

INDUSTRIAL HYGIENE REPORT

INDUSTRIAL HYGIENE SURVEY FOR EMPLOYEE
EXPOSURE TO DOW TELONE®*II DISTRIBUTED
BY THORO PRODUCTS COMPANY, ARVADA,
COLORADO.

THORO PRODUCTS COMPANY IS A DISTRIBUTION
CONTRACTOR FOR DOW CHEMICAL U.S.A. INLAND
TERMINALS OPERATION.

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SUMMARY

This Industrial Hygiene survey was conducted on September 22 and 23, 1977 at Thoro Products Company during the loading of tank trucks with Telone® II.

Data collected indicate overexposure to the Thoro loading man under existing conditions. The replacement of a leaking hose drain valve and alterations to an open top drain bucket should eliminate the overexposure involved in Telone® II tank truck loading at Thoro Products Company.

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DISTRIBUTION

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INTRODUCTION

An Industrial Hygiene survey was conducted to measure employee exposure levels to Telone® II, during tank truck loading operations at Thoro Products Company, Arvada, Colorado. Thoro Products is a distributor of Dow products for the Louisiana Division's Inland Terminals operation. The recommended industrial health guide for Telone® II (1,3-Dichloropropene) is 1.0 ppm for 8 hours T.W.A., with a 3.0 ppm ceiling.

CONCLUSIONS

Based on conditions that existed during this survey on September 22 and 23, 1977, and on data obtained, all results except one were acceptable. Weather conditions were the major factor influencing the exposure levels measured. On the first day, September 22, wind velocity was 0-3 mph, which is about normal. On this day the unacceptable exposure level of 4.4 ppm Telone® II for a 45 minute T.W.A. occurred while loading a tank truck. On September 23, the second day, abnormally high winds of 30 to 50 mph occurred resulting in all exposures being less than 0.3 ppm Telone® II. See Table I.

The data gathered from nine samples taken while loading two tank trucks indicate that under existing conditions the loading man is overexposed for the duration of the tank truck loading operation.

Observations of the tank truck loading operation and results of data obtained indicate that the only serious overexposure occurs to the loading operator. This exposure is caused by a leaking drain valve on the loading hose and the draining of the hose into an open five gallon bucket. This open bucket is a continuous source of Telone® II vapors. Under normal loading procedures there is no skin contact to Telone® II.

RECOMMENDATIONS

The leaking valve on the loading hose should be replaced and kept in good condition. Also, the open top five gallon bucket should be equipped with a cover containing a funnel to reduce vapor loss from the bucket. The use of gloves to prevent skin contact with Telone® II should be continued and all skin contact should be avoided.

The results of this survey should be communicated to employees handling this material. A copy of this report should be filed in the Thoro Products Company Industrial Hygiene file. It would be available if needed for reference during audits for health reasons or government audits.

DISCUSSION

The loading of tank trucks with Telone® II at Thoro Products Company normally involves two people, the Thoro loading man and the tank truck driver. The loading procedure involves hooking up a flexible load line from the Telone® II storage tank pump to a manifold on the tank truck. Each compartment on the tank truck is then filled individually from the bottom. The truck driver remains on top of the trailer and observes the level of liquid in each compartment as it is filled. The loading hose is drained through a drain valve into a bucket before the hose is disconnected after the trailer is full. The material in the bucket is collected and returned to the storage tank. This storage tank is maintained with a 2.0 oz. nitrogen pad. All Telone® II is brought to this location by rail car and pumped into the storage tank. Telone® II is a seasonal product and is generally sold only in the fall and spring.

Other Dow products distributed by Thoro Products Company are methylene chloride, Dow Per®, and Neu-Tri®. All loading at this facility takes place in open, well ventilated areas. Thoro Products Company was monitored for employee exposure to the three compounds listed above in June, 1977. Results can be found in Louisiana Division Report No. LAD-IH-77.06, August, 1977.

The Telone® II storage tank area contains one tank 57 ft. high with a 25 ft. diameter capable of holding 240,000 gallons. It's located within a concrete and earthen wall 40' x 130' with a plastic barrier in the soil. This containment area will hold 480,000 gallons. See attached sketch.

SAMPLE COLLECTION AND ANALYTICAL METHODS

All samples were collected in glass tubes packed with activated carbon and containing break through sections. Model P-200 DuPont personnel sampling pumps were used to draw the samples into the collection tubes. These pumps were calibrated before and after each sample. Blank tubes were analyzed to confirm purity of the activated carbon and carbon disulfide used.

ANALYSIS

Samples were extracted using carbon disulfide at dry ice temperature. Two microliter size samples were injected into an H.P. 5700 Chromatograph equipped with a flame ionization detector. The minimum detectable limit on this instrument was 0.9 micrograms of Telone® II using a 15% tricresyl phosphate coated column. The minimum detectable limit was 0.3 ppm Telone® II for the time period sampled. Sampling durations varied from 45 to 75 minutes. Pump flow rates ranged from 170 cc/min to 250 cc/min.

RESULTS

The results of the monitoring are shown on Table I. The loading man exceeded the 3.0 ppm ceiling on September 22 during the loading operation. Since normally only one tank truck is loaded per day, the loading man's time weighted average for that eight hour day would be less than 1.0 ppm or within the guidelines. The 4.4 ppm result is unacceptable since it exceeds the 3.0 ppm ceiling. Steps should be taken to reduce these excursions during the loading operation.

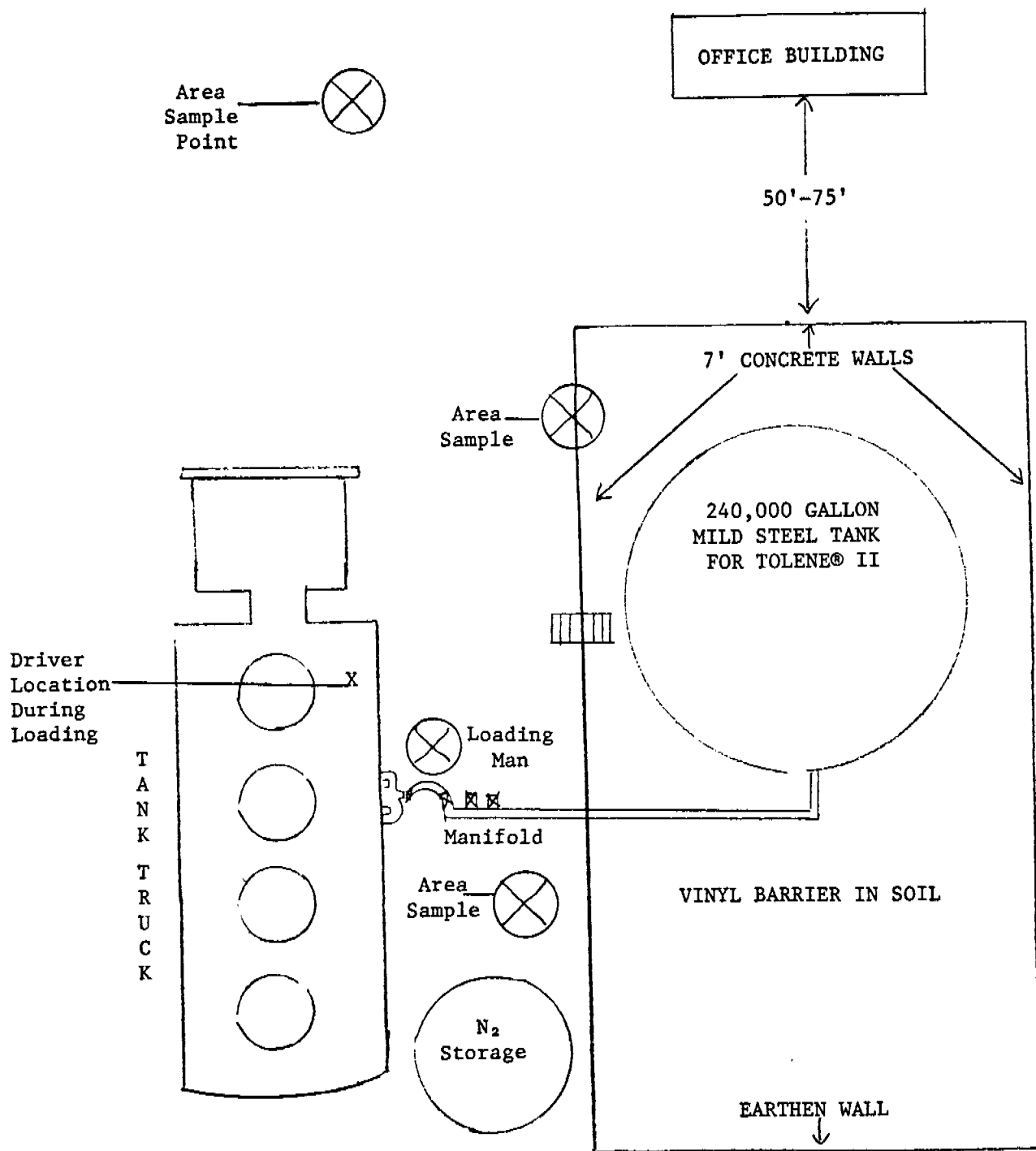


TABLE 1

MONITORING DATA

TELONE® II SURVEY - THORO PRODUCTS COMPANY

September 22 and 23, 1977

Date	Sample No.	Job	Duration	Compound Measured	Quantity Units ppm, mg/m ³	Type of Sample Excursion	Wind Conditions	Brief Job Description
9-22-77	10-5	Truck Driver	45 min.	Telone®II	<0.3 ppm	Personnel	3-5 mph	Located on top of trailer
9-22-77	10-6	-----	45 min.	"	<0.3 ppm	Area	3-5 mph	Loading lot area
9-22-77	10-7	Loading Man	45 min.	"	4.4 ppm	Personnel	3-5 mph	Handling and draining loading hose
9-22-77	10-8	-----	45 min.	"	<0.3 ppm	Area	3-5 mph (downwind)	Next to tank
9-22-77	10-9	-----	45 min.	"	<0.3 ppm	Area	3-5 mph (downwind)	On surrounding wall
9-23-77	10-1	-----	75 min.	"	<0.3 ppm	Area	30-50 mph (downwind)	Loading lot area
9-23-77	10-2	-----	75 min.	"	<0.3 ppm	Area	30-50 mph (downwind)	On surrounding wall
9-23-77	10-3	-----	45 min.	"	<0.3 ppm	Personnel	30-50 mph	Driver on top of trailer
9-23-77	10-4	-----	45 min.	"	<0.3 ppm	Personnel	30-50 mph	Handling and draining loading hose

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