Idaho National Engineering and Environmental Laboratory

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(4TH QTR)

February 1999

IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY RADIOLOGICAL CONTROL PERFORMANCE INDICATOR REPORT

FOURTH QUARTER – CALENDAR YEAR 1998

LOCKHEED MARTIN

INEEL/EXT-98-00148 (4th QTR)

Idaho National Engineering and Environmental Laboratory Radiological Control Performance Indicator Report

Fourth Quarter Calendar Year 1998

Published February 1999

Idaho National Engineering and Environmental Laboratory
Radiological Control
Lockheed Martin Idaho Technologies Company
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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.

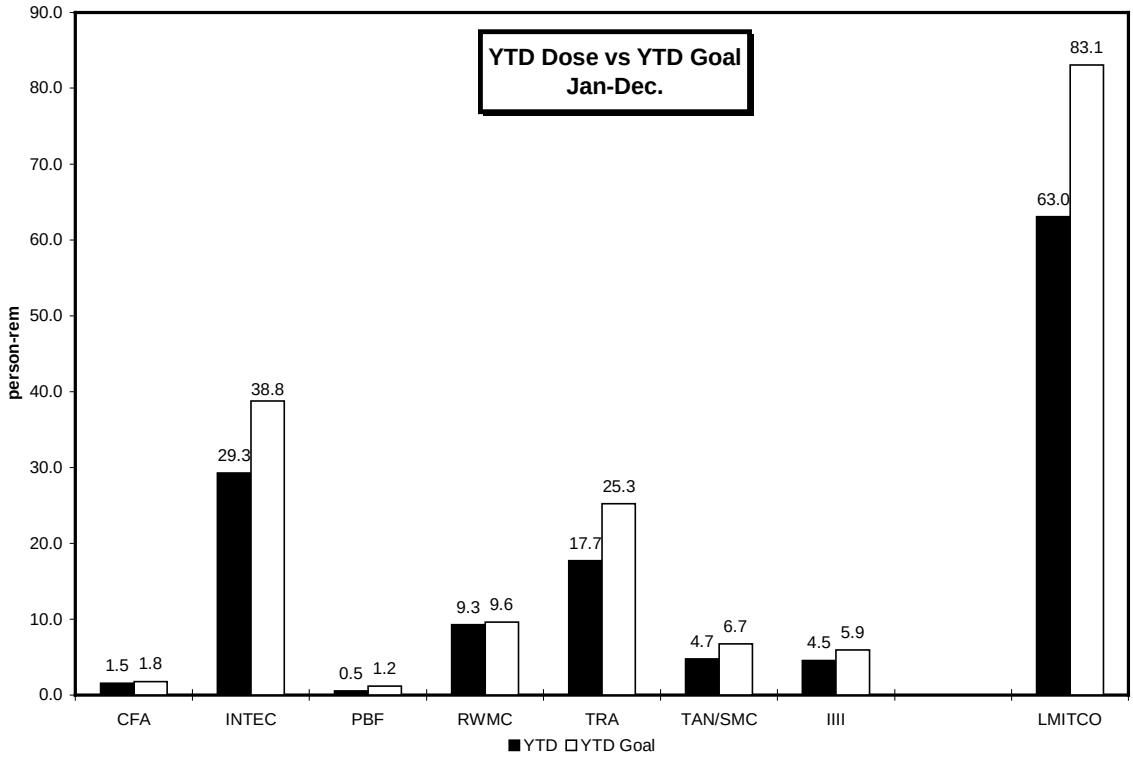
- The Environmental Management Operations Support Department reports the volume and radioactivity content of radioactive waste in the INEEL Radioactive Waste Management Annual Report and on the Radioactive Waste Management Information System (RWMIS).

- 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
Fourth Quarter 1998

This document provides a report and an analysis of the Radiological Control Program through the fourth quarter of Calendar Year 1998 (CY-98) and is the annual report 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 collective occupational radiation deep dose is 63.034 person-rem year to date, compared to a goal of 83.1 person-rem. The site dose goal was previously reduced due to work scope reductions at the Idaho Nuclear Technologies and Engineering Center (INTEC). During the fourth quarter, all areas experienced deletions of work resulting from the Maintenance Stand Down. This reduction in work is a primary factor in the difference in the year end dose and the ALARA goal. The work will be completed during CY-99.



International Isotopes Idaho Inc. (IIII) is a privatized organization responsible for the TRA Hot Cell operation. Since they are not part of LMITCO, their totals are not carried in the INEEL totals. The IIII data is for information only.

Beginning in CY-98, a numeric Radiological Performance Index (RPI) is being used to compare radiological performance. The RPI takes into consideration 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:

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

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 fourth quarter there were 280,940.3 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 tables provide 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.

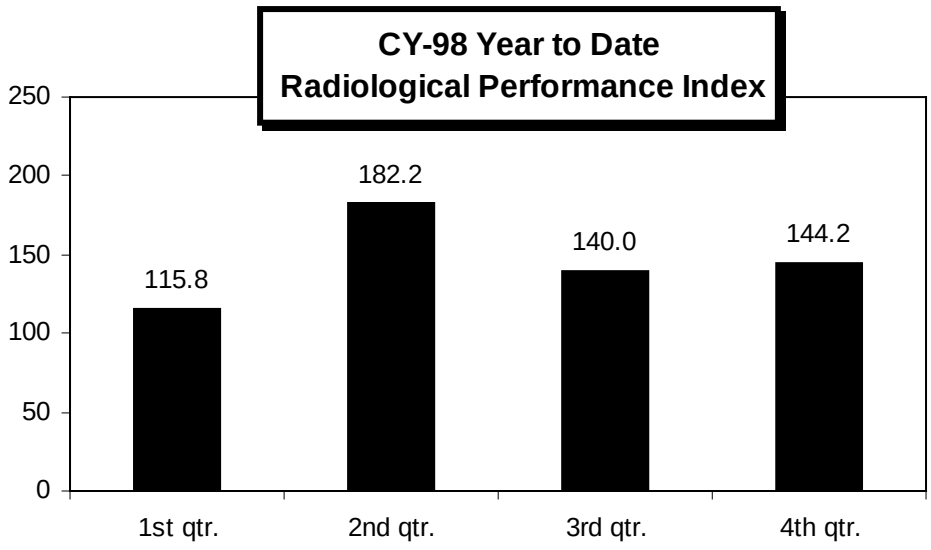
CY-98 Fourth Quarter Contributors

	CFA	INTEC/CPP	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	0	0
UR	0	5	1	0	0	1
AEE	0	0	0	0	0	0
CCE	0	10	1	0	5	0
PBF	0	0	0	0	0	0

CY-97 Fourth 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	7	1	0	4	1
UR	0	4	0	0	1	0
AEE	0	0	0	0	0	0
CCE	0	14	0	0	10	0
PB	0	1	0	0	0	3

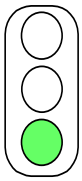
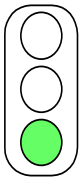
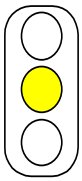
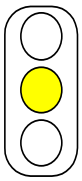
The following chart is used to compare quarterly data during this year as a baseline is established. A comparison of contributors for the same time period in the tables above show this year's fourth quarter as being an improvement over the previous year's values.



Using the CY-97 fourth quarter performance values, and the same RWP hours, we have postulated an index of 260.96 for 97 compared to the 144.2 for this year's fourth quarter. The RPI provides a good comparison since it is valued based on hours worked in radiological environments (i.e. RWP hours)

INEEL Radiological Control Performance Indicator Overview

Fourth Quarter 1999

		Actual	Goal or Average
Collective Year-to-Date Penetrating Radiation Dose		63.034 person-rem	83.070 person-rem (Goal)
Year-to-Date Average Worker Dose		0.057 rem	0.116 rem (3 Year Average)
Maximum Year-to-Date Penetrating Dose to a Worker		0.844 rem	1.500 rem (Goal)
Maximum Year-to-Date Neutron Dose to a Worker		0.082 rem	0.110 rem (3 Year Average)

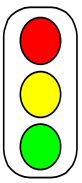
Skin contaminations are included in the performance index on page 5 and will no longer be shown in this area.

Legend

Needs Attention

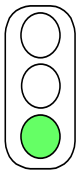
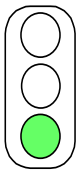
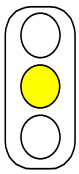
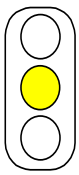
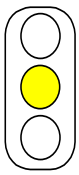
OK

Good



Compared to 3 year average or goal.

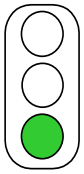
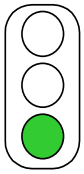
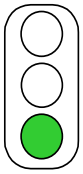
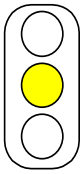
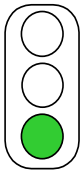
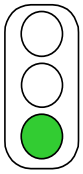
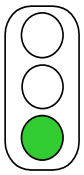
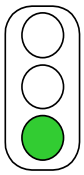
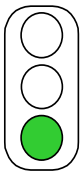
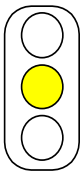
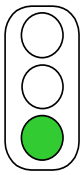
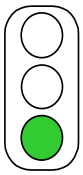
Year-to-Date clothing contaminations are shown in the RPI on page 5 and will no longer be shown on this page.

		Actual	Goal or Average
Year-to-Date Airborne Events > 10% DAC		0	0 (3 Year Average)
Year-to-Date Radioactive Material Intakes ≥ 10 mrem CEDE		0	12 (3 Year Average)
Contamination Area		193,427 ft^2	193,218 ft^2 (3 Year Average)
High Contamination Area		291,648 ft^2	297,767 ft^2 (3 Year Average)
Airborne Radioactivity Area		80,172 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

Fourth Quarter 1999

	CFA	INTEC	PBF	RWMC	TRA	TAN/SMC
Collective Year-to-Date Penetrating Radiation Dose (person-rem)						
	1.521	29.276	0.509	9.273	17.725	4.730
Year-to-Date Average Worker Dose (rem)						
	0.012	0.065	0.013	0.089	0.062	0.044

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.

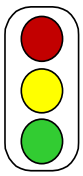
Year to date skin contaminations are included in the performance index on page 5, and will no longer be shown on this page.

Legend

Needs Attention

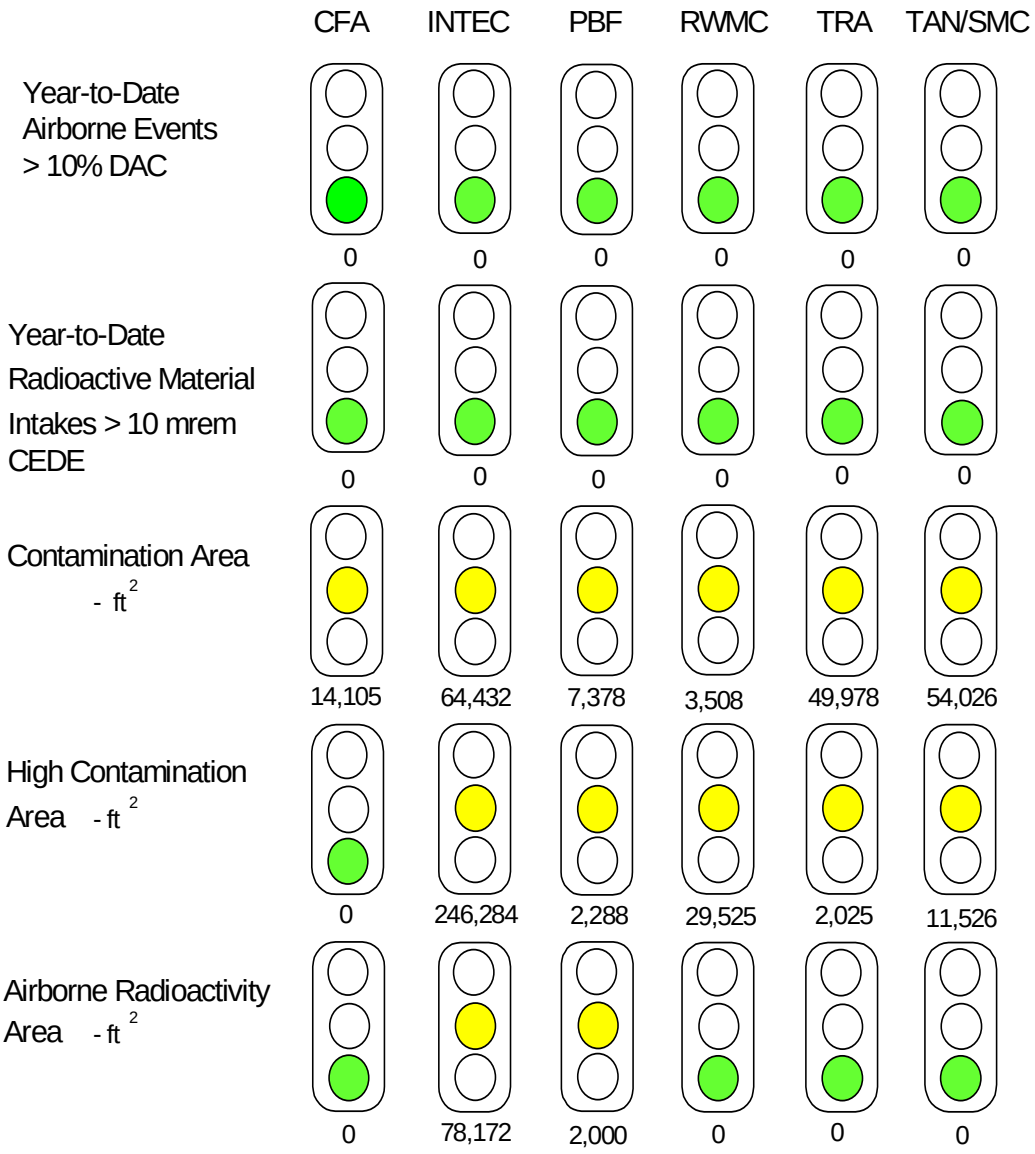
OK

Good



Compared to 3 year average or goal.

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



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 -

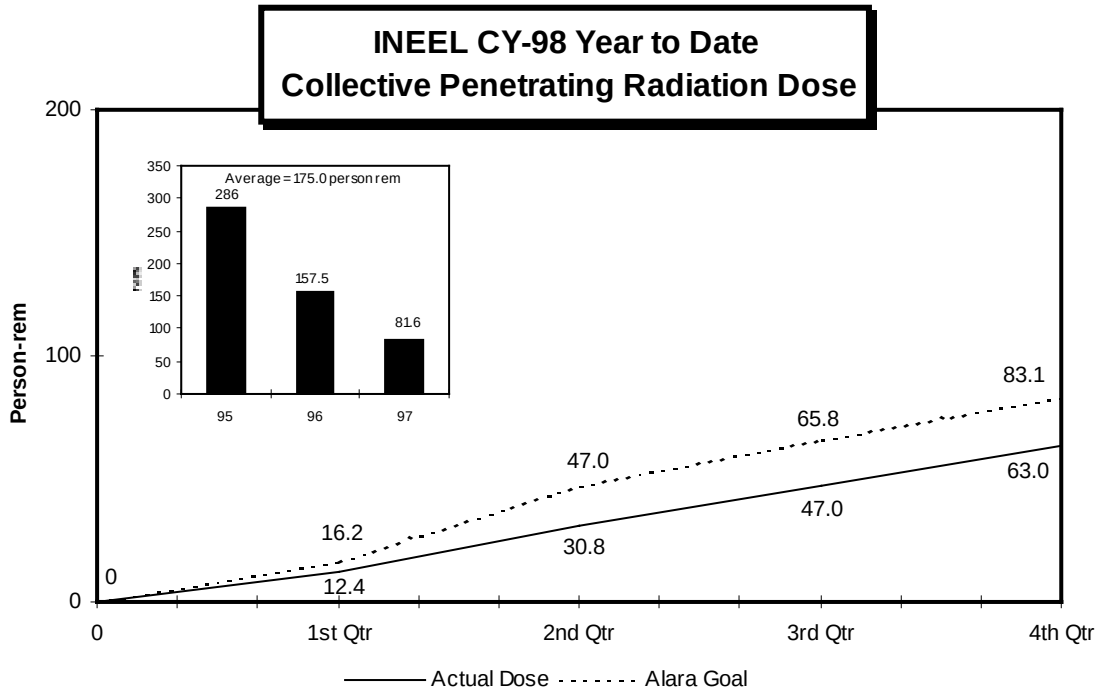
The total area in square feet that falls within the description of an Airborne Radioactivity Area as defined in Table 2-4 of the INEEL Radiological Control Manual.

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.

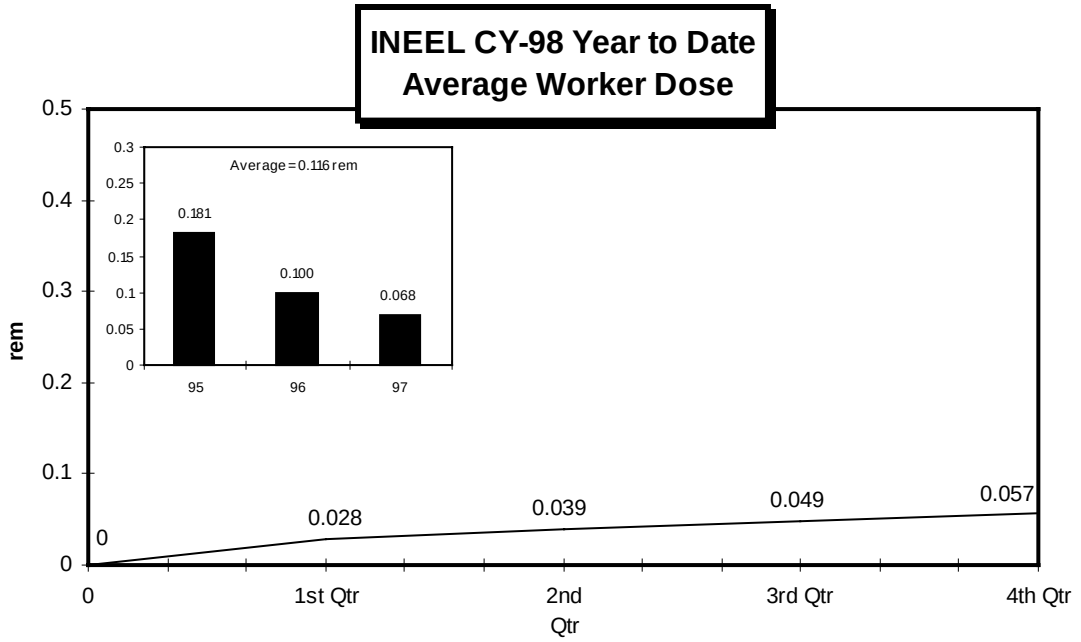
This chart and the charts on the following pages continue to provide an indication of how well LMITCO is performing as a company. Following the company charts are charts showing the six specific facility areas and their performance in selected indicators.



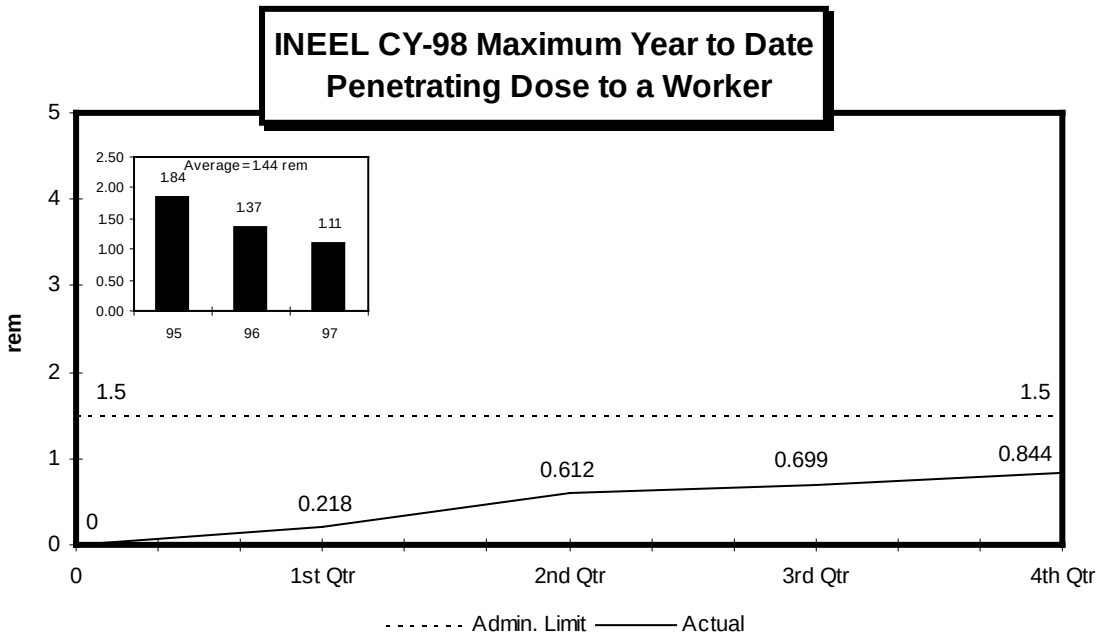
DOE and LMITCO policy is to maintain occupational radiation exposure as low as reasonably achievable (ALARA). The above chart provides a comparison of the INEEL goal and the total year to date collective penetrating radiation dose.

The CY-98 ALARA goal was decreased to 83.1 person-rem in the third quarter to accommodate a goal revision at INTEC from 56.5 person-rem to 38.8 person-rem. The decrease is based on work scope changes from NWCF turnaround operations, valve box B-9 work and deletions of work resulting from the Maintenance Stand Down. Further reductions in work from the stand down during the fourth quarter resulted in lower doses than expected. The LMITCO year end total is 63.034 person-rem.

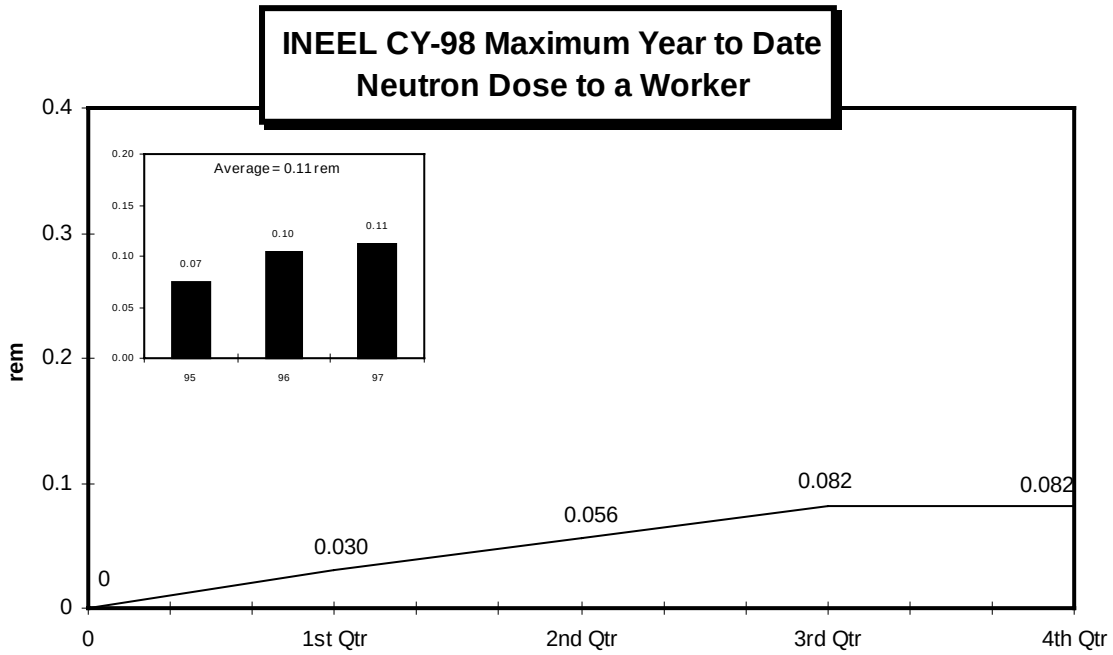
The collective exposure is well below the goal primarily due to implementation of ALARA protective measures at INTEC. These include filling, soaking and rinsing the calciner vessel, identifying and eliminating hot spots through use of a remote Gamma Cam™, remote grouting at the WCF, etc. Work stoppages due to the Maintenance Stand Down added to dose reductions at all facilities. This work will be added to CY 99 work scope and goals will likely increase.



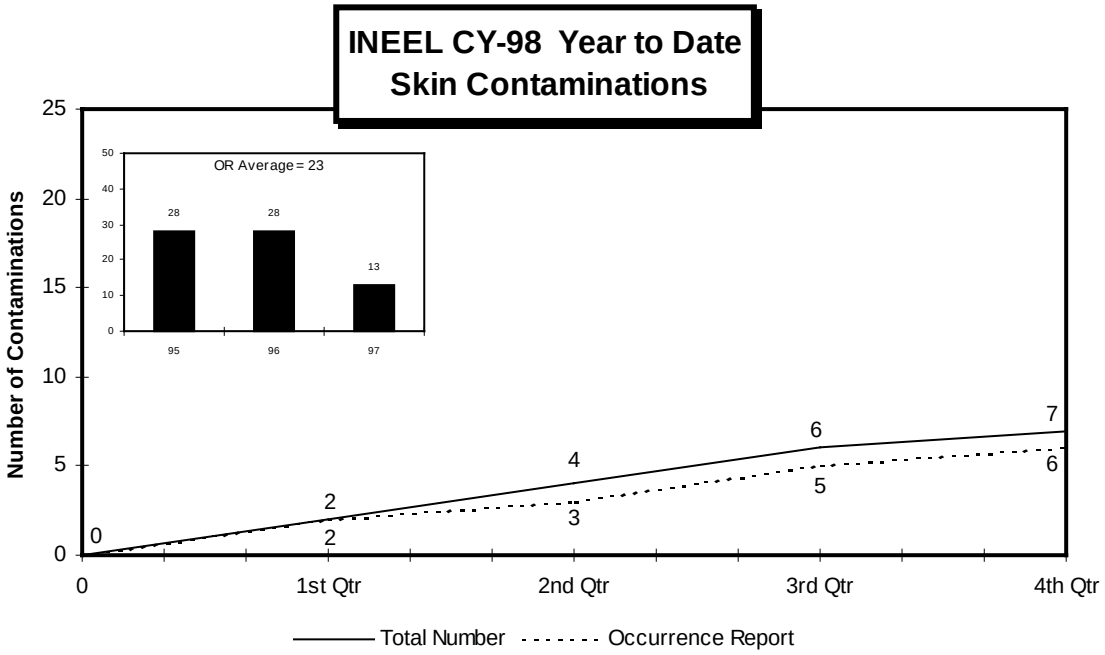
The Average Occupational radiation dose for INEEL workers through the end of the fourth quarter was 0.057 rem based on 1107 workers who received dose greater than 10 mrem. There has been a total of 280,940.3 Radiation Work Permit hours this year.



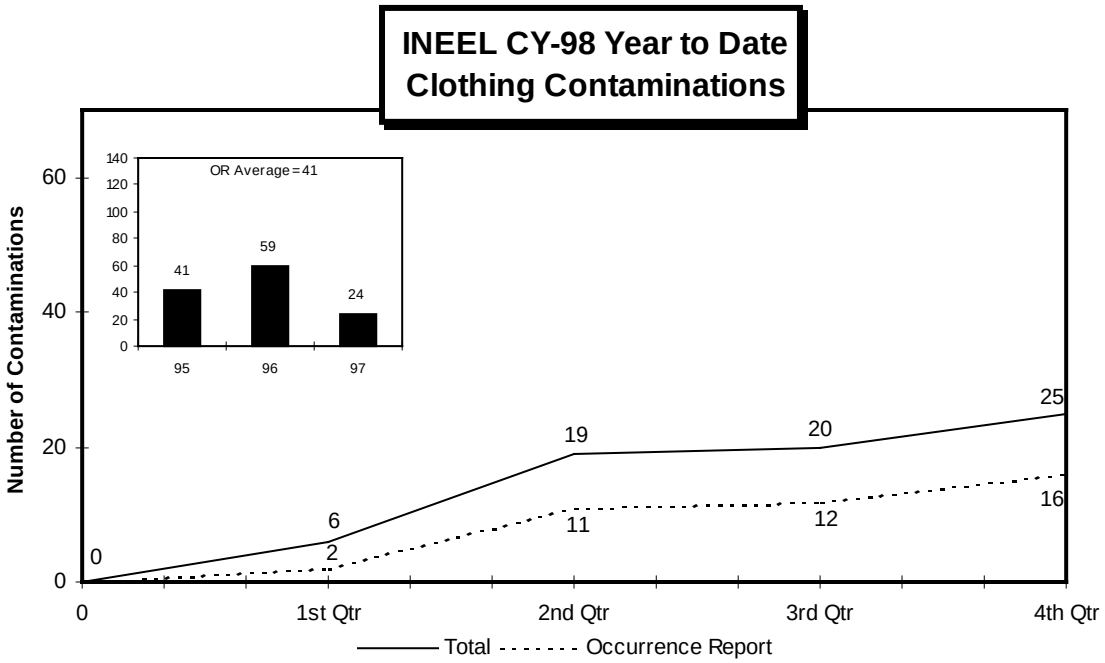
The Maximum penetrating radiation dose to a worker through the end of the fourth quarter was .844 rem. The dose resulted from activities associated with INTEC.



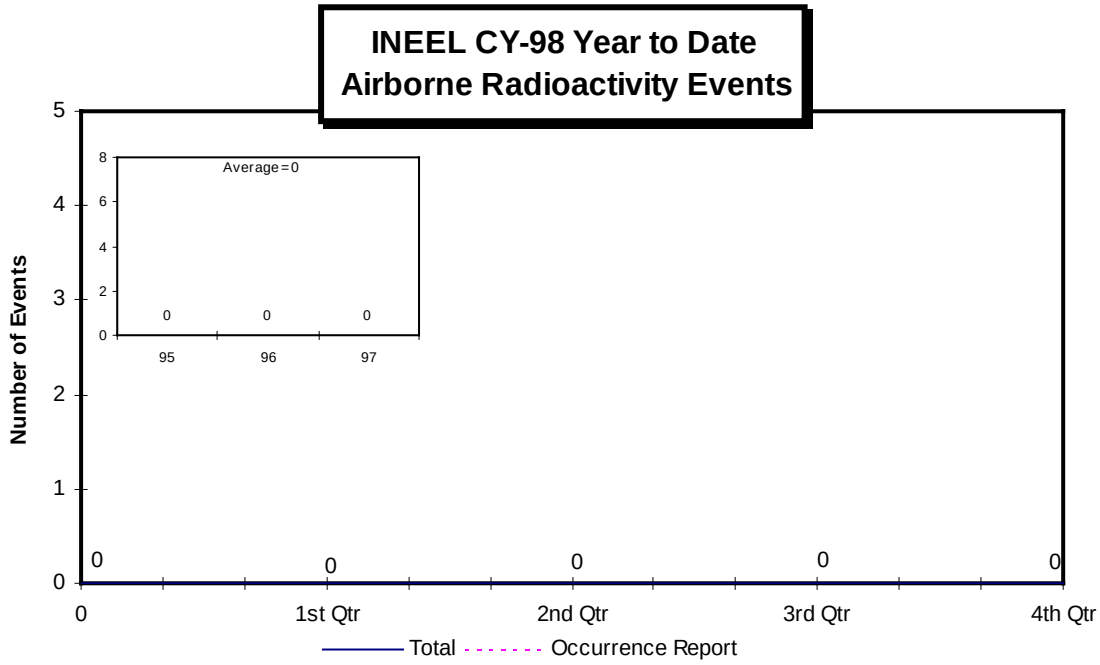
Neutron dose is included in the total penetrating radiation dose. It is shown here as a separate indicator to identify the maximum neutron dose to a worker. Through the end of the fourth quarter the maximum neutron dose is 0.082 rem. The worker receiving this dose is assigned to the IRC and has been working with neutron sources.



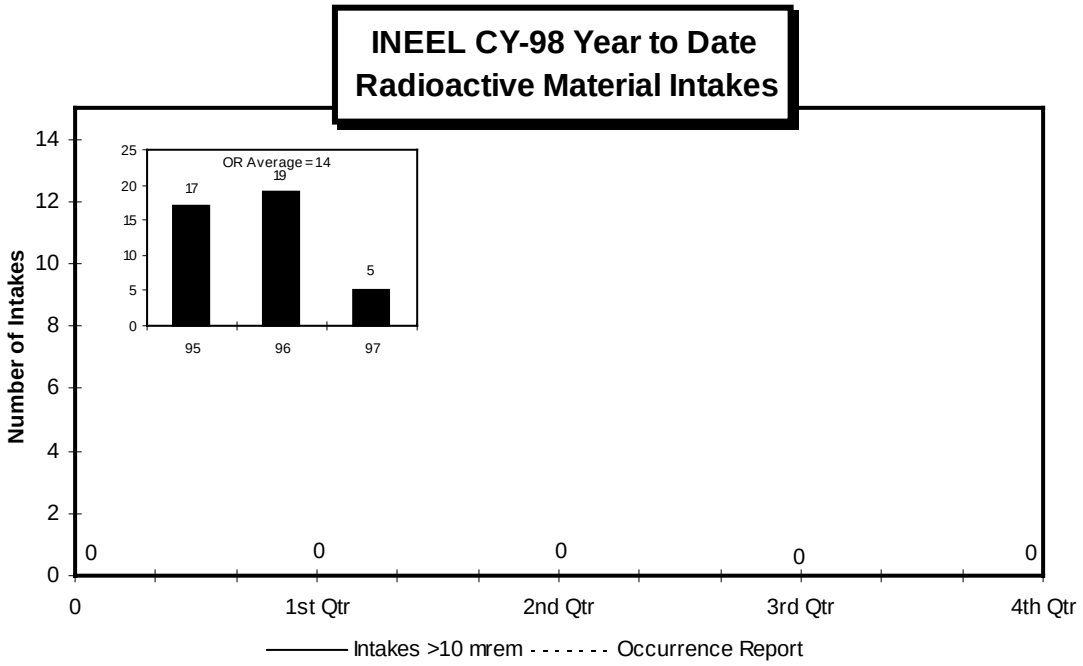
There was one reportable skin contamination at the INEEL during the fourth quarter at the INTEC. There were no facial contaminations or contaminated wounds.



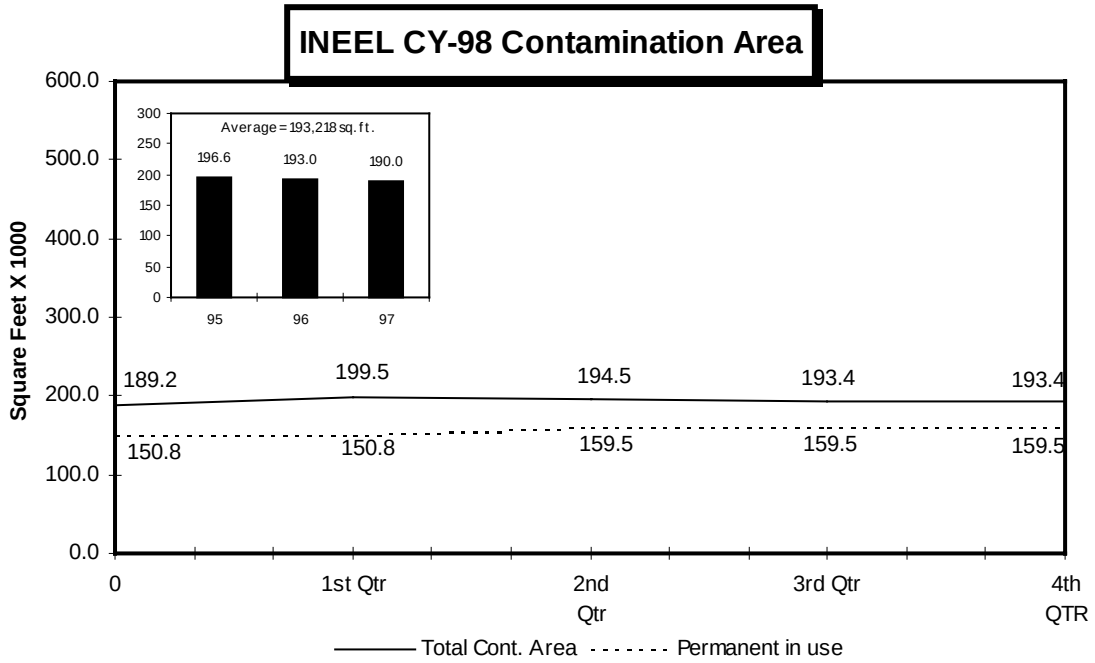
There were five clothing contaminations at the INEEL during the fourth quarter. Two occurred at the TRA, and three at the INTEC. Four of the five were reportable. Detail is contained in the facility summaries.



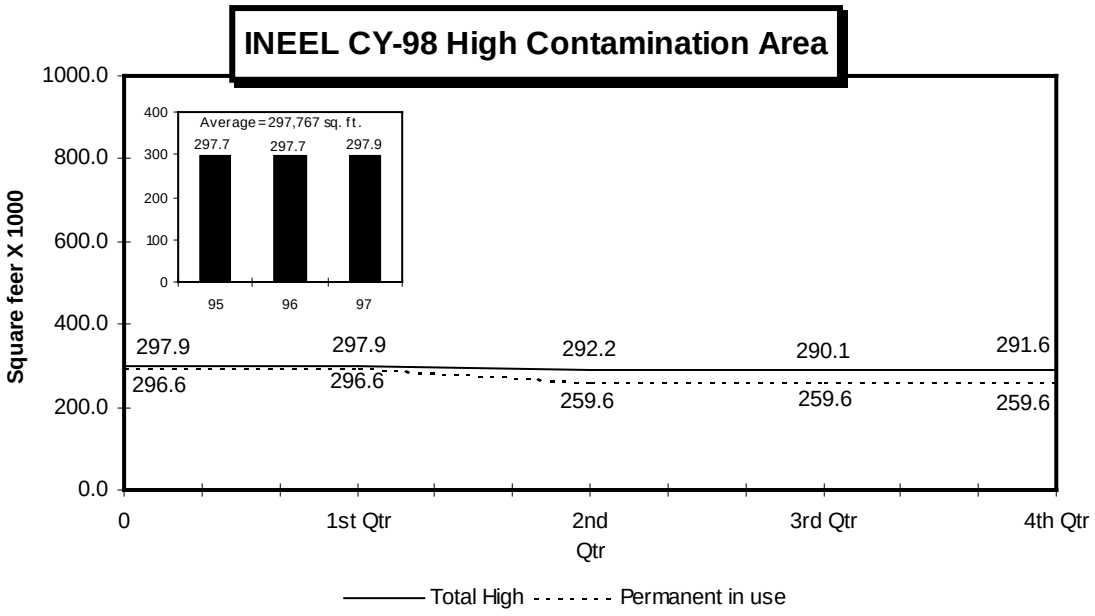
There have been no airborne radioactivity events during the fourth quarter.



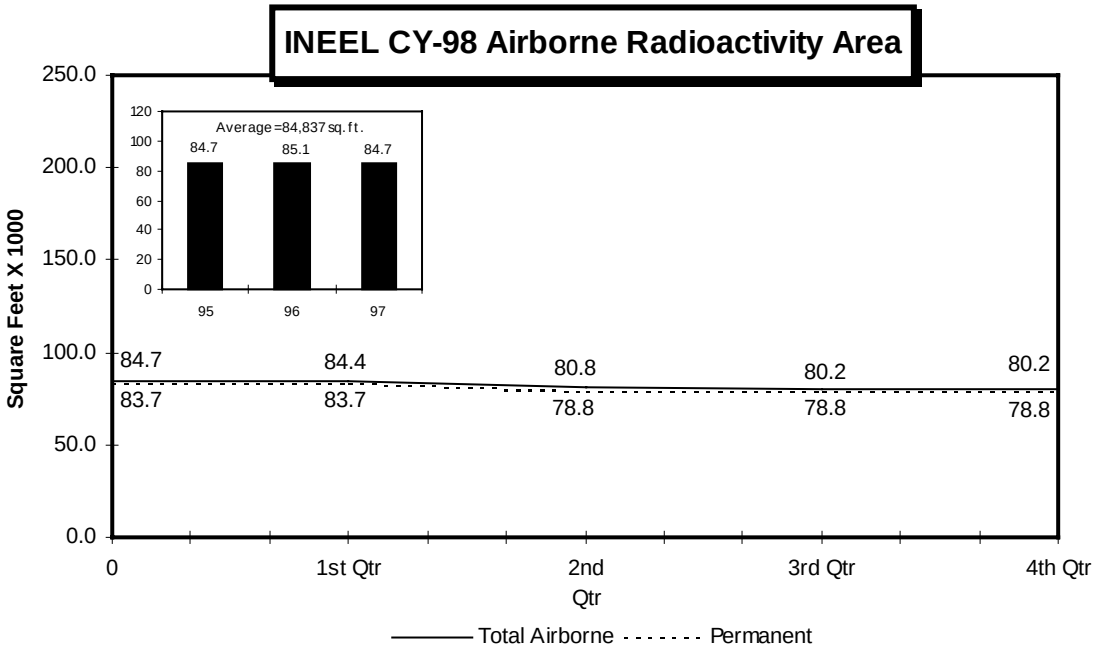
Radioactive material intakes depict the number of positive bioassays that result in a dose assessment of 10 mrem or greater. So far year to date there have been none. Seven routine bioassays are pending final evaluation from the TAN/SMC area.



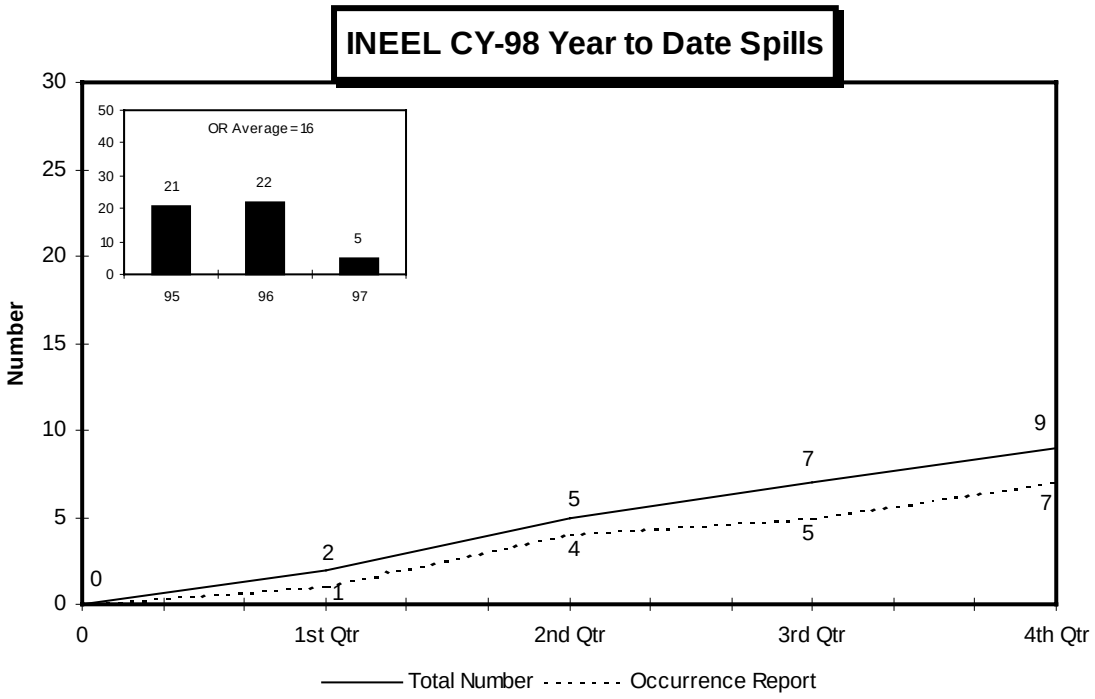
The total area designated as Contamination Area at the end of the fourth quarter was 193,427 square feet. The decrease is from grouting at INTEC. 159,483 square feet is designated as permanent and in use.



Total High Contamination Area at the end of the fourth quarter was 291,648 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.



The total Airborne Radioactivity Area at the INEEL at the end of the fourth quarter was 80,172 square feet. 78,822 square feet is designated as permanent and in use. The reduction is from work clean up at the INTEC.



There were two spills during the fourth quarter. Both spills were reportable, and both were from INTEC. OR ID-LITC-WASTEMNGT-1998-0026 and OR ID-LITC-FUELRCSTR-1998-0015 contain the details. The three-year average noted on this chart represents only those spills that were reportable as ORs in prior report years.

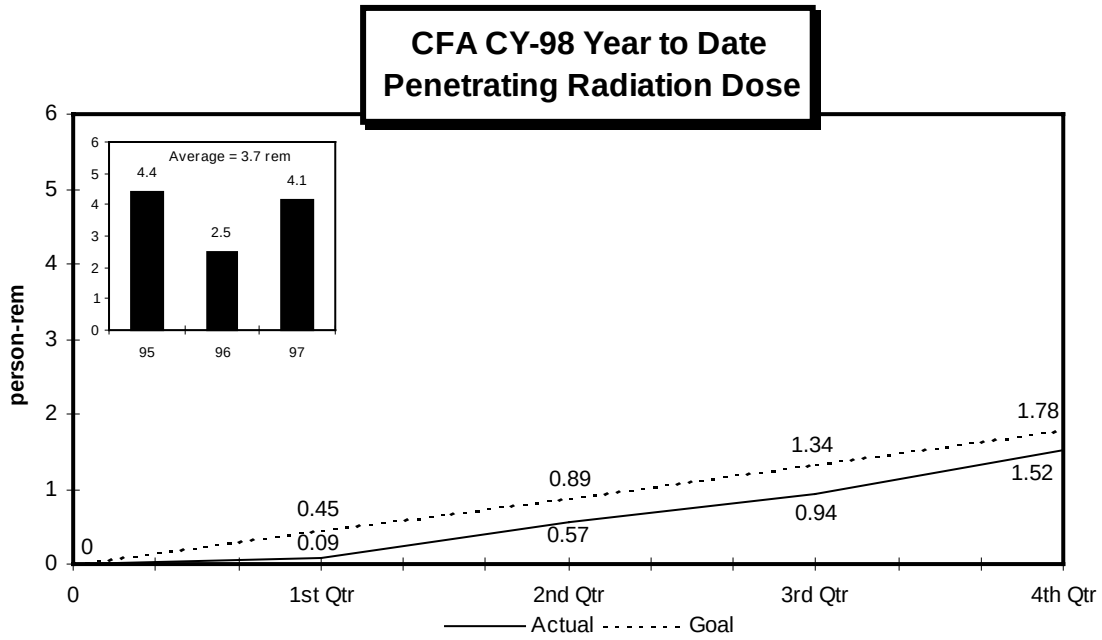
Central Facilities Area

The CFA Facility report also includes
other outlying area information

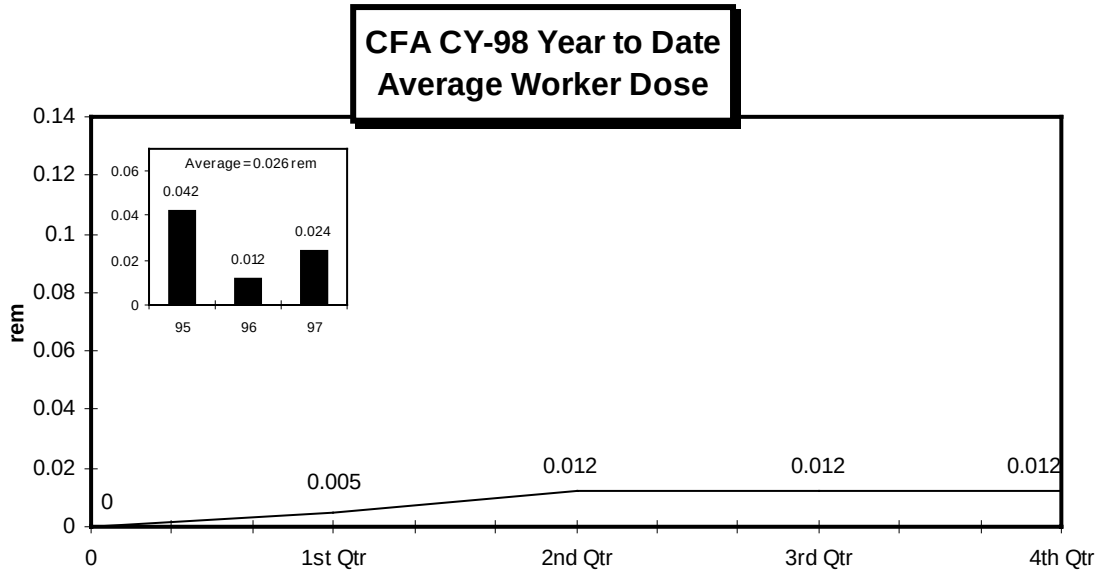
Summary

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

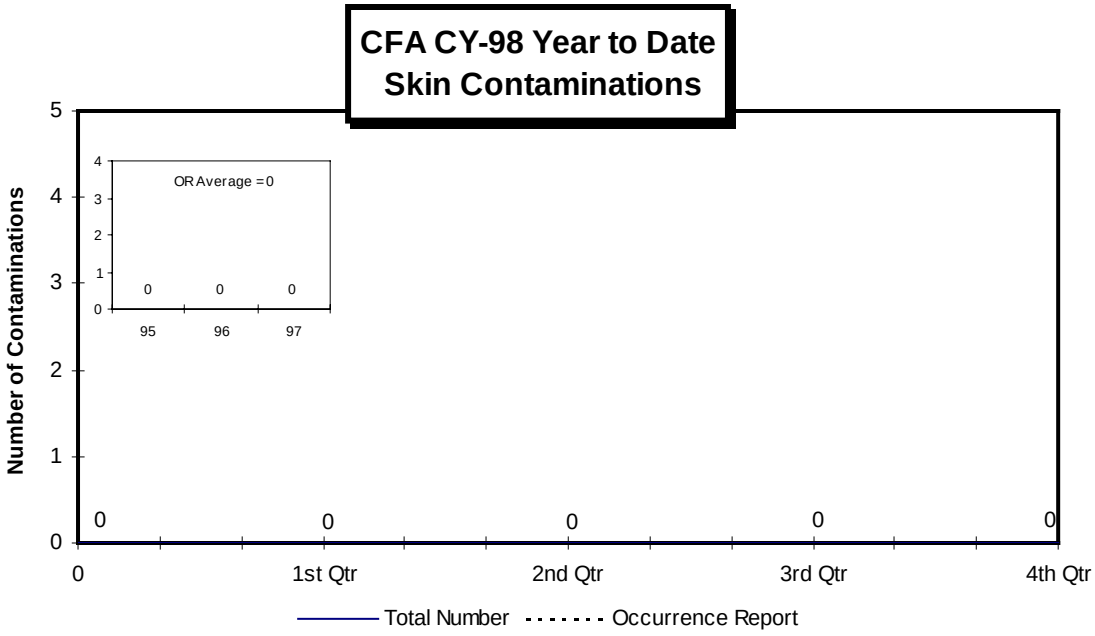
2. Work scope at the CFA is basically similar to that of last year. A complete vehicle survey is taking place, and so far, year to date, no vehicles have been found contaminated.



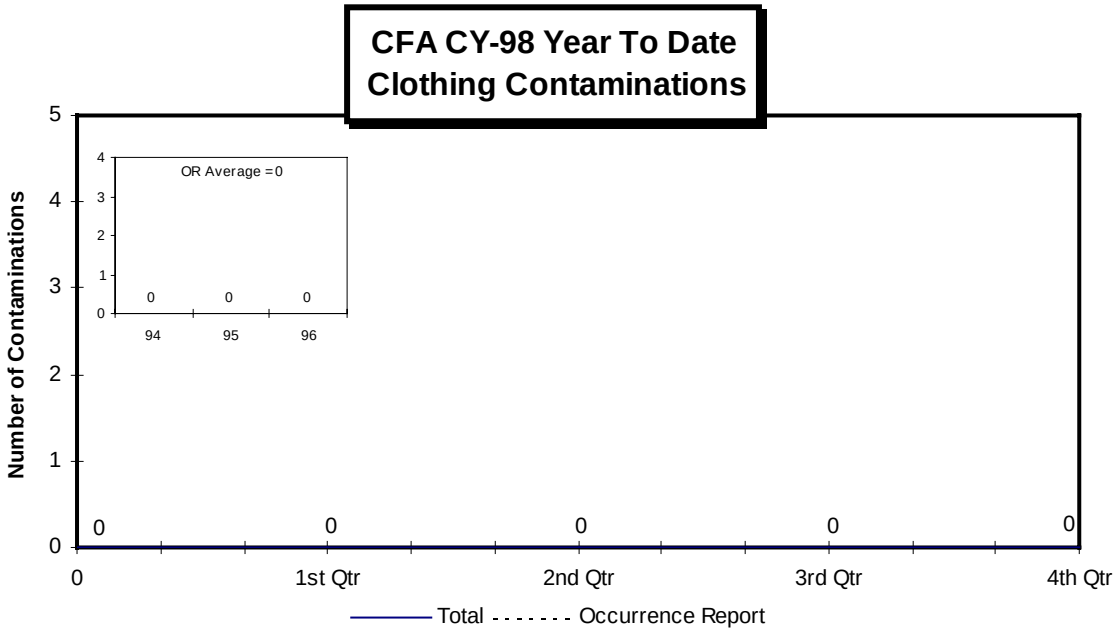
The collective penetrating occupational radiation exposure at CFA through the end of the fourth quarter is 1.521 person-rem. D&D activities, environmental restoration/monitoring and maintenance activities have been the major contributors to CFA dose.



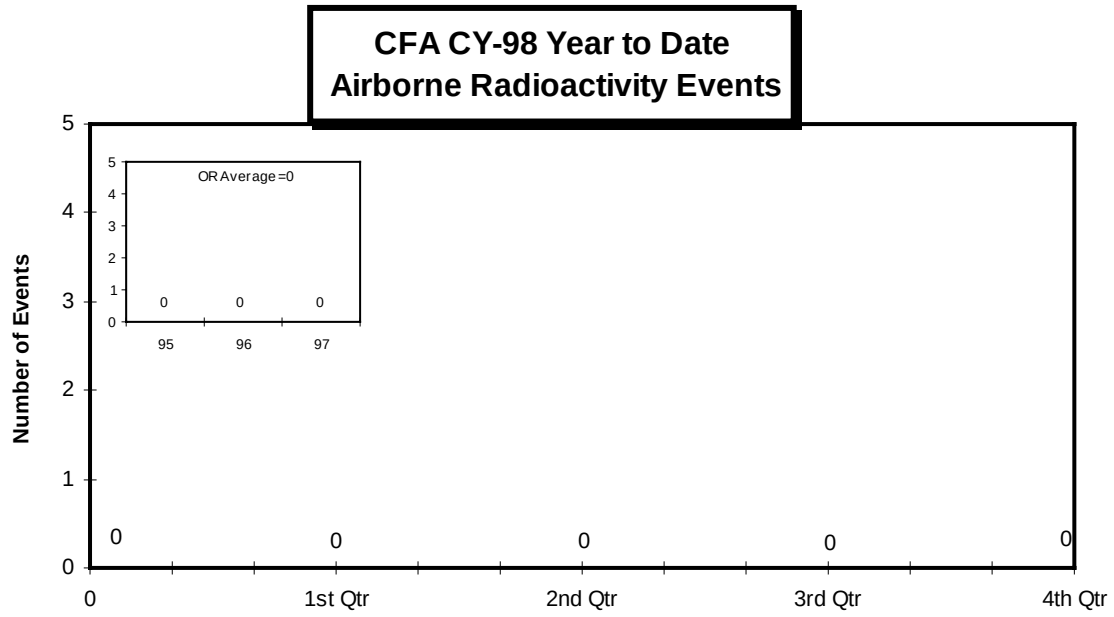
The CFA average worker dose through the end of the fourth quarter was 0.012 rem resulting from 122 workers with dose greater than 10 mrem.



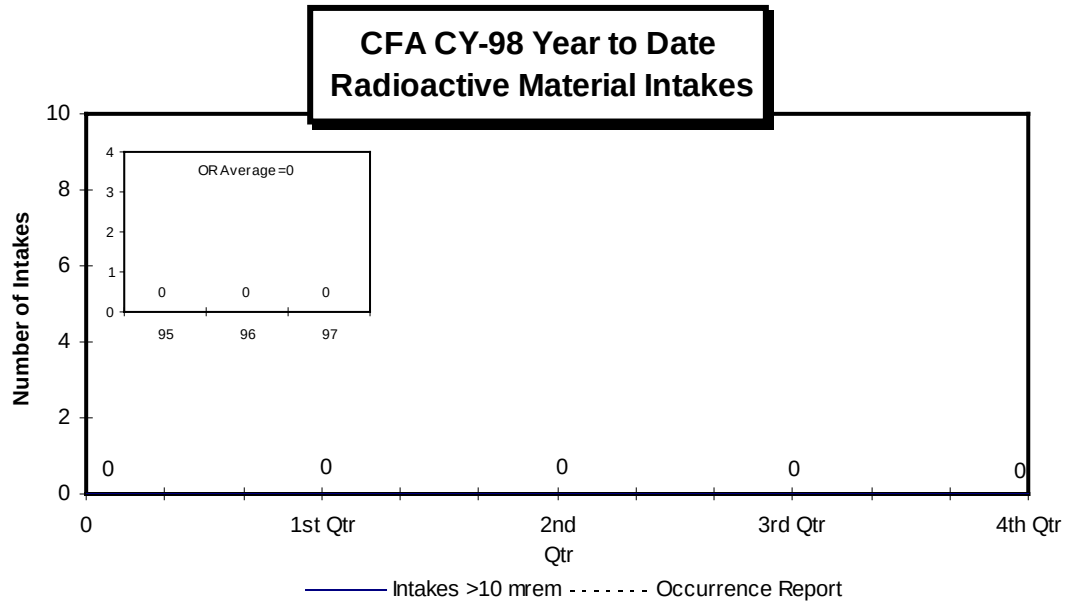
There were no skin contaminations at CFA areas through the end of the fourth quarter.



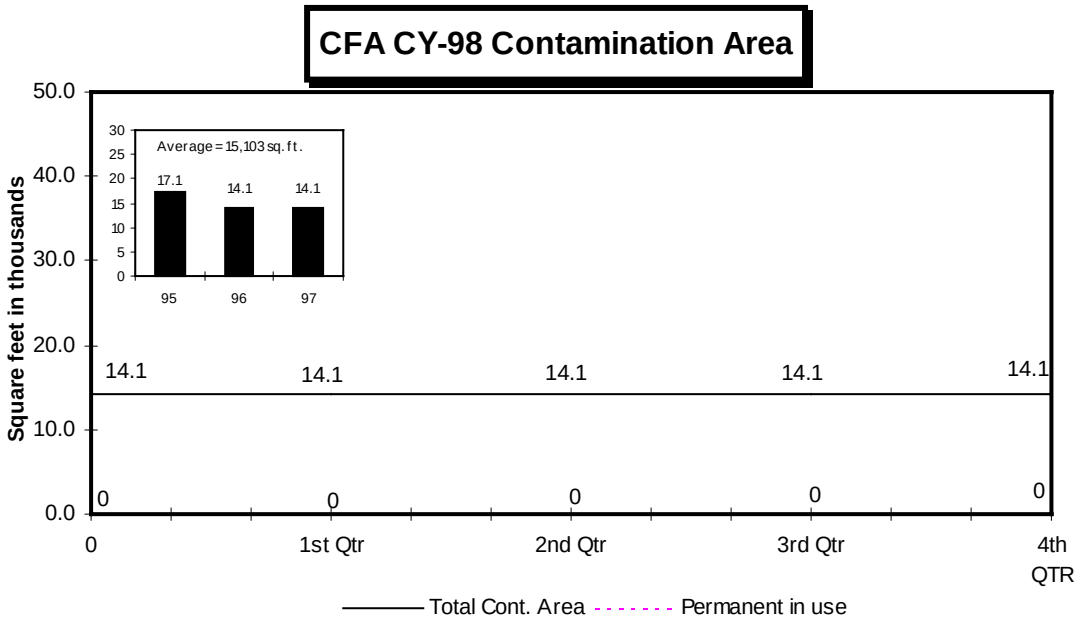
There were no clothing contaminations at CFA areas through the end of the fourth quarter.



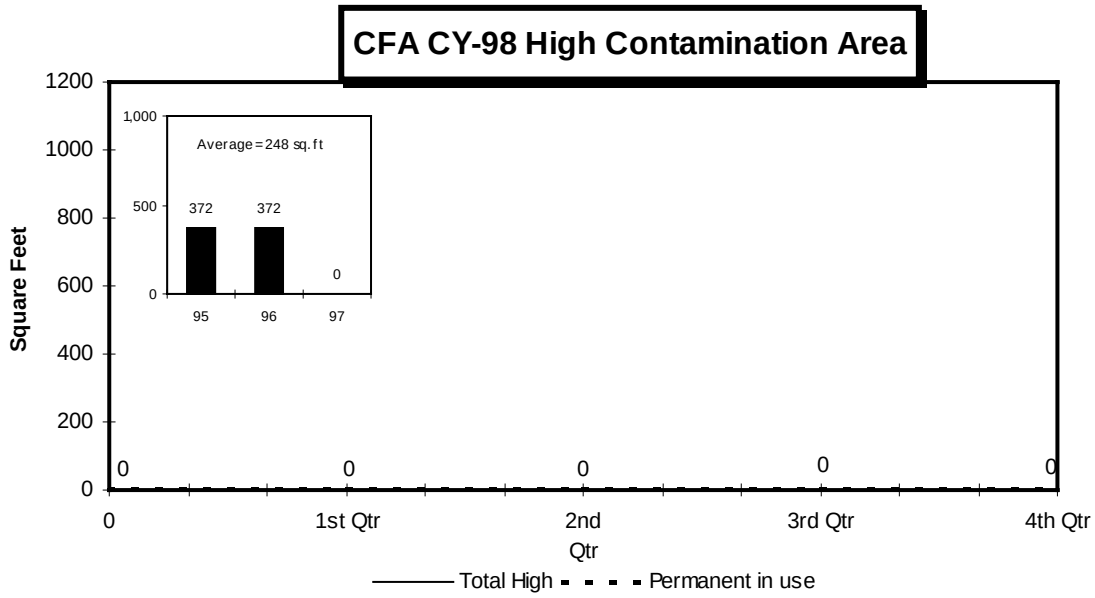
There has been no airborne radioactivity detected that was greater than 10 % DAC at CFA areas through the end of the fourth quarter.



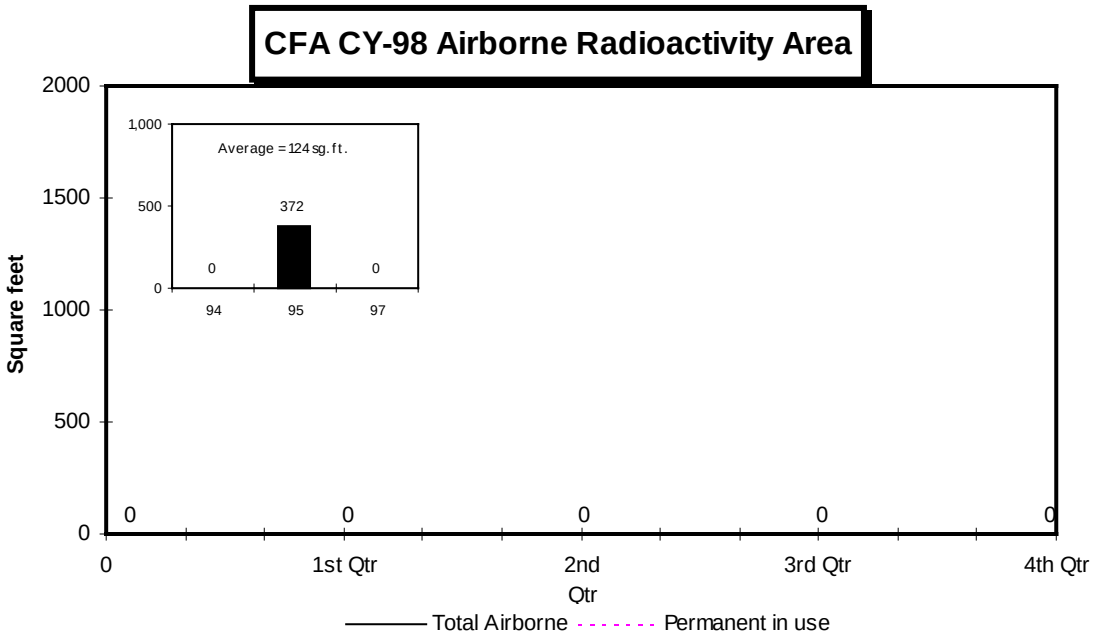
There were no positive bioassays indicating a radioactive material intake that resulted in a dose assessment of 10 mrem or greater at CFA through the end of the fourth quarter.



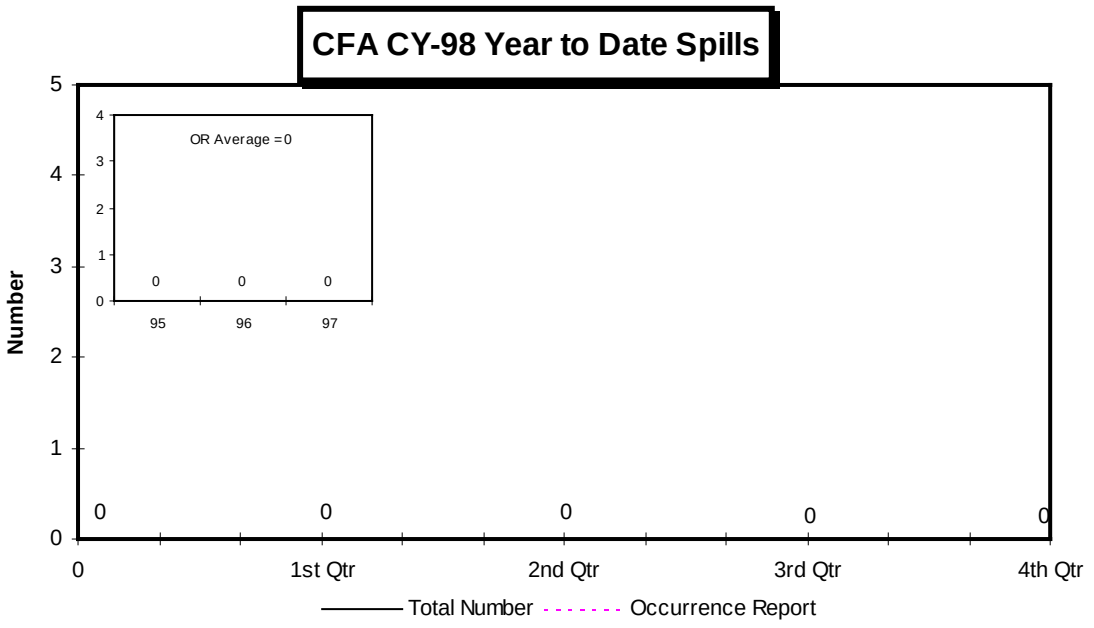
The total Contamination Area at CFA at the end of the fourth quarter was 14,105 square feet. None of this area was designated as permanent and in use.



There are no High Contamination Areas in the area controlled by CFA personnel through the end of the fourth 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 fourth quarter. Vehicle surveys have produced no contamination year to date.

Idaho Nuclear Technology And Engineering Center

INTEC SUMMARY

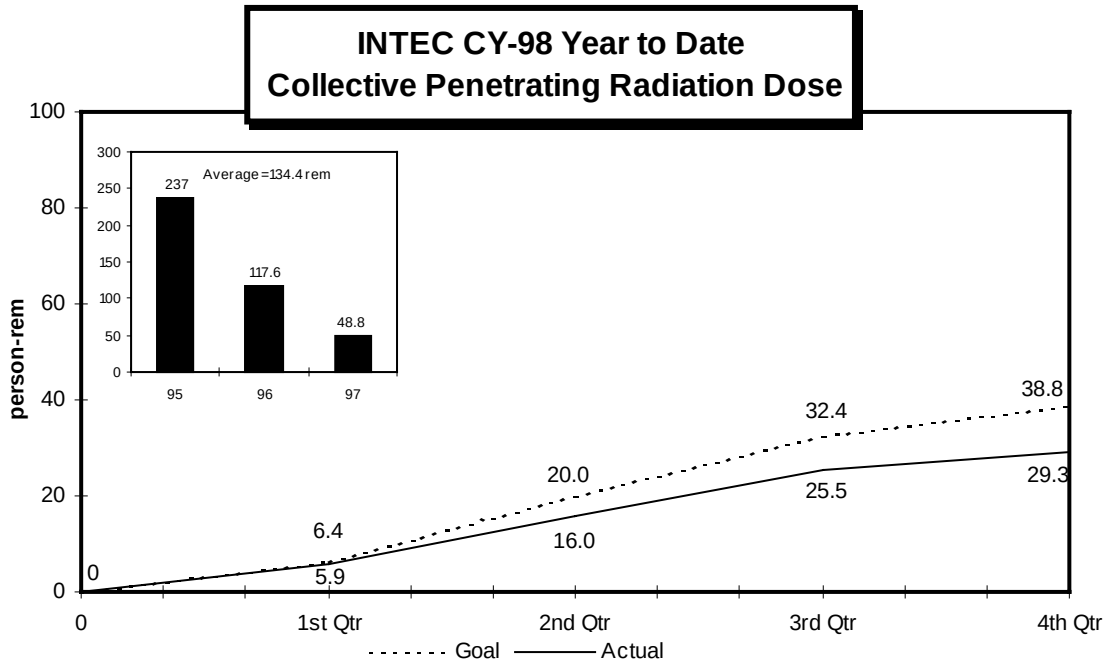
1. Major contributors to the fourth quarter occupational radiation exposure were activities related to fuel movement and storage at CPP 603 and CPP 666, WCF RCRA closure activities and NWCF turnaround activities

2. There was one reportable skin contamination during the fourth quarter. See OR ID-LITC-WASTEMNGT-1998-0023. There were no facial or wound contaminations.

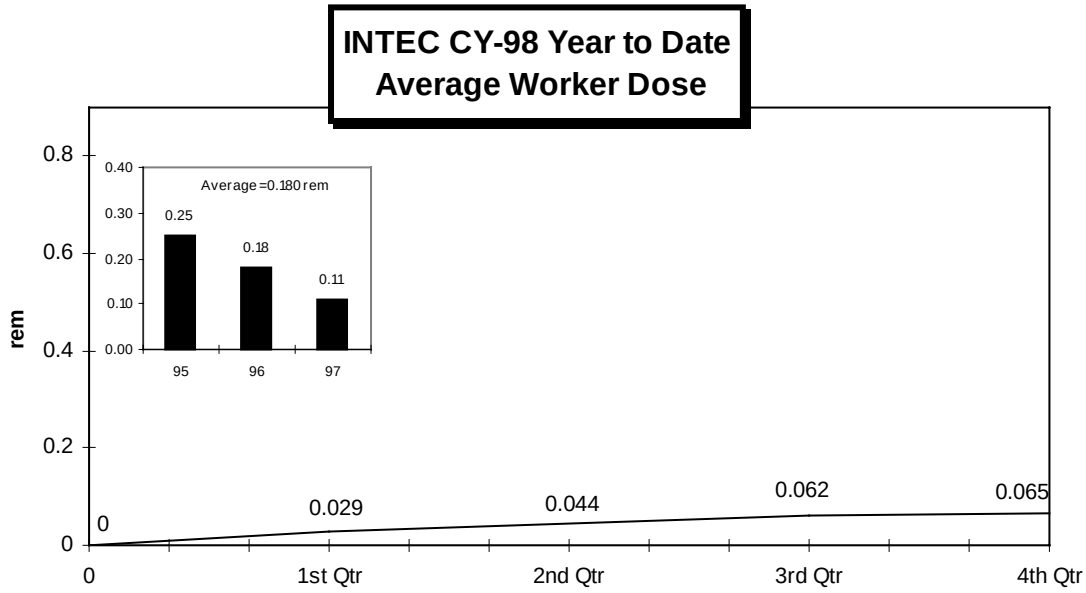
3. There were three reportable clothing contaminations during the fourth quarter. ORs ID-LITC-WASTEMNGT-1998-0018, WASTEMNGT-1998-0026, and ID-LITC-LANDLORD-1998-0032 contain the details. In December, 5 Waste Handling operators and 1 RCT were contaminated. The event in November is suspected to have been caused from contamination at another facility since the nuclide involved, Co-60, is not common to INTEC.

4. There were two reportable spills during the fourth quarter. Details are contained in ORs ID-LITC-WASTEMNGT-1998-0026 and ID-LITC-FUELRCSTR-1998-0015.

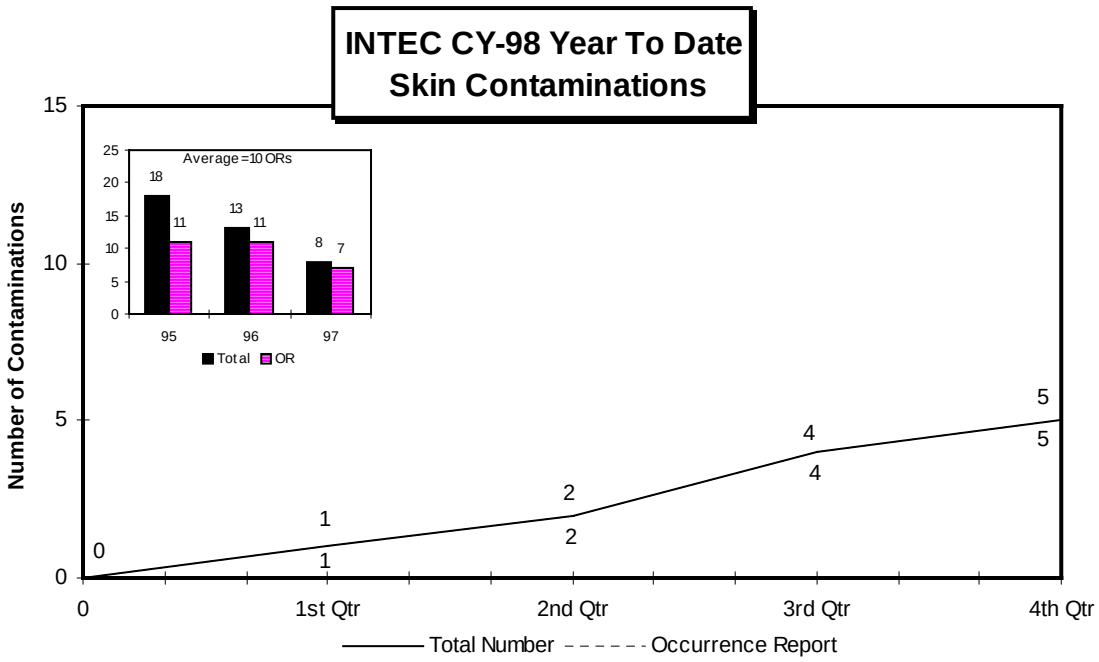
5. An ingestion resulted in a dose of < 1mrem CEDE from work performed in a fume hood. OR ID-LITC-LANDLORD-1998-0027 contains the details.



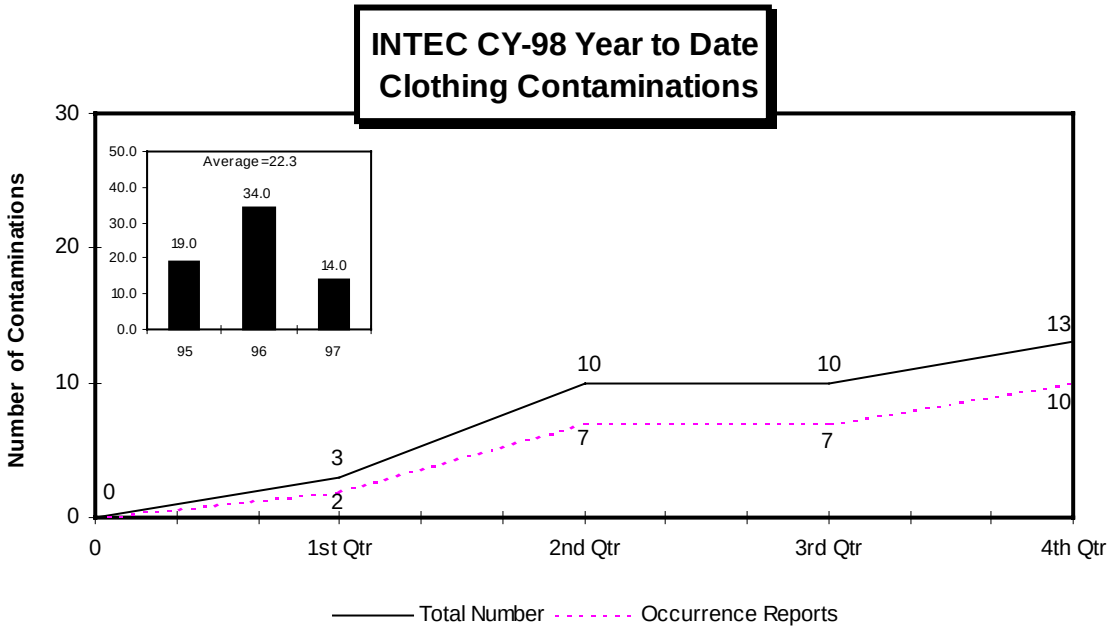
The INTEC collective penetrating occupational radiation exposure through the end of the fourth quarter was 29.276 person-rem. Work scope at the INTEC is much less this year than in years past. Reductions in work scope resulted in an ALARA goal revision to 38.81 rem. Application of ALARA Protective Measures (APMs) in planning and working jobs have significantly reduced employee exposure.



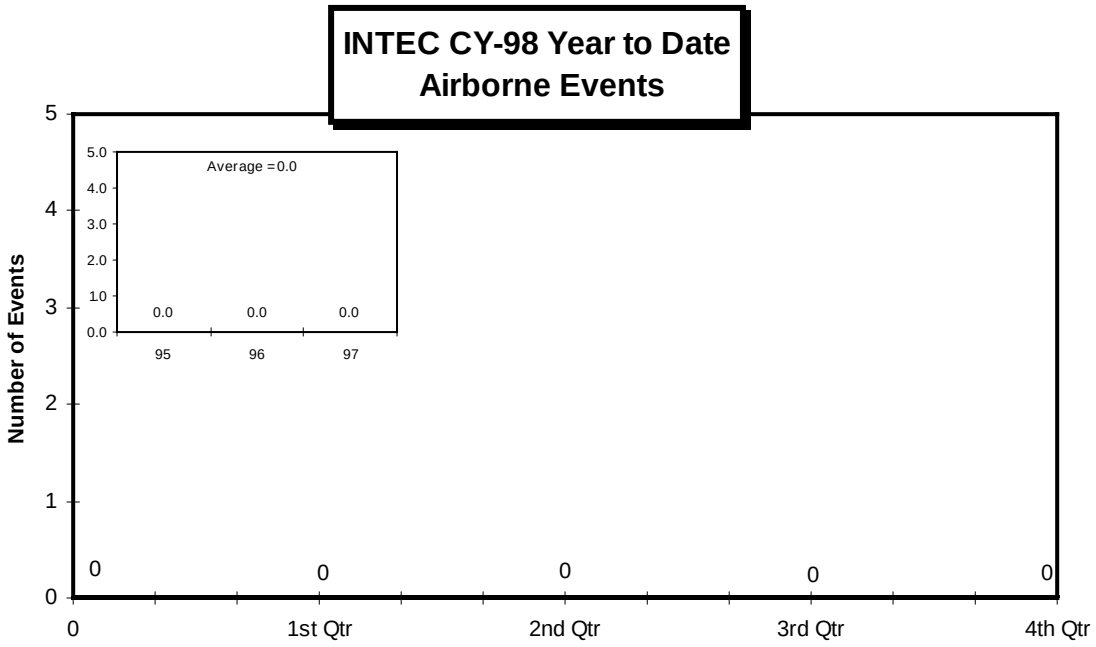
The average worker dose for the INTEC through the end of the fourth quarter was 0.0.062 rem resulting from 447 workers receiving dose greater than 10 mrem.



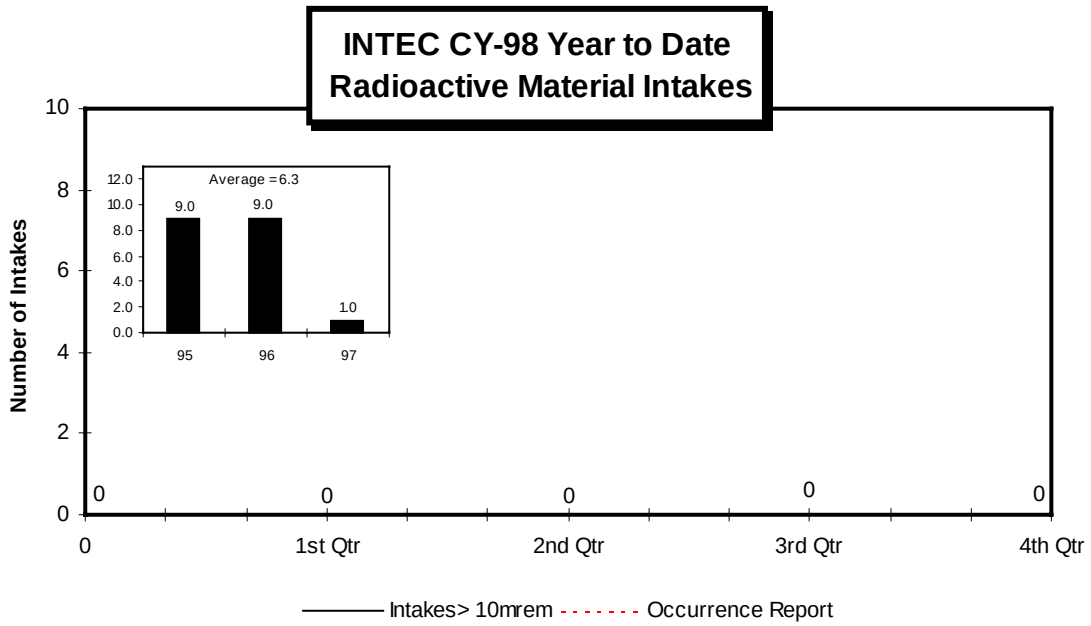
The INTEC had one-reportable skin contamination during the fourth quarter. There were no facial contaminations or contaminated wounds. Details are contained in OR ID-LITC-WASTEMNGT-1998-0023.



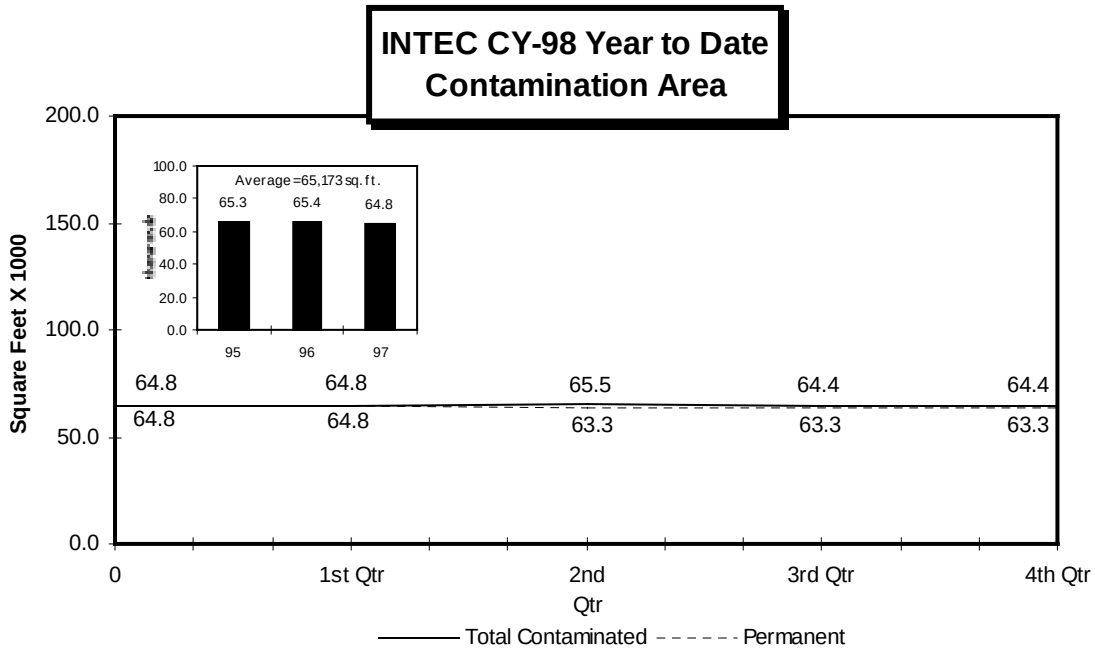
There were three clothing contaminations during the fourth quarter at the INTEC. ORs ID-LITC-WASTEMNGT-1998-0018, WASTEMNGT-1998-0026, and LANDLORD-1998-0032 provide the details of each event.



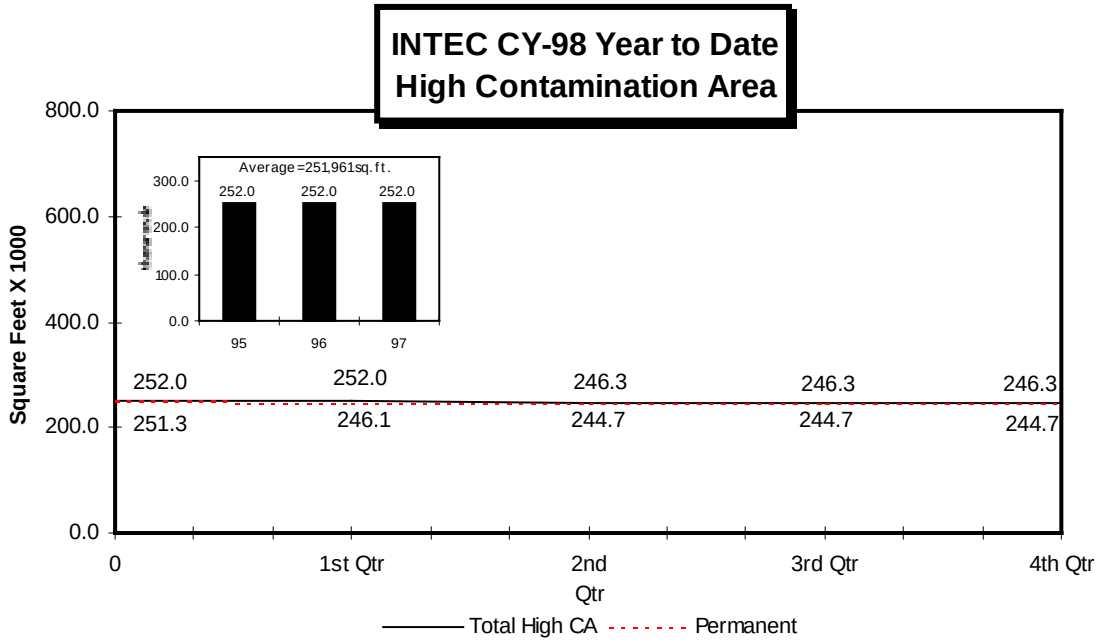
No airborne activity greater than 10 % DAC in unposted areas was detected in INTEC areas during the fourth quarter.



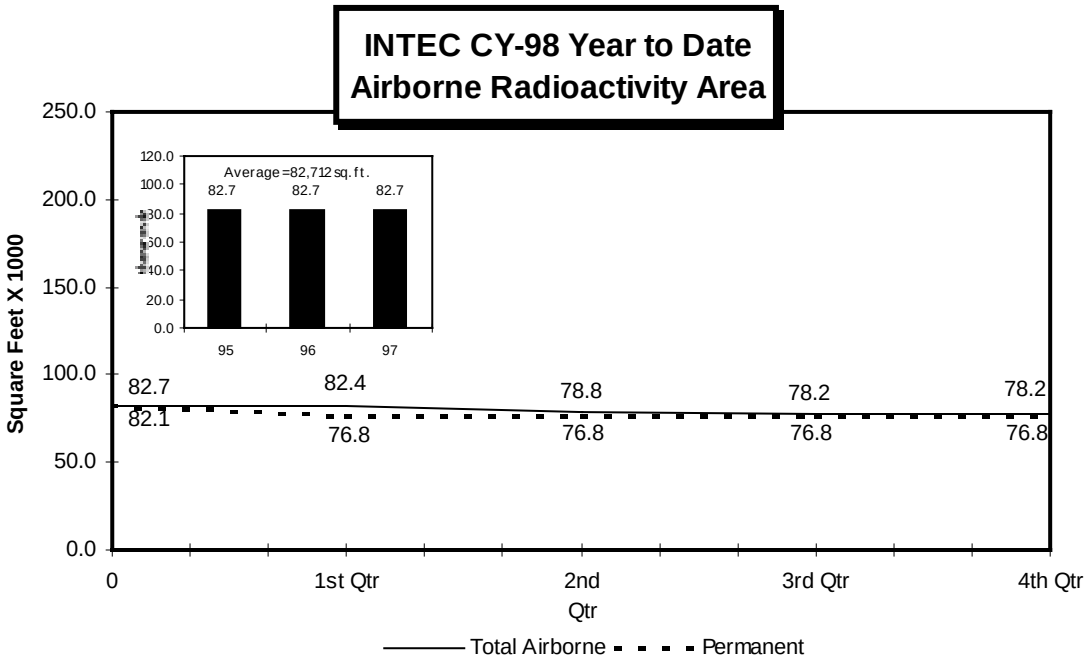
There have been no dose assessments greater than 10 mrem CEDE for the fourth quarter.



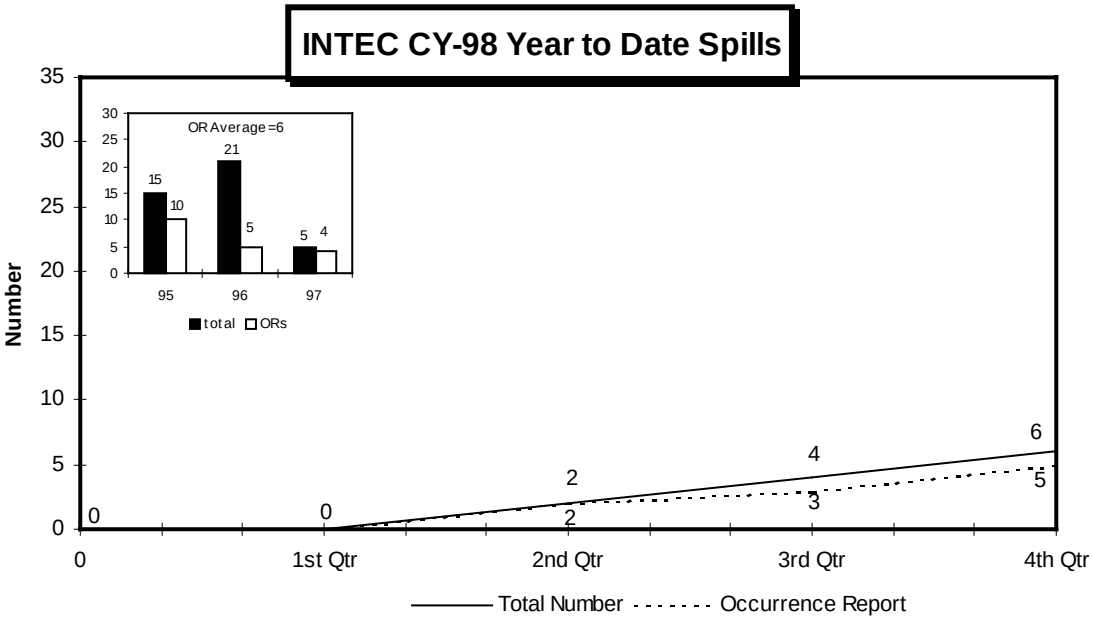
Total Contamination Area at the INTEC at the end of the fourth quarter remains at 64,432 square feet. 63,320 square feet is permanent.



The total High Contamination Area at the INTEC is 246,284 square feet. 244,701 square feet are designated as permanent and in-use.



Total Airborne Radioactivity Area at the INTEC at the end of the fourth quarter is 78,172 square feet. 76,822 square feet remains as permanent.



There were two spills or loss of control of radioactive material during the fourth quarter. ORs ID-LITC-WASTEMNGT-1998-0026 and ID-LITC-FUELRCSTR-1998-0015 contain the details.

Power Burst Facility

Waste Reduction Operations Complex

Waste Experimental Reduction Facility

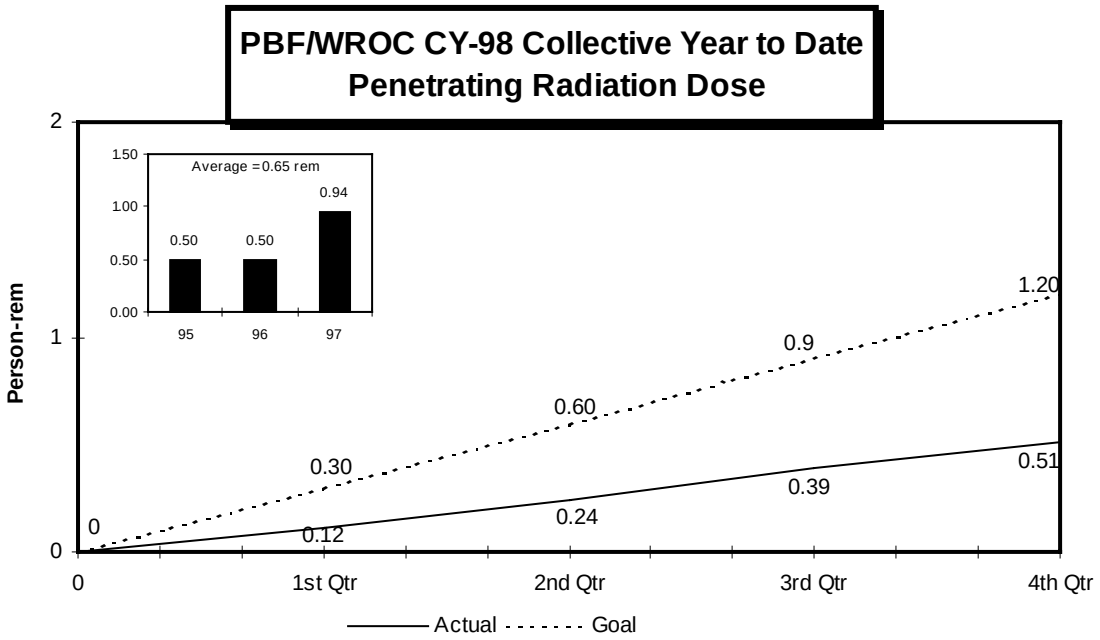
(PBF/WROC)

Summary

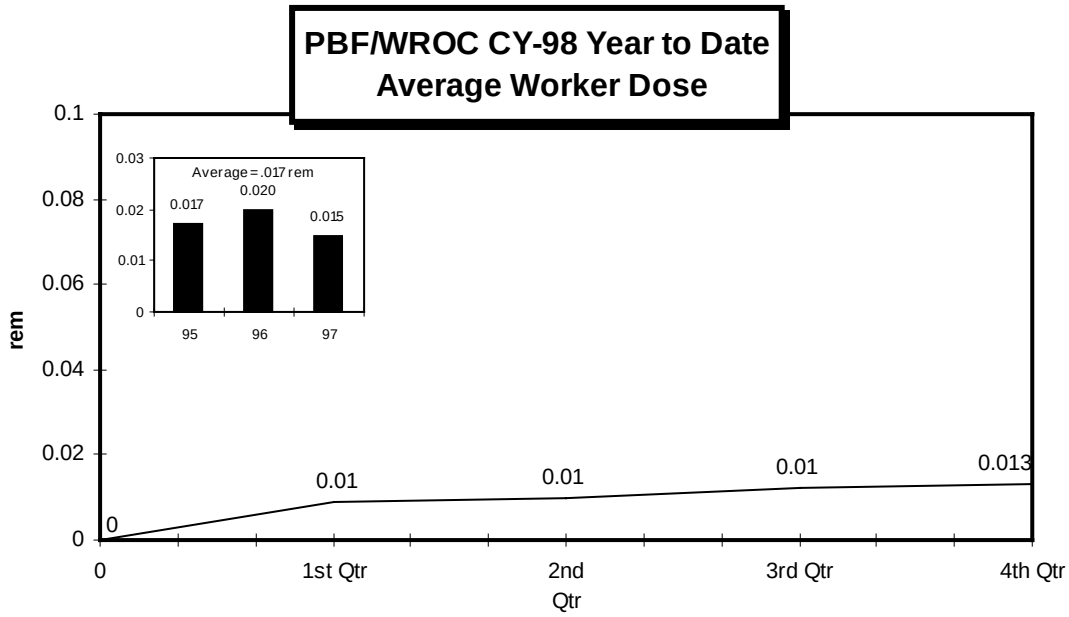
1. Major contributors to the fourth quarter occupational radiation exposure in the PBF/WROC reporting area were working with mixed waste, sizing and compaction of low level waste, incineration, repackaging Foreign Reactor Research equipment, Paducah KY waste, routines, and instrument calibrations.

2. There were no reportable skin contaminations during the fourth quarter.

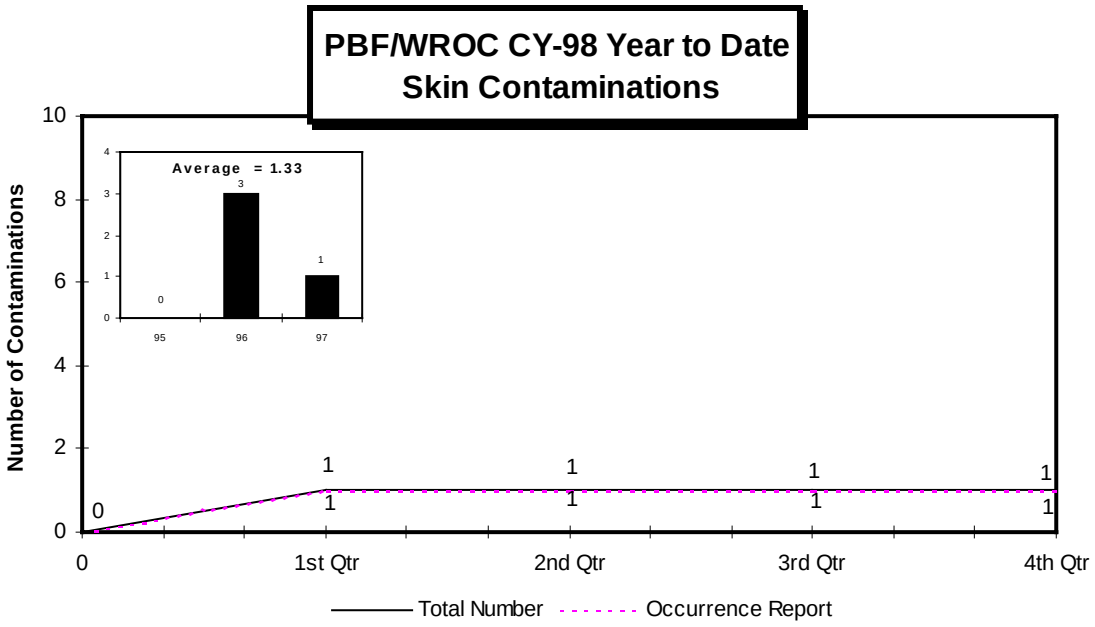
3. There were no clothing contaminations or spills during the fourth quarter.



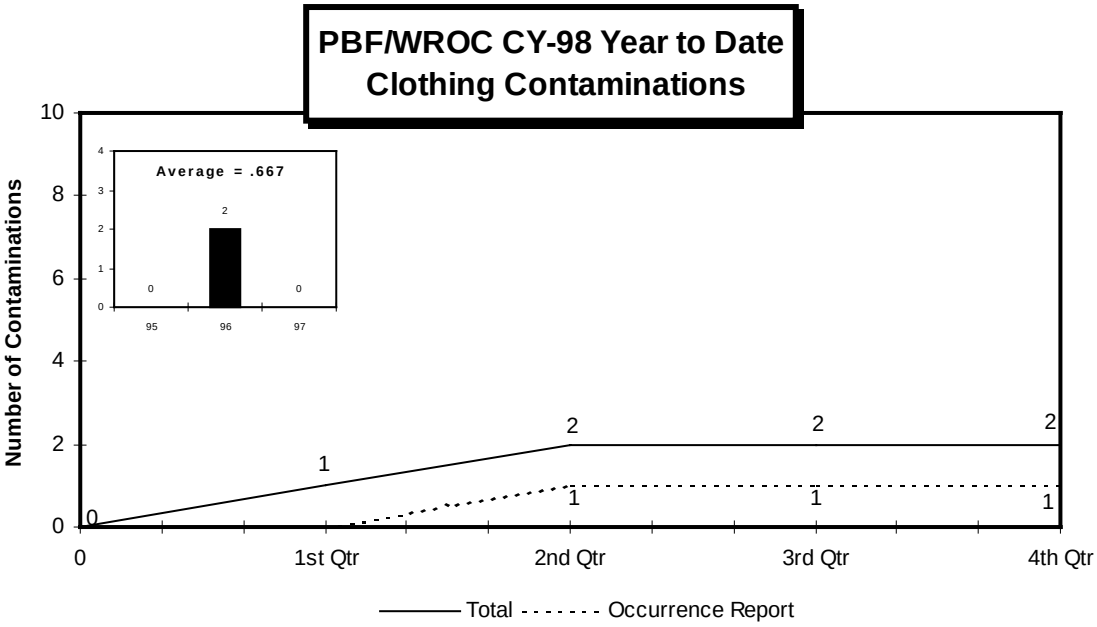
PBF/WROC collective penetrating radiation exposure through the end of the fourth quarter was 0.509 person rem.



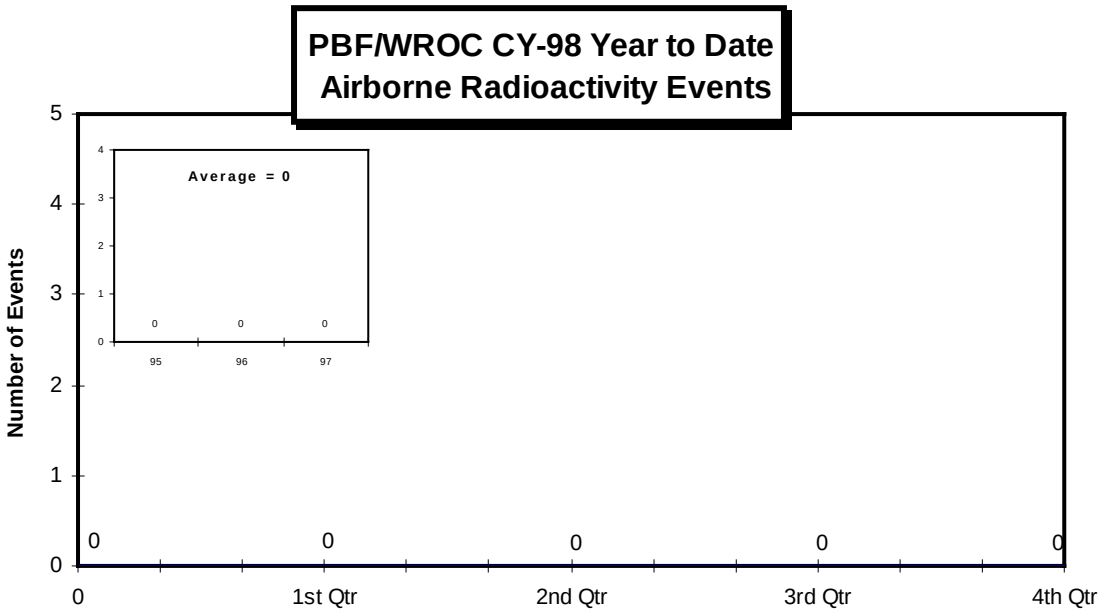
The PBF/WROC average worker dose through the end of the fourth quarter was 0.013 rem. Average dose is based on a comparison of workers who receive measurable dose (39 workers).



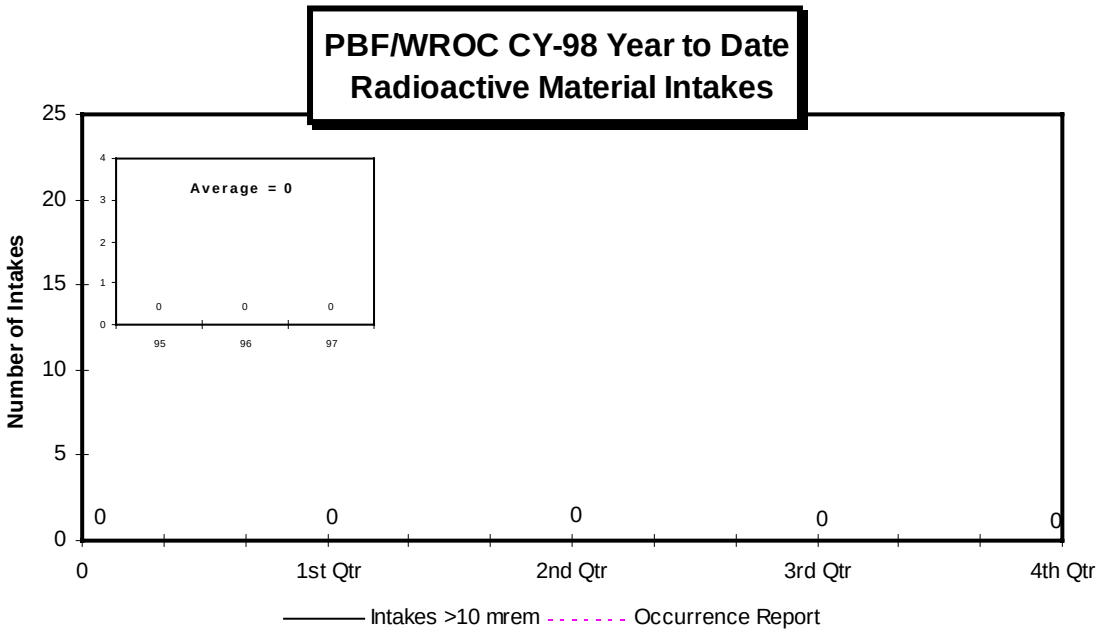
There were no skin contaminations at the PBF/WROC area during the fourth quarter.



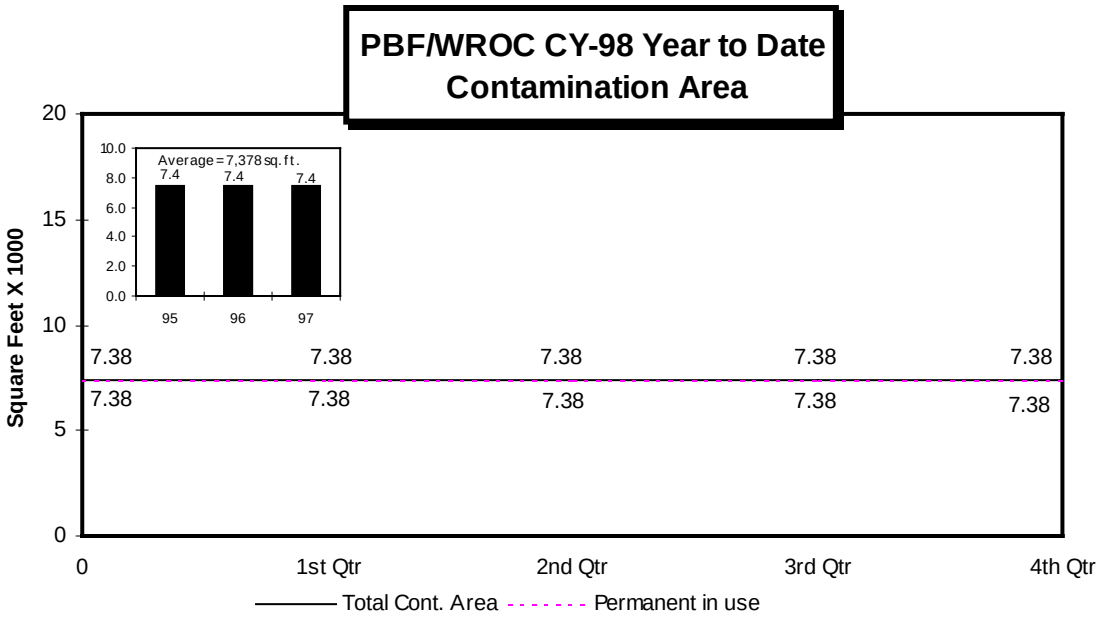
There were no reportable clothing contaminations at the PBF/WROC area during the fourth quarter.



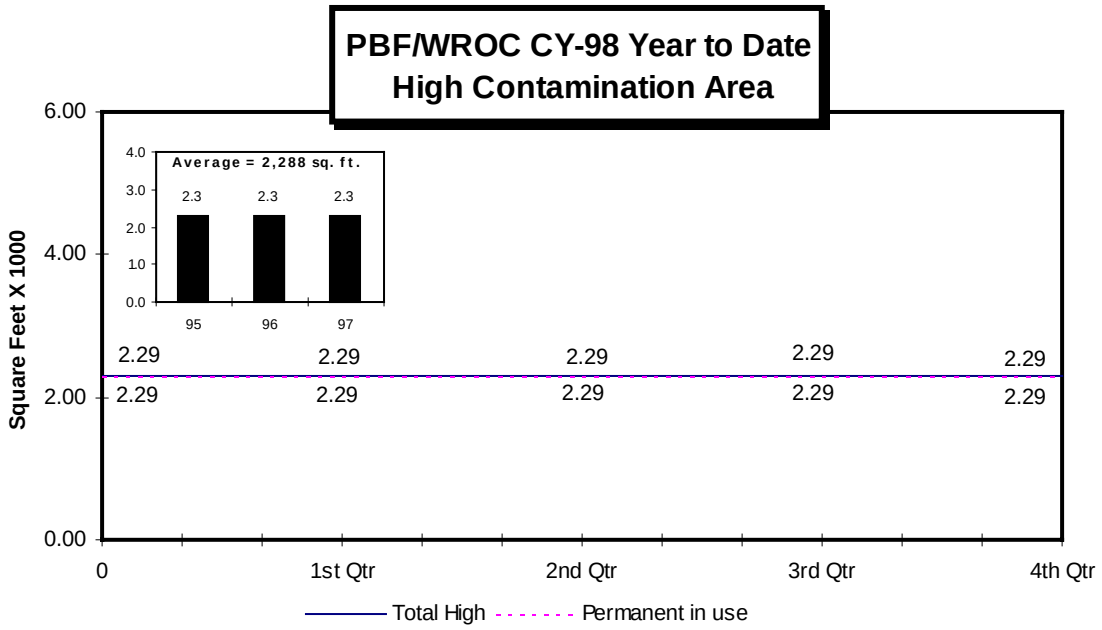
There have been no airborne activity events greater than 10 % DAC detected at the PBF/WROC area through the fourth quarter.



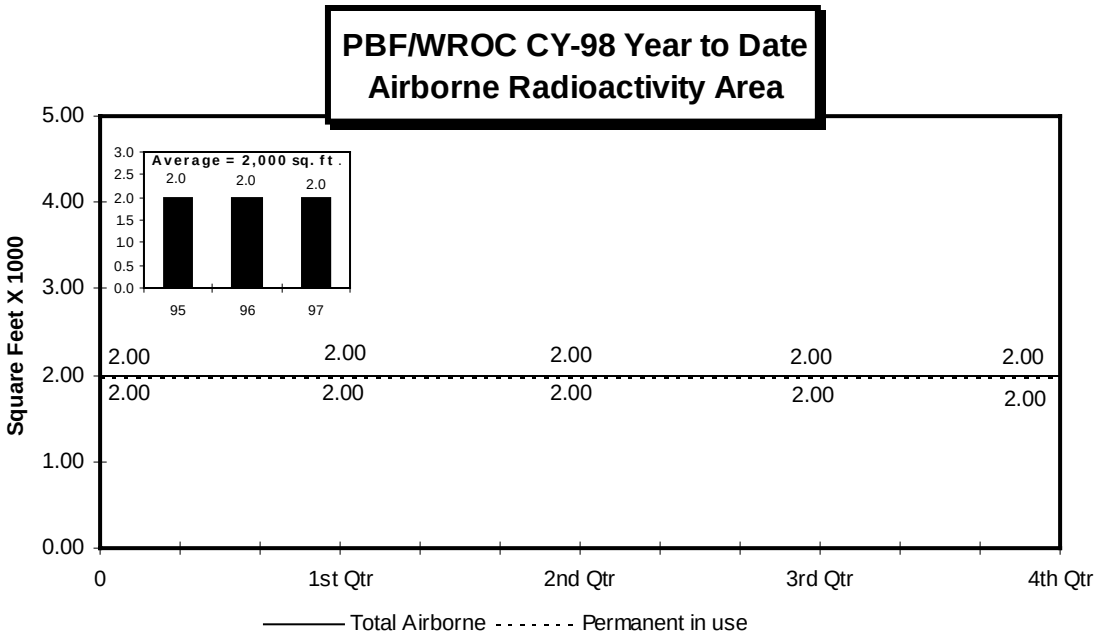
There were no positive bioassays indicating radioactive material intakes that resulted in a dose assessment of 10 mrem or greater in the PBF/WROC area during the fourth quarter.



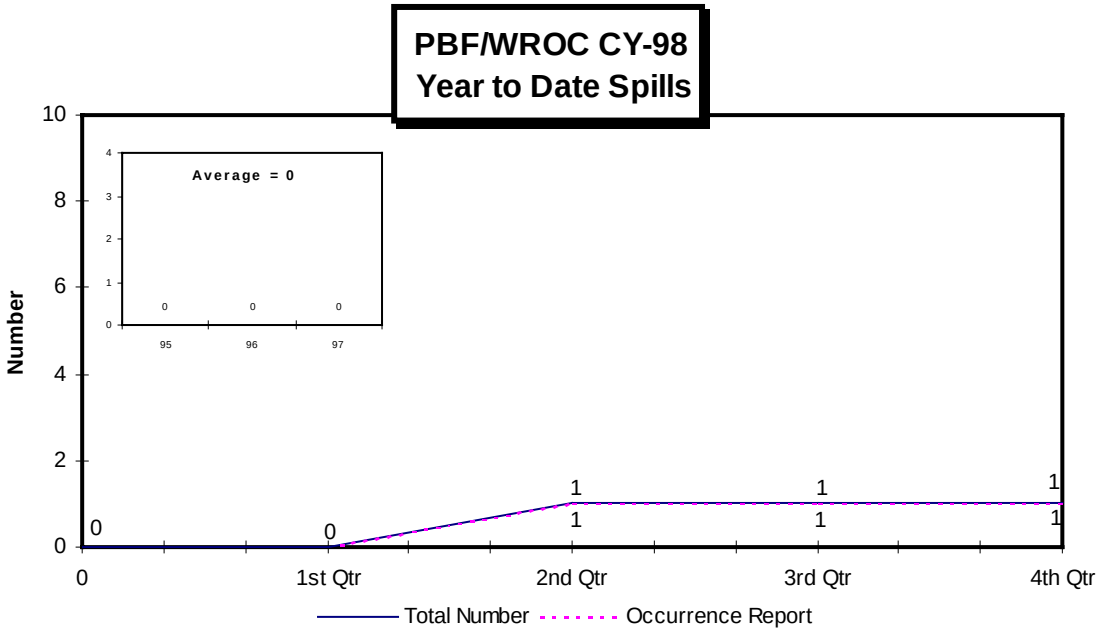
The fourth quarter Contamination Area for the PBF/WROC area remains at 7,378 square feet. All of this is considered permanent and in-use.



The total High Contamination Area through the end of the fourth 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 fourth 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 fourth quarter.

Radioactive Waste Management Complex

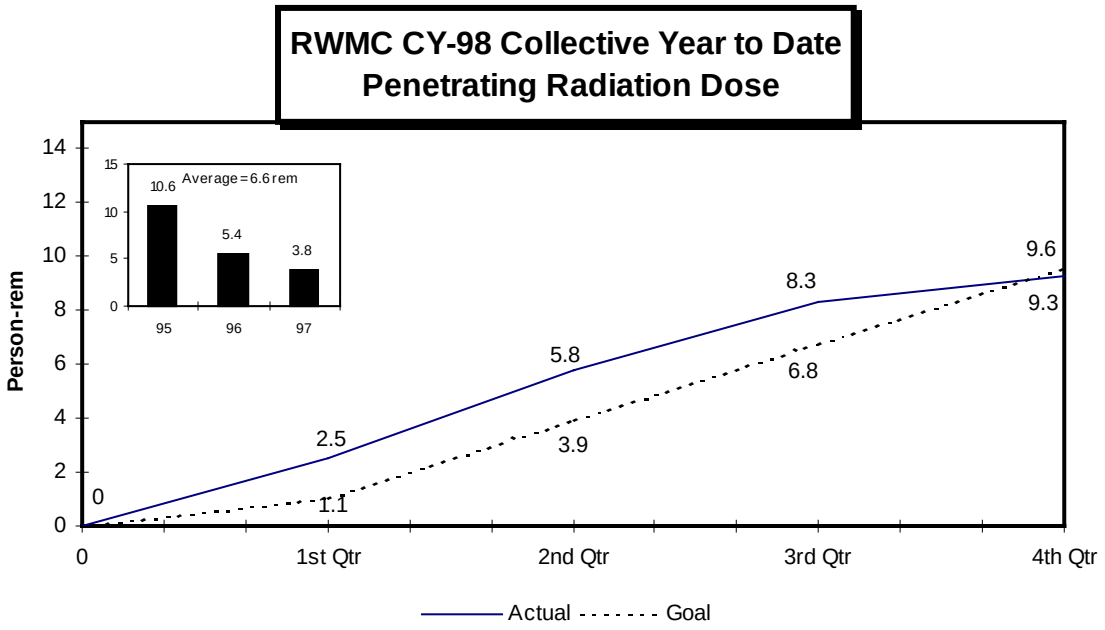
Summary

1. Major contributors to the fourth 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.

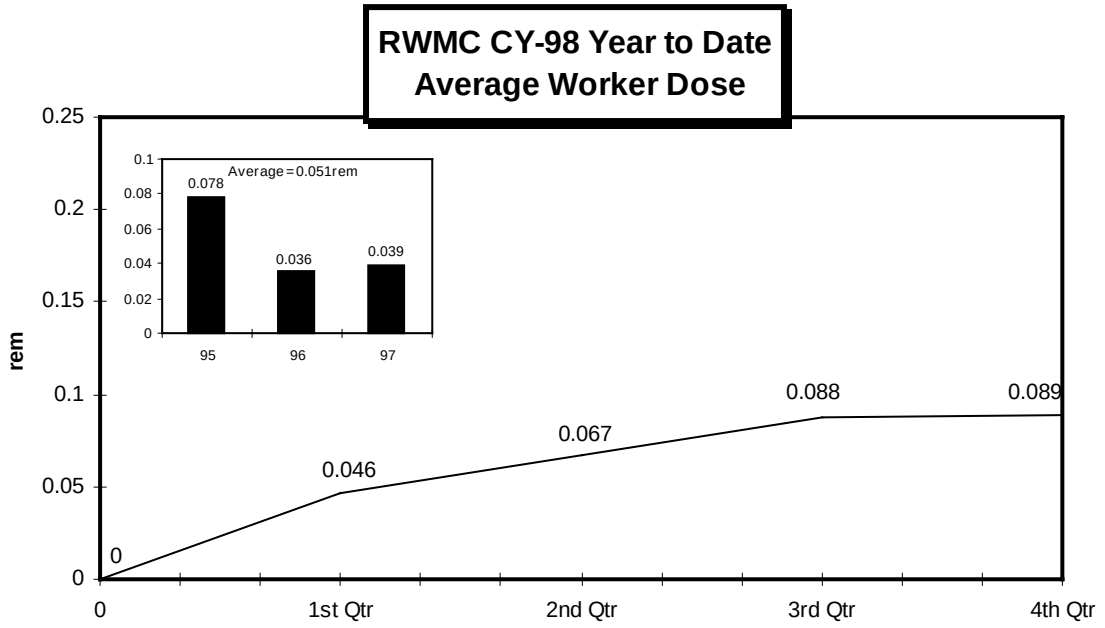
2. The HCA area at the RWMC is under a protective tarp covering the waste stack at the TSA-RE. This area will remain a permanent HCA until retrieval operations begin in that area.

3. Sandia waste boxes in storage modules remain contaminated at the end of the fourth quarter.

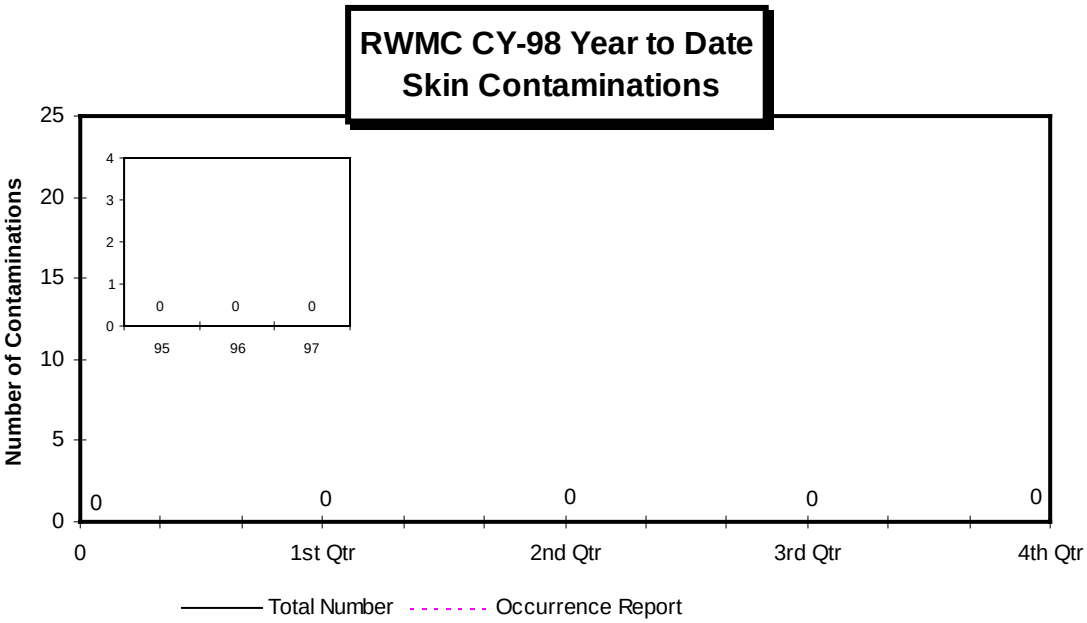
4. There have been no skin contaminations clothing contaminations or spills during this quarter.



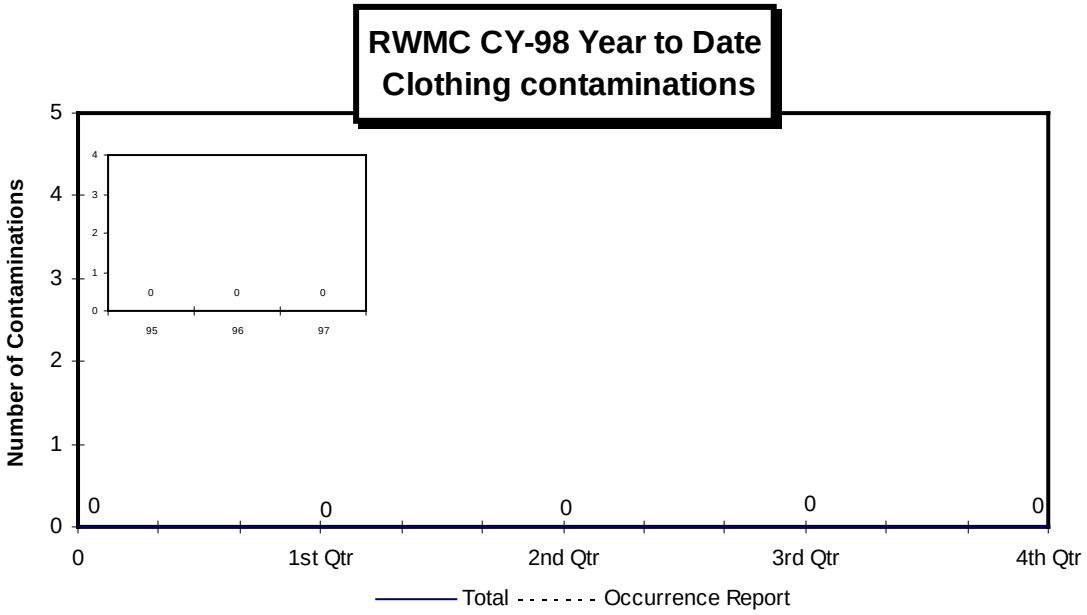
The RWMC collective penetrating radiation exposure through the end of the fourth quarter was 9.273 person-rem compared to a goal of 9.6 person-rem.



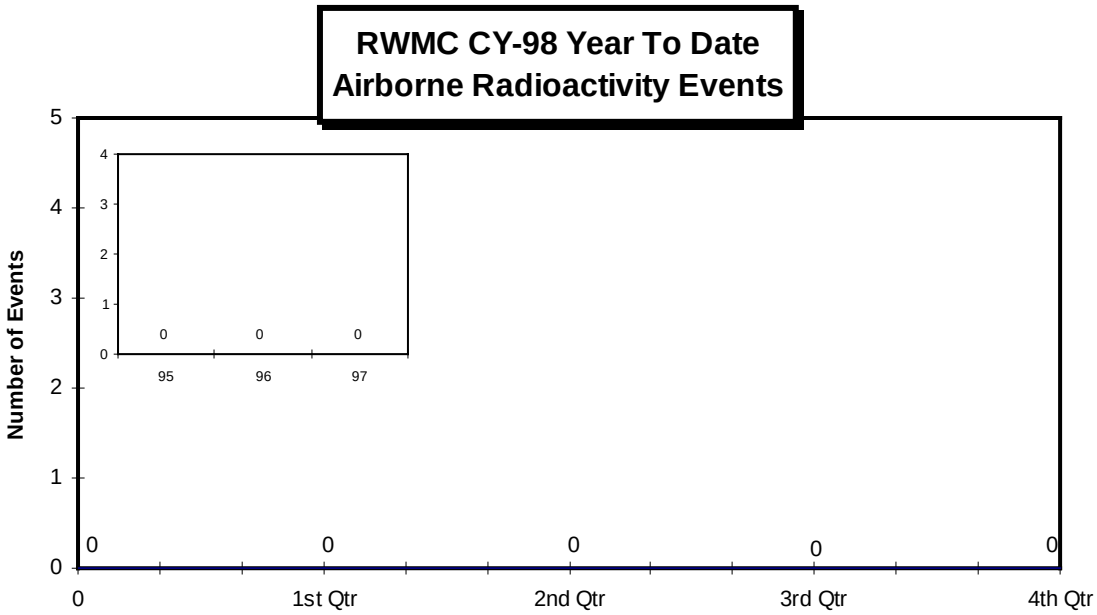
The average worker dose at the RWMC through the end of the fourth quarter was 0.089 rem from 104 workers who received dose greater than 10 mrem.



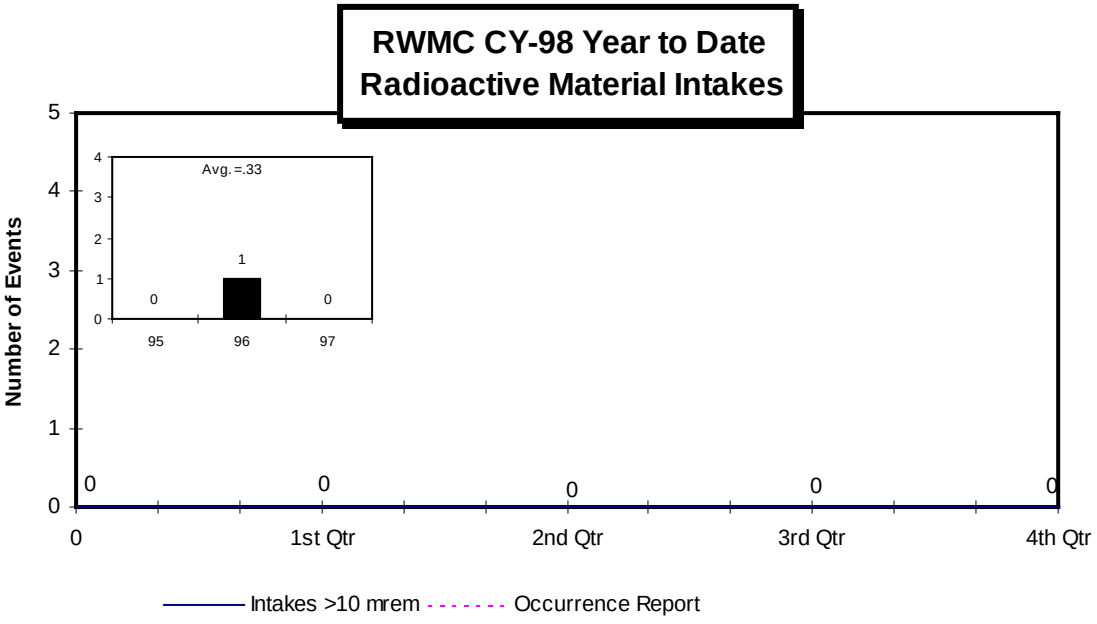
RWMC year to date skin contaminations remain at zero through the end of the fourth quarter.



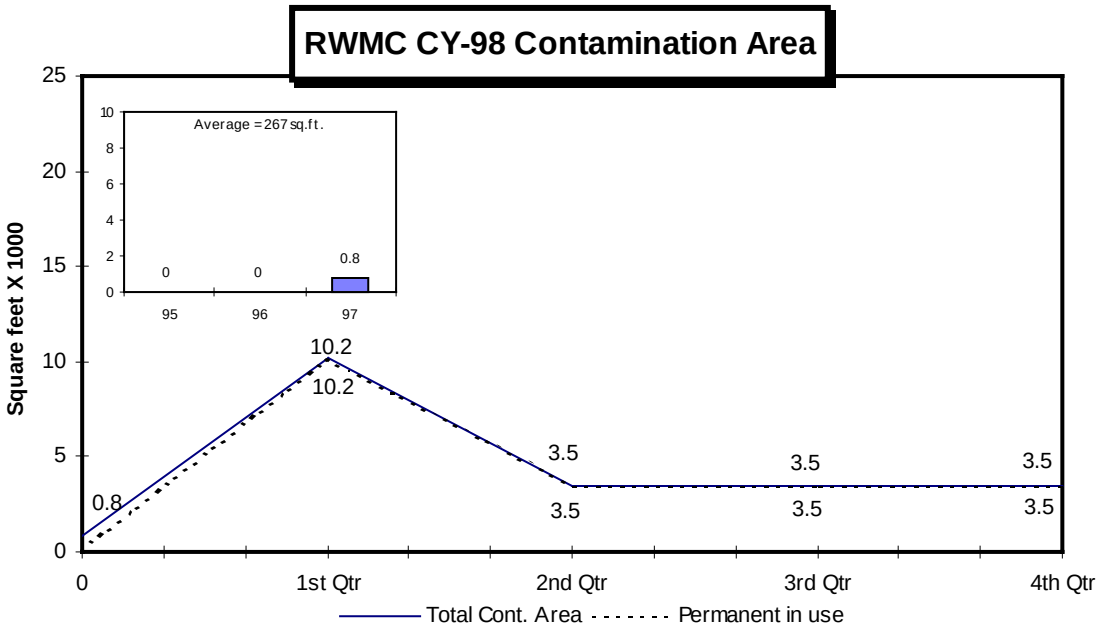
There were no clothing contaminations at the RWMC through the end of the CY-98 fourth quarter.



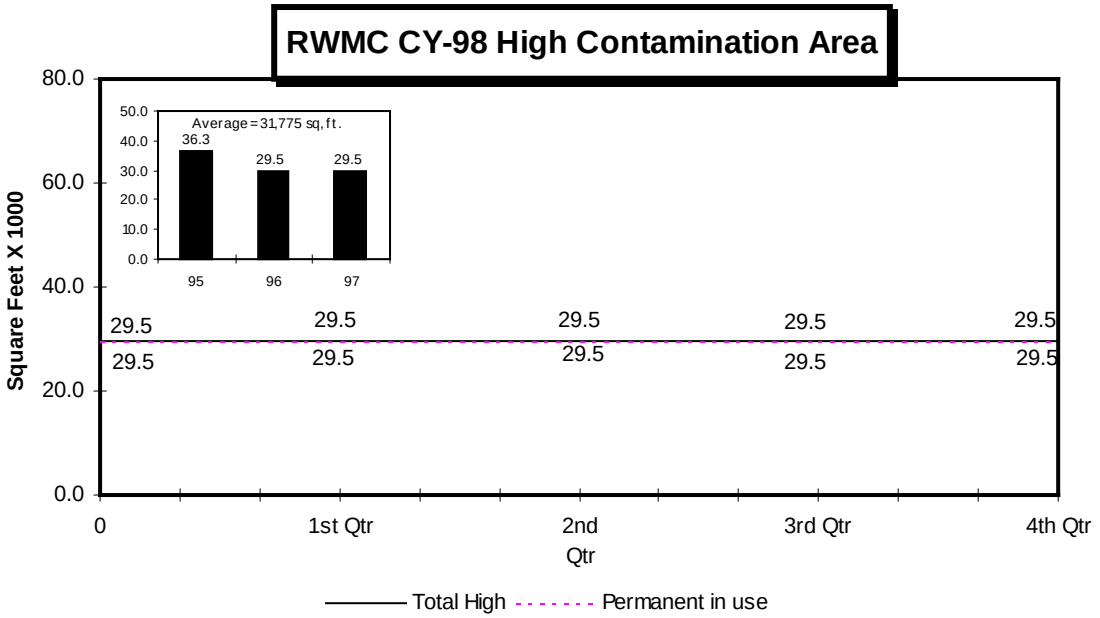
No airborne activity greater than 10 % DAC was detected at RWMC in areas not posted as Airborne Radioactivity Areas through the fourth quarter.



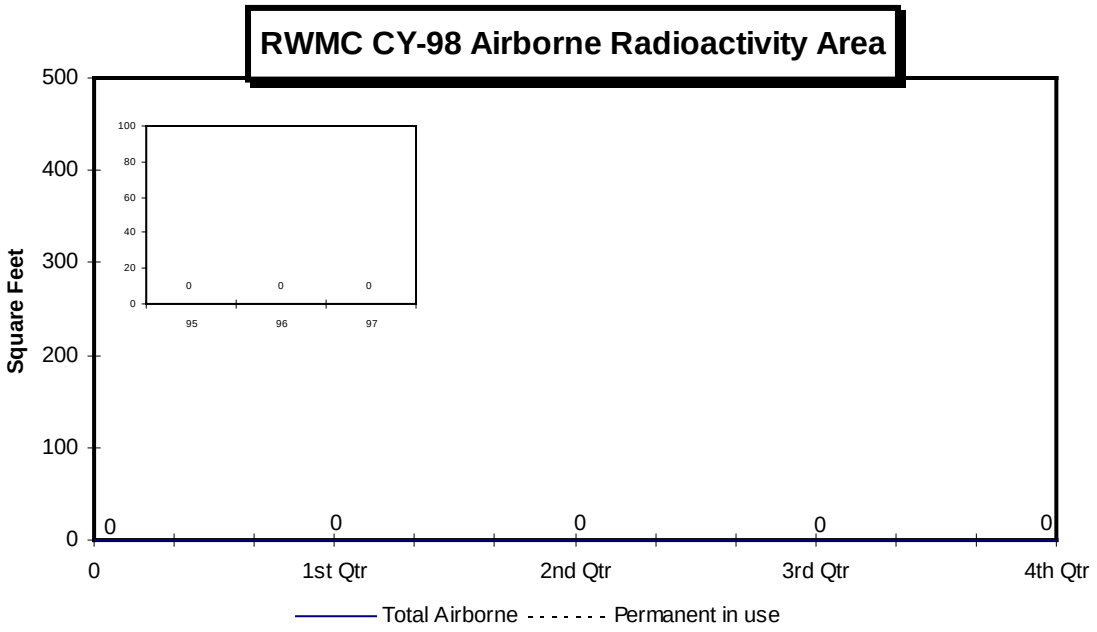
There have been no positive bioassays year to date indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater.



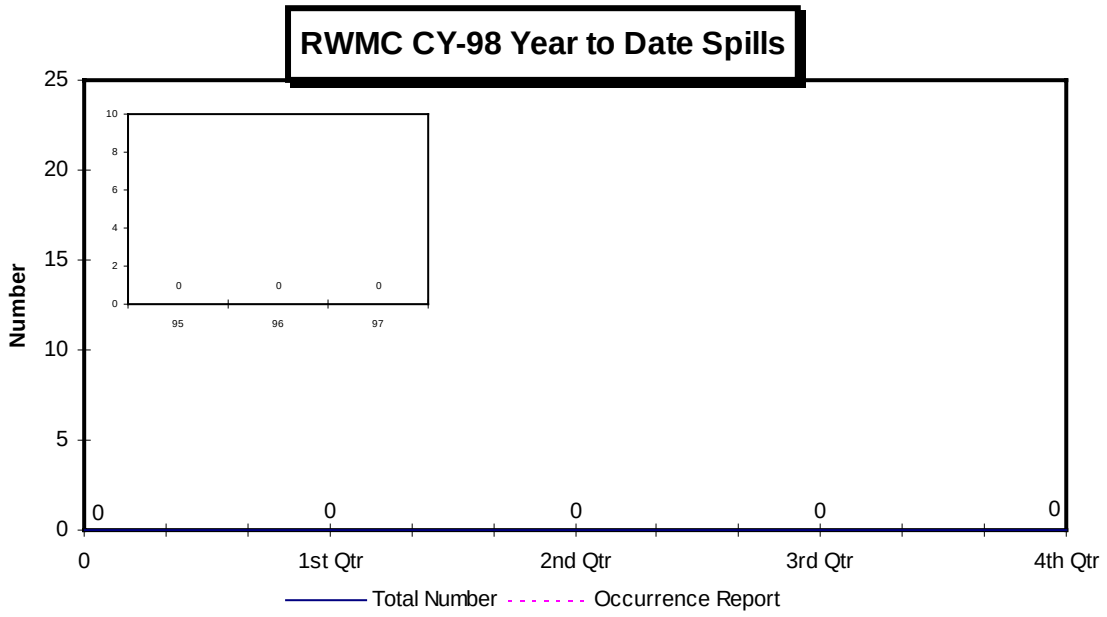
The total Contamination Area at the RWMC through the end of the fourth quarter remains at 3,508 square feet, which is the area of Sandia waste boxes in storage containers.



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



The are no Airborne Radioactivity Areas at the RWMC through the end of the fourth quarter.



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

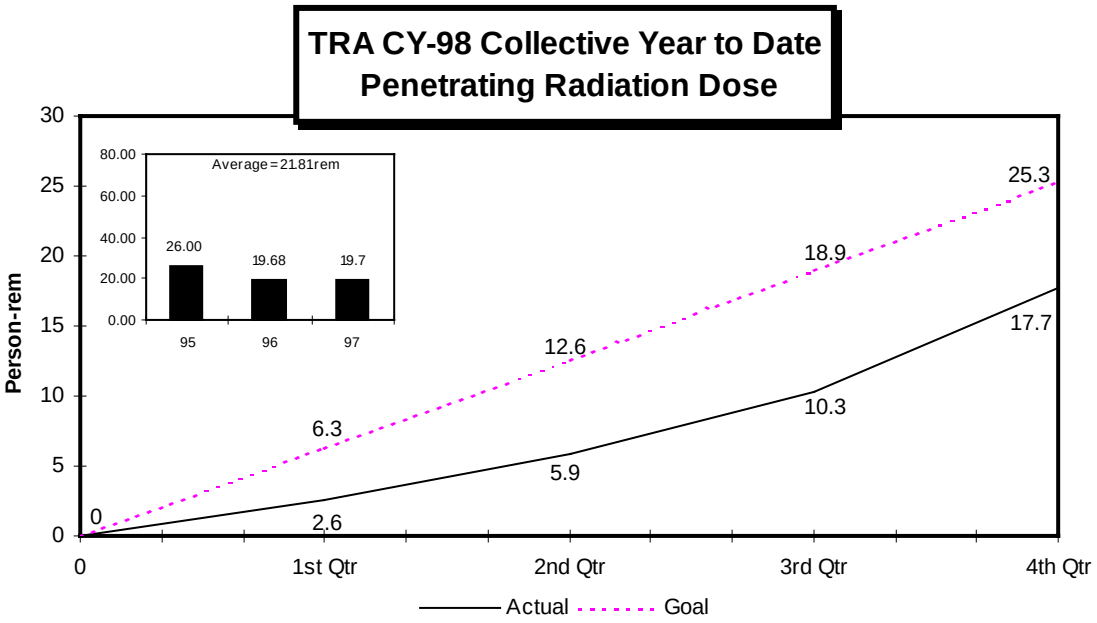
Test Reactor Area

Summary

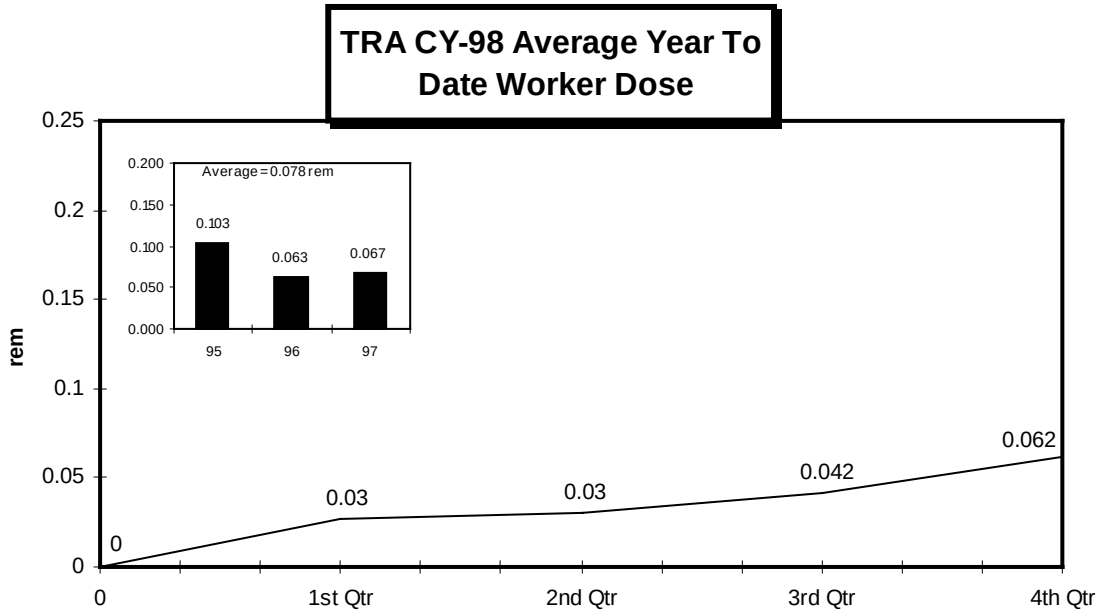
1. Outages at the Advance Test Reactor within the Test Reactor Area are responsible for the major portions of dose during the fourth quarter. Total Penetrating dose for the report is 17.725 person-rem year to date.

2. There was one reportable clothing contamination at the ATR during this quarter. Detail is contained in OR ID-LITC-ATR-1998-0025.

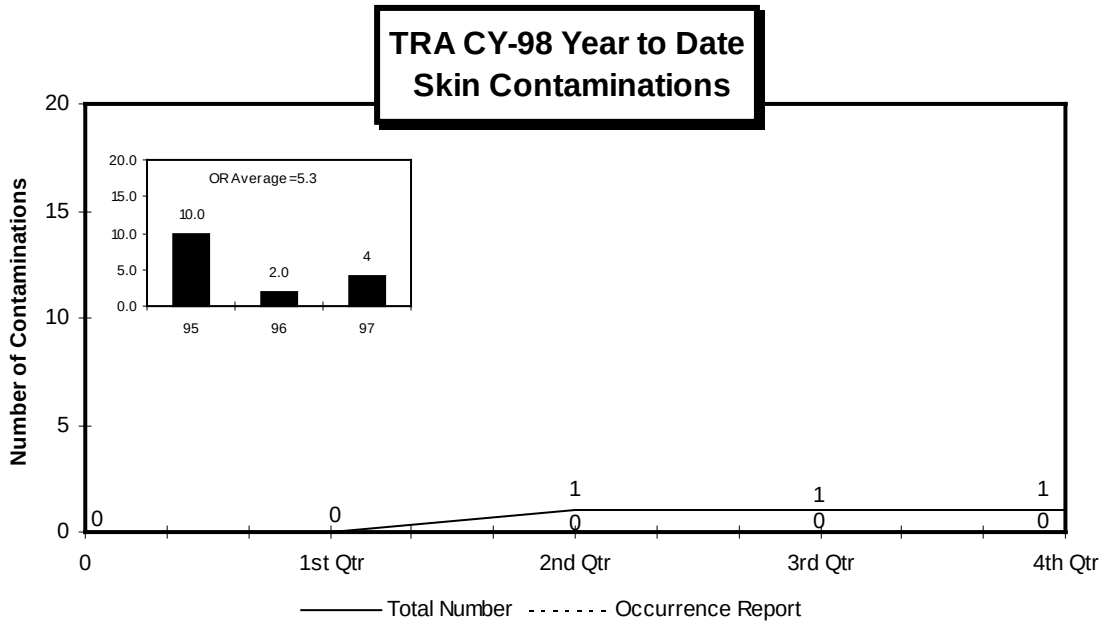
3. There were no skin contaminations or reportable spills during the quarter.



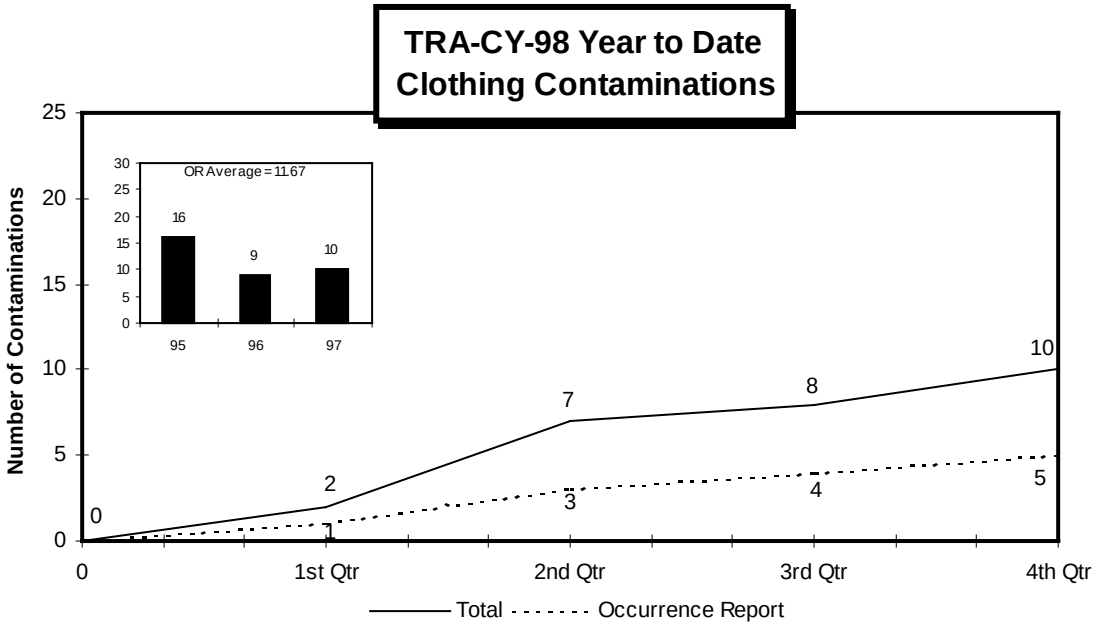
TRA collective penetrating radiation dose through the end of the fourth quarter was 17.725 person-rem. Several jobs were postponed due to a maintenance work stoppage.



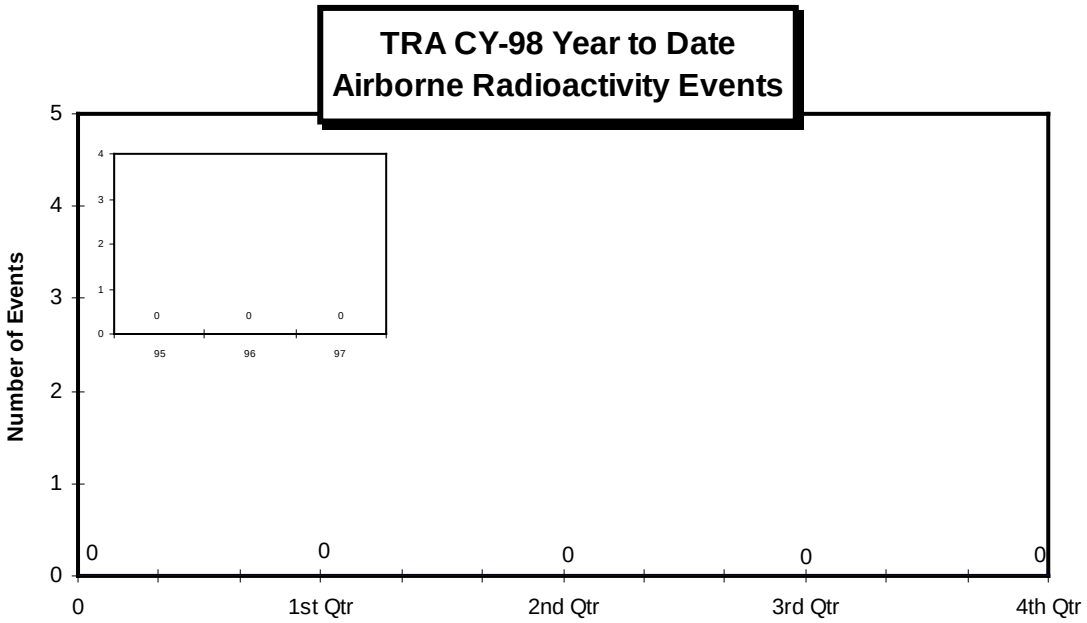
The average worker dose at the TRA through the end of the fourth quarter was 0.062 rem based on 287 workers with dose greater than 10 mrem.



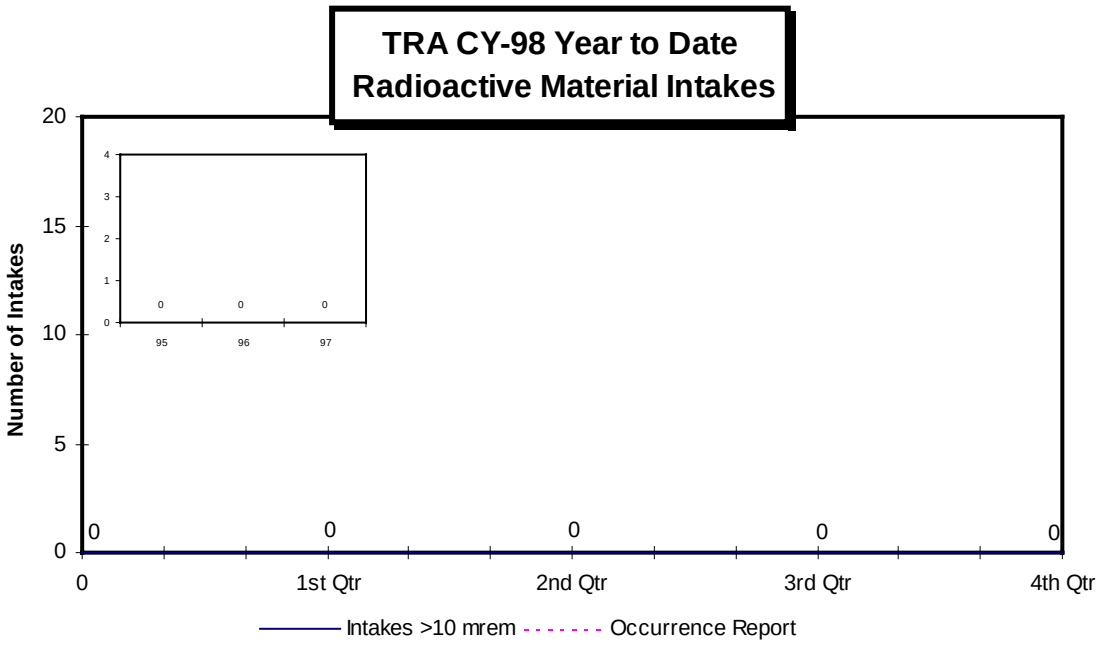
There were no skin contaminations at the TRA during the fourth quarter. There were no contaminated wounds or facial contaminations.



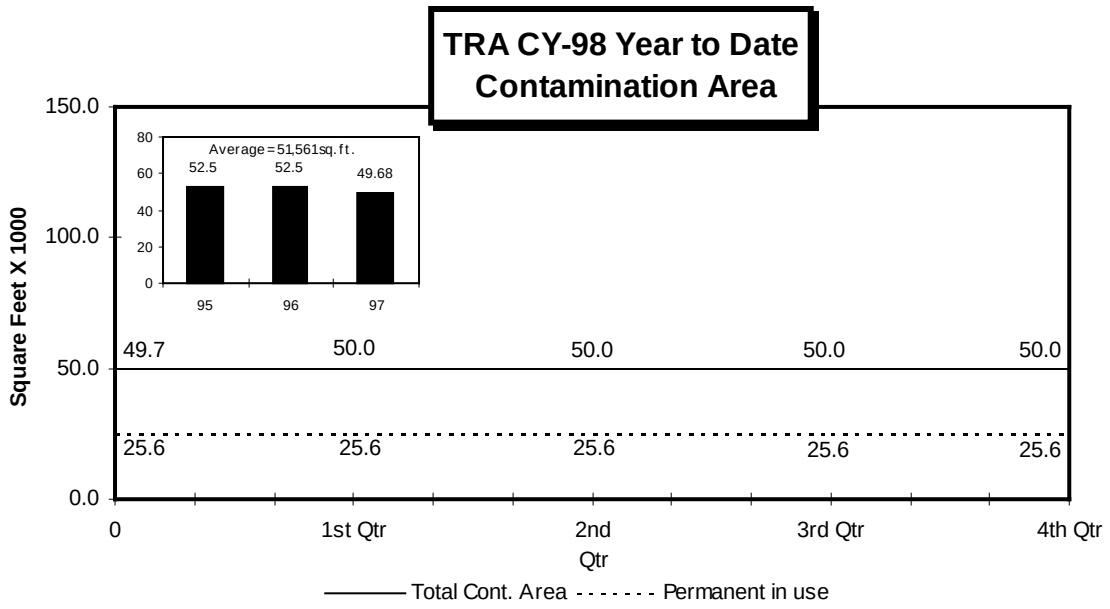
There was one reportable and one non-reportable clothing contamination at the TRA during the fourth quarter. Detail of the reportable contamination is contained in OR ID-LITC-ATR-1998-0025



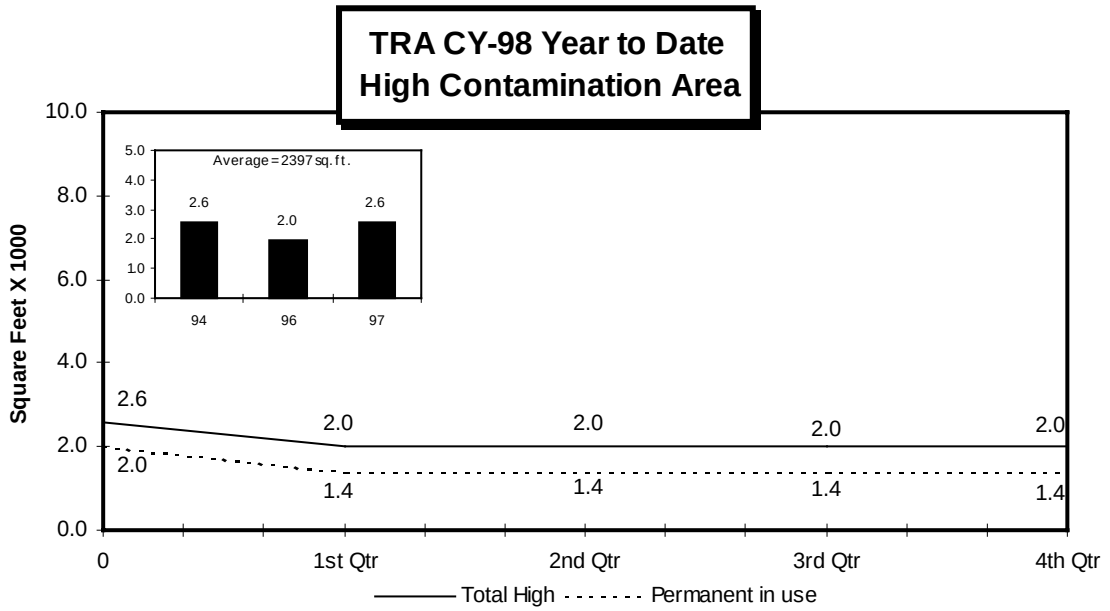
No airborne activity greater than 10 % DAC was detected at the TRA in areas not already posted as Airborne Radioactivity Areas during the fourth quarter.



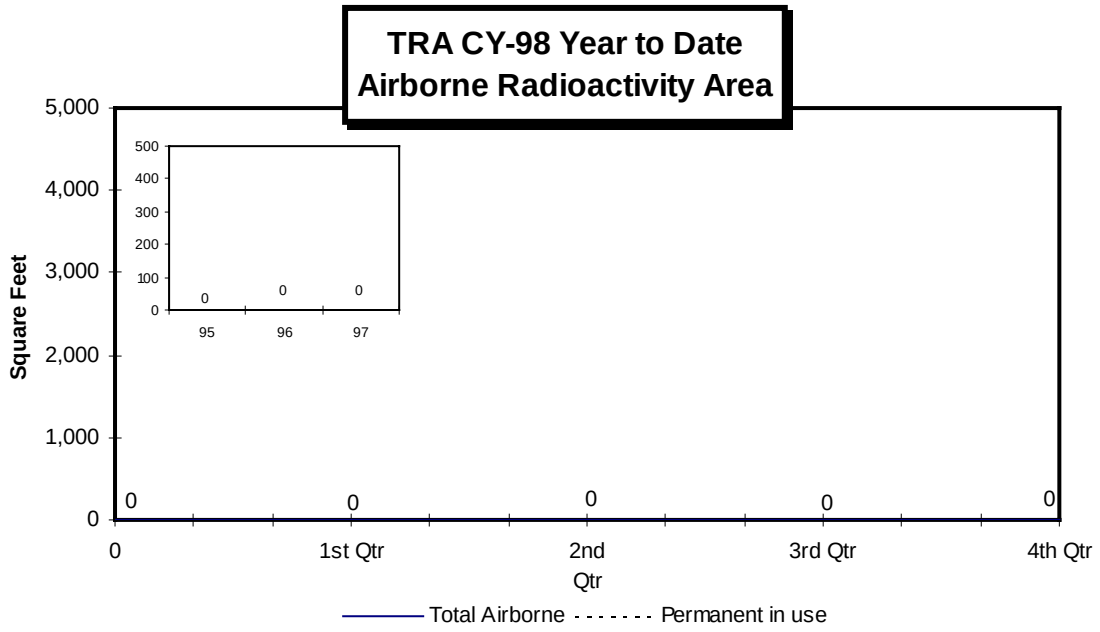
There were no positive bioassays indicating an intake of radioactive material that resulted in a dose assessment of 10 mrem or greater at the TRA during the fourth quarter.



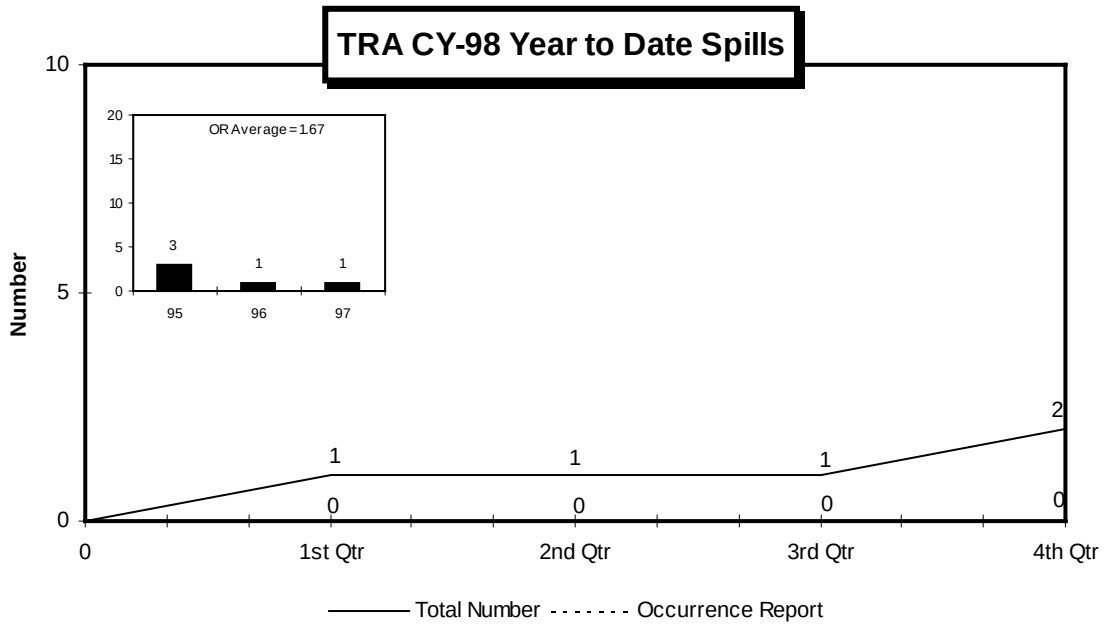
Total indoor Contamination Area for the TRA is 49,978 square feet square feet. 25,619 square feet is designated as permanent and in-use.



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



There was one nonreportable spill with levels just above recordable limits. It was cleaned up within one hour. There were no reportable spills or loss of control of radioactive material at the TRA during the fourth quarter.

International Isotopes Idaho Inc. (IIII)

Formerly MAC-ISOTOPES

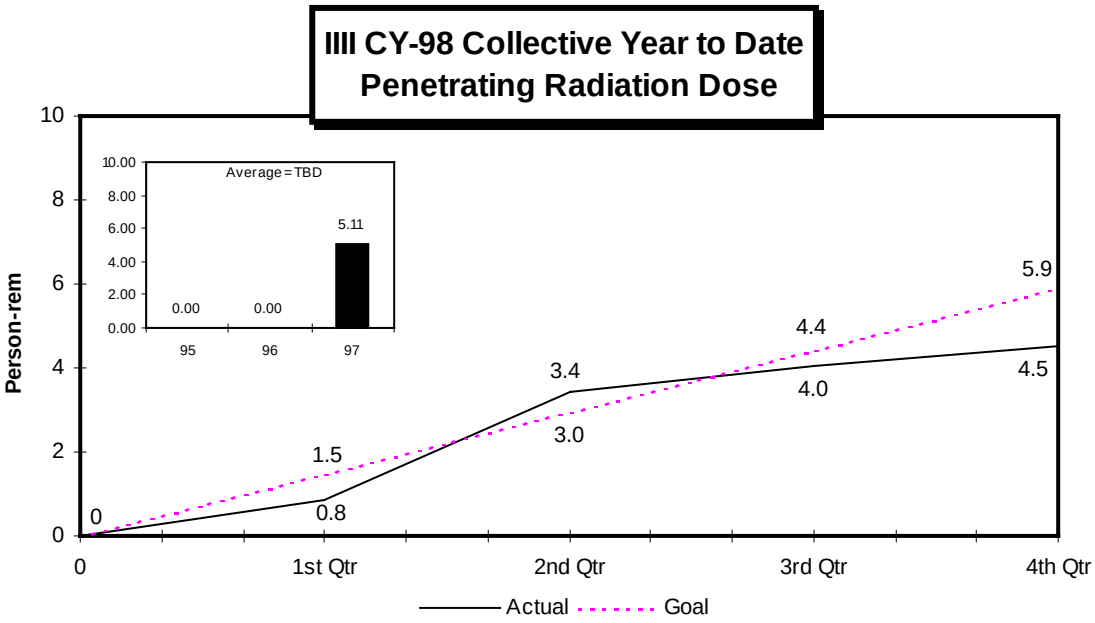
TRA HOT CELL

Summary

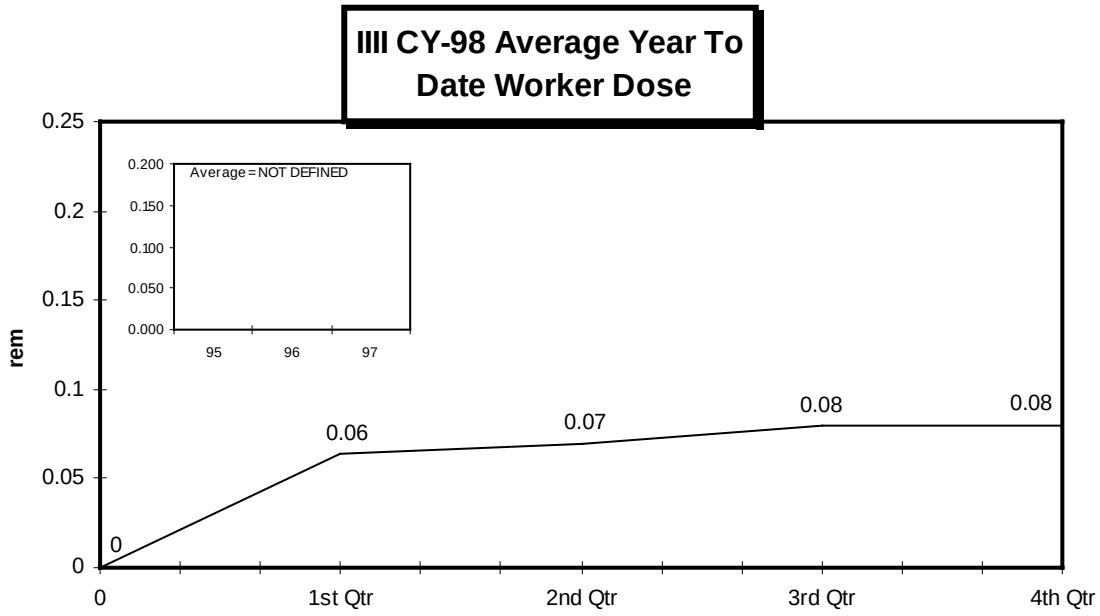
The TRA Hot Cell, IIII, formerly MAC-I is a privatized contractor and is being tracked here since LMITCO provides much of the associated labor support. International Isotopes Inc., of Denton, Texas acquired MAC-I on April 27, 1998.

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

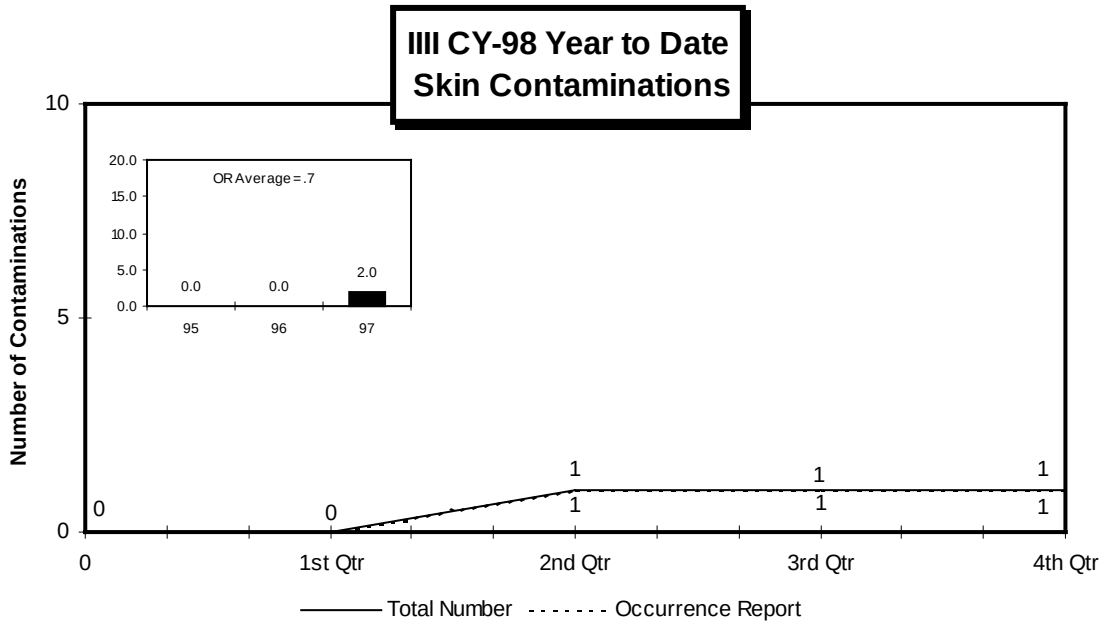
There were no reportable incidents at the IIII this quarter.



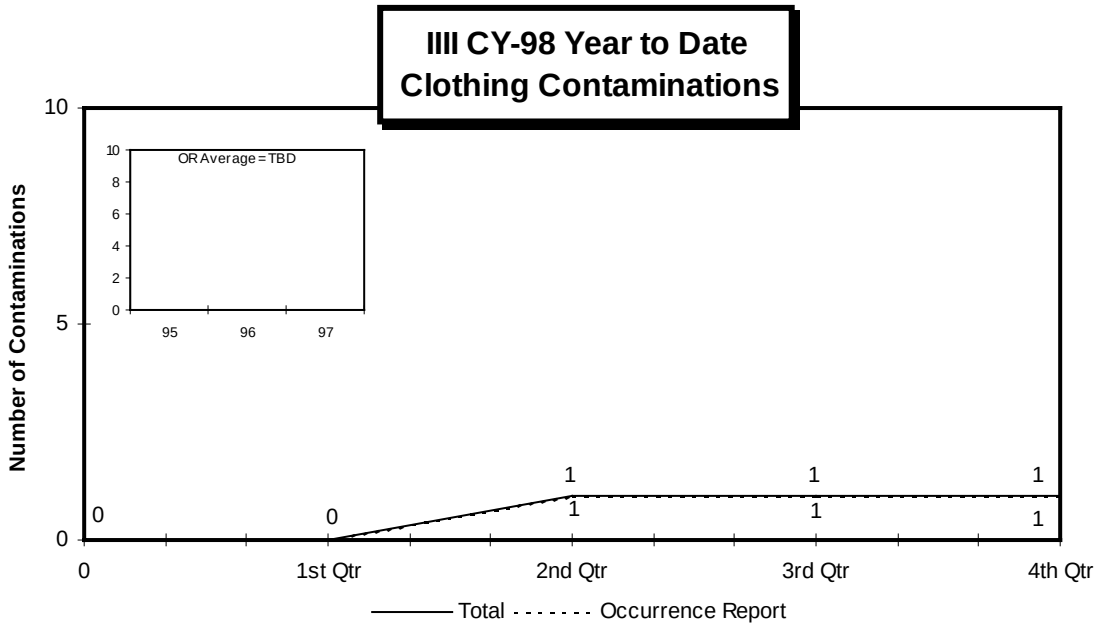
Year to date dose is 4.024 person-rem and the year to date goal is 5.9 person-rem



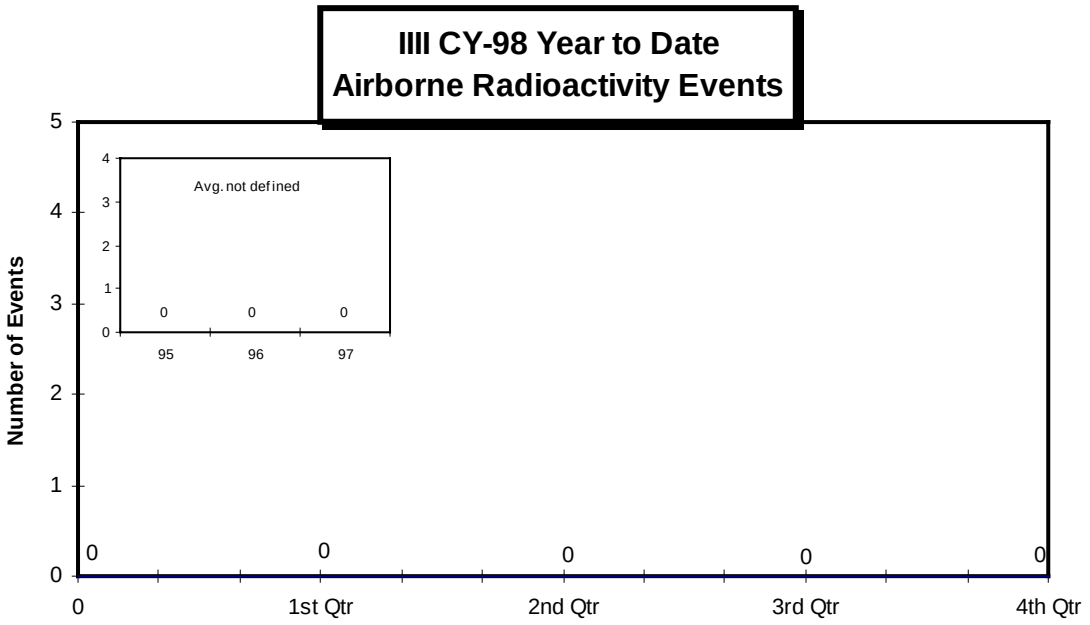
Average year to date worker dose is 0.08 rem based on workers receiving greater than 10 mrem at the IIII facility



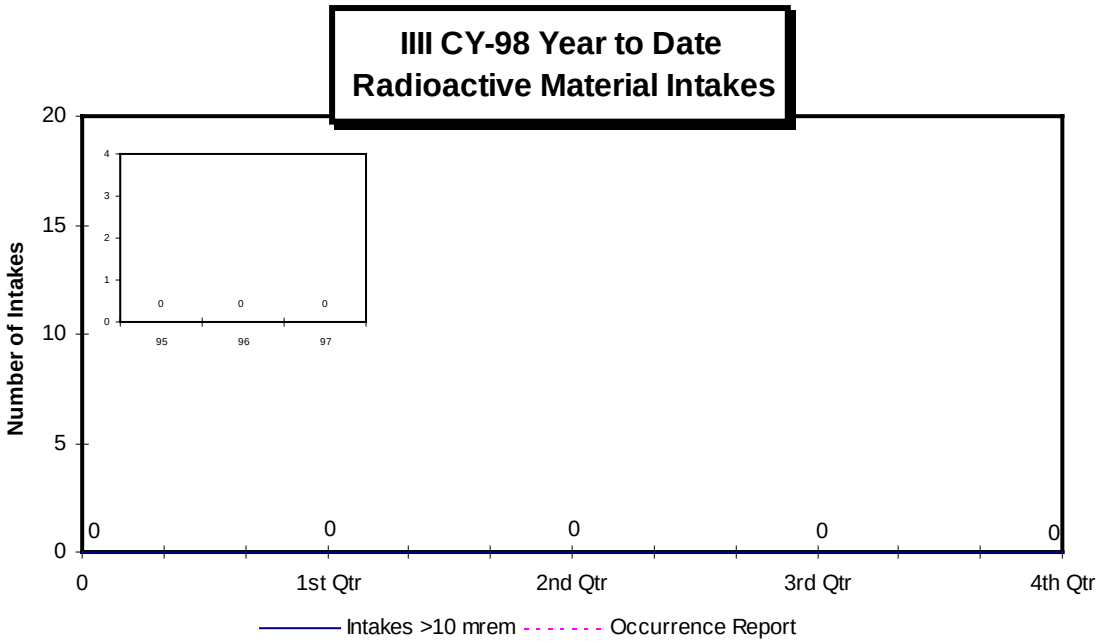
There were no skin contamination events at the Hot Cell facility during the fourth quarter. Note: The average is based on an event at the beginning of CY-97



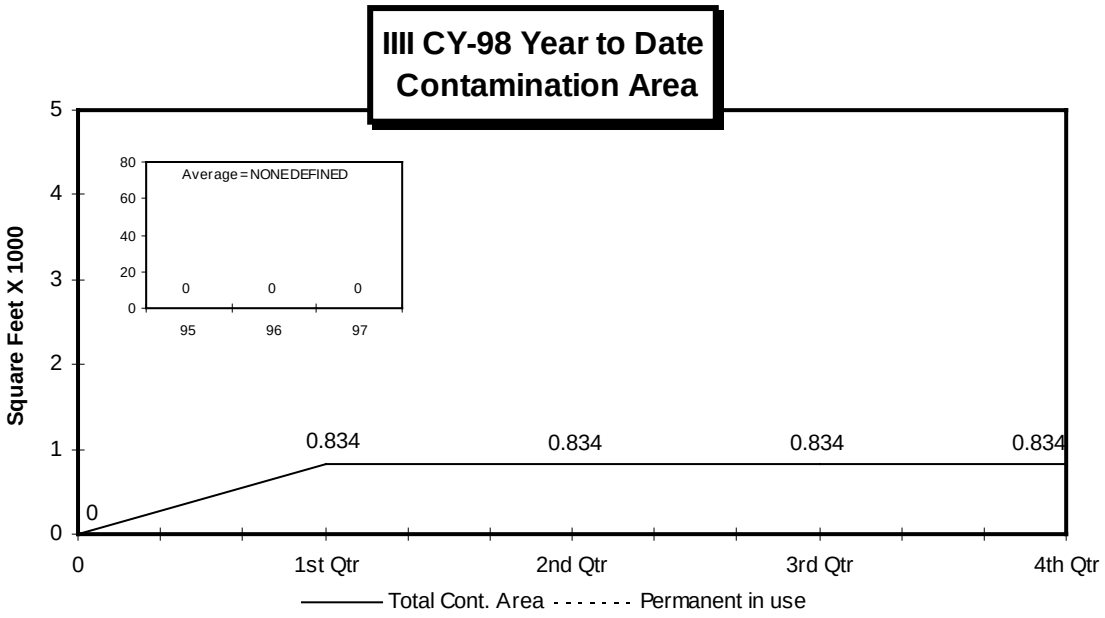
IIII has had one reportable clothing contamination event year to date. The event is not in the TRA total or the INEEL total since IIII is considered to be a sub-contractor.



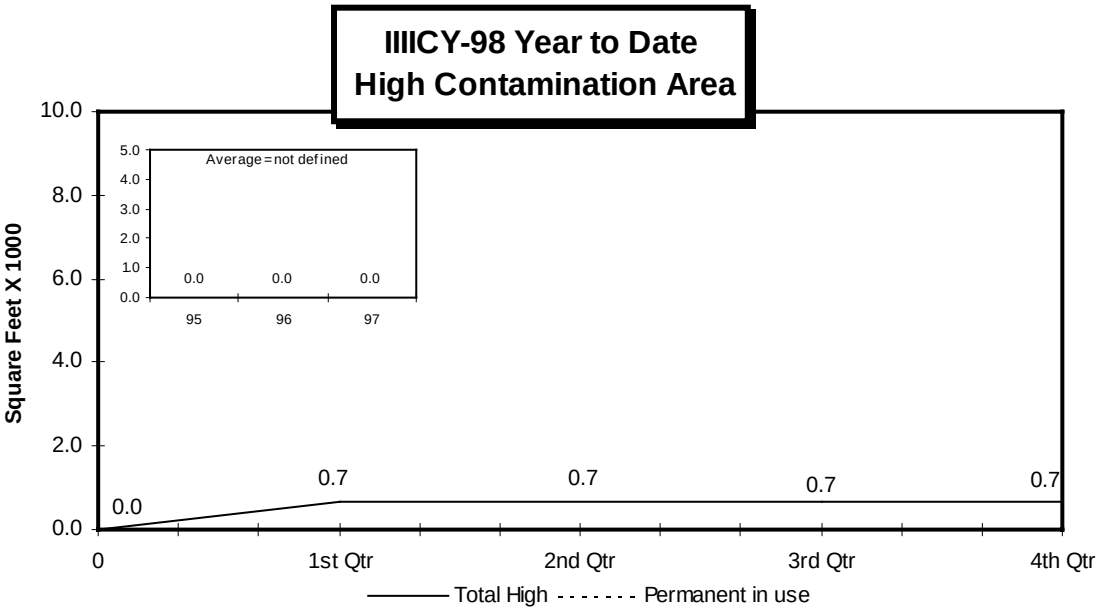
There have been no events greater than 10% DAC year to date.



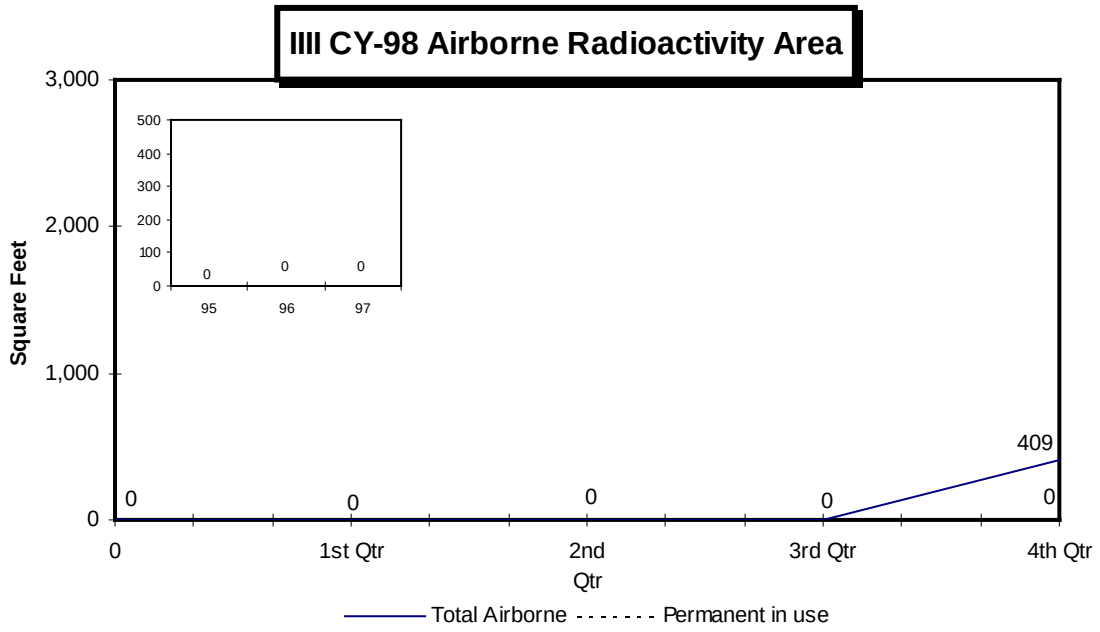
There have been no internal doses greater than 10 mrem CEDE confirmed from IIII operations year to date.



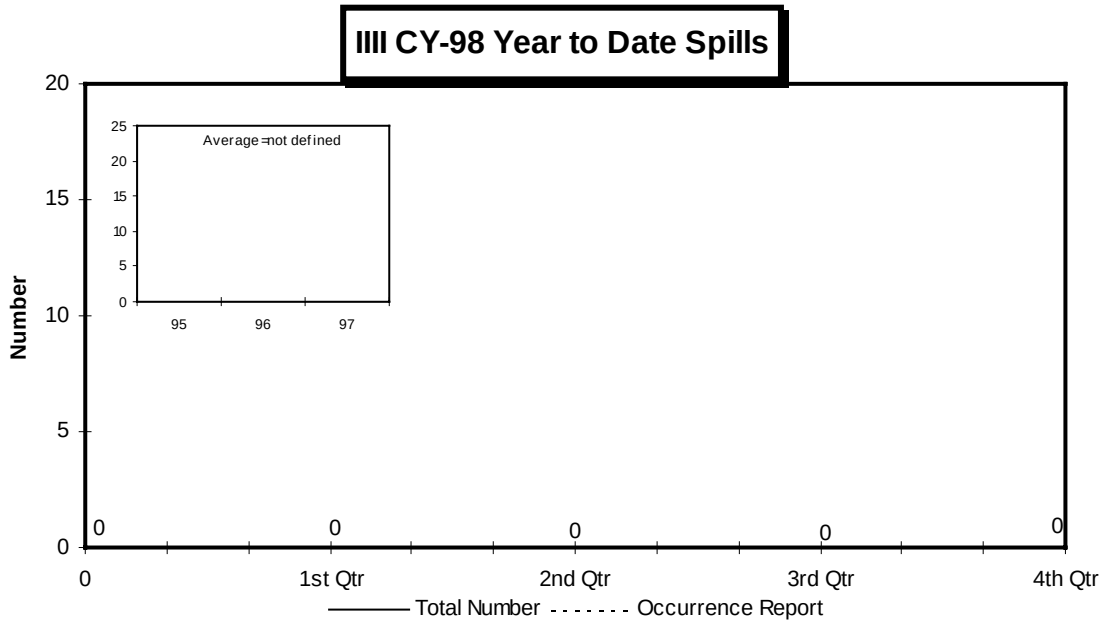
Contamination areas total 834 square feet at the Hot Cell at TRA



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.



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

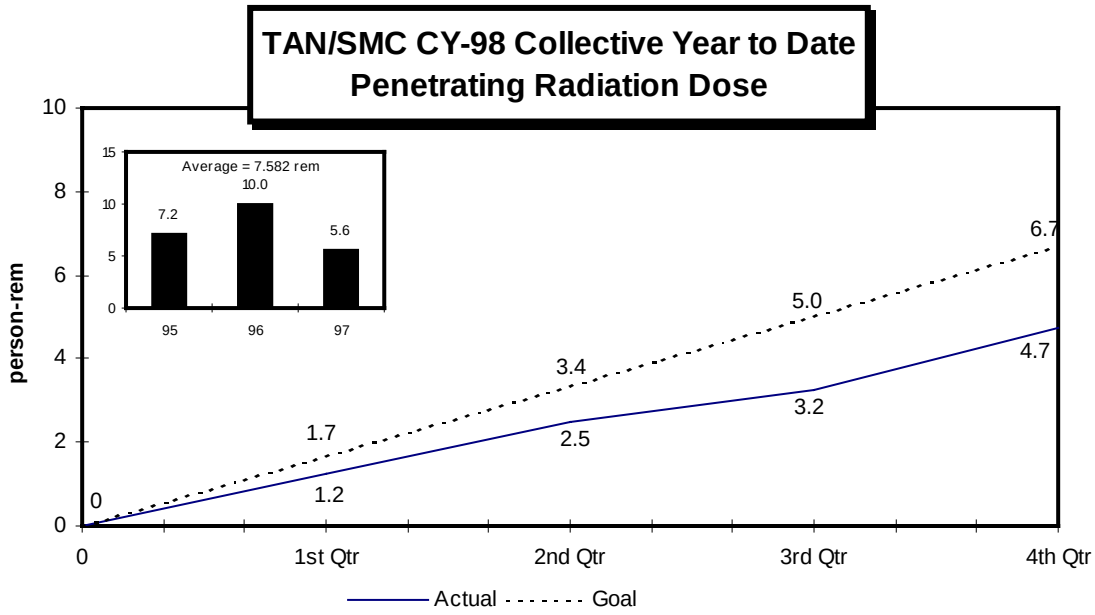
Test Area North
&
Specific Manufacturing Capability

Summary

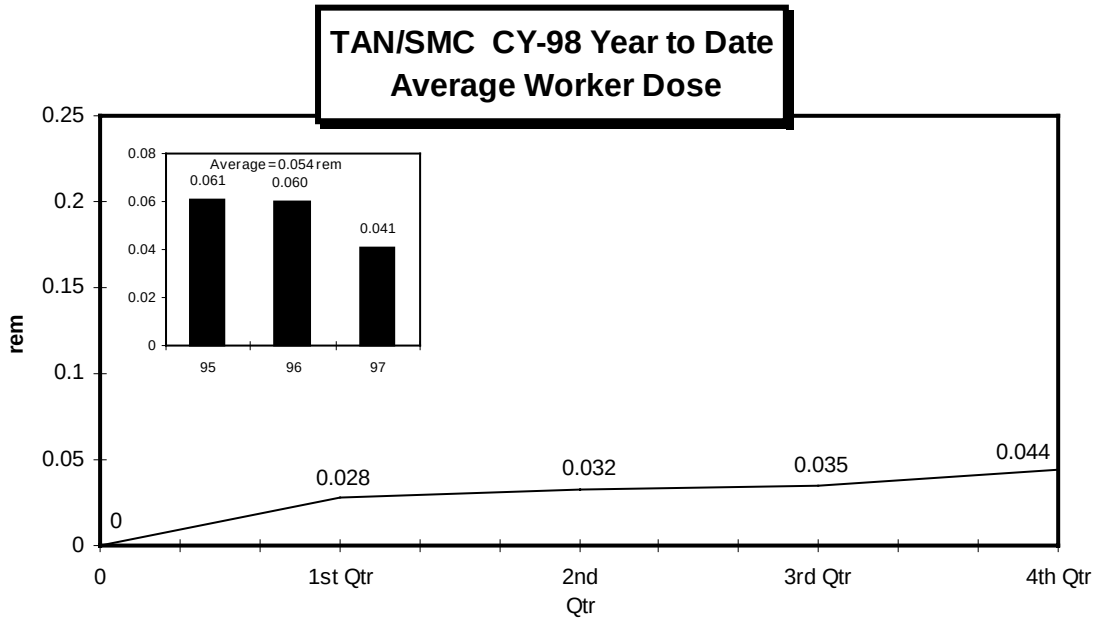
1. TAN hot shop work, handling repackaging and shipment of hot waste, fuel movements, canister dewatering, cask disassembly, ER remediation activities, decontamination, and pool cleaning and vacuuming account for dose at TAN Ops.

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

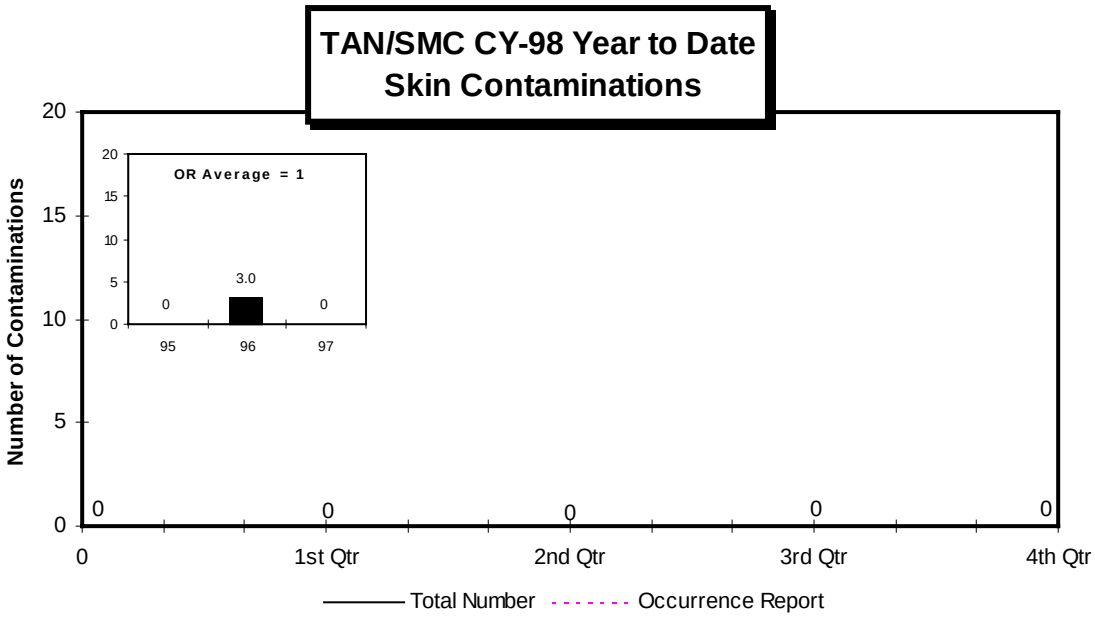
3. The only spill year to date is the one that occurred in the first quarter at TAN 666 as a result of back-flow from the number three holding tank up through floor sumps.



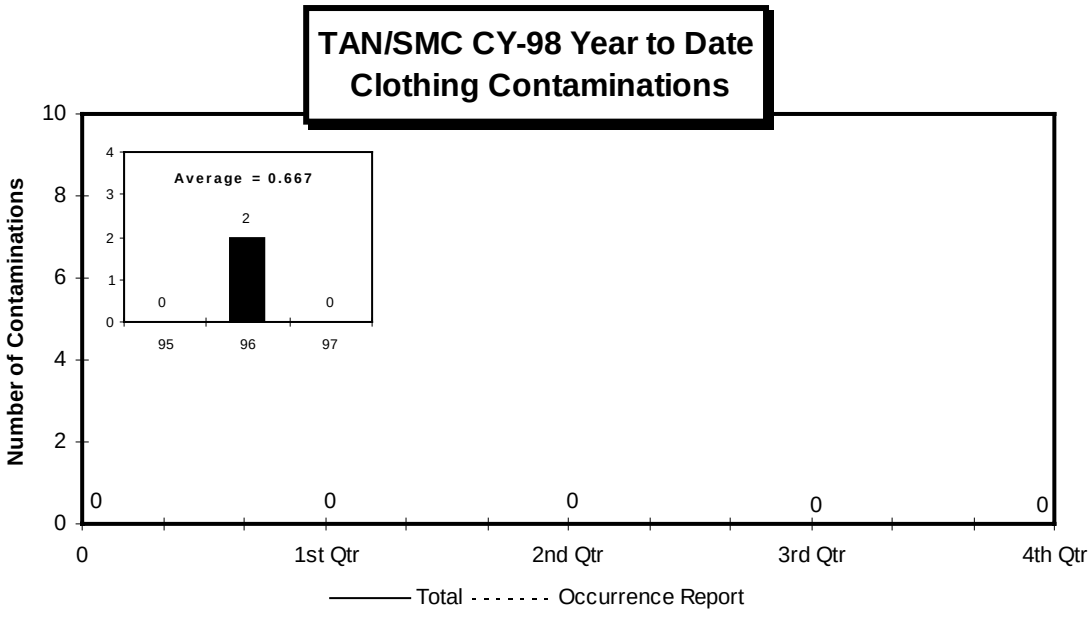
TAN and SMC collective penetrating radiation dose through the end of the fourth quarter was 4.730 person-rem. Some work was postponed due to a maintenance work stoppage.



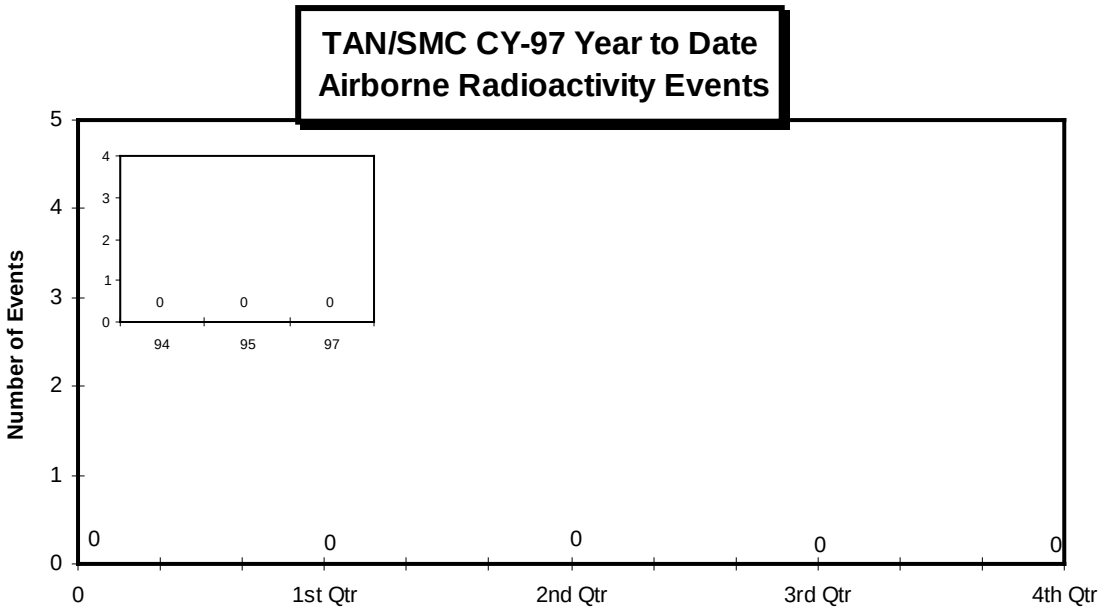
The average worker dose at the TAN/SMC through the end of the fourth quarter was 0.044 rem based on 108 workers who received dose greater than 10 mrem.



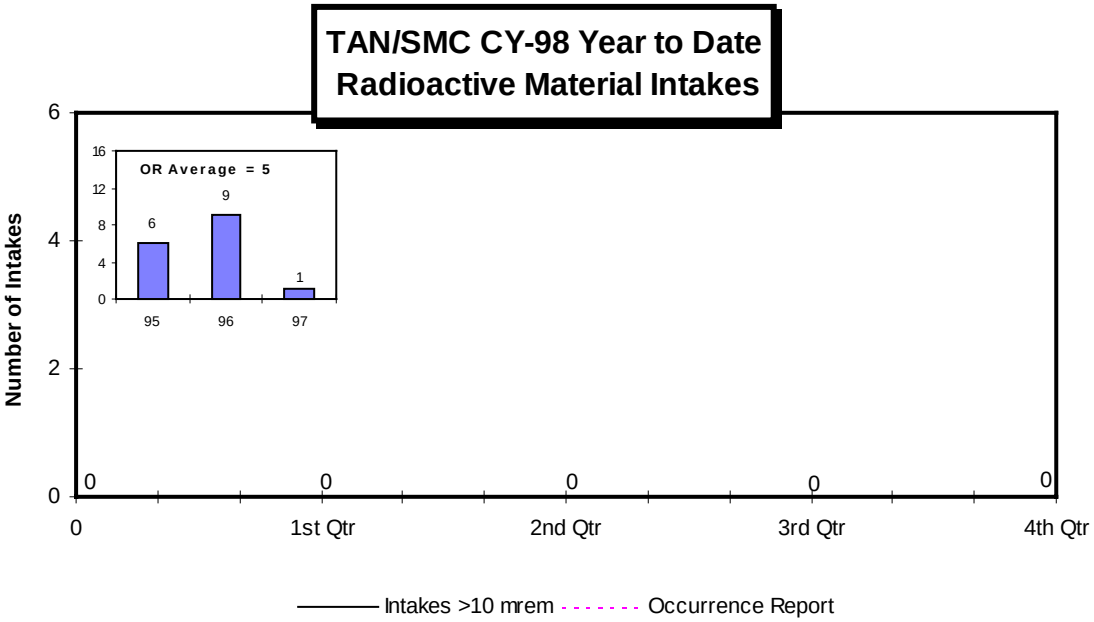
There were no skin contaminations at TAN/SMC during the fourth quarter. There were no facial or wound contaminations during the quarter.



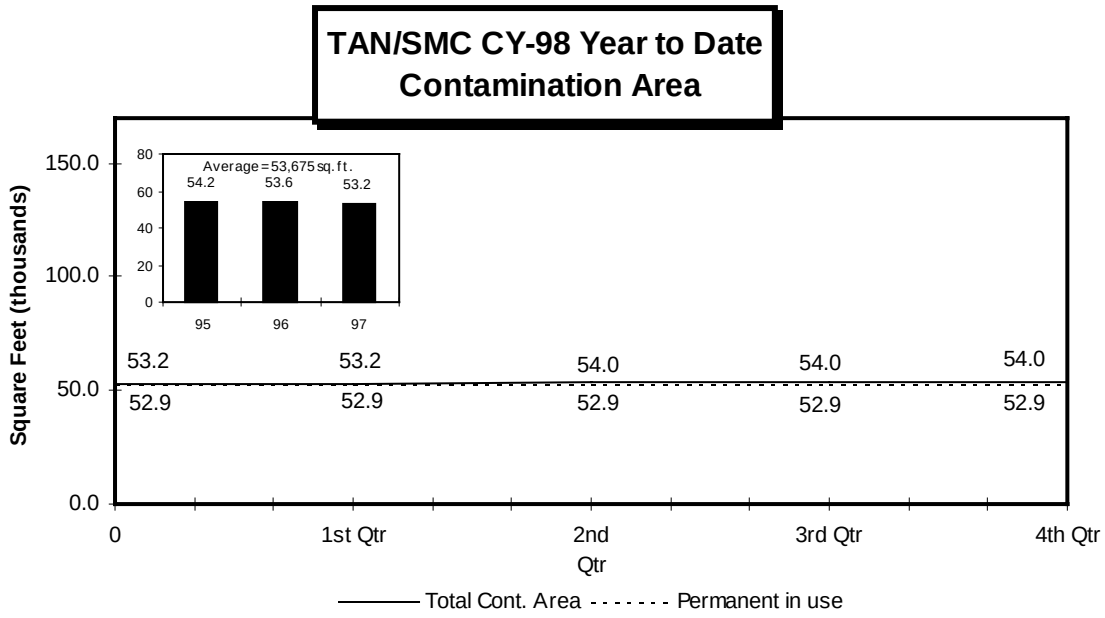
There was no contamination that occurred at TAN/SMC during the fourth quarter.



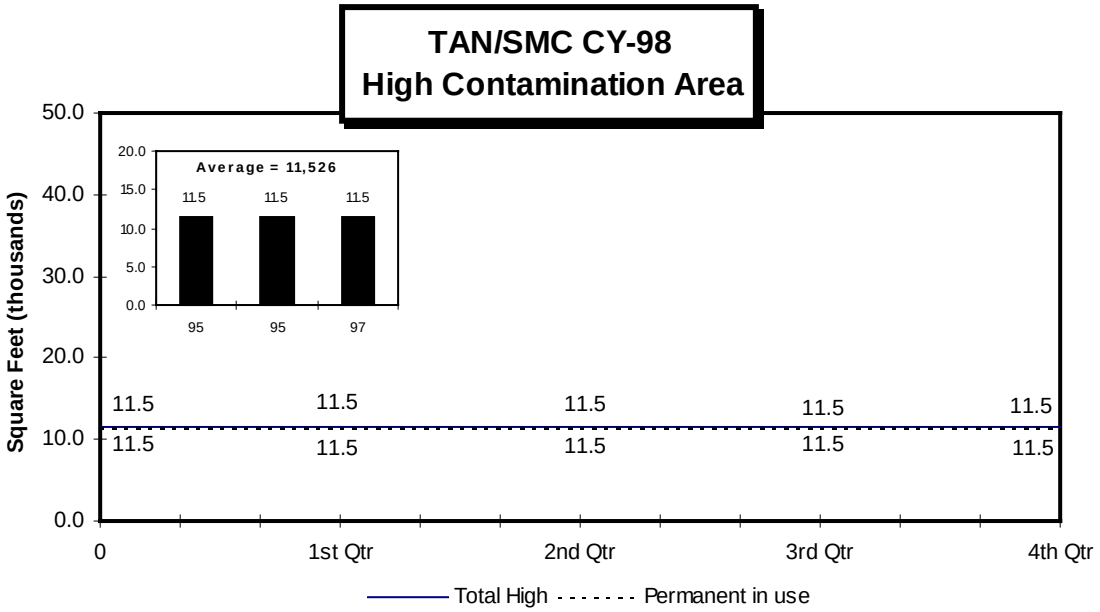
No airborne activity event greater than 10 % DAC was detected at TAN/SMC in areas not posted as Airborne Radioactivity Areas during the fourth quarter.



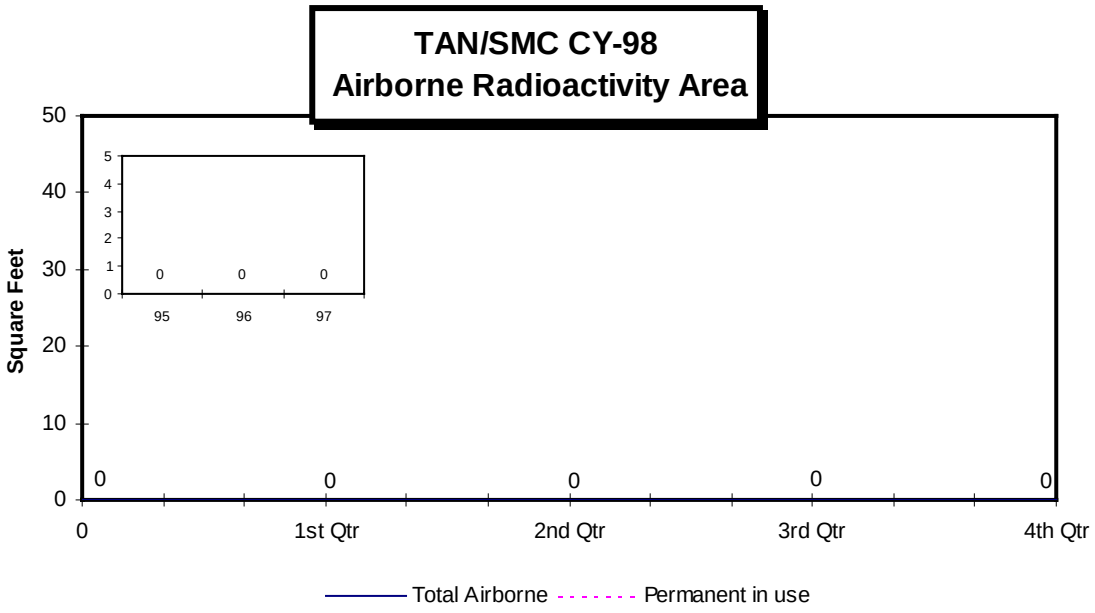
No internal uptakes have occurred at TAN/SMC, year to date. Seven routine bioassays have exceeded the 1.0 µg/l baseline, and are being evaluated for final dose determination, if any.



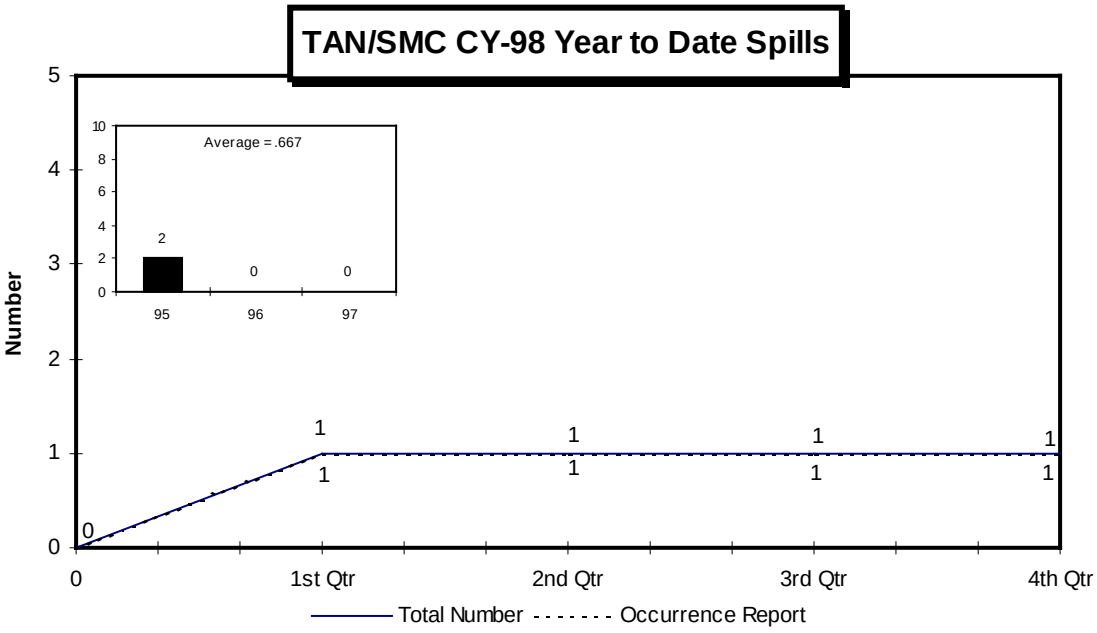
The total Contamination Area at TAN/SMC at the end of the fourth quarter was 54,026 square feet. 52,926 square feet was designated as permanent and in-use.



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



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