Idaho National Engineering and Environmental Laboratory

INEEL/EXT-98-00148 (2nd QTR)

August 1998

Idaho National Engineering and Environmental Laboratory Radiological Control Performance Indicator Report

Second Quarter - Calendar Year 1998

Date Published
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Second Quarter Calendar Year 1998

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

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environment, Safety, and Health
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Prepared By: F. L. Hinckley — 08-17-98
F. L. Hinckley
Consulting Technical Spec.
Date

Approved By: _____ — 08-17-98
G. L. Courtney
Manager, Radiological Control
Date

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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.

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

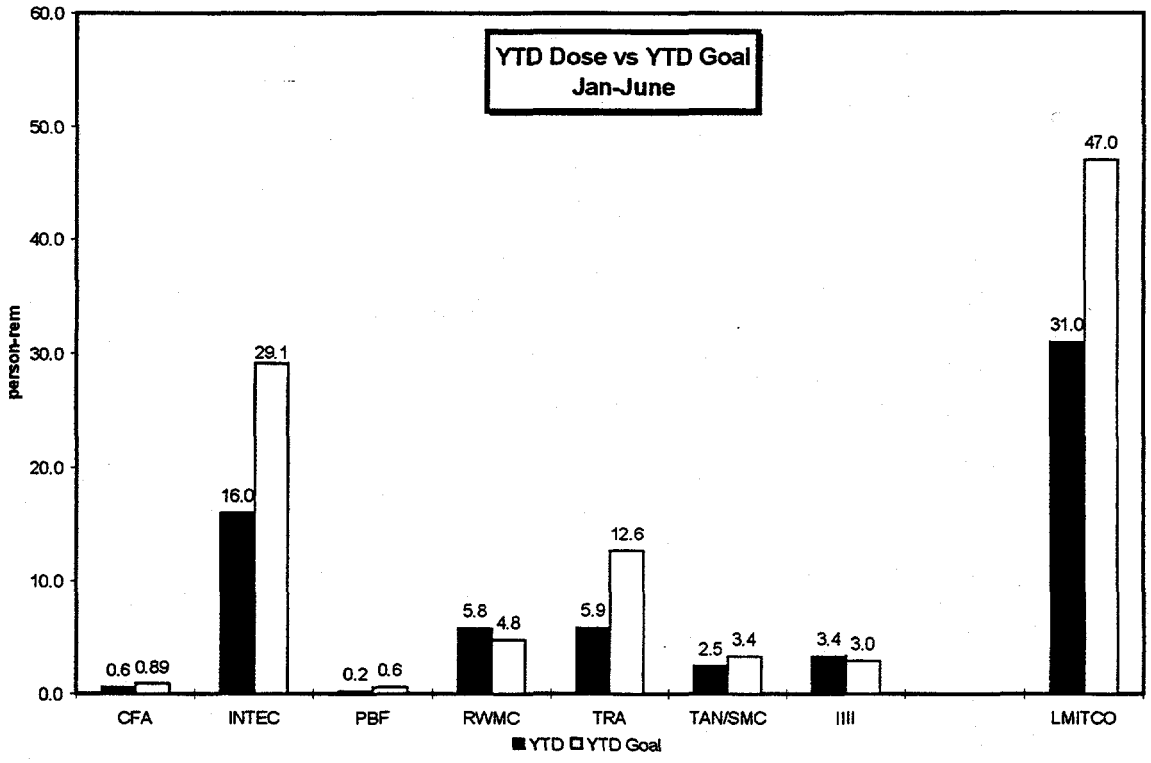
Other Radiological Control indicators suggested in the Radiological Control Manual are tracked and trended in other reports.

- 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
Second Quarter 1998

This document provides a report and an analysis of the Radiological Control Program through the second quarter of Calendar Year 1998 (CY-98) for Lockheed Martin Idaho Technologies Company (LMITCO). LMITCO is the prime contractor at the Idaho National Engineering and Environmental Laboratory (INEEL). This Performance Indicator Report is provided in accordance with Article 133 of the INEEL Radiological Control Manual.

The INEEL collective occupational radiation deep dose is 30.757 person-rem year to date, compared to a year to date goal of 47.0 person-rem. Overall, the site dose goal has been reduced. This is mainly due to work scope reductions at the Idaho Nuclear Technologies and Engineering Center (INTEC). However, due to unforeseen increases in shipments to the Radioactive Waste Management Complex, their goal has been raised to 9.60 person-rem to accommodate the increase in dose. The RWMC increase results in an increase to the LMITCO goal to 100.76 person-rem. The goal is not plotted in a linear fashion since work scope varies from quarter to quarter.



Since the TRA Hot Cell (IIII) is a sub-contractor, their totals are not carried in the INEEL totals. The IIII data is for information only.

Beginning CY-98, a numeric Radiological Performance Index (RPI) is being used to compare radiological performance. The RPI takes into consideration frequency and severity of undesirable events such as skin contaminations, clothing contaminations, spills, exposures to radiation exceeding limits, and positive internal dose. The RPI represents an approximation of the cost of these events in cents per hour of radiological work performed. *Any* positive bioassay is included even though the dose is not considered an internal exposure. This is based on "cost" to evaluate internal dose.

The RPI is calculated as follows:

$$RPI = 100\frac{[(1{,}000{,}000*D)+(500{,}000*ROE)+(200{,}000*AOE)+(25{,}000*SCE)+(25{,}000*UR)+(10{,}000*AEE)+(5{,}000*CCE)+(2000*PB)]}{F}$$

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, Radiological Work Permit (RWP) hours have not been available until CY-98, and are one of the products of the Radiological Control Information Management System (RCIMS) implemented this year. During the second quarter there were 139,970 RWP hours logged on the system. There may be revisions to the RWP hour logging based on access control and work assigned to the RWPs. This is a pilot program at this time.

To make the RPI meaningful, tables have been prepared to show the facility that contributes to the values used in the formula above. The data is compared on a quarterly basis to the prior year to show measurable performance.

The values for CY-98 and CY-97 are shown in the tables on the next page, as well as a chart to be used to establish a baseline from the performance indicators and RWP hours.

The following table provides the year to date values used in the RPI calculation and the facility contributing to those values. CY-97 values for the comparable period are provided as a comparison.

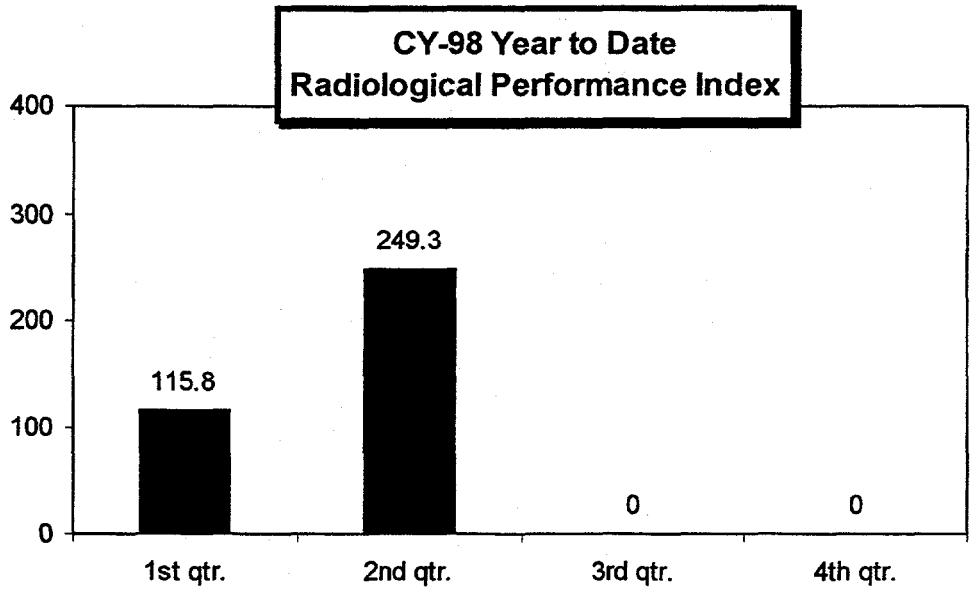
CY-98 Second quarter Contributors

	CFA	ICPP	PBF/WROC	RWMC	TRA	TAN/SMC
D	0	0	0	0	0	0
ROE	0	0	0	0	0	0
AOE	0	0	0	0	0	0
SCE	0	2	1	0	0	0
UR	0	2	1	0	1	1
AEE	0	0	0	0	0	0
CCE	0	7	1	0	3	0
PB	0	0	0	0	0	47

CY-97 Second quarter Contributors

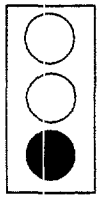
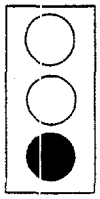
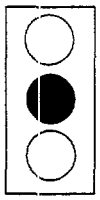
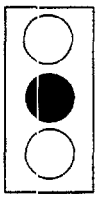
	CFA	ICPP	PBF/WROC	RWMC	TRA	TAN/SMC
D	0	0	0	0	0	0
ROE	0	0	0	0	0	0
AOE	0	0	0	0	0	0
SCE	0	5	1	0	4	1
UR	0	5	0	0	2	0
AEE	0	0	0	0	0	0
CCE	0	10	0	0	9	0
PB	0	0	0	0	5	72

The following chart will be used to compare quarterly data during this year as a baseline is established. A comparison of contributors for the same time period in the tables above show this year's second quarter as being an improvement over the previous year's values.



Using the CY-97 second quarter performance values, and the same RWP hours, we have postulated an index of 499.4 for 97 compared to the 249.3 for this year's second quarter.

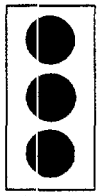
INEEL Radiological Control Performance Indicator Overview
Second Quarter 1998

		Actual	Goal or Average
Collective Year-to-Date Penetrating Radiation Dose		30.757 person-rem	100.76 person-rem (Goal)
Year-to-Date Average Worker Dose		0.039 rem	0.116 rem (3 Year Average)
Maximum Year-to-Date Penetrating Dose to a Worker		.612 rem	1.500 rem (Goal)
Maximum Year-to-Date Neutron Dose to a Worker		0.056 rem	0.110 rem (3 Year Average)

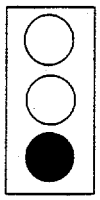
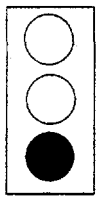
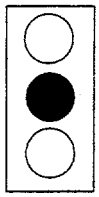
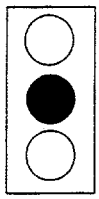
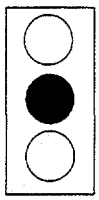
Skin contaminations are included in the performance index on page 5 and will no longer be shown in this area.

Legend

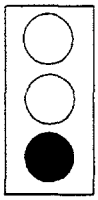
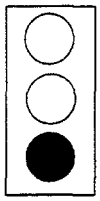
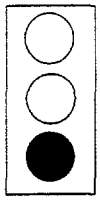
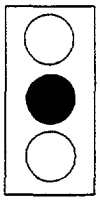
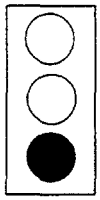
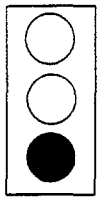
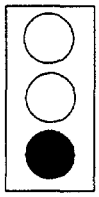
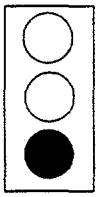
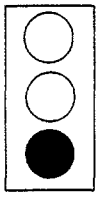
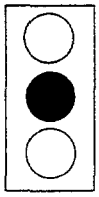
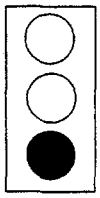
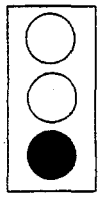
Needs Attention
OK
Good



Compared to three yr. Avg/goal.

		Actual	Goal or Average
Year-to-Date clothing contaminations are shown in the RPI on page 5 and will no longer be shown on this page.			
Year-to-Date Airborne Events > 10% DAC		0	0 (3 Year Average)
Year-to-Date Radioactive Material Intakes > than or = to 10 mrem CEDE		0	12 (3 Year Average)
Contamination Area		194,496 ft^2	193,218 ft^2 (3 Year Average)
High Contamination Area		292,224 ft^2	297,767 ft^2 (3 Year Average)
Airborne Radioactivity Area		80,837 ft^2	84,837 ft^2 (3 Year Average)
Year-To-Date spills are shown in the RPI on page 5 and will no longer be shown on this page.			

INEEL Facility Radiological Control Performance Indicator Overview
Second Quarter 1998

	CFA	INTEC	PBF	RWMC	TRA	TAN/SMC
Collective Year-to-Date Penetrating Radiation Dose (person-rem)	 0.572	 16.006	 0.240	 5.799	 5.874	 2.50
Year-to-Date Average Worker Dose (rem)	 0.012	 0.044	 0.010	 0.067	 0.030	 0.032

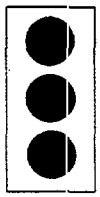
Maximum Year-to-Date penetrating dose to workers is redundant to facility reports and is not repeated in this report.

Maximum Year-to-Date neutron dose is no longer reported for facilities in this report.

Year to date skin contaminations are included in the performance index on page five, and will no longer be shown on this page.

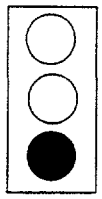
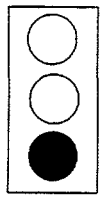
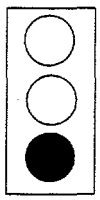
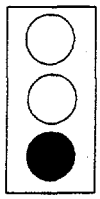
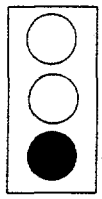
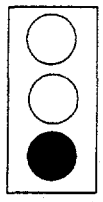
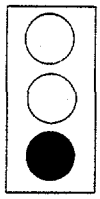
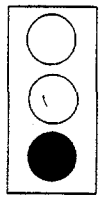
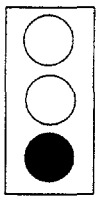
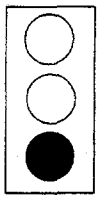
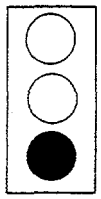
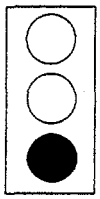
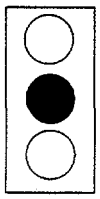
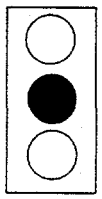
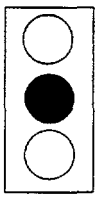
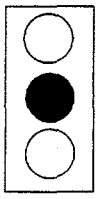
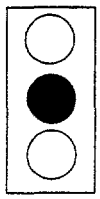
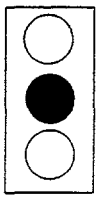
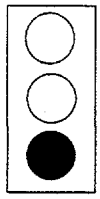
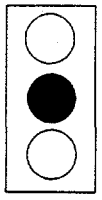
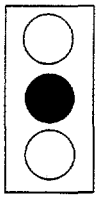
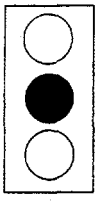
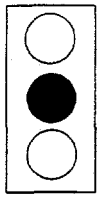
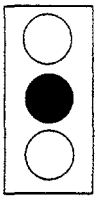
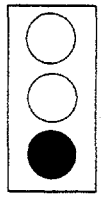
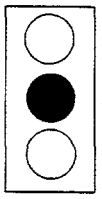
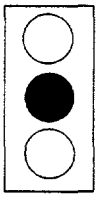
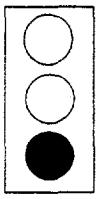
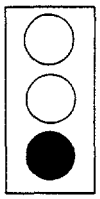
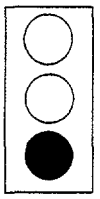
Legend

Needs Attention
OK
Good



Compared to three yr. Avg. or goal

Year to date clothing contaminatons are included in the performance index on page five, and will no longer appear on this page.

Year-to-Date Airborne Events > than 10% DAC	 0	 0	 0	 0	 0	 0
Year-to-Date Radioactive Material Intakes > 10 mrem CEDE	 0	 0	 0	 0	 0	 0
Contamination Area - ft^2	 14,105	 65,505	 7,378	 3,508	 49,978	 54,022
High Contamination Area - ft^2	 0	 246,284	 2,288	 29,525	 2,601	 11,526
Airborne Radioactivity Area - ft^2	 0	 78,832	 2,000	 0	 0	 0

Year to date spills are included in the performance index on page five and will no longer be shown on this page.

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. ***Note:*** *For the RPI all bioassays > 0 are tracked, independent of statistical reliabilities.*

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 -

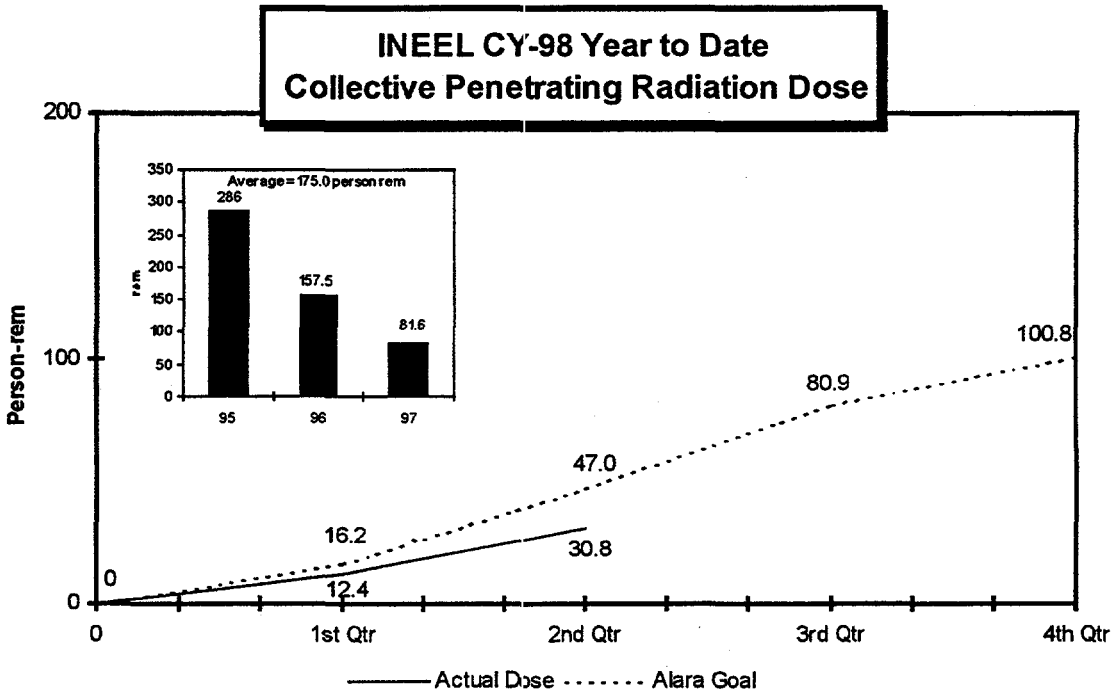
The total area in square feet that falls within the description of an Airborne Radioactivity Area as defined in Table 2-4 of the INEEL Radiological Control Manual.

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.

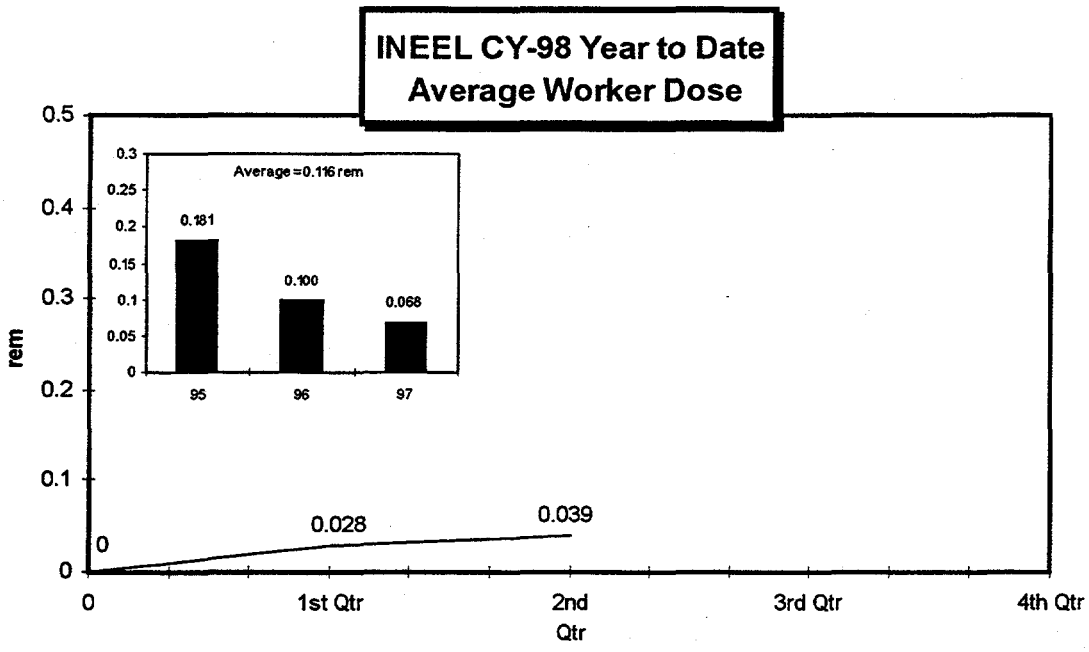
This chart and the charts on the following pages continue to provide an indication of how well LMITCO is performing as a company. Following the company charts are charts showing the six specific facility areas and their performance in selected indicators.



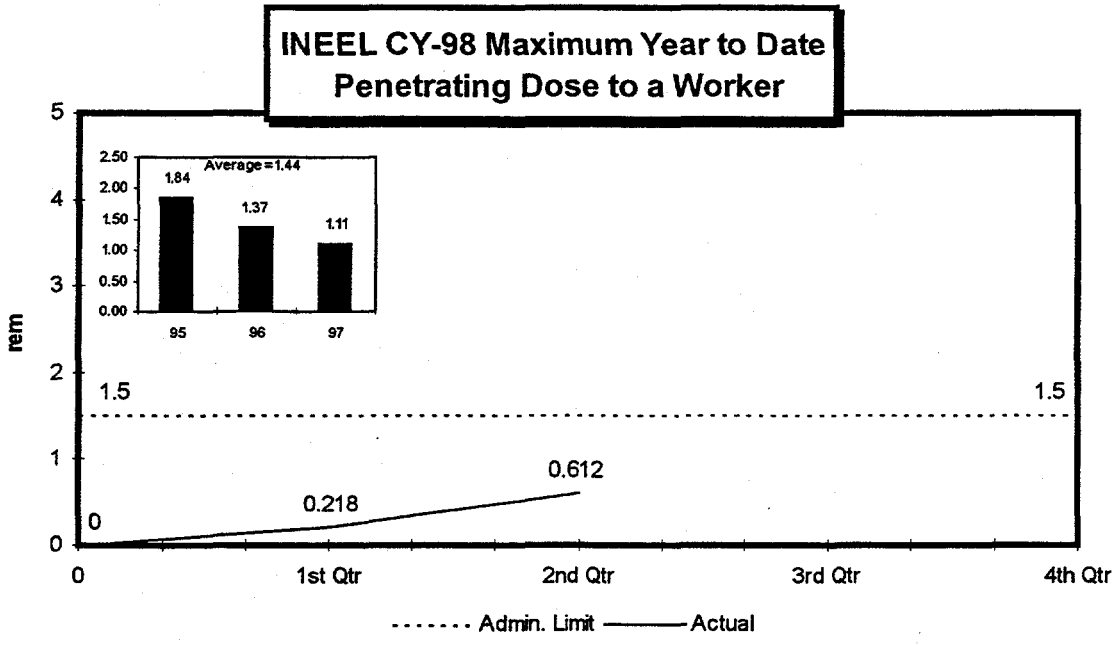
DOE and LMITCO policy is to maintain occupational radiation exposure as low as reasonably achievable (ALARA). The above chart provides a comparison of the INEEL goal and the total year to date collective penetrating radiation dose.

The CY-98 ALARA goal has been increased to 100.76 person-rem to accommodate an increase in goal at the RWMC. The increase is to compensate for increased shipments and required inspections of stored waste. The year to date total is 30.757 person-rem. The step increase in the goal is based on projected work scope at the INTEC. Work scope may decrease in the future

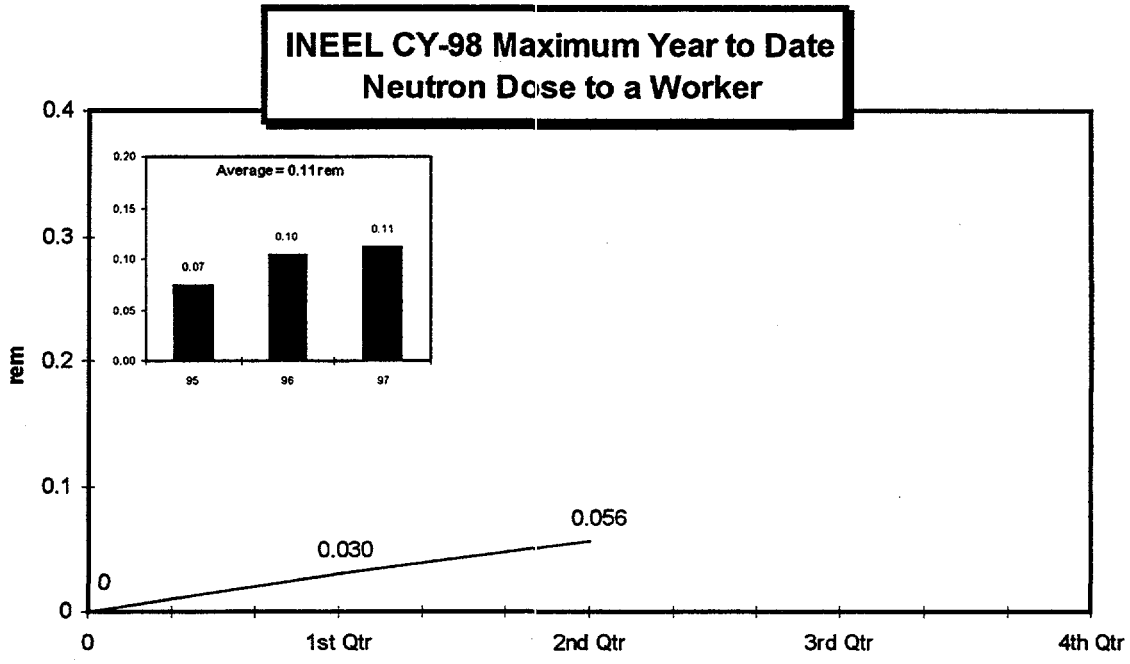
The collective exposure is well below the goal primarily due to implementation of ALARA protective measures at INTEC such as filling soaking and rinsing the calciner vessel, identifying and eliminating hot spots through use of a remote Gamma Cam™, etc. More detail of INTEC's efforts to reduce personnel dose is contained on the INTEC summary, page 25. Based on dose savings at INTEC, and potential work scope reductions the goal is being re-evaluated. Work scope has a tendency to vary from one quarter to the next.



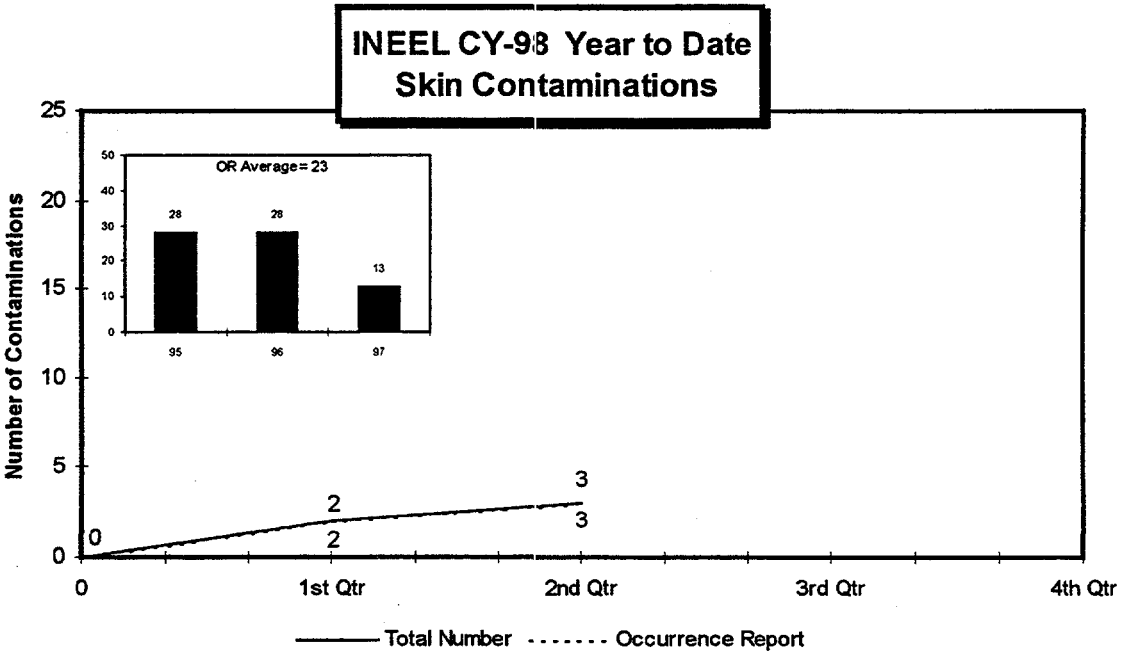
The Average Occupational radiation dose for INEEL workers through the end of the second quarter was 0.039 rem based on 797 workers who received dose greater than 10 mrem. There has been a total of 139,970.1 Radiation Work Permit hours so far year to date.



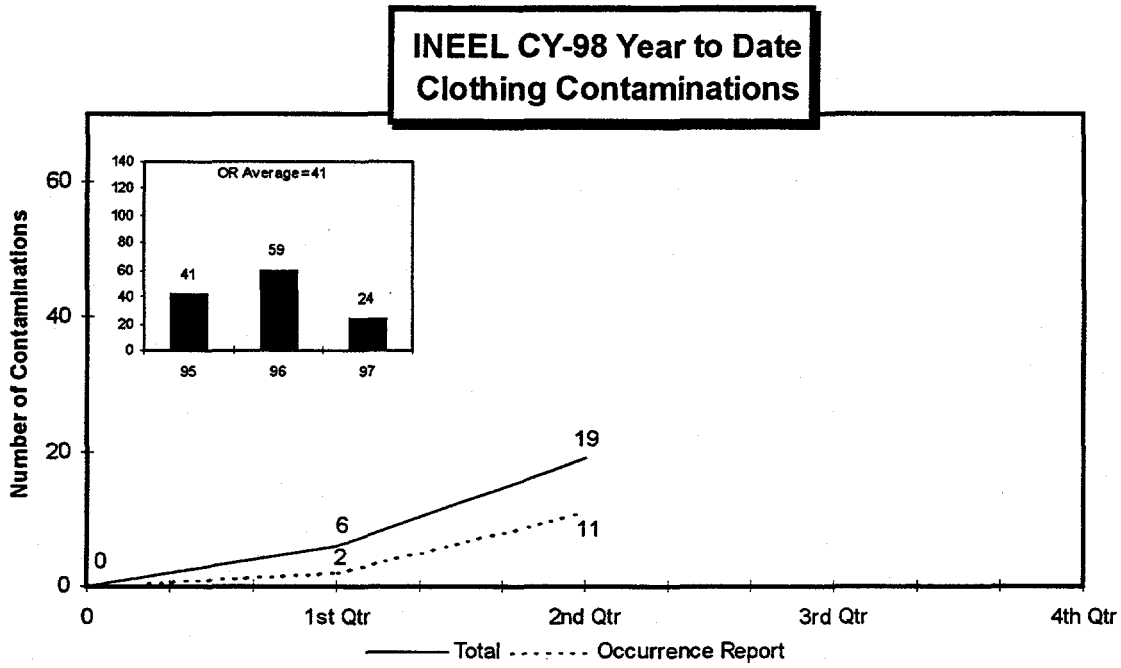
The Maximum penetrating radiation dose to a worker through the end of the second quarter was .612 rem. The dose resulted from activities associated with the ATR outages and work at the TRA Hot Cell (IIII).



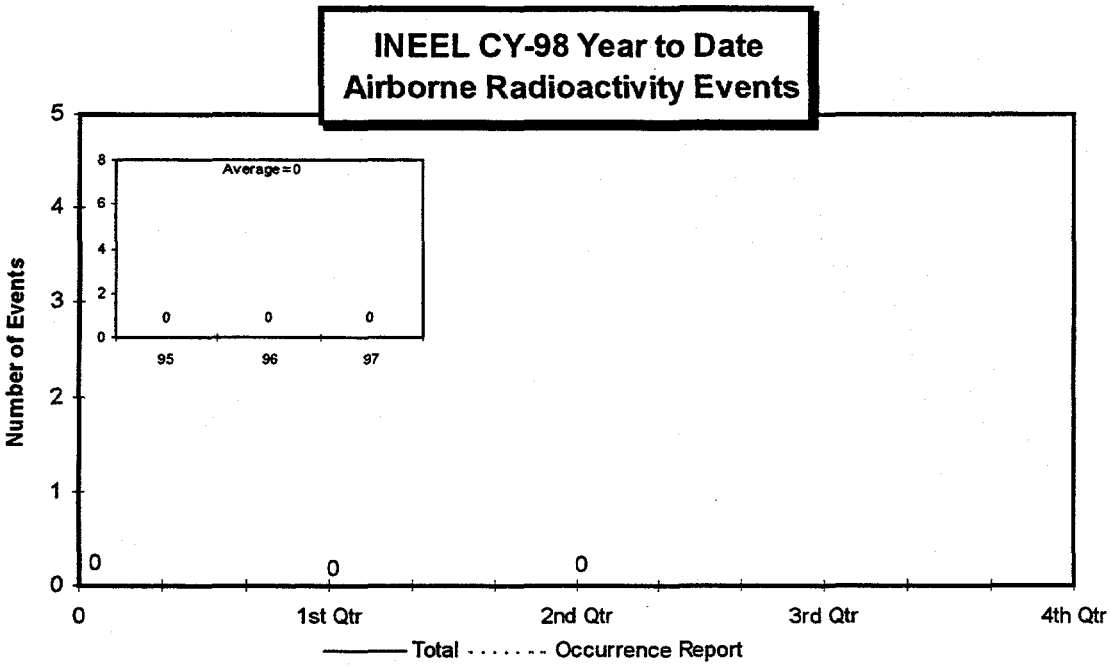
Neutron dose is included in the total penetrating radiation dose. It is shown here as a separate indicator to identify the maximum neutron dose to a worker. Through the end of the second quarter the maximum neutron dose is 0.056 rem. A worker associated with the RWMC received this dose.



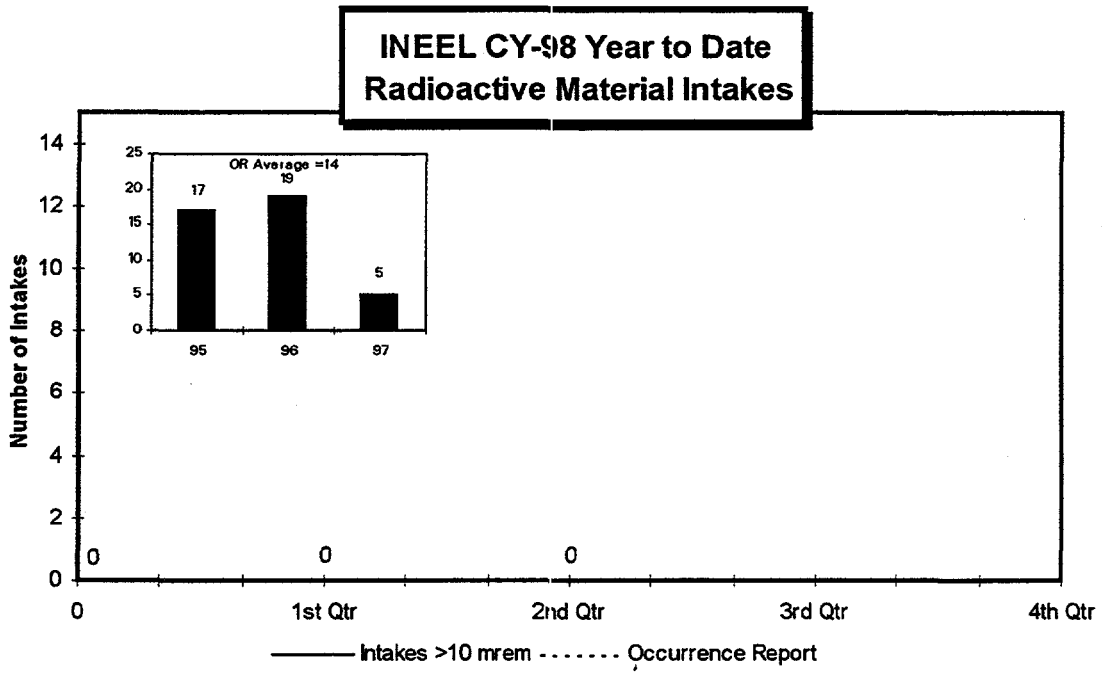
There was one reportable skin contamination at the INEEL during the second quarter at the INTEC. TRA had one non-reportable and the Hot Cell had one reportable not included in the INEEL statistics. There were no facial contaminations or contaminated wounds.



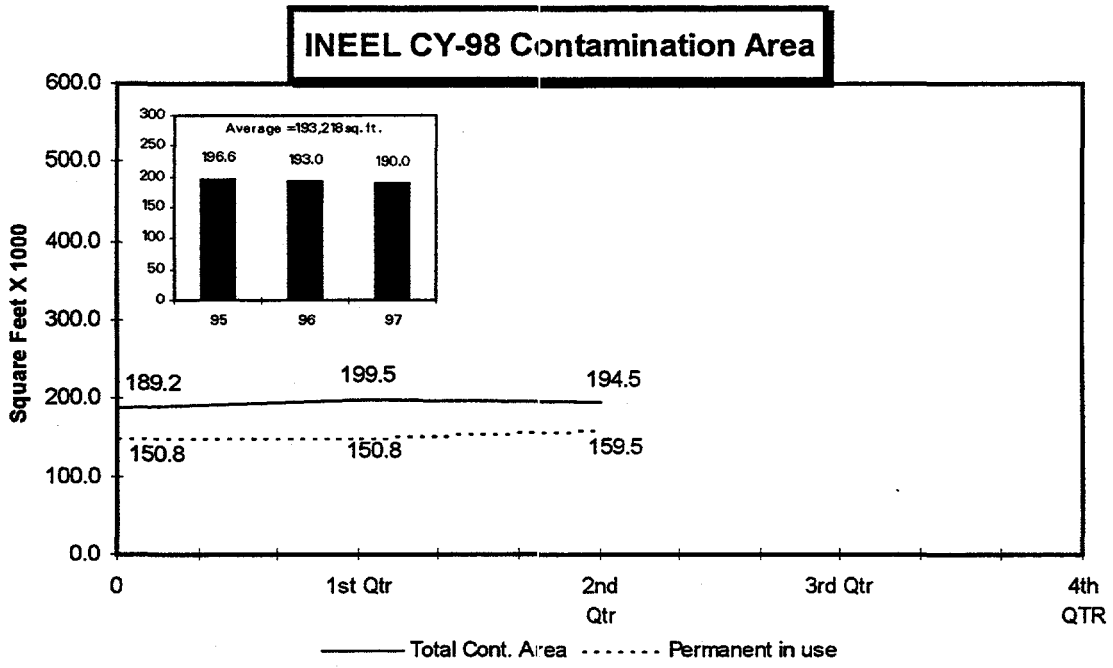
There were 13 clothing contaminations at the INEEL during the second quarter. 9 were ORs. Details are contained in the facility report sections.



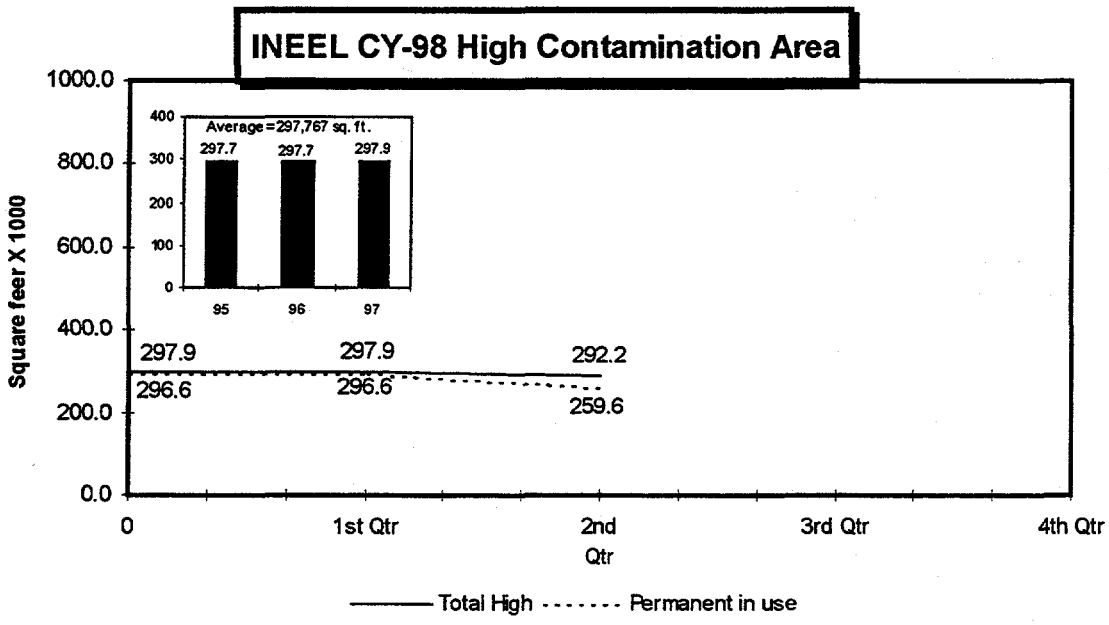
There have been no airborne radioactivity events during the second quarter.



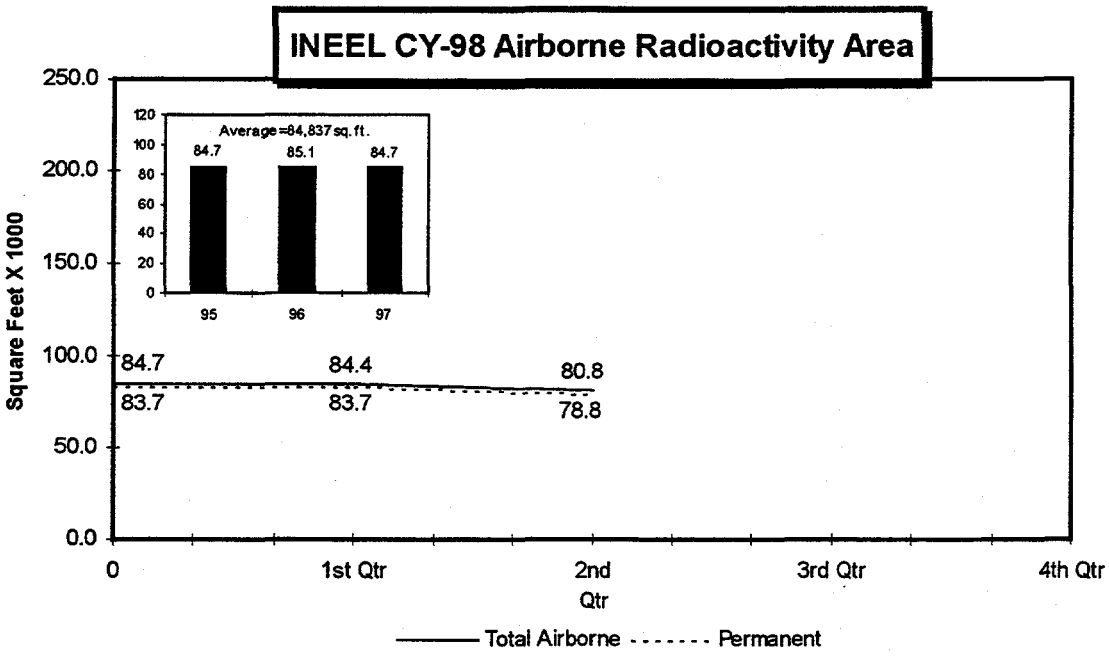
Radioactive material intakes depict the number of positive bioassays that result in a dose assessment of 10 mrem or greater. So far year to date there have been no internal doses.



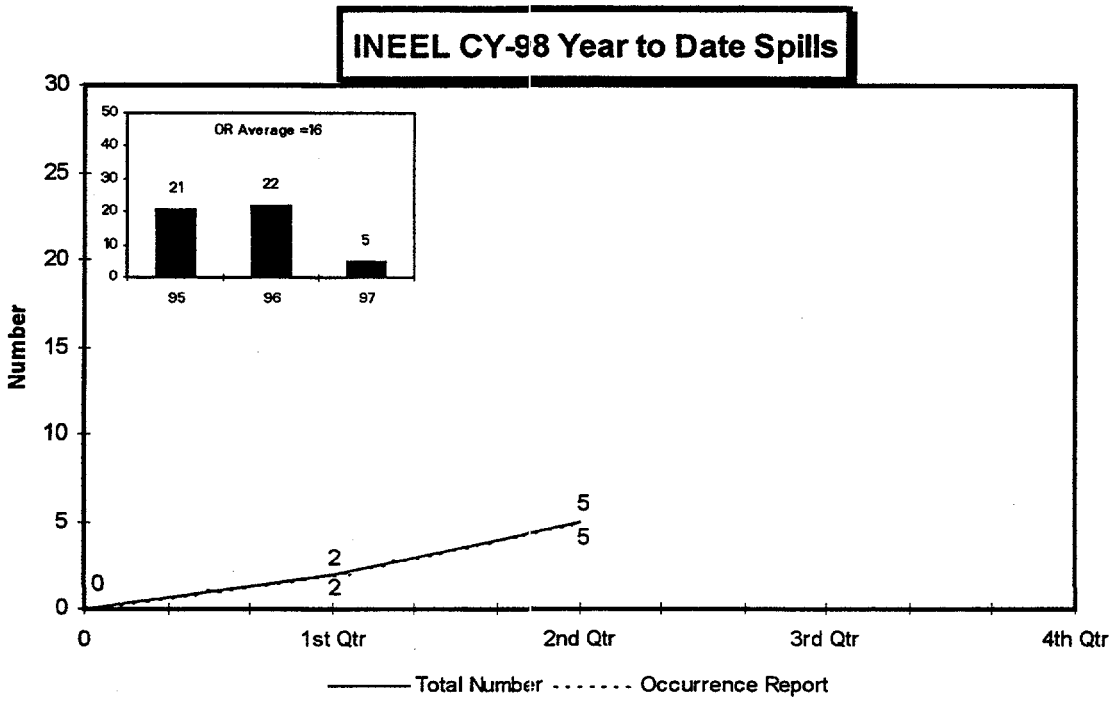
The total area designated as Contamination Area at the end of the second quarter was 194,496 square feet. The decrease is from containers at the RWMC. 159,483 square feet is designated as permanent and in use.



Total High Contamination Area at the end of the second quarter was 292,224 square feet. 259,600 square feet is designated as permanent or in use, such as the sizing facility at WERF and areas slated for D&D. Reductions are from INTEC.



The total Airborne Radioactivity Area at the INEEL at the end of the second quarter was 80,837 square feet. 78,822 square feet is designated as permanent and in use. The reduction is from work clean up at the INTEC (formerly the ICPP).



There were three spills considered to be loss of control of radioactive material during the second quarter. There was one OR from WERF, and there were two from INTEC.

The three-year average noted on this chart represents only those spills that were reportable as ORs in prior report years.

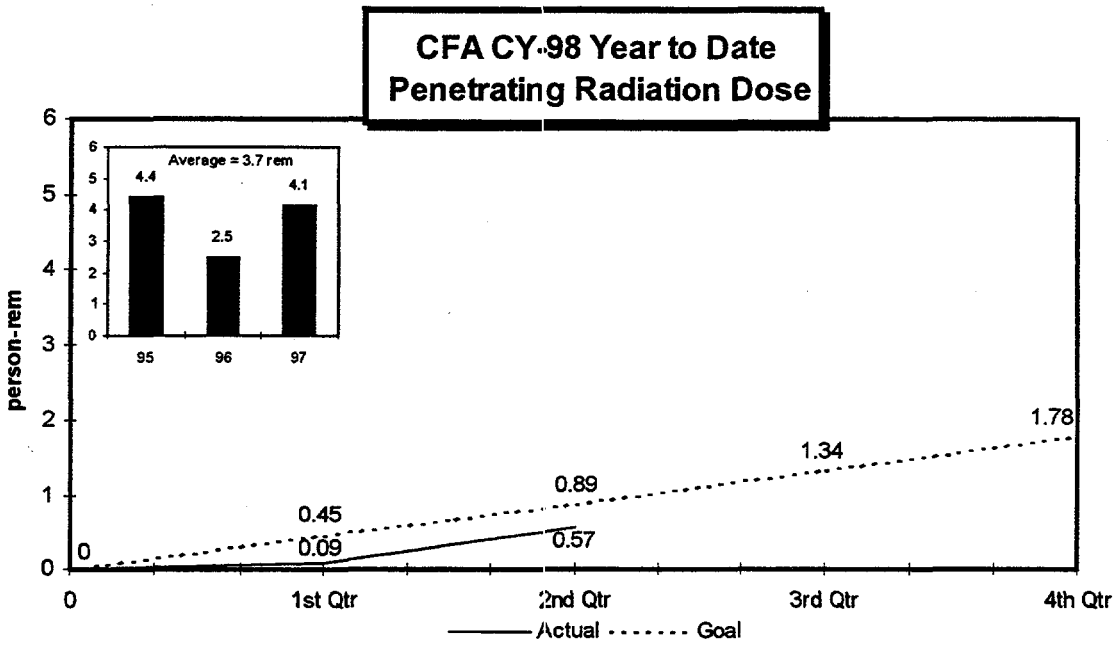
Central Facilities Area

The CFA Facility report also includes
other outlying area information

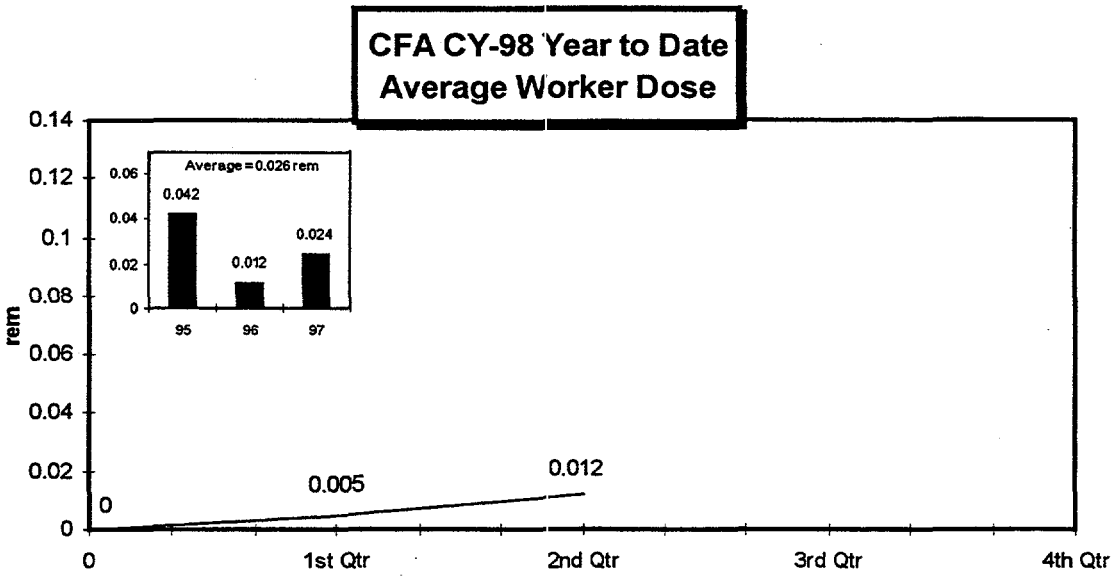
Summary

1. The major activities contributing to radiological exposure so far this year have been Decontamination and Decommissioning, Environmental Restoration, sampling, and facility maintenance.

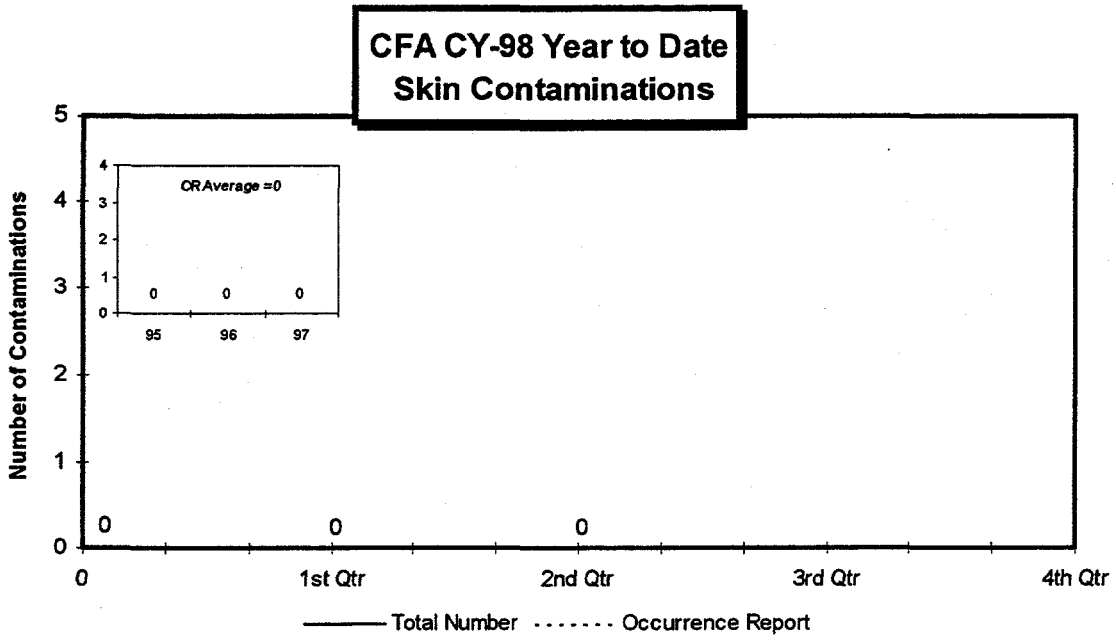
2. Work scope at the CFA is basically similar to that of last year. A complete vehicle survey is taking place, and so far, year to date, no vehicles have been found contaminated.



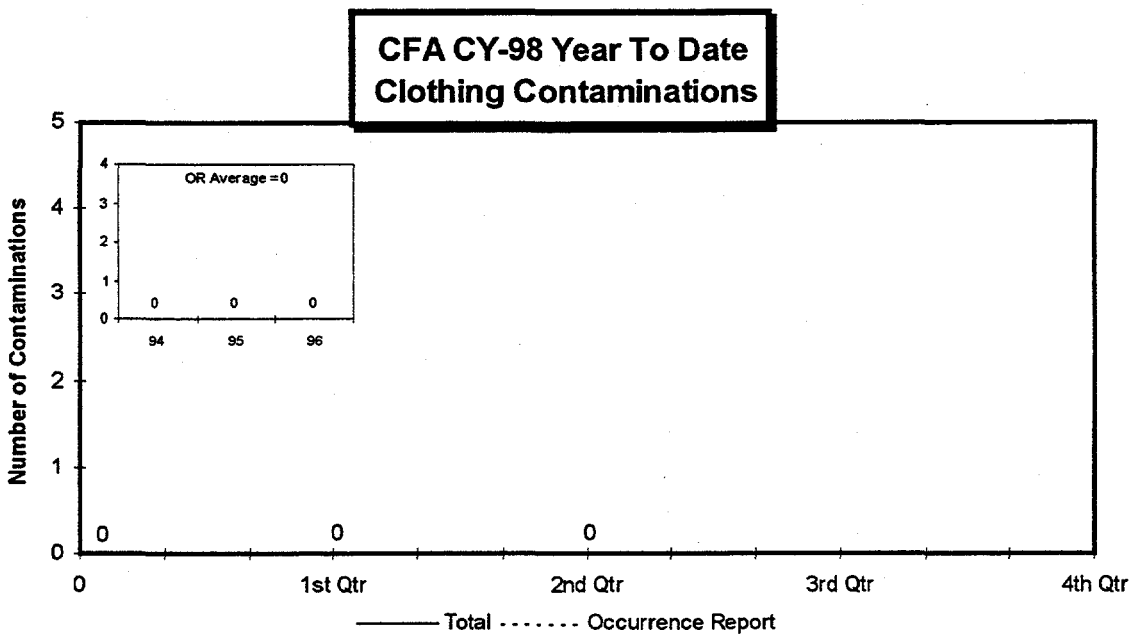
The collective penetrating occupational radiation exposure at CFA through the end of the second quarter is 0.572 person-rem. The major contributor has been Decontamination and Decommissioning (D&D) at ARA.



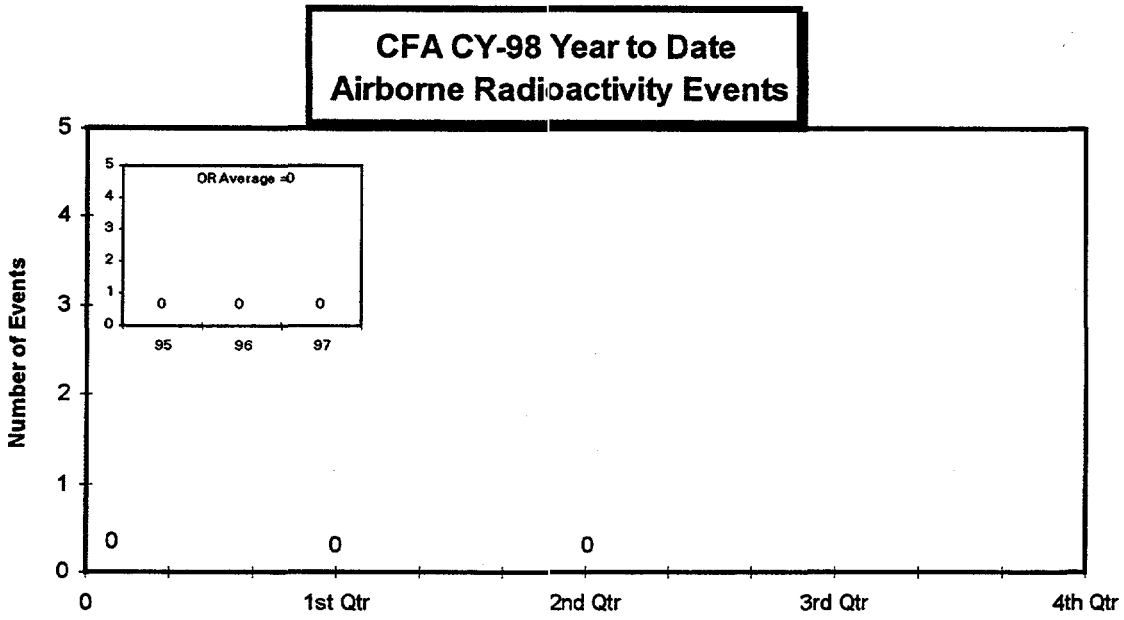
The CFA average worker dose through the end of the second quarter was 0.012 rem evaluating dose from 47 workers with dose greater than 10 mrem.



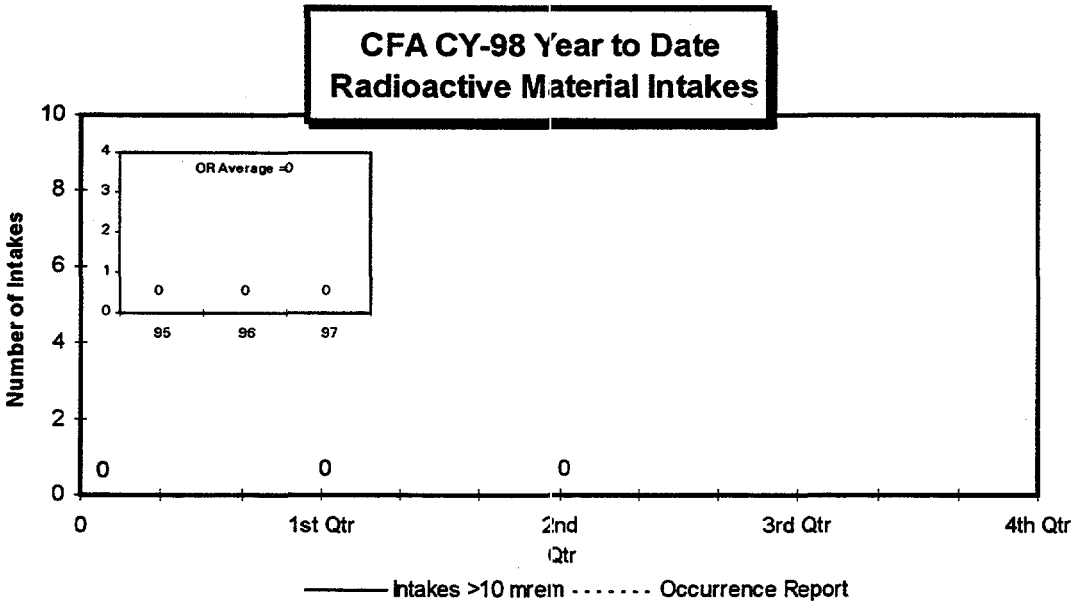
There were no skin contaminations at CFA areas through the end of the second quarter.



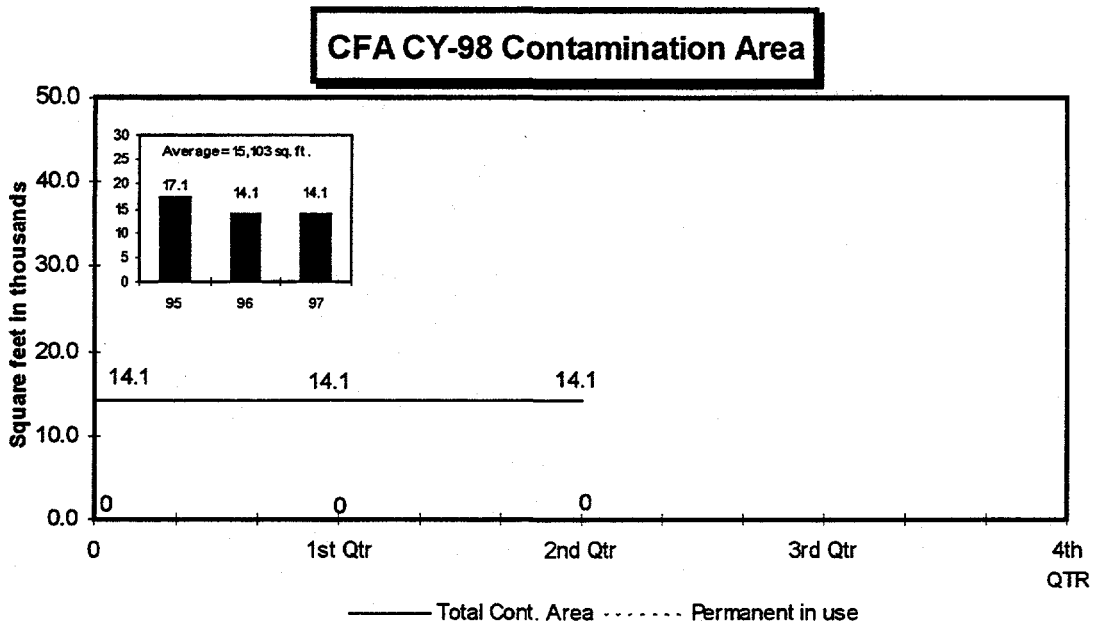
There were no clothing contaminations at CFA areas through the end of the second quarter.



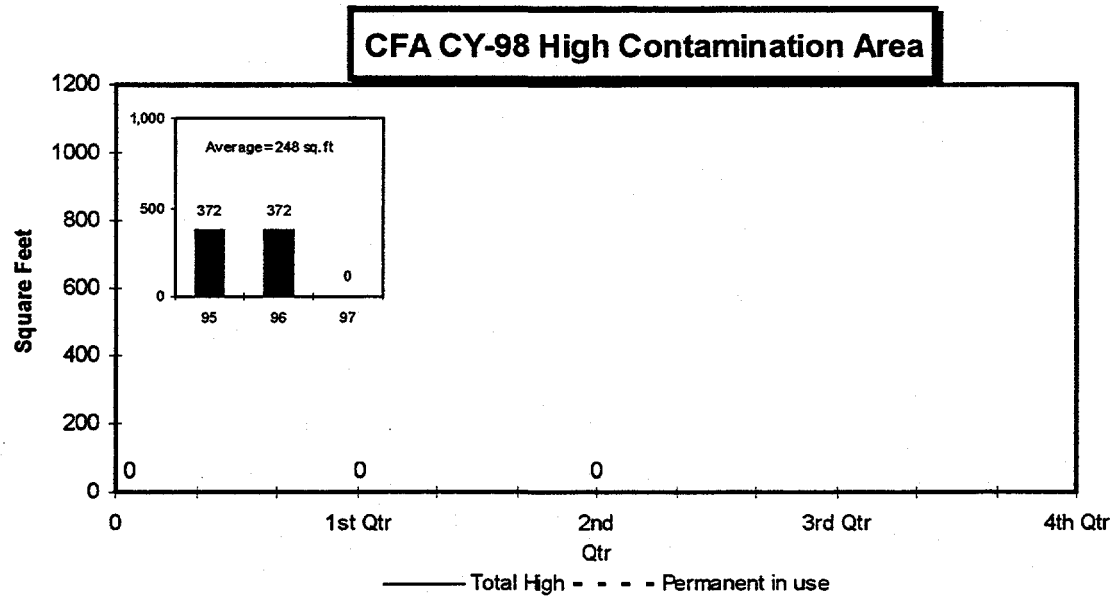
There has been no airborne radioactivity detected that was greater than 10 % DAC at CFA areas through the end of the second quarter.



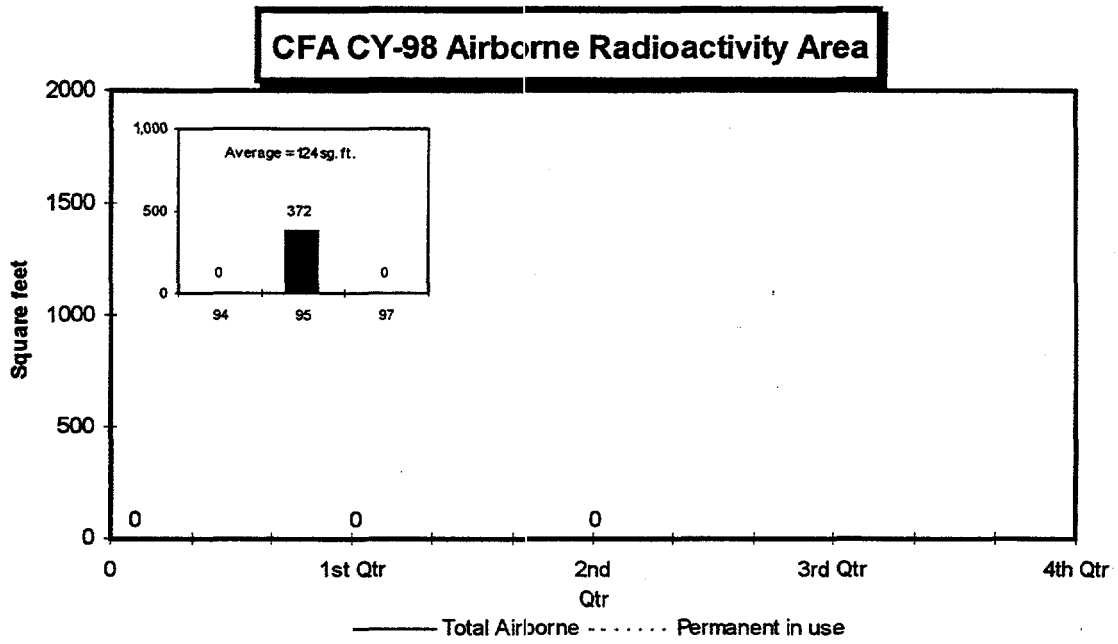
There were no positive bioassays indicating a radioactive material intake that resulted in a dose assessment of 10 mrem or greater at CFA through the end of the second quarter.



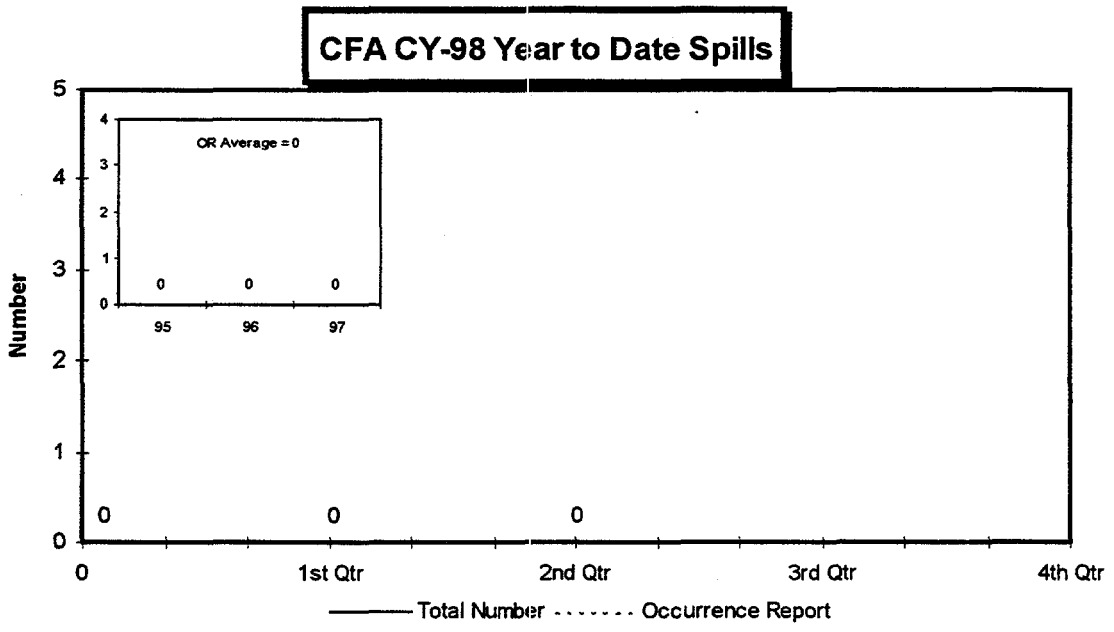
The total Contamination Area at CFA at the end of the second quarter was 14,105 square feet. None of this area was designated as permanent and in use.



There are no High Contamination Areas in the area controlled by CFA personnel through the end of the second quarter.



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



CFA has had no radioactive spills or loss of control of radioactive material during the second quarter. Vehicle surveys have produced no contamination year to date.

Idaho Nuclear Technology And Engineering Center

INTEC SUMMARY

1. Major contributors to second quarter occupational radiation exposure were activities related to fuel movement and storage at CPP 603, NWCF turnaround activities, B-9 valve box upgrade, and WCF RCRA closure. Major dose reductions were achieved through use of the following APMs:

   Major decontamination of the NWCF calciner vessel through filling, soaking, and rinsing reduced contamination levels up to a factor of 10, and reduced radiation working levels from 3 to 5 rem/hr to about .2 rem/hr. Job planning was more detailed and mock ups reduced work time in the hot areas. Use of the remote Gamma Cam™ identified hot spots needing shielding or more decon effort.

   Valve box VB B-9 received similar attention. An acid rinse was recommended and completed reducing working levels by nearly a factor of 100. Identification of hot spots again was able to provide shielding in applicable areas with less associated dose.

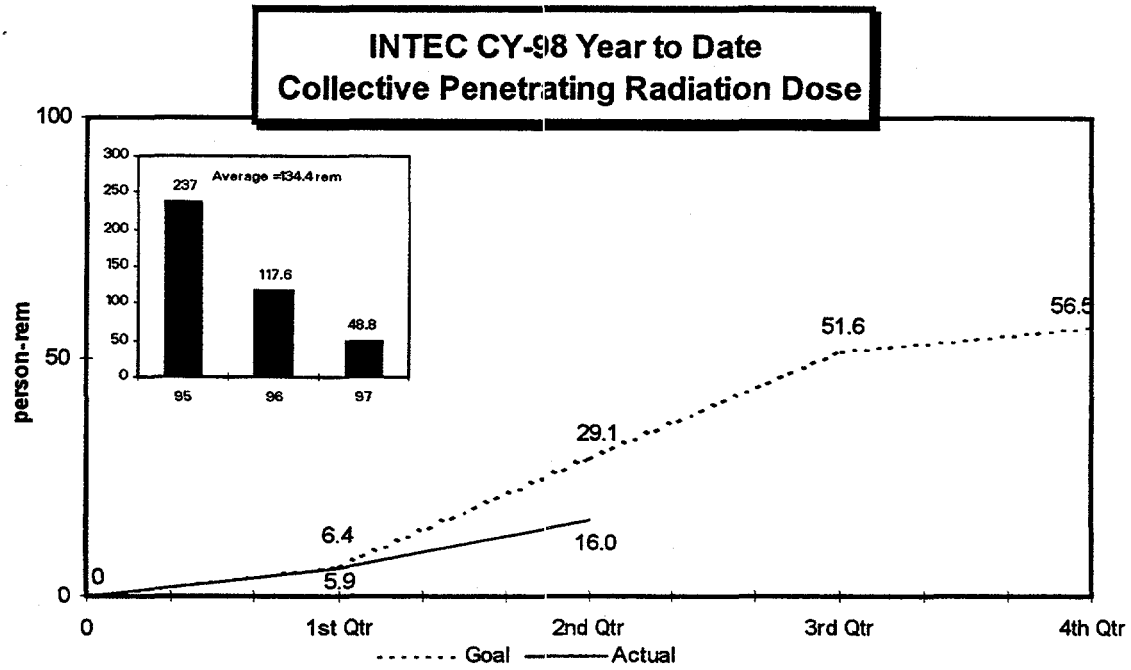
   Increased work scope at the WCF created concern, but teamwork, mockups and dry runs again reduced worker dose by a substantial margin. Pre-fabrication of new piping outside hot areas reduced the number of welds inside radiation areas again reducing dose.

   Work efforts at INTEC saved approximately 13 rem during this quarter through the application AMS.

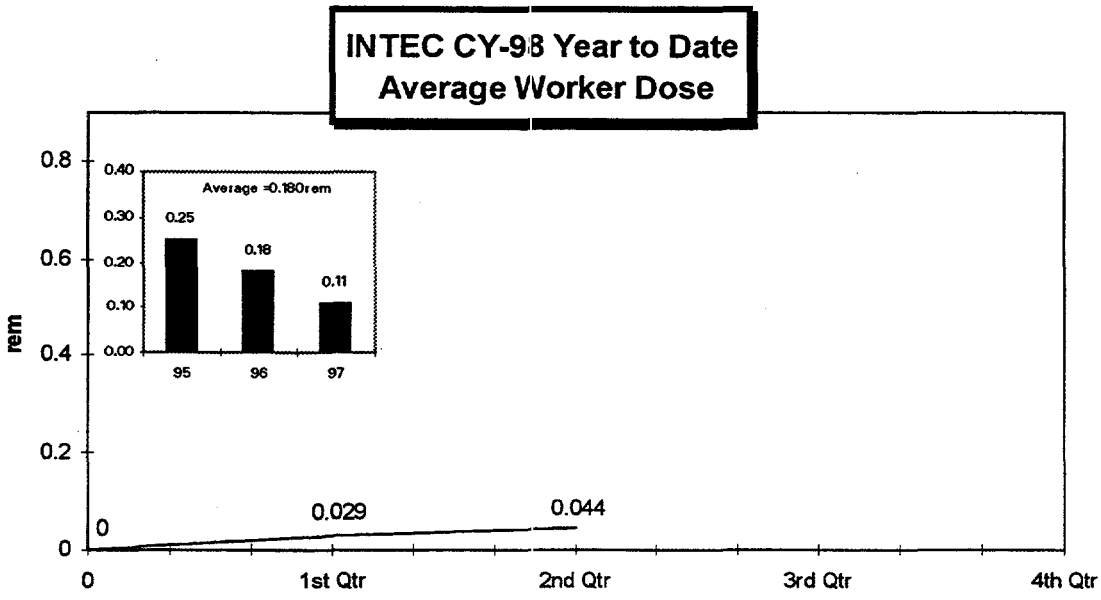
2. There was one reportable skin contamination during the second quarter. OR ID-LITC-WASTEMNGT-1998-0010 contains the detail.

3. There were seven clothing contaminations that occurred during the second quarter. Five were ORs. Detail is contained in OR ID-LITC-WASTEMNGT-1998-0008, ID-LITC-WASTEMNGT-1998-0009, ID-LITC-FUELCSTR-1998-0005 and 1998-0010. The two non-reportable contaminations were on shoes; one at FAST and one in a Lab.

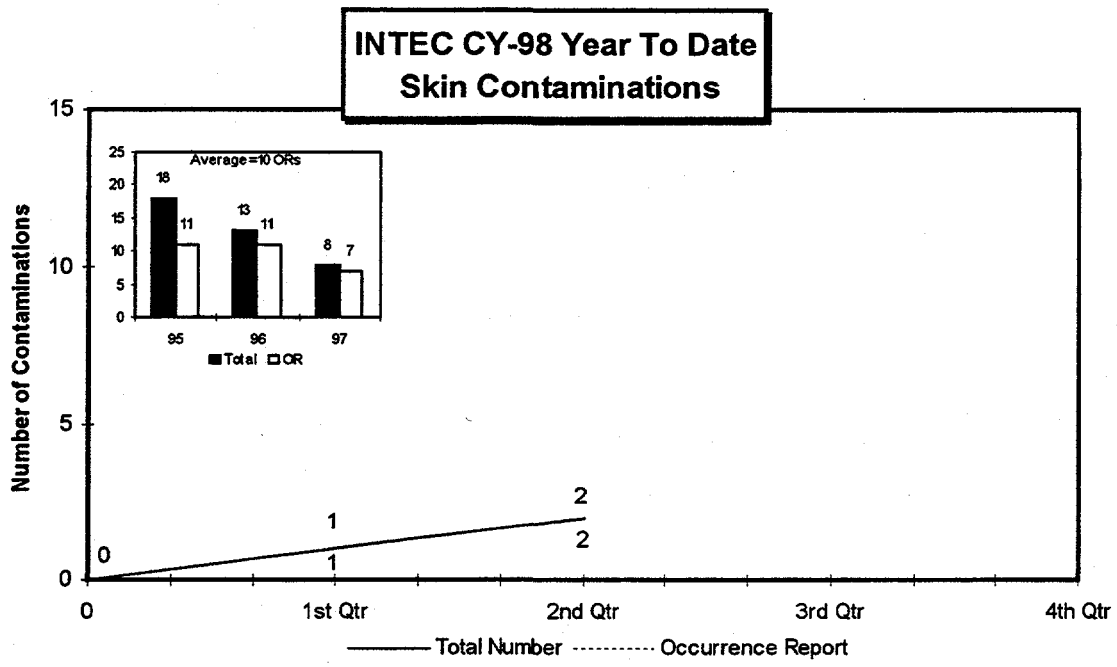
4. There were two reportable spills during the second quarter. Detail is contained in ORs ID-LITC-FUELCSTR-1998-0005 and ID-LITC-WASTEMNGT-1998-0009.



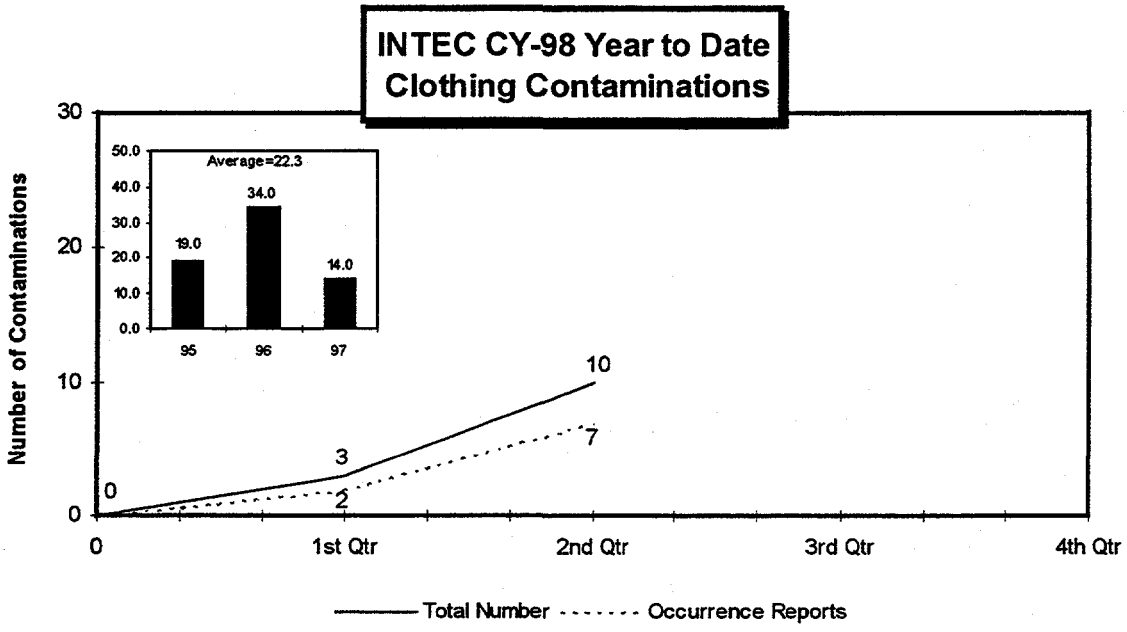
The INTEC collective penetrating occupational radiation exposure through the end of the second quarter was 16.006 person-rem. Work scope change at the INTEC is much less this year than in years past. Work scope is expected to continue to change. Application of ALARA Protective Measures (APMs) in planning helps account for the lower total dose and the lower ALARA goal. See the summary page for implemented APMs



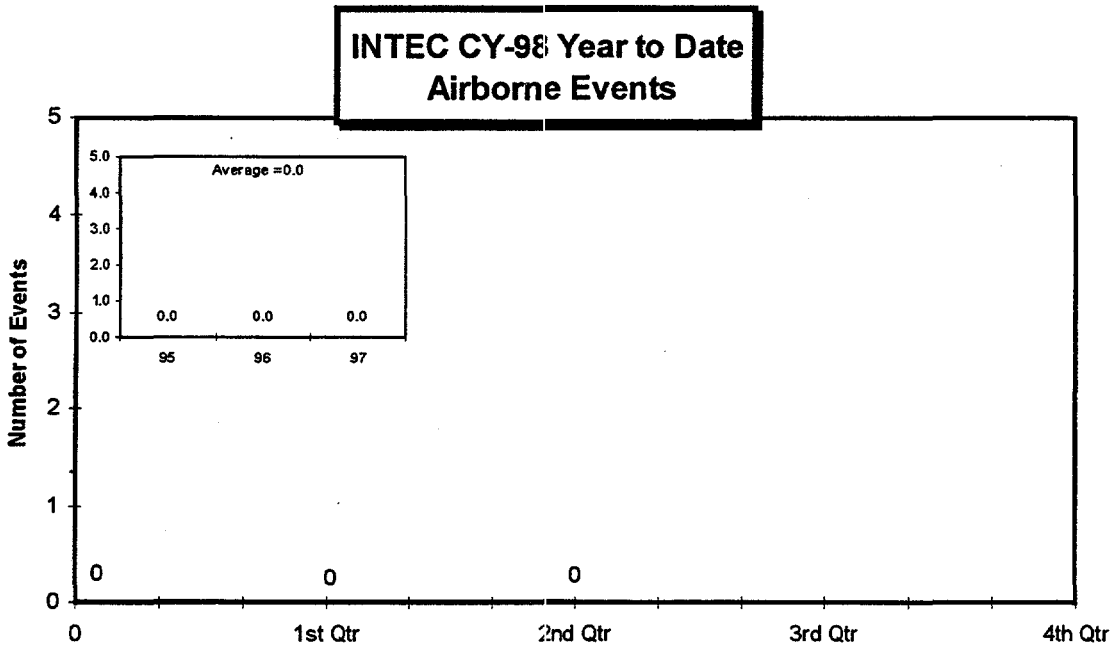
The average worker dose for the INTEC through the end of the second quarter was 0.0.044 rem resulting from 364 workers receiving dose greater than 10 mrem. Work scope will increase during the third quarter.



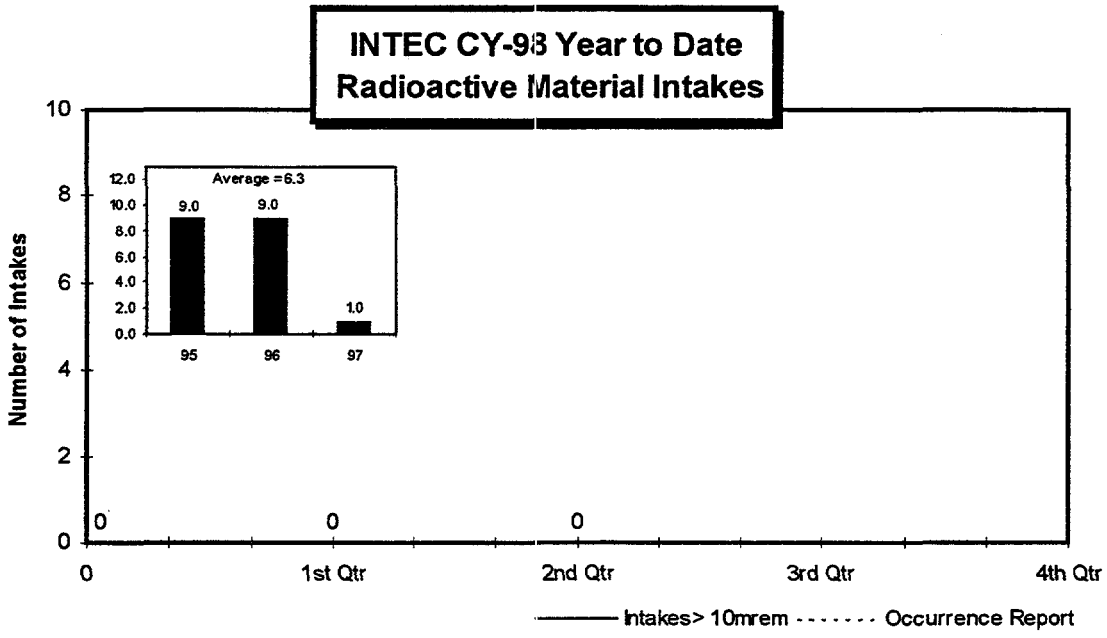
The INTEC had one-reportable skin contaminations during the second quarter. There were no facial contaminations or contaminated wounds. Details are on OR# ID-LITC-PHASEOUT-1998-0010.



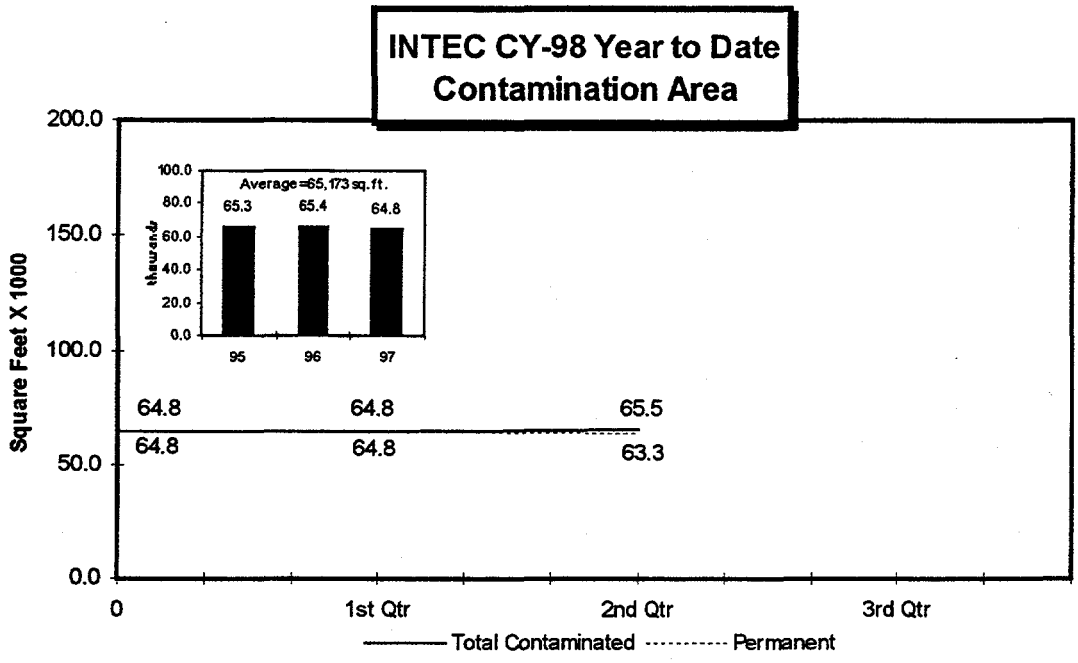
Seven clothing contaminations occurred during the second quarter at the INTEC. Five were reportable. Details are contained on OR ID-LITC-WASTEMNGT-1998-0008, 0009, and ID-LITC-FUELCSTR-1998-0005, and 0010.



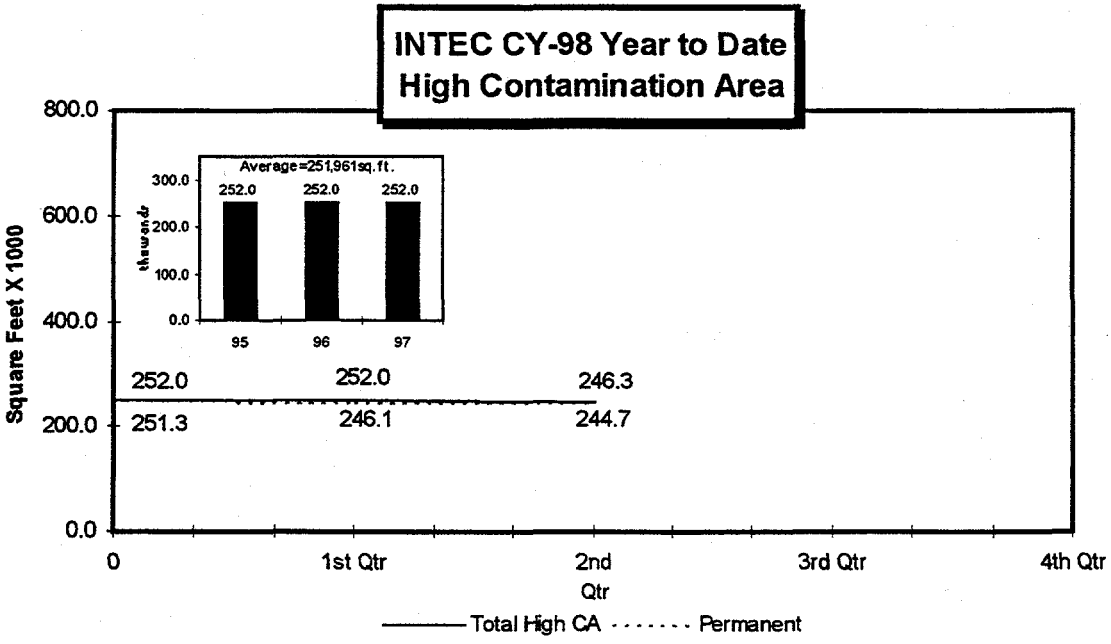
No airborne activity greater than 10 % DAC in unposted areas was detected in INTEC areas during the second quarter.



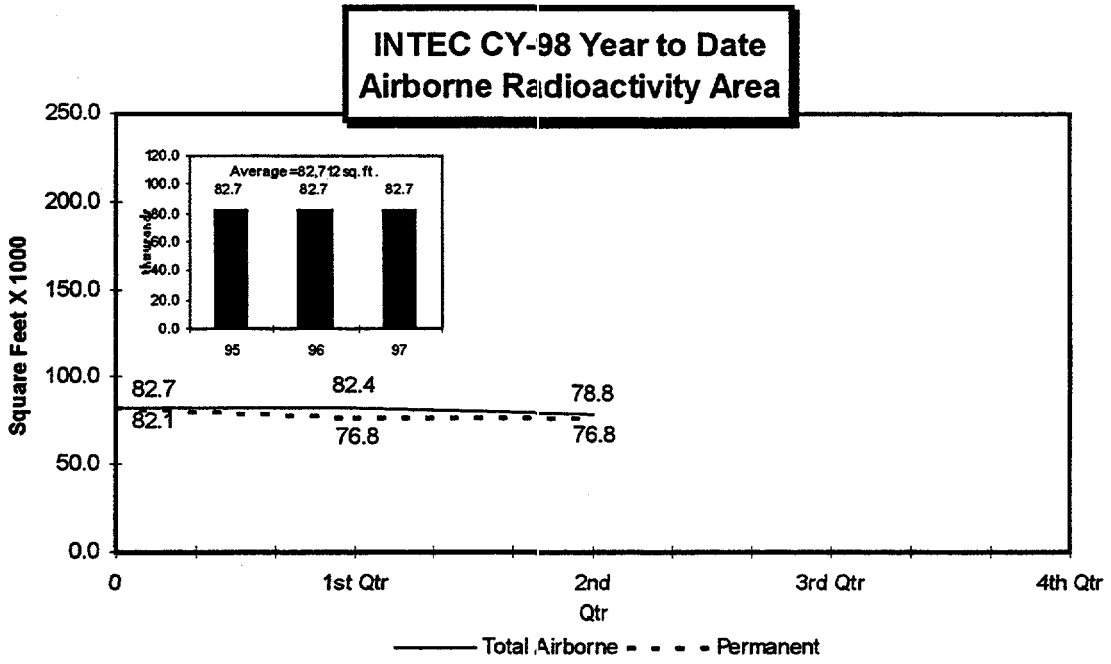
There have been no dose assessments greater than 10 mrem CEDE for the second quarter.



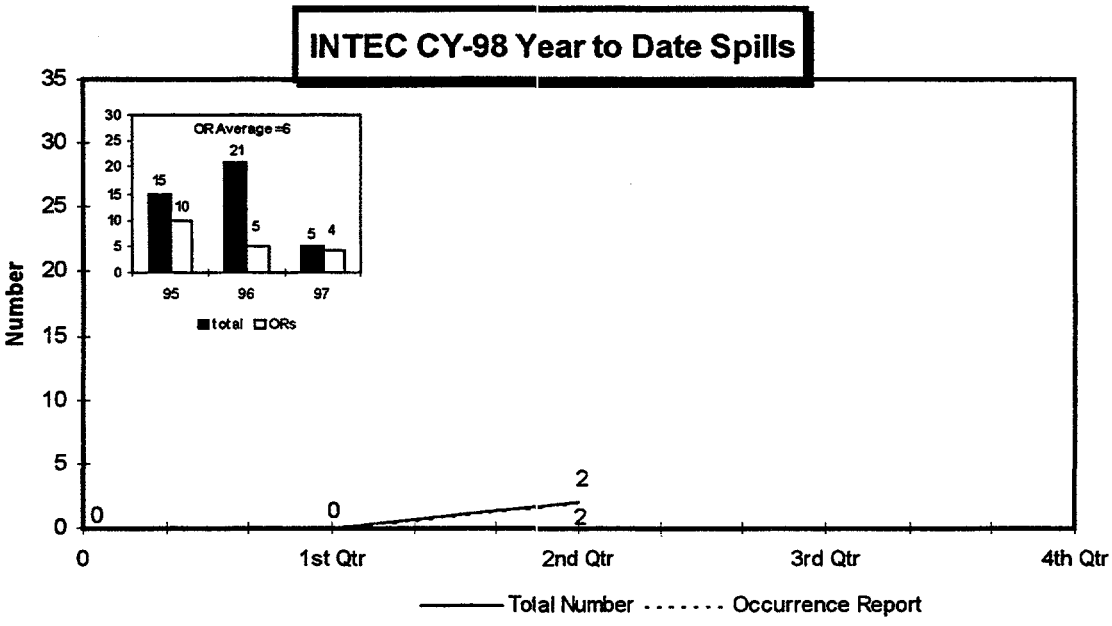
Total Contamination Area at the INTEC at the end of the second quarter increased to 65,505 square feet due to decon of HCAs at the WCF and other areas. 63,320 square feet is permanent.



The total High Contamination Area at the INTEC was reduced by 5,677 square feet to 246,284 because of grouting activities at the WCF. 244,701 square feet are designated as permanent and in-use.



Total Airborne Radioactivity Area at the INTEC at the end of the second quarter was reduced to 78,837 square feet due to grouting at the WCF. 76,822 square feet is designated as permanent and in-use.



There were two spills or loss of control of radioactive material during the second quarter. Details are on ORs ID-LITC-FUELCSTR-1998-0005 and ID-LITC-WASTEMNGT-0009.

Power Burst Facility

Waste Reduction Operations Complex

Waste Experimental Reduction Facility

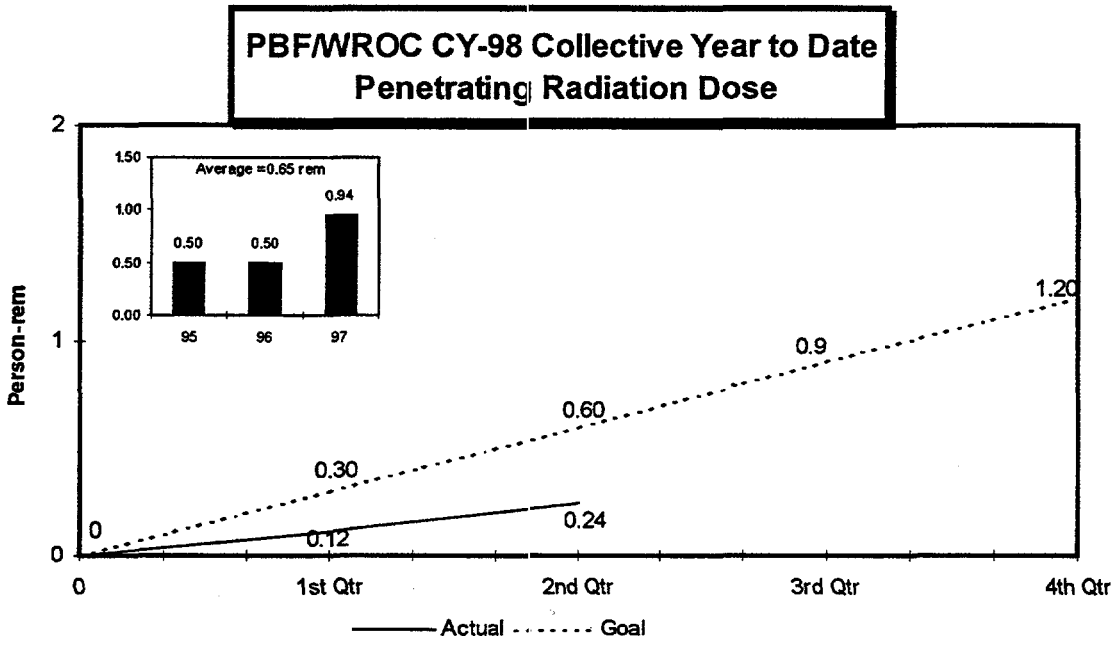
(PBF/WROC)

Summary

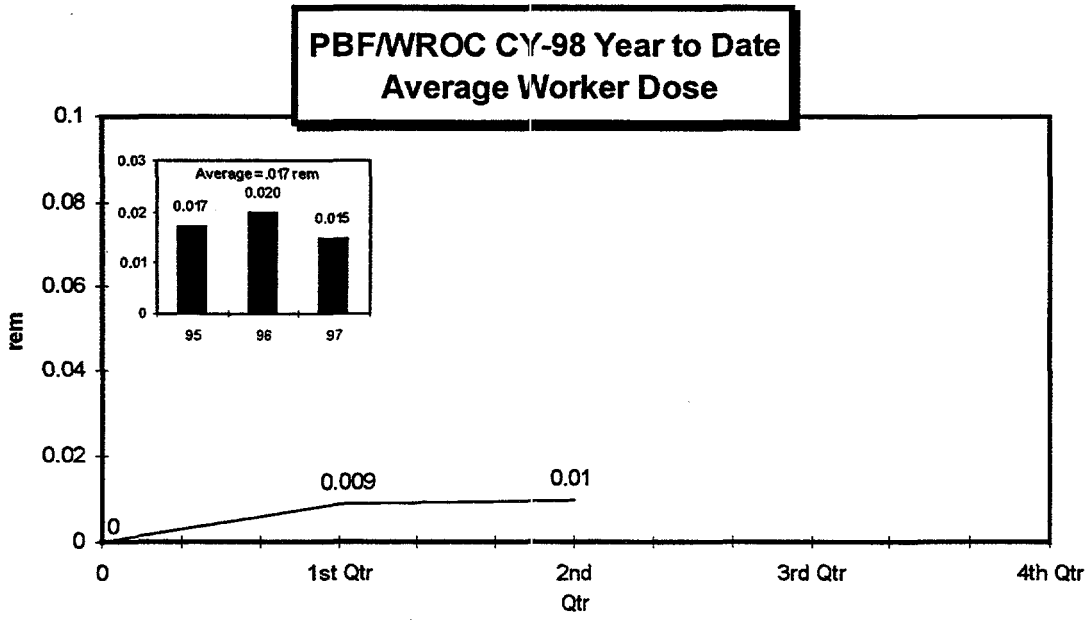
1. Major contributors to the second quarter occupational radiation exposure in the PBF/WROC reporting area were working with mixed waste, sizing and compaction of low level waste, incineration, routines, and instrument calibrations.

2. There was one reportable clothing contamination associated with work at the WROC repackaging booth. An employee's shoe was contaminated. Detail is on OR REPORT # ID-LITC-WROC-1998-0001

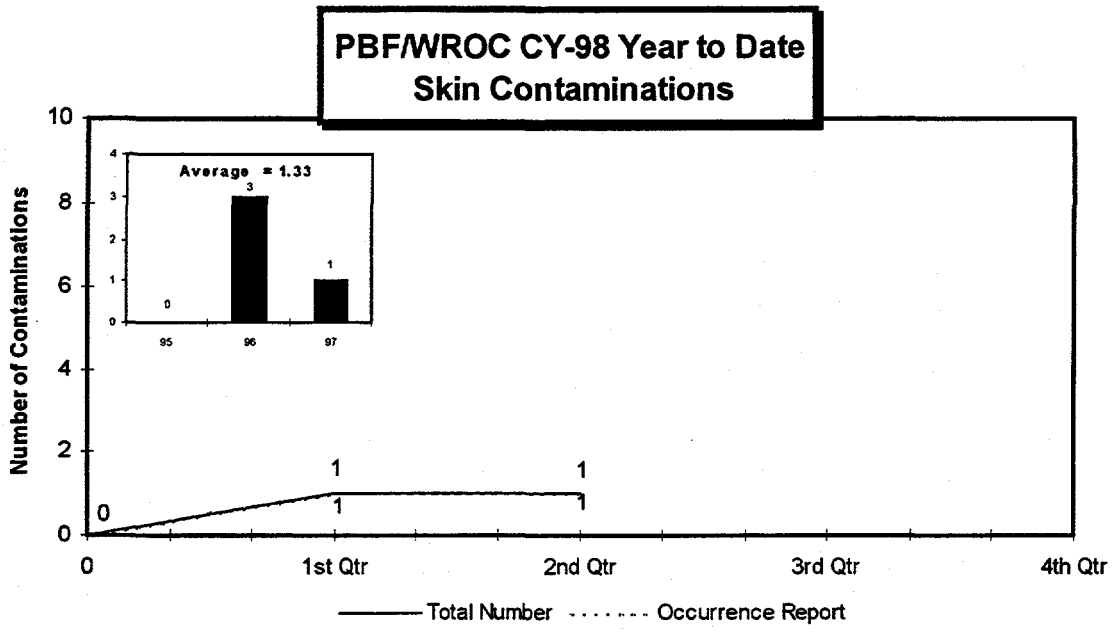
3. There was one incident considered to be a spill at PBF/WROC during the second quarter. A cargo container was shipped to ANL-West with 7972 dpm $\beta\gamma$ and 70 dpm α. Detail is on ID-LITC-WERF-1998-0005



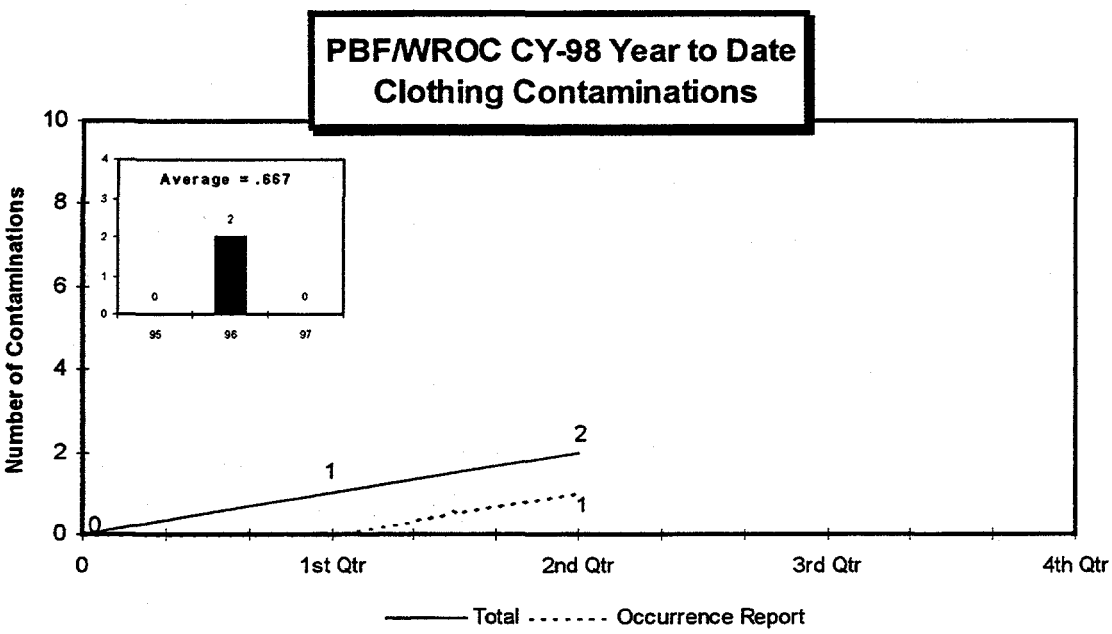
PBF/WROC collective penetrating radiation exposure through the end of the second quarter was 0.240 person rem.



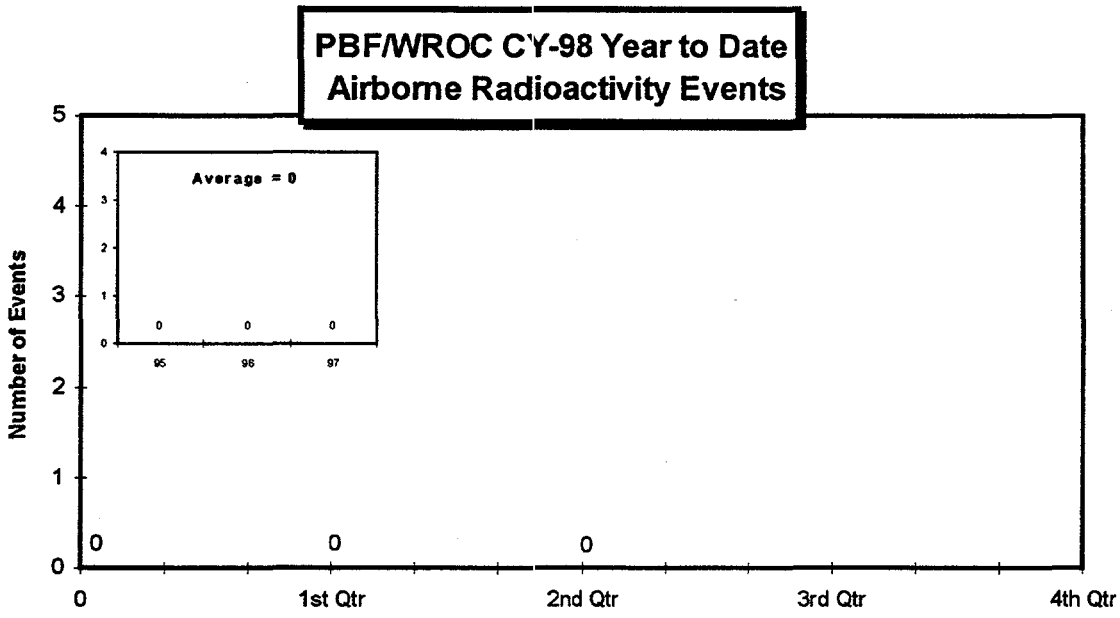
The PBF/WROC average worker dose through the end of the second quarter was 0.010 rem. Average dose is based on a comparison of workers who receive measurable dose (25 workers).



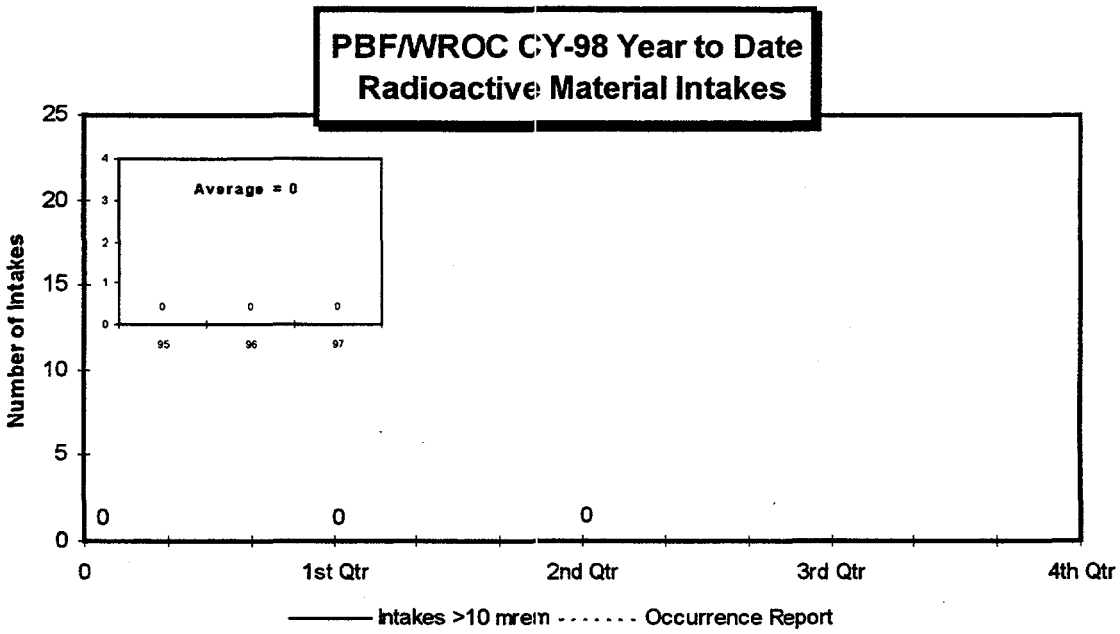
There were no skin contaminations at the PBF/WROC area during the second quarter.



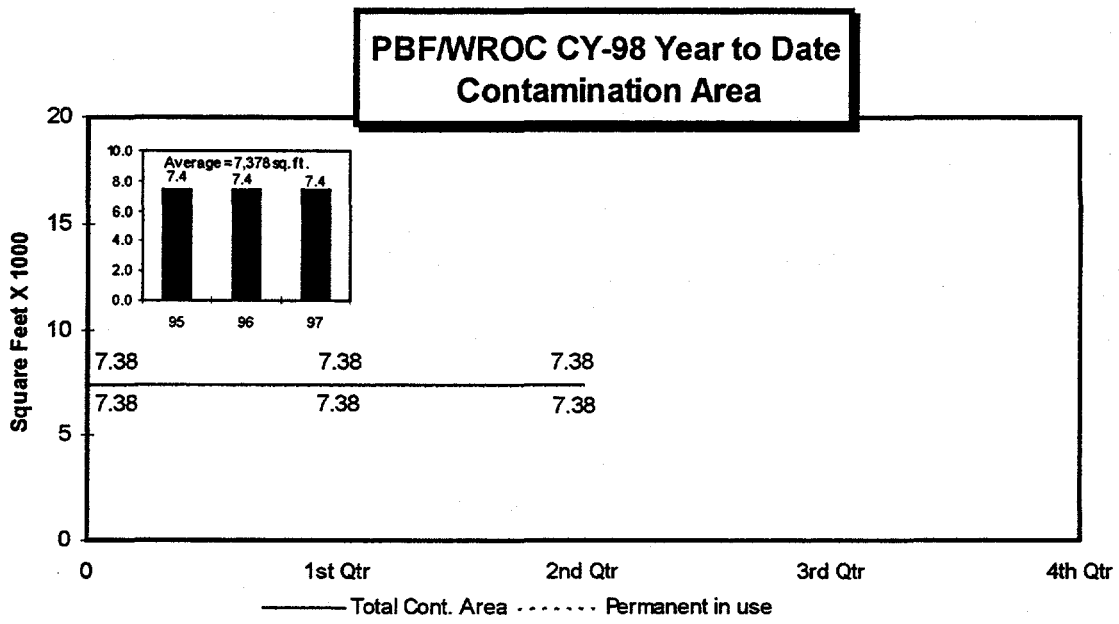
There was one reportable clothing contamination at the PBF/WROC area during the second quarter. An employee's shoe was contaminated during work at the WROC repackaging booth. Detail is contained on OR ID-LITC-WROC-1998-001.



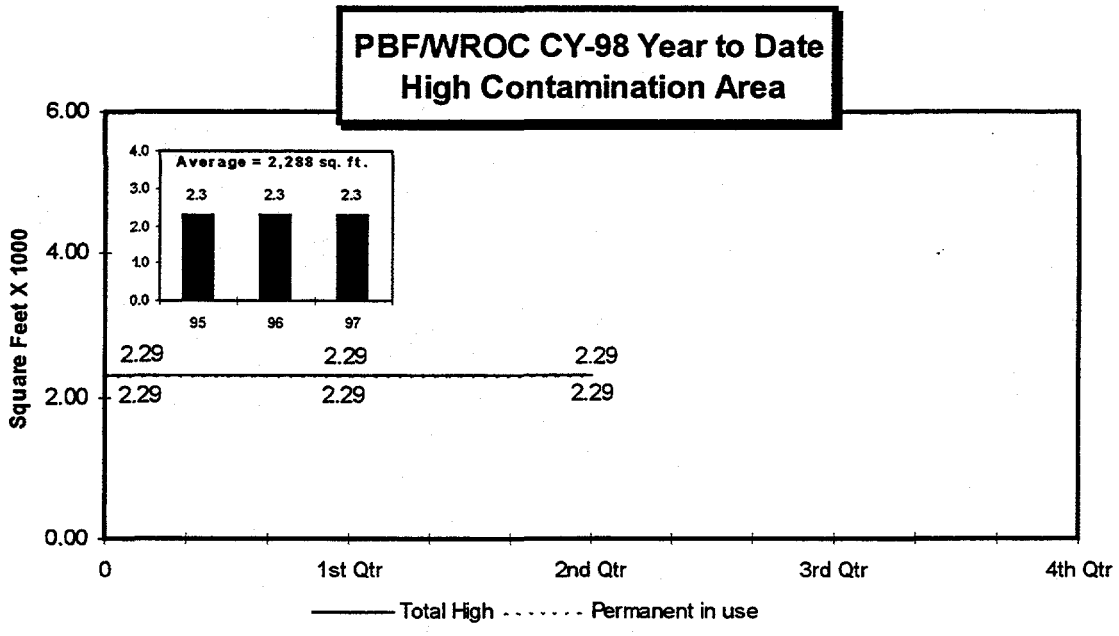
There have been no airborne activity events greater than 10 % DAC detected at the PBF/WROC area through the second quarter.



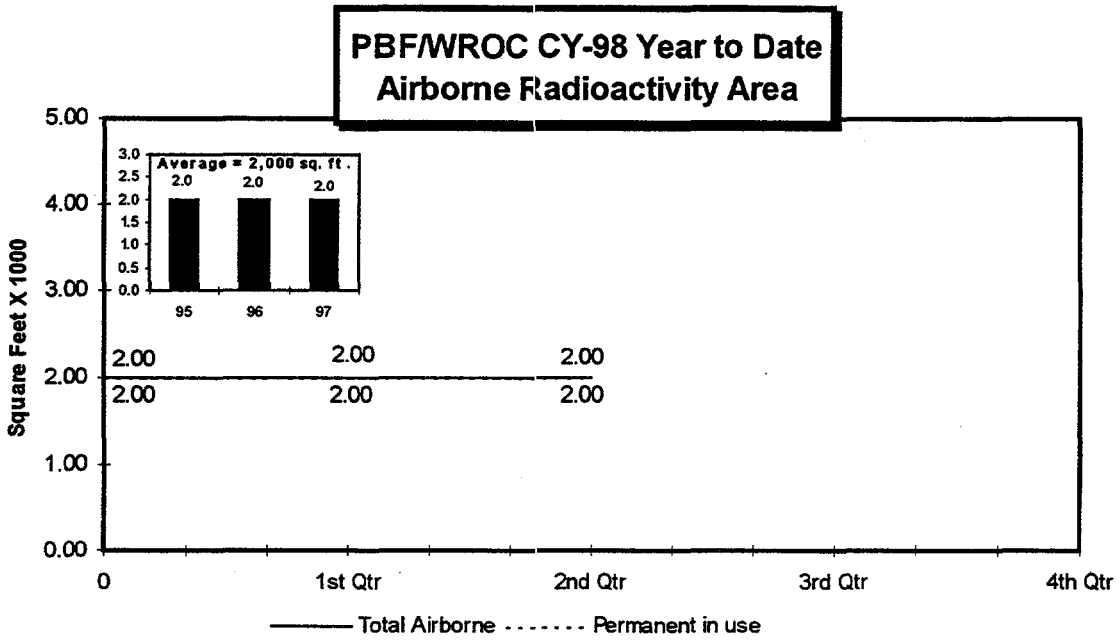
There were no positive bioassays indicating radioactive material intakes that resulted in a dose assessment of 10 mrem or greater in the PBF/WROC area during the second quarter.



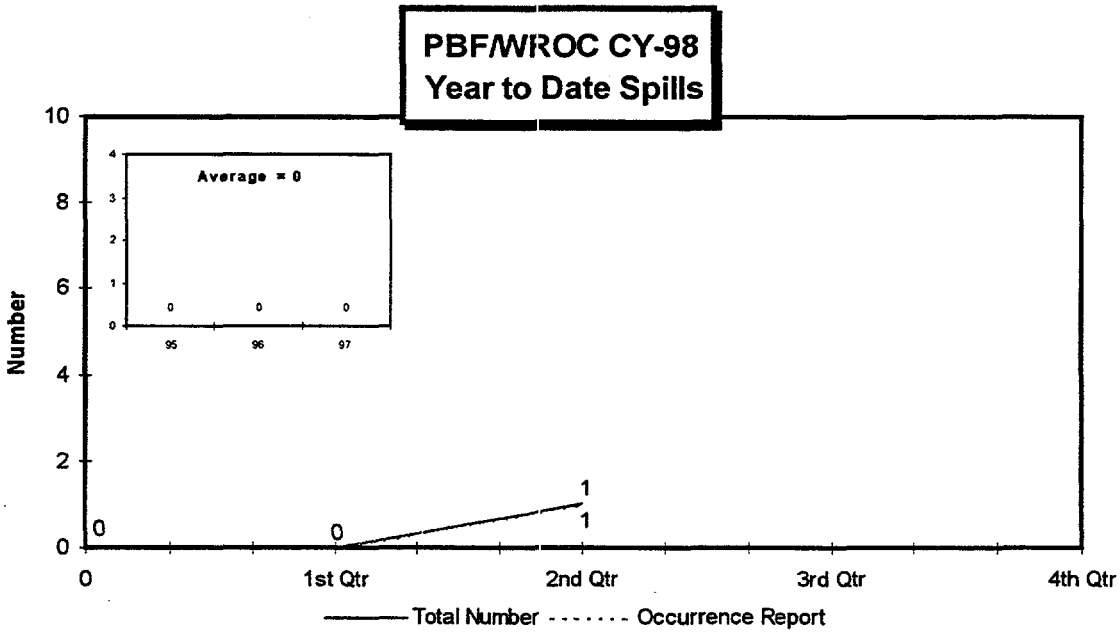
The second quarter Contamination Area for the PBF/WROC area remains at 7,378 square feet. All of this is considered permanent and in-use.



The total High Contamination Area through the end of the second 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 second quarter remained at 2000 square feet. All of this area is designated as permanent and in-use.



There was one incident considered to be a spill at PBF/WROC during the second quarter. A cargo container was shipped to ANL-West with 7972 dpm $\beta\gamma$ and 70 dpm α. Detail is on ID-LITC-WERF-1998-0005

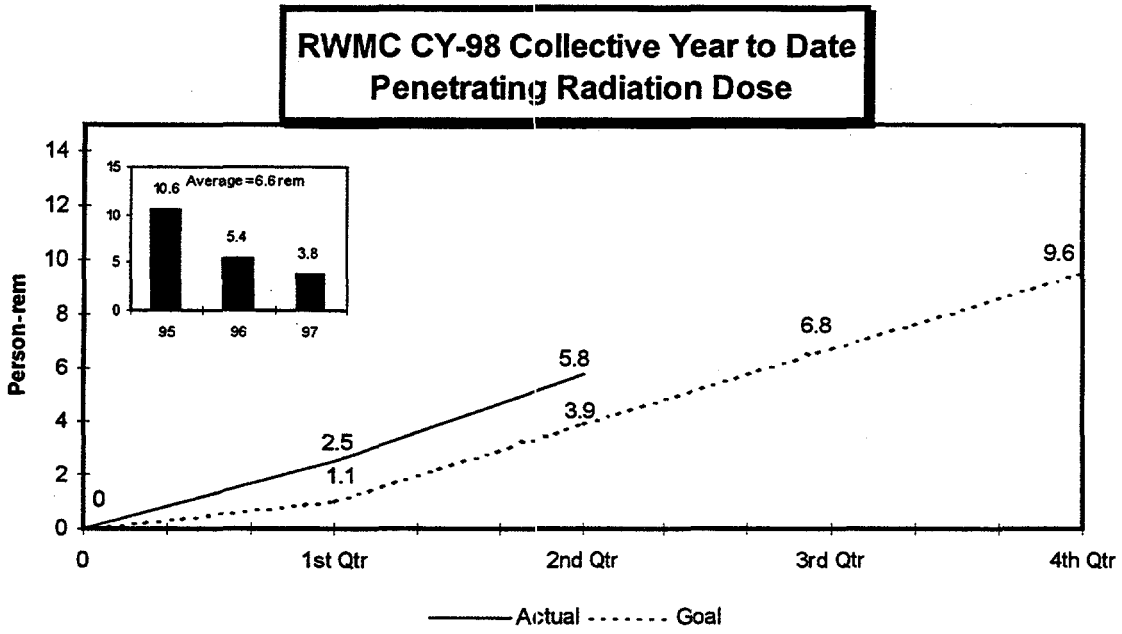
Radioactive Waste Management Complex

Summary

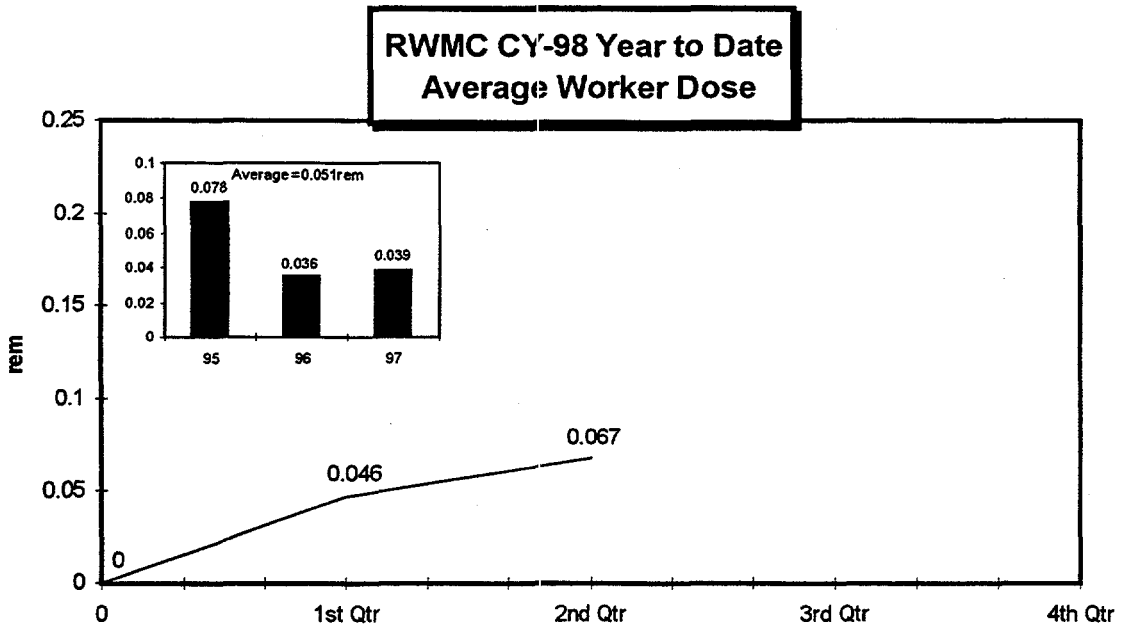
1. Major contributors to the second quarter RWMC occupational radiation exposure have been from waste disposal in the SDA, and drum and box surveys in the storage modules.

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.

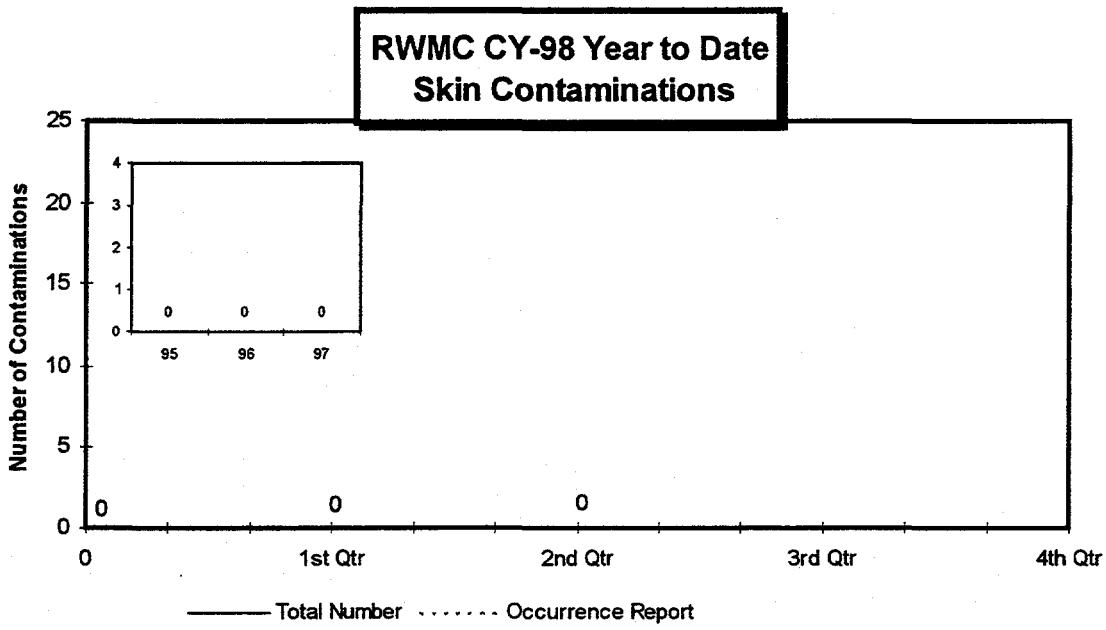
3. Sandia waste boxes in storage modules remain contaminated at the end of the second quarter. These boxes represent the increase in low level contamination shown in the chart on page 39.



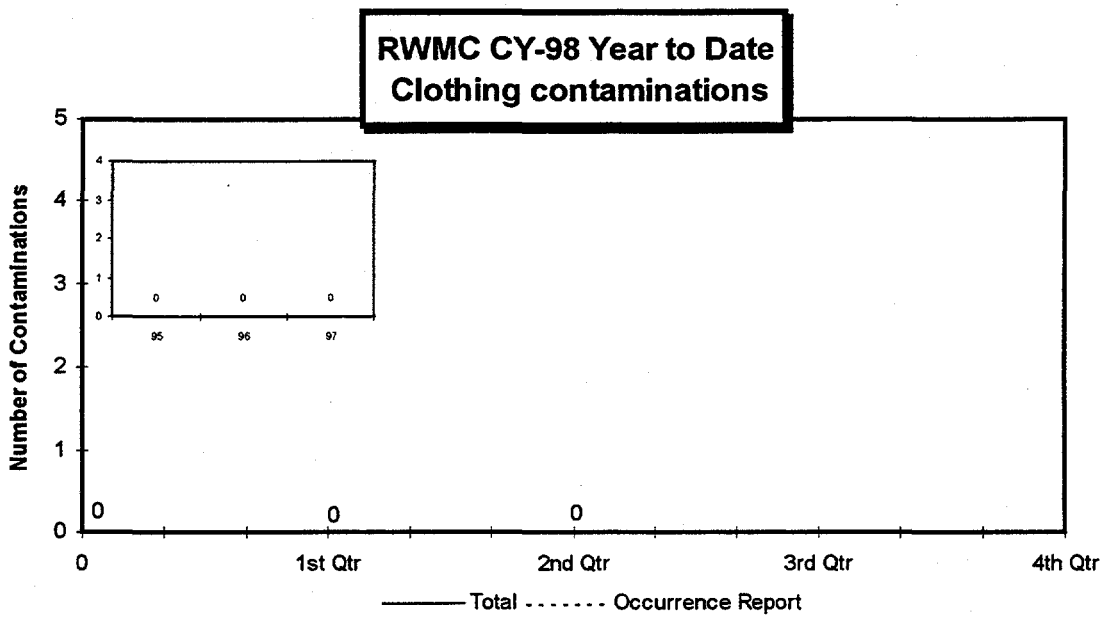
The RWMC collective penetrating radiation exposure through the end of the second quarter was 5.799 person-rem. Dose is up due to increased waste handling operations. The goal was increased to accommodate the increase in work scope.



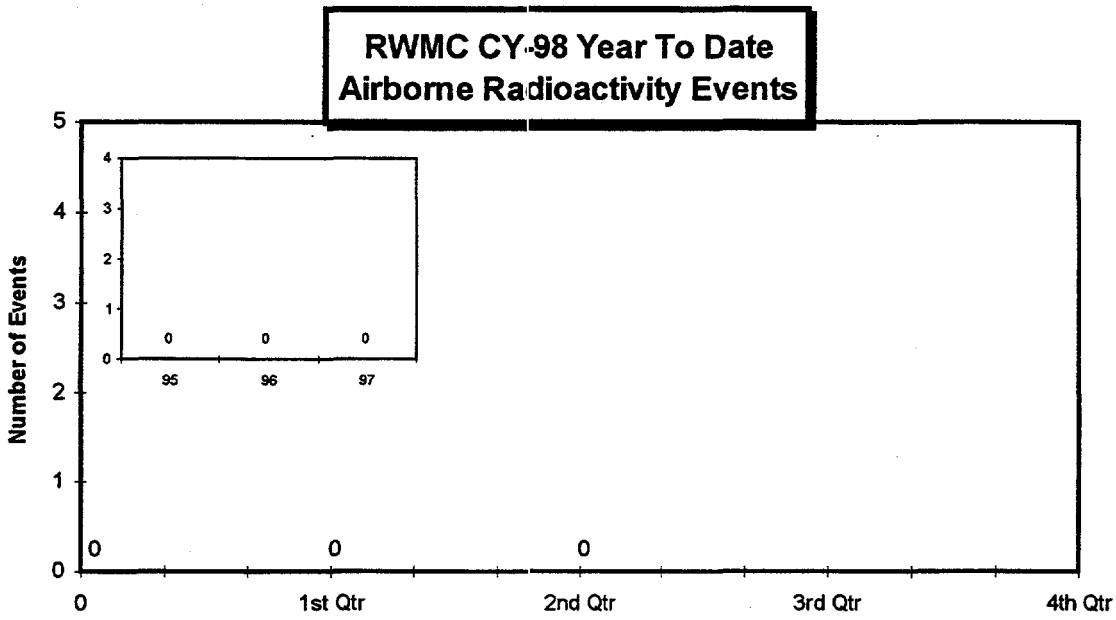
The average worker dose at the RWMC through the end of the second quarter was 0.067 rem from 87 workers who received dose.



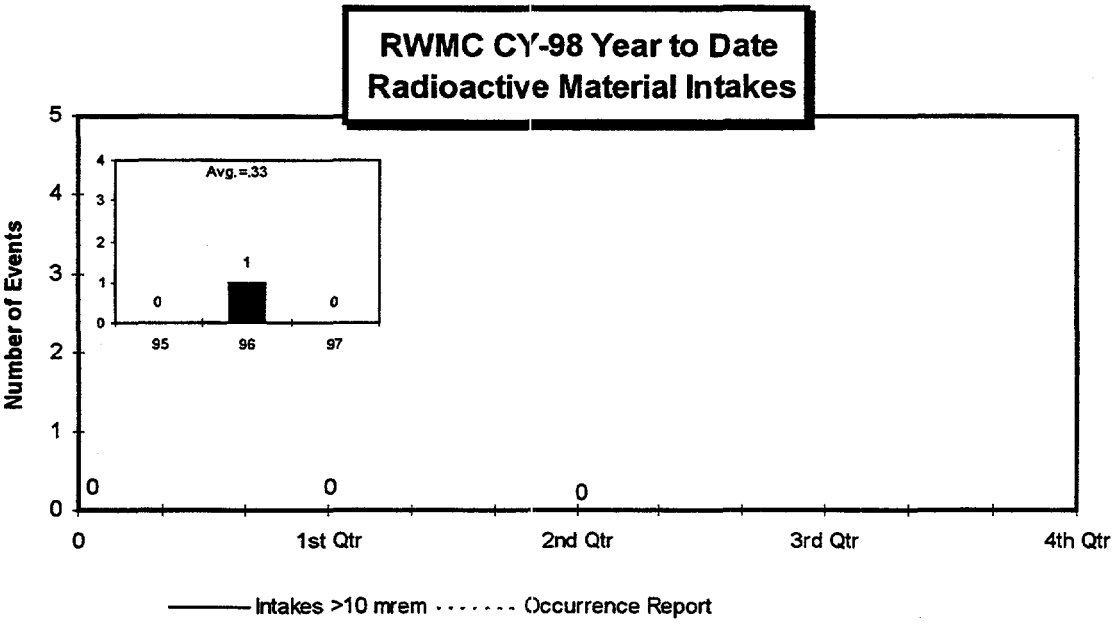
RWMC year to date skin contaminations remain at zero through the end of the second quarter.



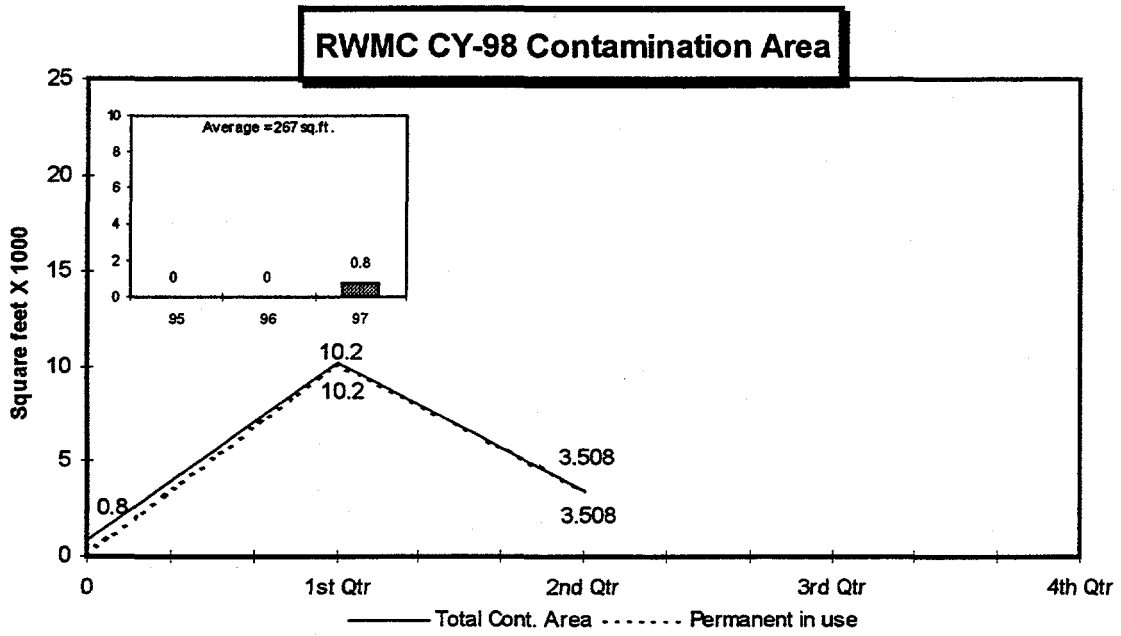
There were no clothing contaminations at the RWMC through the end of the CY-98 second quarter.



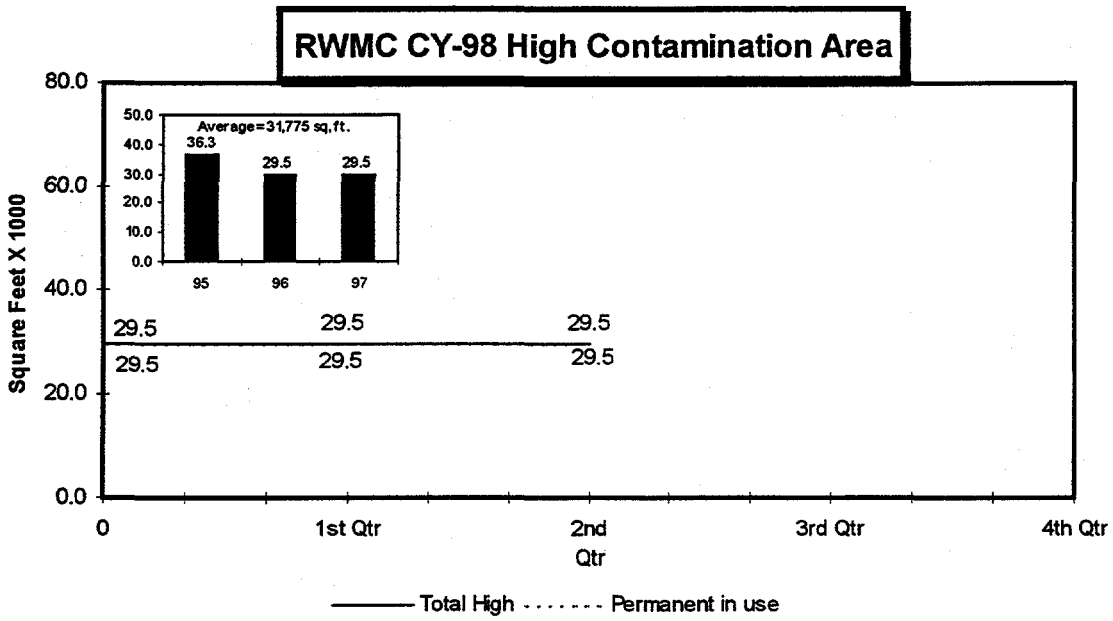
No airborne activity greater than 10 % DAC was detected at RWMC in areas not posted as Airborne Radioactivity Areas through the second quarter.



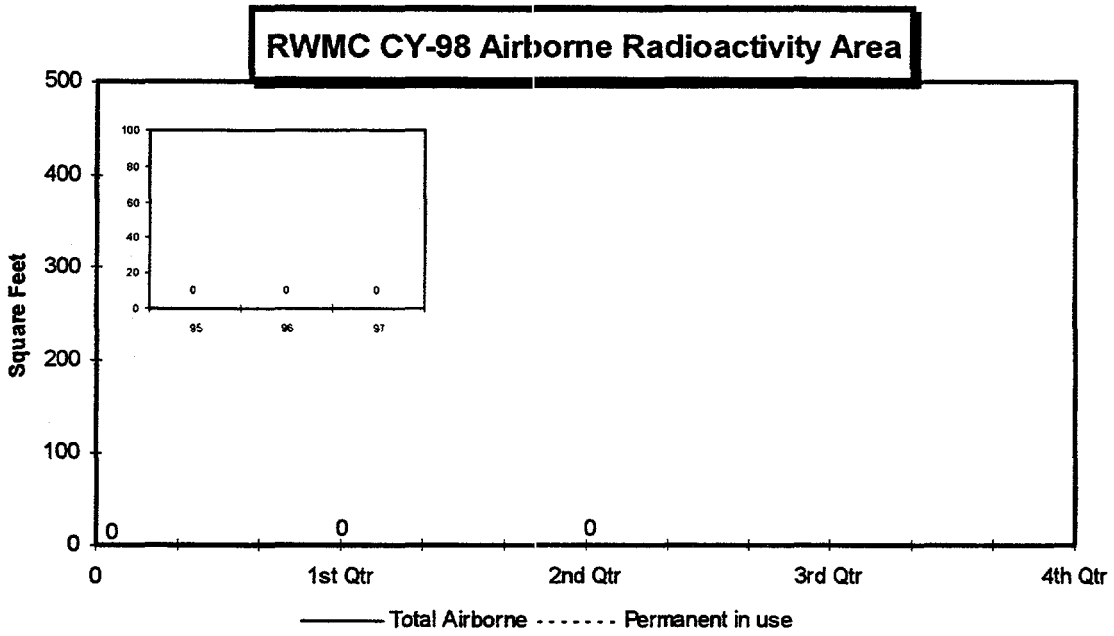
There have been no positive bioassays year to date indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater.



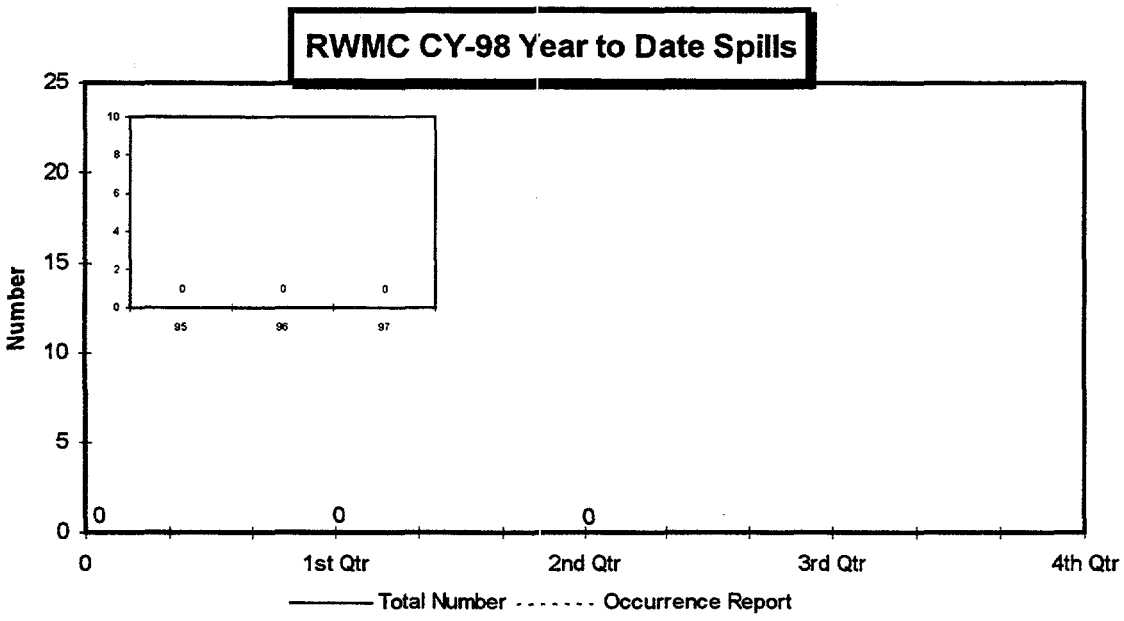
The total Contamination Area at the RWMC through the end of the second quarter decreased to 3,508 square feet, which is the area of Sandia waste boxes in storage containers at the RWMC.



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



The total Airborne Radioactivity Area at the RWMC at the end of the second quarter remains at zero square feet.



There were no spills or loss of control of radioactive material during the second quarter at the RWMC.

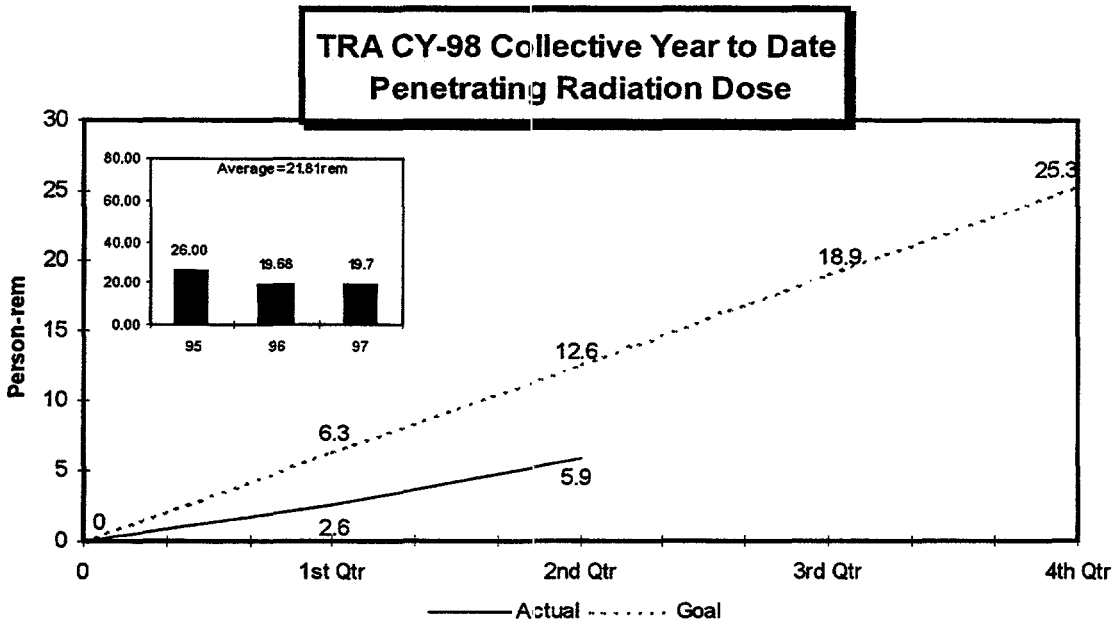
Test Reactor Area

Summary

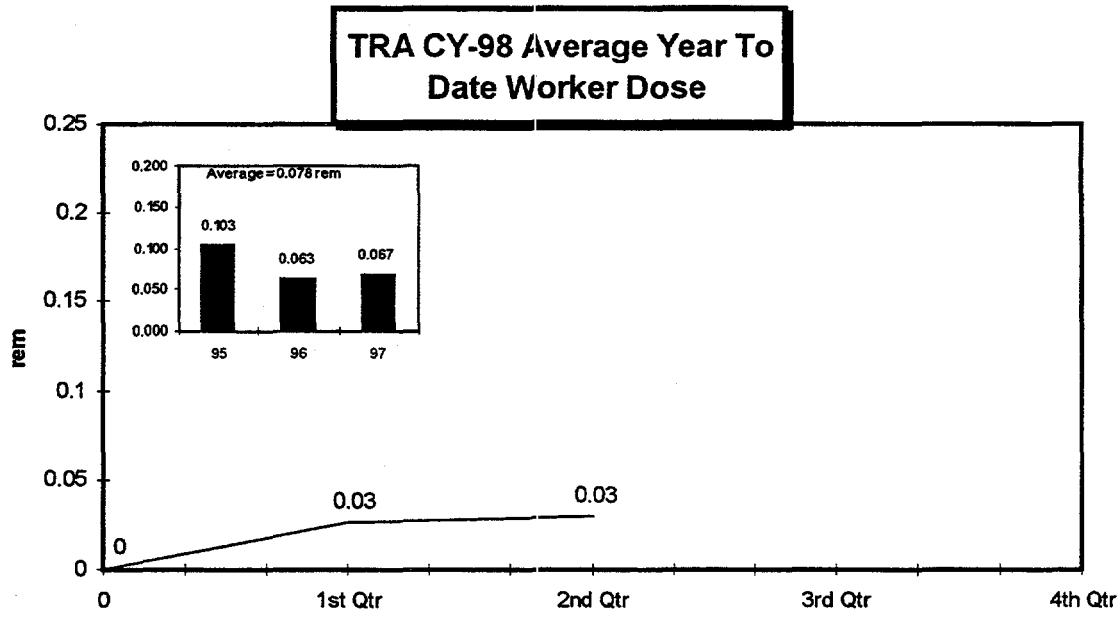
1. Outages at the Advance Test Reactor within the Test Reactor Area are responsible for the major portions of dose during the second quarter. Total Penetrating dose for the report is 5.874 person-rem year to date.

2. There were five contamination events at TRA during this quarter. Two of the events were reportable. See ORs LITC-ATR-1998-0009 and LITC-ATR-1998-0012.

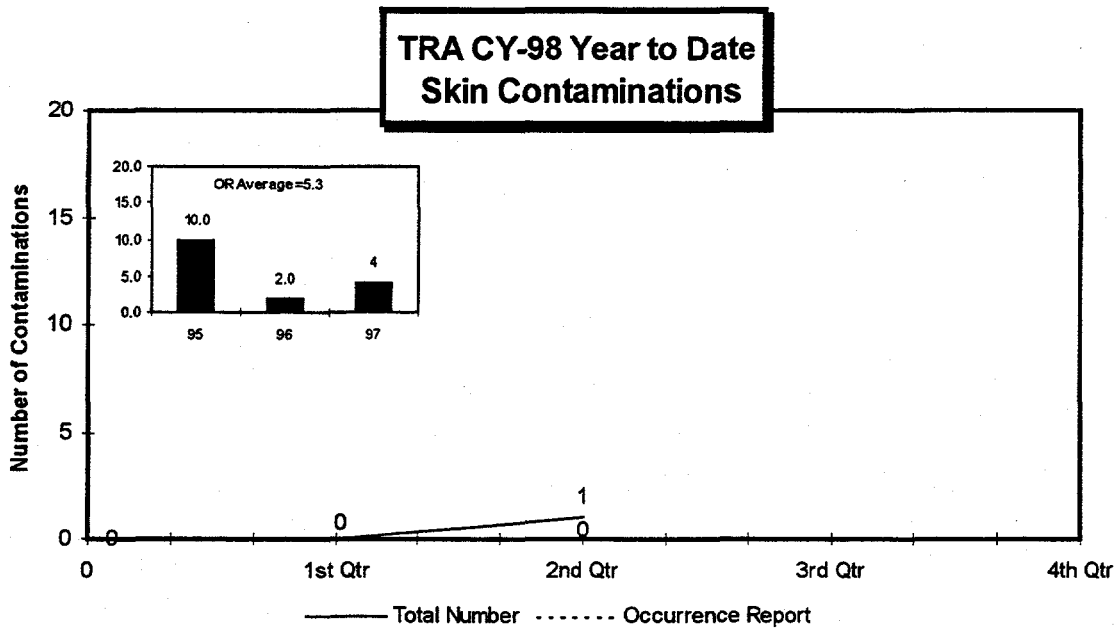
3. There was one skin contamination during the quarter. This event was below reportable levels



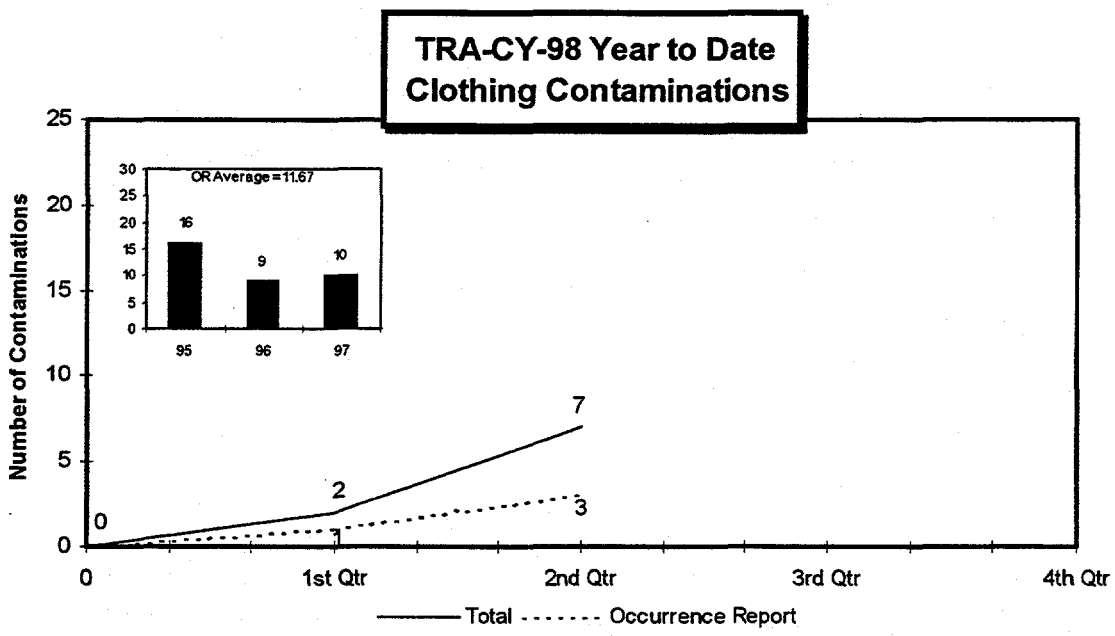
TRA collective penetrating radiation dose through the end of the second quarter was 5.874 person-rem.



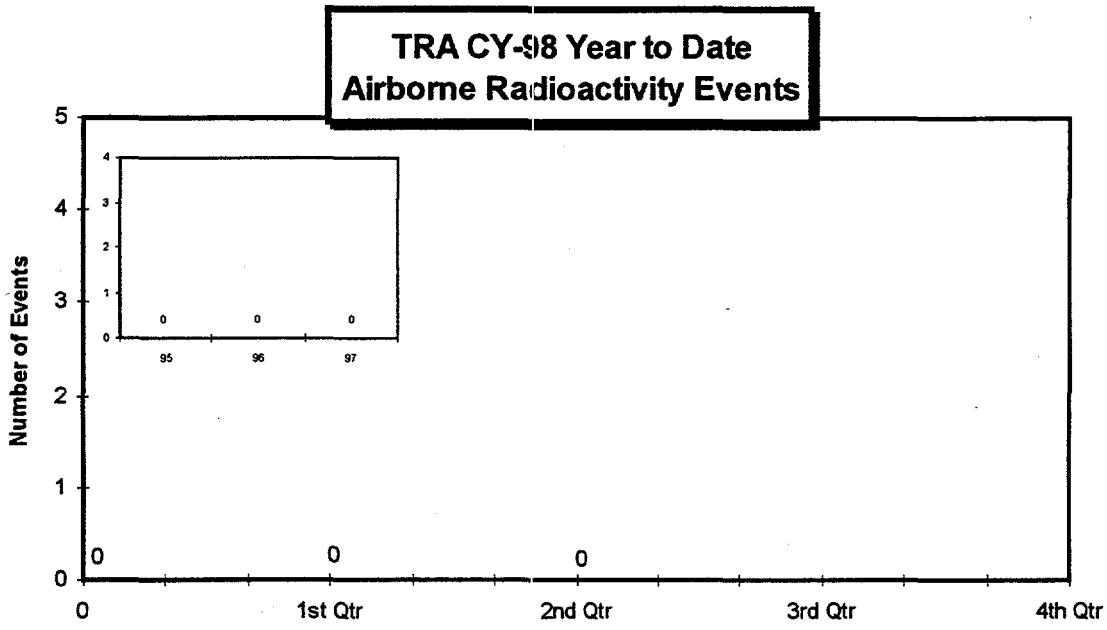
The average worker dose at the TRA through the end of the second quarter was 0.03 rem based on 197 workers with dose greater than 10 mrem.



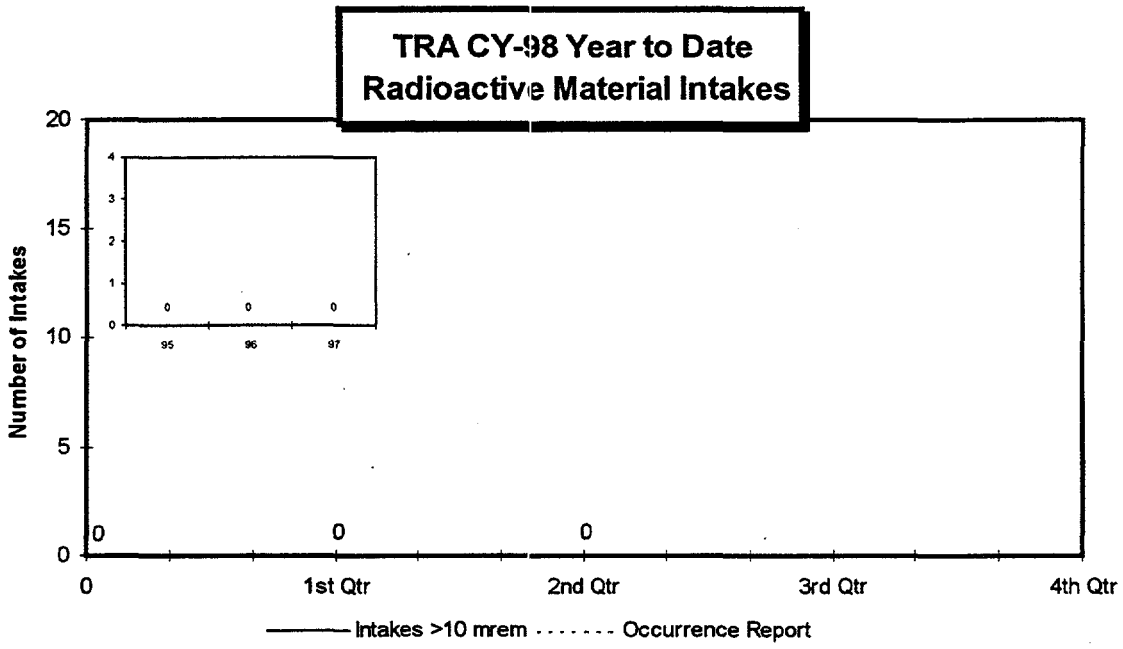
There were one non-reportable skin contamination at the TRA during the second quarter. There were no contaminated wounds or facial contaminations.



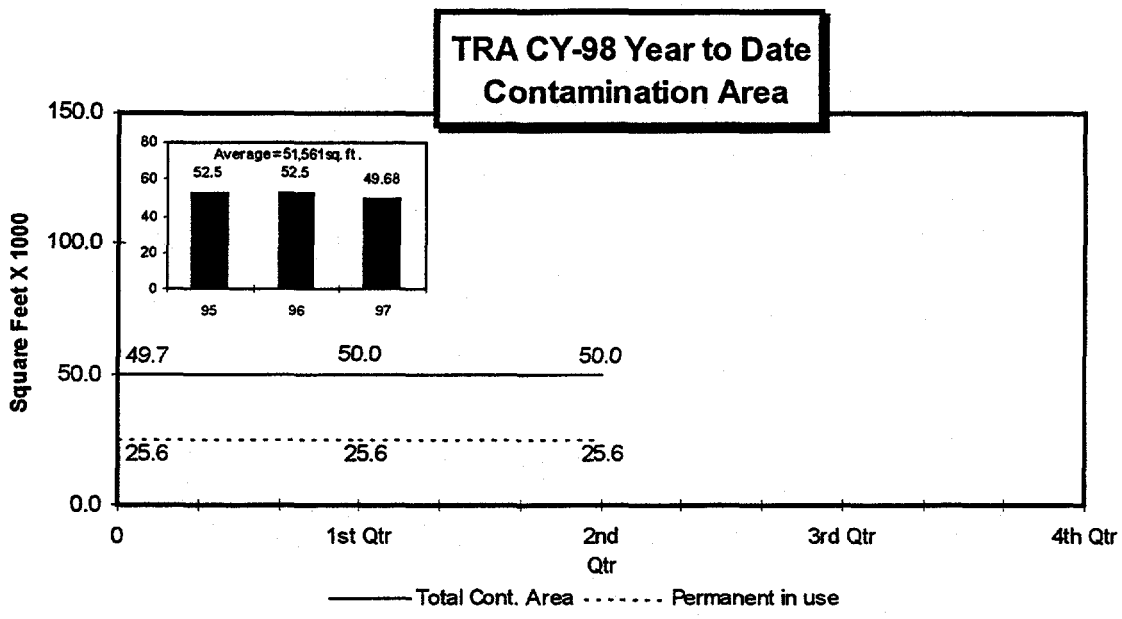
There were 5 clothing contaminations at the TRA during the second quarter. Two were recordable. See ORs ID-LITC-ATR-1998-0009 and 0012.



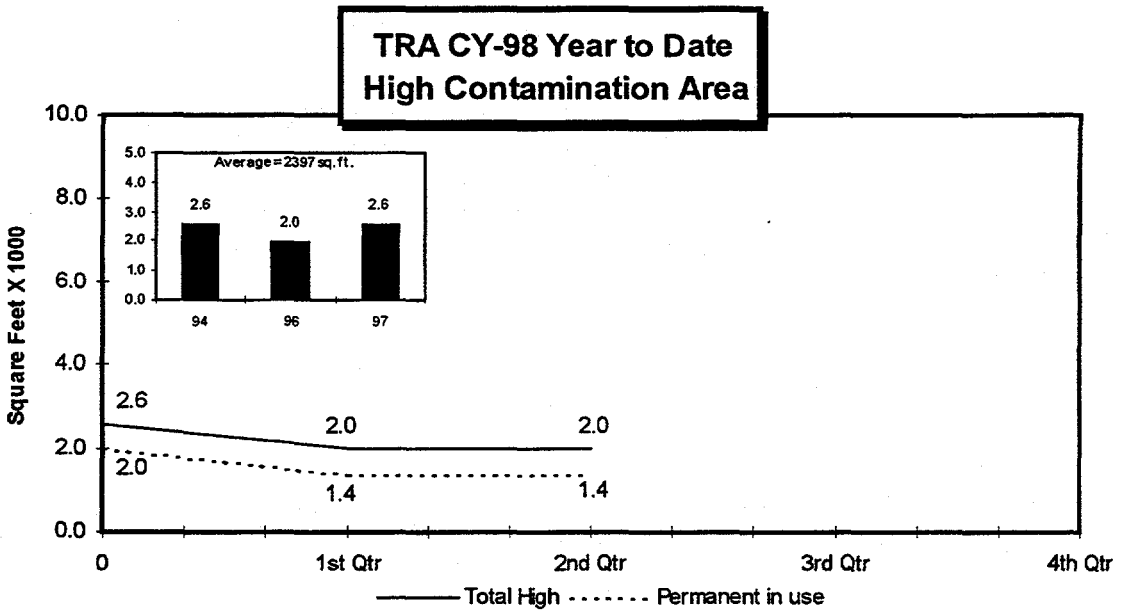
No airborne activity greater than 10 % DAC was detected at the TRA in areas not already posted as Airborne Radioactivity Areas during the second quarter.



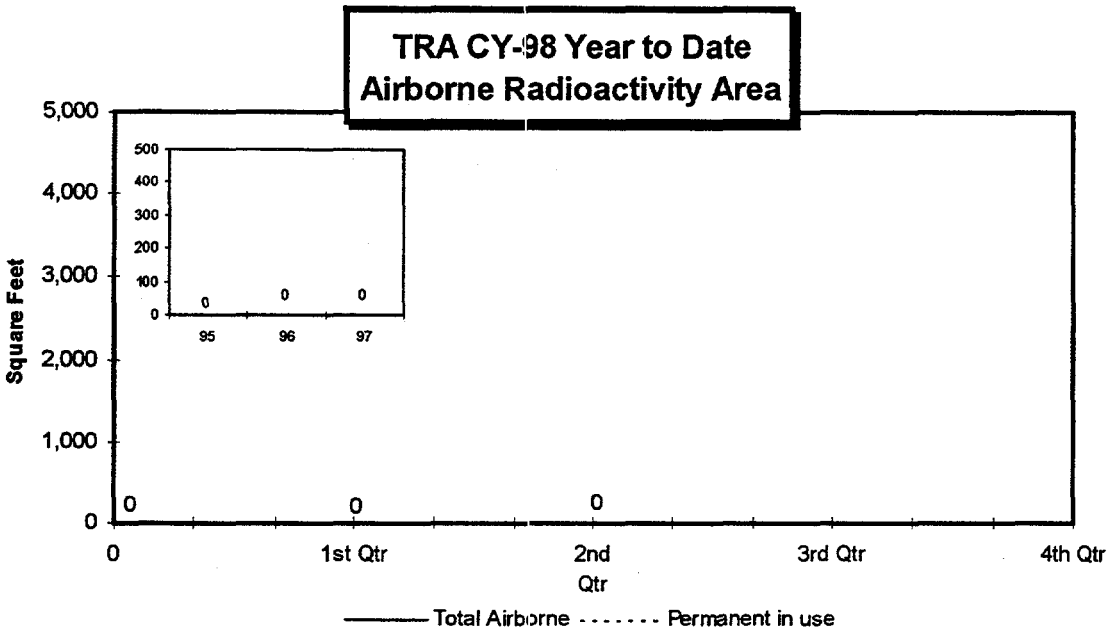
There were no positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at the TRA during the second quarter.



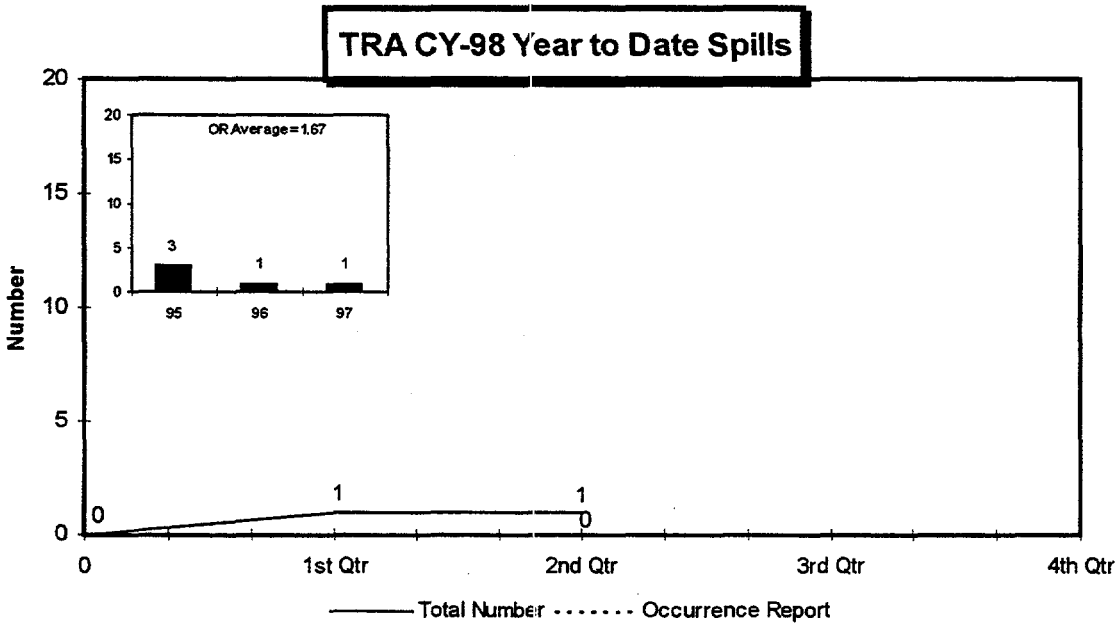
Total indoor Contamination Area for the TRA is 49,978 square feet square feet. 25,619 square feet is designated as permanent and in-use.



Total High Contamination Area for the TRA at the end of the second 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 second quarter remains at zero square feet.



There were no reportable spills or loss of control of radioactive material at the TRA during the second quarter.

International Isotopes Idaho Inc. (IIII)

Formerly MAC-ISOTOPES

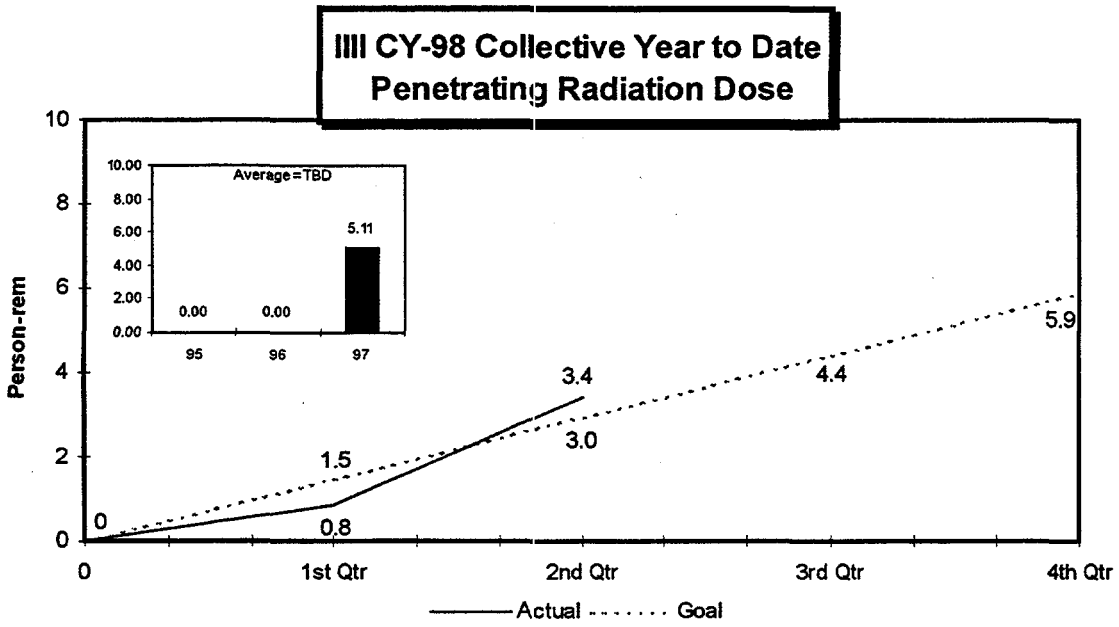
TRA HOT CELL

Summary

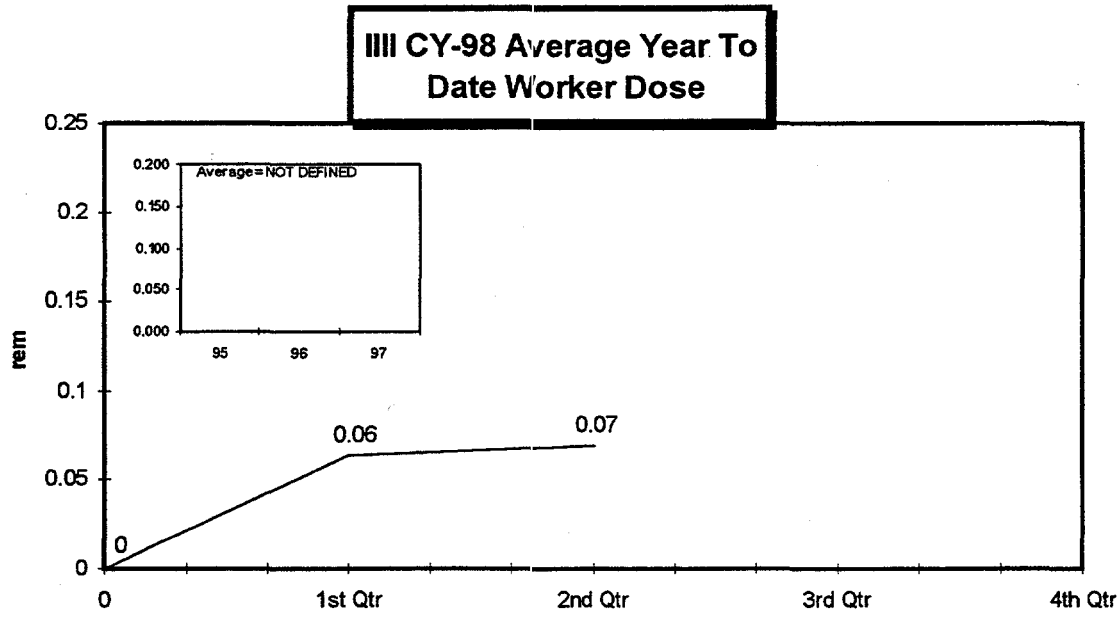
The TRA Hot Cell, IIII, formerly MAC-I is a privatized contractor and is being tracked here since LMITCO provides much of the associated labor support. International Isotopes Inc., of Denton, Texas acquired MAC-I on April 27, 1998.

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

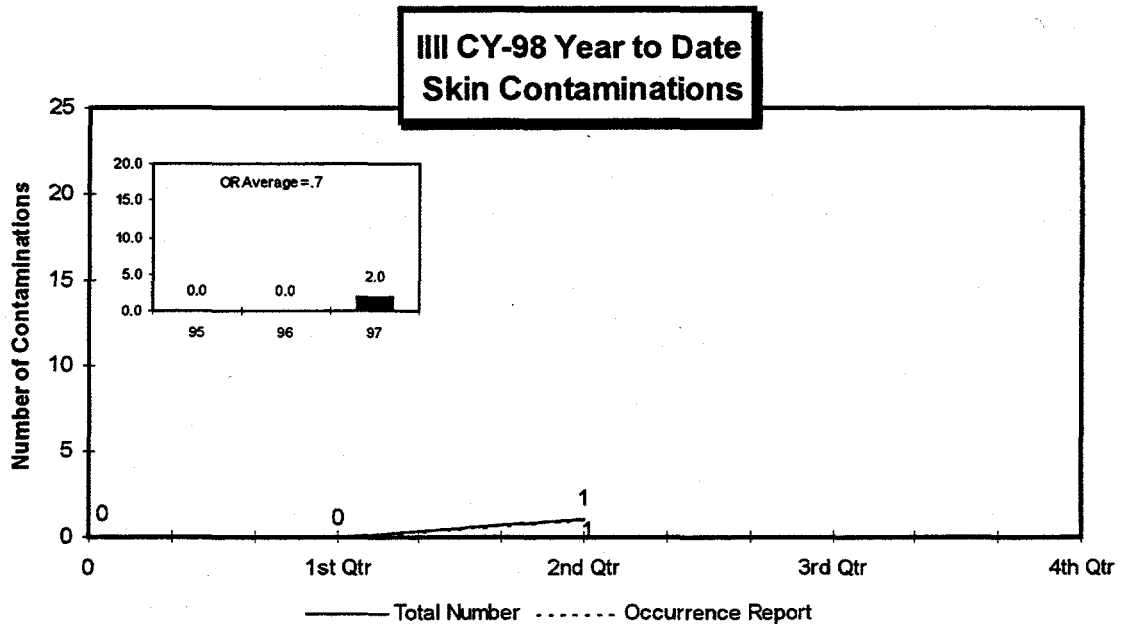
There was one incident reported on OR ID LITC-TRA-1998-0008 that includes data on a skin contamination and a clothing contamination.



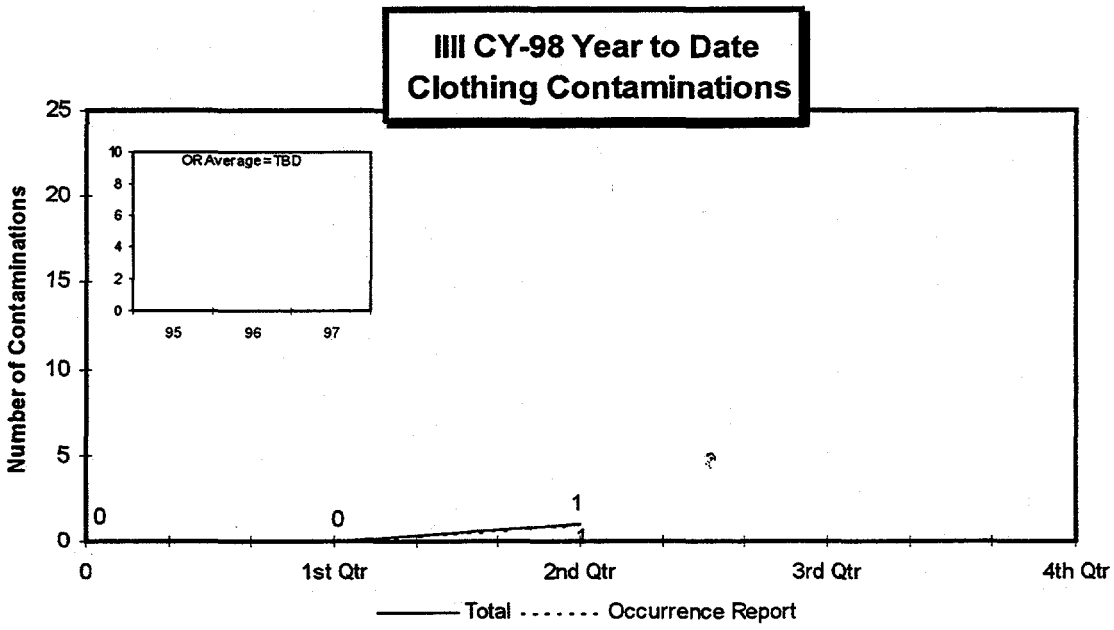
Year to date dose is 3.427 person-rem and the year to date goal is 3.0 person-rem



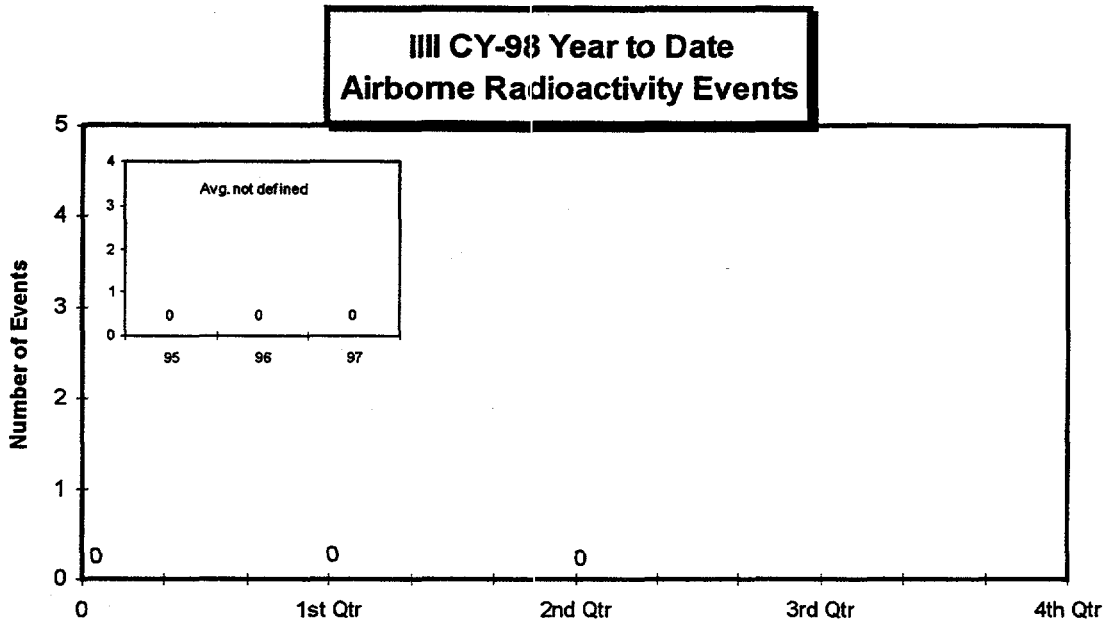
Average year to date is 0.07 rem based on 49 workers at the facility



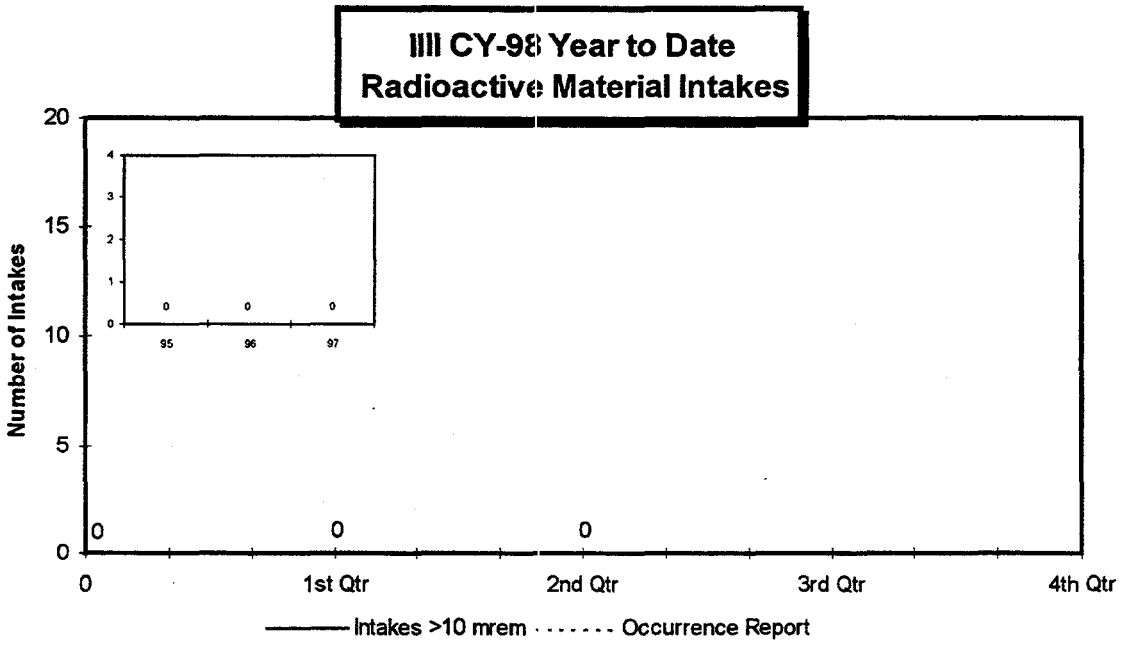
There was one skin contamination events at the Hot Cell facility during the second quarter. The average is based on an event at the beginning of CY-97



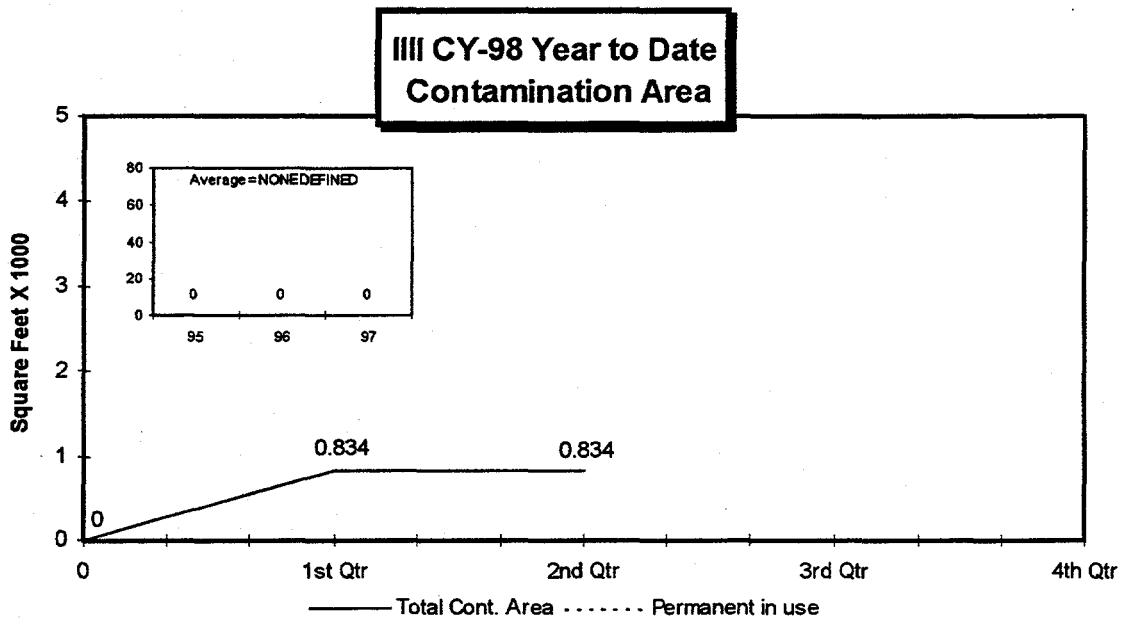
IIII has had one reportable clothing contamination event year to date. It is reported on the same OR as the event above, ID-LITC-TRA-1998-0008. These events are not in the TRA total or the INEEL total since IIII is considered to be a sub-contractor.



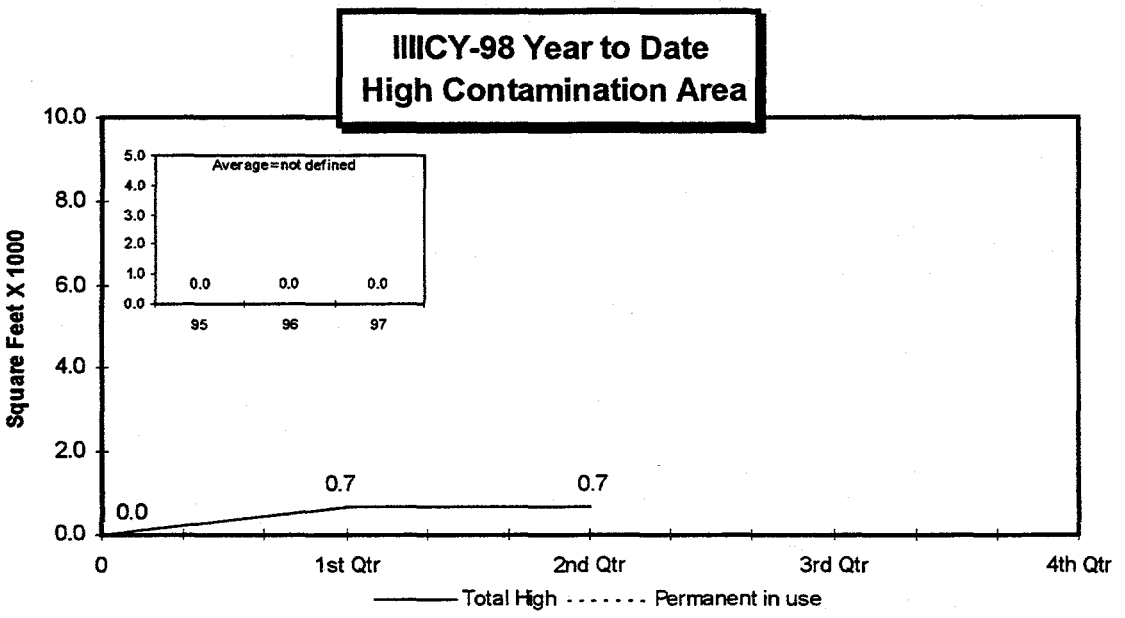
There have been no events greater than 10% DAC year to date.



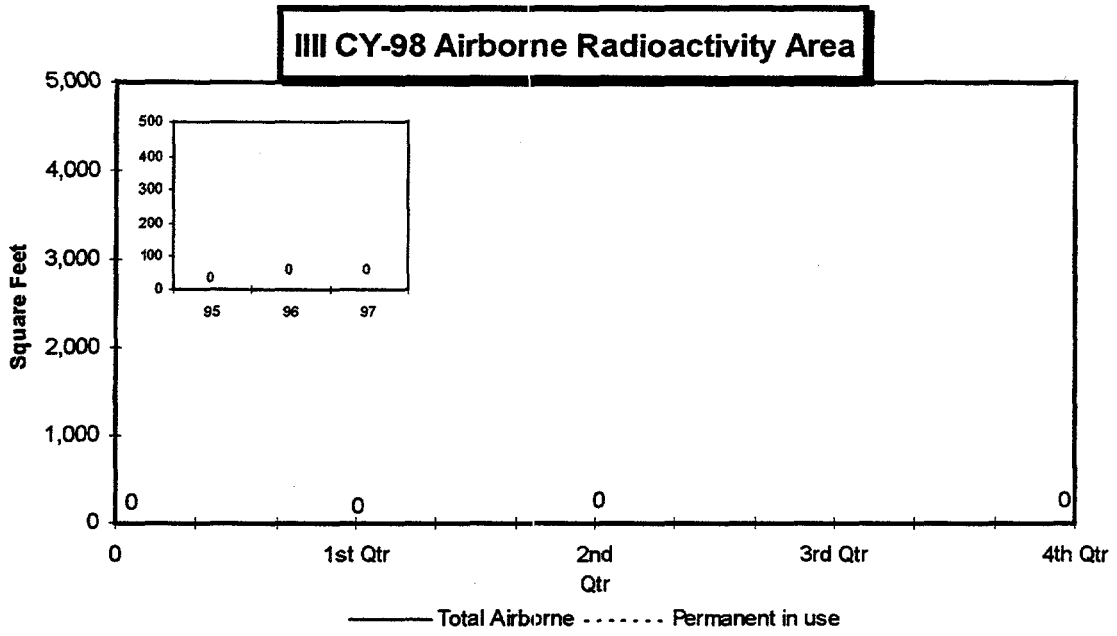
There have been no internal doses greater than 10 mrem CEDE confirmed from IIII operations year to date. There was one event based positive bioassay that showed detectable gadolinium-153. The dose assessed is less than 1 mrem.



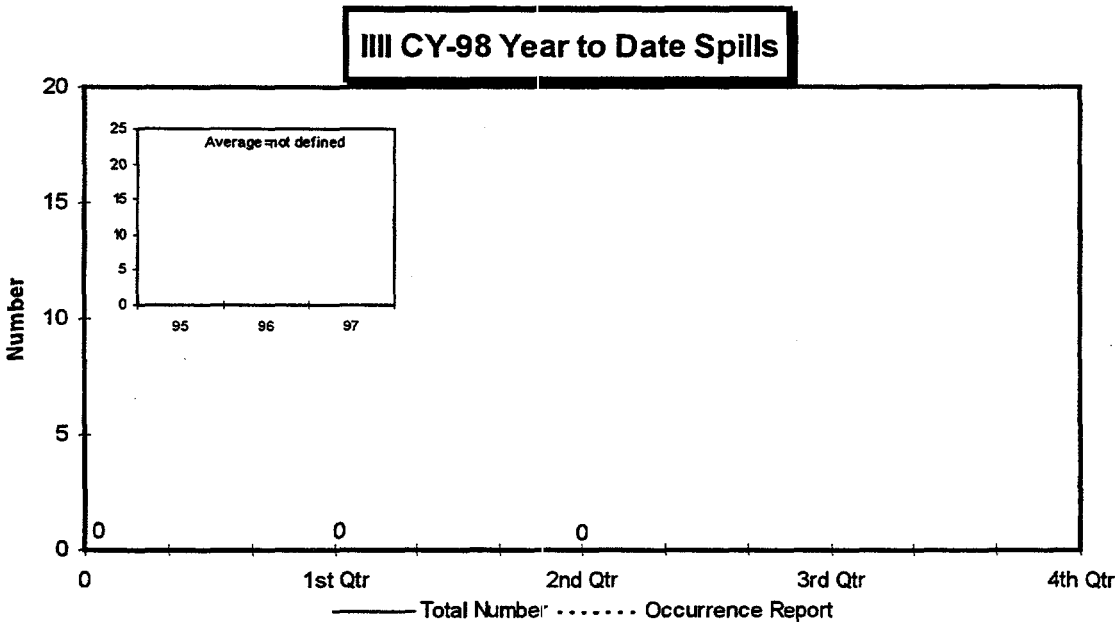
Contamination areas total 834 square feet at the Hot Cell at TRA



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



There has been no Airborne events year to date at the IIII.



No Spills have occurred at the TRA Hot Cells year to date.

Test Area North
&
Specific Manufacturing Capability

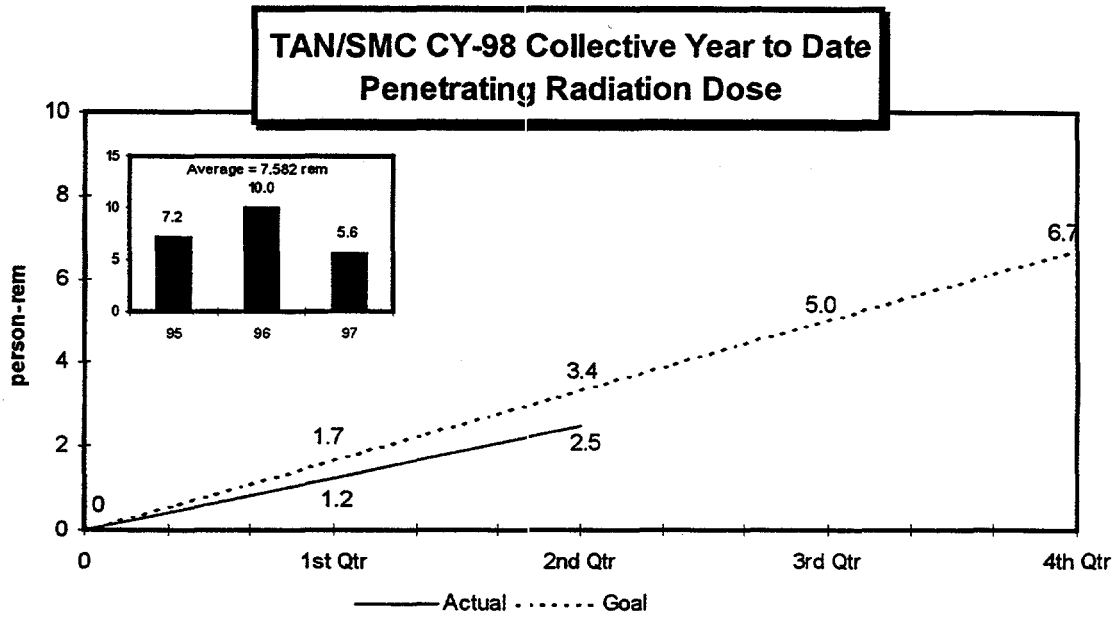
Summary

1. TAN hot shop work, handling repackaging and shipment of hot waste, fuel movements, canister dewatering, cask disassembly, ER remediation activities, and pool cleaning and vacuuming account for dose at TAN Ops.

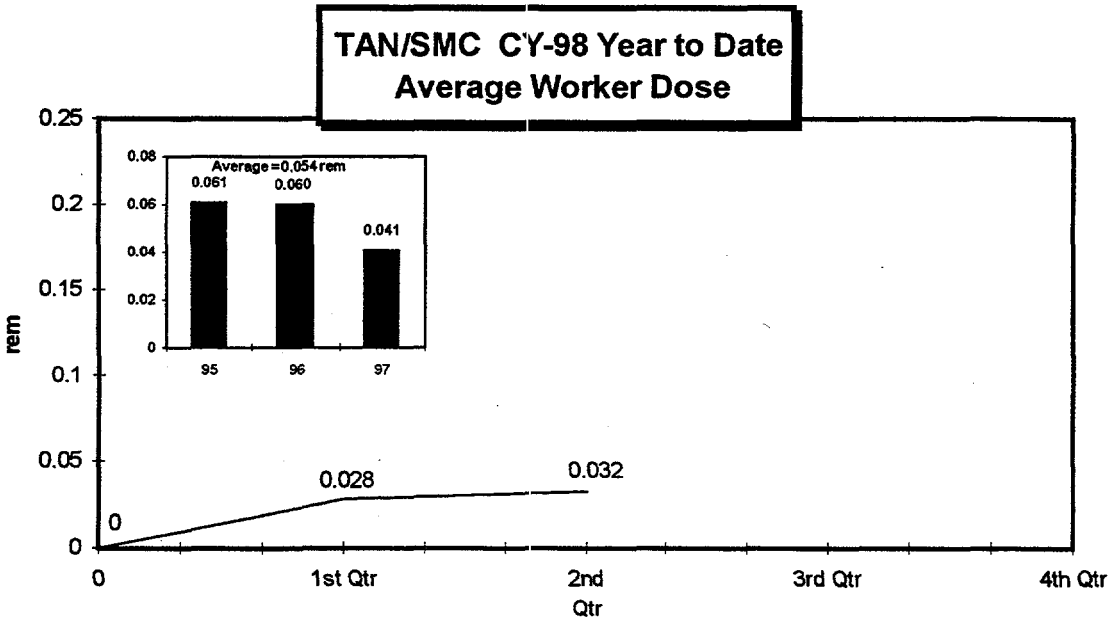
2. For SMC, routine armor manufacturing and routine activities account for the dose contribution.

3. The only spill year to date is the one that occurred in the first quarter at TAN 666 as a result of back-flow from the number three holding tank up through floor sumps.

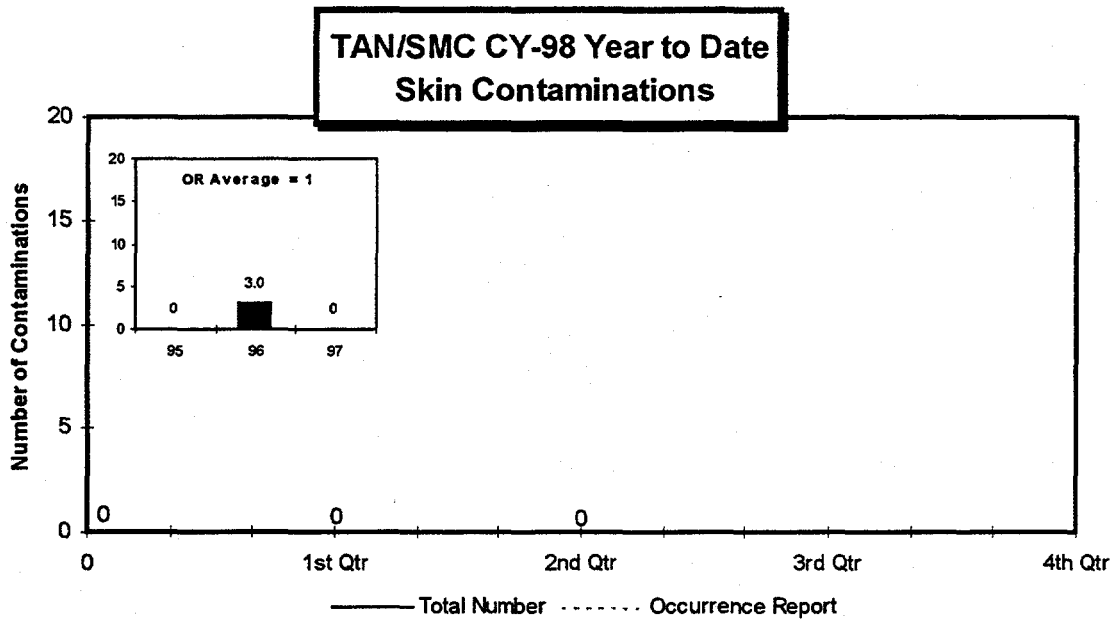
4. It should be noted that internal dose listed on page 58 differs from that shown in the performance index (PI). Positive dose is recorded for anything greater than 10 mrem CEDE. For the PI any dose greater than zero is measured.



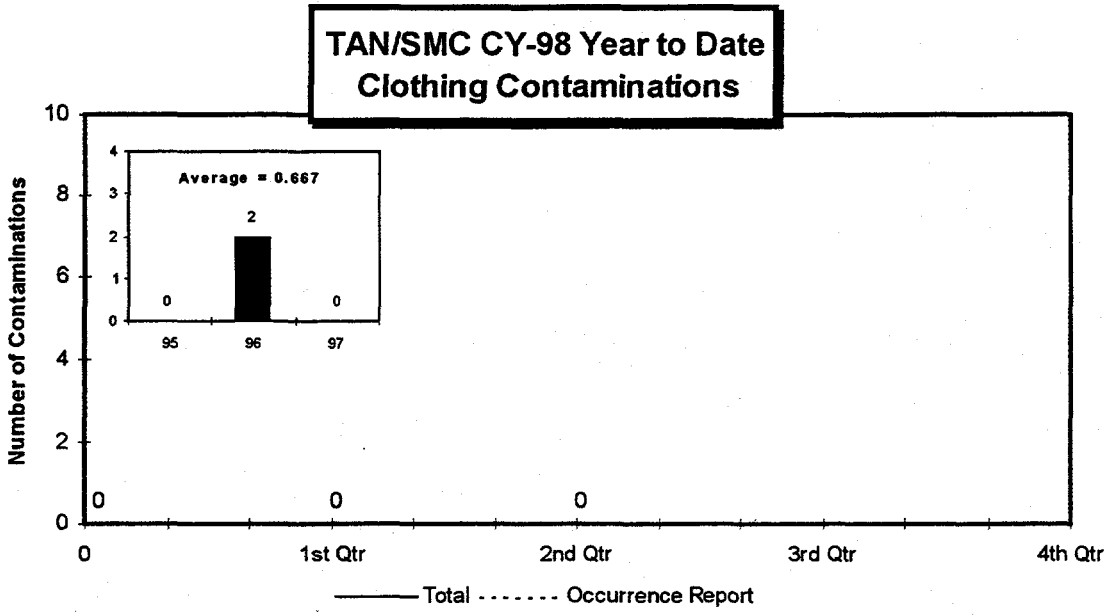
TAN and SMC collective penetrating radiation dose through the end of the second quarter was 2.5 person-rem. Work scope is consistent with that of past years.



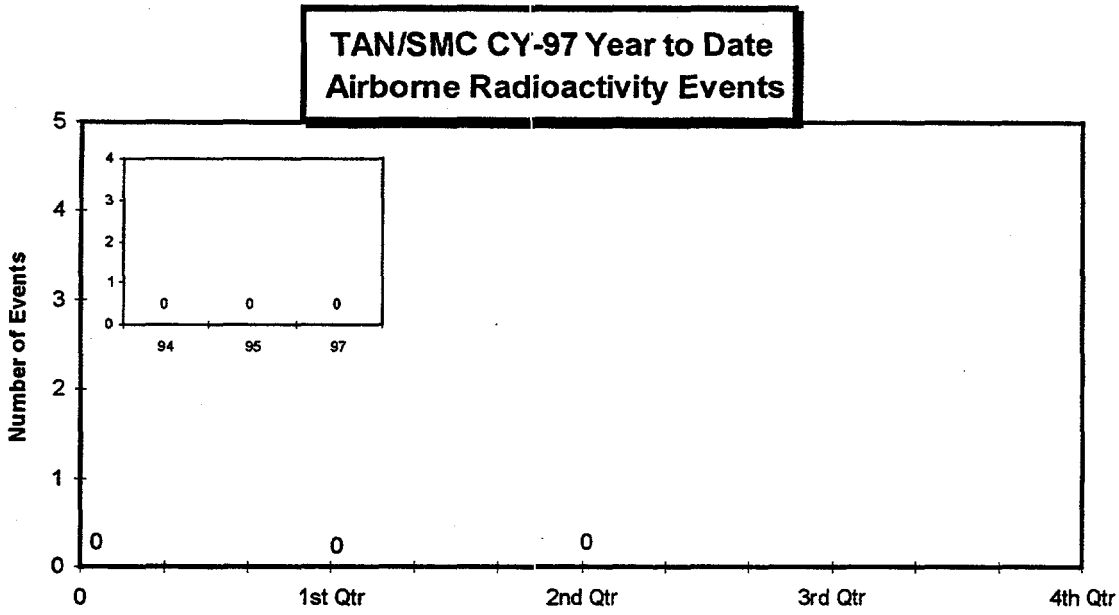
The average worker dose at the TAN/SMC through the end of the second quarter was 0.032 rem based on 77 workers who received dose greater than 10 mrem.



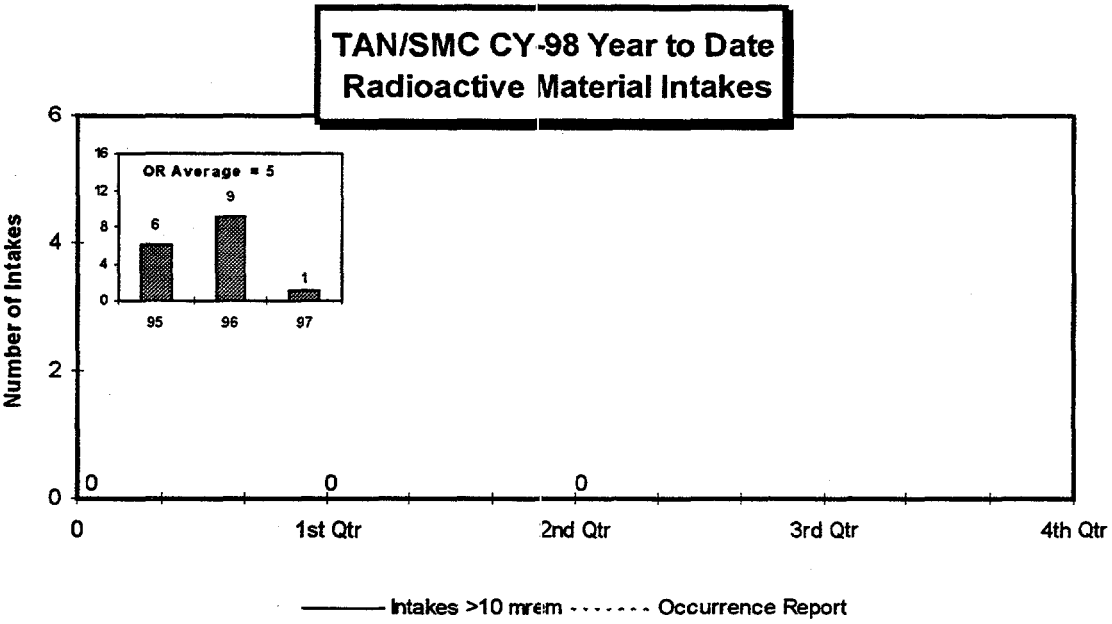
There were no skin contaminations at TAN/SMC during the second quarter. There were no facial or wound contaminations during the quarter.



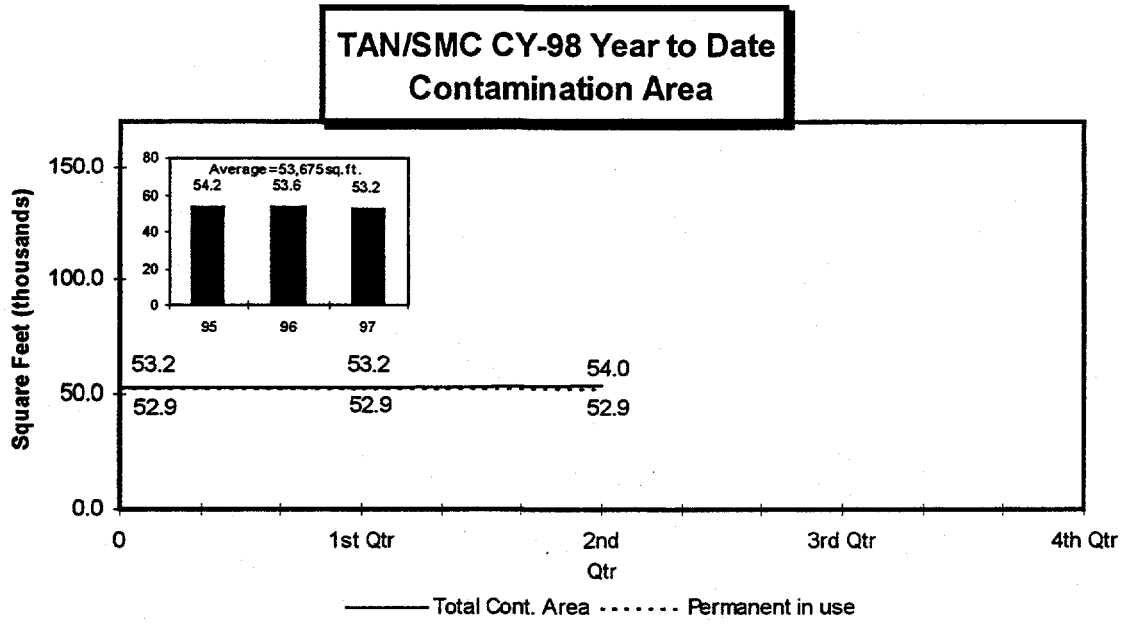
There was no contamination that occurred at TAN/SMC during the second quarter.



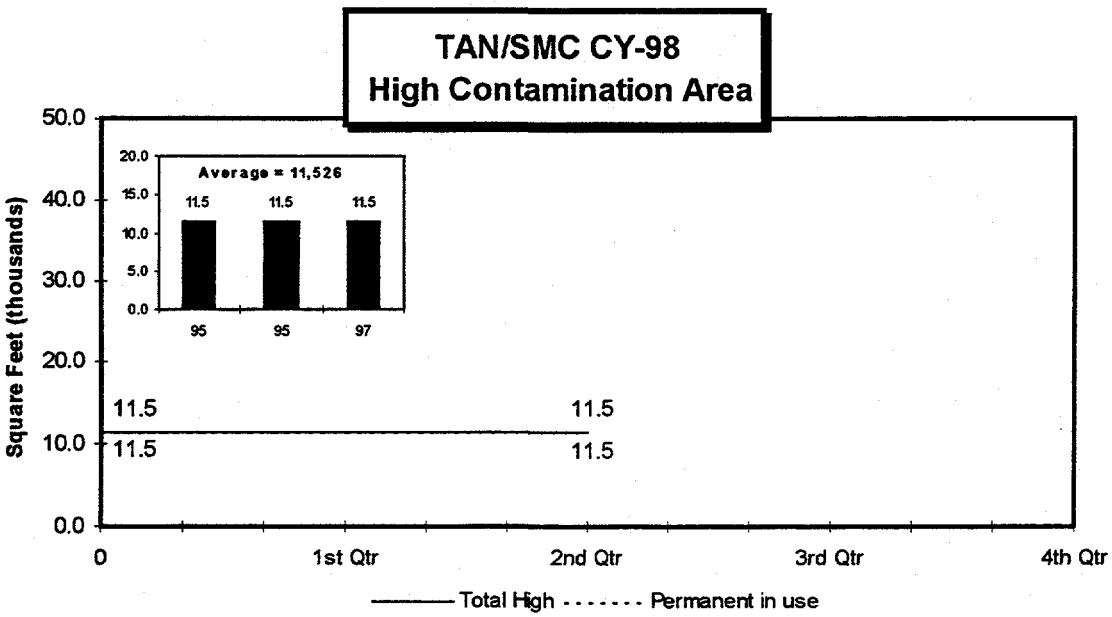
No airborne activity event greater than 10 % DAC was detected at TAN/SMC in areas not posted as Airborne Radioactivity Areas during the second quarter.



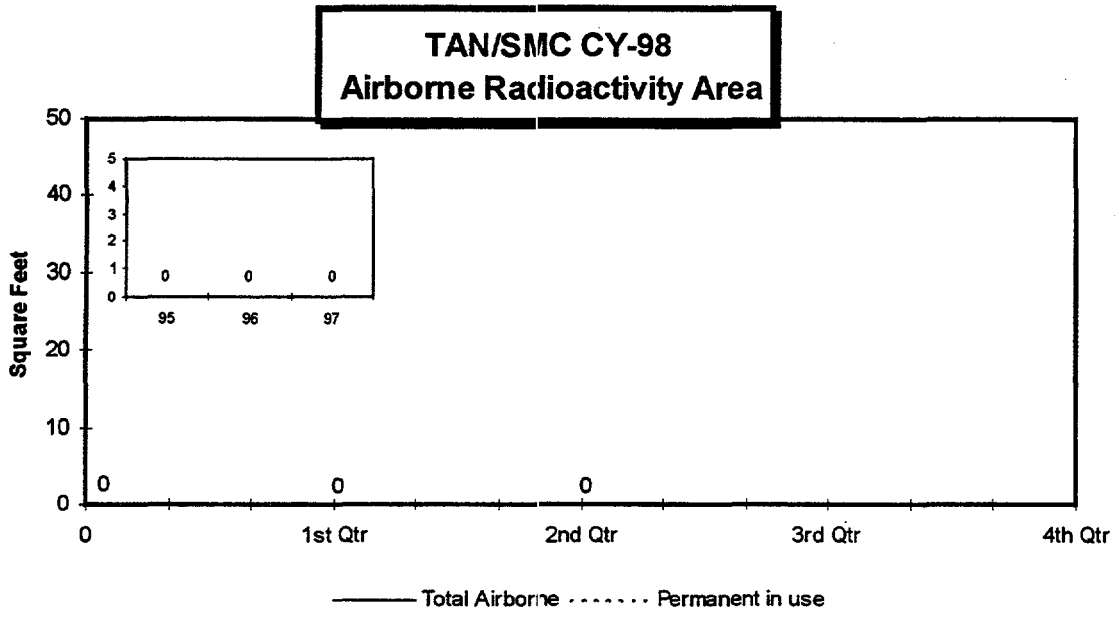
No internal uptakes have occurred at TAN/SMC, year to date.



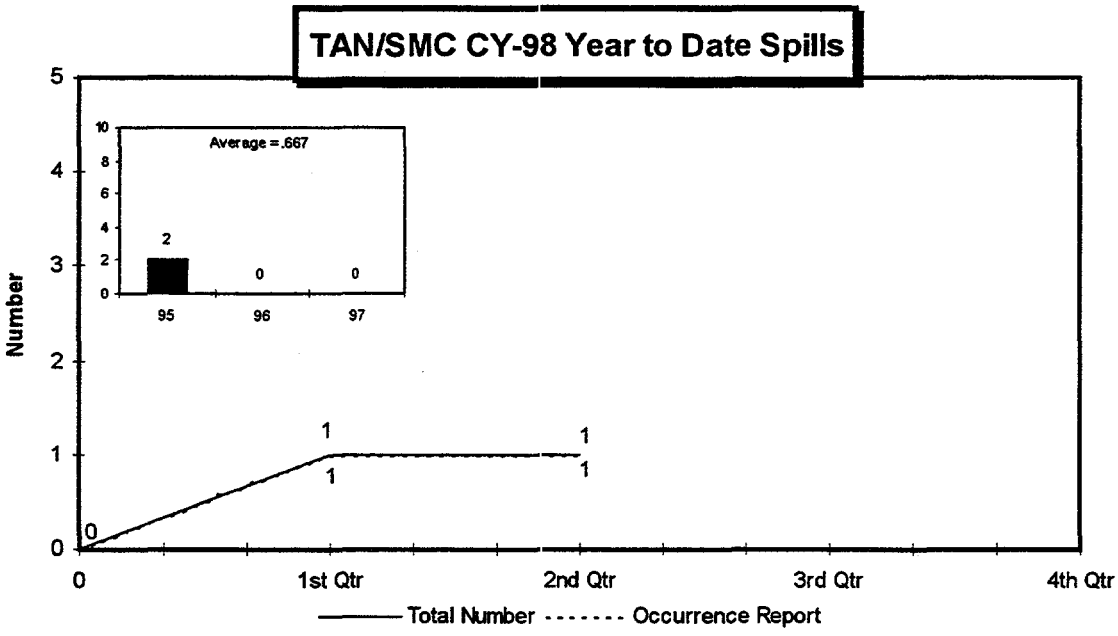
The total Contamination Area at TAN/SMC at the end of the second quarter was 54,022 square feet. 52,926 square feet was designated as permanent and in-use.



The total High Contamination Area at TAN/SMC at the end of the second 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 second quarter.



One spill occurred at TAN 666 as a result of back-flow from the number three holding tank up through floor sumps in the first quarter. There have been no spills this quarter.