

0047585

File-2,4-D Site



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Reply To
Attn Of: OEA-095

JUL 15 1997

MEMORANDUM

SUBJECT: 2,4-D Dump Site Investigation Report

FROM: Jed Januch, Compliance Officer
Investigations and Engineering Unit

Jed Januch

Keven McDermott, Civil Investigator
Investigations and Engineering Unit

Keven McDermott

TO: Marie Jennings, Manager
Pesticides Unit

Philip Wong, Manager
Investigations and Engineering Unit

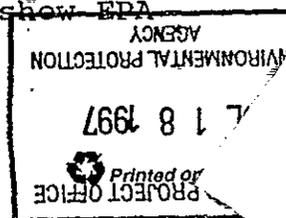


Introduction

On November 2, 1996, while John Hough was hunting Wahluke Wildlife Management Area, he was exposed to 2,4-dichlorophenoxyacetic acid (2,4-D) through an aerial application contracted for by the South Columbia Basin Irrigation District. Having experienced acute physical symptoms as a result of exposure to the pesticide, Mr. Hough made a formal complaint to the Washington State Department of Agriculture. On December 18, 1996, the Washington State Department of Agriculture referred the complaint to the Environmental Protection Agency, Region 10, Pesticides Unit.

Jed Januch of the Pesticides Unit, currently on detail to the Office of Environmental Assessment, and Keven McDermott of the Office of Environmental Assessment began an investigation into Mr. Hough's complaint on January 2, 1997. A comprehensive investigation was conducted and a report was completed on March 18, 1997.

On May 1, 1997, John Hough called and asked if EPA would be interested in pursuing information about a possible 2,4-D disposal site located somewhere in the vicinity of the Wahluke Wildlife Management Area. He explained that he had recently talked with a friend and neighbor, Roger Contor, who told him there were markers identifying a 2,4-D burial site near the Columbia River on the North Slope. Mr. Hough emphasized that he had not seen the site, and knew of it only second hand through Mr. Contor. He said that Mr. Contor was willing to show EPA



personnel where the site was located, but was only available to do so on Saturday, May 3rd.

Arrangements were made to meet John Hough and Roger Contor at the Hough residence in Ellensburg, WA, on May 3, 1997. Before proceeding to the site, we queried Roger Contor as to his background and his knowledge of the Wahluke Wildlife Management Area. Mr. Contor said he was trained as a biologist. He began working for the National Park Service (NPS) in 1949, and was Regional Director for the NPS in Alaska when he retired in 1985. After retirement he moved to the Ellensburg area, and for a number of years has hunted each fall in the Wahluke Wildlife Management Area.

In 1993 or 1994 he discovered the 2,4-D site while hunting. He recalled seeing signs reading "2,4-D Dump" or "2,4-D Site". He noticed that the ground in the area had been disturbed, and he saw what he thought were tire marks or tracks made by heavy equipment. While he thought it was strange that 2,4-D would be buried close to the Columbia River in what is now a wildlife habitat, he didn't give much thought to the matter until he learned that his friend and neighbor, John Hough, had been exposed to 2,4-D while hunting in the general vicinity.

Historical Information

On May 12, 1997, Bill Gray, Bureau of Reclamation, Ephrata, WA, was interviewed concerning the 2,4-D site. Mr. Gray said he has been with the Bureau of Reclamation (BOR) in Ephrata for approximately ten years, and is currently the office manager. He said he recalled seeing some documentation referring to the 2,4-D site, and would search his files for any pertinent information.

On June 3, 1997, Mr. Gray provided documents describing the materials the BOR had buried at the 2,4-D site. A summary of these documents follows, with copies appended to the report of investigation.

On June 3, 1966, leaks were discovered in buried storage tanks containing 2,4-D at a BOR watermaster facility near Othello, WA. Permission was requested from the Atomic Energy Commission to bury the contaminated soil on the Wahluke Slope because the chosen disposal area was in a controlled, isolated area, the ground water table was low, and it was on the leeward side of a moving sand dune.

Sometime between June 3, 1966, and September 16, 1966, 2,4-D contaminated soil was buried at the Wahluke Slope disposal site in a trench 400 feet long, 12 feet wide and 4 feet deep. It is unclear from the documents if the leaking tank was buried on site at this time, but Mr. Gray said it is likely the leaking tank was disposed of with the contaminated soil.

In a BOR memo dated March 28, 1967, eleven corroded 2,4-D storage tanks at a watermaster headquarters containing a layer of precipitated 2,4-D salt on the bottom inside the tanks were to be buried at the Wahluke Slope site. On September 14, 1967, "ten eroded 2,4-D tanks were buried" at the Wahluke Slope. Each tank was 12 feet long and 4 feet in diameter. The tanks were "flattened with a bulldozer and buried in the sand".

BOR memoranda refer to eleven 2,4-D storage tanks, but only document the burial of ten tanks. While it appears that all eleven tanks were buried at the disposal site, only ten are fully accounted for.

Site Location

The 2,4-D burial site is located within the Wahluke Habitat Management Area in the West 1/2 of Section 35, T14N, R27E, of Franklin County, Washington. The site is north-east of the Columbia River and is situated at the base of a steep east-facing hill that lies between the 2,4-D site and the river.

Observations on Site

Saturday, May 3, 1997, 11:00 am

While at the site, we were accompanied by John Hough and Roger Contor. We first observed a white wooden sign at the base of the hill that read, "2,4-D Burial Site June 1966". We also observed a Walla Walla District Corps of Engineers (COE) survey marker staked in the ground beneath the sign. We observed another white wooden sign approximately 400 feet to the north that also read, "2,4-D Burial Site June 1966". It also had a Walla Walla District COE marker staked in the ground beneath the sign.

After a cursory observation of the area, we climbed the hill adjacent to the site and looked down on the area below. Weed species observed in the area included broadleaf weeds such as mustard, annual sowthistle, common yarrow, balsamroot, meadow salsify, sagebrush, and russian thistle. We also observed grass species which mostly consisted of downey brome. There were to be at least three large irregular bare places that looked as if they were void of vegetation. Closer observation revealed that there were very few broadleaf weeds found within the boundaries of the bare places, and those broadleaf weeds that were growing there did not appear as vigorous as the broadleaf weeds observed outside the area. Broadleaf weeds observed did not appear to exhibit characteristic phenoxy herbicide type symptoms. Also, the downey brome seemed less vigorous within these areas and exhibited a red pigmentation.

We collected a total of three soil samples from the base of

the hill. While collecting the first soil sample within one of the bare places approximately 100 feet south west of the wooden sign on the north side of the site, we observed gray colored course sand at the 1-2 foot depth that was dissimilar to the light brown fine textured sand otherwise observed in the area. In addition to being an unusual texture and color, the course sand had a strong "chemical type" odor.

On the following Monday, May 5, 1997, we met with Chris Field, EPA On Scene Coordinator, Emergency Response Unit, Environmental Cleanup Office, to describe what we had observed on May 3, 1997, and to discuss subsequent actions. Chris Field later referred us to Dennis Faulk at the EPA Hanford Project Office. Over the period of the next three weeks, we participated in several meetings, conference calls, and telephone conversations with Dennis Faulk, EPA, Glen Goldberg, Department of Energy, and Jack Donnelly of the Washington State Department of Ecology. Plans were made to meet at the site on May 29, 1997, to take additional samples and conduct further investigation.

Thursday, May 29, 1997, 7:00 am

When we arrived at the site, we met with Dennis Faulk, Glen Goldberg, Jack Donnelly, and Jerry Yokel, a chemist with the Washington State Department of Ecology. Also present were contractors hired by the Department of Energy to conduct sampling and analysis.

A survey of the area revealed vegetation in the area had been slightly moisture stressed since the May 3, 1997, visit. Subsequent to the May 3, 1997 visit, information provided by the BOR revealed contaminated soil had been buried in a trench that extended along the base of the hill and there were at least ten crushed tanks buried further east of the trench. Much of the vegetation in the area had been driven/walked on and there was also some signs of insect feeding on some of the broadleaf weeds. The bare areas appeared similar to how they appeared on May 3, 1997, with the exception that some additional holes had been dug in the area. There were occasional broadleaf weeds that expressed phenoxy herbicide type symptoms.

Initially, we intended to take splits of those samples taken by the Department of Energy contractors, which showed detection of 2,4-D through immunoassay field test kits. However, once on site, it was determined by the contractors that the test kits would require 16 hours to yield results. Since the initial sample plan could not be followed, we received permission from Jack Donnelly and Glen Goldberg to take our own samples off the south edge of the exclusion zone, which was centered around the original area where we had previously detected 2,4-D.

At approximately 3:00 pm we began to dig sample holes using

a hand auger device. We sampled in five areas, approximately 100 feet south of the hole #1 sample site dug on May 3, 1997. In each of the auger holes we encountered gray colored coarse sand at the 4-5 foot depth similar to the grey colored coarse sand observed on May 3, 1997, found in hole #1.

Laboratory Analysis

On Saturday, May 3, 1997, we collected five samples for analysis at EPA Region 10's Laboratory in Manchester, Washington. Samples were analyzed for phenoxy herbicides including 2,4-D, 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), and 2-(2,4,5-trichlorophenoxy) propionic acid (Silvex). Three soil samples were collected from the 2,4-D Dump site and two sediment samples were collected from seep areas on the west-facing side of the hill adjacent to the Columbia River. The results of analysis are as follows:

SAMPLE #	SITE	MATRIX	RESULT
97194550	Hole #1	Soil	2,4-D = 2,500 ppm 2,4,5-T = 1.30 ppm Silvex = 0.08 ppm
97194551	Hole #2	Soil	2,4-D = ND 2,4,5-T = ND Silvex = ND
97194552	Hole #3	Soil	2,4-D = 1.07 ppm 2,4,5-T = 0.03 ppm Silvex = ND
97194553	White Bluffs	Sed.	2,4-D = ND 2,4,5-T = ND Silvex = ND
97194554	White Bluffs	Sed.	2,4-D = ND 2,4,5-T = ND Silvex = ND

ND = not detected

ppm = parts per million

Sed. = Sediment sample

Levels depicted in **bold** are above the 800 ppm clean-up level set by the Washington State Department of Ecology, Model Toxics Control Act Cleanup levels and Risk Calculations (CLARC II) Update, Publication #94-145 (Updated 1/96).

On Thursday, May 29, 1997, we collected five additional soil samples for analysis. The samples were analyzed for phenoxy herbicides including 2,4-D, 2,4,5-T, and Silvex. The soil samples were collected from the 2,4-D Dump site approximately

100+ feet south of the sample collected from hole #1 on May 3, 1997. The results of analysis are as follows:

SAMPLE #	SITE	MATRIX	RESULT
97224450	Auger Hole #1	Soil	2,4-D = 200 ppm 2,4,5-T = 0.25 ppm Silvex = 0.02 ppm
97224451	Auger Hole #2	Soil	2,4-D = 1,300 ppm 2,4,5-T = 0.88 ppm Silvex = ND
97224452	Auger Hole #3	Soil	2,4-D = 1,000 ppm 2,4,5-T = 0.62 ppm Silvex = ND
97224453	Auger Hole #4	Soil	2,4-D = 0.20 ppm 2,4,5-T = 0.01 ppm Silvex = ND
97224454	Auger Hole #5	Soil	2,4-D = 6.20 ppm 2,4,5-T = 0.03 ppm Silvex = ND

ND = not detected

ppm = parts per million

Levels depicted in bold are above the 800 ppm clean-up level set by the Washington State Department of Ecology, Model Toxics Control Act Cleanup levels and Risk Calculations (CLARC II) Update, Publication #94-145 (Updated 1/96).

Split samples collected by the Department of Energy contractors were provided to the Washington State Department of Ecology for analysis. These samples were collected from the immediate area surrounding EPA's sample site from May 3, 1997, identified as hole #1. The analysis of these samples revealed levels of 2,4-D between 0.18 ppm to 12,000 ppm.

Herbicide Characteristics

The herbicides 2,4-D, 2,4,5-T, and Silvex belong to the phenoxy herbicide family. These herbicides are normally applied as foliar treatments to control annual and perennial broad leaf weeds. Phenoxy herbicides are readily absorbed by broadleaf plants through roots and/or foliage and are translocated through both the transpiration and photosynthate streams. Phenoxy herbicides can cause abnormal seedling development in both broadleaf plants and grasses and in established broadleaf plants, symptoms can include epinasty which appears as bending, twisting, or curling of leaves and stems. Other symptoms may include chlorosis (yellowing of leaves) and eventual dieback.

Degradation of 2,4-D, 2,4,5-T, and Silvex in the soil occurs primarily through microbial action. Under normal field rate applications, phenoxy herbicides would be expected to break down within 2-8 weeks given the right conditions. The period of time it takes for relatively high concentrations of 2,4-D buried beneath the soil surface to degrade is difficult to predict. Ultimately, the rate of degradation will be influenced over time by combinations of factors including the physical, chemical, and biological characteristics of the soil such as temperature, amount of moisture present, aeration, pH, and organic-matter content. It can also be influenced by the concentration and chemical structure or formulation of the herbicides and the presence of other contaminants in the soil.

Attachments

cc: Michael Gearheard, EPA Region 10
Douglas Sherwood, EPA Region 10 - Hanford Office

1.0 PROJECT BACKGROUND/OBJECTIVE

The 2,4-D Site is located in the Hanford North Slope Area (Figure 1) approximately 25 miles north of the city of Richland, Washington. The site is located approximately 0.5 miles east of the Columbia River within Section 35, Township 27 East, Range 14 North. The site consists of an area approximately 60 feet in width by 440 feet in length which runs parallel to the base of a semi-stabilized sand dune which is approximately 60 feet in height (Figure 2). The area had been used to dispose of approximately 50 cubic yards of soil which had been impacted by 2,4-D. The impacted soil had resulted from the release of approximately 900 gallons from storage tanks located in Eltopia, Washington. After disposal of the soils in a shallow trench constructed at the base of the sand dune, the tanks themselves were flattened and buried at the site.

2,4-D is a chlorinated herbicide which was used to control vegetation. The herbicide can be metabolized by bacteria and is generally not as persistent in the environment as are most other herbicides. Previously, eight soil samples were collected at the site using a rotary auger drilling rig and analyzed in the field using a field screening test. Only one sample indicated the presence of 2,4-D, however, laboratory analysis of this sample and other selected samples did not contain detectable levels of chlorinated herbicides.

The objective of the current project was to obtain samples of soil adjacent to and beneath the flattened, buried tanks to assess possible impacts to site soils or groundwater. The project consisted of drilling four inclined borings to approximately 20 feet and the collection of four soil samples from each boring.

There are no surficial signs of the excavation or the buried tanks. The site was previously backfilled and leveled using native materials and native vegetation entirely covers the site. The locations of the tanks were determined using geophysical techniques (see Geophysics Survey, 2,4-D Site, Hanford-North Slope dated April 1994 by Shannon & Wilson, Inc.). Figure 2 shows the boundaries of the tank burial area as determined by geophysical techniques. These boundaries are marked at the site using flagging and were used to determine the drilling points for the current project.

2.0 FIELD INVESTIGATION

On July 19, 1994, an Environmental Technician and a Registered Professional Geologist from Cascade Earth Sciences, Ltd. met with Randy Chong and several representatives of the U.S. Army Corps of Engineers (COE) at the North Slope Job Shack. Two representatives of Environmental West Exploration (the drilling contractor), Driller Bob Sheldon and assistant Wendell Hawley, were also in attendance.

All parties mobilized to the access road to the 2,4-D site where a "tailgate" safety meeting was held from 7:45 am to 8:00 am. Concerns of access to the site from the main road were expressed, especially for the drill rig which was not 4-wheel drive equipped. A discussion of possible health hazards at the site included heat exhaustion, possible chemical exposure, and interaction with area wildlife. After discussions on the level of personal protection equipment (PPE) required by the site, it was determined that a modified Level D (including chemical resistant gloves) would be adequate unless specific site conditions warranted upgrading to respirators and Tyvek.

The driller and a representative of the COE walked the path to the site (approximately one-half mile) to assess the probability of accessing the site. After attempting to access the site, the drill rig became stuck in the loose sand approximately 100 yards from the site. A representative of CES and the COE went to Othello, Washington to purchase plywood to aid in moving the drill rig to the site. From 10:00 a.m. to 10:30 a.m., the drill rig was freed and moved into position at the 2,4-D Site.

After walking the site, it was determined (in conjunction with COE representatives) that all four site borings would have to be performed along the eastern edge of the excavation boundary: access to the opposite side could not be accomplished by the drill rig due to the proximity of the sand dune. The borings were to be started approximately 6 feet from the outer edge of the boundary determined by geophysical methods. Figure 2 shows the locations of the four site borings with the electro-magnetic anomaly outline as a reference. The figure also shows the orientation of the inclined borings and the approximate horizontal extent beneath the anomaly after correction for the inclination. Figure 3 presents a cross-section showing the inclined borings and the approximate dimensions of the excavation based on available site information.

Drilling of the first inclined boring (designated S1) was initiated at 10:30 a.m. The orientation of the boring was approximately 235 degrees azimuth and the drilling stems were inclined 30 degrees from the vertical plane. In conjunction with Richard Fink of the COE, it was determined that split-spoon samples would be collected from the 5 to 7 feet, 10 to 12 feet, 15 to 17 feet, and 20 to 22 feet intervals. The second boring (S2) was initiated at 1:45 p.m. Boring S3 was initiated at 4:00 p.m. and S4 was initiated at 6:30 p.m. There was no evidence that the tanks were struck or penetrated during the drilling process.

Samples were collected into laboratory-prepared 9-ounce jars with Teflon-lined lids. The samples were placed on ice in a cooler for transportation to the laboratory. All sampling equipment and the split-spoons were decontaminated using a three-stage process consisting of a tap water wash, an Alconox wash, and a deionized water rinse. The augers and lead bit were steam cleaned between each boring. All decontamination fluids were placed in lined and sealed 55-gallon drums for disposal after sample results were obtained.

Soils encountered consisted of gray, dry to damp, loose, fine to medium-grained sand. Sand consisted of well-sorted, angular to sub-rounded grains predominantly of quartz and lithic fragments with feldspar and lesser white mica. Some samples showed iron-stained bands. No odors or other discolorations were noted. Refer to Appendix A for copies of the boring logs for the four site borings.

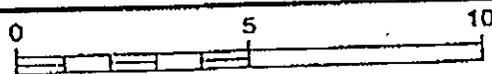
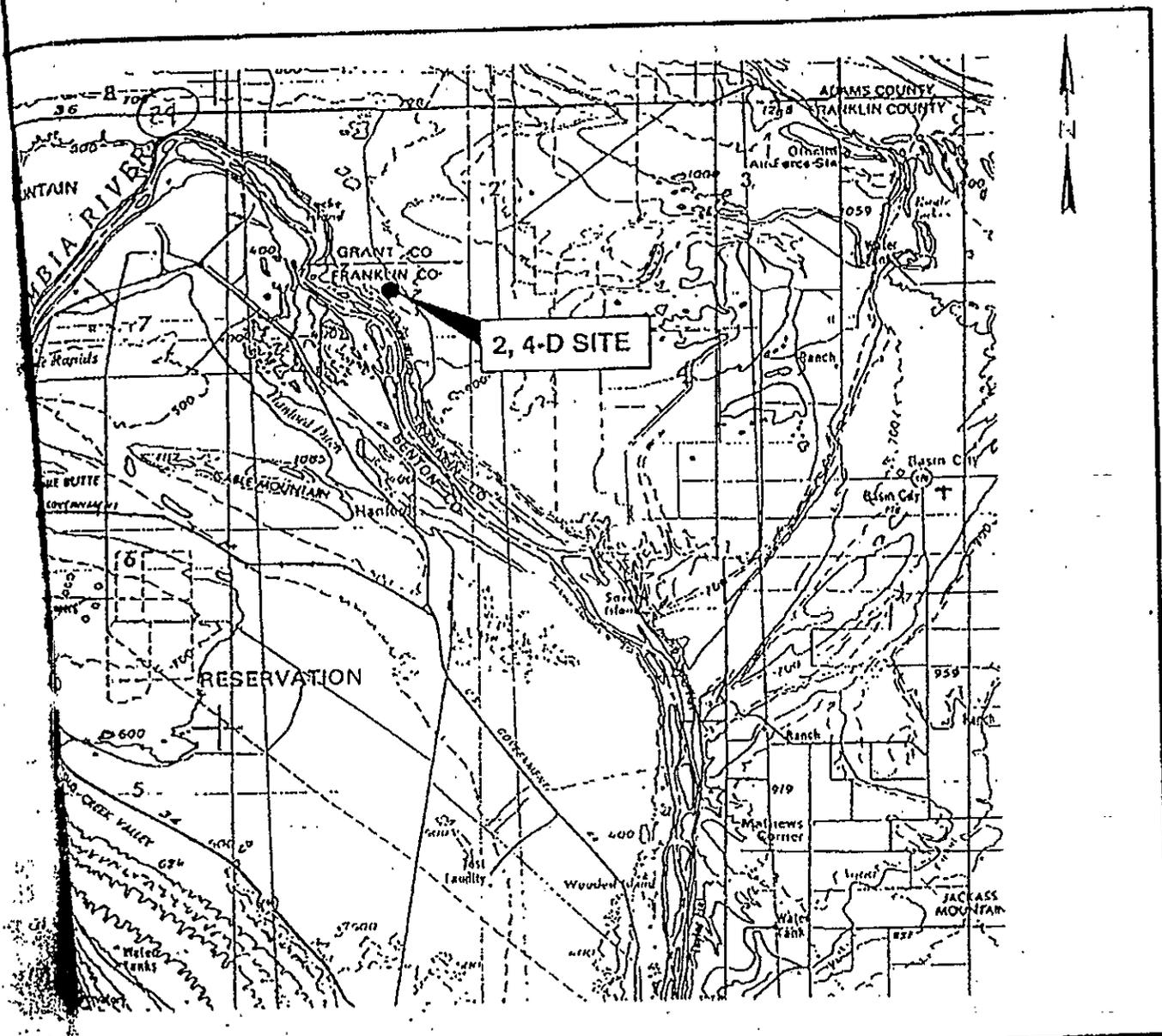
3.0 ANALYTICAL RESULTS/CONCLUSIONS

Eighteen soil samples (the four soil samples from each boring and two duplicate soil samples designated S1-S25 and S3-S25) were submitted to Columbia Analytical Services, Inc. (CAS) in Kelso, Washington. Additionally, a sample split from the first boring was provided to representatives of the Washington Department of Ecology and selected quality assurance samples were provided to the COE for analysis at their Troutdale, Oregon laboratory.

The eighteen soil samples collected from the site borings were analyzed for chlorinated herbicides including 2,4-D using EPA Method 8150A modified. No chlorinated herbicides were detected in these soil samples. The method detection limit for 2,4-D is 0.2 mg/Kg (ppm). Refer to the laboratory reports for the method detection limits for other chlorinated herbicides covered by EPA Method 8150A. The official Laboratory Reports and Chain-of-Custody documentation is presented in Appendix B.

Based on the soil samples collected adjacent to and beneath the 2,4-D Site (and submitted to CAS for analysis), the disposal of the tanks used to store 2,4-D have not significantly impacted the soils beneath the filled excavation. Accordingly, if samples analyzed by the COE Laboratory and the Department of Ecology display similar results, no further actions appear to be required to protect human health and the environment at this time. However, the investigation was not designed to discover all possible contaminants at the site. Future actions or changes in site conditions may warrant additional investigation and/or monitoring to protect the environment and/or limit exposure of site personnel.

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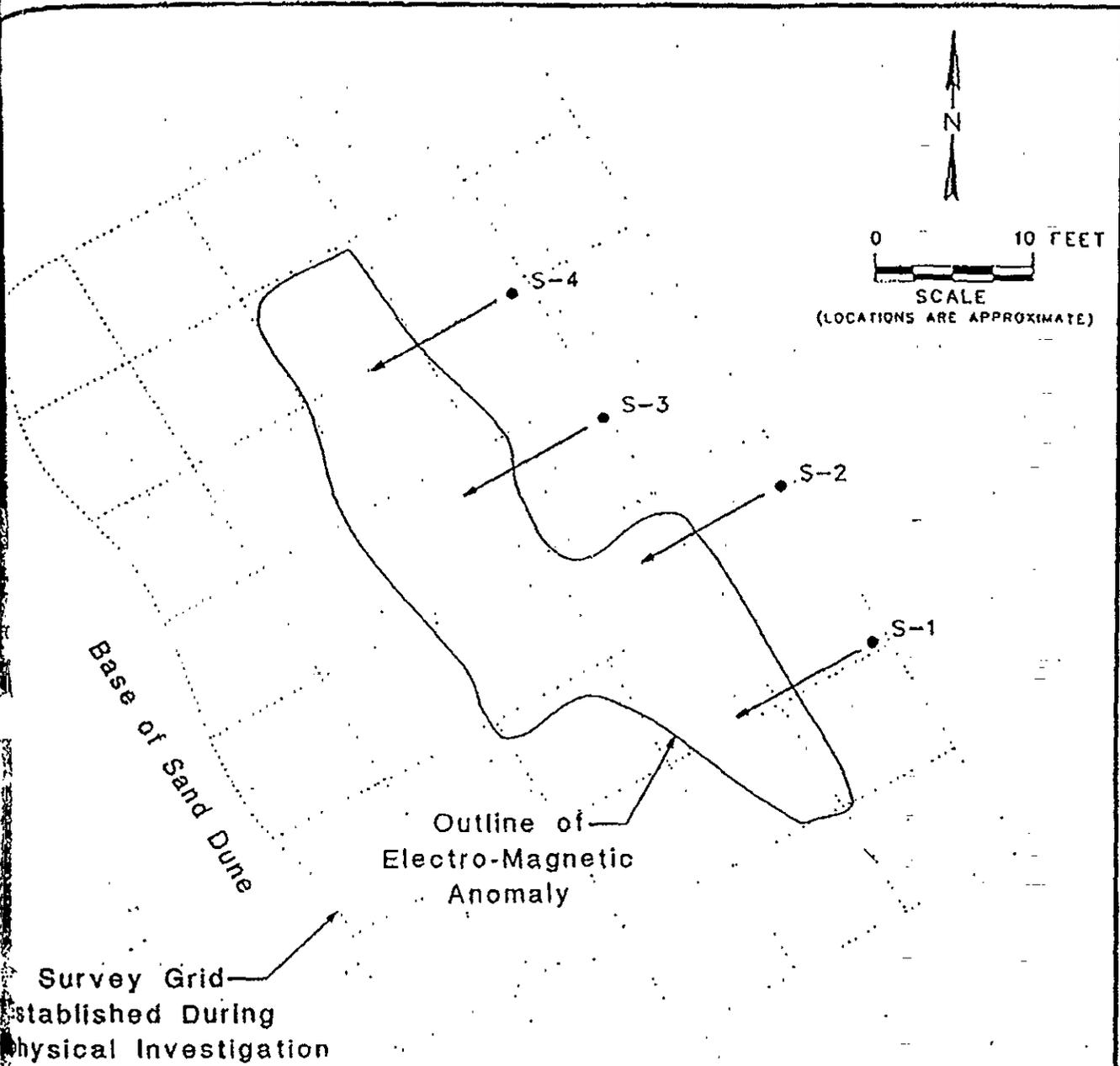


Scale in Miles
1:250,000

FIGURE 1 - Vicinity Map

<p>DATE: 5/2/97 BY: [illegible] CHECKED: [illegible] SCALE: 1:250,000 SHEET: 1 OF 1</p>	<p>CORPS OF ENGINEERS HANFORD 2,4-D SITE</p>
<p>HANFORD, NORTH SLOPE</p>	
<p> CASCADE EARTH SCIENCES, LTD Oregon - Washington - Idaho</p>	

USGS TOPOGRAPHIC MAP OF WALLA WALLA, WA. (1981)



EXPLANATION

2 Boring Location with Direction and Horizontal Extent of Inclined Boring

FIGURE 2 - Site Plan

PROJECT NUMBER: 352059	CORPS OF ENGINEERS HANFORD 2,4-D SITE
DATE: 8/25/94	
DWG. NO.: NG 352059F2	HANFORD, NORTH SLOPE
PROJECT MANAGER: SWC	
REVISIONS:	 CASCADE EARTH SCIENCES, LTD Oregon - Washington - Idaho

FILE 850

SEP 16 1966

410

Atomic Energy Commission
Box 550
Richland, Washington 99352

Attention: Norm Fuller

Gentlemen:

Leaks were discovered in buried storage tanks containing project's supply of 2,4-D on June 3, 1966. This prompted members of my staff to call Mr. Norm Fuller of the AEC and receive verbal permission for emergency disposal of the contaminated soil caused by the pesticide. The disposal area chosen is located in the NW 1/4 of Section 35, T. 14 N., R. 27 E., W.M., as indicated on the attached topography sketch. This area was chosen because of (1) its location in a controlled, isolated area, (2) low ground water table and no chance of a ground water rise as a result of irrigation on the Wahluke Slope, and (3) its location on the leeward side of a moving sand dune which is expected to continuously increase depth of sand cover over contaminated material.

The area is marked on the ground by three signs, "2,4-D burial site". One sign is near the center of the site, the other two at the northerly and southerly ends. The pit was excavated with a dozer and is approximately 400 feet in length, 12 feet wide by 4 feet deep. Approximately 3 feet of cover was placed over the contaminated material.

The above information is for your records along the lines discussed June 3, 1966. Your cooperation and assistance in this matter was appreciated by all project personnel concerned.

Sincerely yours,
J. D. HUMES
Acting for
H. R. Gray, Chief
Irrigation and Land Division

Attachment

Copy to: 4001, 430, 420, 490, 462
460, 410 (w/attachment to each)
831-3 ((w/1 attachment))

DGaston :gmr

Date	Signature	Initials
8/12	[Signature]	[Initials]
8/12	[Signature]	[Initials]
9/12	[Signature]	[Initials]
9/15	[Signature]	[Initials]
9-15	[Signature]	[Initials]

File Copy in 161 - A.E.C.

678
[Handwritten initials]

INTEROFFICE MEMORANDUM
OFFICIAL FILE COPY

March 28, 1967

Date	Surname	Co
3-28	CLARK	4-
3-28	WILSON	410

4101

To: Irrigation Managers--440, 450
From: Chief, Irrigation and Land Division--400

Subject: Disposal of eleven old 2,4-D tanks dug up at watermaster headquarters

These tanks are badly corroded on the outside and determined to have little salvage value as scrap. Since they also have a layer of precipitated 2,4-D salt on the bottom inside, and their bulk would be objectionable, it would be unwise to dispose of them in municipal or county dumps.

You are directed to remove subject tanks and transfer them to the 2,4-D debris disposal site on the Wahluke Slope by the approximate date of May 1. You should coordinate with each other on the exact date and have your lowboys work together. It is expected that one lowboy can haul all the tanks from the Wahluke Watermaster area to the disposal site in Section 35, T. 14 N., R. 27 E., W.M., and the other can haul a dozer to crush and bury the tanks.

By copy of this letter 430 is directed to contact AEC for permission to dispose of the tanks; therefore, let him know what date you will be in the area several days in advance.

cc: each watermaster
410
411
420
430
831-3

DGaston/FOliver:lmk

INTEROFFICE MEMORANDUM
OFFICIAL FILE COPY

Date	Surname	Code
	<i>[Signature]</i>	400
	<i>[Signature]</i>	410

April 10, 1967

AKS

To: Chief, Irrigation & Land Division - 400

From: Chief, Realty Branch - 430

Subject: Disposal of eroded 24D tanks in W $\frac{1}{2}$, Sec. 35, T. 14 N.,
R. 27 E., W. M.

Permission has been received through Norm Fuller, AEC, at Richland, to dispose of the subject tanks at the site where the other deposits were made. This is to be done April 20 and 21.

Mr. Fuller has requested a confirming letter, after the job is completed, stating the size of tanks, method of disposal and number of tanks involved. He also requests that the area be re-marked. I understand this area has been marked previously; however, I suggest that signs or other markings be renewed or replaced if necessary.

Robert V. Culp

cc: 4001
 4003
 410
 450 (Mesa) Unbewust
 450 (Othello) Williams
 831-2

RVCulp:gl

Form 7-1596
(10-66)
Bureau of Reclamation

INTEROFFICE MEMORANDUM
OFFICIAL FILE COPY

Date	Surname	Cod
9/15	BAW	450
	Loy	400
9/19	Williams	410
		430
		831

September 15, 1967

To: Chief, Irrigation & Land Division ^{MS} 400
Attention: 430
From: Irrigation Manager, Othello Field Office - 450

Subject: Disposal of eroded 2,4-D tanks in W $\frac{1}{2}$, Sec. 35, T. 14N, R 27E.

On September 14, 1967 ten eroded 2,4-D tanks were buried at the subject site. The tanks were 12' long and 4' in diameter. The tanks were flattened with a bulldozer and buried in the sand. The disposal site markings were replaced.

Please send Mr. Norm Fuller, AEC, at Richland a confirming letter that the job has been completed.

In duplicate

Copy to: 4001
410
450
460
831-3

John S. Unhewest

HWilliams:HMc

OFFICIAL FILE COPY

Date	Surname	Code
10/12/67 9/2	J. D. Humes	4112
	Wick	11
	Humes	411
		FE

OCT 3 1967

410

Mr. Norm Fuller
 Atomic Energy Commission
 Richland, Washington 99352

Dear Mr. Fuller:

In accordance with arrangements made with you several months ago, ten eroded 2,4-D tanks were buried at the disposal site in the W $\frac{1}{2}$ of Section 35, T. 14 N., R. 27 E., on September 24, 1967. These tanks were 12 feet long and 4 feet in diameter. The tanks were flattened with a bulldozer and buried in the sand.

The disposal site markings were replaced as requested.

Sincerely yours,

J. D. HUMES
 Acting for
 H. R. Gray, Chief
 Irrigation and Land Division

Copy to: 4001
 410
 4112
 430
 450
831-3

TJMorris:gmr

5/21/97
16:58:33

Manchester Environmental Laboratory

Final Report

Page 1

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #1 HOLE - WAHLUKE

Collected: 5/ 3/97
Matrix: Solid
Sample Number: 97194550
Type: Reg sample

		Result	Units	Olfr
GC				
Parameter	: Herbicides			
Method	:			
Prep Method:				
Analytes	: 118796	Phenol, 2,4,6-tribromo		NAR
	93765	2,4,5-T	1300	ug/kg
	94757	2,4-D	2500000	ug/kg
	93721	Silvex	88	ug/kg U

Sent to:
Kevin McDermott
CC: Jed Januch

Received 5/27/97

97194550 Reg sample

5/23/97 SAH

Final Report

Project Code: TEC-683B
 Project Name: WAHLUKE SPRAY
 Project Officer: KEVIN MCDERMOTT
 Account Code: 9798B10PFKX
 Station Description:

Collected: 5/ 3/97
 Matrix: Solid
 Sample Number: 97194551
 Type: Matrix Spike

Result Units Olfr

GC

Parameter : Herbicides

Method :

Prep Method:

Analytes		Result	Units	Olfr
93765	2,4,5-T	93	%Rec	-
94757	2,4-D	84	%Rec	-
118796	Phenol, 2,4,6-tribromo	87	%Rec	-
93721	Silvex	88	%Rec	-

5/21/97
16:58:33

Manchester Environmental Laboratory

Final Report

Page 4

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description:

Collected: 5/ 3/97
Matrix: Solid
Sample Number: 97194551
Type: Matrix Spike Dupl

		Result	Units	Qlfr
GC				
Parameter	: Herbicides			
Method	:			
Prep Method:				
Analytes	: 93765	2,4,5-T	111	%Rec
	94757	2,4-D	88	%Rec
	118796	Phenol, 2,4,6-tribromo	94	%Rec
	93721	Silvex	98	%Rec

5/21/97
16:58:33

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Final Report

Page 5

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #3 HOLE - WAHLUKE

Collected: 5/ 3/97
Matrix: Solid
Sample Number: 97194552
Type: Reg sample

		Result	Units	Olfr
GC				
Parameter :	Herbicides			
Method :				
Prep Method:				
Analytes :	93765	2,4,5-T	30	ug/kg
	94757	2,4-D	1070	ug/kg
	93721	Silvex	20	ug/kg U
	118796	Phenol, 2,4,6-tribromo	100	%Rec

5/21/97
16:58:33

Manchester Environmental Laboratory
Final Report

Page 6

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #4 HOLE - WAHLUKE/WHITE BLUFFS

Collected: 5/ 3/97
Matrix: Solid
Sample Number: 97194553
Type: Reg sample

		Result	Units	Olfr	
GC					
Parameter :	Herbicides				
Method :					
Prep Method:					
Analytes :	93765	2,4,5-T	23	ug/kg	U
	94757	2,4-D	47	ug/kg	U
	93721	Silvex	23	ug/kg	U
	118796	Phenol, 2,4,6-tribromo	80	%Rec	--

5/21/97
16:58:33

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Final Report

Page 7

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #5 HOLE - WAHLUKE/WHITE BLUFFS

Collected: 5/ 3/97
Matrix: Solid
Sample Number: 97194554
Type: Reg sample

		Result	Units	Qlfr
GC				
Parameter :	Herbicides			
Method :				
Prep Method:				
Analytes :	93765 2,4,5-T	25	ug/kg	U
	94757 2,4-D	50	ug/kg	U
	93721 Silvex	25	ug/kg	U
	118796 Phenol, 2,4,6-tribromo	67	%Rec	

5/21/97
16:58:33

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Final Report

Page 8

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description:

Collected: 5/ 3/97
Matrix: Solid
Sample Number: OBT9133A1
Type: Blank

			Result	Units	Qlfr
GC					
Parameter	: Herbicides				
Method	:				
Prep Method:					
Analytes	: 93765	2,4,5-T			ND
	94757	2,4-D			ND
	93721	Silvex			ND
	118796	Phenol, 2,4,6-tribromo	45	%Rec	

5/21/97
16:58:33

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Final Report

Page 9

Project Code: TEC-683B
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description:

Collected: 5/ 3/97
Matrix: Solid
Sample Number: OBT9133A2
Type: Blank

		Result	Units	Qlfr
GC				
Parameter :	Herbicides			
Method :				
Prep Method:				
Analytes :	93765	2,4,5-T		ND
	94757	2,4-D		ND
	93721	Silvex		ND
	118796	Phenol, 2,4,6-tribromo	71	%Rec

6/16/97
11:13:21

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Final Report

Page 1

Project Code: TEC-683C
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #1 Auger Hole (1)

Collected: 5/29/97
Matrix: Solid
Sample Number: 97224450
Type: Reg sample

		Result	Units	Olfr
GC				
Parameter	: Herbicides			
Method	:			
Prep Method:				
Analytes	: 118796	Phenol, 2,4,6-tribromo		NAR
	93765	2,4,5-T	240	ug/kg
	94757	2,4-D	200000	ug/kg
	93721	Silvex	20	ug/kg U

*Sent to -
Kevin McDermott
cc: Jed Januch*

6/16/97
11:13:21

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Final Report

Page 3

Project Code: TEC-683C
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #3 Auger Hole (3A)

Collected: 5/29/97
Matrix: Solid
Sample Number: 97224452
Type: Reg sample

		Result	Units	Olfr
GC				
Parameter :	Herbicides			
Method :				
Prep Method:				
Analytes :	118796	Phenol, 2,4,6-tribromo		NAR
	93765	2,4,5-T	620	ug/kg
	94757	2,4-D	1000000	ug/kg
	93721	Silvex	14	ug/kg U

6/16/97
11:13:21

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Final Report

Page 5

Project Code: TEC-683C
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #4 Auger Hole (4A)

Collected: 5/29/97
Matrix: Solid
Sample Number: 97224453
Type: Matrix Spike

		Result	Units	Olfr
GC				
Parameter :	Herbicides			
Method :				
Prep Method:				
Analytes :	93765	2,4,5-T	103	%
	94757	2,4-D	96	%
	118796	Phenol, 2,4,6-tribromo	96	%
	93721	Silvex	95	%

6/16/97
11:13:21

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Final Report

Page 7

Project Code: TEC-683C
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description: #5 Auger Hole (5A)

Collected: 5/29/97
Matrix: Solid
Sample Number: 97224454
Type: Reg sample

		Result	Units	Olfr
GC				
Parameter :	Herbicides			
Method :				
Prep Method:				
Analytes :	93765	2,4,5-T	33	ug/kg
	94757	2,4-D	6200	ug/kg
	93721	Silvex	13	ug/kg U
	118796	Phenol, 2,4,6-tribromo	114	%

6/16/97
11:13:21

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Final Report

Page 9

Project Code: TEC-683C
Project Name: WAHLUKE SPRAY
Project Officer: KEVIN MCDERMOTT
Account Code: 9798B10PFKX
Station Description:

Collected: 5/29/97
Matrix: Solid
Sample Number: OB57154H2
Type: Blank

		Result	Units	Qlfr
GC				
Parameter	: Herbicides			
Method	:			
Prep Method:				
Analytes	: 94757	2,4-D		ND
	94826	2,4-DB		ND
	93721	Silvex		ND
	118796	Phenol, 2,4,6-tribromo	95	%

Marina Bates



WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC II) Update

February 1996

Publication #94-145
(Updated 1/96)



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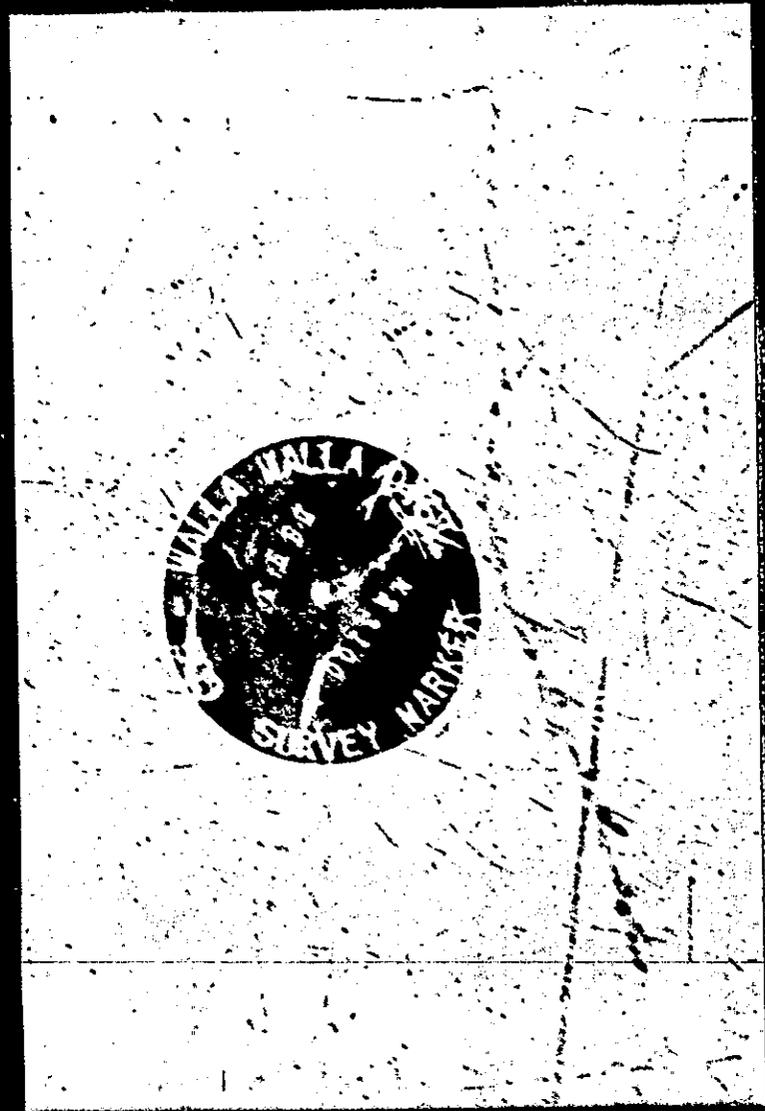
Model Toxics Control Act
 Method B Formula Values
 Data updated: 2/28/96

Chemical Name	CAS Number	Ground Water (ug/L)		Surface Water (ug/L)		Soil (mg/kg)		Soil (mg/kg) 100 x Groundwater	
		Non-		Non-		Non-		Non-	
		Carcinogen	Carcinogen	Carcinogen	Carcinogen	Carcinogen	Carcinogen	Carcinogen	Carcinogen
dichlorobenzene;1,2-	95-50-1		7.20e+002		4.20e+003		7.20e+003		7.20e+001
dichlorobenzene;1,4-	106-46-7	1.82e+000		4.86e+000		4.17e+001		1.82e-001	
dichlorobenzidine;3,3'-	91-94-1	1.94e-001		4.62e-002		2.22e+000		1.94e-002	
dichlorodifluoromethane	75-71-8		1.60e+003				1.60e+004		1.60e+002
dichloroethane;1,1-	75-34-3		8.00e+002				8.00e+003		8.00e+001
dichloroethane;1,2-	107-06-2	4.81e-001		5.94e+001		1.10e+001		4.81e-002	
dichloroethylene;1,1-	75-35-4	7.29e-002	7.20e+001	1.93e+000	4.17e+003	1.67e+000	7.20e+002	7.29e-003	7.20e+000
dichloroethylene;1,2-,cis	156-59-2		8.00e+001				8.00e+002		8.00e+000
dichloroethylene;1,2-,trans	156-60-5		1.60e+002		3.28e+004		1.60e+003		1.60e+001
dichloromethane	75-09-2	5.83e+000	4.80e+002	9.60e+002	1.73e+005	1.33e+002	4.80e+003	5.83e-001	4.80e+001
dichlorophenol;2,4-	120-83-2		4.80e+001		1.91e+002		2.40e+002		4.80e+000
dichlorophenoxyacetic acid;2,4-	94-75-7		1.60e+002				8.00e+002		1.60e+001
dichloropropane;1,2-	78-87-5	6.43e-001		2.32e+001		1.47e+001		6.43e-002	
dichloropropanol;2,3-	616-23-9		4.80e+001				2.40e+002		4.80e+000
dichloropropene;1,3-	542-75-6	2.43e-001	2.40e+000	1.89e+001	4.07e+002	5.56e+000	2.40e+001	2.43e-002	2.40e-001
dichlorvos	62-73-7	3.01e-001	8.00e+000			3.44e+000	4.00e+001	3.01e-002	8.00e-001
dicofol	115-32-2								
dicyclopentadiene	77-73-6		4.80e+002				2.40e+003		4.80e+001
dieldrin	60-57-1	5.47e-003	8.00e-001	8.67e-005	2.78e-002	6.25e-002	4.00e+000	5.47e-004	8.00e-002
diethyl phthalate	84-66-2		1.28e+004		2.84e+004		6.40e+004		1.28e+003
diethyl-p-nitrophenylphosphate	311-45-5								
diethylene glycol	111-46-6		3.20e+004				1.60e+005		3.20e+003
diethylene glycol dinitrate	693-21-0								
diethylformamide	617-84-5		1.76e+002				8.80e+002		1.76e+001
diethylstilbesterol	56-53-1	1.86e-005				2.13e-004		1.86e-006	
difenzoquat	43222-48-6		1.28e+003				6.40e+003		1.28e+002
diflubenzuron	35367-38-5		3.20e+002				1.60e+003		3.20e+001
difluoroethane;1,1-	75-37-6								
diisopropyl methylphosphonate	1445-75-6		1.28e+003				6.40e+003		1.28e+002
dimethipin	55290-64-7		3.20e+002				1.60e+003		3.20e+001
dimethoate	60-51-5		3.20e+000				1.60e+001		3.20e-001
dimethoxybenzidine;3,3'-	119-90-4	6.25e+000				7.14e+001		6.25e-001	

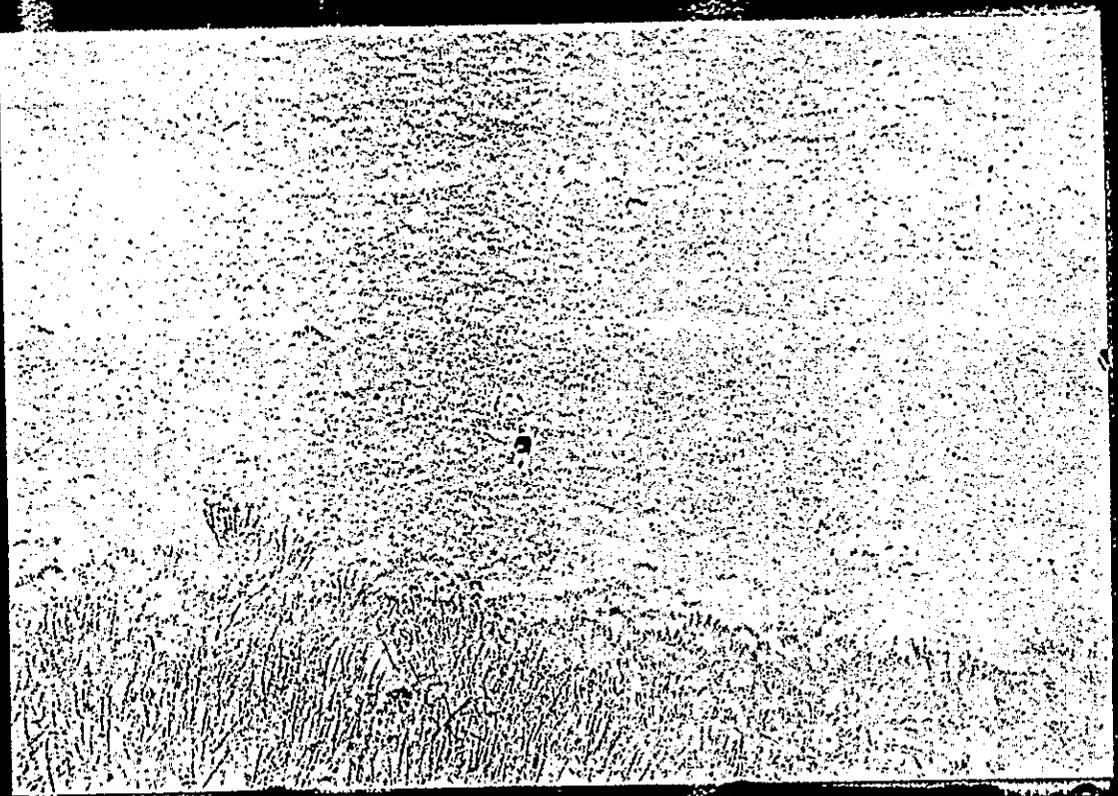
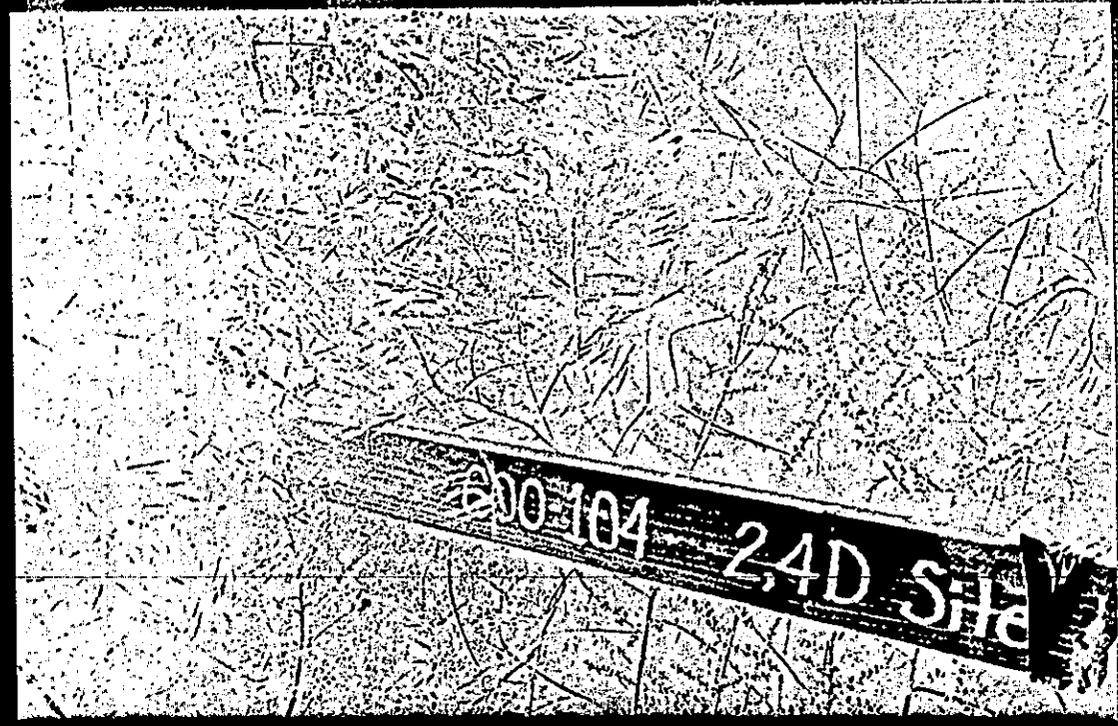
"2,4-D Dump Site"
5/3/97 JWW

- 1) View of site from hill
- 2) COE survey marker
- 3) Marker posted 1/4 mi east

2



3



"2,4-D Dump Site"

5/3/97 JWJ

- 1) Sign and COE survey marker
- 2) Sample hole in bare spot
- 3) Sample hole in another bare spot

2



3

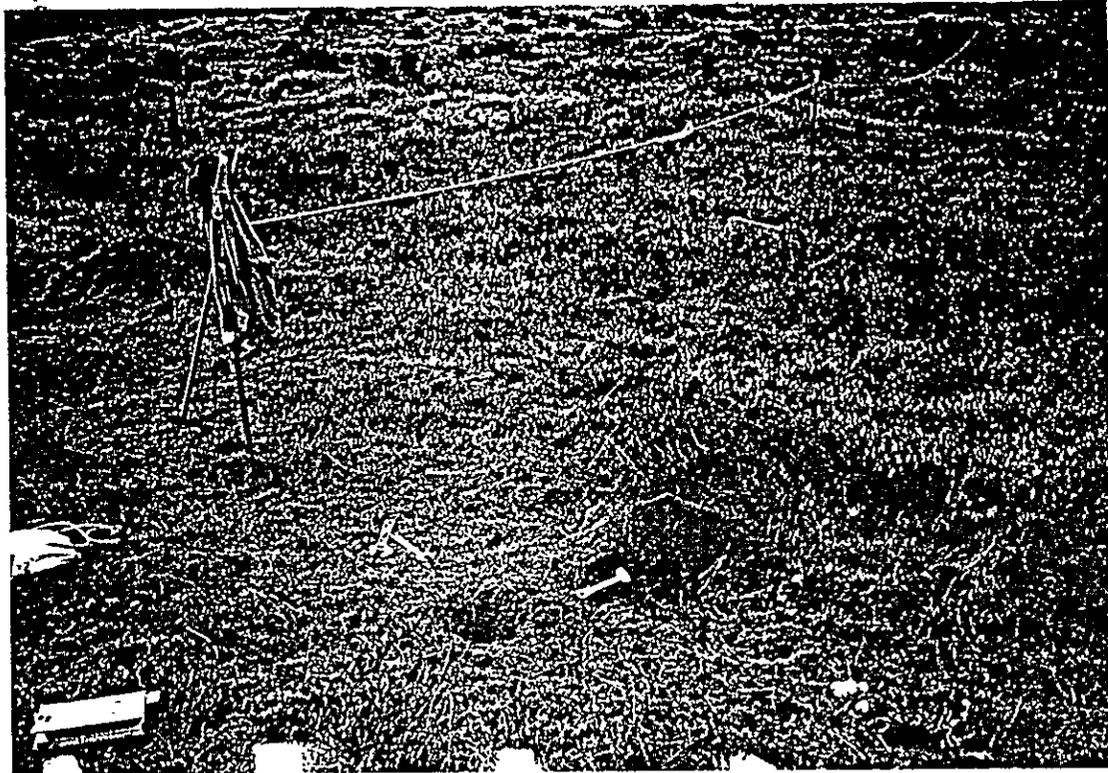
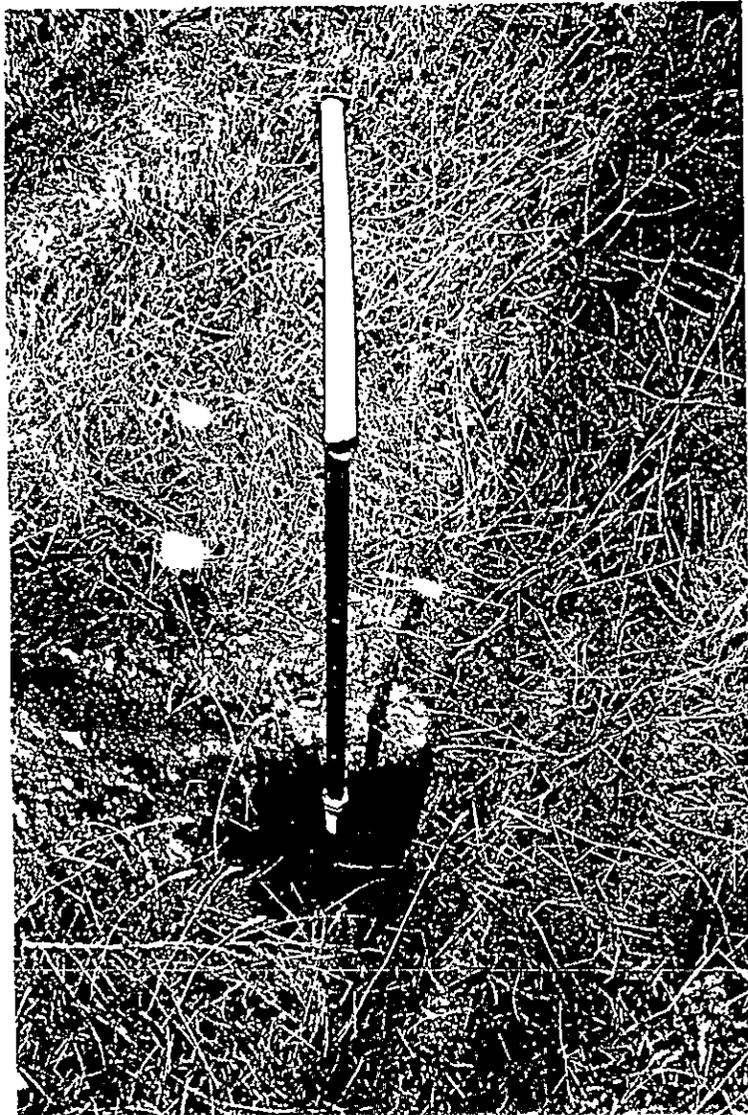


"2,4-D Dump Site"

5/29/97 J W J

- 1) Sampling Area South of "Hot Spot"
- 2) Sample hole w/ grey sand
- 3) Weed exhibiting epinasty

2



3

