235	13.0	2.55	6.50
236	8.0	-2.45	6.00
237	8.0	-2.45	6.00
238	13.0	2.55	6.50
239	15.0	4.55	20.71
240	9.0	-1.45	2.10
241	9.0	-1.45	2.10
242	6.0	-4.45	19.80
243	7.0	-3.45	11.90
244	7.0	-3.45	11.90
245	6.0	-4.45	19.80
246	9.0	-1.45	2.10
247	7.0	-3.45	11.90
248	9.0	-1.45	2.10
249	9.0	-1.45	2.10
250	14.0	3.55	12.61
	584.0		1570.6
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
251	12.0	1.55	2.40
252	14.0	3.55	12.61
253	14.0	3.55	12.61
254	7.0	-3.45	11.90
255	10.0	-0.45	0.20
256	19.0	8.55	73.11
257	10.0	-0.45	0.20
258	17.0	6.55	42.91
259	16.0	5.55	30.81
260	12.0	1.55	2.40
261	7.0	-3.45	11.90
262	14.0	3.55	12.61
263	14.0	3.55	12.61
264	16.0	5.55	30.81
265	21.0	10.55	111.31
266	14.0	3.55	12.61
267	11.0	0.55	0.30
268	13.0	2.55	6.50
269	20.0	9.55	91.21
270	11.0	0.55	0.30
271	8.0	-2.45	6.00
272	14.0	3.55	12.61
273	13.0	2.55	6.50
274	12.0	1.55	2.40
275	10.0	-0.45	0.20
276	12.0	1.55	2.40
277	14.0	3.55	12.61
278	11.0	0.55	0.30
279	33.0	22.55	508.52
280	11.0	0.55	0.30
281	28.0	17.55	308.02
282	9.0	-1.45	2.10
283	6.0	-4.45	19.80
284	9.0	-1.45	2.10
285	12.0	1.55	2.40
286	10.0	-0.45	0.20
287	14.0	3.55	12.61
288	12.0	1.55	2.40
289	12.0	1.55	2.40
290	8.0	-2.45	6.00
291	10.0	-0.45	0.20
292	9.0	-1.45	2.10
293	7.0	-3.45	11.90
294	5.0	-5.45	29.70
295	16.0	5.55	30.81
296	13.0	2.55	6.50
297	10.0	-0.45	0.20
298	12.0	1.55	2.40
299	9.0	-1.45	2.10
300	13.0	2.55	6.50
	634.0		1481.6
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
301	11.0	0.55	0.30
302	8.0	-2.45	6.00
303	8.0	-2.45	6.00
304	13.0	2.55	6.50
305	12.0	1.55	2.40
306	7.0	-3.45	11.90
307	23.0	12.55	157.51
308	7.0	-3.45	11.90
309	5.0	-5.45	29.70
310	11.0	0.55	0.30
311	13.0	2.55	6.50
312	7.0	-3.45	11.90
313	11.0	0.55	0.30
314	13.0	2.55	6.50
315	10.0	-0.45	0.20
316	14.0	3.55	12.61
317	9.0	-1.45	2.10
318	6.0	-4.45	19.80
319	6.0	-4.45	19.80
320	9.0	-1.45	2.10
321	9.0	-1.45	2.10
322	7.0	-3.45	11.90
323	9.0	-1.45	2.10
324	13.0	2.55	6.50
325	6.0	-4.45	19.80
326	12.0	1.55	2.40
327	12.0	1.55	2.40
328	15.0	4.55	20.71
329	11.0	0.55	0.30
330	8.0	-2.45	6.00
331	10.0	-0.45	0.20
332	10.0	-0.45	0.20
333	9.0	-1.45	2.10
334	10.0	-0.45	0.20
335	8.0	-2.45	6.00
336	11.0	0.55	0.30
337	12.0	1.55	2.40
338	9.0	-1.45	2.10
339	9.0	-1.45	2.10
340	11.0	0.55	0.30
341	9.0	-1.45	2.10
342	8.0	-2.45	6.00
343	14.0	3.55	12.61
344	13.0	2.55	6.50
345	12.0	1.55	2.40
346	8.0	-2.45	6.00
347	10.0	-0.45	0.20
348	6.0	-4.45	19.80
349	11.0	0.55	0.30
350	8.0	-2.45	6.00
	503.0		466.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
351	9.0	0.00	0.00
352	12.0	1.55	2.40
353	5.0	-5.45	29.70
354	9.0	-1.45	2.10
355	11.0	0.55	0.30
356	12.0	1.55	2.40
357	9.0	-1.45	2.10
358	11.0	0.55	0.30
359	8.0	-2.45	6.00
360	12.0	1.55	2.40
361	12.0	1.55	2.40
362	12.0	1.55	2.40
363	12.0	1.55	2.40
364	13.0	2.55	6.50
365	16.0	5.55	30.81
366	18.0	7.55	57.01
367	11.0	0.55	0.30
368	8.0	-2.45	6.00
369	7.0	-3.45	11.90
370	7.0	-3.45	11.90
371	10.0	-0.45	0.20
372	10.0	-0.45	0.20
373	10.0	-0.45	0.20
374	7.0	-3.45	11.90
375	10.0	-0.45	0.20
376	11.0	0.55	0.30
377	9.0	-1.45	2.10
378	17.0	6.55	42.91
379	10.0	-0.45	0.20
380	5.0	-5.45	29.70
381	11.0	0.55	0.30
382	14.0	3.55	12.61
383	10.0	-0.45	0.20
384	9.0	-1.45	2.10
385	7.0	-3.45	11.90
386	23.0	12.55	157.51
387	7.0	-3.45	11.90
388	12.0	1.55	2.40
389	5.0	-5.45	29.70
390	8.0	-2.45	6.00
391	18.0	7.55	57.01
392	6.0	-4.45	19.80
393	28.0	17.55	308.02
394	7.0	-3.45	11.90
395	6.0	-4.45	19.80
396	11.0	0.55	0.30
397	10.0	-0.45	0.20
398	12.0	1.55	2.40
399	6.0	-4.45	19.80
400	11.0	0.55	0.30
	534.0		941.4
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
401	12.0	1.55	2.40
402	8.0	-2.45	6.00
403	4.0	-6.45	41.60
404	7.0	-3.45	11.90
405	7.0	-3.45	11.90
406	16.0	5.55	30.81
407	8.0	-2.45	6.00
408	4.0	-6.45	41.60
409	8.0	-2.45	6.00
410	6.0	-4.45	19.80
411	7.0	-3.45	11.90
412	34.0	23.55	554.62
413	8.0	-2.45	6.00
414	9.0	-1.45	2.10
415	9.0	-1.45	2.10
416	10.0	-0.45	0.20
417	5.0	-5.45	29.70
418	6.0	-4.45	19.80
419	13.0	2.55	6.50
420	7.0	-3.45	11.90
421	9.0	-1.45	2.10
422	10.0	-0.45	0.20
423	6.0	-4.45	19.80
424	7.0	-3.45	11.90
425	8.0	-2.45	6.00
426	14.0	3.55	12.61
427	11.0	0.55	0.30
428	15.0	4.55	20.71
429	11.0	0.55	0.30
430	7.0	-3.45	11.90
431	8.0	-2.45	6.00
432	9.0	-1.45	2.10
433	18.0	7.55	57.01
434	9.0	-1.45	2.10
435	10.0	-0.45	0.20
436	8.0	-2.45	6.00
437	6.0	-4.45	19.80
438	8.0	-2.45	6.00
439	10.0	-0.45	0.20
440	8.0	-2.45	6.00
441	7.0	-3.45	11.90
442	14.0	3.55	12.61
443	7.0	-3.45	11.90
444	5.0	-5.45	29.70
445	5.0	-5.45	29.70
446	10.0	-0.45	0.20
447	3.0	-7.45	55.50
448	8.0	-2.45	6.00
449	9.0	-1.45	2.10
450	5.0	-5.45	29.70
	453.0		1203.4
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
451	7.0	-3.45	11.90
452	5.0	-5.45	29.70
453	6.0	-4.45	19.80
454	12.0	1.55	2.40
455	8.0	-2.45	6.00
456	17.0	6.55	42.91
457	0.0	0.00	0.00
458	0.0	0.00	0.00
459	0.0	0.00	0.00
460	0.0	0.00	0.00
461	0.0	0.00	0.00
462	0.0	0.00	0.00
463	0.0	0.00	0.00
464	0.0	0.00	0.00
465	0.0	0.00	0.00
466	0.0	0.00	0.00
467	0.0	0.00	0.00
468	0.0	0.00	0.00
469	0.0	0.00	0.00
470	0.0	0.00	0.00
471	0.0	0.00	0.00
472	0.0	0.00	0.00
473	0.0	0.00	0.00
474	0.0	0.00	0.00
475	0.0	0.00	0.00
476	0.0	0.00	0.00
477	0.0	0.00	0.00
478	0.0	0.00	0.00
479	0.0	0.00	0.00
480	0.0	0.00	0.00
481	0.0	0.00	0.00
482	0.0	0.00	0.00
483	0.0	0.00	0.00
484	0.0	0.00	0.00
485	0.0	0.00	0.00
486	0.0	0.00	0.00
487	0.0	0.00	0.00
488	0.0	0.00	0.00
489	0.0	0.00	0.00
490	0.0	0.00	0.00
491	0.0	0.00	0.00
492	0.0	0.00	0.00
493	0.0	0.00	0.00
494	0.0	0.00	0.00
495	0.0	0.00	0.00
496	0.0	0.00	0.00
497	0.0	0.00	0.00
498	0.0	0.00	0.00
499	0.0	0.00	0.00
500	0.0	0.00	0.00
	55.0		112.7
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
501	0.0	0.00	0.00
502	0.0	0.00	0.00
503	0.0	0.00	0.00
504	0.0	0.00	0.00
505	0.0	0.00	0.00
506	0.0	0.00	0.00
507	0.0	0.00	0.00
508	0.0	0.00	0.00
509	0.0	0.00	0.00
510	0.0	0.00	0.00
511	0.0	0.00	0.00
512	0.0	0.00	0.00
513	0.0	0.00	0.00
514	0.0	0.00	0.00
515	0.0	0.00	0.00
516	0.0	0.00	0.00
517	0.0	0.00	0.00
518	0.0	0.00	0.00
519	0.0	0.00	0.00
520	0.0	0.00	0.00
521	0.0	0.00	0.00
522	0.0	0.00	0.00
523	0.0	0.00	0.00
524	0.0	0.00	0.00
525	0.0	0.00	0.00
526	0.0	0.00	0.00
527	0.0	0.00	0.00
528	0.0	0.00	0.00
529	0.0	0.00	0.00
530	0.0	0.00	0.00
531	0.0	0.00	0.00
532	0.0	0.00	0.00
533	0.0	0.00	0.00
534	0.0	0.00	0.00
535	0.0	0.00	0.00
536	0.0	0.00	0.00
537	0.0	0.00	0.00
538	0.0	0.00	0.00
539	0.0	0.00	0.00
540	0.0	0.00	0.00
541	0.0	0.00	0.00
542	0.0	0.00	0.00
543	0.0	0.00	0.00
544	0.0	0.00	0.00
545	0.0	0.00	0.00
546	0.0	0.00	0.00
547	0.0	0.00	0.00
548	0.0	0.00	0.00
549	0.0	0.00	0.00
550	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
1	2.0	0.64	0.40
2	1.0	-0.36	0.13
3	2.0	0.64	0.40
4	2.0	0.64	0.40
5	1.0	-0.36	0.13
6	1.0	-0.36	0.13
7	1.0	-0.36	0.13
8	1.0	-0.36	0.13
9	1.0	-0.36	0.13
10	1.0	-0.36	0.13
11	1.0	-0.36	0.13
12	1.0	-0.36	0.13
13	1.0	-0.36	0.13
14	1.0	-0.36	0.13
15	1.0	-0.36	0.13
16	1.0	-0.36	0.13
17	1.0	-0.36	0.13
18	2.0	0.64	0.40
19	1.0	-0.36	0.13
20	1.0	-0.36	0.13
21	1.0	-0.36	0.13
22	1.0	-0.36	0.13
23	1.0	-0.36	0.13
24	1.0	-0.36	0.13
25	1.0	-0.36	0.13
26	2.0	0.64	0.40
27	2.0	0.64	0.40
28	1.0	-0.36	0.13
29	1.0	-0.36	0.13
30	1.0	-0.36	0.13
31	2.0	0.64	0.40
32	1.0	-0.36	0.13
33	1.0	-0.36	0.13
34	1.0	-0.36	0.13
35	1.0	-0.36	0.13
36	1.0	-0.36	0.13
37	1.0	-0.36	0.13
38	1.0	-0.36	0.13
39	1.0	-0.36	0.13
40	1.0	-0.36	0.13
41	1.0	-0.36	0.13
42	1.0	-0.36	0.13
43	1.0	-0.36	0.13
44	1.0	-0.36	0.13
45	1.0	-0.36	0.13
46	1.0	-0.36	0.13
47	2.0	0.64	0.40
48	1.0	-0.36	0.13
49	1.0	-0.36	0.13
50	1.0	-0.36	0.13
	70		12.065
	80		14.784
	68		11.521
	74		13.152
	73		12.880
	81		15.056
	59		9.073
	53		7.442
	6		0.795
	0		0.000
	0		
	622.0		105.570
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 456

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.36

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 0.48
2 Std Deviations: 0.96
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.645

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.40 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	INFINITE	is (B)	1.645	95%
(df) low value(Y)	400	is (A)	1.649	95%
Desired value(df) (X)	455	is calculated as follow:		

EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]

The (df) value for (X)	455	1.645	95%

PERFORMED BY: Mackey Hedges DATE: 4-1-99

REVIEWED BY: W. C. Rogers DATE: 4-1-99

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AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
51	1.0	-0.36	0.13
52	1.0	-0.36	0.13
53	1.0	-0.36	0.13
54	1.0	-0.36	0.13
55	1.0	-0.36	0.13
56	2.0	0.64	0.40
57	1.0	-0.36	0.13
58	1.0	-0.36	0.13
59	1.0	-0.36	0.13
60	1.0	-0.36	0.13
61	1.0	-0.36	0.13
62	1.0	-0.36	0.13
63	1.0	-0.36	0.13
64	1.0	-0.36	0.13
65	2.0	0.64	0.40
66	1.0	-0.36	0.13
67	2.0	0.64	0.40
68	1.0	-0.36	0.13
69	1.0	-0.36	0.13
70	2.0	0.64	0.40
71	2.0	0.64	0.40
72	2.0	0.64	0.40
73	1.0	-0.36	0.13
74	1.0	-0.36	0.13
75	1.0	-0.36	0.13
76	1.0	-0.36	0.13
77	2.0	0.64	0.40
78	2.0	0.64	0.40
79	2.0	0.64	0.40
80	1.0	-0.36	0.13
81	2.0	0.64	0.40
82	2.0	0.64	0.40
83	1.0	-0.36	0.13
84	2.0	0.64	0.40
85	2.0	0.64	0.40
86	2.0	0.64	0.40
87	1.0	-0.36	0.13
88	1.0	-0.36	0.13
89	1.0	-0.36	0.13
90	1.0	-0.36	0.13
91	2.0	0.64	0.40
92	1.0	-0.36	0.13
93	2.0	0.64	0.40
94	1.0	-0.36	0.13
95	1.0	-0.36	0.13
96	2.0	0.64	0.40
97	2.0	0.64	0.40
98	2.0	0.64	0.40
99	2.0	0.64	0.40
100	1.0	-0.36	0.13
	70		12.065
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
101	2.0	0.64	0.40
102	2.0	0.64	0.40
103	1.0	-0.36	0.13
104	2.0	0.64	0.40
105	2.0	0.64	0.40
106	2.0	0.64	0.40
107	2.0	0.64	0.40
108	1.0	-0.36	0.13
109	1.0	-0.36	0.13
110	1.0	-0.36	0.13
111	1.0	-0.36	0.13
112	1.0	-0.36	0.13
113	1.0	-0.36	0.13
114	1.0	-0.36	0.13
115	2.0	0.64	0.40
116	2.0	0.64	0.40
117	1.0	-0.36	0.13
118	2.0	0.64	0.40
119	1.0	-0.36	0.13
120	2.0	0.64	0.40
121	2.0	0.64	0.40
122	2.0	0.64	0.40
123	2.0	0.64	0.40
124	2.0	0.64	0.40
125	1.0	-0.36	0.13
126	2.0	0.64	0.40
127	2.0	0.64	0.40
128	2.0	0.64	0.40
129	1.0	-0.36	0.13
130	1.0	-0.36	0.13
131	1.0	-0.36	0.13
132	2.0	0.64	0.40
133	1.0	-0.36	0.13
134	2.0	0.64	0.40
135	2.0	0.64	0.40
136	2.0	0.64	0.40
137	2.0	0.64	0.40
138	2.0	0.64	0.40
139	1.0	-0.36	0.13
140	2.0	0.64	0.40
141	2.0	0.64	0.40
142	2.0	0.64	0.40
143	1.0	-0.36	0.13
144	2.0	0.64	0.40
145	2.0	0.64	0.40
146	2.0	0.64	0.40
147	1.0	-0.36	0.13
148	1.0	-0.36	0.13
149	1.0	-0.36	0.13
150	2.0	0.64	0.40
	80		14.784
	Sum(n)		Sum(n-N)²

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AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
151	2.0	0.64	0.40
152	2.0	0.64	0.40
153	1.0	-0.36	0.13
154	1.0	-0.36	0.13
155	1.0	-0.36	0.13
156	1.0	-0.36	0.13
157	1.0	-0.36	0.13
158	2.0	0.64	0.40
159	1.0	-0.36	0.13
160	1.0	-0.36	0.13
161	1.0	-0.36	0.13
162	1.0	-0.36	0.13
163	1.0	-0.36	0.13
164	2.0	0.64	0.40
165	2.0	0.64	0.40
166	1.0	-0.36	0.13
167	1.0	-0.36	0.13
168	2.0	0.64	0.40
169	1.0	-0.36	0.13
170	2.0	0.64	0.40
171	1.0	-0.36	0.13
172	1.0	-0.36	0.13
173	1.0	-0.36	0.13
174	2.0	0.64	0.40
175	2.0	0.64	0.40
176	2.0	0.64	0.40
177	2.0	0.64	0.40
178	1.0	-0.36	0.13
179	1.0	-0.36	0.13
180	1.0	-0.36	0.13
181	1.0	-0.36	0.13
182	1.0	-0.36	0.13
183	1.0	-0.36	0.13
184	1.0	-0.36	0.13
185	1.0	-0.36	0.13
186	2.0	0.64	0.40
187	1.0	-0.36	0.13
188	1.0	-0.36	0.13
189	2.0	0.64	0.40
190	2.0	0.64	0.40
191	1.0	-0.36	0.13
192	1.0	-0.36	0.13
193	2.0	0.64	0.40
194	1.0	-0.36	0.13
195	1.0	-0.36	0.13
196	2.0	0.64	0.40
197	2.0	0.64	0.40
198	2.0	0.64	0.40
199	1.0	-0.36	0.13
200	1.0	-0.36	0.13
	68		11.521
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
201	2.0	0.64	0.40
202	2.0	0.64	0.40
203	1.0	-0.36	0.13
204	1.0	-0.36	0.13
205	1.0	-0.36	0.13
206	2.0	0.64	0.40
207	1.0	-0.36	0.13
208	1.0	-0.36	0.13
209	1.0	-0.36	0.13
210	2.0	0.64	0.40
211	1.0	-0.36	0.13
212	1.0	-0.36	0.13
213	2.0	0.64	0.40
214	2.0	0.64	0.40
215	2.0	0.64	0.40
216	1.0	-0.36	0.13
217	2.0	0.64	0.40
218	2.0	0.64	0.40
219	1.0	-0.36	0.13
220	1.0	-0.36	0.13
221	1.0	-0.36	0.13
222	2.0	0.64	0.40
223	1.0	-0.36	0.13
224	1.0	-0.36	0.13
225	1.0	-0.36	0.13
226	2.0	0.64	0.40
227	2.0	0.64	0.40
228	1.0	-0.36	0.13
229	1.0	-0.36	0.13
230	1.0	-0.36	0.13
231	2.0	0.64	0.40
232	1.0	-0.36	0.13
233	2.0	0.64	0.40
234	2.0	0.64	0.40
235	1.0	-0.36	0.13
236	1.0	-0.36	0.13
237	2.0	0.64	0.40
238	1.0	-0.36	0.13
239	2.0	0.64	0.40
240	2.0	0.64	0.40
241	2.0	0.64	0.40
242	1.0	-0.36	0.13
243	1.0	-0.36	0.13
244	2.0	0.64	0.40
245	2.0	0.64	0.40
246	2.0	0.64	0.40
247	1.0	-0.36	0.13
248	1.0	-0.36	0.13
249	2.0	0.64	0.40
250	2.0	0.64	0.40
	74		13.152
	Sum(n)		Sum(n-N)²

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n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
251	2.0	0.64	0.40
252	1.0	-0.36	0.13
253	2.0	0.64	0.40
254	2.0	0.64	0.40
255	1.0	-0.36	0.13
256	2.0	0.64	0.40
257	2.0	0.64	0.40
258	1.0	-0.36	0.13
259	2.0	0.64	0.40
260	1.0	-0.36	0.13
261	2.0	0.64	0.40
262	1.0	-0.36	0.13
263	2.0	0.64	0.40
264	2.0	0.64	0.40
265	1.0	-0.36	0.13
266	2.0	0.64	0.40
267	1.0	-0.36	0.13
268	1.0	-0.36	0.13
269	1.0	-0.36	0.13
270	2.0	0.64	0.40
271	2.0	0.64	0.40
272	1.0	-0.36	0.13
273	2.0	0.64	0.40
274	1.0	-0.36	0.13
275	1.0	-0.36	0.13
276	1.0	-0.36	0.13
277	1.0	-0.36	0.13
278	2.0	0.64	0.40
279	2.0	0.64	0.40
280	1.0	-0.36	0.13
281	1.0	-0.36	0.13
282	1.0	-0.36	0.13
283	1.0	-0.36	0.13
284	2.0	0.64	0.40
285	1.0	-0.36	0.13
286	1.0	-0.36	0.13
287	1.0	-0.36	0.13
288	1.0	-0.36	0.13
289	2.0	0.64	0.40
290	2.0	0.64	0.40
291	2.0	0.64	0.40
292	1.0	-0.36	0.13
293	1.0	-0.36	0.13
294	2.0	0.64	0.40
295	2.0	0.64	0.40
296	1.0	-0.36	0.13
297	2.0	0.64	0.40
298	1.0	-0.36	0.13
299	2.0	0.64	0.40
300	1.0	-0.36	0.13
	73		12.880
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
301	1.0	-0.36	0.13
302	2.0	0.64	0.40
303	2.0	0.64	0.40
304	1.0	-0.36	0.13
305	1.0	-0.36	0.13
306	2.0	0.64	0.40
307	2.0	0.64	0.40
308	2.0	0.64	0.40
309	2.0	0.64	0.40
310	2.0	0.64	0.40
311	1.0	-0.36	0.13
312	2.0	0.64	0.40
313	1.0	-0.36	0.13
314	2.0	0.64	0.40
315	1.0	-0.36	0.13
316	2.0	0.64	0.40
317	1.0	-0.36	0.13
318	2.0	0.64	0.40
319	1.0	-0.36	0.13
320	1.0	-0.36	0.13
321	2.0	0.64	0.40
322	2.0	0.64	0.40
323	2.0	0.64	0.40
324	2.0	0.64	0.40
325	2.0	0.64	0.40
326	2.0	0.64	0.40
327	2.0	0.64	0.40
328	1.0	-0.36	0.13
329	1.0	-0.36	0.13
330	1.0	-0.36	0.13
331	2.0	0.64	0.40
332	2.0	0.64	0.40
333	2.0	0.64	0.40
334	2.0	0.64	0.40
335	2.0	0.64	0.40
336	1.0	-0.36	0.13
337	2.0	0.64	0.40
338	2.0	0.64	0.40
339	2.0	0.64	0.40
340	1.0	-0.36	0.13
341	1.0	-0.36	0.13
342	2.0	0.64	0.40
343	2.0	0.64	0.40
344	1.0	-0.36	0.13
345	1.0	-0.36	0.13
346	2.0	0.64	0.40
347	1.0	-0.36	0.13
348	2.0	0.64	0.40
349	2.0	0.64	0.40
350	1.0	-0.36	0.13
	81		15.056
	Sum(n)		Sum(n-N)²

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AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
351	1.0	-0.36	0.13
352	1.0	-0.36	0.13
353	1.0	-0.36	0.13
354	1.0	-0.36	0.13
355	1.0	-0.36	0.13
356	1.0	-0.36	0.13
357	1.0	-0.36	0.13
358	2.0	0.64	0.40
359	2.0	0.64	0.40
360	2.0	0.64	0.40
361	1.0	-0.36	0.13
362	2.0	0.64	0.40
363	1.0	-0.36	0.13
364	2.0	0.64	0.40
365	1.0	-0.36	0.13
366	1.0	-0.36	0.13
367	2.0	0.64	0.40
368	2.0	0.64	0.40
369	1.0	-0.36	0.13
370	1.0	-0.36	0.13
371	1.0	-0.36	0.13
372	1.0	-0.36	0.13
373	2.0	0.64	0.40
374	1.0	-0.36	0.13
375	1.0	-0.36	0.13
376	1.0	-0.36	0.13
377	1.0	-0.36	0.13
378	2.0	0.64	0.40
379	1.0	-0.36	0.13
380	1.0	-0.36	0.13
381	1.0	-0.36	0.13
382	1.0	-0.36	0.13
383	1.0	-0.36	0.13
384	1.0	-0.36	0.13
385	1.0	-0.36	0.13
386	1.0	-0.36	0.13
387	1.0	-0.36	0.13
388	1.0	-0.36	0.13
389	1.0	-0.36	0.13
390	1.0	-0.36	0.13
391	1.0	-0.36	0.13
392	1.0	-0.36	0.13
393	1.0	-0.36	0.13
394	1.0	-0.36	0.13
395	1.0	-0.36	0.13
396	1.0	-0.36	0.13
397	1.0	-0.36	0.13
398	1.0	-0.36	0.13
399	1.0	-0.36	0.13
400	1.0	-0.36	0.13
	59		9.073
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
401	1.0	-0.36	0.13
402	1.0	-0.36	0.13
403	1.0	-0.36	0.13
404	1.0	-0.36	0.13
405	1.0	-0.36	0.13
406	1.0	-0.36	0.13
407	1.0	-0.36	0.13
408	1.0	-0.36	0.13
409	1.0	-0.36	0.13
410	1.0	-0.36	0.13
411	1.0	-0.36	0.13
412	1.0	-0.36	0.13
413	1.0	-0.36	0.13
414	2.0	0.64	0.40
415	1.0	-0.36	0.13
416	2.0	0.64	0.40
417	1.0	-0.36	0.13
418	1.0	-0.36	0.13
419	1.0	-0.36	0.13
420	1.0	-0.36	0.13
421	2.0	0.64	0.40
422	1.0	-0.36	0.13
423	1.0	-0.36	0.13
424	1.0	-0.36	0.13
425	1.0	-0.36	0.13
426	1.0	-0.36	0.13
427	1.0	-0.36	0.13
428	1.0	-0.36	0.13
429	1.0	-0.36	0.13
430	1.0	-0.36	0.13
431	1.0	-0.36	0.13
432	1.0	-0.36	0.13
433	1.0	-0.36	0.13
434	1.0	-0.36	0.13
435	1.0	-0.36	0.13
436	1.0	-0.36	0.13
437	1.0	-0.36	0.13
438	1.0	-0.36	0.13
439	1.0	-0.36	0.13
440	1.0	-0.36	0.13
441	1.0	-0.36	0.13
442	1.0	-0.36	0.13
443	1.0	-0.36	0.13
444	1.0	-0.36	0.13
445	1.0	-0.36	0.13
446	1.0	-0.36	0.13
447	1.0	-0.36	0.13
448	1.0	-0.36	0.13
449	1.0	-0.36	0.13
450	1.0	-0.36	0.13
	53		7.442
	Sum(n)		Sum(n-N)²

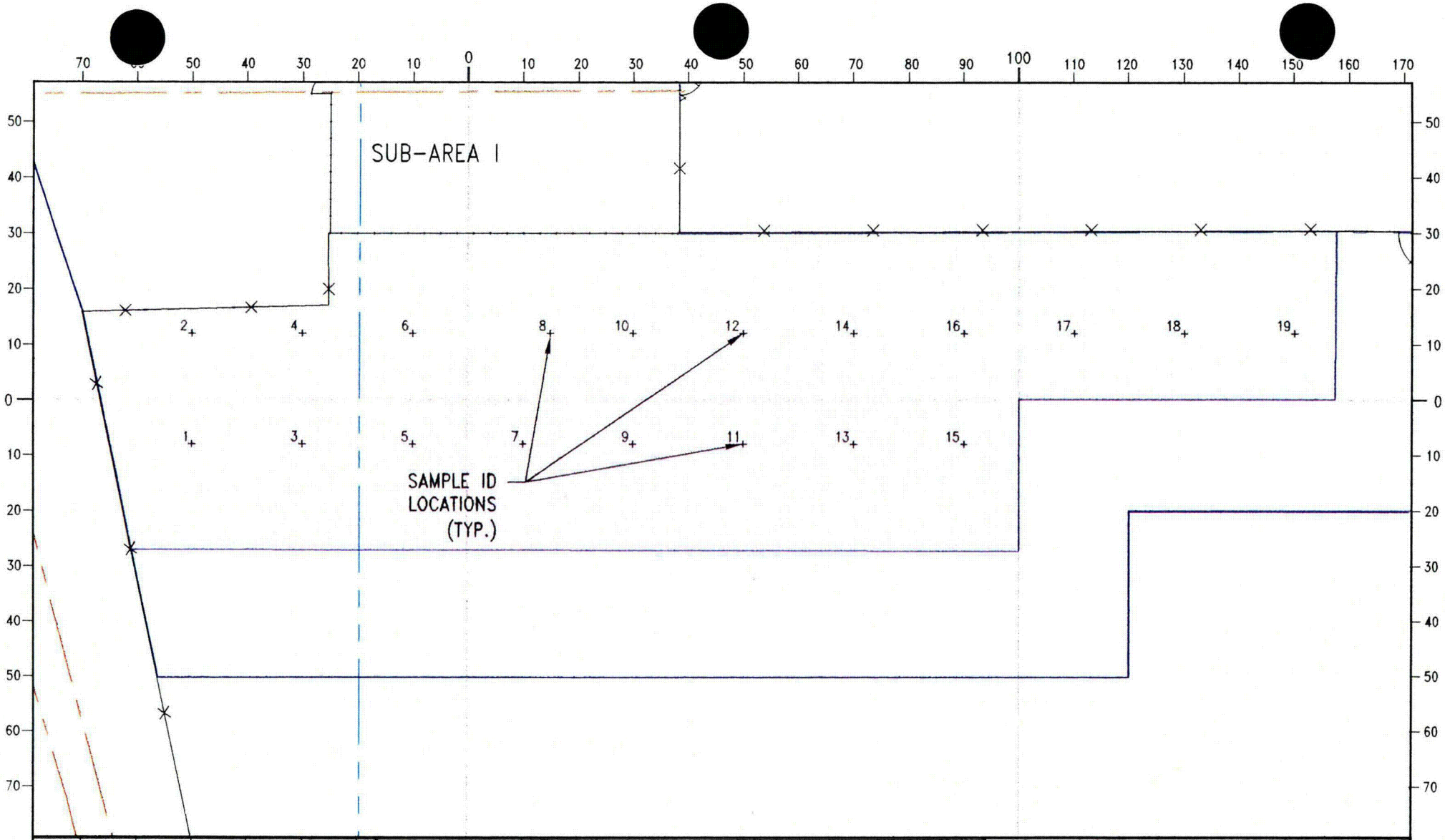
CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH OF URANIUM PLANT (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
451	1.0	-0.36	0.13
452	1.0	-0.36	0.13
453	1.0	-0.36	0.13
454	1.0	-0.36	0.13
455	1.0	-0.36	0.13
456	1.0	-0.36	0.13
457	0.0	0.00	0.00
458	0.0	0.00	0.00
459	0.0	0.00	0.00
460	0.0	0.00	0.00
461	0.0	0.00	0.00
462	0.0	0.00	0.00
463	0.0	0.00	0.00
464	0.0	0.00	0.00
465	0.0	0.00	0.00
466	0.0	0.00	0.00
467	0.0	0.00	0.00
468	0.0	0.00	0.00
469	0.0	0.00	0.00
470	0.0	0.00	0.00
471	0.0	0.00	0.00
472	0.0	0.00	0.00
473	0.0	0.00	0.00
474	0.0	0.00	0.00
475	0.0	0.00	0.00
476	0.0	0.00	0.00
477	0.0	0.00	0.00
478	0.0	0.00	0.00
479	0.0	0.00	0.00
480	0.0	0.00	0.00
481	0.0	0.00	0.00
482	0.0	0.00	0.00
483	0.0	0.00	0.00
484	0.0	0.00	0.00
485	0.0	0.00	0.00
486	0.0	0.00	0.00
487	0.0	0.00	0.00
488	0.0	0.00	0.00
489	0.0	0.00	0.00
490	0.0	0.00	0.00
491	0.0	0.00	0.00
492	0.0	0.00	0.00
493	0.0	0.00	0.00
494	0.0	0.00	0.00
495	0.0	0.00	0.00
496	0.0	0.00	0.00
497	0.0	0.00	0.00
498	0.0	0.00	0.00
499	0.0	0.00	0.00
500	0.0	0.00	0.00
	6		0.795
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
501	0.0	0.00	0.00
502	0.0	0.00	0.00
503	0.0	0.00	0.00
504	0.0	0.00	0.00
505	0.0	0.00	0.00
506	0.0	0.00	0.00
507	0.0	0.00	0.00
508	0.0	0.00	0.00
509	0.0	0.00	0.00
510	0.0	0.00	0.00
511	0.0	0.00	0.00
512	0.0	0.00	0.00
513	0.0	0.00	0.00
514	0.0	0.00	0.00
515	0.0	0.00	0.00
516	0.0	0.00	0.00
517	0.0	0.00	0.00
518	0.0	0.00	0.00
519	0.0	0.00	0.00
520	0.0	0.00	0.00
521	0.0	0.00	0.00
522	0.0	0.00	0.00
523	0.0	0.00	0.00
524	0.0	0.00	0.00
525	0.0	0.00	0.00
526	0.0	0.00	0.00
527	0.0	0.00	0.00
528	0.0	0.00	0.00
529	0.0	0.00	0.00
530	0.0	0.00	0.00
531	0.0	0.00	0.00
532	0.0	0.00	0.00
533	0.0	0.00	0.00
534	0.0	0.00	0.00
535	0.0	0.00	0.00
536	0.0	0.00	0.00
537	0.0	0.00	0.00
538	0.0	0.00	0.00
539	0.0	0.00	0.00
540	0.0	0.00	0.00
541	0.0	0.00	0.00
542	0.0	0.00	0.00
543	0.0	0.00	0.00
544	0.0	0.00	0.00
545	0.0	0.00	0.00
546	0.0	0.00	0.00
547	0.0	0.00	0.00
548	0.0	0.00	0.00
549	0.0	0.00	0.00
550	0.0	0.00	0.00
	0		0.000
	Sum(n)		Sum(n-N)²



NOTES:
REFER TO DATA TABLE FOR SURVEY RESULTS.

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED AREA – SOUTH OF URANIUM PLANT YARD
SOIL SAMPLE RESULTS – DEPTH

DRWN. BY	DATE	SCALE:
JE	4-19-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSISS-2	0

...\SUBAREAI\SOUTH-OF-U-PLANT-DEPTH\99POSISS-DEPTH

CIMARRON FACILITY

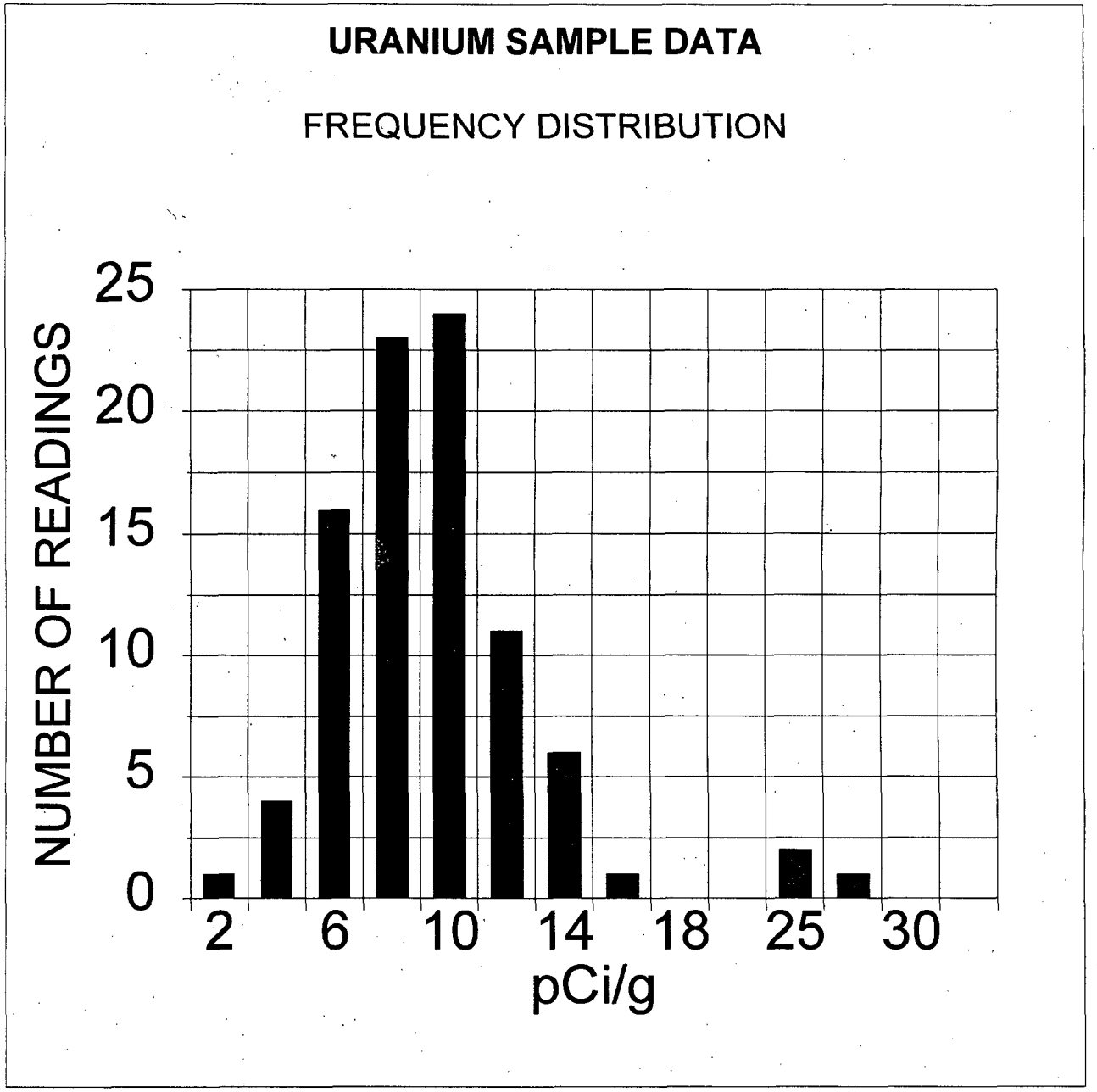
PHASE II - SUB-AREA "I" SOUTH OF URANIUM PLANT AFFECTED - DEPTH

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA	BACKGROUND NOT SUBTRACTED
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	9	2	REVIEWED BY: W. Q. Rogers DATE: 4-19-99
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	7000	N/A	
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4 Th (Nat) 1.5	10 1.5	

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	pCi/g 0- 6" Total- U	0- 6" Th (Nat)	6"- 1' Total- U	6"- 1' Th (Nat)	1'- 2' Total- U	1'- 2' Th (Nat)	2' 3' Total- U	2' 3' Th (Nat)	3' 4' Total- U	3' 4' Th (Nat)
1	50	W	-	8	S	7952	9	8	7	2	8	2	6	2	6	1	5	1
2	50	W	-	12	N	6682	7	7	9	1	6	1	11	1	11	2	14	2
3	30	W	-	8	S	8276	8	8	11	1	11	1	10	2	9	1	10	1
4	30	W	-	12	N	7874	9	8	9	1	8	1	5	1	ROCK	ROCK	ROCK	ROCK
5	10	W	-	8	S	8276	8	8	10	1	12	2	9	1	9	2	7	2
6	10	W	-	12	N	8016	8	8	6	2	8	1	13	2	7	2	9	2
7	10	E	-	8	S	6956	7	7	16	2	23	1	7	2	7	1	2	1
8	15	E	-	12	N	7612	7	7	21	1	14	1	9	1	5	1	9	2
9	30	E	-	8	S	6920	8	8	8	1	8	1	10	2	10	2	4	1
10	30	E	-	12	N	6912	7	7	10	1	10	1	29	2	13	1	9	1
11	50	E	-	8	S	9106	9	9	12	2	11	2	9	1	5	1	ROCK	ROCK
12	50	E	-	12	N	7076	7	7	13	1	7	1	5	1	11	2	7	1
13	70	E	-	8	S	8340	9	9	10	2	10	1	7	1	6	1	ROCK	ROCK
14	70	E	-	12	N	7292	8	7	10	2	5	2	7	1	8	1	ROCK	ROCK
15	90	E	-	8	S	8064	8	8	12	1	7	2	7	2	8	2	11	1
16	90	E	-	12	N	8434	9	8	10	2	8	2	10	2	5	2	10	1
17	110	E	-	12	N	6962	7	7	14	1	4	1	9	1	11	1	8	1
18	130	E	-	12	N	6588	7	7	8	1	6	1	7	1	6	1	5	1
19	150	E	-	12	N	5264	5	5	6	1	4	1	8	1	6	1	4	1
20																		
21																		
22																		
23																		
24																		

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
CIMARRON SOIL COUNTER AFFECTED DEPTH
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

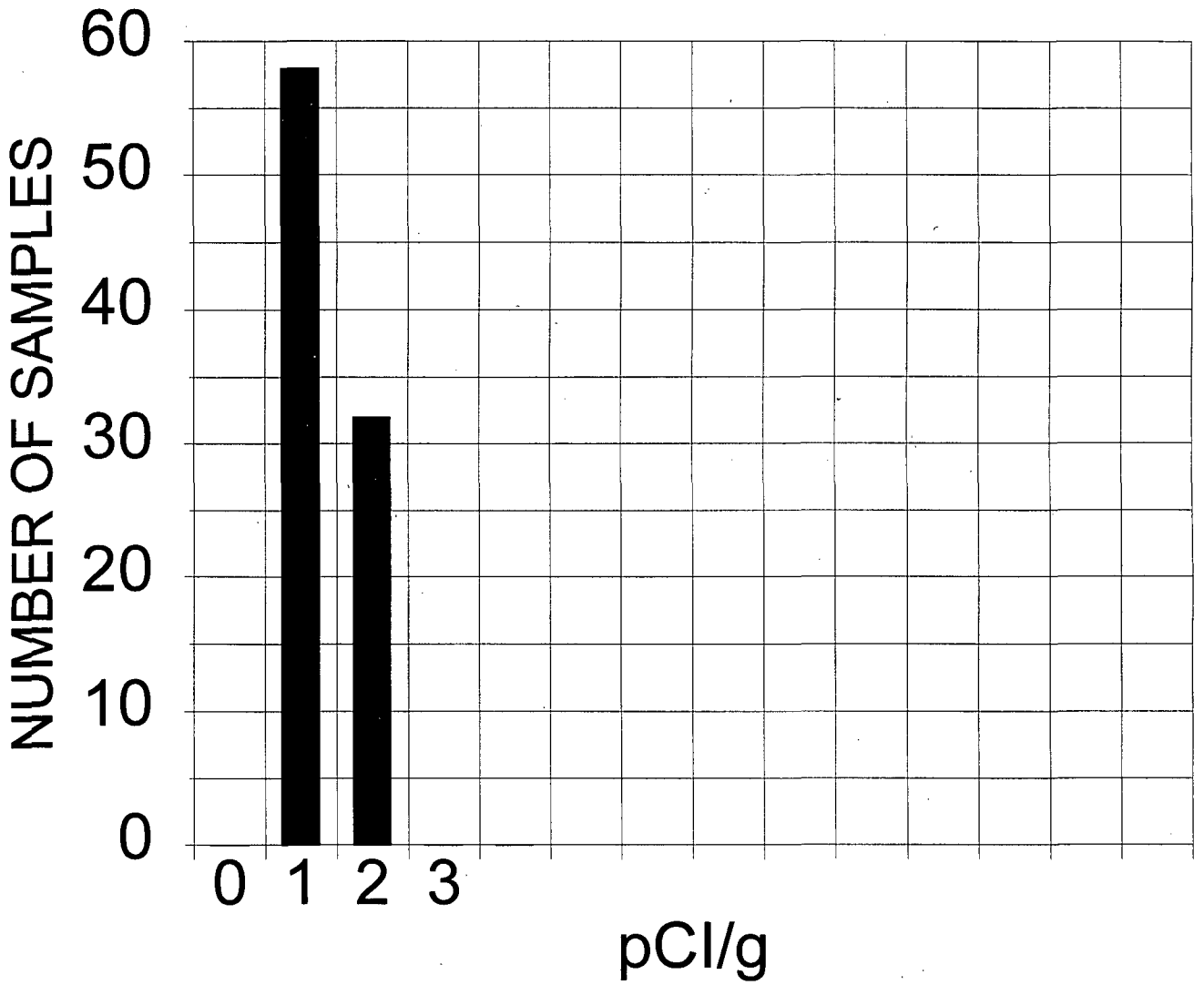


NUMBER OF SAMPLES	90
AVERAGE SAMPLE	9.0
MINIMUM SAMPLE	2.0
MAXIMUM SAMPLE	29.0
STANDARD DEVIATION	4.0

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
CIMARRON SOIL COUNTER
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED

MARCH, 1999

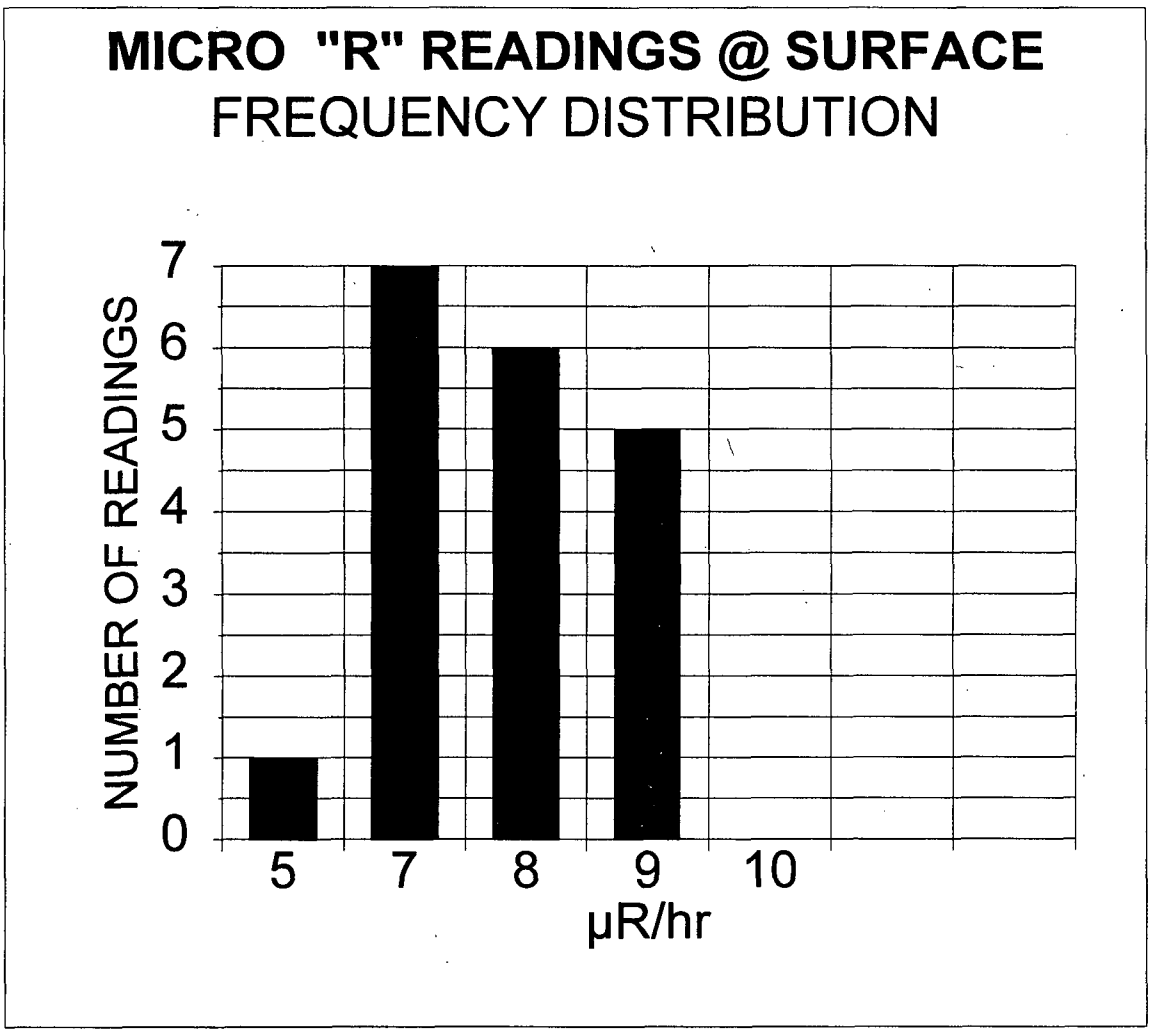
THORIUM SAMPLE RESULTS
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	90
AVERAGE SAMPLE	1.4
MINIMUM SAMPLE	1.0
MAXIMUM SAMPLE	2.0
STANDARD DEVIATION	0.5

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
LUDLUM MODEL 19 S/N 111299 AFFECTED - DEPTH
MICRO-R METER READINGS AT SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
RESULTS IN µR/hr

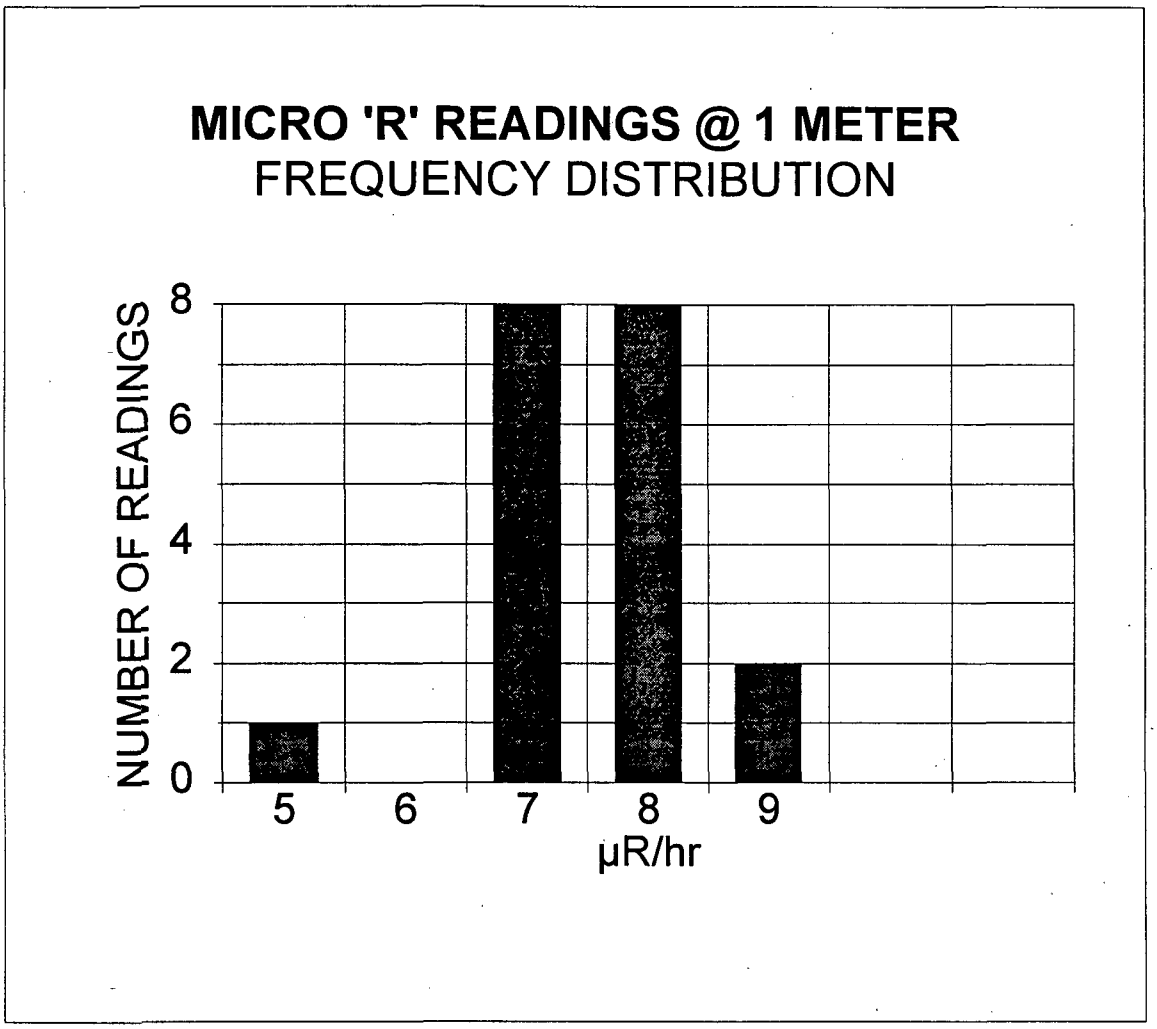
MARCH, 1999



NUMBER OF READINGS	19
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	9
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
LUDLUM MODEL 19 S/N 111299 AFFECTED - DEPTH
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
RESULTS IN µR/hr

MARCH, 1999

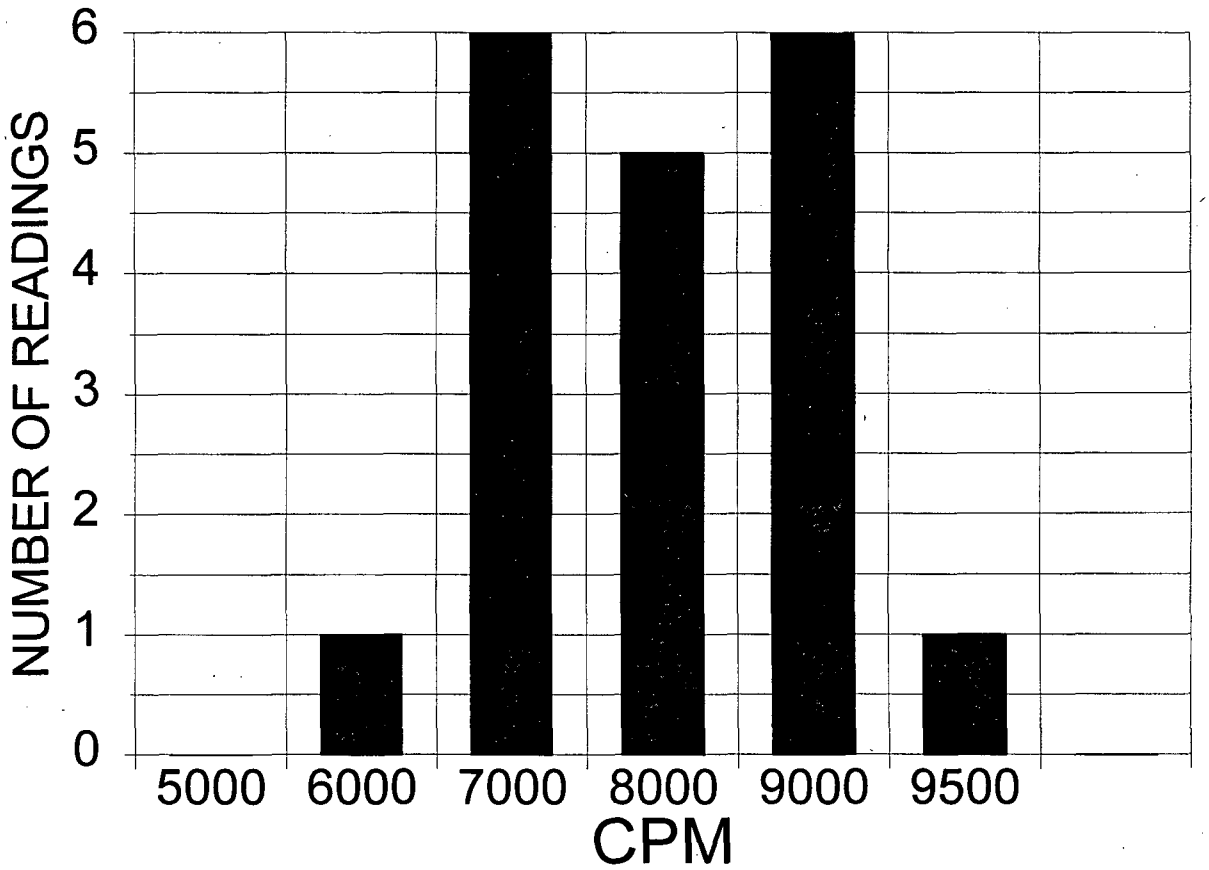


NUMBER OF READINGS	19
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	9
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" SOUTH OF URANIUM PLANT
3" NaI DETECTOR AFFECTED - DEPTH
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 97264 (UNSHIELDED)
BACKGROUND AVERAGE: 7000 CPM

MARCH, 1999

3" NaI DETECTOR READINGS
FREQUENCY DISTRIBUTION



NUMBER OF READINGS	19
AVERAGE READING	7505
MINIMUM READING	5264
MAXIMUM READING	9106
STANDARD DEVIATION	867

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH URANIUM OF PLANT (AFFECTED) DEPTH

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	7.0	-2.0	3.9
2	9.0	0.0	0.0
3	11.0	2.0	4.1
4	9.0	0.0	0.0
5	10.0	1.0	1.1
6	6.0	-3.0	8.8
7	16.0	7.0	49.5
8	21.0	12.0	144.8
9	8.0	-1.0	0.9
10	10.0	1.0	1.1
11	12.0	3.0	9.2
12	13.0	4.0	16.3
13	10.0	1.0	1.1
14	10.0	1.0	1.1
15	12.0	3.0	9.2
16	10.0	1.0	1.1
17	14.0	5.0	25.3
18	8.0	-1.0	0.9
19	6.0	-3.0	8.8
20	8.0	-1.0	0.9
21	6.0	-3.0	8.8
22	11.0	2.0	4.1
23	8.0	-1.0	0.9
24	12.0	3.0	9.2
25	8.0	-1.0	0.9
26	23.0	14.0	196.9
27	14.0	5.0	25.3
28	8.0	-1.0	0.9
29	10.0	1.0	1.1
30	11.0	2.0	4.1
31	7.0	-2.0	3.9
32	10.0	1.0	1.1
33	5.0	-4.0	15.7
34	7.0	-2.0	3.9
35	8.0	-1.0	0.9
36	4.0	-5.0	24.7
37	6.0	-3.0	8.8
38	4.0	-5.0	24.7
39	6.0	-3.0	8.8
40	11.0	2.0	4.1
41	10.0	1.0	1.1
42	5.0	-4.0	15.7
43	9.0	0.0	0.0
44	13.0	4.0	16.3
45	7.0	-2.0	3.9
46	9.0	0.0	0.0
47	10.0	1.0	1.1
48	29.0	20.0	401.3
49	9.0	0.0	0.0
50	5.0	-4.0	15.7
	312.0		308.8
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	807		1400.9
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 90

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) + (x)

Sample Mean (N) : 8.97

Standard Deviation (Sd) = SQRT [(n-N)² + (x - 1)]

Standard Deviation: 3.97

2 Std Deviations: 7.93

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.665

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 9.66 pCi/gU TOTAL U

GUIDELINE VALUE: 30 pCi/gU TOTAL U

Acceptable Level: 34.0 pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	89	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) + (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	89	1.665	95%

PERFORMED BY: Mickey Hodges DATE: 3-31-99

REVIEWED BY: W. A. Rogers DATE: 3-31-99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH URANIUM OF PLANT (AFFECTED) DEPTH

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
51	7.0	-1.97	3.87
52	7.0	-1.97	3.87
53	7.0	-1.97	3.87
54	10.0	1.03	1.07
55	9.0	0.03	0.00
56	7.0	-1.97	3.87
57	8.0	-0.97	0.93
58	6.0	-2.97	8.80
59	11.0	2.03	4.13
60	9.0	0.03	0.00
61	9.0	0.03	0.00
62	7.0	-1.97	3.87
63	7.0	-1.97	3.87
64	5.0	-3.97	15.73
65	10.0	1.03	1.07
66	13.0	4.03	16.27
67	5.0	-3.97	15.73
68	11.0	2.03	4.13
69	6.0	-2.97	8.80
70	8.0	-0.97	0.93
71	8.0	-0.97	0.93
72	5.0	-3.97	15.73
73	11.0	2.03	4.13
74	6.0	-2.97	8.80
75	6.0	-2.97	8.80
76	5.0	-3.97	15.73
77	14.0	5.03	25.33
78	10.0	1.03	1.07
79	7.0	-1.97	3.87
80	9.0	0.03	0.00
81	2.0	-6.97	48.53
82	9.0	0.03	0.00
83	4.0	-4.97	24.67
84	9.0	0.03	0.00
85	7.0	-1.97	3.87
86	11.0	2.03	4.13
87	10.0	1.03	1.07
88	8.0	-0.97	0.93
89	5.0	-3.97	15.73
90	4.0	-4.97	24.67
91	0.0	0.00	0.00
92	0.0	0.00	0.00
93	0.0	0.00	0.00
94	0.0	0.00	0.00
95	0.0	0.00	0.00
96	0.0	0.00	0.00
97	0.0	0.00	0.00
98	0.0	0.00	0.00
99	0.0	0.00	0.00
100	0.0	0.00	0.00
	312.0		308.8
	Sum(n)		Sum(n-N)²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
101	0.0	0.00	0.00
102	0.0	0.00	0.00
103	0.0	0.00	0.00
104	0.0	0.00	0.00
105	0.0	0.00	0.00
106	0.0	0.00	0.00
107	0.0	0.00	0.00
108	0.0	0.00	0.00
109	0.0	0.00	0.00
110	0.0	0.00	0.00
111	0.0	0.00	0.00
112	0.0	0.00	0.00
113	0.0	0.00	0.00
114	0.0	0.00	0.00
115	0.0	0.00	0.00
116	0.0	0.00	0.00
117	0.0	0.00	0.00
118	0.0	0.00	0.00
119	0.0	0.00	0.00
120	0.0	0.00	0.00
121	0.0	0.00	0.00
122	0.0	0.00	0.00
123	0.0	0.00	0.00
124	0.0	0.00	0.00
125	0.0	0.00	0.00
126	0.0	0.00	0.00
127	0.0	0.00	0.00
128	0.0	0.00	0.00
129	0.0	0.00	0.00
130	0.0	0.00	0.00
131	0.0	0.00	0.00
132	0.0	0.00	0.00
133	0.0	0.00	0.00
134	0.0	0.00	0.00
135	0.0	0.00	0.00
136	0.0	0.00	0.00
137	0.0	0.00	0.00
138	0.0	0.00	0.00
139	0.0	0.00	0.00
140	0.0	0.00	0.00
141	0.0	0.00	0.00
142	0.0	0.00	0.00
143	0.0	0.00	0.00
144	0.0	0.00	0.00
145	0.0	0.00	0.00
146	0.0	0.00	0.00
147	0.0	0.00	0.00
148	0.0	0.00	0.00
149	0.0	0.00	0.00
150	0.0	0.00	0.00
	0.0		0.0
	Sum(n)		Sum(n-N)²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH URANIUM OF PLANT (AFFECTED) DEPTH

n = pCi/g Th (NAT)

Number	n	(n-N)	$(n-N)^2$
1	2.0	0.64	0.42
2	1.0	-0.36	0.13
3	1.0	-0.36	0.13
4	1.0	-0.36	0.13
5	1.0	-0.36	0.13
6	2.0	0.64	0.42
7	2.0	0.64	0.42
8	1.0	-0.36	0.13
9	1.0	-0.36	0.13
10	1.0	-0.36	0.13
11	2.0	0.64	0.42
12	1.0	-0.36	0.13
13	2.0	0.64	0.42
14	2.0	0.64	0.42
15	1.0	-0.36	0.13
16	2.0	0.64	0.42
17	1.0	-0.36	0.13
18	1.0	-0.36	0.13
19	1.0	-0.36	0.13
20	2.0	0.64	0.42
21	1.0	-0.36	0.13
22	1.0	-0.36	0.13
23	1.0	-0.36	0.13
24	2.0	0.64	0.42
25	1.0	-0.36	0.13
26	1.0	-0.36	0.13
27	1.0	-0.36	0.13
28	1.0	-0.36	0.13
29	1.0	-0.36	0.13
30	2.0	0.64	0.42
31	1.0	-0.36	0.13
32	1.0	-0.36	0.13
33	2.0	0.64	0.42
34	2.0	0.64	0.42
35	2.0	0.64	0.42
36	1.0	-0.36	0.13
37	1.0	-0.36	0.13
38	1.0	-0.36	0.13
39	2.0	0.64	0.42
40	1.0	-0.36	0.13
41	2.0	0.64	0.42
42	1.0	-0.36	0.13
43	1.0	-0.36	0.13
44	2.0	0.64	0.42
45	2.0	0.64	0.42
46	1.0	-0.36	0.13
47	2.0	0.64	0.42
48	2.0	0.64	0.42
49	1.0	-0.36	0.13
50	1.0	-0.36	0.13
	53		8.812
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	0		
	122.0		20.622
	Sum(n)		$Sum(n-N)^2$

No. of Samples (x) : 90

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.36

Standard Deviation (Sd) = SQRT $[(n-N)^2 \div (x - 1)]$

Standard Deviation: 0.48
2 Std Deviations: 0.96
Degree of Freedom(df) = (x) - 1 Data listed on Table B-1
(df) = 1.665

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.44 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	120	is (B)	1.658	95%
(df) low value(Y)	60	is (A)	1.671	95%
Desired value(df) (X)	89	is calculated as follow:		

EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]

The (df) value for (X)	89	1.665	95%

PERFORMED BY: Mubey Hodi DATE: 3-31-99

REVIEWED BY: W. A. Rogers DATE: 3-31-99

FILE:OWP1CMTH

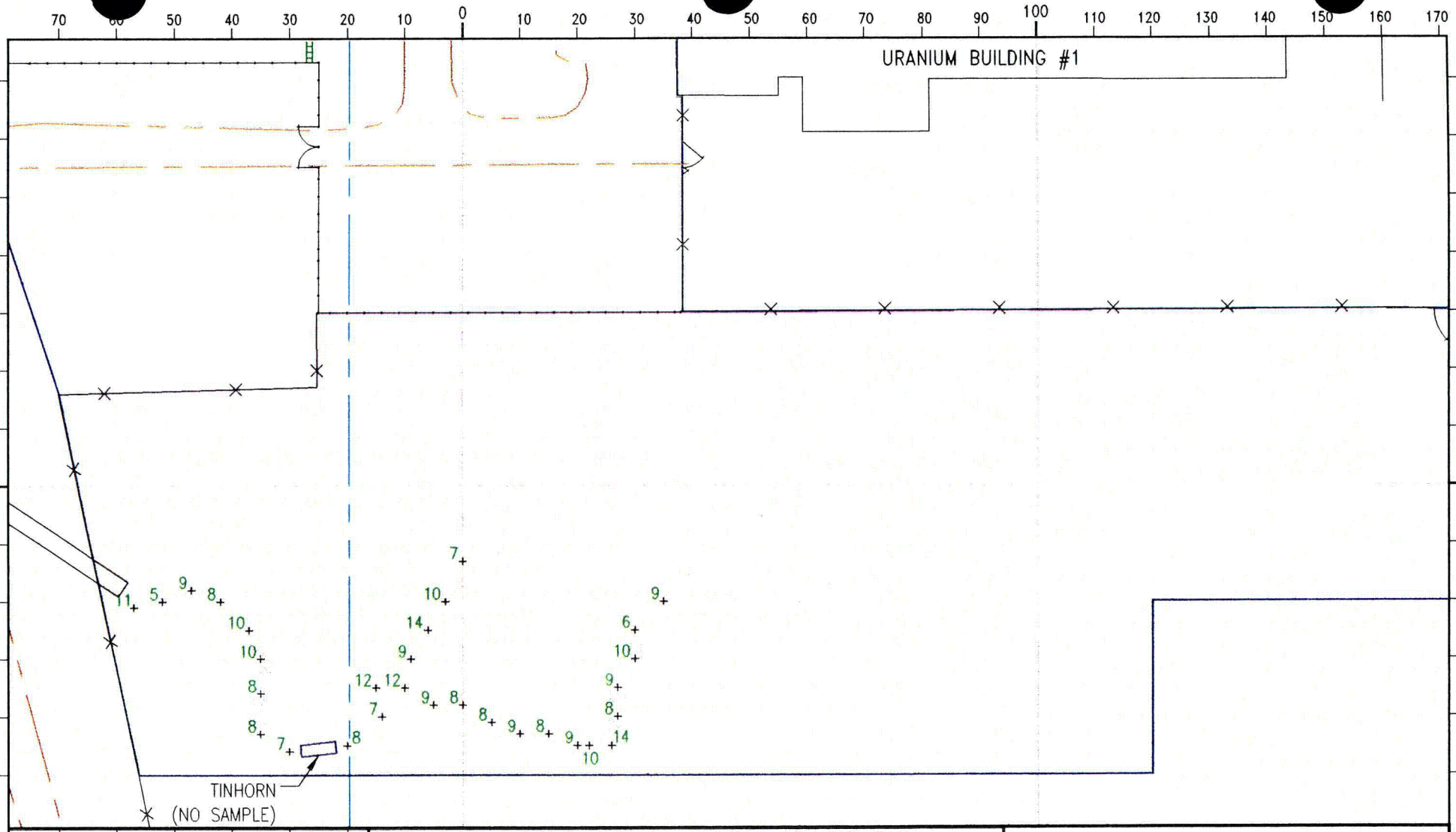
CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" SOUTH URANIUM OF PLANT (AFFECTED) DEPTH

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
51	1.0	-0.36	0.13
52	1.0	-0.36	0.13
53	2.0	0.64	0.42
54	2.0	0.64	0.42
55	1.0	-0.36	0.13
56	1.0	-0.36	0.13
57	1.0	-0.36	0.13
58	1.0	-0.36	0.13
59	2.0	0.64	0.42
60	1.0	-0.36	0.13
61	2.0	0.64	0.42
62	2.0	0.64	0.42
63	1.0	-0.36	0.13
64	1.0	-0.36	0.13
65	2.0	0.64	0.42
66	1.0	-0.36	0.13
67	1.0	-0.36	0.13
68	2.0	0.64	0.42
69	1.0	-0.36	0.13
70	1.0	-0.36	0.13
71	2.0	0.64	0.42
72	2.0	0.64	0.42
73	1.0	-0.36	0.13
74	1.0	-0.36	0.13
75	1.0	-0.36	0.13
76	1.0	-0.36	0.13
77	2.0	0.64	0.42
78	1.0	-0.36	0.13
79	2.0	0.64	0.42
80	2.0	0.64	0.42
81	1.0	-0.36	0.13
82	2.0	0.64	0.42
83	1.0	-0.36	0.13
84	1.0	-0.36	0.13
85	1.0	-0.36	0.13
86	1.0	-0.36	0.13
87	1.0	-0.36	0.13
88	1.0	-0.36	0.13
89	1.0	-0.36	0.13
90	1.0	-0.36	0.13
91		0.00	0.00
92		0.00	0.00
93		0.00	0.00
94		0.00	0.00
95		0.00	0.00
96		0.00	0.00
97		0.00	0.00
98		0.00	0.00
99		0.00	0.00
100		0.00	0.00
	53		8.812
	Sum(n)		Sum(n-N)²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N)²
101		0.00	0.00
102		0.00	0.00
103		0.00	0.00
104		0.00	0.00
105		0.00	0.00
106		0.00	0.00
107		0.00	0.00
108		0.00	0.00
109		0.00	0.00
110		0.00	0.00
111		0.00	0.00
112		0.00	0.00
113		0.00	0.00
114		0.00	0.00
115		0.00	0.00
116		0.00	0.00
117		0.00	0.00
118		0.00	0.00
119		0.00	0.00
120		0.00	0.00
121		0.00	0.00
122		0.00	0.00
123		0.00	0.00
124		0.00	0.00
125		0.00	0.00
126		0.00	0.00
127		0.00	0.00
128		0.00	0.00
129		0.00	0.00
130		0.00	0.00
131		0.00	0.00
132		0.00	0.00
133		0.00	0.00
134		0.00	0.00
135		0.00	0.00
136		0.00	0.00
137		0.00	0.00
138		0.00	0.00
139		0.00	0.00
140		0.00	0.00
141		0.00	0.00
142		0.00	0.00
143		0.00	0.00
144		0.00	0.00
145		0.00	0.00
146		0.00	0.00
147		0.00	0.00
148		0.00	0.00
149		0.00	0.00
150		0.00	0.00
	0		0.000
	Sum(n)		Sum(n-N)²



NORTH

25 0 25

SCALE IN METERS

NOTES:

URANIUM (pCi/g U).

CIMARRON GAMMA SPEC SOIL COUNTER

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U, NOT SUBTRACTED.

LEGEND:

6_+ URANIUM, 1 – 30 pCi/g U

45_+ URANIUM, > 30 pCi/g U

REV.	DESCRIPTION	DRWN BY:	CK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JL	6/21/99

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE II – SUB-AREA I
AFFECTED DRAINAGE
SOIL SAMPLE RESULTS – SURFACE

DRWN. BY	DATE	SCALE:
JE	2-7-99	AS SHOWN

JOB NO.	DRAWING NO.	REV.
	99POSISS-1	0

...SUBAREAI\SOUTH-OF-U-PLANT-SURFACE\99POSISS-1

CIMARRON FACILITY

SUB AREA "I" DRAINAGE
PHASE II

INSTRUMENTS:	S/N	RESULTS IN	BACKGROUND	MDA
LUDLUM MICRO 'R' METER - M/N 19	111299	µr/hr	7-10	2
LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR	97264	CPM	8386	N/A
CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR		pCi/G	Total U 4.0 Th (Nat) 1.5	10 1

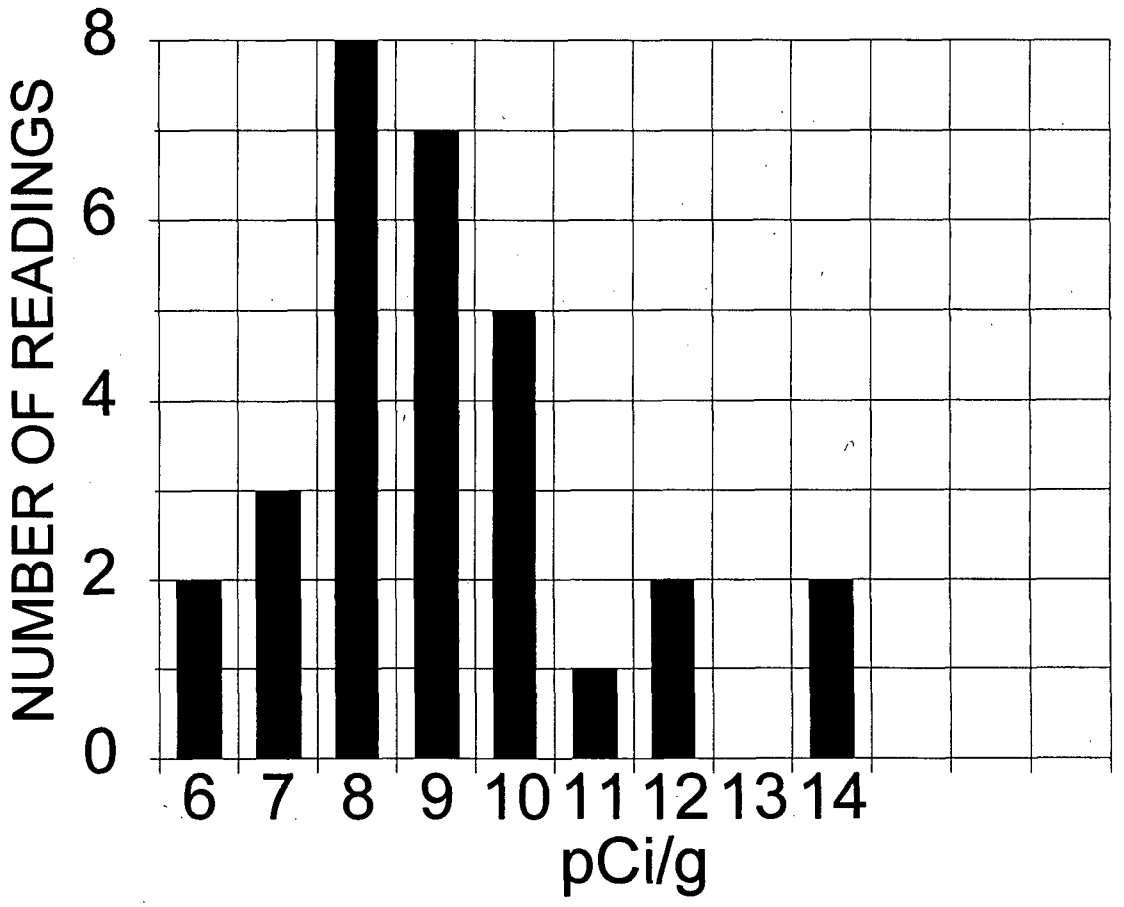
BACKGROUND NOT SUBTRACTED
REVIEWED BY: W.O. Royer DATE: 5-18-99

LN #	GRID LOCATION					3" DETECT C.P.M.	MICRO R' SURF	MICRO R' 1 METER	0" - 6' Total-U	0" - 6' Th (Nat)
1	57	W	-	21	S	7152	8	7	11	1
2	52	W	-	20	S	7600	8	7	5	1
3	47	W	-	18	S	6720	8	7	9	1
4	42	W	-	20	S	6782	7	7	8	1
5	37	W	-	25	S	7918	7	8	10	1
6	35	W	-	30	S	6474	7	7	10	1
7	35	W	-	36	S	6260	7	7	8	1
8	35	W	-	43	S	6382	7	6	8	1
9	30	W	-	46	S	8184	7	7	7	2
10	20	W	-	45	S	6786	7	8	8	1
11	15	W	-	35	S	8742	8	9	12	1
12	14	W	-	40	S	8074	10	9	7	1
13	10	W	-	35	S	9666	9	8	12	1
14	9	W	-	30	S	8386	10	9	9	1
15	6	W	-	25	S	8818	9	10	14	1
16	5	W	-	38	S	9084	8	8	9	1
17	3	W	-	20	S	8990	10	10	10	2
18	0	W	-	13	S	10296	10	11	7	1
19	0	E	-	38	S	7416	8	9	8	1
20	5	E	-	41	S	8802	9	8	8	1
21	10	E	-	43	S	8990	10	8	9	2
22	15	E	-	43	S	8826	9	9	8	1
23	20	E	-	45	S	8214	9	8	9	1
24	22	E	-	45	S	8548	9	9	10	2
25	26	E	-	45	S	8944	10	9	14	1
26	27	E	-	40	S	9674	10	9	8	1
27	27	E	-	35	S	9328	9	9	9	2
28	30	E	-	30	S	8998	11	10	10	2
29	30	E	-	25	S	8660	9	9	6	1
30	35	E	-	20	S	10398	11	10	9	2

PHASE II SUB-AREA "I" DRAINAGE
CIMARRON SOIL COUNTER AFFECTED SURFACE
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED

MARCH, 1999

URANIUM SAMPLE DATA
FREQUENCY DISTRIBUTION

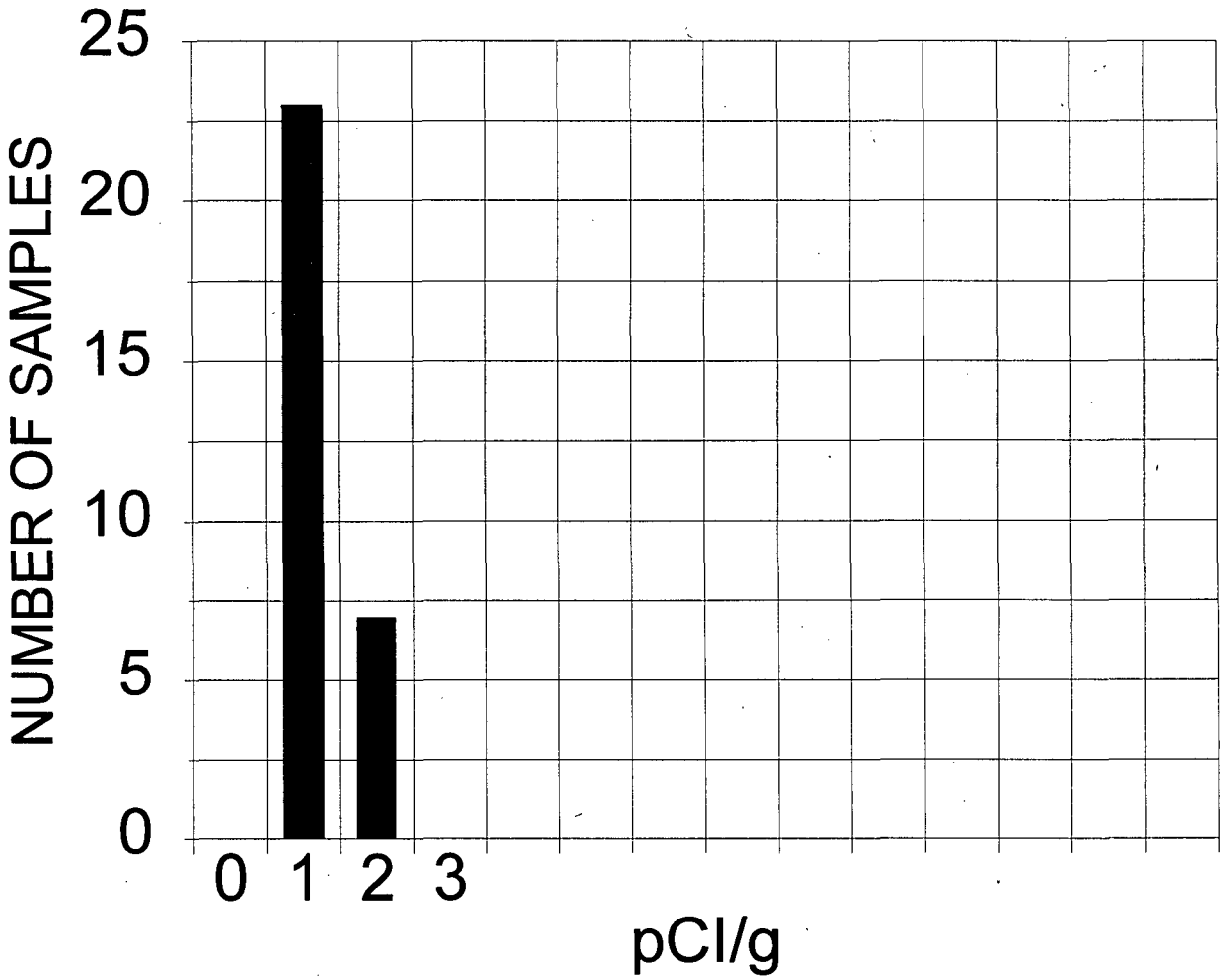


NUMBER OF SAMPLES	30
AVERAGE SAMPLE	9
MINIMUM SAMPLE	5
MAXIMUM SAMPLE	14
STANDARD DEVIATION	2

PHASE II SUB-AREA "I" DRAINAGE
CIMARRON SOIL COUNTER SURFACE
TOTAL THORIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED

MARCH, 1999

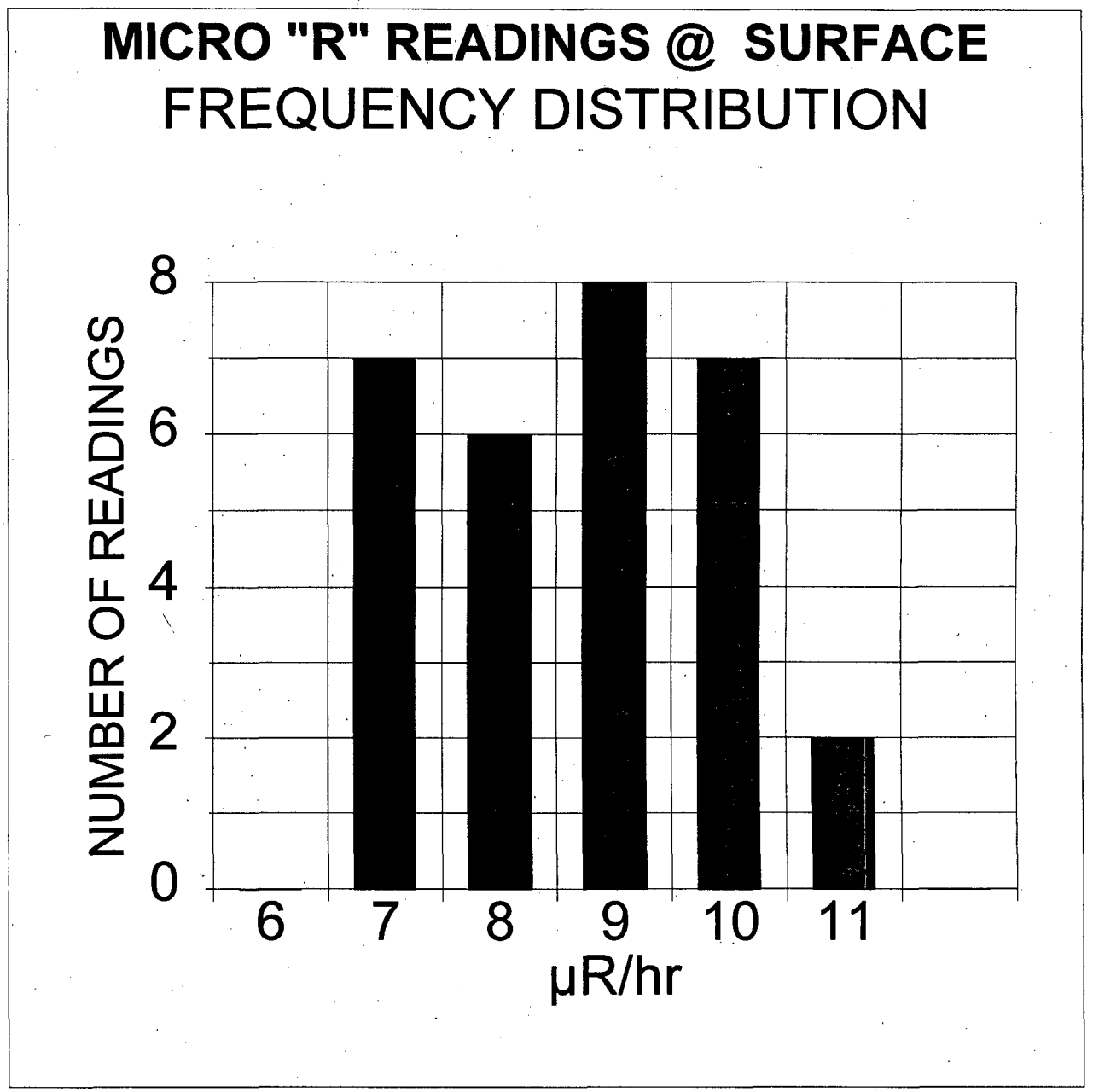
THORIUM SAMPLE RESULTS
FREQUENCY DISTRIBUTION



NUMBER OF SAMPLES	30
AVERAGE SAMPLE	1
MINIMUM SAMPLE	1
MAXIMUM SAMPLE	2
STANDARD DEVIATION	0.4

PHASE II SUB-AREA "I" DRAINAGE
LUDLUM MODEL 19 S/N 111299 AFFECTED - SURFACE
MICRO-R METER READINGS AT SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
RESULTS IN µR/hr

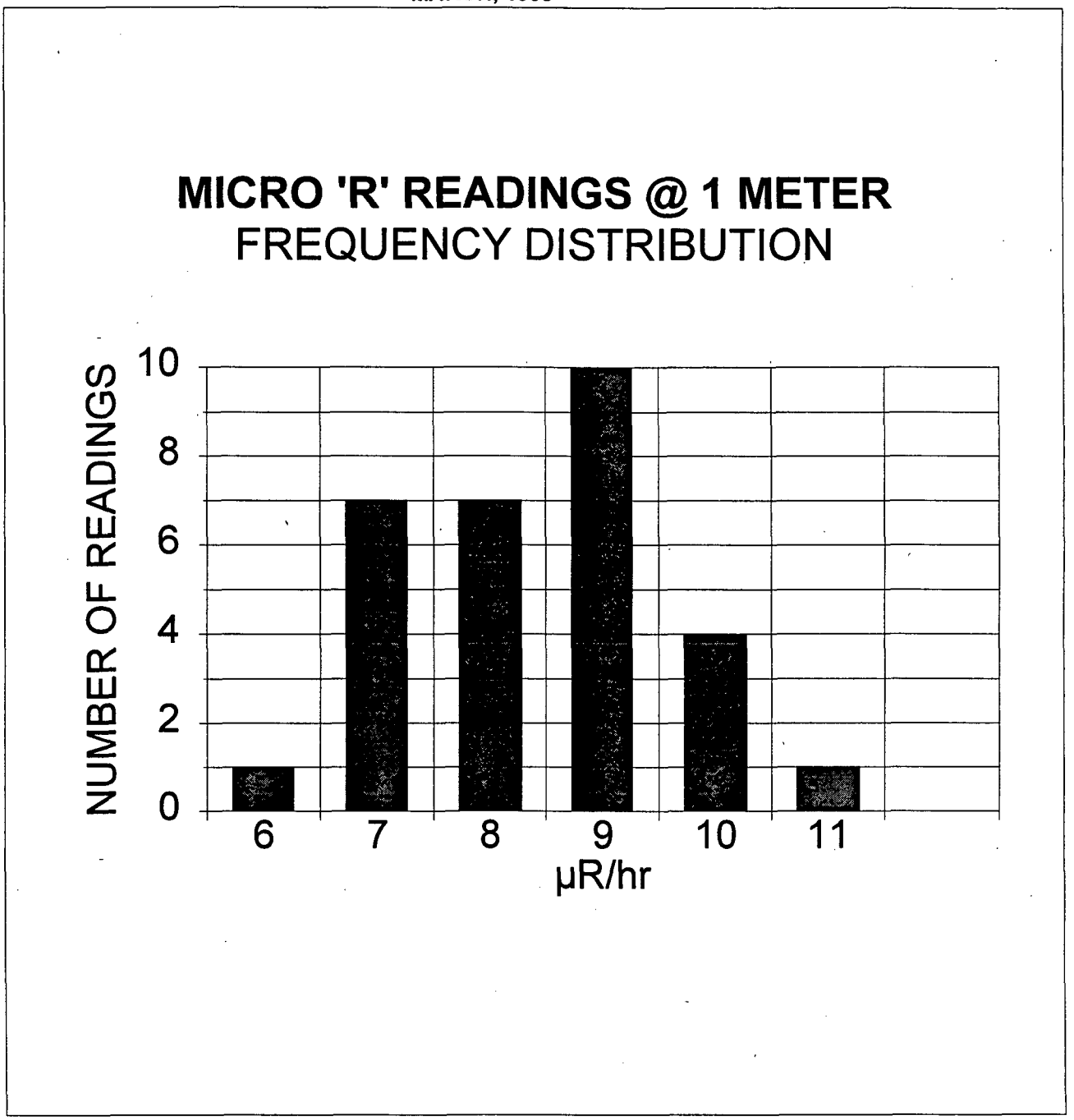
MARCH, 1999



NUMBER OF READINGS	30
AVERAGE READING	9
MINIMUM READING	7
MAXIMUM READING	11
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" DRAINAGE
LUDLUM MODEL 19 S/N 111299 AFFECTED - SURFACE
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
SITE BACKGROUND OF 9 µR/hr NOT SUBTRACTED
RESULTS IN µR/hr

MARCH, 1999



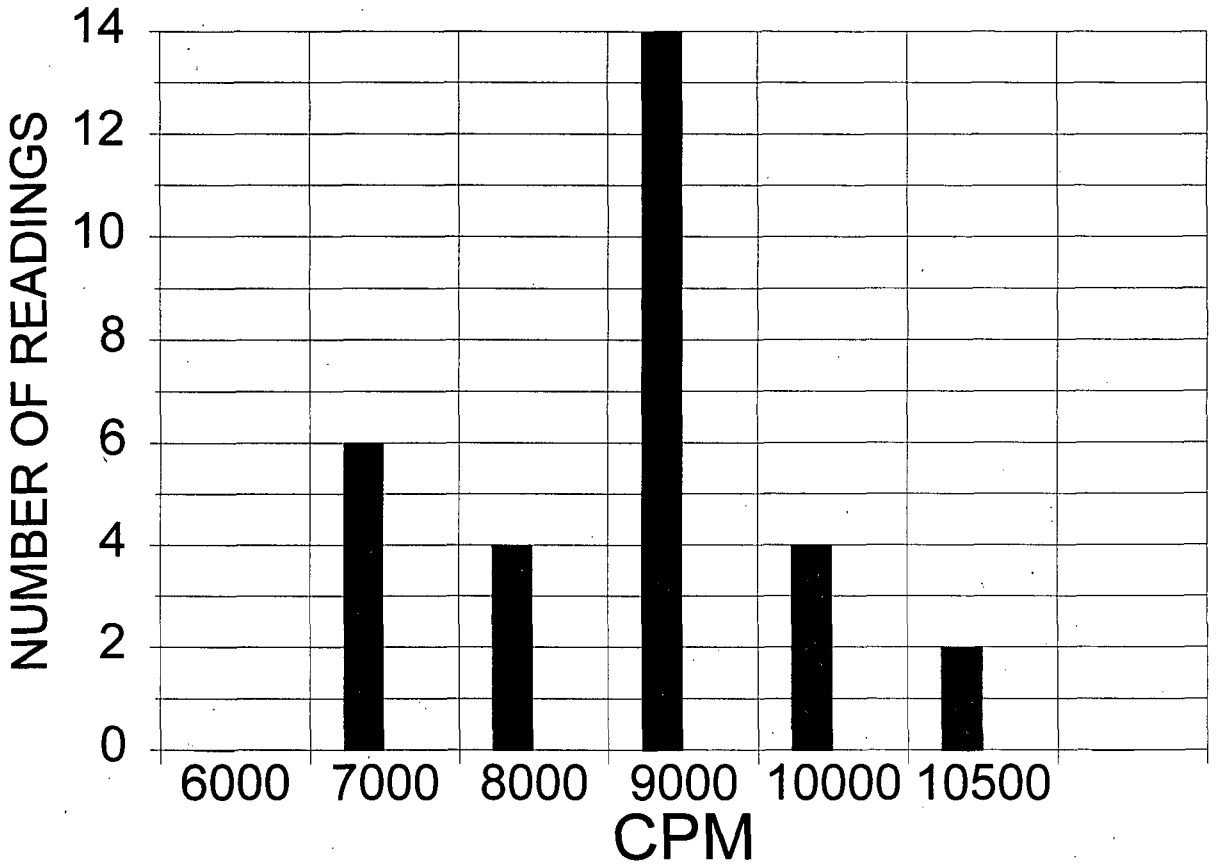
NUMBER OF READINGS	30
AVERAGE READING	8
MINIMUM READING	6
MAXIMUM READING	11
STANDARD DEVIATION	1

PHASE II SUB-AREA "I" DRAINAGE
3" NaI DETECTOR AFFECTED - SURFACE
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 97264 (UNSHIELDED)
BACKGROUND AVERAGE: 8386 CPM

MARCH, 1999

3" NaI DETECTOR READINGS

FREQUENCY DISTRIBUTION



NUMBER OF READINGS	30
AVERAGE READING	8304
MINIMUM READING	6260
MAXIMUM READING	10398
STANDARD DEVIATION	1124

04/19/99

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" DRAINAGE (AFFECTED) SURFACE

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N)²
1	11.0	1.9	3.7
2	5.0	-4.1	16.5
3	9.0	-0.1	0.0
4	8.0	-1.1	1.1
5	10.0	0.9	0.9
6	10.0	0.9	0.9
7	8.0	-1.1	1.1
8	8.0	-1.1	1.1
9	7.0	-2.1	4.3
10	8.0	-1.1	1.1
11	12.0	2.9	8.6
12	7.0	-2.1	4.3
13	12.0	2.9	8.6
14	9.0	-0.1	0.0
15	14.0	4.9	24.3
16	9.0	-0.1	0.0
17	10.0	0.9	0.9
18	7.0	-2.1	4.3
19	8.0	-1.1	1.1
20	8.0	-1.1	1.1
21	9.0	-0.1	0.0
22	8.0	-1.1	1.1
23	9.0	-0.1	0.0
24	10.0	0.9	0.9
25	14.0	4.9	24.3
26	8.0	-1.1	1.1
27	9.0	-0.1	0.0
28	10.0	0.9	0.9
29	6.0	-3.1	9.4
30	9.0	-0.1	0.0
31	0.0	0.0	0.0
32	0.0	0.0	0.0
33	0.0	0.0	0.0
34	0.0	0.0	0.0
35	0.0	0.0	0.0
36	0.0	0.0	0.0
37	0.0	0.0	0.0
38	0.0	0.0	0.0
39	0.0	0.0	0.0
40	0.0	0.0	0.0
41	0.0	0.0	0.0
42	0.0	0.0	0.0
43	0.0	0.0	0.0
44	0.0	0.0	0.0
45	0.0	0.0	0.0
46	0.0	0.0	0.0
47	0.0	0.0	0.0
48	0.0	0.0	0.0
49	0.0	0.0	0.0
50	0.0	0.0	0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
	0.0		0.0
total	272		121.9
	Sum(n)		Sum(n-N)²

No. of Samples (x) : 30

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 9.07

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 2.05

2 Std Deviations: 4.10

Degree of Freedom(df).= (x) - 1 Data listed on Table B-1

(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/SQRT(x)]

(Aμ) = 9.70 pCi/gU TOTAL U

GUIDELINE VALUE: 30 pCi/gU TOTAL U

Acceptable Level: 34.0 pCi/gU TOTAL U

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines

(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.984	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B)-Ln(A)) ÷ (Z-Y)) (X-Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Mickey Hock DATE: 4-19-99

REVIEWED BY: W. A. Rogers DATE: 4-19-99

C:\OFFICE\AREA\I\DRAIN\DRAINCMU.WB2

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE
AREA "I" DRAINAGE (AFFECTED) SURFACE

n = pCi/g Th (NAT)

Number	n	(n-N)	$(n-N)^2$
1	1.0	-0.23	0.05
2	1.0	-0.23	0.05
3	1.0	-0.23	0.05
4	1.0	-0.23	0.05
5	1.0	-0.23	0.05
6	1.0	-0.23	0.05
7	1.0	-0.23	0.05
8	1.0	-0.23	0.05
9	2.0	0.77	0.59
10	1.0	-0.23	0.05
11	1.0	-0.23	0.05
12	1.0	-0.23	0.05
13	1.0	-0.23	0.05
14	1.0	-0.23	0.05
15	1.0	-0.23	0.05
16	1.0	-0.23	0.05
17	2.0	0.77	0.59
18	1.0	-0.23	0.05
19	1.0	-0.23	0.05
20	1.0	-0.23	0.05
21	2.0	0.77	0.59
22	1.0	-0.23	0.05
23	1.0	-0.23	0.05
24	2.0	0.77	0.59
25	1.0	-0.23	0.05
26	1.0	-0.23	0.05
27	2.0	0.77	0.59
28	2.0	0.77	0.59
29	1.0	-0.23	0.05
30	2.0	0.77	0.59
31	0.0	0.00	0.00
32	0.0	0.00	0.00
33	0.0	0.00	0.00
34	0.0	0.00	0.00
35	0.0	0.00	0.00
36	0.0	0.00	0.00
37	0.0	0.00	0.00
38	0.0	0.00	0.00
39	0.0	0.00	0.00
40	0.0	0.00	0.00
41	0.0	0.00	0.00
42	0.0	0.00	0.00
43	0.0	0.00	0.00
44	0.0	0.00	0.00
45	0.0	0.00	0.00
46	0.0	0.00	0.00
47	0.0	0.00	0.00
48	0.0	0.00	0.00
49	0.0	0.00	0.00
50	0.0	0.00	0.00
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	0		0.000
	37.0		5.367
	Sum(n)		$Sum(n-N)^2$

No. of Samples (x) : 30

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)
Sample Mean (N) : 1.23

Standard Deviation (Sd) = SQRT $[(n-N)^2 \div (x - 1)]$

Standard Deviation: 0.43
2 Std Deviations: 0.86
Degree of Freedom(df).= (x) - 1 Data listed on Table B-1
(df) = 1.699

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/sqrt(x)]

(Aμ) = 1.37 pCi/gTh (NAT)
GUIDELINE VALUE: 10 pCi/gTh (NAT)
Acceptable Level: 4.0 pCi/gTh (NAT)
(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparision of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	40	is (B)	1.684	95%
(df) low value(Y)	29	is (A)	1.699	95%
Desired value(df) (X)	29	is calculated as follow:		

EXP[((Ln(B) - Ln(A)) ÷ (Z - Y)) (X - Y) + Ln(A)]

The (df) value for (X)	29	1.699	95%

PERFORMED BY: Mickey Hodo DATE: 4-19-99

REVIEWED BY: W.A. Rogers DATE: 4-19-99