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RESULTS OF SAMPLING FOR VERIFICATION OF EFFECTIVENESS OF RAILCAR
CLEANING PROCEDURES NCBC GULFPORT MS
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VERIFICATION OF EFFECTIVENESS
OF RAILCAR CLEANING PROCEDURES

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UNITED STATES AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY
OPERATING LOCATION AA
KELLY AFB, TEXAS 78241

I. BACKGROUND: During the Gulfport phase of Operation PACER HO, fifteen railcars were utilized to transfer Herbicide Orange from the dedrum site on the Naval Construction Battalion Center base to the city of Gulfport's dock, a distance of approximately three miles. A total of 900,000 gallons of herbicide were transferred over a three week period. A list of serial numbers of the cars is included as Appendix 1. An average of seven railcars per day were loaded with herbicide at the dedrum facility and moved to the dock area. One empty railcar was included in the movement as a part of the Spill Contingency Plan.

II. RAILCAR DECONTAMINATION:

A. Prior to return of the railcars to normal service as POL carriers, several procedures were utilized to insure that no detectable levels of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) would remain in the cars.

B. Based upon the results of prior sampling and analyses of the various lots of herbicide, 127,000 gallons of herbicide containing no detectable levels of TCDD were identified and set aside. At the completion of the transfer of the herbicide containing measurable quantities of TCDD each railcar was filled with "clean" herbicide and this herbicide transported to the ship.

C. Following this initial rinse, 3000 gallons of diesel fuel was utilized to clean the interior of the railcars utilizing high pressure counter-rotating spray nozzles on a spray boom extending longitudinally into the railcar. This cleaning was accomplished sequentially, thus each car received a spray rinse of 3000 gallons of diesel fuel. Following this, each railcar was filled with high pressure steam which was allowed to condense. The condensate was then drained from the cars. The cars were allowed to air dry for approximately thirty days prior to wipe sampling of the interior.

III. WIPE SAMPLING PROCEDURE:

A. Wipe samples were collected from the interior of each tank car utilizing 11 centimeter diameter Whatman 41 filter paper. The filter paper was clamped to a pad mounted on the end of a twelve foot wand. This device allowed collection of the samples without personnel entry into the railcar. Five railcars were initially sampled utilizing dry filter paper as well as filter paper that had been wet with nanograde grade hexane.

B. Analysis of these samples indicated that the dry filter paper provided the best removal of material from the railcars and all remaining samples were collected utilizing dry filter paper.

C. All wipe samples were collected from the bottom surface of the railcars, the area of maximum probable contamination. An area of approximately one square foot was wiped. Each wipe sample was placed in previously rinsed containers for shipment to Wright State University for analysis.

IV. ANALYSIS OF SWIPE SAMPLES: Swipe samples collected from the railcars were placed in glass stoppered 125 ml Erlenmeyer flasks and extracted with benzene. Analysis of the extract for TCDD was accomplished by an automated multiple-ion-monitoring gas chromatography-mass spectrometry system. The system consisted of a Varian 1440 gas chromatograph coupled through an AEI silicone membrane separator to an AEI MS-30 double beam spectrometer. The system allowed repetitive scanning (20 scans/second) over a narrow portion of the mass scale (0.3 AMU) which brackets the base peak for TCDD ($m/e = 321.8936$). This method was capable of detecting TCDD at a concentration of one microgram per sample.

V. RESULTS AND DISCUSSION: The results of the analysis of all railcar swipe samples are shown on Table 1. In all cases, no TCDD could be detected at a sensitivity of one microgram per swipe. These results verify that the cleaning procedures utilized were effective in removing TCDD from the walls of the railcars and that further cleaning of these cars would be unnecessary.

VI. SUMMARY: Based upon the results of the analyses of the swipe samples, this Laboratory recommends that the railcars listed in Appendix 1 be released for POL service carrying light petroleum products.

APPENDIX I
LISTING OF RAILCARS
UTILIZED TO TRANSPORT
HERBICIDE ORANGE

CAR NUMBER

DODX 11648

DODX 11650

DODX 12604

DODX 12612

DODX 12621

DODX 12628

DODX 12836

DODX 12648

DODX 12649

DODX 12655

DODX 12664

DODX 12680

DDODX 12690

DODX 12691

DODX 12692

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TABLE 1
RESULTS OF RAILCAR SWIPE SAMPLES

| <u>CAR NUMBER</u> | <u>TCDD CONCENTRATION</u> |
|-------------------|-------------------------------|
| DODX 11648 | ND* |
| DODX 11650 | ND |
| DODX 12604 | ND |
| DODX 12612 | ND |
| DODX 12621 | ND |
| DODX 12628 | ND |
| DODX 12636 | ND |
| DODX 12648 | ND |
| DODX 12649 | ND |
| DODX 12655 | ND |
| DODX 12664 | ND |
| DODX 12680 | ND |
| DODX 12690 | ND |
| DODX 12691 | ND |
| DODX 12692 | ND |

*ND = None Detected, Sensitivity = 1 microgram per sample