



INEEL/EXT-99-00197

May 1999

# **IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY RADIOLOGICAL CONTROL PERFORMANCE INDICATOR REPORT**

**FIRST QUARTER - CALENDAR YEAR 1999**

**Idaho National Engineering and  
Environmental Laboratory  
Radiological Control Performance Indicator Report**

**First Quarter  
Calendar Year 1999**

**Published May 1999**

**Idaho National Engineering and Environmental Laboratory  
Radiological Control  
Lockheed Martin Idaho Technologies Company  
Idaho Falls, Idaho 83415**

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Assistant Secretary for Environment, Safety, and Health  
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## **Radiological Control Performance Indicator Purpose**

The INEEL Radiological Control Performance Indicator Report is provided quarterly, in accordance with Article 133 of the INEEL Radiological Control Manual. Indicators are used to measure performance of the Radiological Control Program and as a motivation for improvement, not as goals in themselves. These indicators should be used by management as tools to focus priorities, attention, and adherence to As-Low-As-Reasonably-Achievable (ALARA) practices.

The ALARA Committees establish ALARA goals for the INEEL based on forecasts and goals provided by each facility organizational manager or supervisor.

Performance goals are realistic and measurable. Stringent goals are set at least annually to reflect expected workloads and improvement of radiological performance. Goals higher than previous goals may occasionally be set due to changes in work scope or mission.

The INEEL Radiological Control Performance Indicators consist of:

- ! Collective dose in person-rem.
- ! Average worker dose, maximum dose to a worker, and maximum neutron dose equivalent to a worker.
- ! Number of skin and clothing contaminations, including the number of contaminated wounds and facial contaminations that are greater than the OR criteria.
- ! Number of radioactive material intakes resulting in a dose assessment of 10 mrem or more.
- ! Area of Contamination, High Contamination, and Airborne Radioactivity Areas, in square feet.
- ! Airborne radioactivity events and spills that are greater than the OR criteria.
- ! A radiological Performance Index that takes into consideration frequency and severity of the other indicators by applying a cost coefficient to undesirable events.

These indicators also provide tracking and trending for the previous three years.

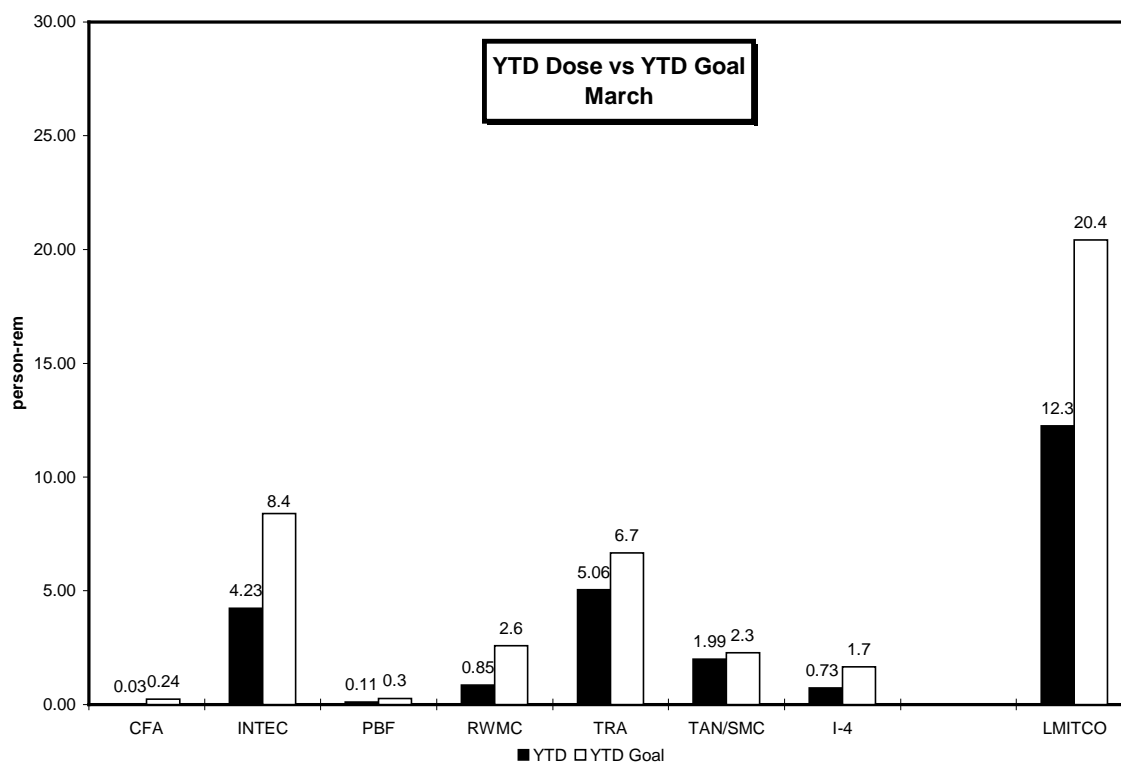
Other Radiological Control indicators suggested in the Radiological Control Manual are tracked and trended in other reports.

- The Environmental Management Operations Support Department reports the volume and radioactivity content of radioactive waste in the INEEL Radioactive Waste Management Annual Report and on the Radioactive Waste Management Information System (RWMIS).
- Releases of liquid and airborne radioactivity discharges are reported by the Environmental Affairs Branch in the INEEL Environmental Monitoring Report and the INEEL National Emission Standard for Hazardous Pollutants ( NESHAPs) - Radionuclide Annual Report.

# **Executive Summary** **Radiological Control Performance Indicator Report** **First Quarter 1999**

This document provides a report and an analysis of the Radiological Control Program through the first quarter of Calendar Year 1999 (CY-99) for Lockheed Martin Idaho Technologies Company (LMITCO). This Performance Indicator Report is provided in accordance with Article 133 of the INEEL Radiological Control Manual.

The LMITCO CY-99 ALARA goal has been established at 87.7 person-rem based on projected work for this year. Based on Electronic Dosimetry (EDs), year to date, collective occupational radiation deep dose is 12.3 person-rem year. Goals are based on projected work scope for the calendar year. In some cases work is not actually performed unless weather conditions allow, and some radiological work may be planned for later in the year. Some first quarter work has been deferred due to the considerable training required to implement ISMS and new maintenance programs that further enhance excellence programs. The chart below shows year to date performance. Actual exposure is below goal due to those items mentioned above.



International Isotopes Idaho Inc. (I-4) is a privatized organization responsible for the TRA Hot Cell operation. They are not part of LMITCO and their totals are not carried in the INEEL totals. The I-4 data is for information only.

The numeric Radiological Performance Index (RPI) is used to compare radiological performance considering frequency and severity of events such as skin contaminations, clothing contaminations, spills, exposures to radiation exceeding limits, and positive internal dose. The RPI measures the cost of these events in cents per hour of radiological work performed.

The RPI is calculated as follows:

$$RPI = 100 \left[ \frac{(1,000,000 * D) + (500,000 * ROE) + (200,000 * AOE) + (25,000 * SCE) + (25,000 * UR) + (10,000 * AEE) + (5,000 * CCE) + (2,000 * PB)}{F} \right]$$

Variable	Description	Cost Coefficient
D	Number of deaths due to acute radiation exposure	1,000,000
ROE	Number of regulatory unplanned over exposures (>5 rem TEDE)	500,000
AOE	Number of administrative over exposures (>2 rem TEDE)	200,000
SCE	Number of skin contamination events	25,000
UR	Number of uncontrolled releases of radioactive material or radioactive contamination outside of radiologically controlled areas	25,000
AEE	Number of exposures above expected exposures by >100 mrem (TEDE)	10,000
CCE	Number of clothing contamination events	5,000
PB	Number of positive bioassays	2,000
F	Radiological Work Permit (RWP) hours = Total hours worked on RWPs	RWP hours

In the “F” section of the calculation, actual Radiological Work Permit (RWP) hours are used. These hours were not readily available prior to CY-98, and are one of the products of the Radiological Control Information Management System (RCIMS). During the first quarter of CY-99 there were 67,852.67 RWP hours logged on the system.

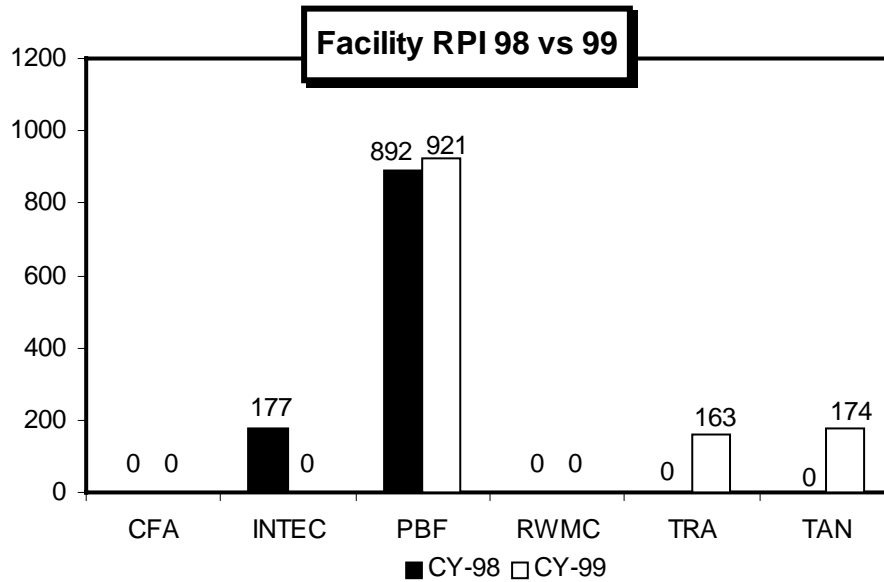
The following table provides the values used in the RPI calculation and the facility contributing to those values for CY-98 and CY-99 through March of each year.

Calendar Year Contributors Through March for CY-98 and CY-99

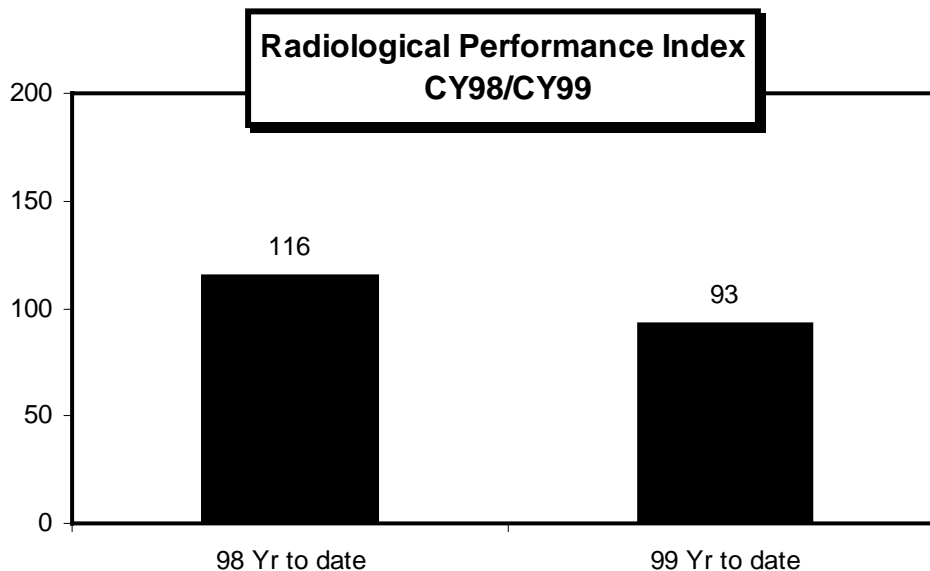
Facility	CFA		INTEC		PBF/WROC		RWMC		TRA		TAN/SMC	
Calendar Year	98	99	98	99	98	99	98	99	98	99	98	99
Deaths due to acute exposure	0	0	0	0	0	0	0	0	0	0	0	0
Over regulatory exposure limit	0	0	0	0	0	0	0	0	0	0	0	0
Over administrative limit	0	0	0	0	0	0	0	0	0	0	0	0
Skin contamination events	0	0	1	0	1	1	0	0	0	0	0	0
Uncontrolled releases	0	0	0	0	0	0	0	0	0	0	0	0
> expected exp. By > 100 mrem	0	0	0	0	0	0	0	0	0	0	0	0
Clothing contaminations	0	0	2	0	0	0	0	0	0	5	0	2
Bioassays > limit	0	0	0	0	0	0	0	0	0	0	0	3
Totals	0	0	3	0	1	1	0	0	0	5	0	5

Only reportable events ORs are considered in the RPI data.

The following chart provides a first quarter RPI comparison by facility. One facility should not be compared to another. Compare each facility's individual performance year to date.



The following chart is used to compare the overall company RPI data with the previous year's values for the same period of time (first quarter).



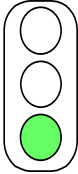
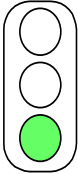
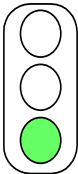
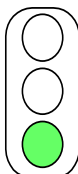
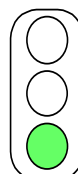
The RPI in the charts above is based on RWP hours worked, so the comparison takes into consideration the difference in the actual hours worked in a radiological area to normalize the value. 73,419 RWP hours for 98 and 67,852 RWP hours for 99 through March of each year.

Data on the following pages give a quick look at performance in areas not covered by the RPI.






## Company Radiological Control Performance Indicator Overview

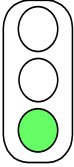
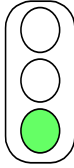
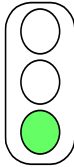
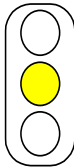
Year to Date 1999

		<u>Actual</u>	<u>Goal or Average</u>
Collective Year-to-Date Penetrating Radiation Dose		12.3 person-rem	87.650 person-rem (Goal)
Year-to-Date Average Worker Dose		0.036 rem	0.116 rem (3 Year Average)
Maximum Year-to-Date Penetrating Dose to a Worker		0.327 rem	1.500 rem (Goal)
Maximum Year-to-Date Neutron Dose to a Worker		0.086 rem	0.110 rem (3 Year Average)
1999 year to date RPI. Color is based on above, at, or below 1998 for same time period.		93 rem	1998 RPI (Same time period) 116

### Legend

Needs Attention		Red indicates over 10% of goal or over the three year average.
OK		Yellow indicates 80% of goal or approaching average.
Good		Green is well below average or goal.

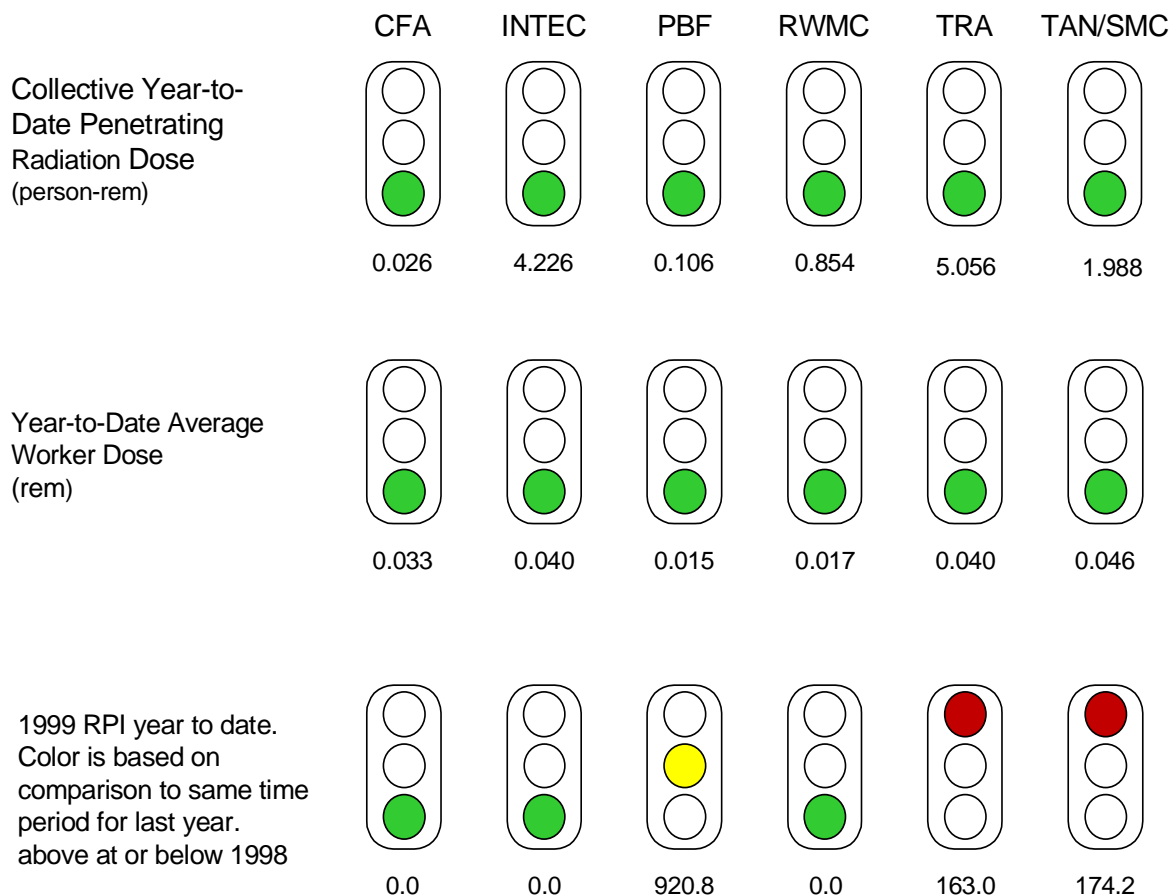
## ADDITIONAL YEAR TO DATE PERFORMANCE INDICATORS

		<u>Actual</u>	<u>Goal or Average</u>
Year-to-Date Airborne Events > 10% DAC		0	0 (3 Year Average)
Contamination Area <b>INTEC eliminated some CAs and reduced HCAs to CAs. The change in CA is positive overall , However, the reduction in HCA makes it a positive indicator so both lights are green.</b>		212,178 ft <sup>2</sup>	192,160 ft <sup>2</sup> (3 Year Average)
High Contamination Area		154,014 ft <sup>2</sup>	295,750 ft <sup>2</sup> (3 Year Average)
Airborne Radioactivity Area		79,472 ft <sup>2</sup>	84,837 ft <sup>2</sup> (3 Year Average)

Much of the “area” information shown on this page represents areas of continuing use (such as the TRA cubicles, the WERF sizing area, etc.) or areas not normally occupied awaiting D&D (such as TAN building 616).

## Facility Radiological Control Performance Indicator Overview

Year to Date 1999



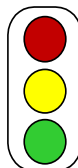
The facility information shown on this page and on the following page is used to provide a breakdown of the data that is used to develop the total Company performance information year to date. The data on these two pages is information that is not included in the Radiological Performance Index.

### Legend

Needs Attention

OK

Good

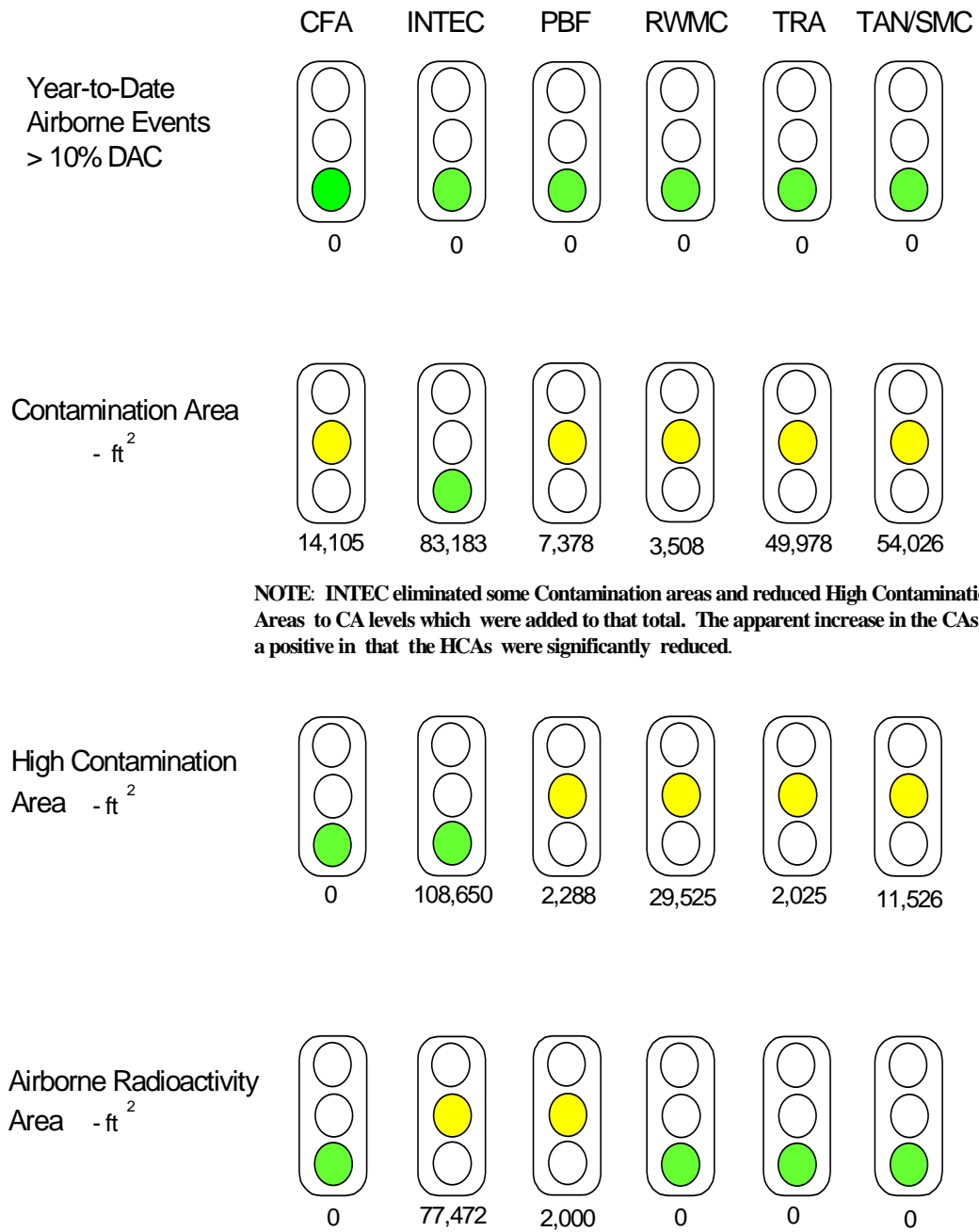


Red indicates over 10% of goal or over the three year average.

Yellow indicates 80% of goal or approaching average.

Green is well below average or goal

# Facility Performance Indicators Continued



## **Radiological Control Performance Indicator Report Criteria**

The INEEL Radiological Control Performance Indicator Report is comprised of a description of the indicator and the criteria used for measurement. Table 1-1 of the INEEL RCM is the source for the indicators used.

### **Collective Radiation Dose -**

The INEEL collective total penetrating radiation exposure received and the associated quarterly and annual ALARA goals.

### **Average Worker Radiation Dose -**

The average penetrating radiation dose based on collective dose and the total number of personnel receiving measured radiation exposure.

### **Maximum Radiation Dose to a Worker -**

The highest penetrating radiation dose received by a worker at the INEEL.

### **Maximum Neutron Dose to a Worker -**

This indicator reports the highest neutron radiation dose equivalent received by a worker.

### **Number of Skin Contaminations -**

The total number of radioactive skin contaminations and the number of those contaminations resulting in an Occurrence Report, the number of facial contaminations, and the number of contaminated wounds.

### **Number of Clothing Contaminations -**

The total number of radioactive clothing contaminations and the number of those contaminations resulting in an Occurrence Report.

### **Airborne Events -**

The number of occupied facility areas not posted as Airborne Radioactivity Areas that exceed 10% Derived Air Concentrations (DAC). The value is based on posting criteria from Table 2-4 in the INEEL RCM.

### **Total Year-to-Date Intakes -**

The number of positive bioassays that indicate an intake of radioactive material resulting in a dose assessment of 10 mrem or more from an INEEL occupational exposure. The total number of positive bioassays that resulted in an Occurrence Report are also tracked and trended.

**Contamination Area -**

The total inside area in square feet that falls within the description of a Contamination Area as defined in Table 2-4 of the INEEL Radiological Control Manual.

**High Contamination Area -**

The total inside area in square feet that falls within the description of a High Contamination Area as defined in Table 2-4 of the INEEL Radiological Control Manual.

**Airborne Radioactivity Area -**

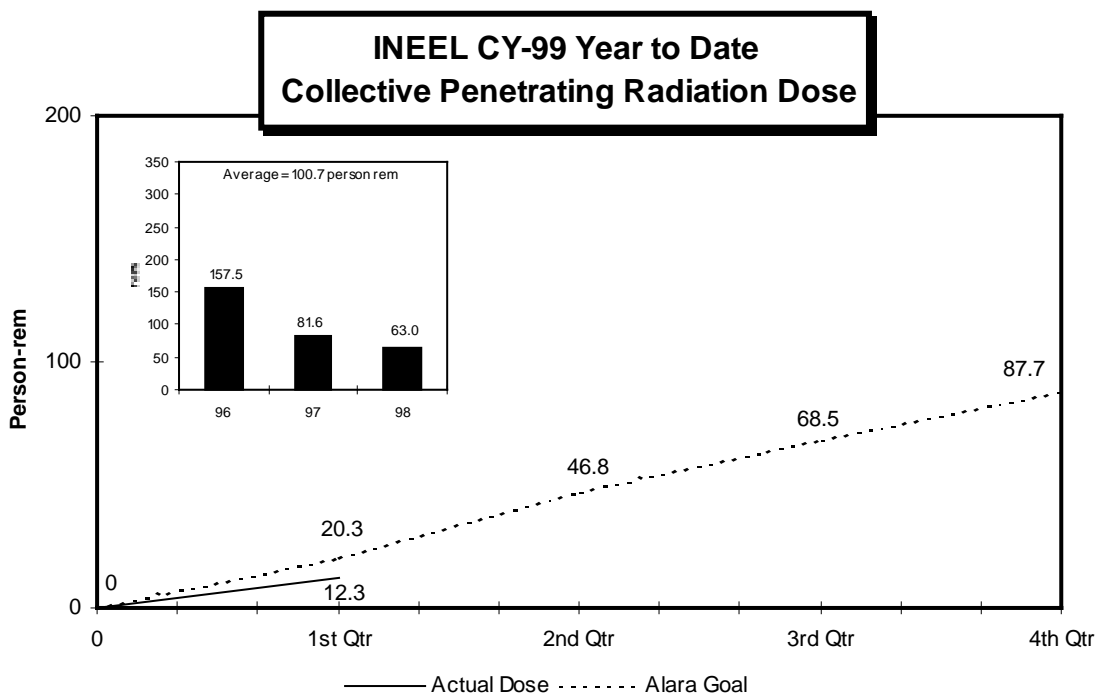
The total area in square feet that falls within the description of an Airborne Radioactivity Area as defined in Table 2-4 of the INEEL Radiological Control Manual.

**Radioactive Spills -**

The total number of radioactive spills at the INEEL that meet reporting criteria. A spill is considered an inadvertent loss or release of radioactive contamination outside a Radiologically Controlled Area.

The INEEL Performance Indicators are designed to reflect a challenging, yet positive control of occupational radiological work.

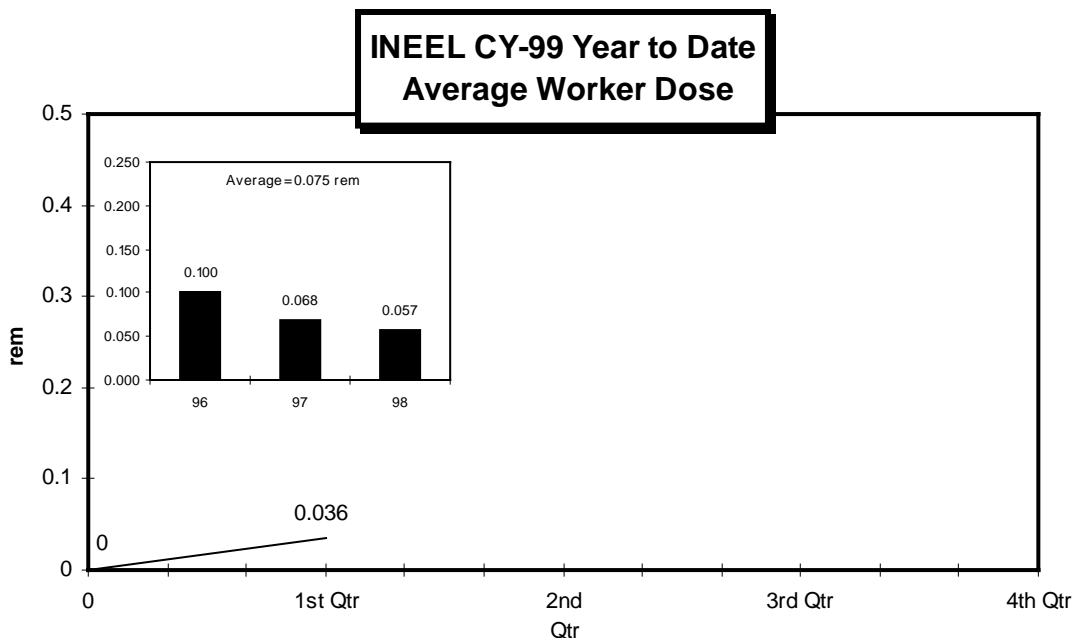
This chart and the charts on the following pages continue to provide an indication of how well LMITCO is performing as a company. Following the company charts are charts showing the six specific facility areas and their performance in selected indicators.



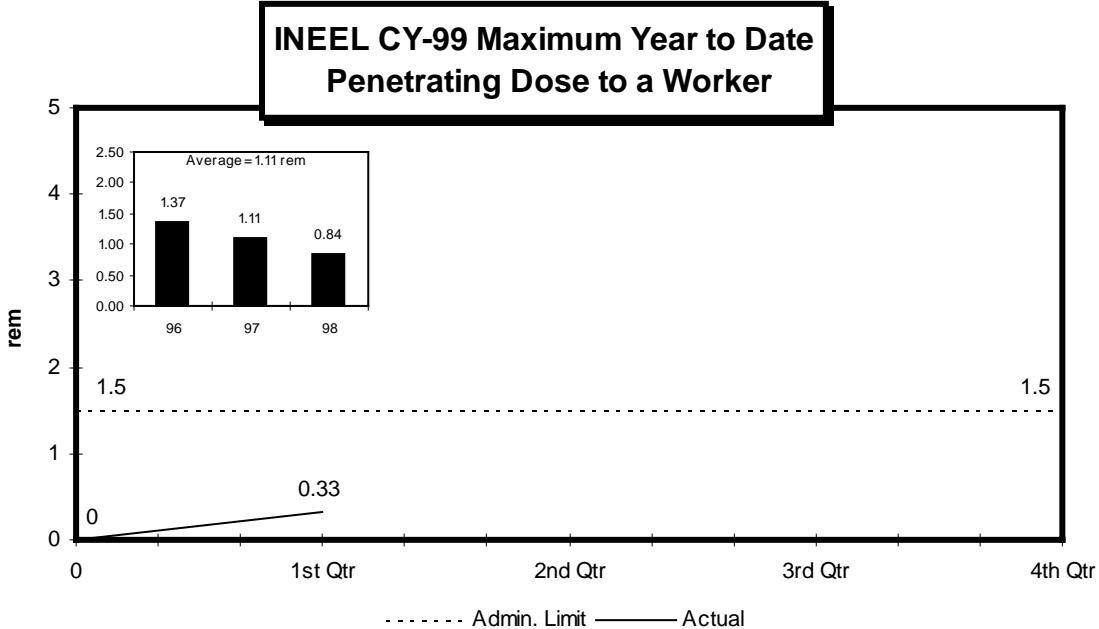
DOE and LMITCO policy is to maintain occupational radiation exposure as low as reasonably achievable (ALARA). The above chart provides a comparison of the INEEL goal and the total year to date collective penetrating radiation dose.

The CY-99 ALARA goal was set at 87.7 person-rem. The goal is based on projected work activities taking into account those jobs deferred from last year and those already planned for CY-99. ALARA protective measures are included in the projections. TMI fuel handling and shipments, RCRA required inspections at RWMC and work at the TRA in higher radiation fields have contributed to a slightly higher goal at these three facilities.

Year to date exposure is well below the goal in the first quarter. Much of the actual work is projected to occur during the summer months; however, the goal is shown as a straight line to accommodate potential fluctuations based on unknown conditions. In addition there has been considerable training during the first quarter to ensure the work force is familiar with operational excellence programs and the Integrated Safety Management Systems (ISMS) core functions. Excellence in planning and conducting work has been included in the training program.

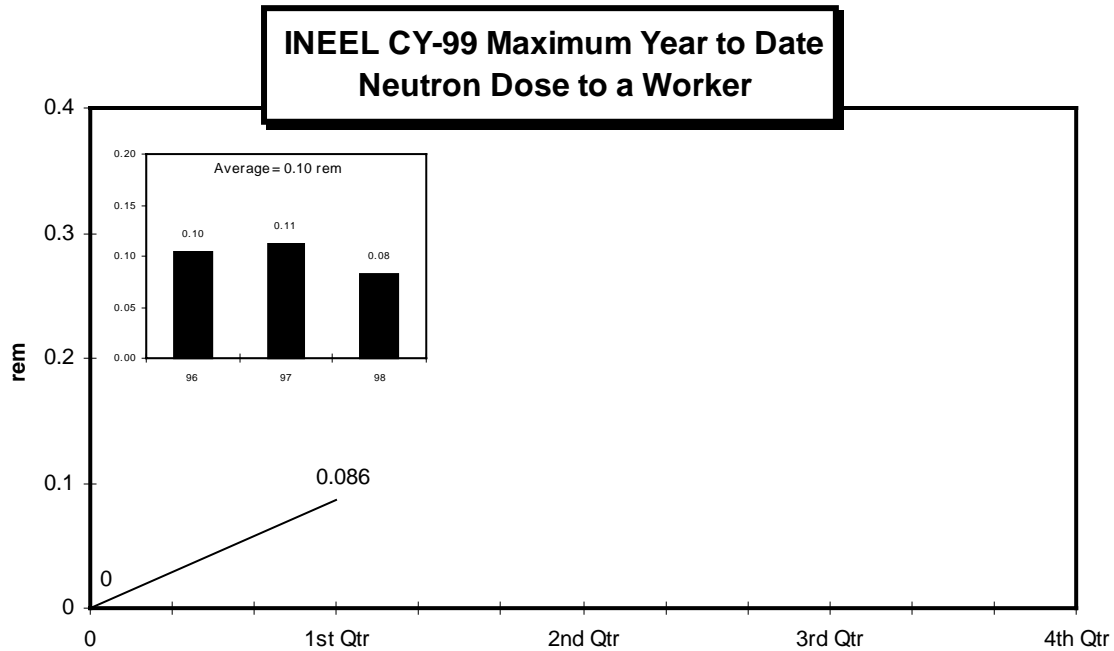


The Average Occupational radiation dose for INEEL workers through the end of the first quarter is 0.036 rem based on 341 workers and a total of 67,852.67 Radiation Work Permit hours year to date

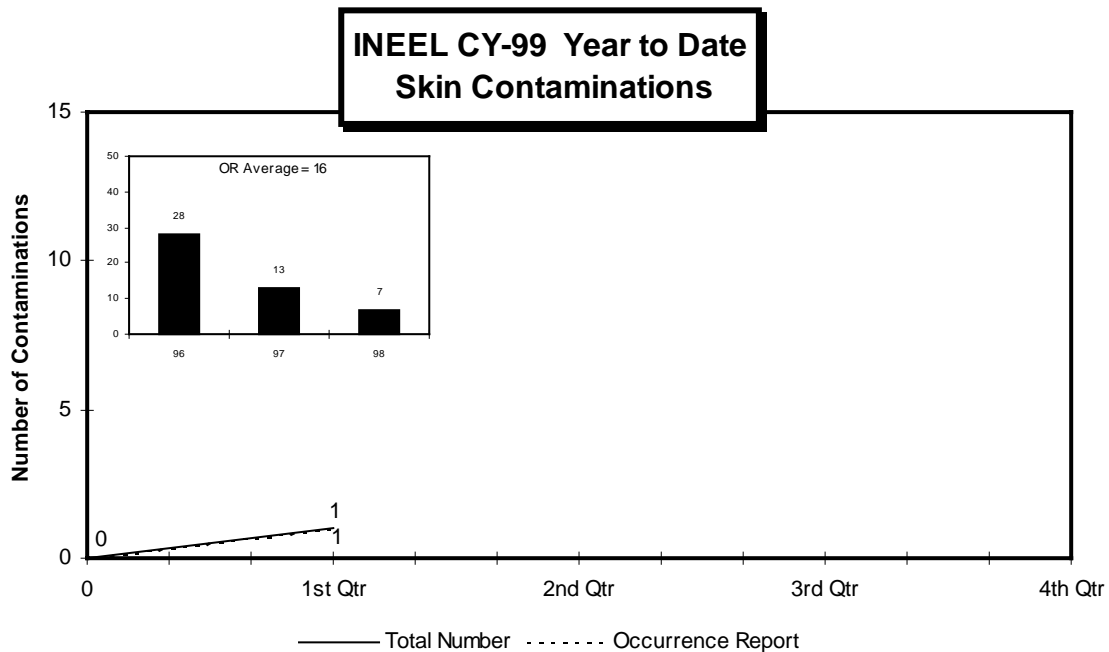


The Maximum penetrating radiation dose to a worker through the end of the first quarter was 0.327 rem to a TRA worker.

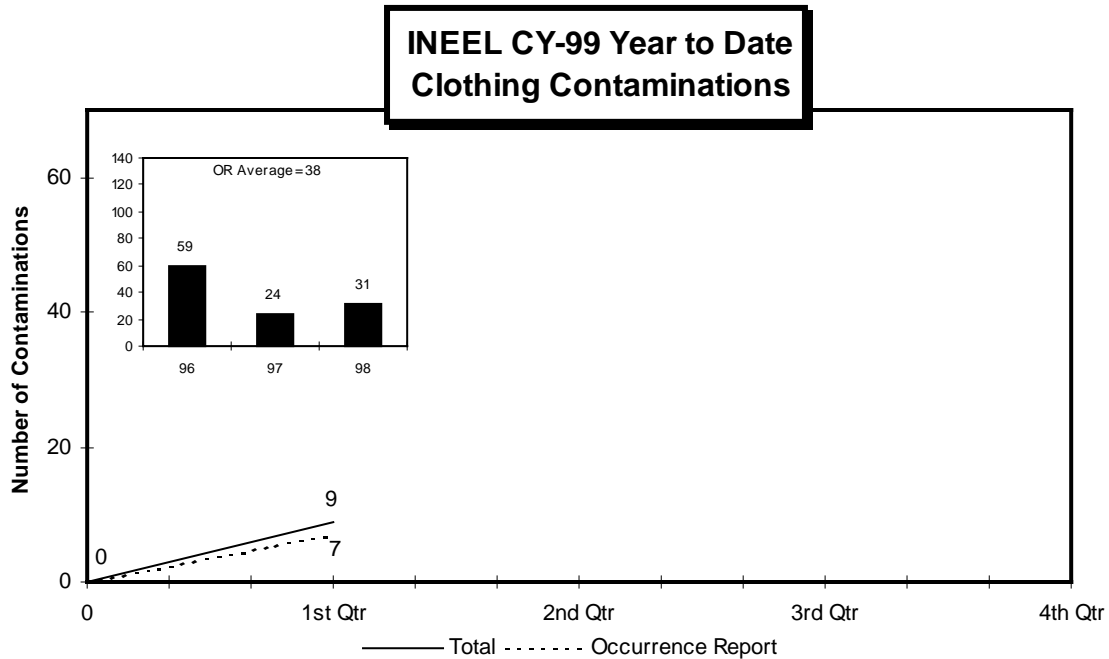




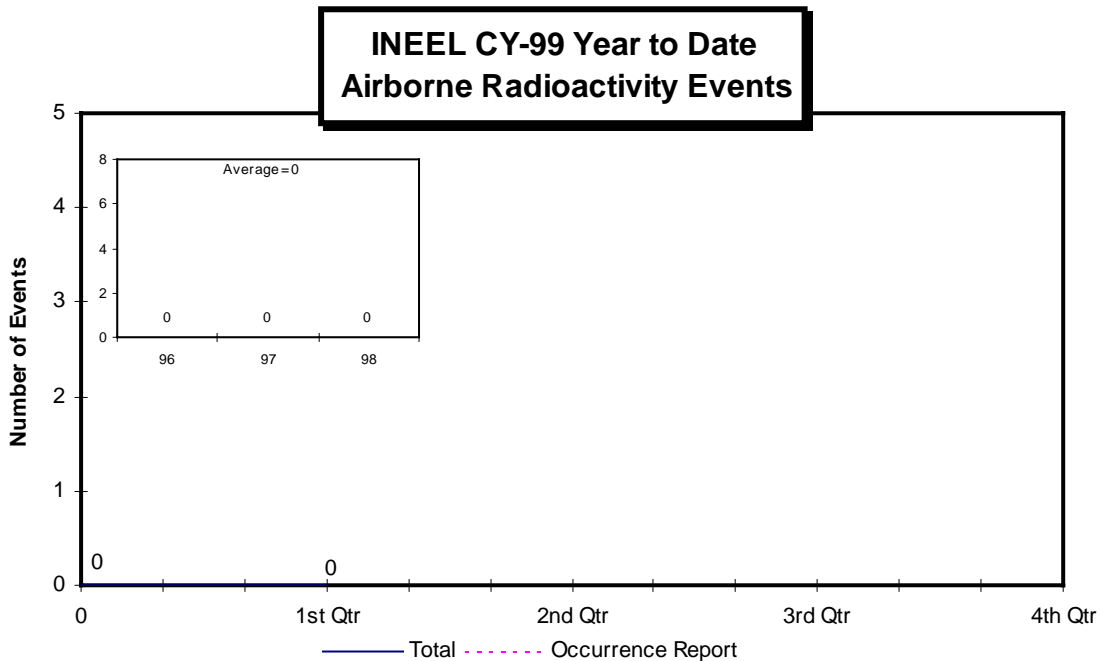
Neutron dose is included in the total penetrating radiation dose. It is shown here as a separate indicator to identify the maximum neutron dose to a worker. Through the end of the first quarter the maximum neutron dose is 0.086 rem to a TRA worker



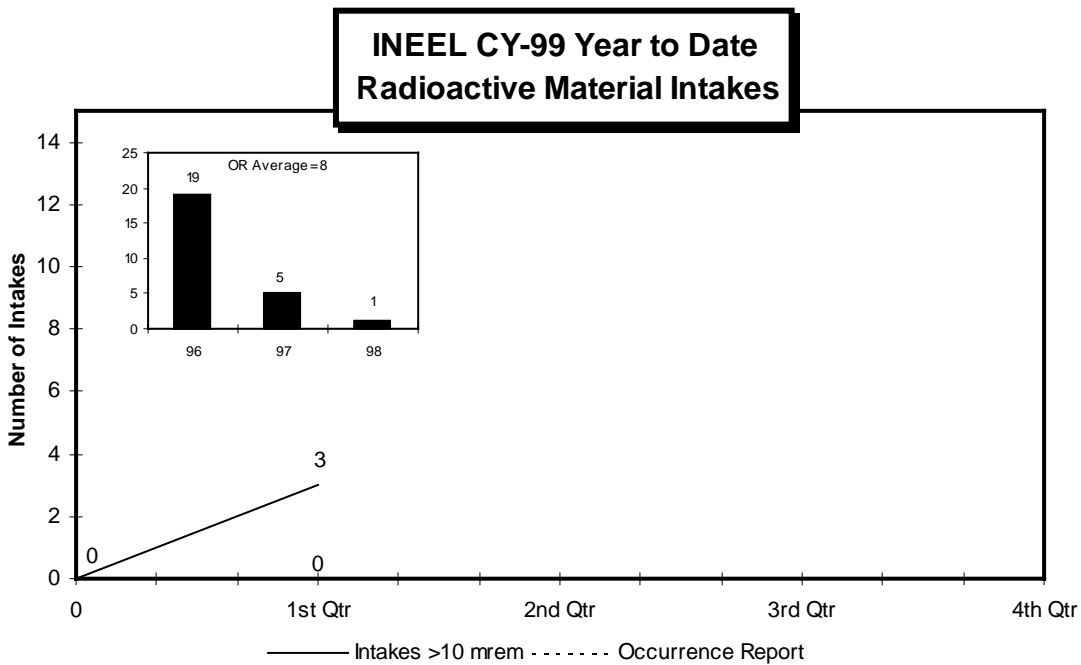
There was one reportable skin contamination at the INEEL during the first quarter at the WERF. There were no facial contaminations or contaminated wounds.



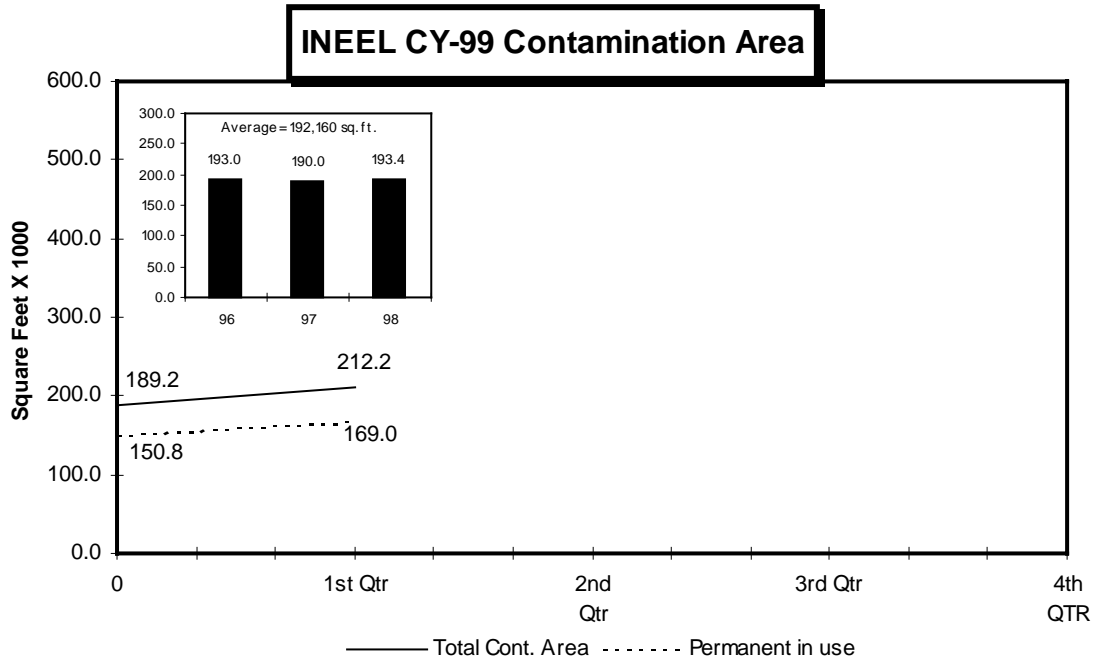
There were seven reportable clothing contaminations at the INEEL during the first quarter. Two occurred at the TAN, and five at the TRA. Two non-reportable events occurred at the INTEC. Details of these events may be found in the ORs listed in each facility summary.



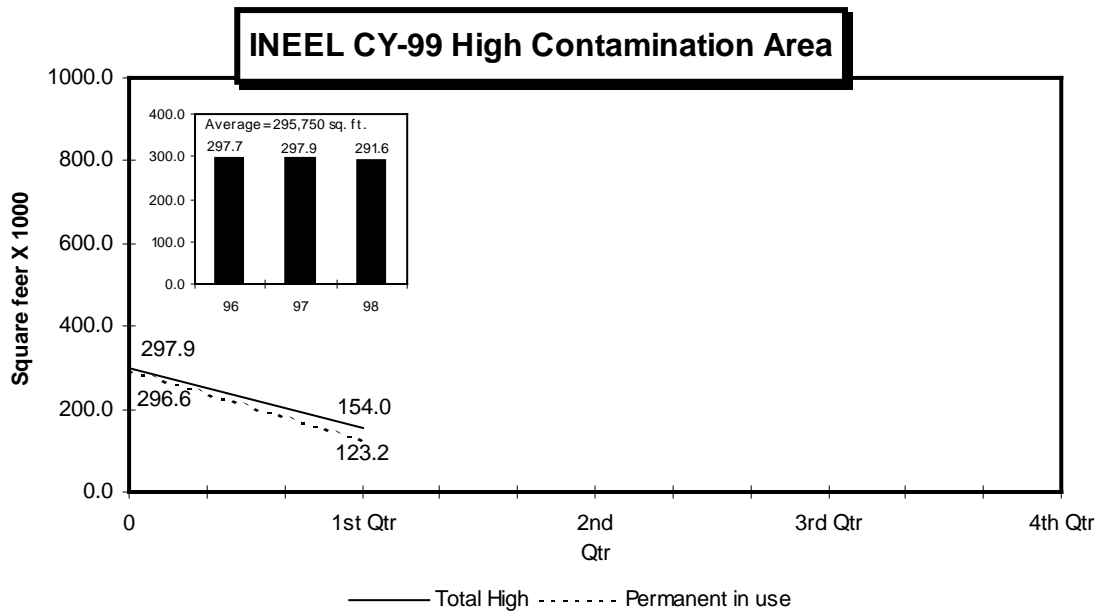
There have been no airborne radioactivity events year to date.



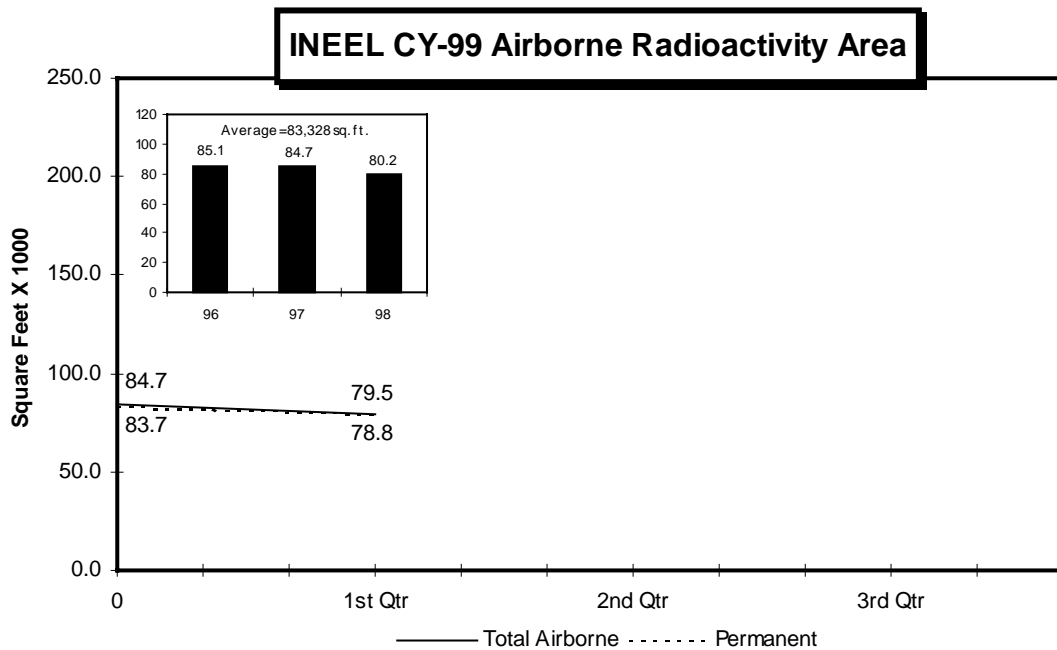
Radioactive material intakes depict the number of positive bioassays that result in a dose assessment of 10 mrem or greater. There was one assessment from TAN assigned to last year's total. There are three positive urine bioassays from TAN/SMC year to date.



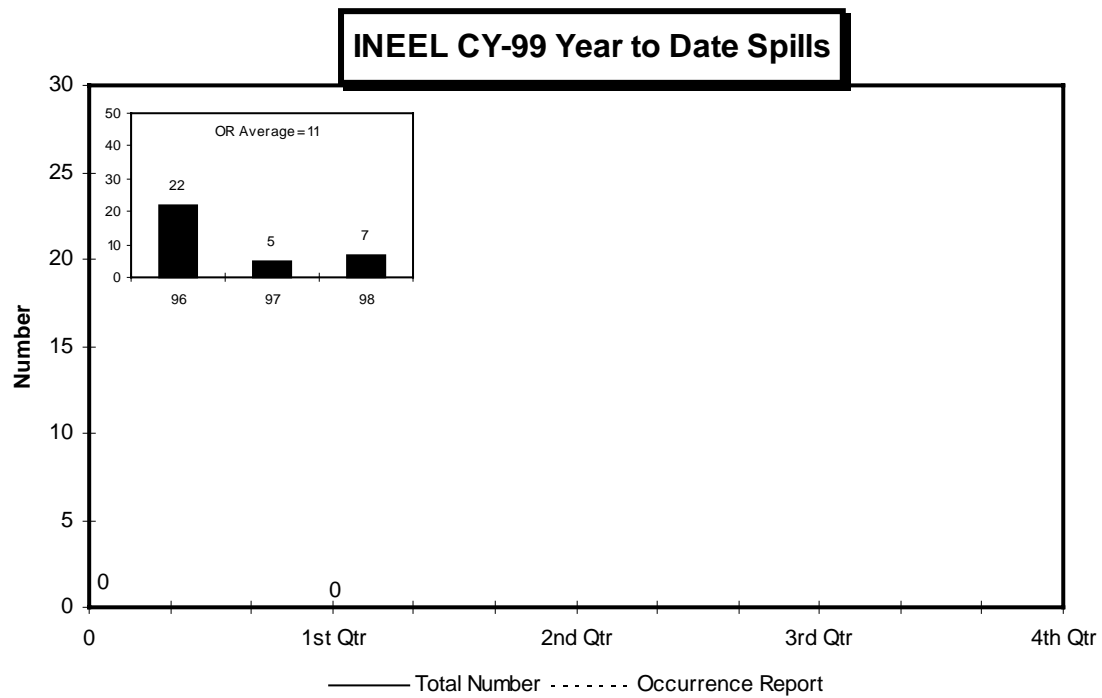
The total area designated as Contamination Area at the end of the first quarter was 212,178 square feet. 1914 ft<sup>2</sup> of area was removed from the INTEC CA listing due to WCF closure activities. Additional areas at INTEC were reduced from High CA and added to the CA listing.



Total High Contamination Area at the end of the first quarter was 154,014 square feet. Areas at the INTEC were reduced from High CA and added to the CA listing. More detail is shown in the facility summary.



The total Airborne Radioactivity Area at the INEEL at the end of the first quarter was 79,472 square feet. 78,822 square feet is designated as permanent and in use. The reduction is from work clean up at the INTEC including closure of the old Waste Calcine facility.



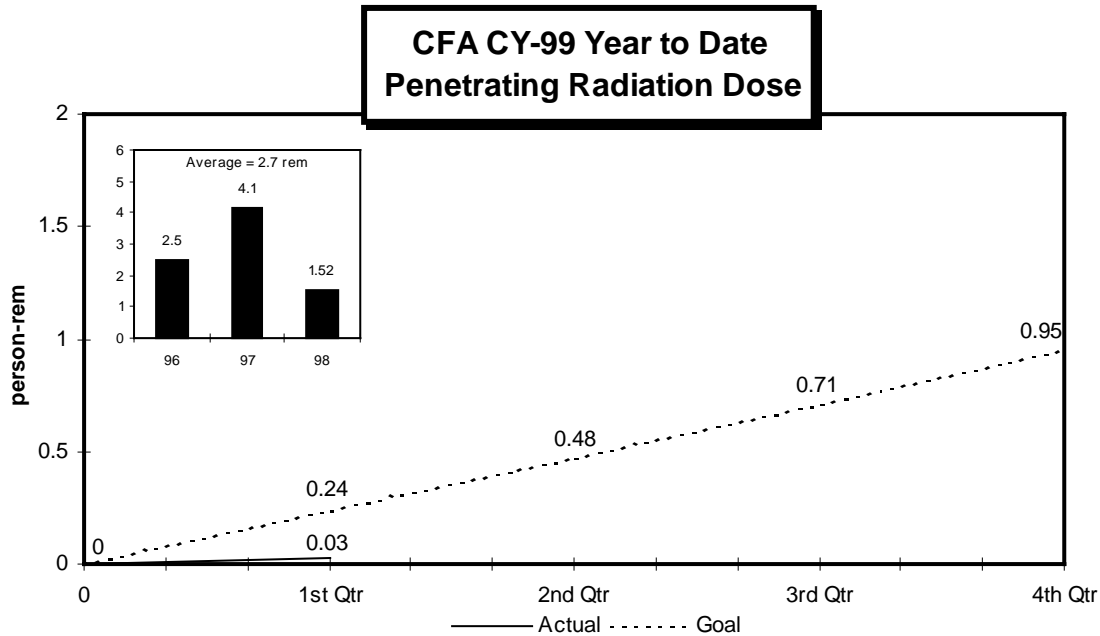
There has been no reportable spills year to date at the INEEL.

# Central Facilities Area

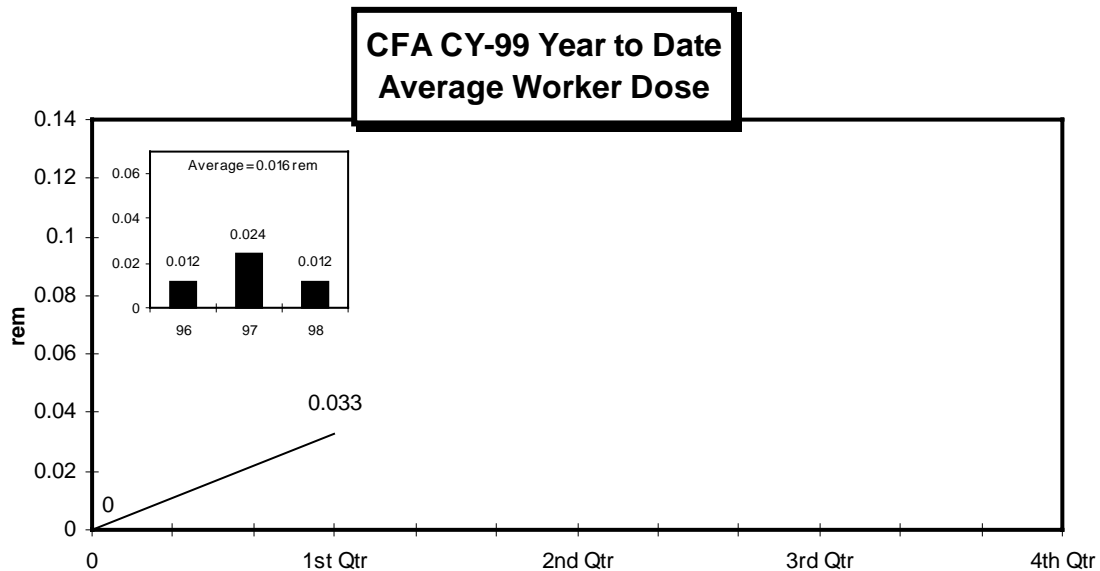
The CFA Facility Report Includes  
Information Outside Other Facility Fences

## Summary

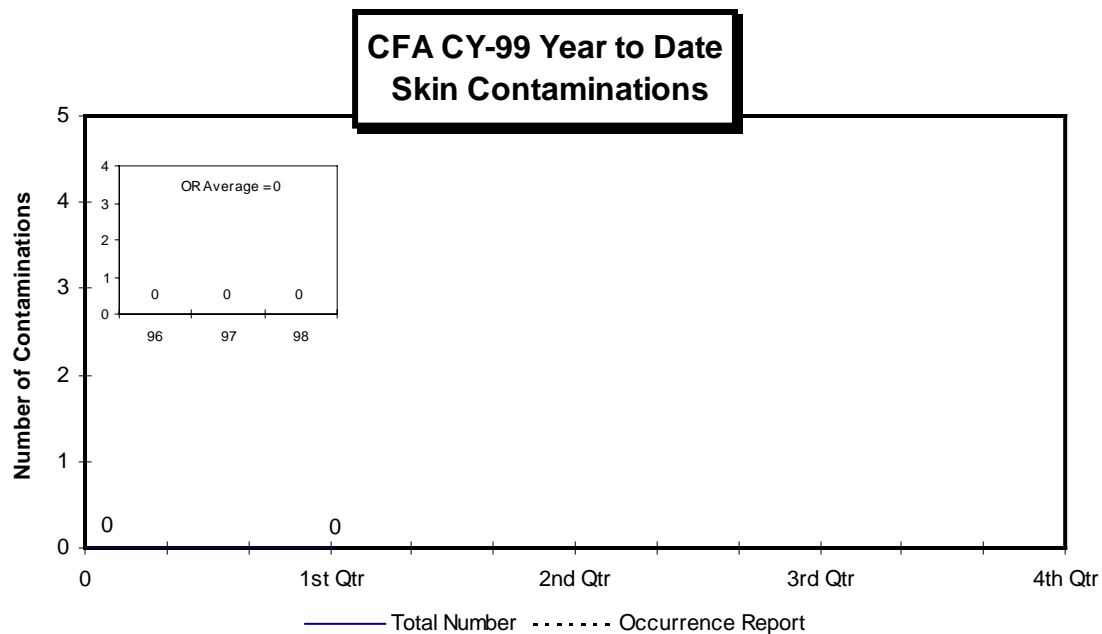
1. The major activities contributing to radiological exposure so far this year have been Decontamination and Decommissioning, environmental restoration, environmental sampling, and facility maintenance.
2. Work scope at the CFA is similar to that of last year.
3. During the routine vehicle survey that is taking place, one vehicle was found with fixed contamination at 9000 disintegrations per minute.



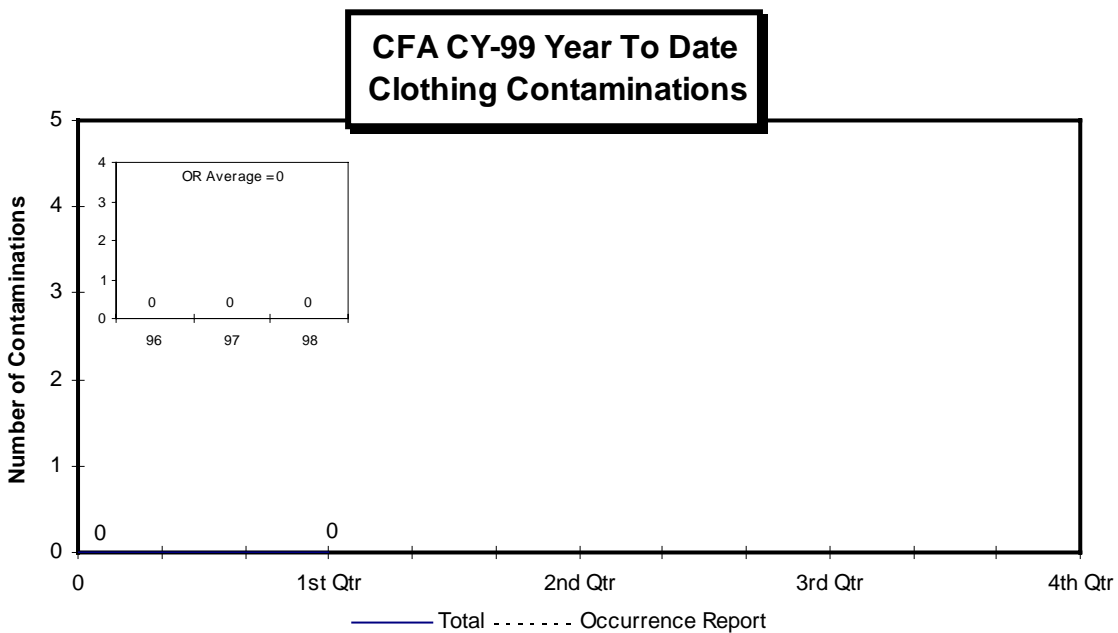
The collective penetrating occupational radiation exposure (as measured by Electronic Dosimeters through RCIMS) at CFA through the end of the first quarter is .026 person-rem. D&D activities, environmental restoration/monitoring and maintenance activities have been the major contributors to CFA dose.



The CFA average worker dose through the end of the first quarter was 0.033 rem resulting from 8 workers with dose greater than 10 mrem.

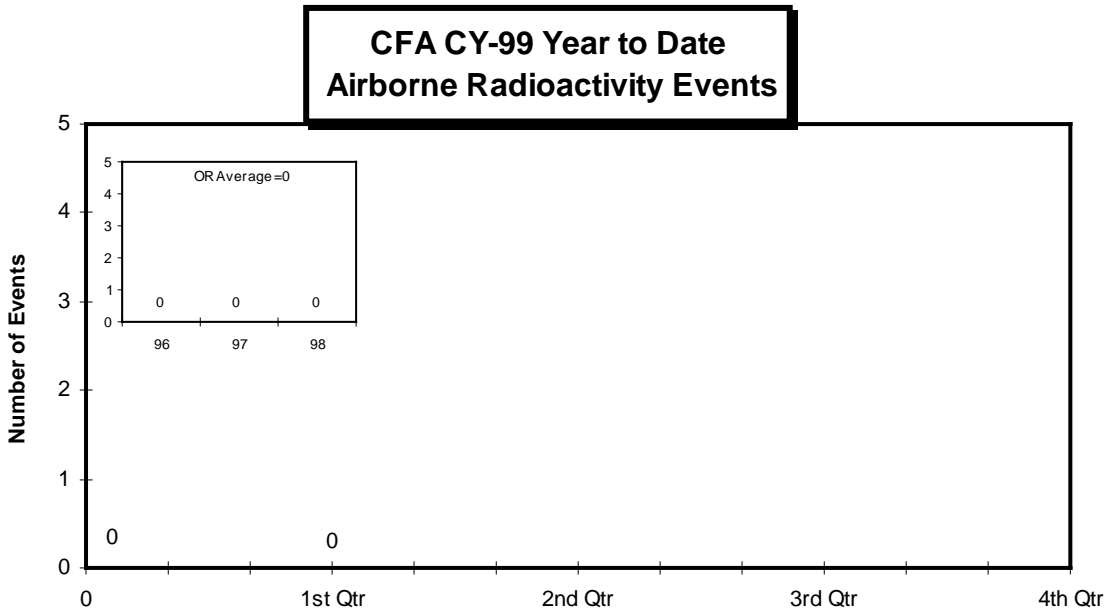


There were no skin contaminations at CFA areas through the end of the first quarter.

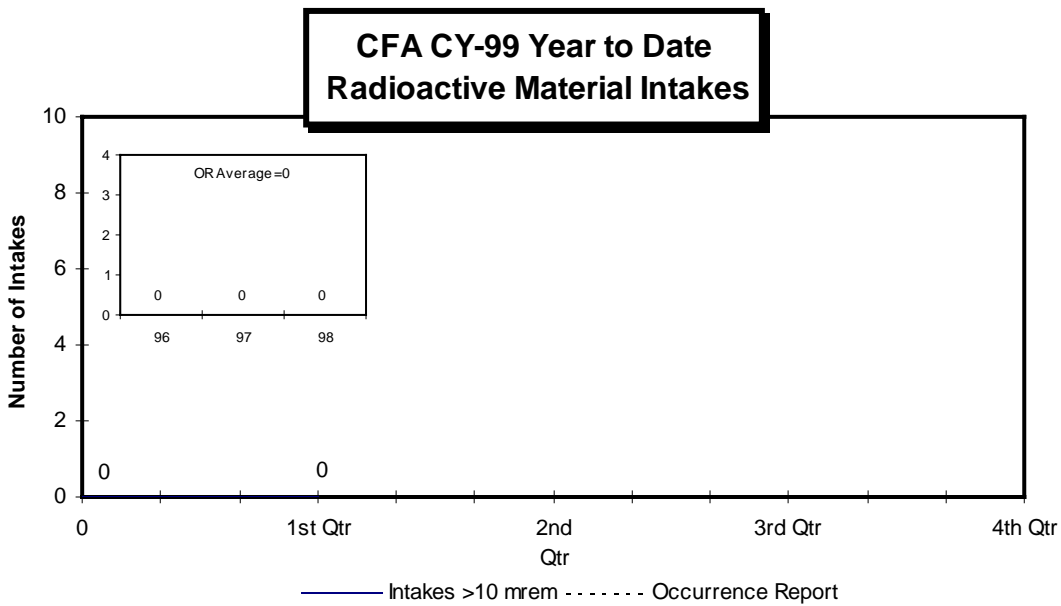


There were no clothing contaminations at CFA areas through the end of the first quarter.

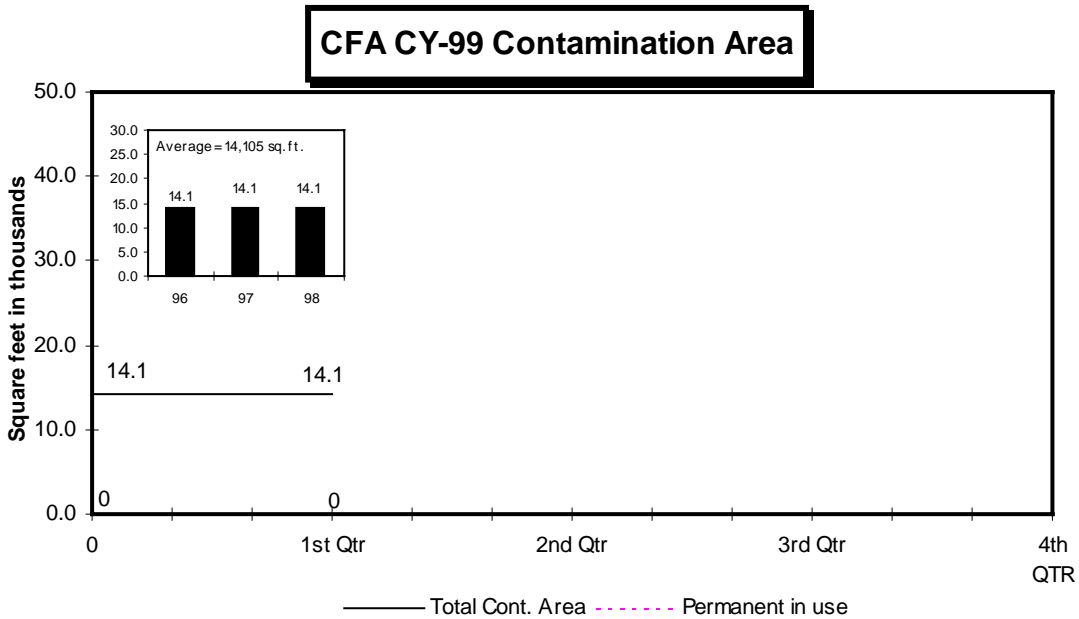




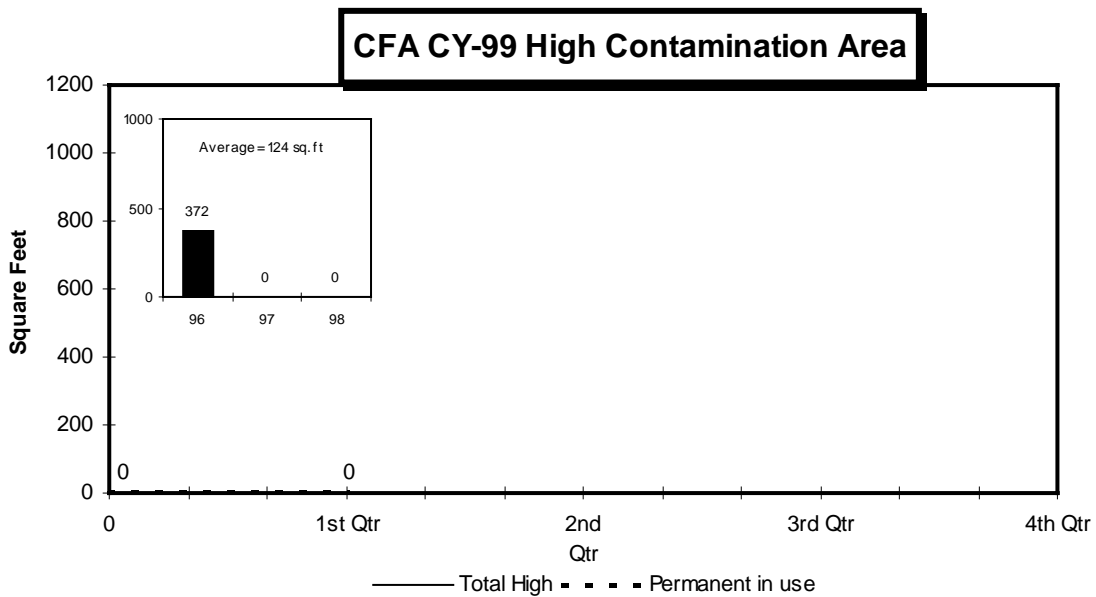
There has been no airborne radioactivity detected that was greater than 10 % DAC at CFA areas through the end of the first quarter.



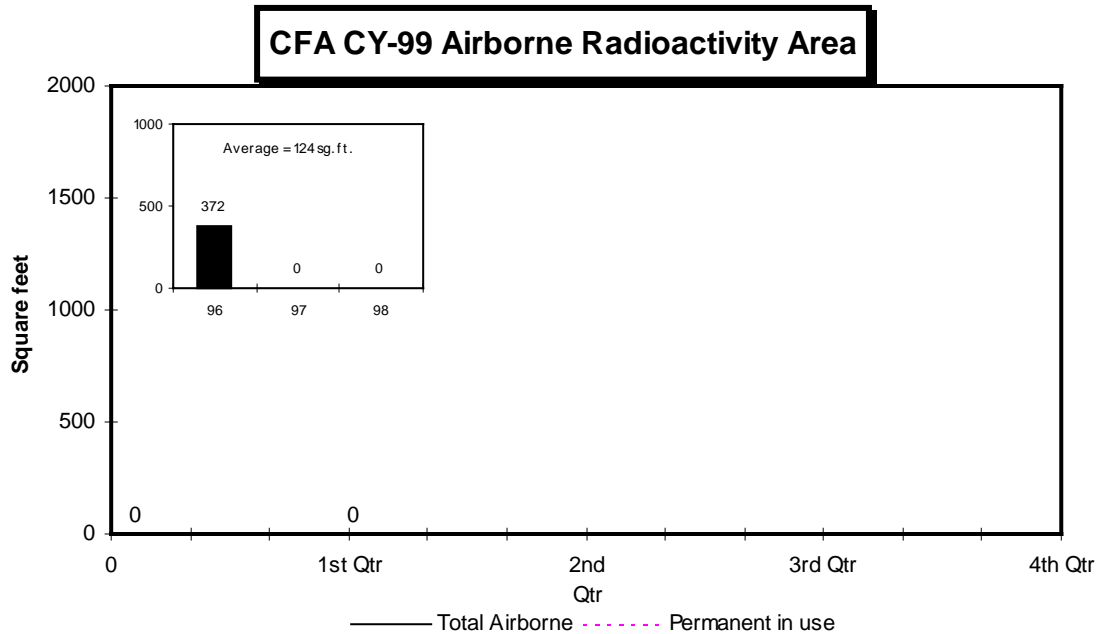
There were no positive bioassays indicating a radioactive material intake that resulted in a dose assessment of 10 mrem or greater at CFA through the end of the first quarter.



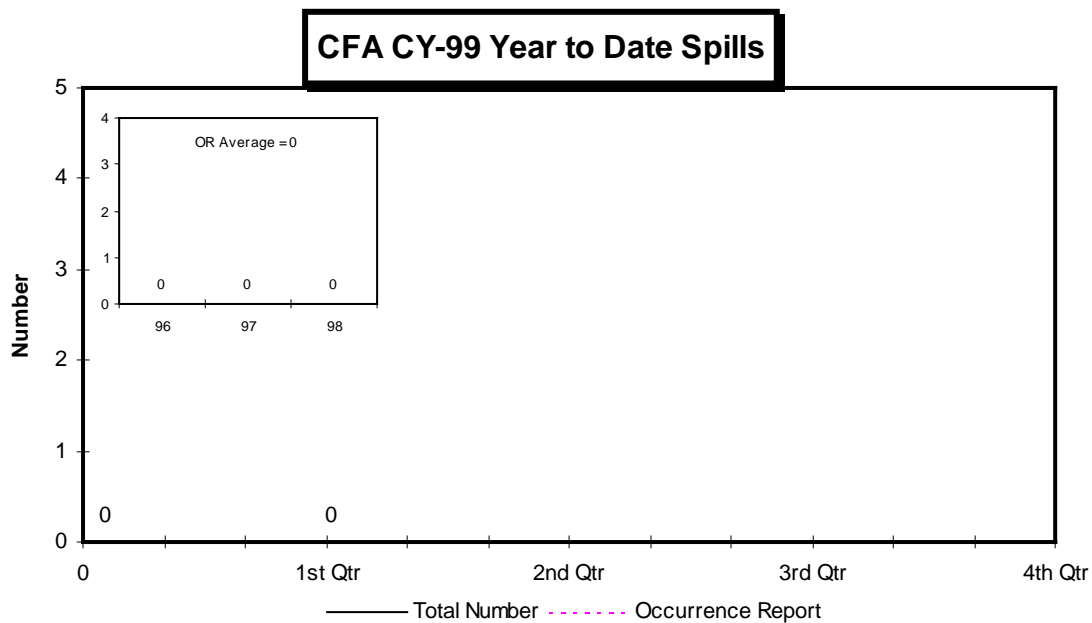
The total Contamination Area at CFA at the end of the first quarter was 14,105 square feet. None of this area was designated as permanent and in use.



So far, year to date, CFA has no posted High Contamination Areas.



Currently, there are no Airborne Radioactivity Areas in CFA facility areas.

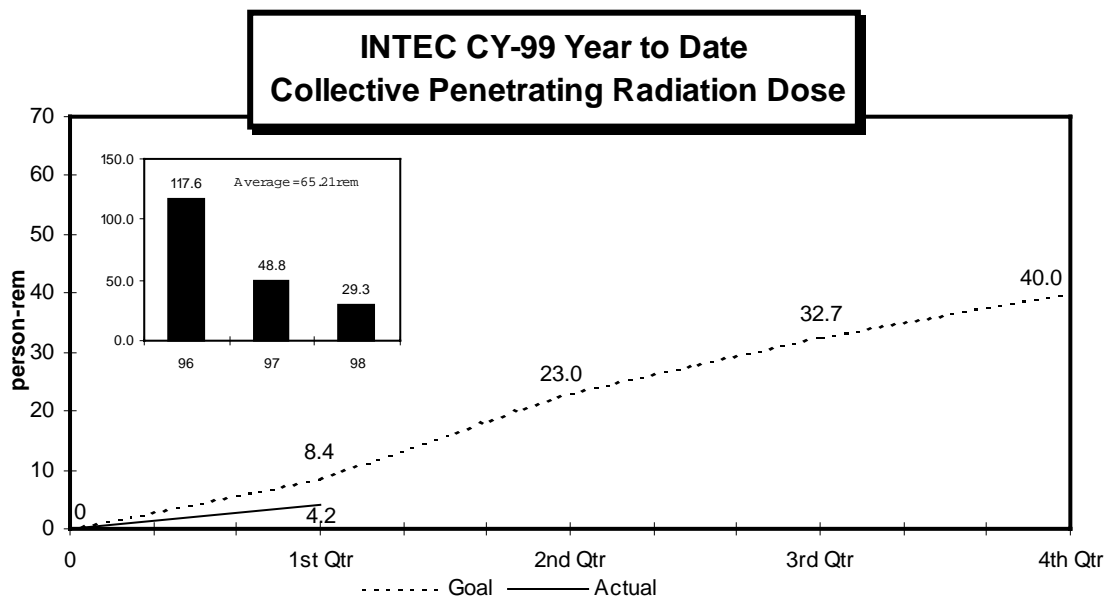


CFA has had no radioactive spills or loss of control of radioactive material year to date. There has been one vehicle with fixed contamination below reportable levels.

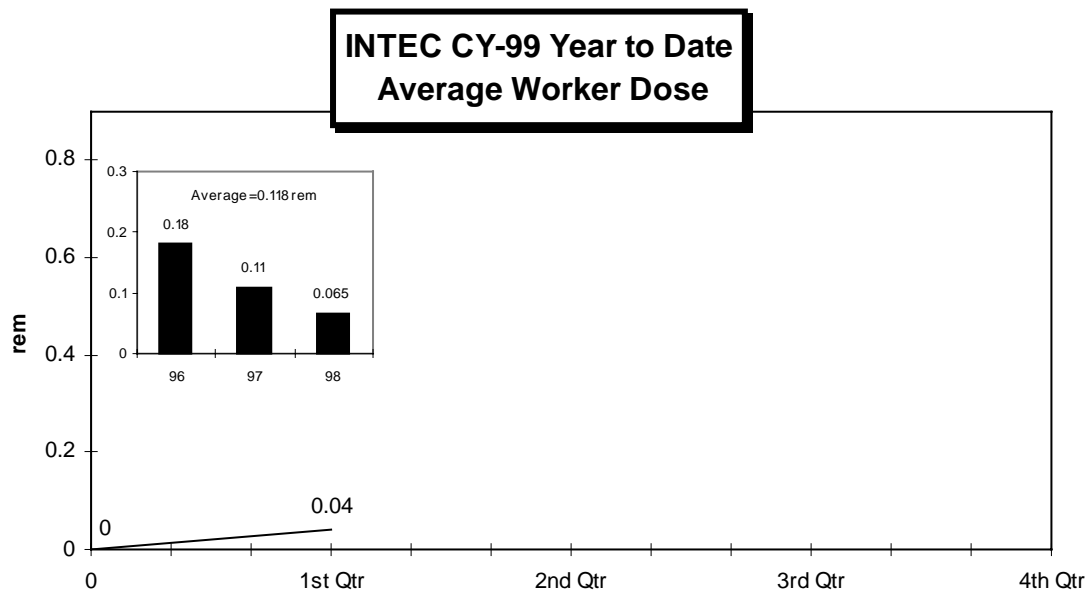
# Idaho Nuclear Technology And Engineering Center

## INTEC SUMMARY

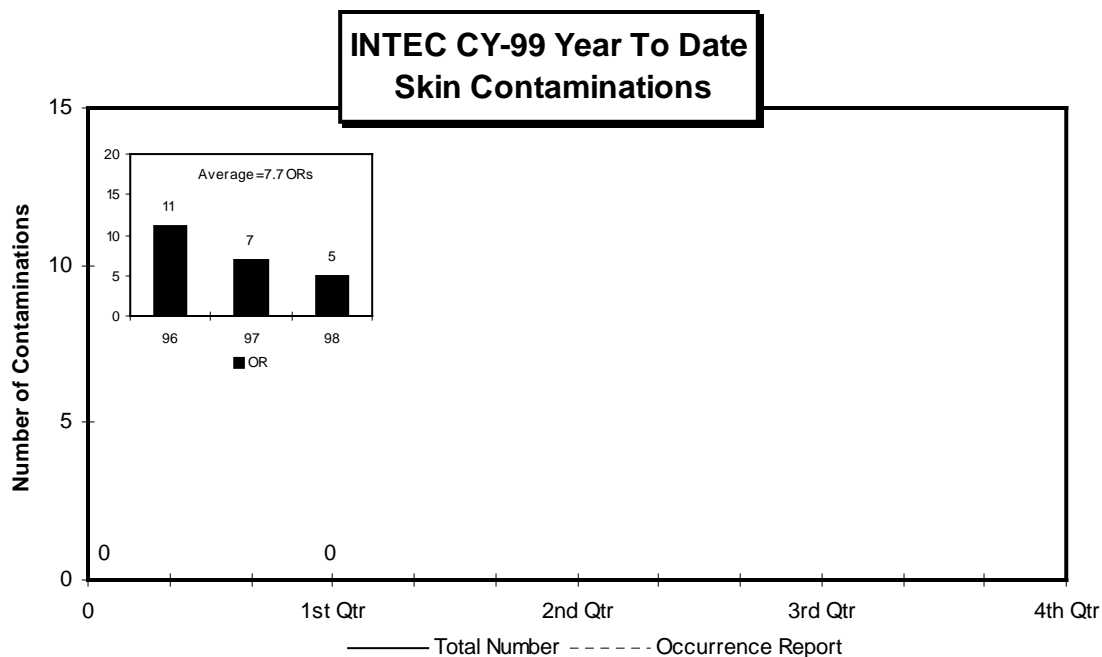
1. Major contributors to the first quarter occupational radiation exposure were activities related to fuel movement and storage at CPP 603 and CPP 666, WCF RCRA closure activities and NWCF startup and operational activities. Electronic Dosimeter data is used this quarter to provide penetrating dose information based on RCIMS reports.
2. There were no reportable skin contaminations during the first quarter. There were no facial or wound contaminations.
3. There were two non-reportable clothing contaminations this quarter. They were rolled into OR ID-LITC-WASTEMNGT-1998-0026, however, based on associated circumstances.
4. There were no reportable spills during the first quarter.
5. 1914 ft<sup>2</sup> of area was removed from the CA listing. Most of this was due to WCF closure activities. Large areas High CAs were reduced to CA levels and added to the CA listing. This is due to decontamination efforts in the tank farm valve boxes and a reevaluation of total square footage of contamination areas at INTEC.



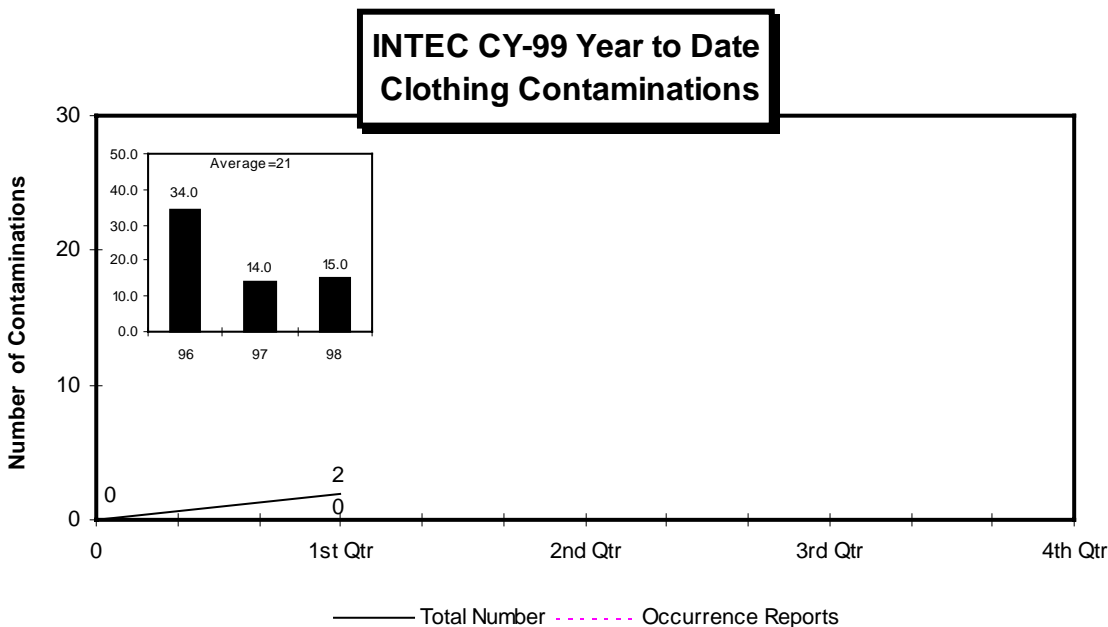
The INTEC collective penetrating occupational radiation exposure year to date, based on Electronic Dosimeter data, is 4.226 person-rem. Work scope at the INTEC is less this year than in years past. Reductions in work scope and application of ALARA Protective Measures (APMs) in planning and working jobs resulted in an ALARA goal of 39.950 person-rem for this year.



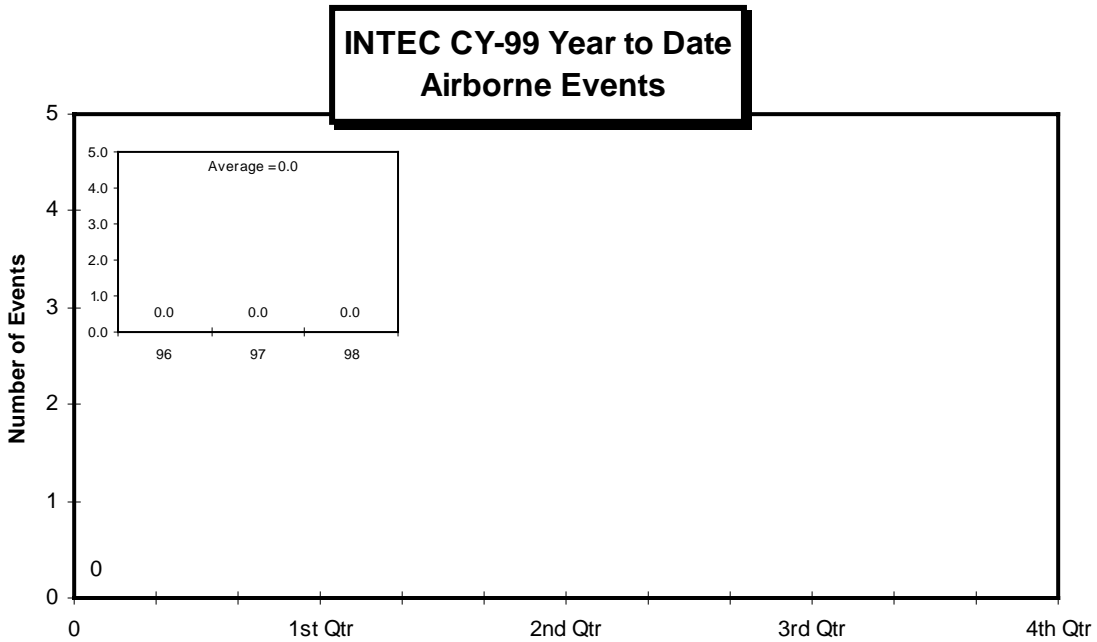
The average worker dose for the INTEC through the end of the first quarter was 0.040 rem resulting from 105 workers receiving dose greater than 10 mrem.



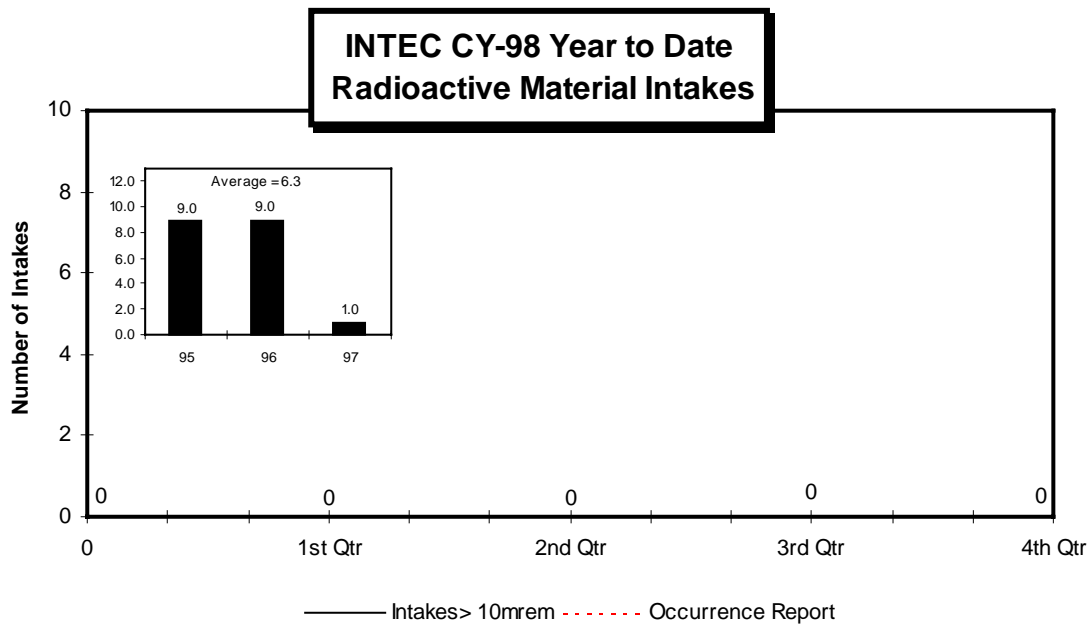
The INTEC has had no-reportable skin contamination year to date. There were no facial contaminations or contaminated wounds.



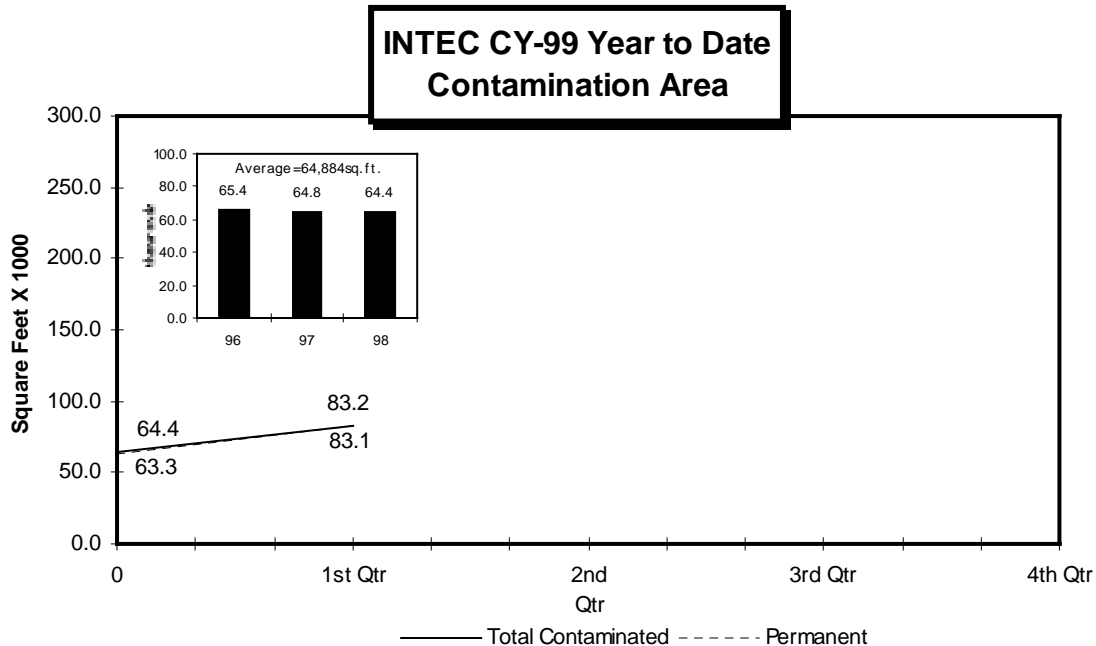
There have been no reportable clothing contaminations years to date at the INTEC. However, the two non-reportable events were rolled into OR ID-LITC-WASTEMNGT-1998-0026 due to associated circumstances.



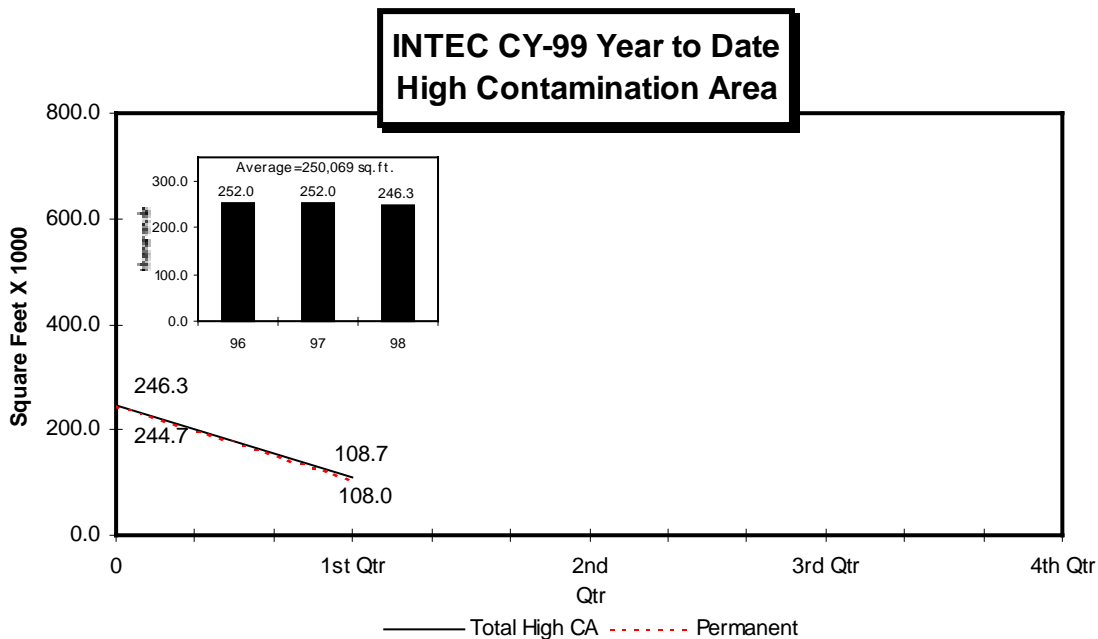
No airborne activity greater than 10 % DAC in unposted areas has been detected in INTEC areas year to date.



There have been no dose assessments greater than 10 mrem CEDE for the first quarter.

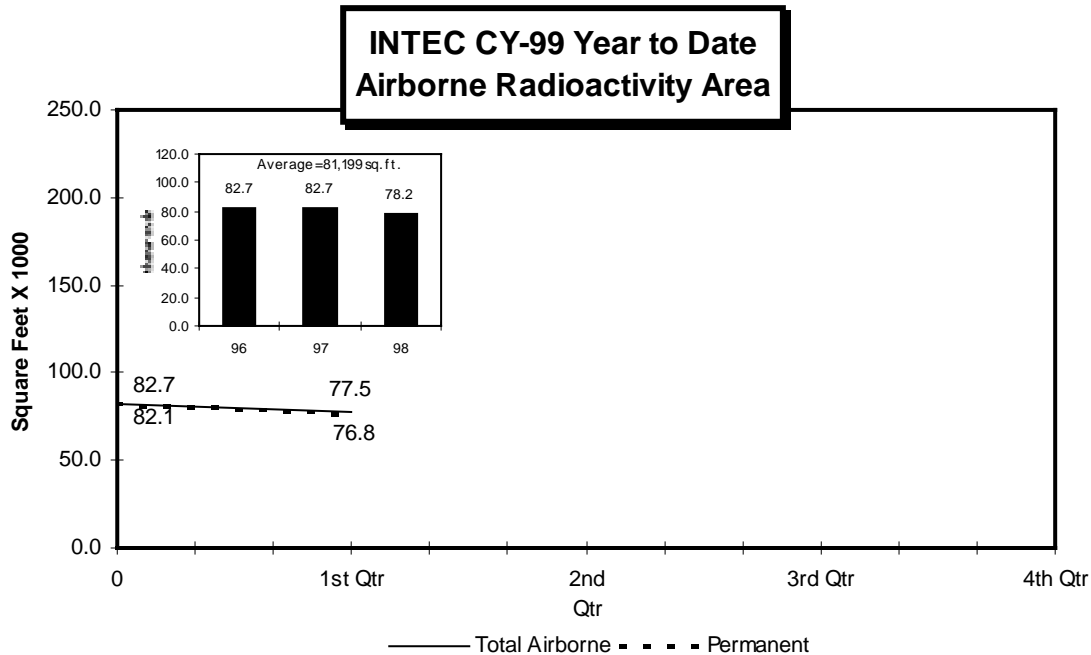


1914 square feet of area was reduced from the CA totals due to WCF closure activities. However, additional sq. footage was added based on reductions of HCAs to CAs during WCF closure and tank farm valve box decontamination efforts. The total area was also re-evaluated to ensure proper accounting. Total CA is now 83,183 ft.<sup>2</sup> with 83,098 ft.<sup>2</sup> listed as permanent.

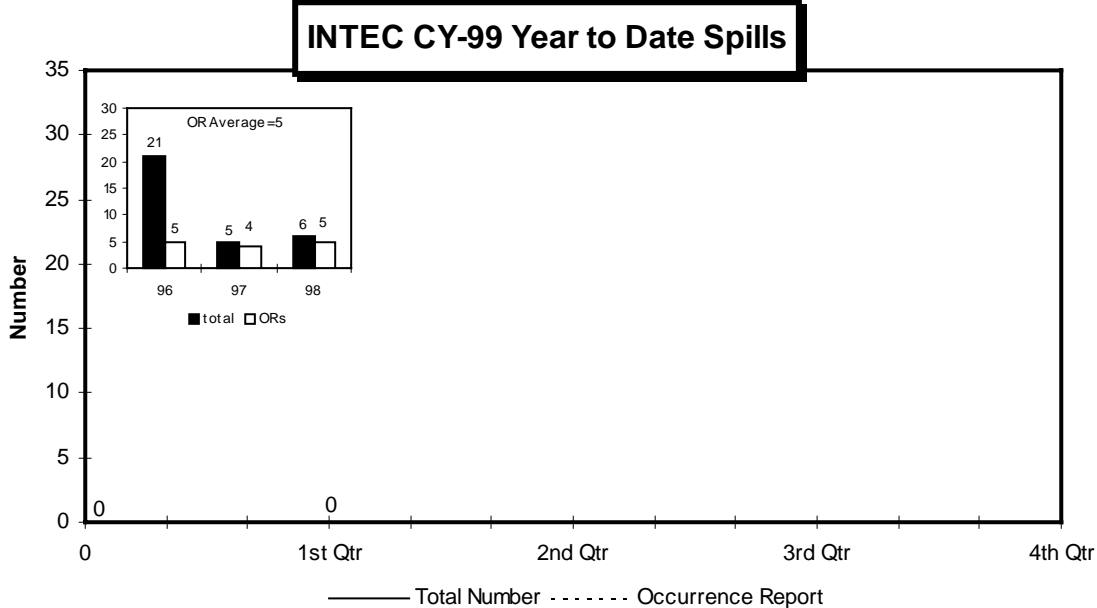


The total High Contamination Area at the INTEC was significantly reduced due to WCF closure activities and the reduction from HCA to CA levels due to decontamination efforts at the tank farm. Based on are re-evaluation, total HCA is now 108,650 square feet. 108,000 square feet is designated as permanent and in-use.





Total Airborne Radioactivity Area at the INTEC was reduced by to 77,472 square feet due to WCF closure activities. 76,822 square feet remains as permanent.



There have been no spills or loss of control of radioactive material during the first quarter at the INTEC.

# Power Burst Facility

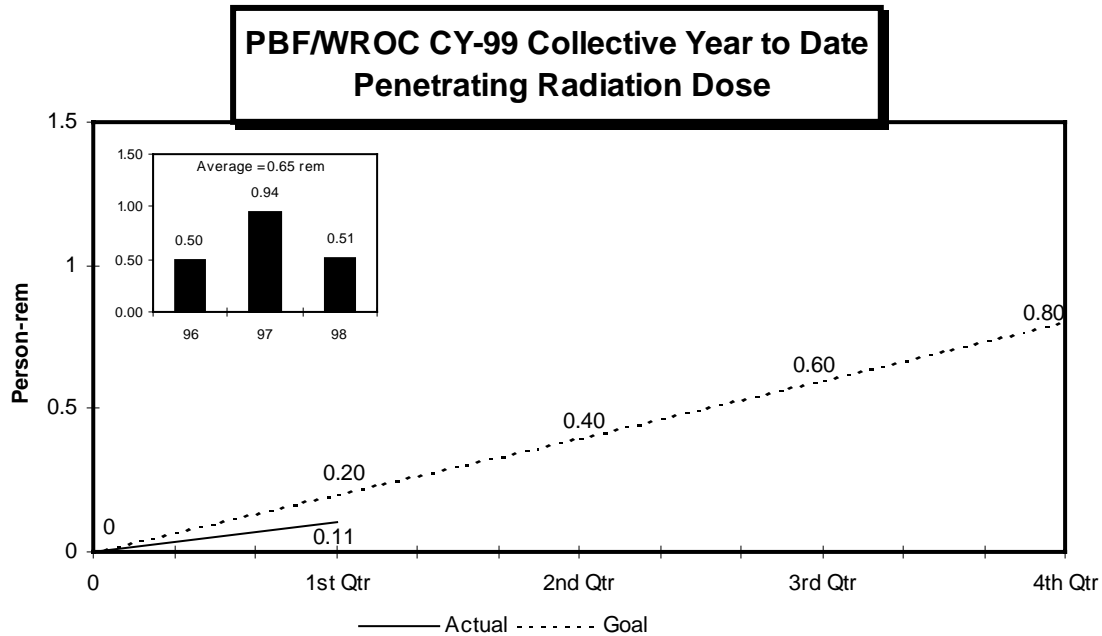
## Waste Reduction Operations Complex

### Waste Experimental Reduction Facility

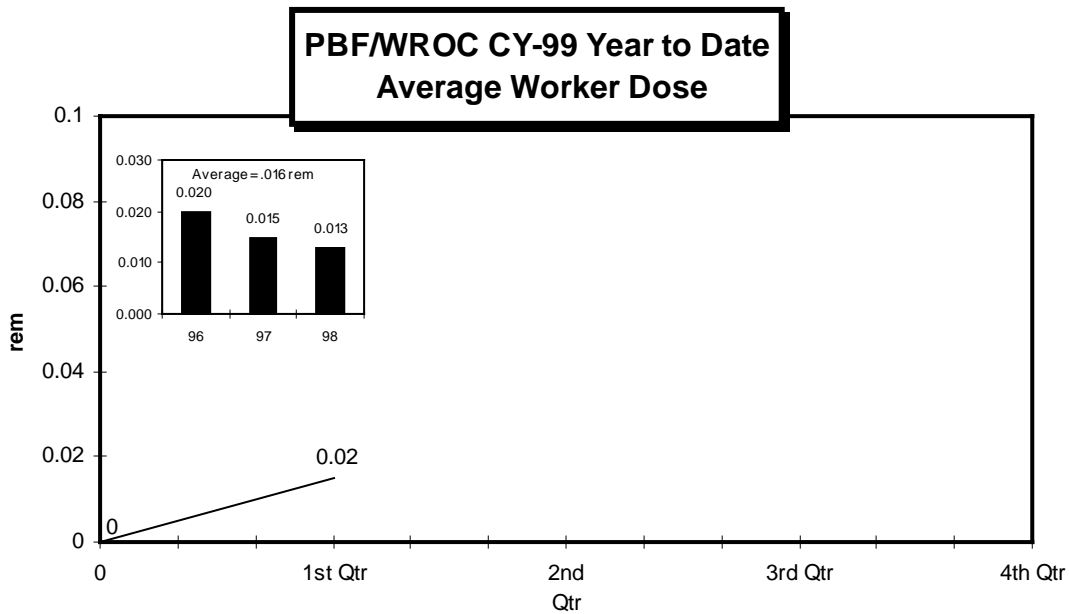
(PBF/WROC)

#### Summary

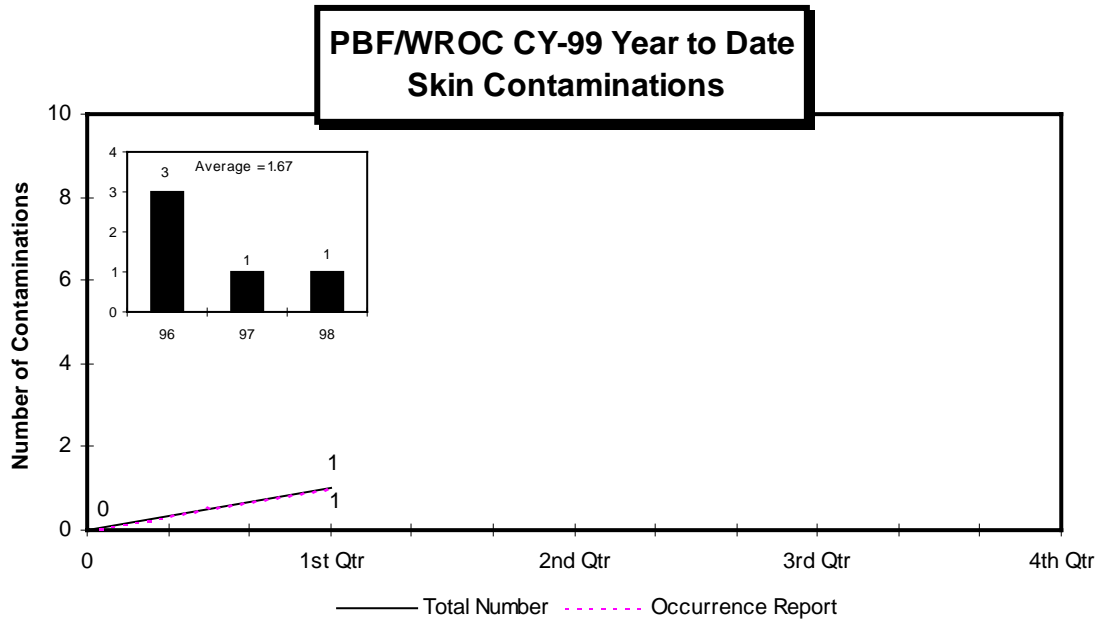
1. Major contributors to the first quarter occupational radiation exposure in the PBF/WROC reporting area were receiving and shipping waste, repackaging and sampling waste, compaction, and routines.
2. There was one reportable skin contamination during the first quarter. This resulted from opening the wrapping on a piece of equipment to be sized that was contaminated to levels much higher than planned. Details are on OR ID-LITC-WERF-1999-0003.
3. There were no clothing contaminations or spills during the first quarter.



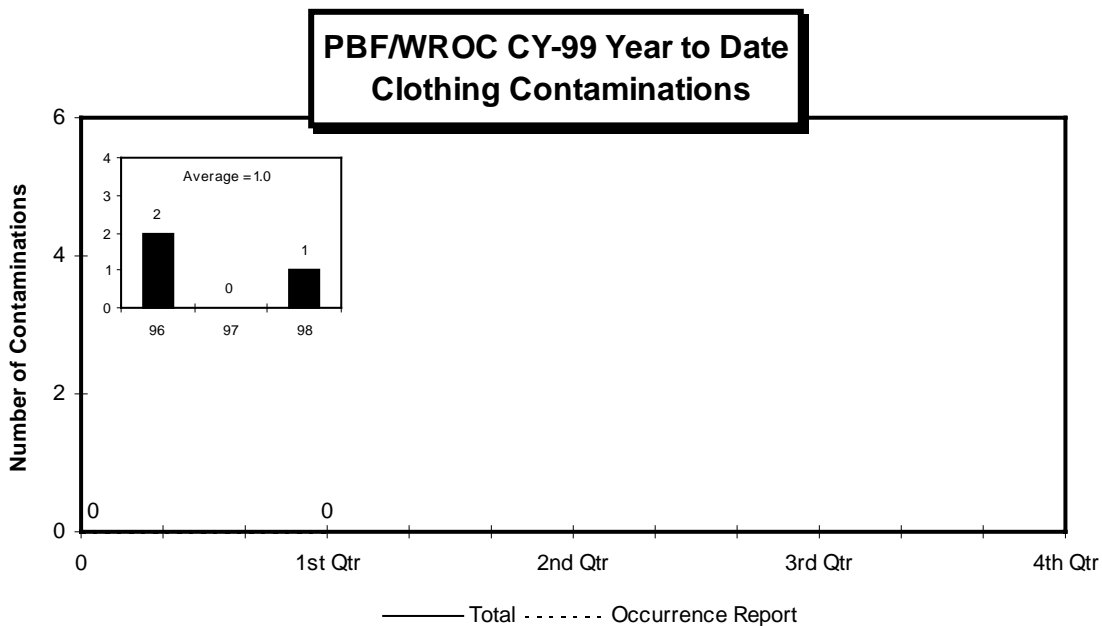
PBF/WROC collective penetrating radiation exposure through the end of the first quarter was 0.106 person rem based on Electronic Dosimeter totals in the RCIMS.



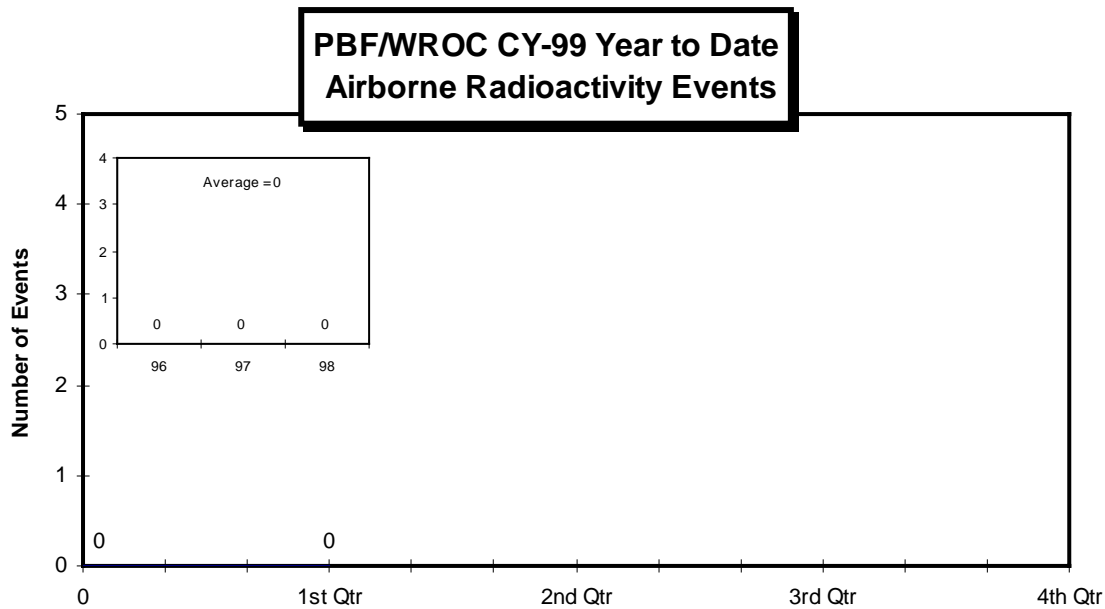
The PBF/WROC average worker dose through the end of the first quarter was 0.015 rem. Average dose is based on a comparison of workers who receive measurable dose (7 workers).



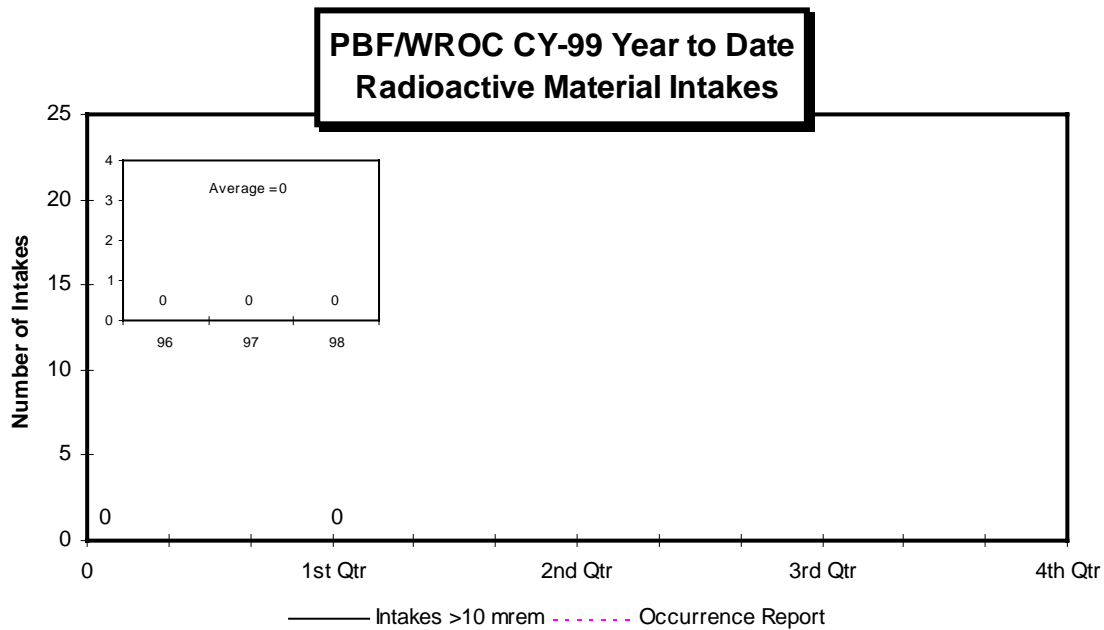
There was one skin contamination at the PBF/WROC area during the first quarter. Detail is in OR ID-LITC-WERF-1999-0003.



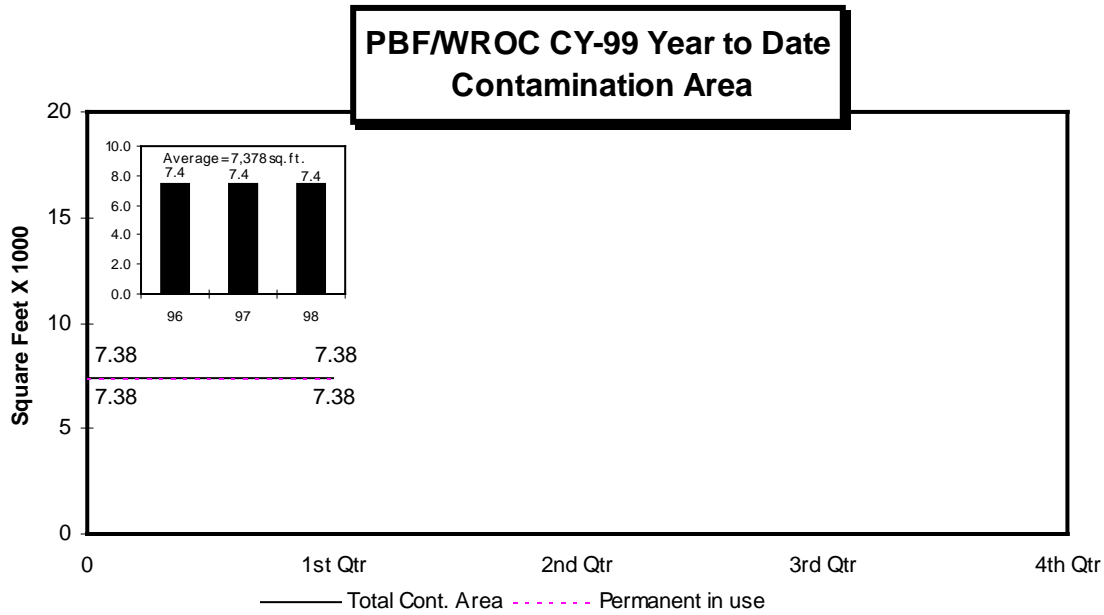
There were no reportable clothing contaminations at the PBF/WROC area during the first quarter.



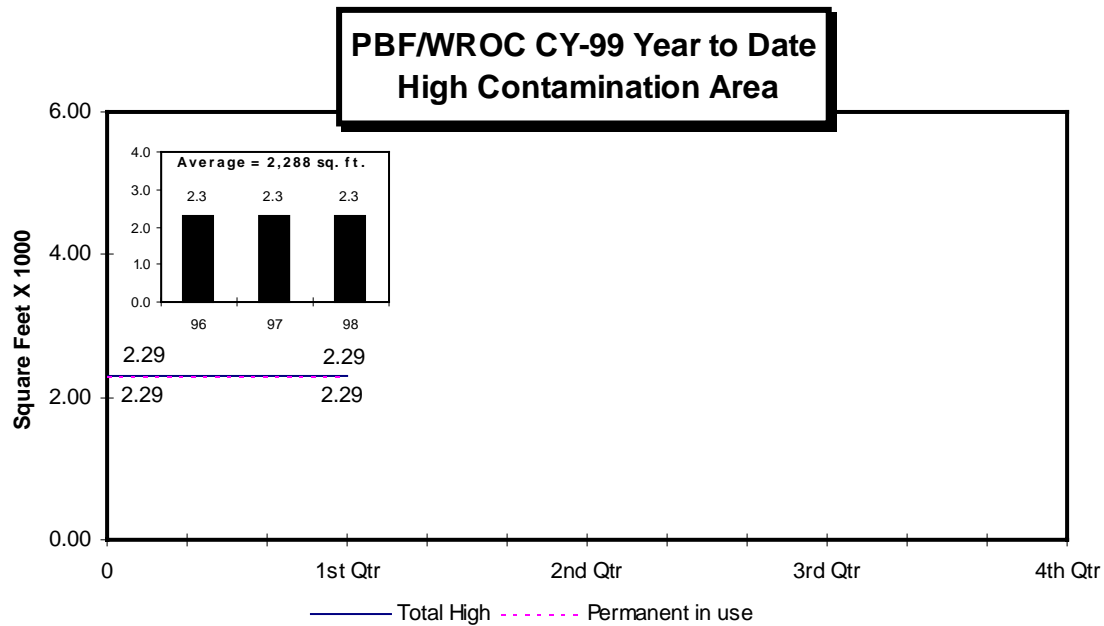
There have been no airborne activity events greater than 10 % DAC detected at the PBF/WROC area through the first quarter.



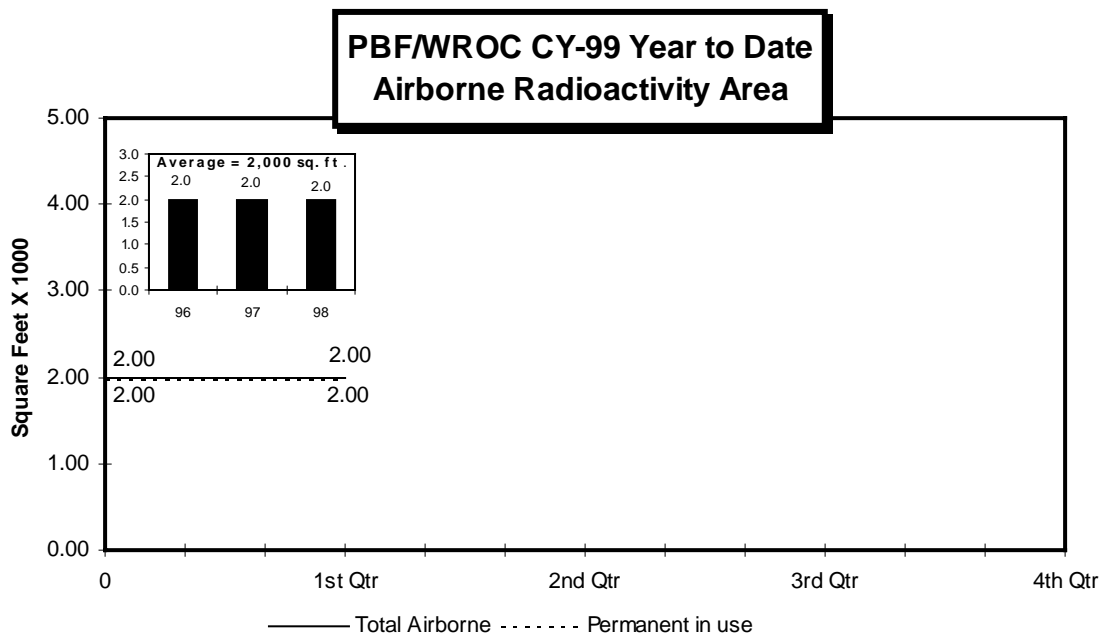
There were no positive bioassays indicating radioactive material intakes that resulted in a dose assessment of 10 mrem or greater in the PBF/WROC area during the first quarter.



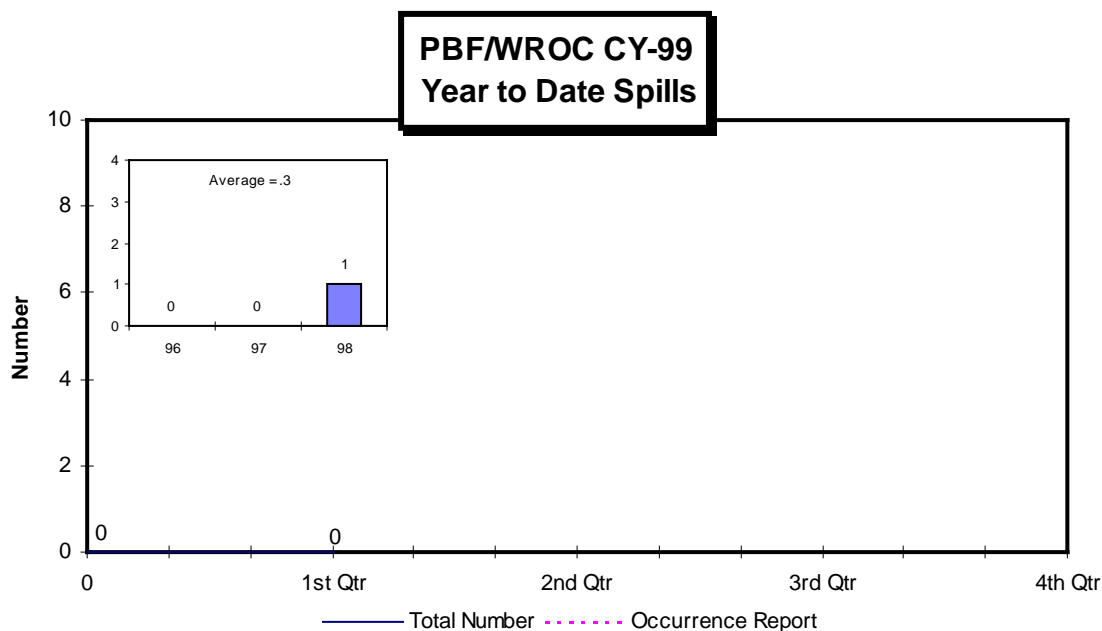
The first quarter Contamination Area for the PBF/WROC area remains at 7,378 square feet. All of this is considered permanent and in-use.



The total High Contamination Area through the end of the first quarter at the PBF/WROC area remains at 2,288 square feet. All of this is considered permanent and in use.



The total Airborne Radioactivity Area at PBF/WROC at the end of the first quarter remained at 2000 square feet. All of this area is designated as permanent and in-use.



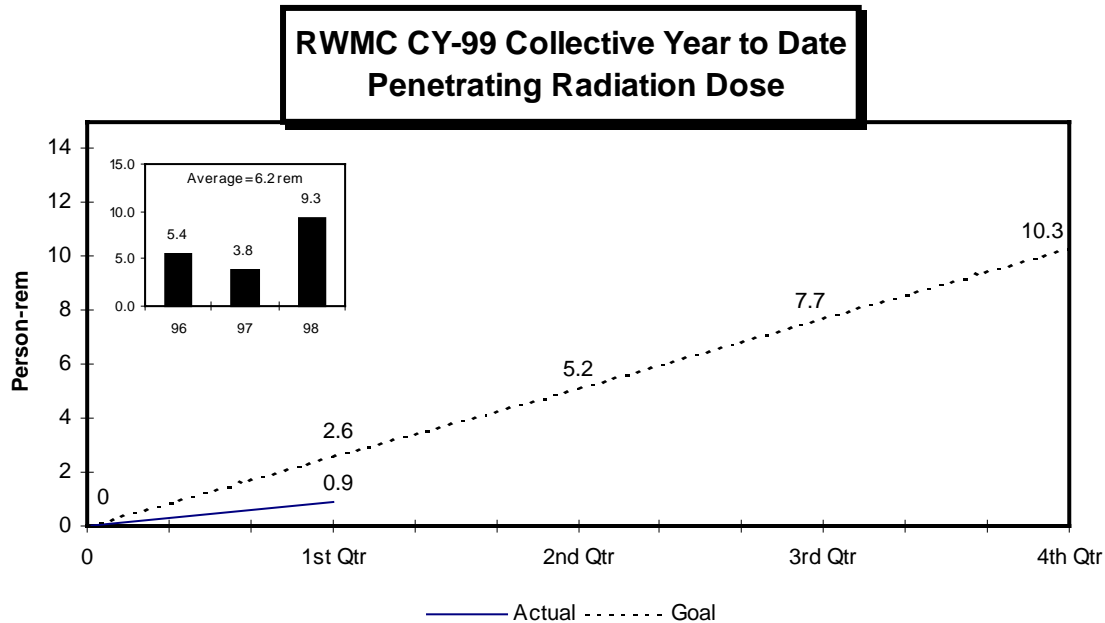
There were no incidents considered to be a loss of control of radioactive material during the first quarter.

# Radioactive Waste Management Complex

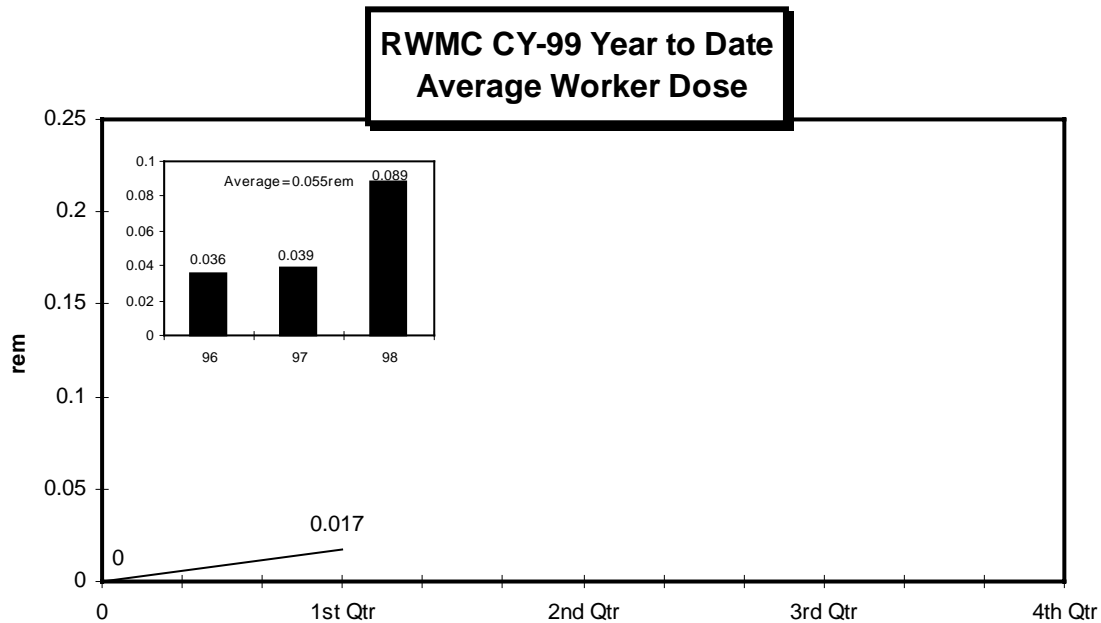
## Summary

1. Major contributors to the first quarter RWMC occupational radiation exposure have been from waste disposal in the SDA, Drum re-configuration, SWEPP Operations, and drum and box surveys in the storage modules. The ALARA goal for RWMC is slightly higher due to increased work scope with required inspections and the addition of Pit 9.
2. The HCA area at the RWMC is under a protective tarp covering the waste stack at the TSA-RE. This area will remain a permanent HCA until retrieval operations begin in that area.
3. Sandia waste boxes in storage modules remain contaminated at the end of the first quarter.
4. There have been no skin contaminations clothing contaminations or spills during this quarter.

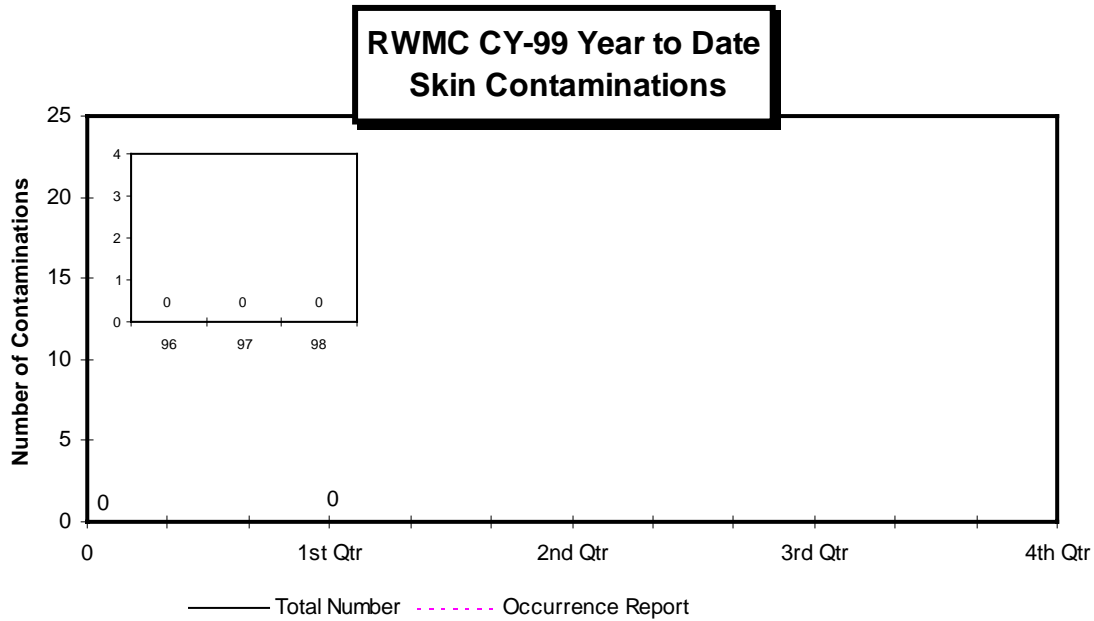




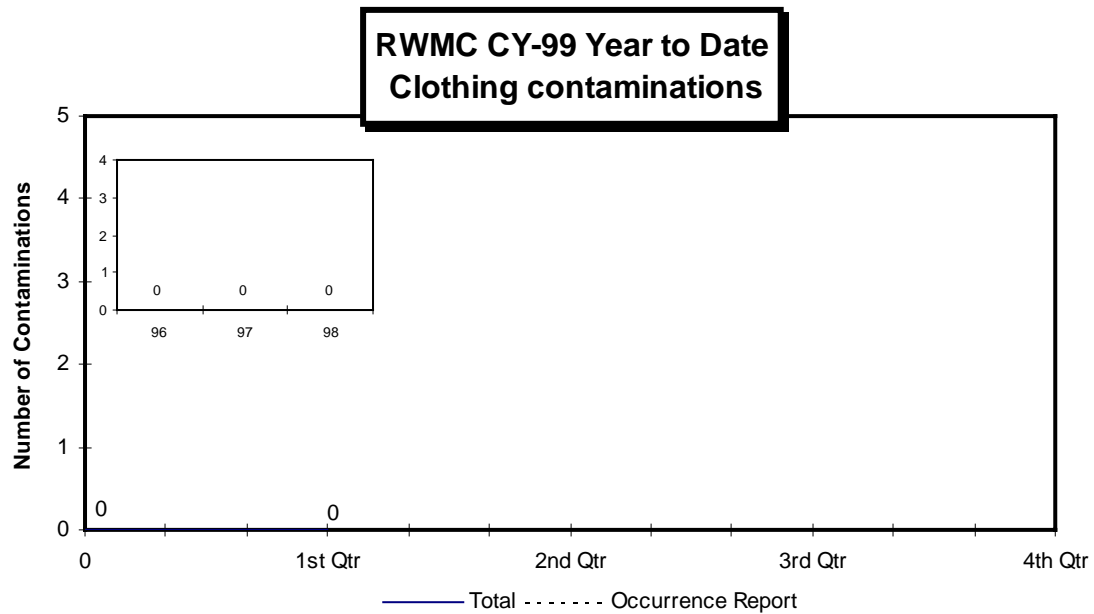
The RWMC collective penetrating radiation exposure through the end of the first quarter was 0.854 person-rem based on Electronic Dosimeter totals on the RCIMS.



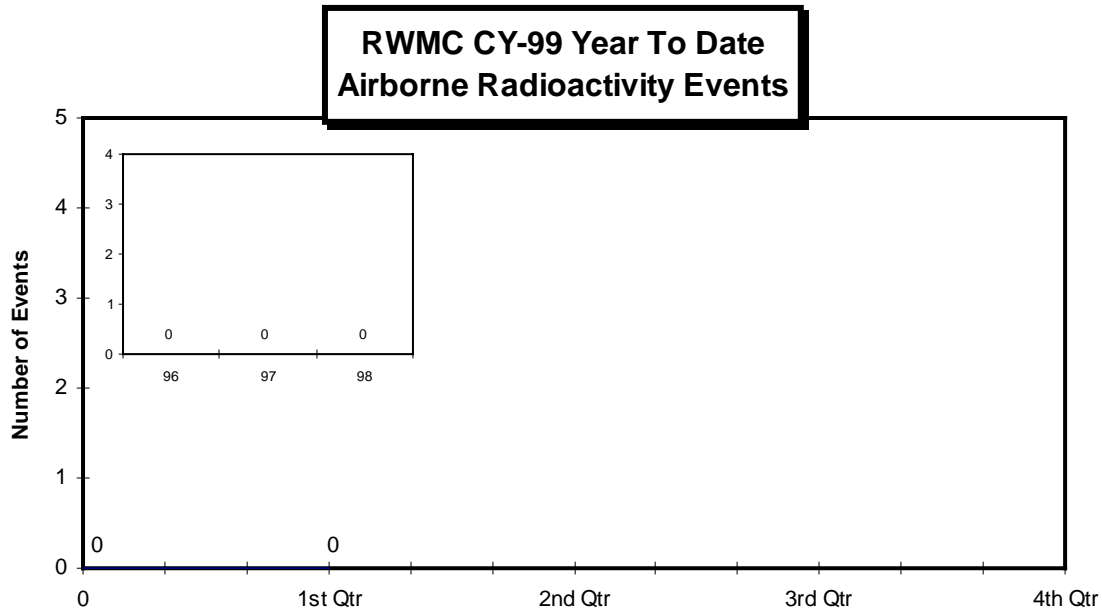
The average worker dose at the RWMC through the end of the first quarter was 0.017 rem from 23 workers who received dose greater than 10 mrem.



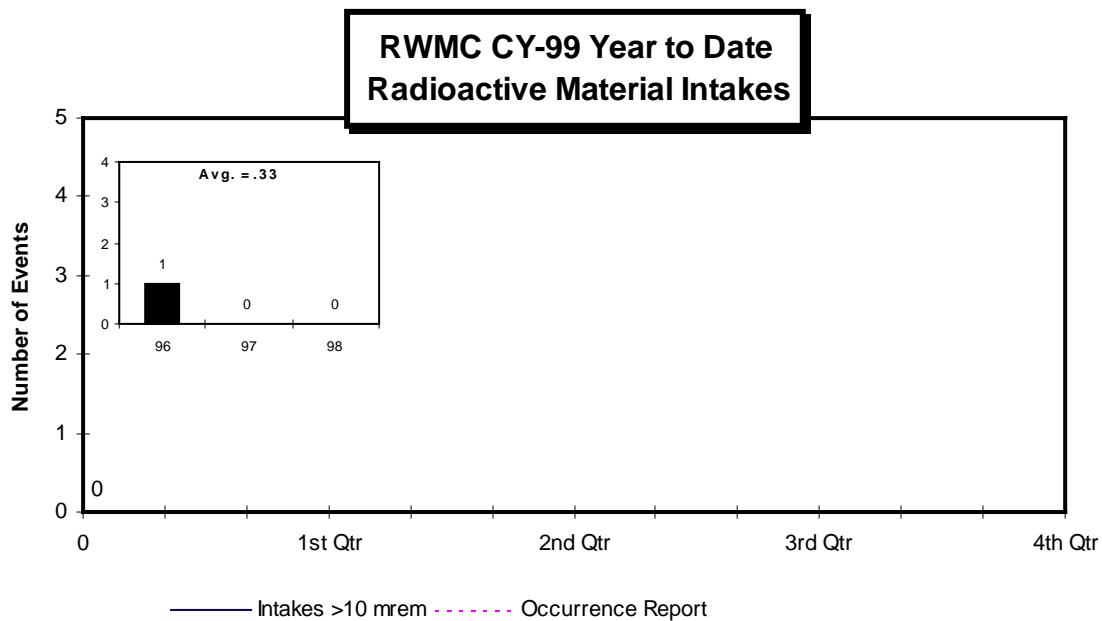
RWMC year to date skin contaminations remain at zero through the end of the first quarter.



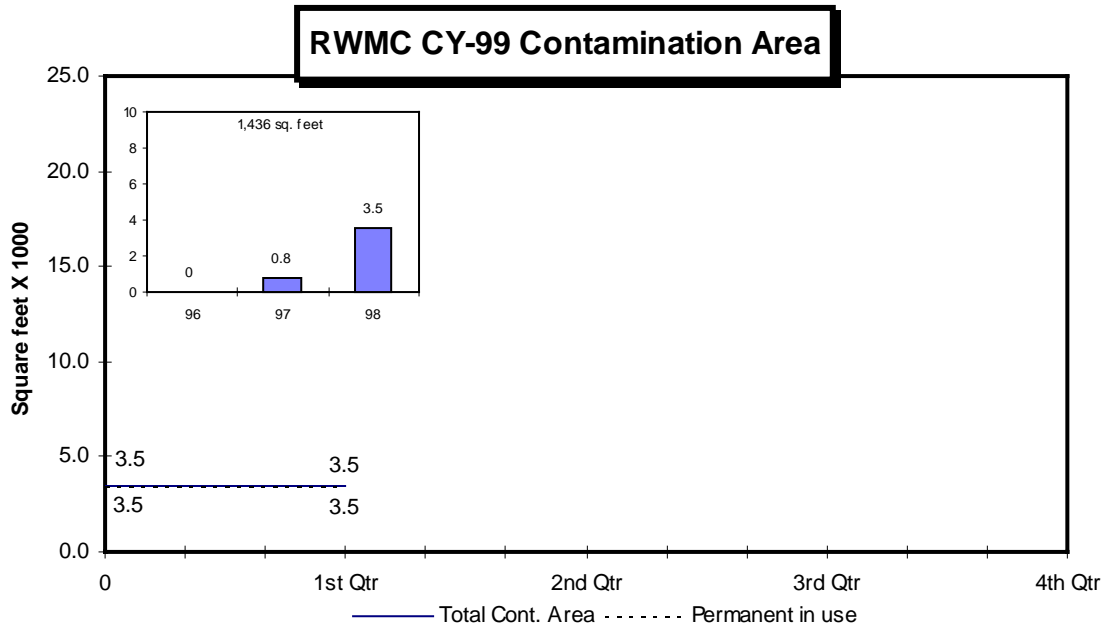
There were no clothing contaminations at the RWMC through the end of the CY-99 first quarter.



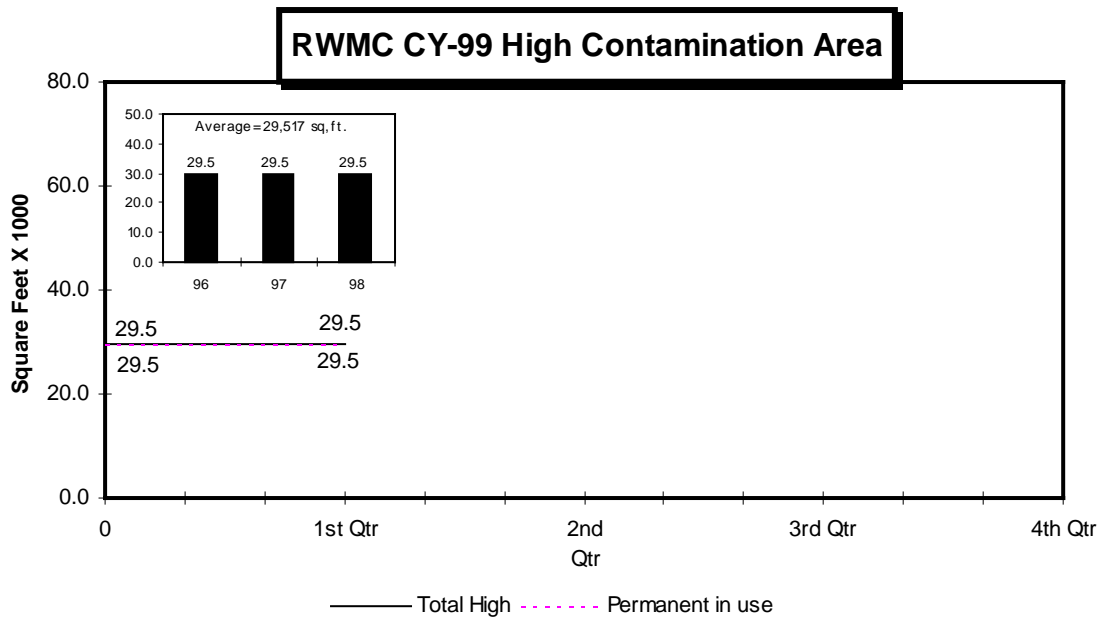
No airborne activity greater than 10 % DAC was detected at RWMC in areas not posted as Airborne Radioactivity Areas year to date.



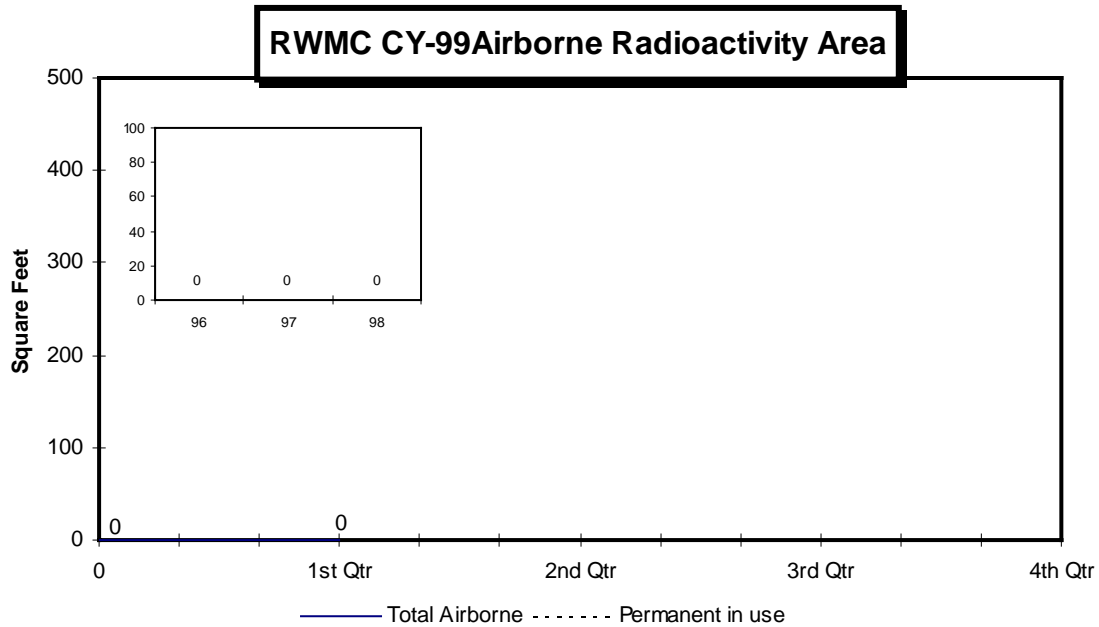
There have been no positive bioassays year to date indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater.



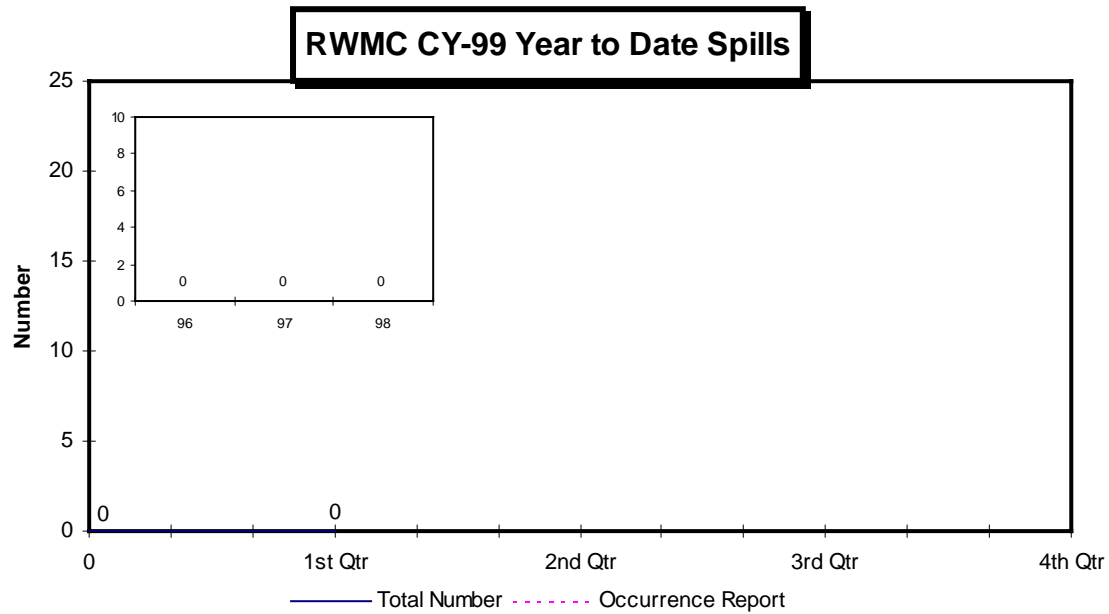
The total Contamination Area at the RWMC through the end of the first quarter remains at 3,508 square feet, which is the area of Sandia waste boxes in storage containers.



The total High Contamination Area at the RWMC through the end of the first quarter remains at 29,525 square feet. All of this area is designated as permanent and in-use.



There are no Airborne Radioactivity Areas at the RWMC through the end of the first quarter.

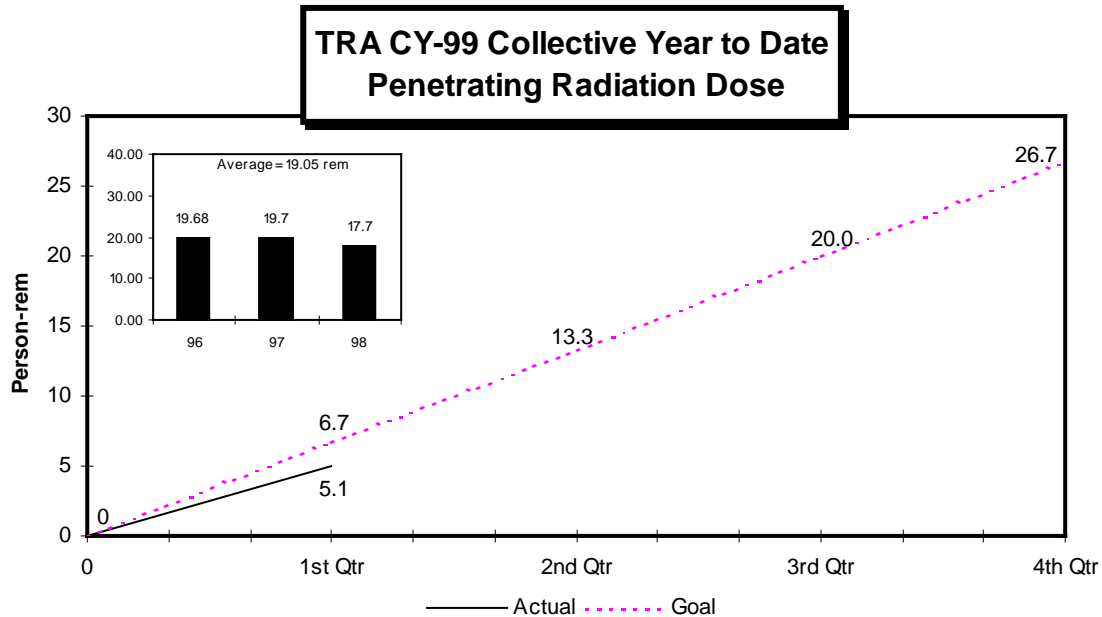


There were no spills or loss of control of radioactive material through the first quarter at the RWMC.

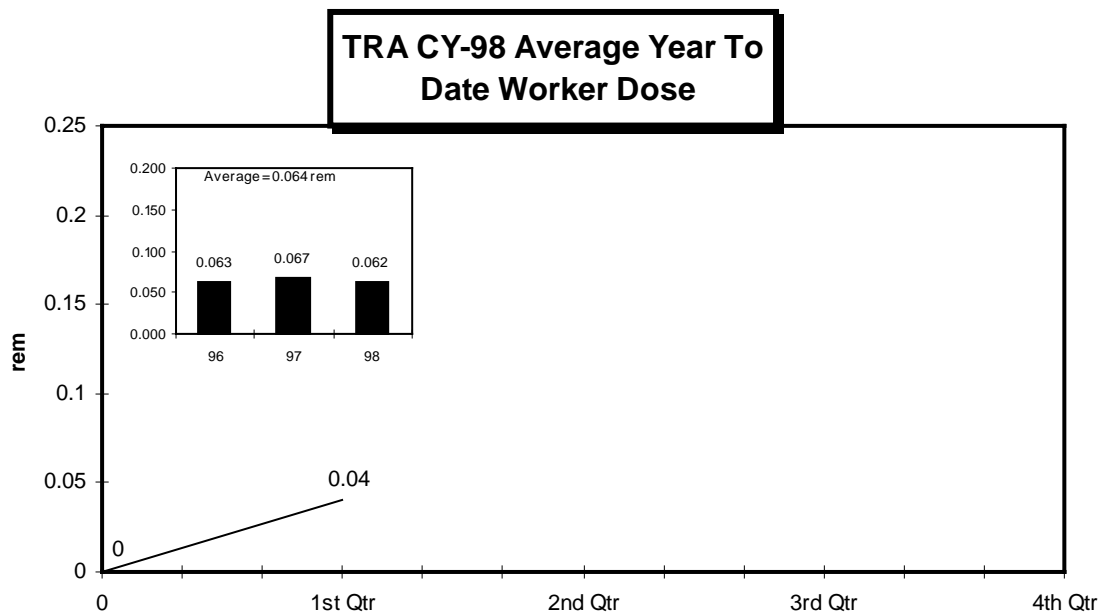
# Test Reactor Area

## Summary

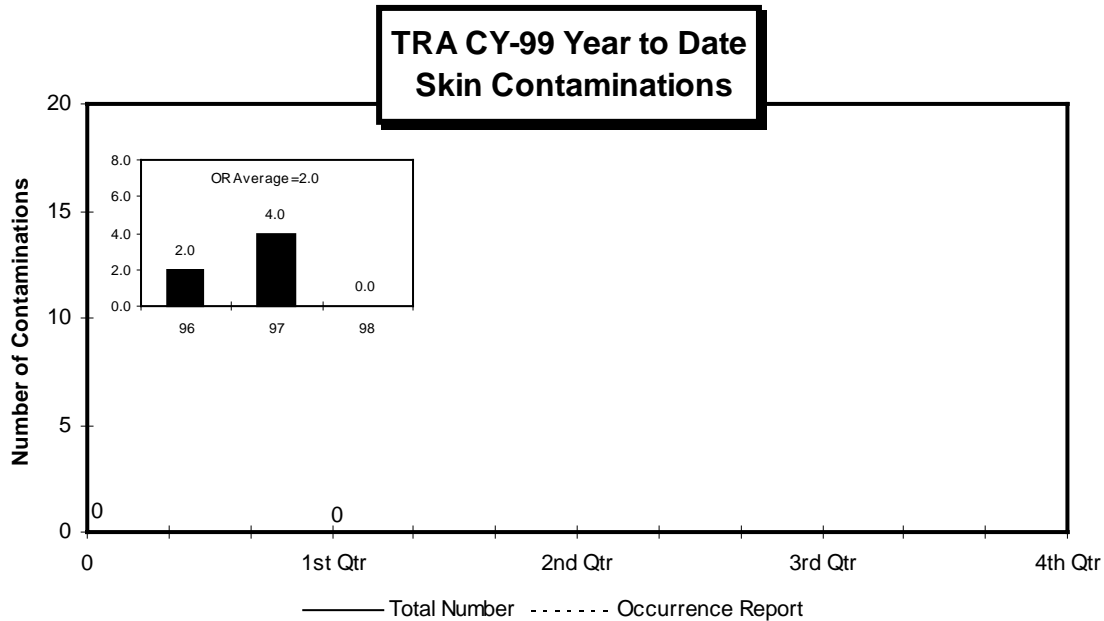
1. The CY-99 goal for TRA is 26.650 person-rem. Outages at the Advance Test Reactor (ATR) within the Test Reactor Area (TRA) are responsible for the major portions of dose during the first quarter. Penetrating dose for the report is based on Electronic Dosimeter data from the RCIMS. Year to date dose at TRA is 5.783 person-rem.
2. There were five reportable clothing contaminations at the TRA during this quarter. Details are contained in ORs ID-LITC-ATR-1999-0001, 1999-0003, and 1999-0004. There was one OR at the I-4 not included here.
3. There were no skin contaminations or reportable spills during the quarter.



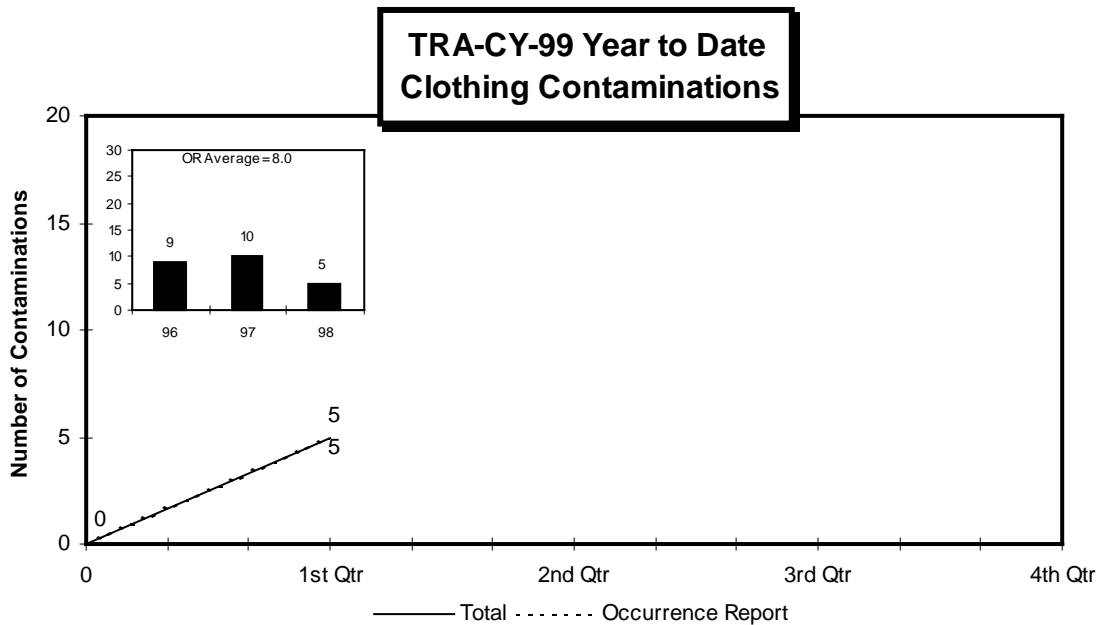
TRA collective penetrating radiation dose through the end of the first quarter based on Electronic Dosimeter data was 5.056 person-rem. The ALARA goal is higher this year due to jobs that were deferred last year due to the maintenance work stoppage. These jobs will be completed in CY-99.



The average worker dose at the TRA through the end of the first quarter was 0.040 rem based on 127 workers with dose greater than 10 mrem.

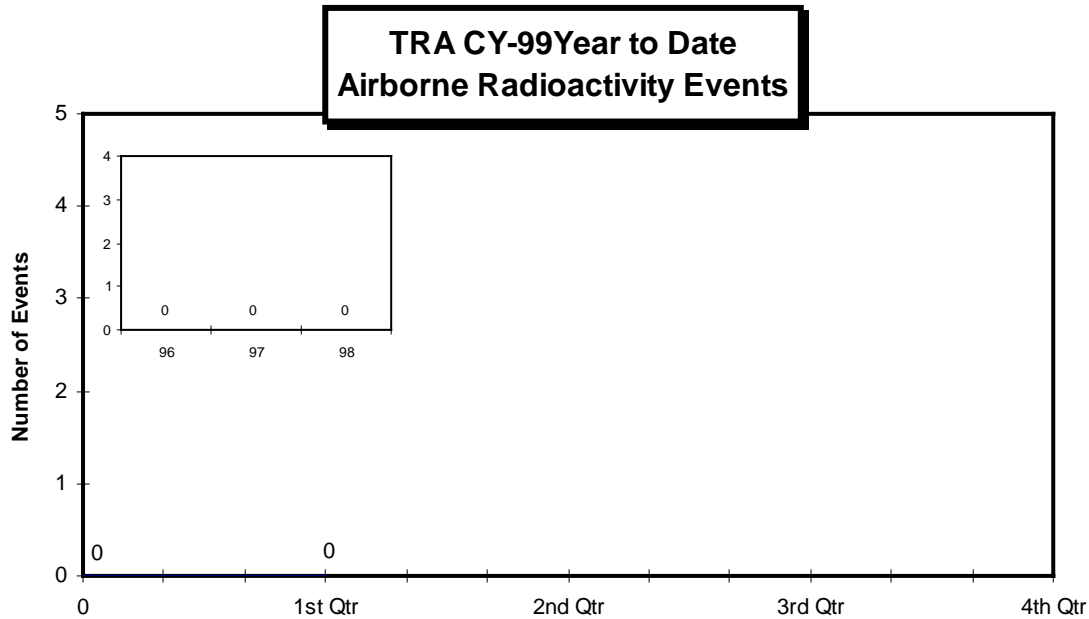


There were no skin contaminations at the TRA during the first quarter. There were no contaminated wounds or facial contaminations.

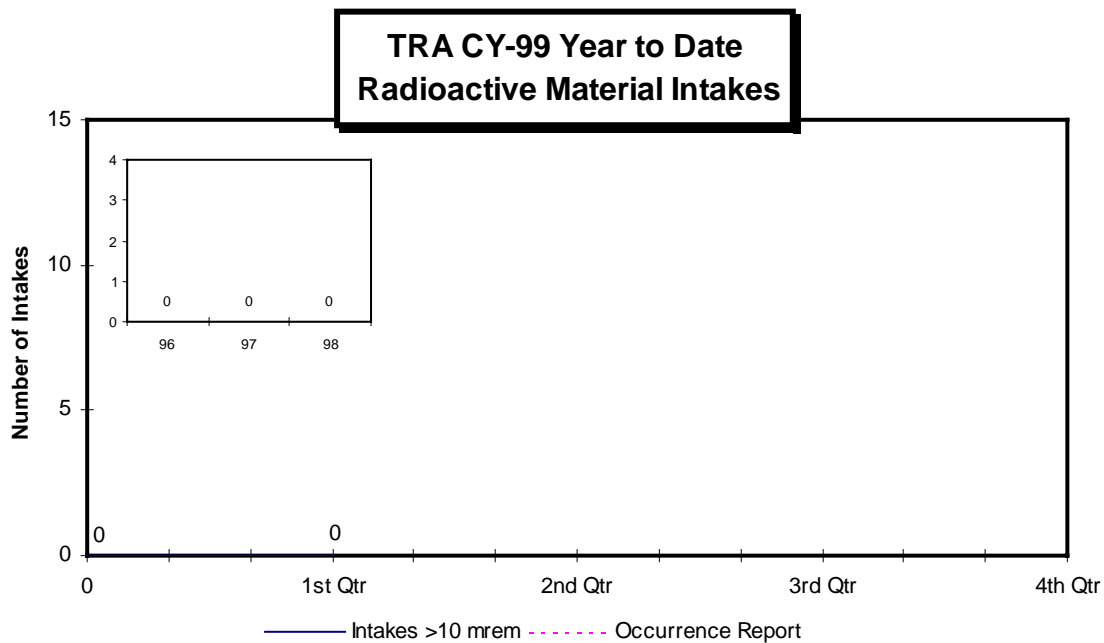


There were five reportable clothing contaminations at the TRA during the first quarter. Details of the reportable contaminations are contained in ORs ID-LITC-ATR-1999-0001, 0003, and 0005.

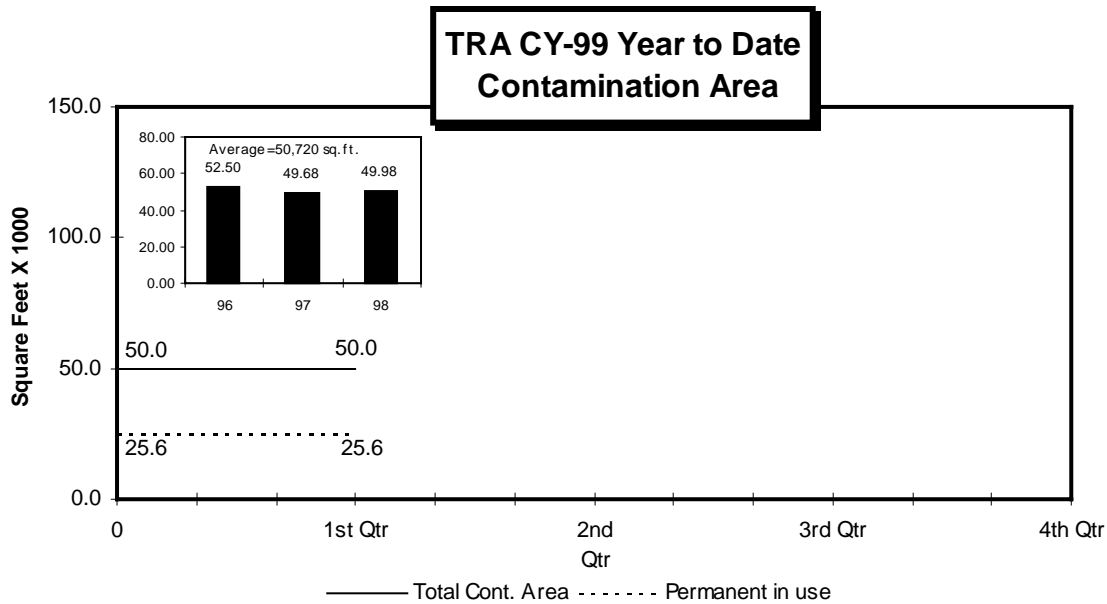




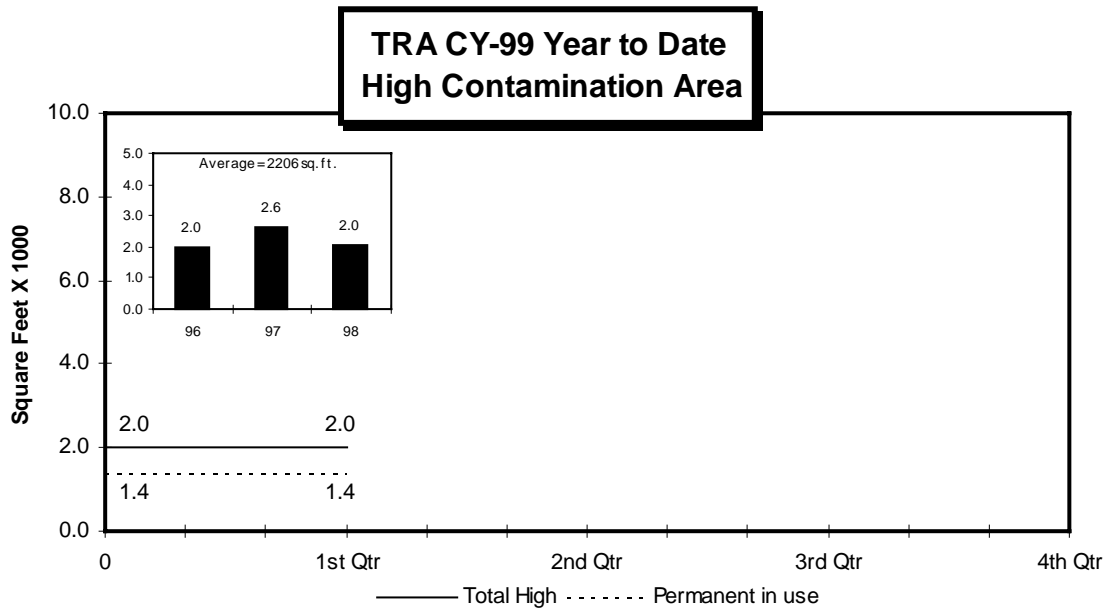
No airborne activity greater than 10 % DAC was detected at the TRA in areas not already posted as Airborne Radioactivity Areas during the first quarter.



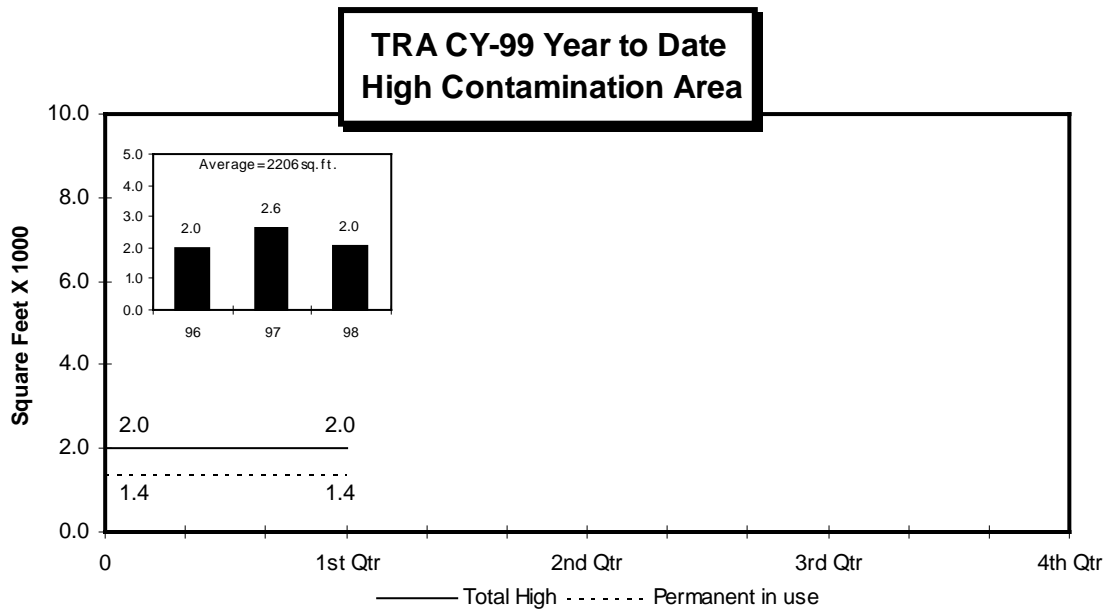
There were no positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at the TRA during the first quarter.



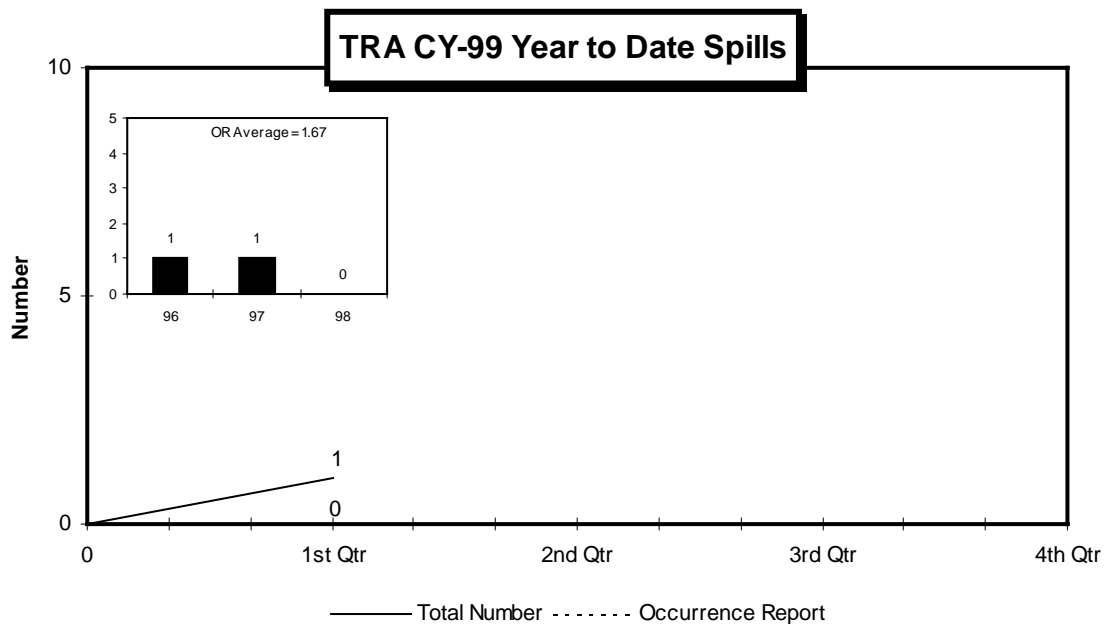
Total indoor Contamination Area for the TRA is 49,978 square feet square feet. 25,619 square feet is designated as permanent and in-use.



Total High Contamination Area for the TRA at the end of the first quarter remains at 2,025 square feet. 1,400 square feet of this area is designated as permanent and in-use. The chart shows rounded values.



Total Airborne Radioactivity Area at the TRA at the end of the first quarter remains at zero square feet.



There was one non-reportable spill at the ATR. The area,  $< 3 \text{ ft}^2$ , was decontaminated in less than 24 hours. There were no reportable spills or loss of control of radioactive material at the TRA during the first quarter.

# International Isotopes Idaho Inc. (III)

## Formerly MAC-ISOTOPES

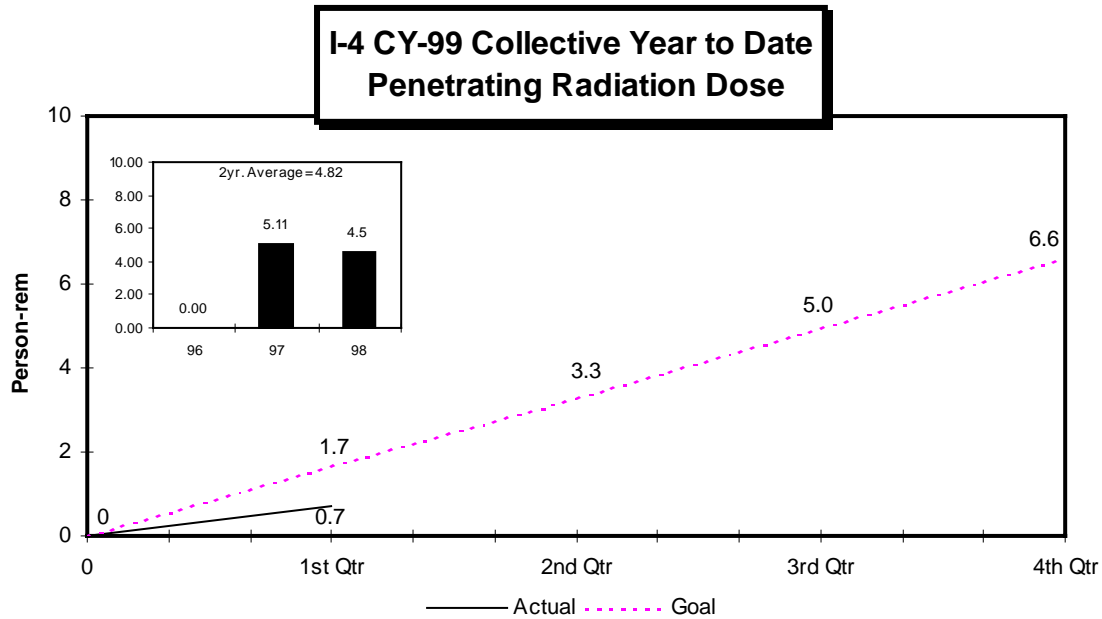
### TRA HOT CELL

#### Summary

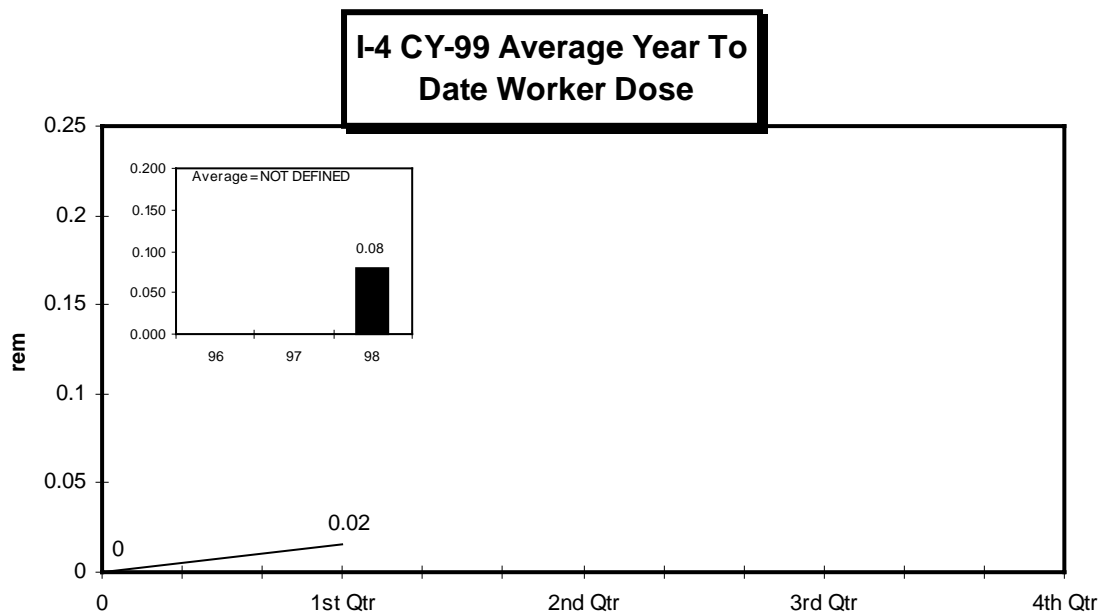
The TRA Hot Cell, I-4, formerly MAC-I is a privatized contractor and is being tracked here since LMITCO provides much of the associated labor support. International Isotopes Inc., of Denton, Texas acquired MAC-I on April 27, 1998.

Activities include isotope separation work and associated source activities. The data on the following pages is not added to LMITCO totals.

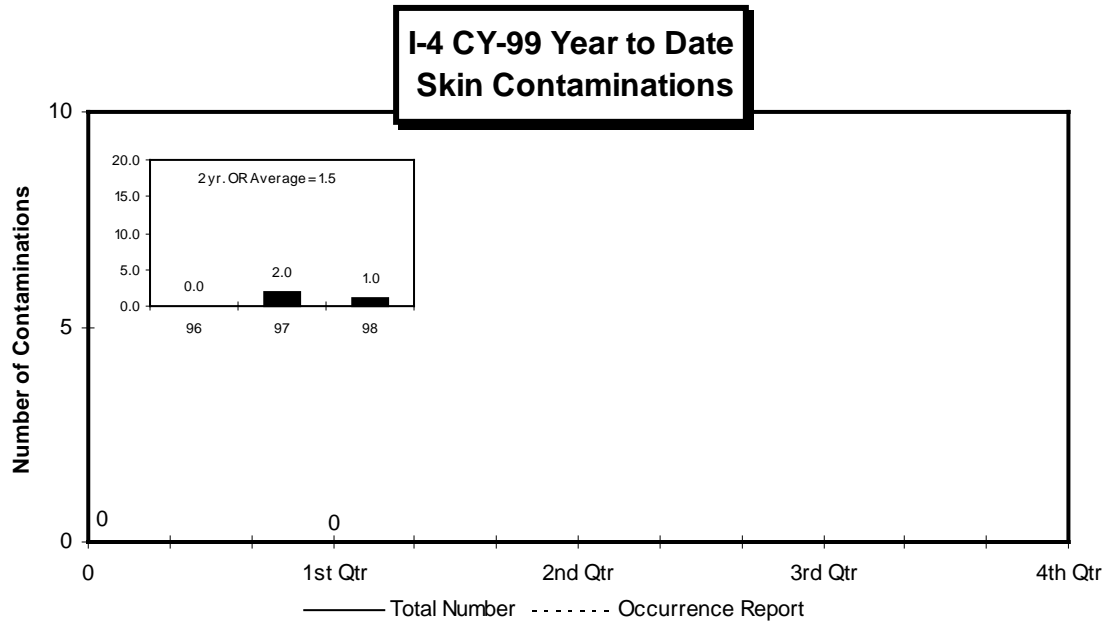
There was one reportable clothing contamination at the I-4 this quarter. Detail is on OR ID-LITC-TRA-0006.



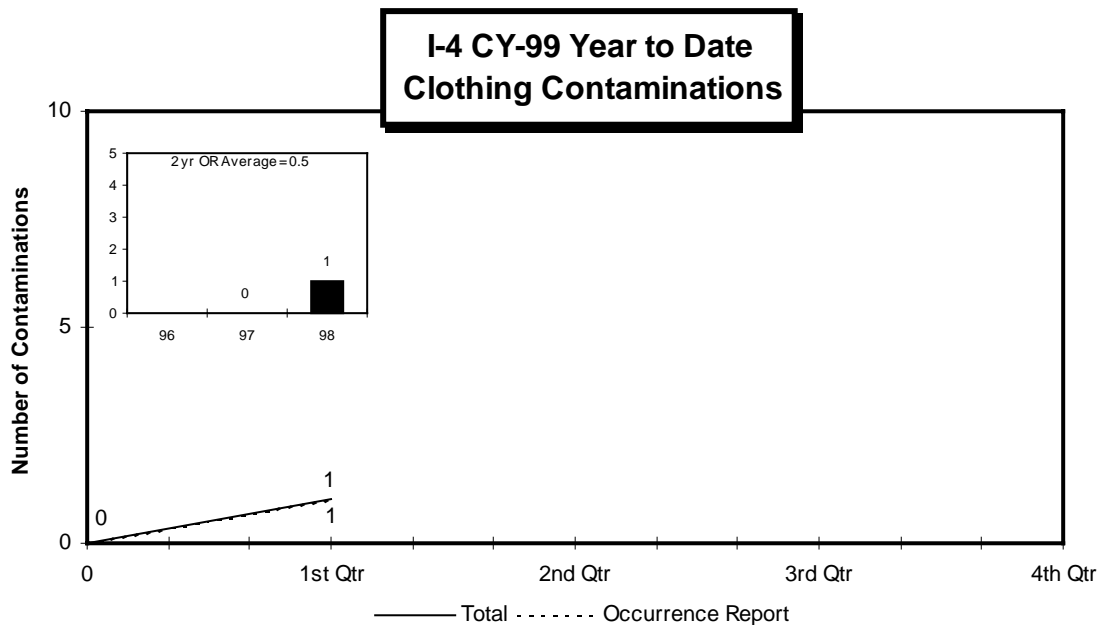
Year to date dose is 0.727 person-rem. The ALARA goal for CY-99 is 6.6 person-rem.



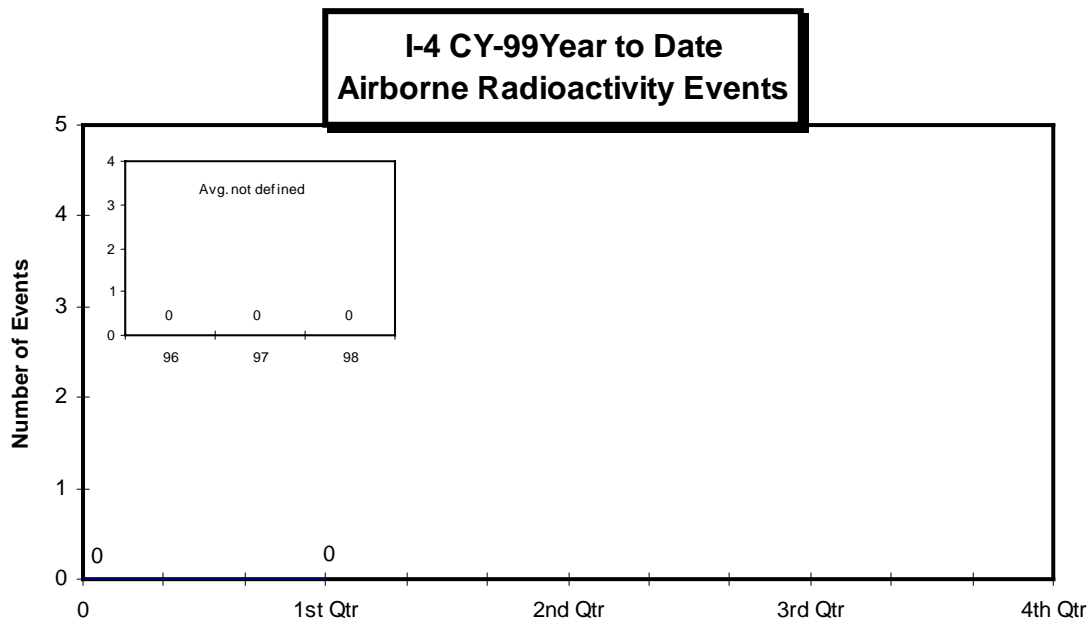
Average year to date worker dose is 0.016 rem based on 45 workers receiving dose at the I-4 facility.



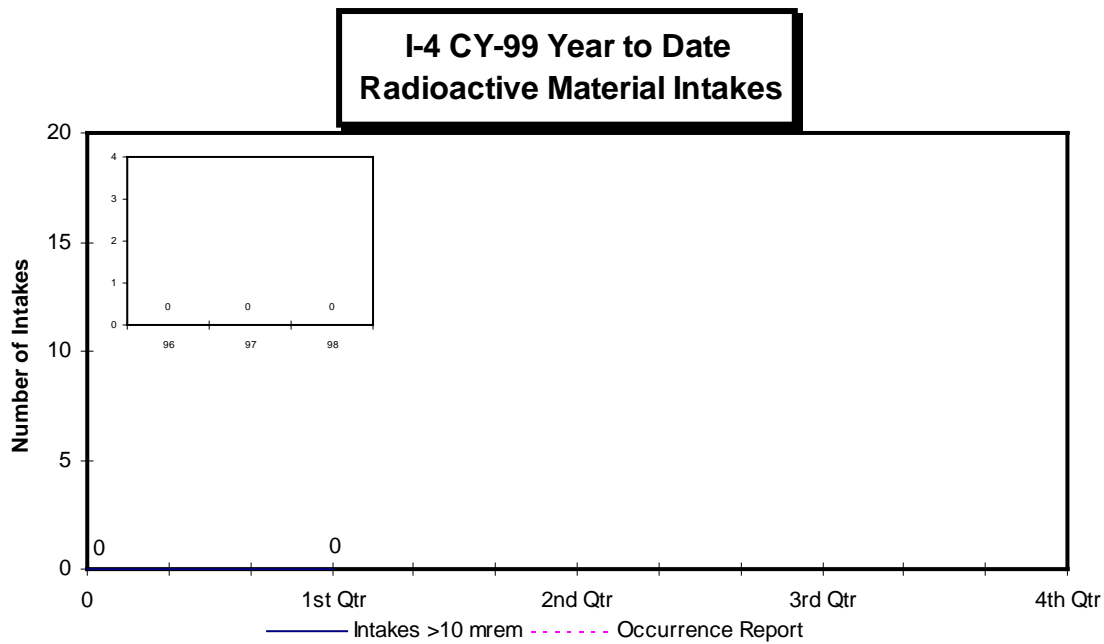
There were no skin contamination events at the Hot Cell facility during the first quarter. Note: The average is based on two years beginning CY-97.



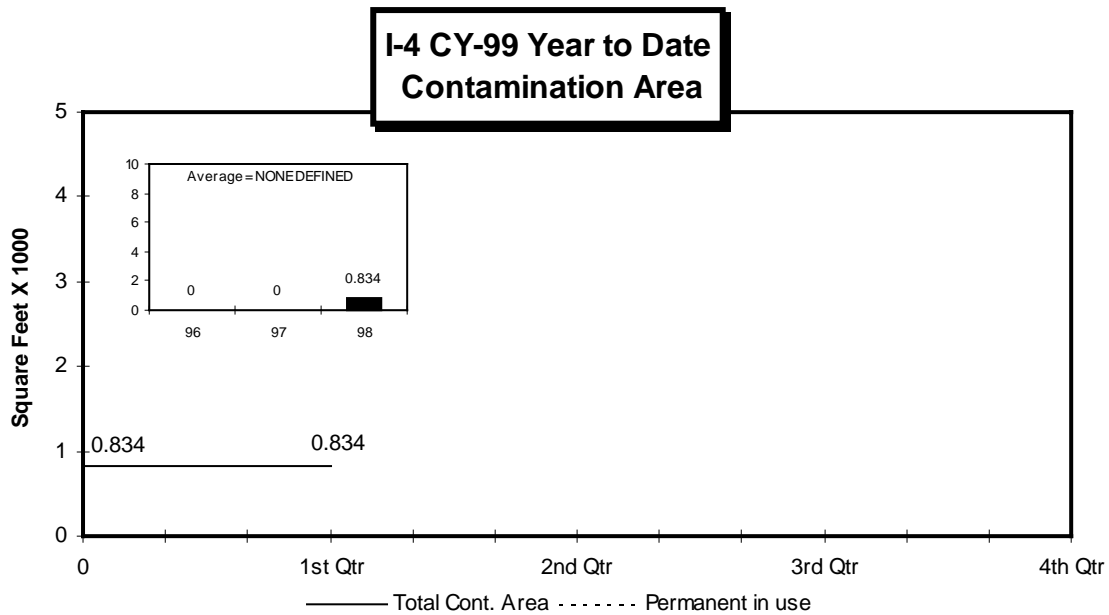
I-4 has had one reportable clothing contamination event year to date. The event is not in the TRA total or the INEEL total since I-4 is considered to be a sub-contractor.



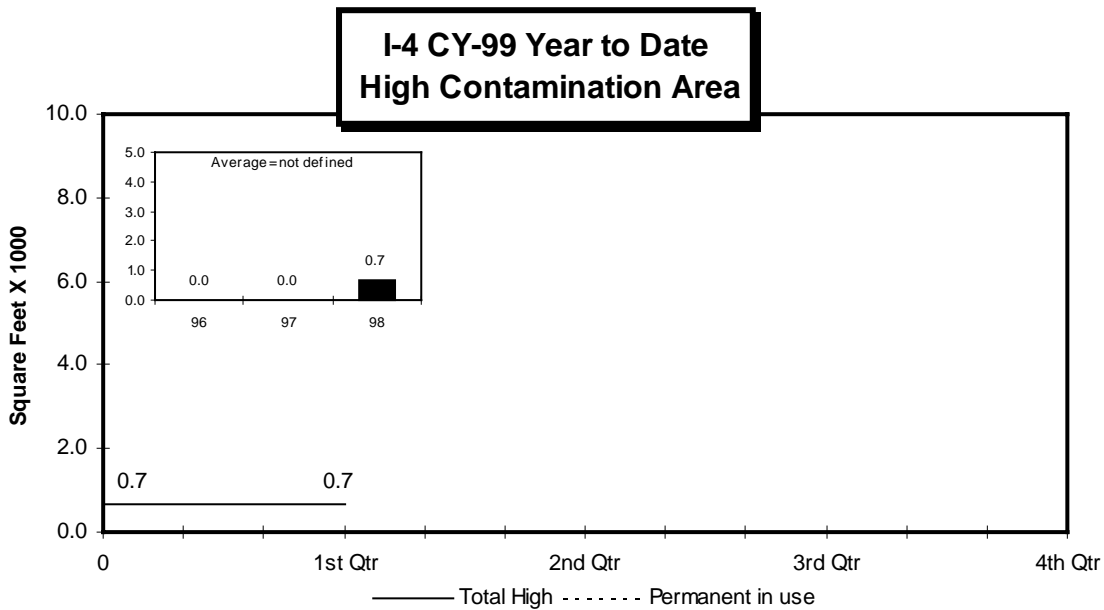
There have been no events greater than 10% DAC year to date.



There have been no internal doses greater than 10 mrem CEDE confirmed from IIII operations year to date.

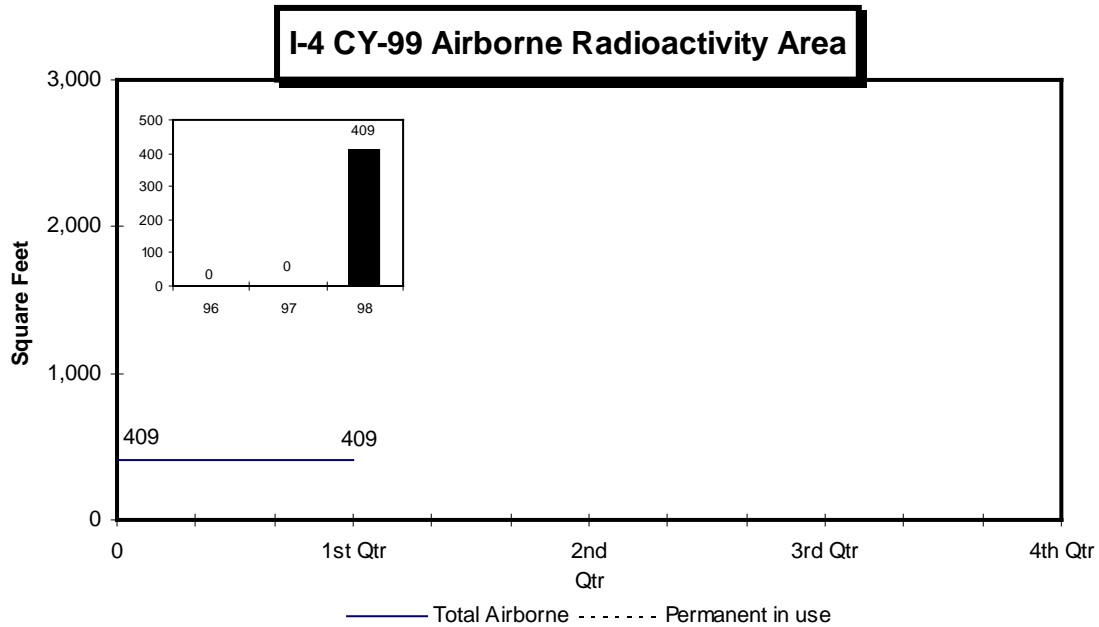


Contamination areas total 834 square feet at the Hot Cell at TRA

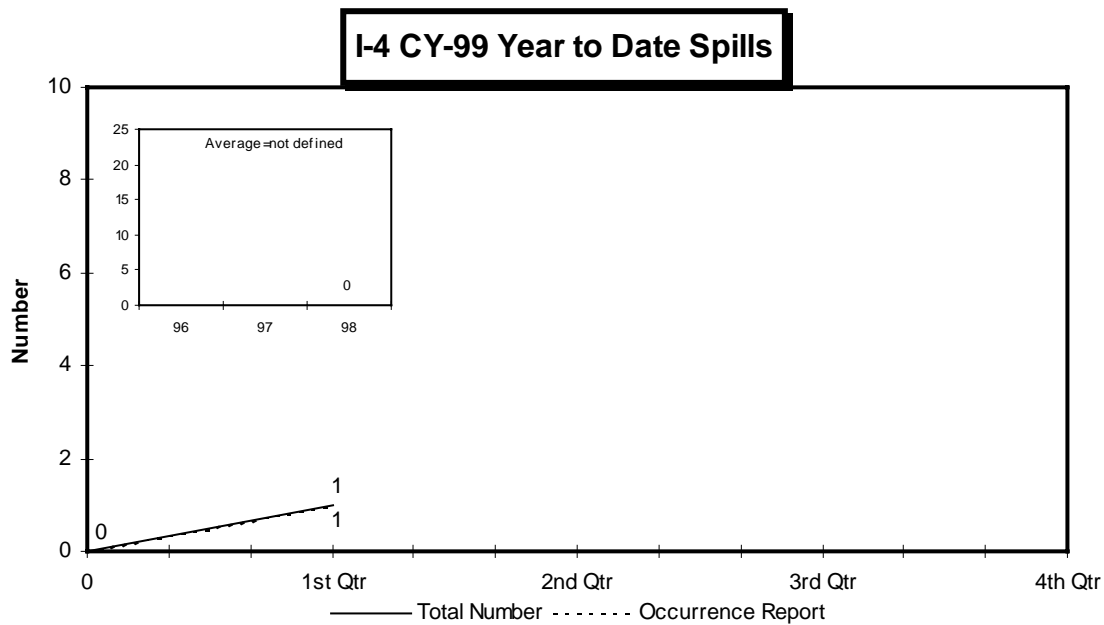


Trending data is just being established for IIII. Year to date High Contamination is 680 square feet.





There are three posted Airborne Radioactivity Areas at the Hot Cell Facility for a total of 409 square feet.

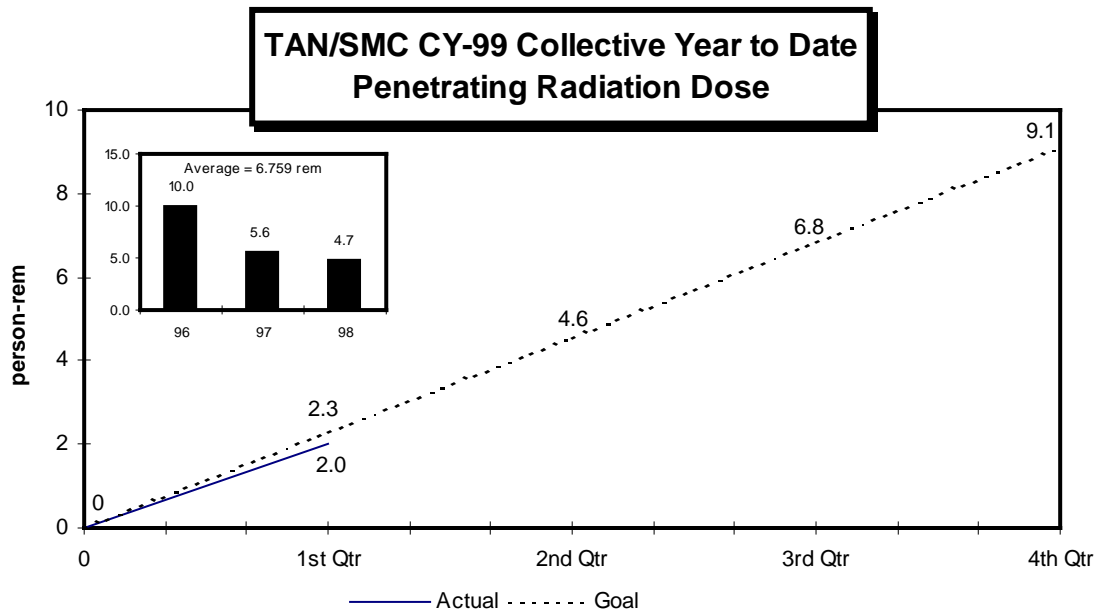


There has been one loss of control of radioactive material at the TRA Hot Cells year to date. An isotopic wafer was found in the transfer port.

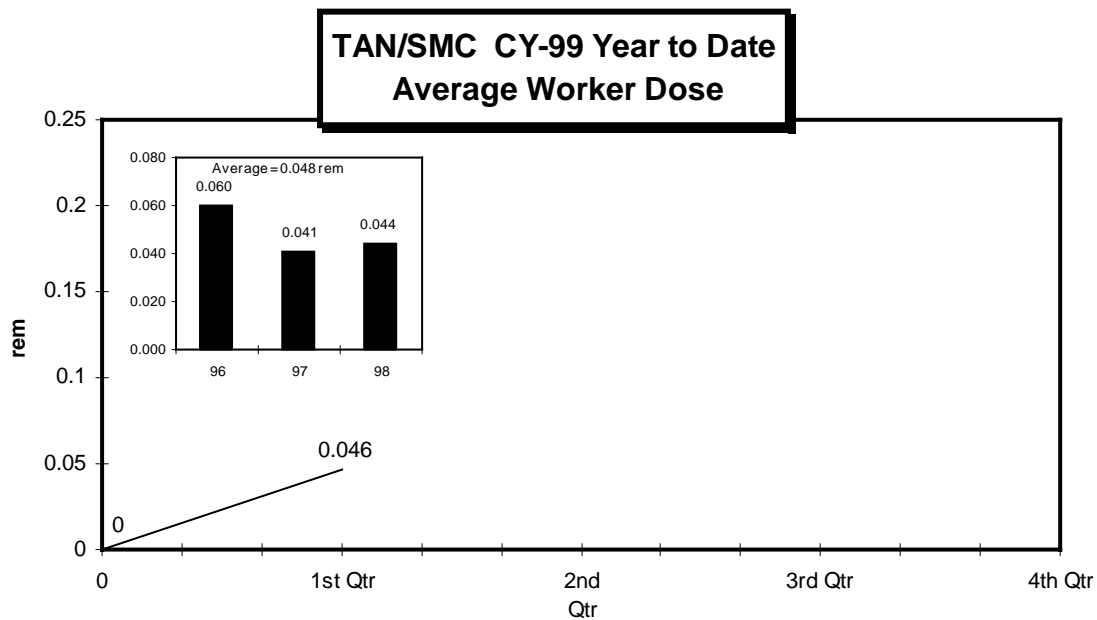
# Test Area North & Specific Manufacturing Capability

## Summary

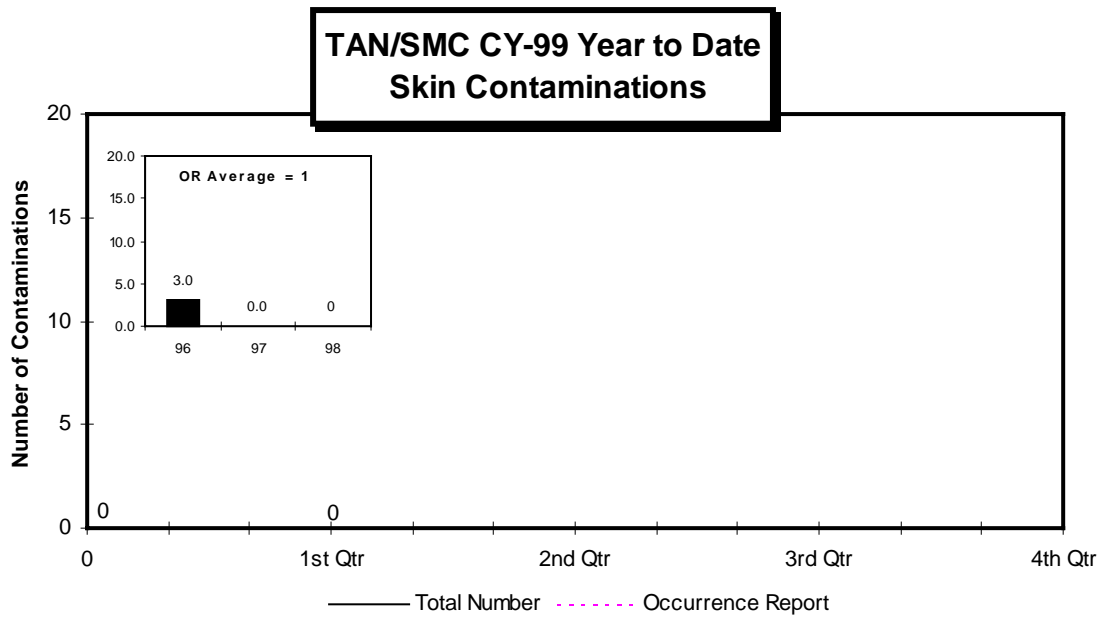
1. The ALARA goal at TAN is higher this year based primarily on work associated with TMI-2 fuel shipments (9.1 person-rem). TAN hot shop work, including TMI-2 fuel shipment preparation, handling repackaging and shipment of hot waste, fuel movements, canister dewatering, cask disassembly, ER remediation activities, decontamination, and pool cleaning and vacuuming account for dose at TAN Ops.
2. For SMC, routine armor manufacturing, routines, and D&D activities account for the dose contribution.
3. There were two clothing contaminations at TAN during the first quarter. Ors ID-LITC-TAN-1999-0001 and 0002 contain the details.
4. Three urine bioassays indicated greater than 1.0  $\mu\text{g/l}$  total uranium. These three will continue to be tracked and evaluated for a final dose assessment. Worst case is <100 mrem CEDE.



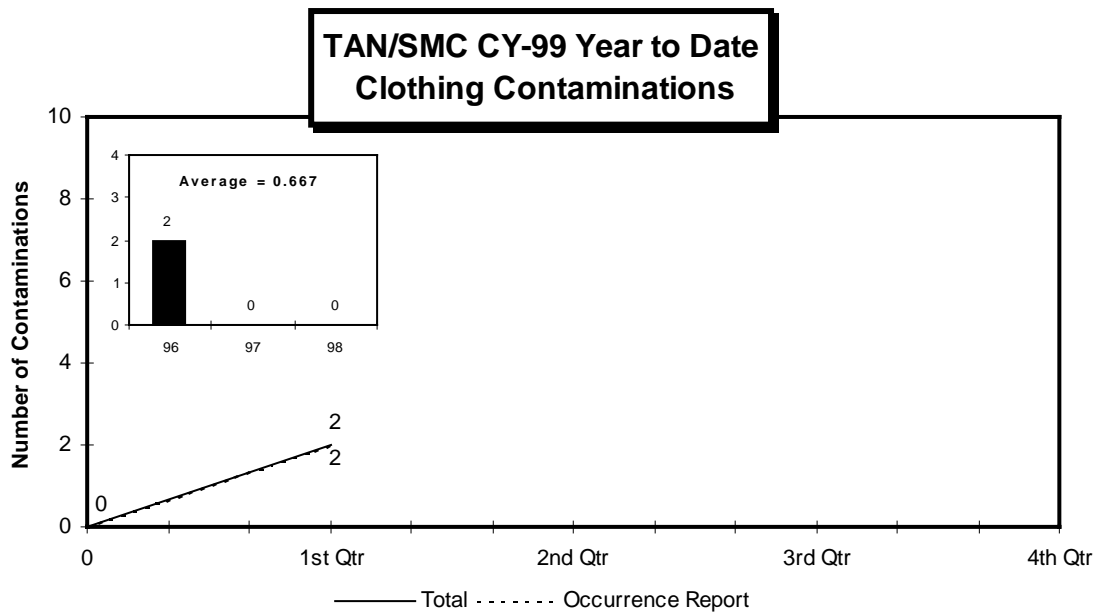
TAN and SMC collective penetrating radiation dose through the end of the first quarter was 1.988 person-rem based on Electronic Dosimetry data.



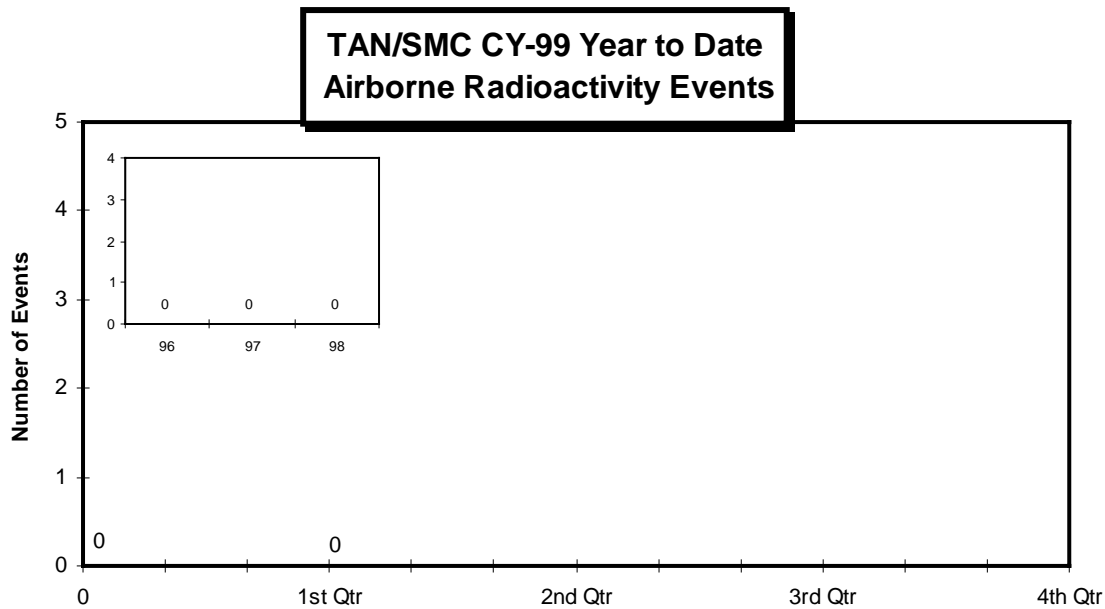
The average worker dose at the TAN/SMC through the end of the first quarter was 0.046 rem based on 43 workers who received dose greater than 10 mrem.



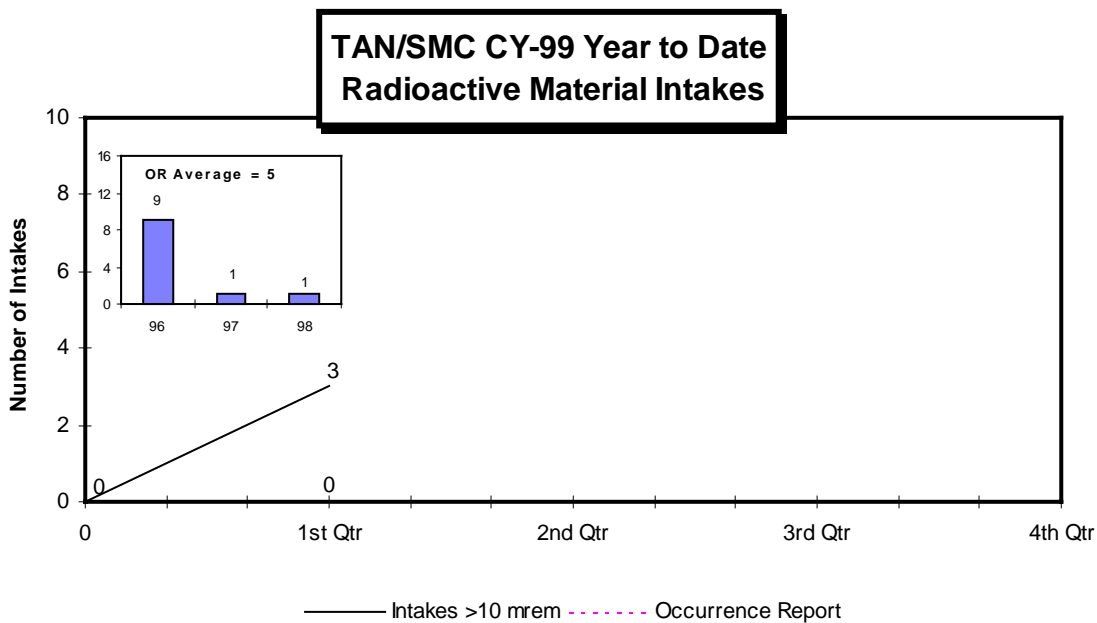
There were no skin contaminations at TAN/SMC during the first quarter. There were no facial or wound contaminations during the quarter.



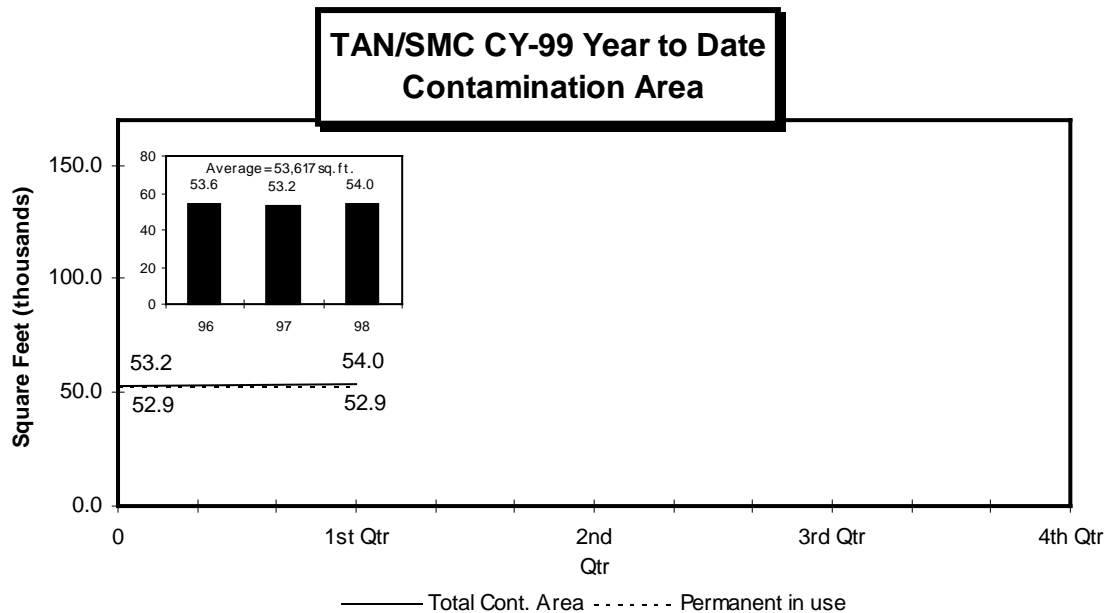
There were two contaminations that occurred at TAN/SMC during the first quarter. Details are contained in ORs ID-LITC-TAN-1999-0001 and 0002.



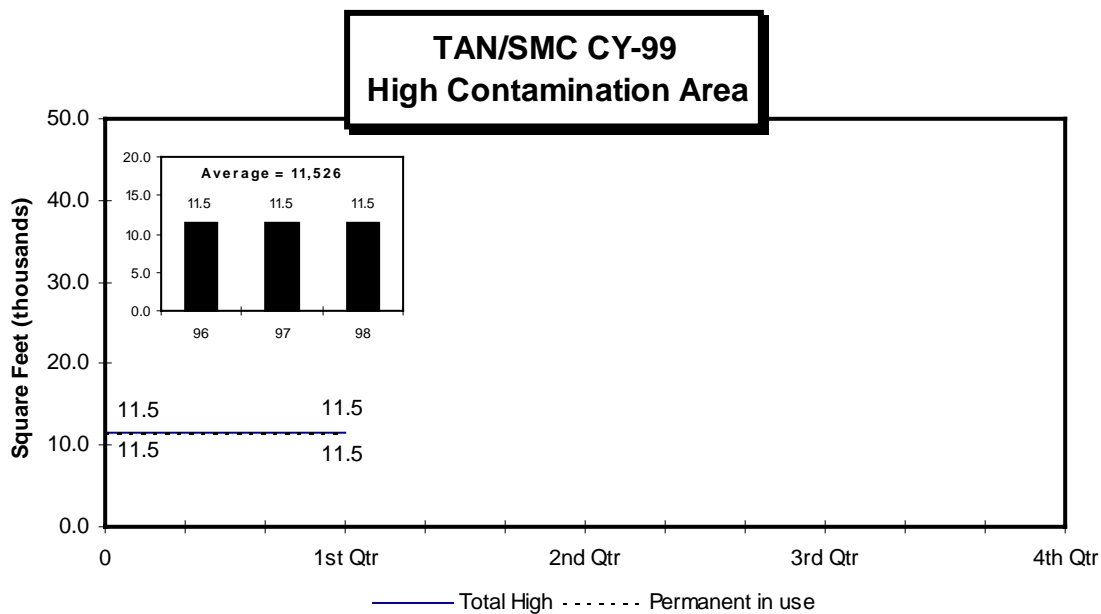
No airborne activity event greater than 10 % DAC was detected at TAN/SMC in areas not posted as Airborne Radioactivity Areas during the first quarter.



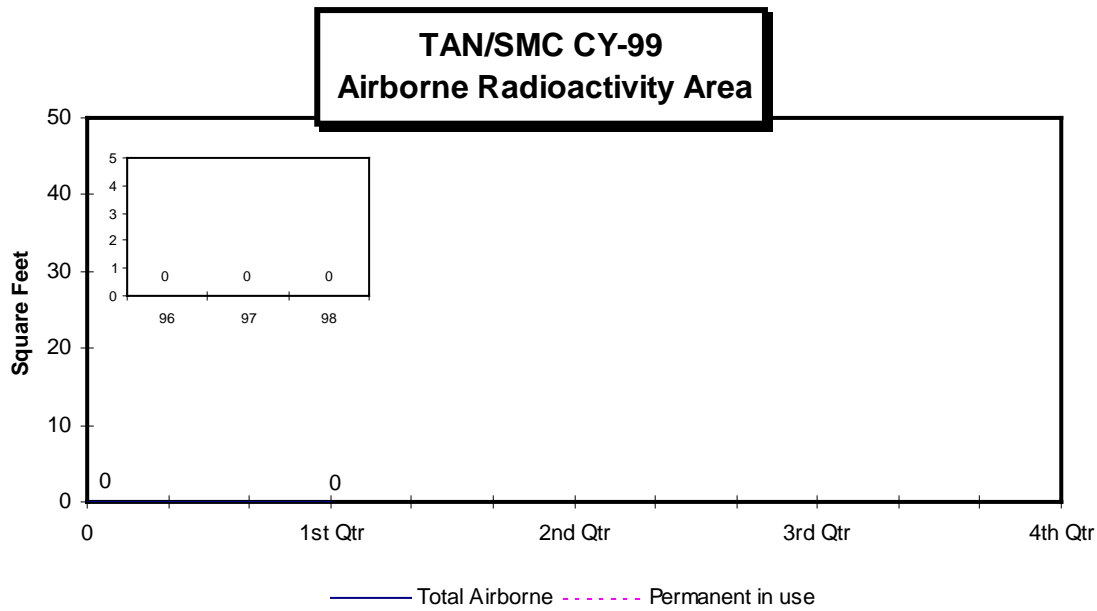
Three positive urine samples have occurred at SMC, year to date. Final dose assessment is pending. There was also one final assessment completed showing a positive dose for the 1998 totals. This is reflected in the three-year average chart.



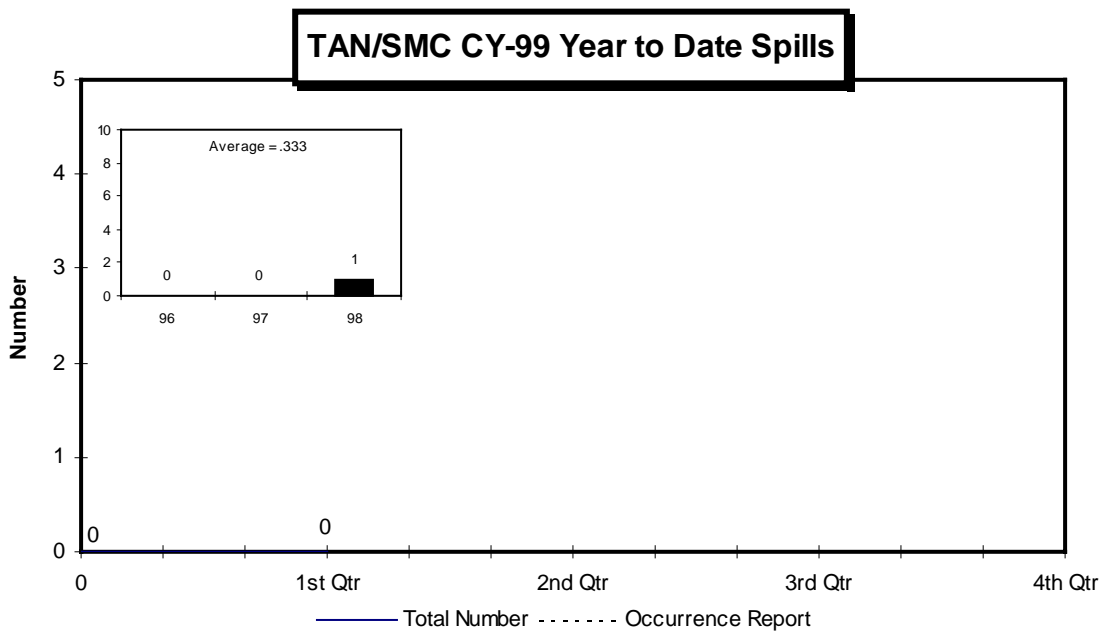
The total Contamination Area at TAN/SMC at the end of the first quarter remains at 54,026 square feet. 52,926 square feet was designated as permanent and in-use. There is a large area at SMC that is currently being decontaminated and will no longer be in use.



The total High Contamination Area at TAN/SMC at the end of the first quarter remains constant at 11,526 square feet. All of this area is designated as permanent and in-use. The area includes the waste evaporator building (TAN 616) which is currently locked and inaccessible. The building is slated for D & D.



Total Airborne Radioactivity Area at TAN/SMC remains at zero through the end of the first quarter.



There have been no spills at the TAN/SMC area so far year to date.