1.4

Vermiculite Northwest Removal Site Evaluation
Trip Report
Spokane, Washington
TDD: 01-07-0014

Contract: 68-S0-01-01
December 2001

Region 10

START-2

Superfund Technical Assessment and Response Team

Submitted to: Earl Liverman, On-Scene Coordinator
United States Environmental Protection Agency
Coeur d'Alene, Idaho

USEPA SF
1174338

DATE: December 14, 2001

TO: Earl Liverman, On-Scene Coordinator, EPA, Region 10, Coeur d'Alene, ID

FROM: Howard Zorzi, START-2 Project Manager, E & E, Boise, ID

SUBJ: Vermiculite Northwest Removal Site Evaluation Trip Report

REF: Contract No. 68-S0-01-01
Technical Direction Document (TDD) No. 01-17-0014

Place Visited

Vermiculite Northwest, Inc./W.R. Grace facility, 1318 N. Maple Street, Spokane, Washington (Figure 1).

Purpose of Trip:

To provide technical assistance and oversight for the United States Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) and to collect asbestos samples as necessary.

Persons Responding:

Earl Liverman, OSC
Environmental Protection Agency
Coeur d'Alene, Idaho
(208) 664-4858

Howard Zorzi, START-2 Project Manager
Ecology and Environment, Inc. (E & E),
Boise, Idaho
(208) 378-1709

Kerrie Stewart, START-2, Site Safety Officer
E & E
Seattle, Washington
(208) 624-9537

Dates of Trip:

September 5 and 6, 2001

BACKGROUND

The EPA, Region 8, currently is involved in investigating potential asbestos contamination issues associated with a former vermiculite mine in Libby, Montana. W.R. Grace operated the Libby Mine

between 1963 and 1990. The EPA is identifying and evaluating vermiculite facilities in the United States which received vermiculite ore from Libby Mine (E & E 2001a).

The crude Libby vermiculite ore was sold to processors, who used the extraction method "benefication," which separates the vermiculite from the ore. Historical documents provided by the EPA, Region 8, indicated that the processors were located in Libby, Montana. The processed ore then was sold to product manufacturers nationwide, who converted it into commercial vermiculite by a process called "exfoliation" or "expansion". The EPA developed a list of vermiculite expansion facilities nationwide that are believed to have been in operation since 1953. The list contains information from the United States Geological Survey and W. R. Grace. The EPA is determining which of these facilities actually received vermiculite from Libby Mine and whether there are any health or environmental concerns at these sites (E & E 2001a).

The EPA used its authority under the Comprehensive Environmental, Response, Compensation, and Liability Act (commonly known as Superfund) to identify sites that may require cleanup. In April 2000, under TDD No. 00-03-0012, the Superfund Technical Assessment and Response Team (START) collected asbestos soil and wipe samples from eight areas located on the former Vermiculite Northwest, Inc./W.R. Grace facility. The samples contained trace amounts to 2% total asbestos fibers.

E & E is the designated contractor to the EPA, Region 10, Emergency Response and Site Cleanup Unit under the START-2 contract (68-S0-01-01). In July 2001, the START-2 was tasked, under TDD No. 01-17-0014, to conduct a removal site evaluation at the Vermiculite Northwest facility, in Spokane, Washington. The START-2 was tasked to characterize the extent of potential asbestos contamination on the Vermiculite Northwest property and within surrounding residential locations. This characterization involved the collection of additional samples within these areas.

START-2 ACTIONS

On August 10, 2001, the START-2 met the EPA OSC at the Vermiculite Northwest facility, to identify potential asbestos sample locations. The OSC and the START-2 identified drainage pathways, railway bedding, residential homes, storm drains, and ventilation ducts (Attachment A, Photographs 1.02, 1.08, 1.15, 1.18, and 1.20 respectively).

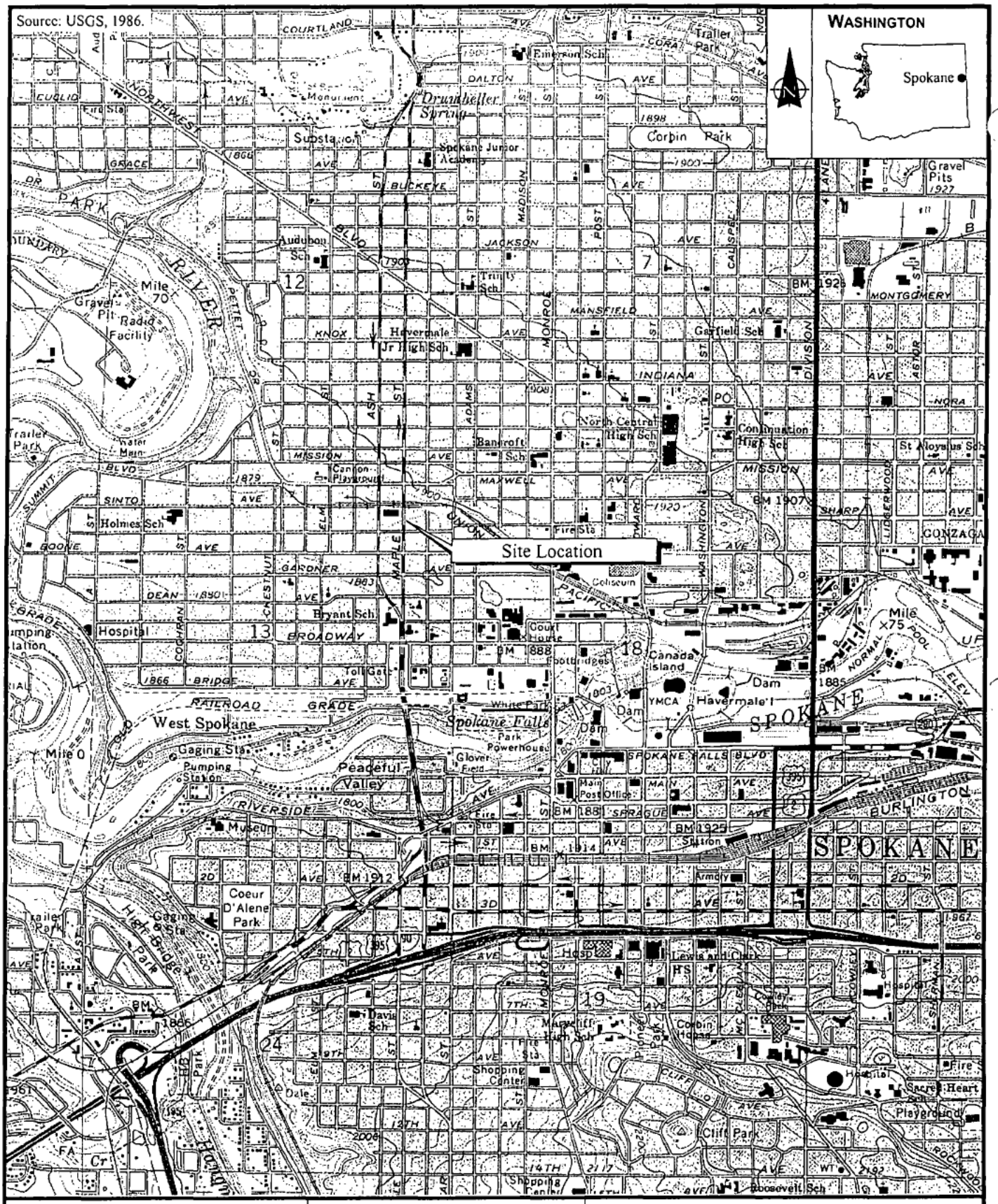
On September 5, 2001, the OSC and the START-2 arrived at the Vermiculite Northwest facility and prepared to sample 27 locations. All sample locations are depicted on Figure 2 except samples 01090325 and 01030326. These two samples were collected by the OSC at the request of a Chattaroy, Washington, resident whose property previously was owned by a deceased Vermiculite Northwest employee. The locations of the two samples were not provided to the START-2.

The START-2 collected samples on September 5, 2001 (samples 01090301 through 01090309) and September 6, 2001 (samples 01090310 through 01090317; Attachment A, Photographs 2.01 through 2.27). All samples collected by START-2 were collected in accordance with the E & E quality assurance project plan (E & E 2001). The soil and storm drain sediment samples were collected from on-site locations except for samples 01090307, 01090308, and 01090317, which were collected from the northwest bluff and R9 locations, respectively (Figure 2). The EPA OSC collected off-site residential soil samples (01090318 through 01090327) on September 5, 2001 (Attachment A, Photographs 3.01-3.10).

Samples were collected in 8-ounce glass jars. Samples were sent to a subcontracted commercial laboratory with National Voluntary Laboratory Accreditation Program certification for asbestos analysis. Samples were analyzed following the National Institute of Occupational Safety and Health Method 9002 utilizing polarized light microscopy. In addition, samples 01090306, 01090310, 01090312, 01090316, and 01090321 through 01090324 were confirmed using transmission electron microscopy under EPA Method 600/R-93-116. Analytical results for the samples described above are provided in Table 1; the data validation memorandum is included as Attachment B.

CONCLUSION:

In April 2000, under TDD No. 00-03-0012, the START collected asbestos soil and wipe samples from eight areas located on the former Vermiculite Northwest, Inc./W.R. Grace facility. The samples contained trace amounts to 2% total asbestos fibers. The START-2 was tasked with conducting additional, more extensive sampling within buildings and on the property's grounds. On September 5 and 6, 2001, the START-2 collected 27 samples. The on-site samples consist of 11 soil samples and 2 storm drain sediment samples. Fourteen off-site soil samples were collected. Three sample results indicate concentrations above sample detection limits. All other samples contained <1% asbestos or were nondetect. No further work is anticipated under this TDD.



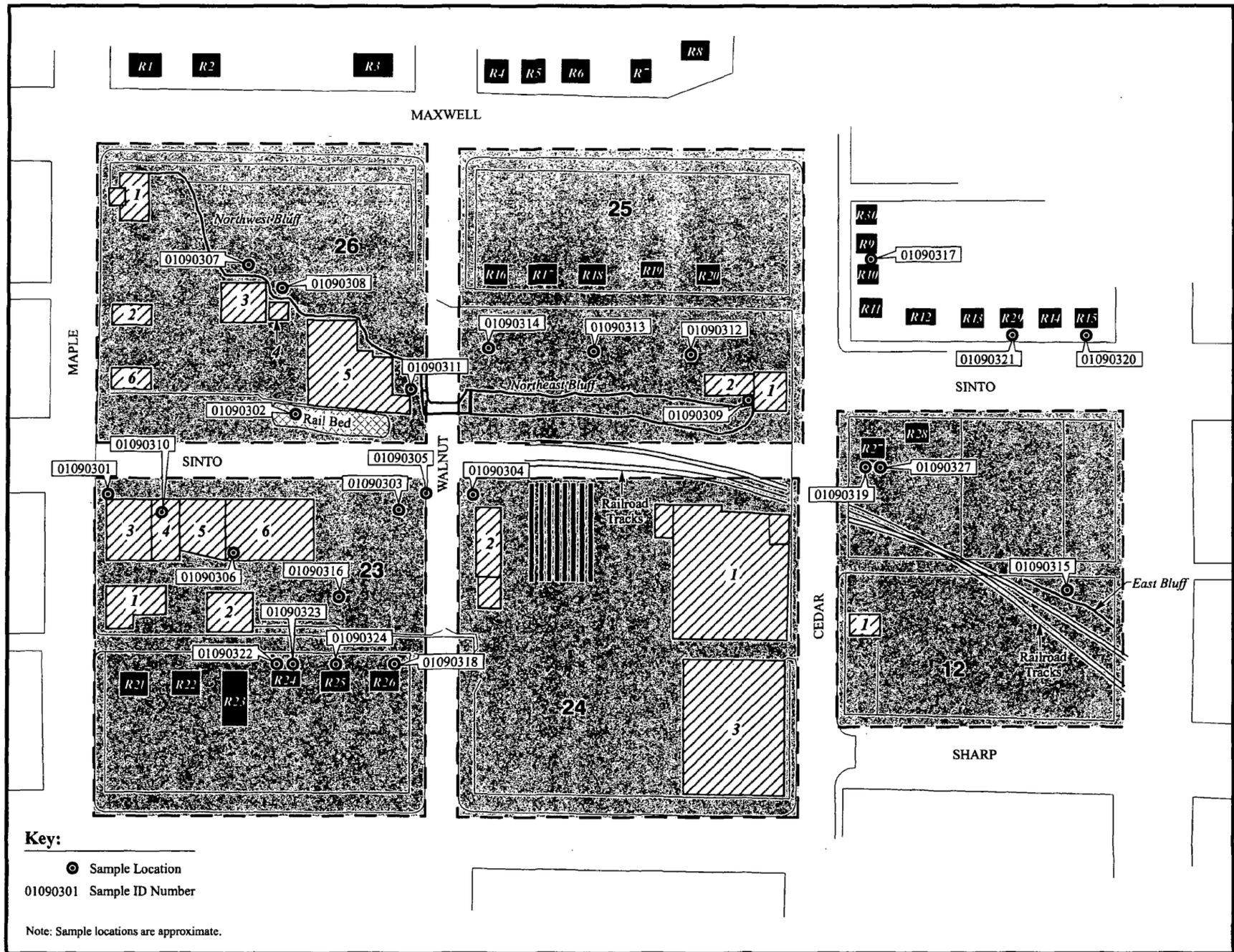
ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

VERMICULITE NORTHWEST SITE
Spokane, Washington

Figure 1
SITE LOCATION MAP

0 .25 .5
Approximate Scale in Miles

Date:	Drawn by:	
12-12-01	AES	10:START-2\01070014\S675\fig 1



INDEX TO BUILDINGS

BLK #	BUILDING #	DESCRIPTION
26	1	Office
26	2	Quonset Hut
26	3	Shop
26	4	Office
26	5	Warehouse
26	6	Loading Dock
23	1	Office
23	2	Shop
23	3	Warehouse A
23	4	Warehouse B
23	5	Warehouse C
23	6	Warehouse D
23	R21	Residence 1
23	R22	Residence 2
23	R23	Residence 3
23	R24	Residence 4 ((b) (6))
23	R25	Residence 5 ((b) (6))
23	R26	Residence 6 ((b) (6))
24	1	Warehouse A
24	2	Storage Shed
24	3	Warehouse B
25	1	Office
25	2	Garage
25	R16	Residence 1 ((b) (6))
25	R17	Residence 2
25	R18	Residence 3
25	R19	Residence 4
25	R20	Residence 5
12	1	Rebar Shed
12	R27	Residence 1 ((b) (6))
12	R28	Residence 2

BUILDINGS NORTH OF BLOCK 26, NORTH AND EAST OF BLOCK 25

R1	Residence 1	R10	Residence 10
R2	Residence 2	R11	Residence 11
R3	Residence 3	R12	Residence 12
R4	Residence 4	R13	Residence 13
R5	Residence 5	R14	Residence 14
R6	Residence 6	R15	Residence 15 ((b) (6))
R7	Residence 7	R29	Residence 29
R8	Residence 8	R30	Residence 30
R9	Residence 9		

ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

VERMICULITE NORTHWEST SITE
Spokane, Washington

Figure 2
GENERAL SITE MAP

Date:	Drawn by:	
12/12/01	AES	10:START-2\01-07-0014\fig 2

Note: This page is intentionally left blank.

Table 1

ASBESTOS SAMPLE ANALYTICAL RESULTS
VERMICULITE NORTHWEST REMOVAL SITE EVALUATION
SPOKANE, WASHINGTON

Sample ID	01090301		01090302		01090303		01090304		01090305		01090306	
Location ID	ON-01-SS		ON-02-SS		ON-03-SS		ON-04-SS		ON-05-DR		ON-06-SS	
Sample Date	9/5/01		9/5/01		9/5/01		9/5/01		9/5/01		9/5/01	
Appearance	Brown/Gray Fibrous Homogeneous		Brown/Gray Fibrous Homogeneous		Brown/Gray Fibrous Homogeneous		Brown/Gray Fibrous Homogeneous		Various Fibrous Homogeneous		Brown Fibrous Homogeneous	
Percent Type	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**
Chrysotile	<1%	-	<1%	-	ND	-	-	-	ND	-	-	0.66%
Amosite	2%	-	<1%	-	ND	-	-	-	ND	-	-	-
Tremolite-Actinolite	-	-	-	-	ND	-	<1%	-	ND	-	<1%	<0.1%
Mineral Wool	-	-	-	-	-	-	-	-	-	-	5%	-
Cellulose	13%	-	5%	-	2%	-	5%	-	5%	-	-	-

Table 1

ASBESTOS SAMPLE ANALYTICAL RESULTS
VERMICULITE NORTHWEST REMOVAL SITE EVALUATION
SPOKANE, WASHINGTON

Sample ID	01090307		01090308		01090309		01090310		01090311		01090312	
Location ID	OF-01-SS		OF-02-SS		ON-07-SS		ON-08-SS		ON-09-DR		ON-10-SS	
Sample Date	9/5/01		9/5/01		9/5/01		9/5/01		9/6/01		9/6/01	
Appearance	Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Various Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown/White Fibrous Homogeneous	
Percent Type	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**
Chrysotile	-	-	<1%	-	ND	-	3%	.25%	<1%	-	2%	ND
Amosite	-	-	-	-	ND	-	<1%	-	-	-	-	ND
Tremolite-Actinolite	<1%	-	-	-	ND	-	-	-	<1%	-	-	ND
Mineral Wool	5%	-	5%	-	5%	-	5%	-	5%	-	-	-
Cellulose	20%	-	10%	-	5%	-	50%	-	10%	-	8%	-

Table 1

ASBESTOS SAMPLE ANALYTICAL RESULTS
VERMICULITE NORTHWEST REMOVAL SITE EVALUATION
SPOKANE, WASHINGTON

Sample ID	01090313		01090314		010903015		01090316		01090317		01090318	
Location ID	ON-11-SS		ON-12-SS		OF-03-SS		ON-13-SS		OF-04-SS		OF-05-SS	
Sample Date	9/6/01		9/6/01		9/6/01		9/6/01		9/6/01		9/5/01	
Appearance	Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous	
Percent Type	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**
Chrysotile	ND	-	ND	-	ND	-	-	ND	-	-	ND	-
Amosite	ND	-	ND	-	ND	-	-	ND	-	-	ND	-
Tremolite-Actinolite	ND	-	ND	-	ND	-	<1%	ND	<1%	-	ND	-
Mineral Wool	-	-	-	-	-	-	-	-	-	-	5%	-
Cellulose	5%	-	5%	-	20%	-	30%	-	10%	-	20%	-

Table 1

ASBESTOS SAMPLE ANALYTICAL RESULTS
VERMICULITE NORTHWEST REMOVAL SITE EVALUATION
SPOKANE, WASHINGTON

Sample ID	01090319		01090320		01090321		01090322		01090323		01090324	
Location ID	OF-06-SS		OF-07-SS		OF-08-SS		OF-09-SS		OF-10-SS		OF-11-SS	
Sample Date	9/5/01		9/5/01		9/5/01		9/5/01		9/5/01		9/5/01	
Appearance	Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous	
Percent Type	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**
Chrysotile	ND	-	ND	-	ND	ND	ND	-	-	ND	<1%	<0.1%
Amosite	ND	-	ND	-	ND	ND	ND	-	-	ND	-	-
Tremolite-Actinolite	ND	-	ND	-	ND	ND	ND	-	<1%	ND	<1%	<0.1%
Mineral Wool	2%	-	2%	-	-	-	5%	-	-	-	5%	-
Cellulose	8%	-	8%	-	5%	-	10%	-	20%	-	15%	-

Table 1

ASBESTOS SAMPLE ANALYTICAL RESULTS
VERMICULITE NORTHWEST
REMOVAL SITE EVALUATION
SPOKANE, WASHINGTON

Sample ID	01090325		01090326		01090327	
Location ID	OF-12-SS		OF-13-SS		OF-14-SS	
Sample Date	9/5/01		9/5/01		9/5/01	
Appearance	Brown Fibrous Homogeneous		Brown Fibrous Homogeneous		Brown Fibrous Homogeneous	
Percent Type	**PLM**	**TEM**	**PLM**	**TEM**	**PLM**	**TEM**
Chrysotile	-	-	-	-	ND	-
Amosite	-	-	-	-	ND	-
Tremolite-Actinolite	<1%	-	<1%	-	ND	-
Mineral Wool	-	-	-	-	5%	-
Cellulose	20%	-	20%	-	20%	-

Note: Bold type and shading indicates concentrations above sample detection limits. Only analytes that were detected in at least one method were reported.

Key:

DR = Storm drain.
ID = Identification.
ND = Nondetect.
OF = Off site.
ON = On site.
PLM = Polarized light microscopy (National Institite of Occupational Safety and Health Method 9002).
TEM = Transmission electron microscopy (as described in EPA 600/R-93/116).
SS = Surface soil.

REFERENCES

Ecology and Environment, Inc. (E & E), April 21, 2000a, *Sampling and Quality Assurance Plan for Former Vermiculite Processing Facilities Screening Assessments*, under Contract No. 68-W6-0008, Technical Direction Document (TDD) No. 00-03-0012, prepared for the United States Environmental Protection Agency, Region 10, Seattle, Washington.

_____2001b, *Vermiculite Northwest Removal Site Evaluation QAPP*, TDD 00-01-0017.

United States Geological Survey (USGS), 1986, Spokane, Washington Quadrangle, 1:5,000,000 series (topographic).

ATTACHMENT A

PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial No. 897926, digital **TDD No. 01-07-0014**

Site Name: Vermiculite Northwest Removal Site Evaluation

Photo	Date	Time	By	Direction	Description
1.01	8/10/01	1043	HZ	NW	Best Computer; Building 1, Block 23.
1.02	8/10/01	1044	HZ	E	Building 2, Block 23.
1.03	8/10/01	1110	HZ	SE	Buildings 3 to 6, Block 23.
1.04	8/10/01	1111	HZ	NE	Buildings 3 and 5, Block 26. The rail bed is located south of Building 5 (Figure 2).
1.05	8/10/01	1112	HZ	NE	Sinto Street extends east to west across the Vermiculite Northwest property.
1.06	8/10/01	1120	HZ	N	Building 2, Block 26.
1.07	8/10/01	1121	HZ	W	Northwest bluff.
1.08	8/10/01	1130	HZ	W	Rail bed located south of Building 5, Block 26.
1.09	8/10/01	1135	HZ	SW	The intersection of Sinto and Walnut streets.
1.10	8/10/01	1140	HZ	NE	Northeast bluff.
1.11	8/10/01	1145	HZ	SW	The southwest area of the site.
1.12	8/10/01	1145	HZ	S	The south area of the site.
1.13	8/10/01	1145	HZ	SE	The southeast area of the site.
1.14	8/10/01	1146	HZ	W	The top of the northeast bluff.
1.15	8/10/01	1146	HZ	NW	Residential homes located north of the site.
1.16	8/10/01	1147	HZ	N	The northeast bluff and Buildings 1 and 2, Block 25.
1.17	8/10/01	1148	HZ	W	North side of Building 1, Block 24.
1.18	8/10/01	1149	HZ	N	Storm drain on the northwest side of the Building 1, Block 24.
1.19	8/10/01	1200	HZ	NW	Ventilation duct located in Building 1, Block 24.
1.20	8/10/01	1205	HZ	SE	Ventilation duct located in Building 3, Block 24.
1.21	8/10/01	1210	HZ	W	Southwest area of the site.
1.22	8/10/01	1210	HZ	N	Northeast area of the site.
1.23	8/10/01	1210	HZ	NE	Northeast area of the site.
1.24	8/10/01	1221	HZ	E	Empty lot located 100 feet east of Building 1, Block 24.
1.25	8/10/01	1221	HZ	E	Empty lot located 100 feet east of Building 1, Block 24.
1.26	8/10/01	1225	HZ	E	Empty lot located 200 feet east of Building 1, Block 24.

PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial No. Disposable Camera **TDD No. 01-07-0014**

Site Name: Vermiculite Northwest Removal Site Evaluation

Photo	Date	Time	By	Direction	Description
2.01	9/5/01	1230	HZ	S	Sample No. 01090301 location.
2.02	9/5/01	1234	HZ	S	Sample No. 01090301.
2.03	9/5/01	1310	HZ	N	Sample No. 01090302 location.
2.04	9/5/01	1310	HZ	NW	Sample No. 01090302.
2.05	9/5/01	1320	HZ	N	Sample No. 01090303 location.
2.06	9/5/01	1320	HZ	NE	Sample No. 01090303.
2.07	9/5/01	1545	HZ	NW	Sample No. 01090304 location.
2.08	9/5/01	1545	HZ	NW	Sample No. 01090304.
2.09	9/5/01	1610	HZ	W	Sample No. 01090305 location.
2.10	9/5/01	1610	HZ	W	Sample No. 01090305 (note that the sample No. 01090405, is incorrect in the photograph).
2.11	9/5/01	1645	HZ	S	Photograph of sample No. 01090306 location did not develop.
2.12	9/5/01	1645	HZ	S	Sample No. 01090306.
2.13	9/5/01	1735	HZ	S	Sample No. 01090307 location.
2.14	9/5/01	1735	HZ	S	Sample No. 01090307.
2.15	9/5/01	1750	HZ	S	Sample No. 01090308 location.
2.16	9/5/01	1750	HZ	S	Sample No. 01090308.
2.17	9/5/01	1835	HZ	E	Sample No. 01090309.
2.18	9/5/01	0805	HZ	S	Photograph of sample No. 01090310 did not develop.
2.19	9/6/01	0820	HZ	N	Photograph of sample No. 01090311 did not develop.
2.20	9/6/01	0845	HZ	NE	Sample No. 01090312.
2.21	9/6/01	0850	HZ	E	Sample No. 01090313.
2.22	9/6/01	0900	HZ	E	Sample No. 01090314.
2.23	9/6/01	1045	HZ	N	Sample No. 01090315.
2.24	9/6/01	1046	HZ	W	Sample No. 01090315 location.
2.25	9/6/01	1102	HZ	W	Sample No. 01090316. (note that the sample No. 0109031 is incorrect in the photograph).
2.26	9/6/01	1120	HZ	N	Sample No. 01090317.
2.27	9/6/01	1120	HZ	W	Sample No. 01090317 location.

PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial No. Disposable Camera

TDD No. 01-07-0014

Site Name: Vermiculite Northwest Removal Site Evaluation

Photo	Date	Time	By	Direction	Description
3.01	9/5/01	1230	EL	N	Sample No. 01090325 location.
3.02	9/5/01	1230	EL	N	Sample No. 01090326 location.
3.03	9/5/01	1420	EL	N	Sample No. 01090322 location.
3.04	9/5/01	1430	EL	NW	Sample No. 01090323 location.
3.05	9/5/01	1445	EL	E	Sample No. 01090324 location.
3.06	9/5/01	1645	EL	NE	Sample No. 01090319 location.
3.07	9/5/01	1649	EL	NW	Sample No. 01090327 location.
3.08	9/5/01	1723	EL	N	Sample No. 01090321 location.
3.09	9/5/01	1718	EL	NW	Sample No. 01090320 location.
3.10	9/5/01	1730	EL	SW	Sample No. 01090318 location.

Key:

E = East.
EL = Earl Liverman.
HZ = Howard Zorzi.
N = North.
NE = Northeast.
No. = Number.
NW = Northwest.
S = South.
SE = Southeast.
SW = Southwest.
TDD = Technical Direction Document.
W = West.

Note: This page is
intentionally left blank.

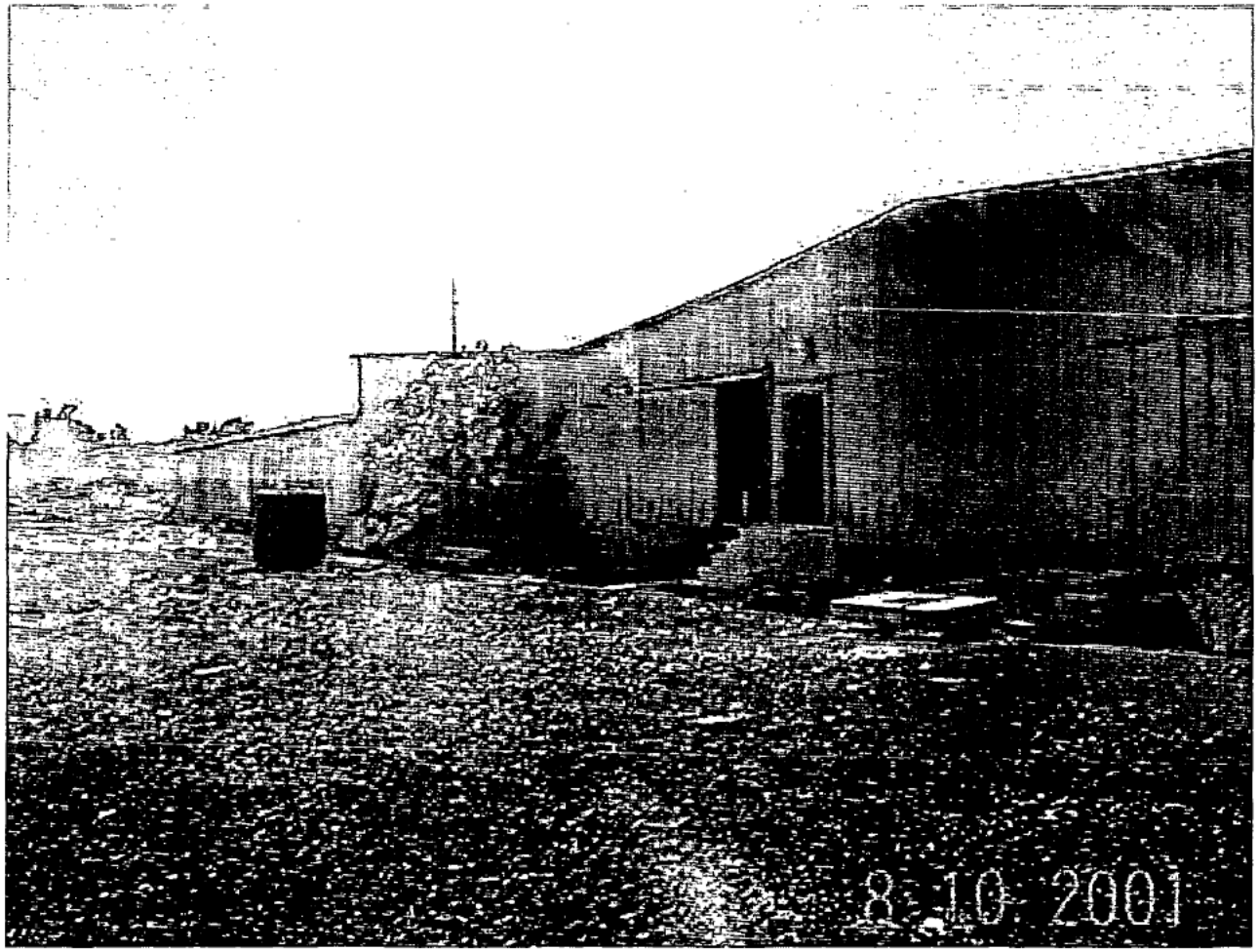
Vermiculite Northwest Removal Site Evaluation

1.01

Vermiculite Northwest Removal Site Evaluation

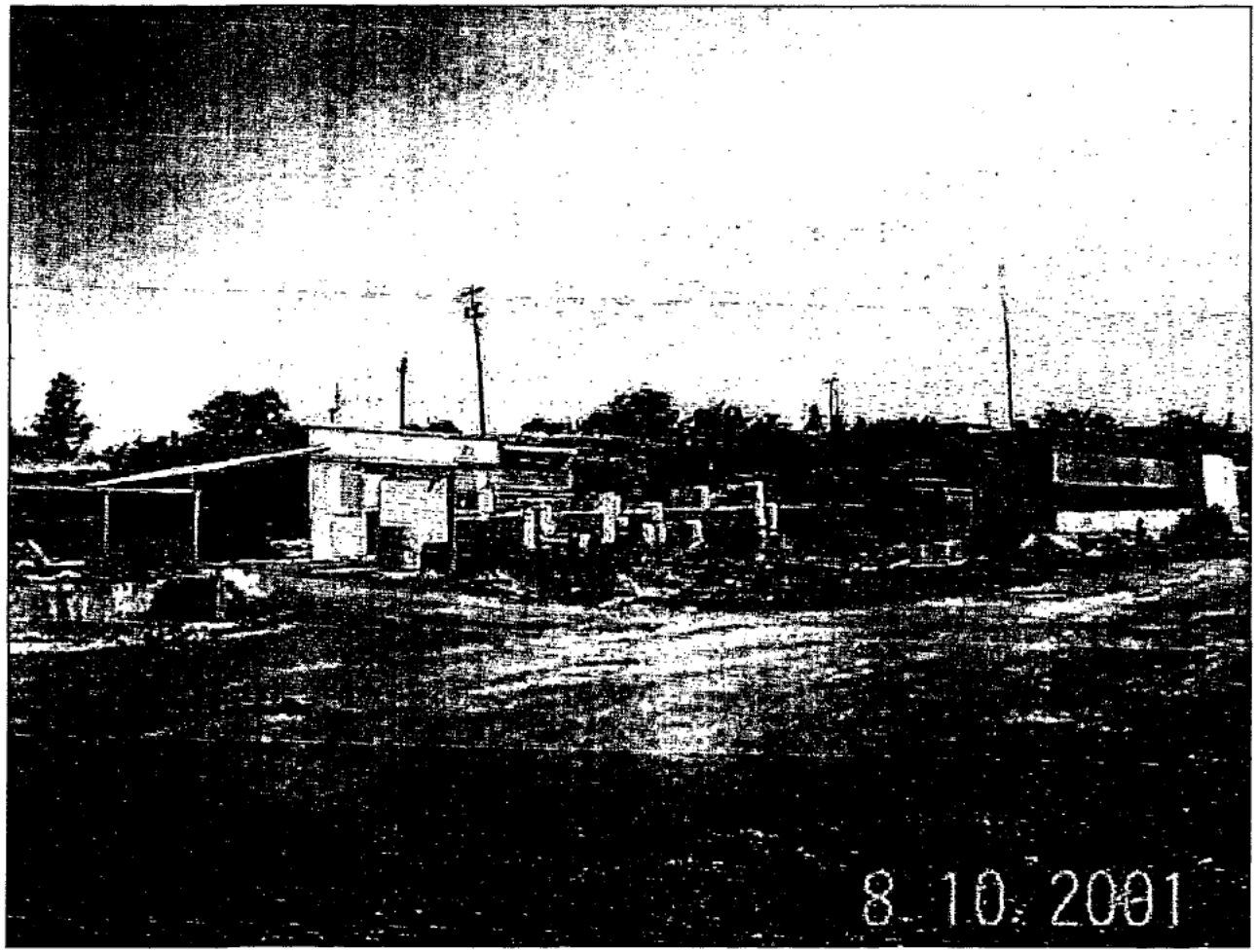
1.02

Vermiculite Northwest Removal Site Evaluation



1.03

Vermiculite Northwest Removal Site Evaluation

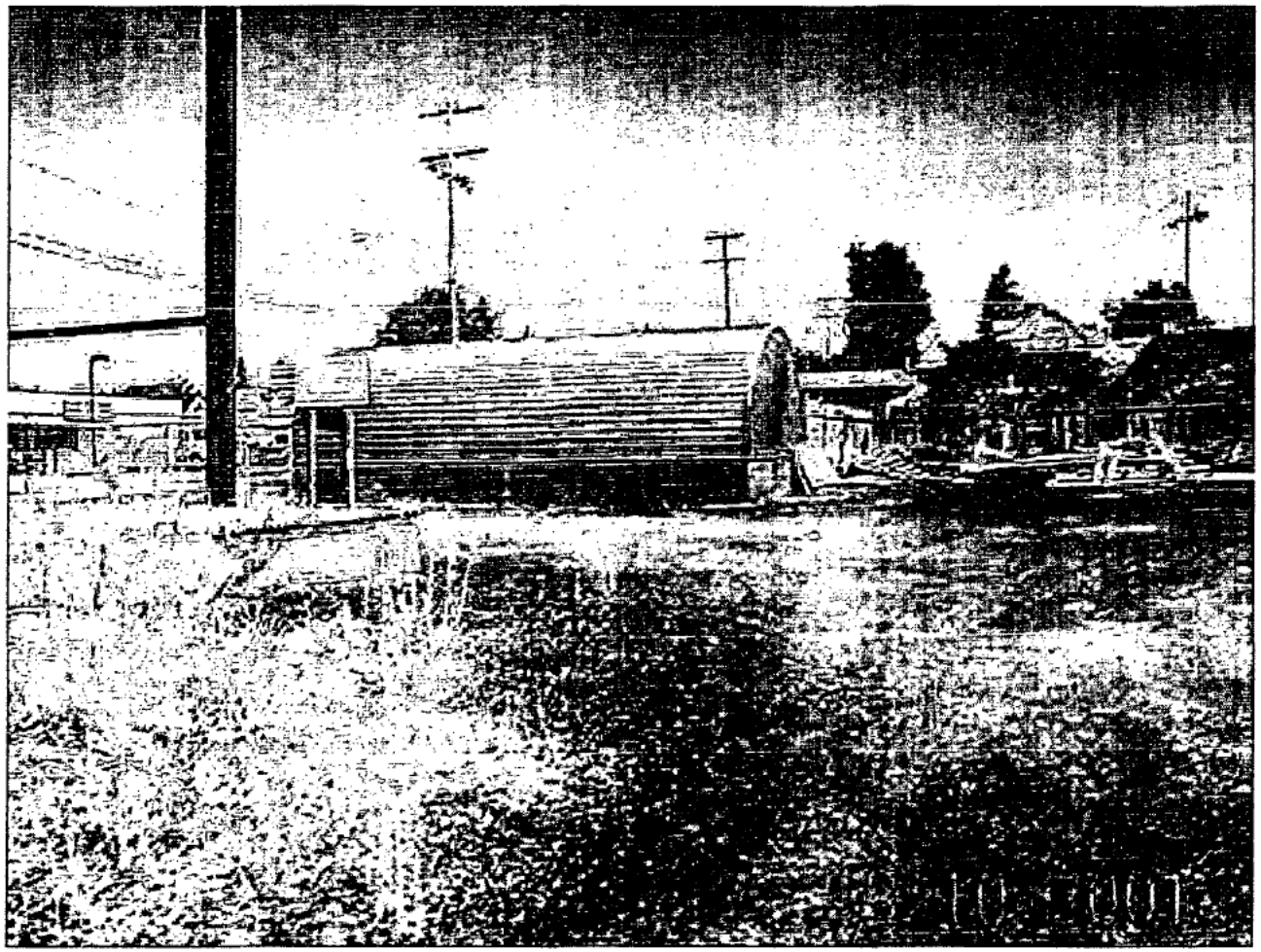


1.04

Vermiculite Northwest Removal Site Evaluation

1.05

Vermiculite Northwest Removal Site Evaluation



1.06

Vermiculite Northwest Removal Site Evaluation

1.07

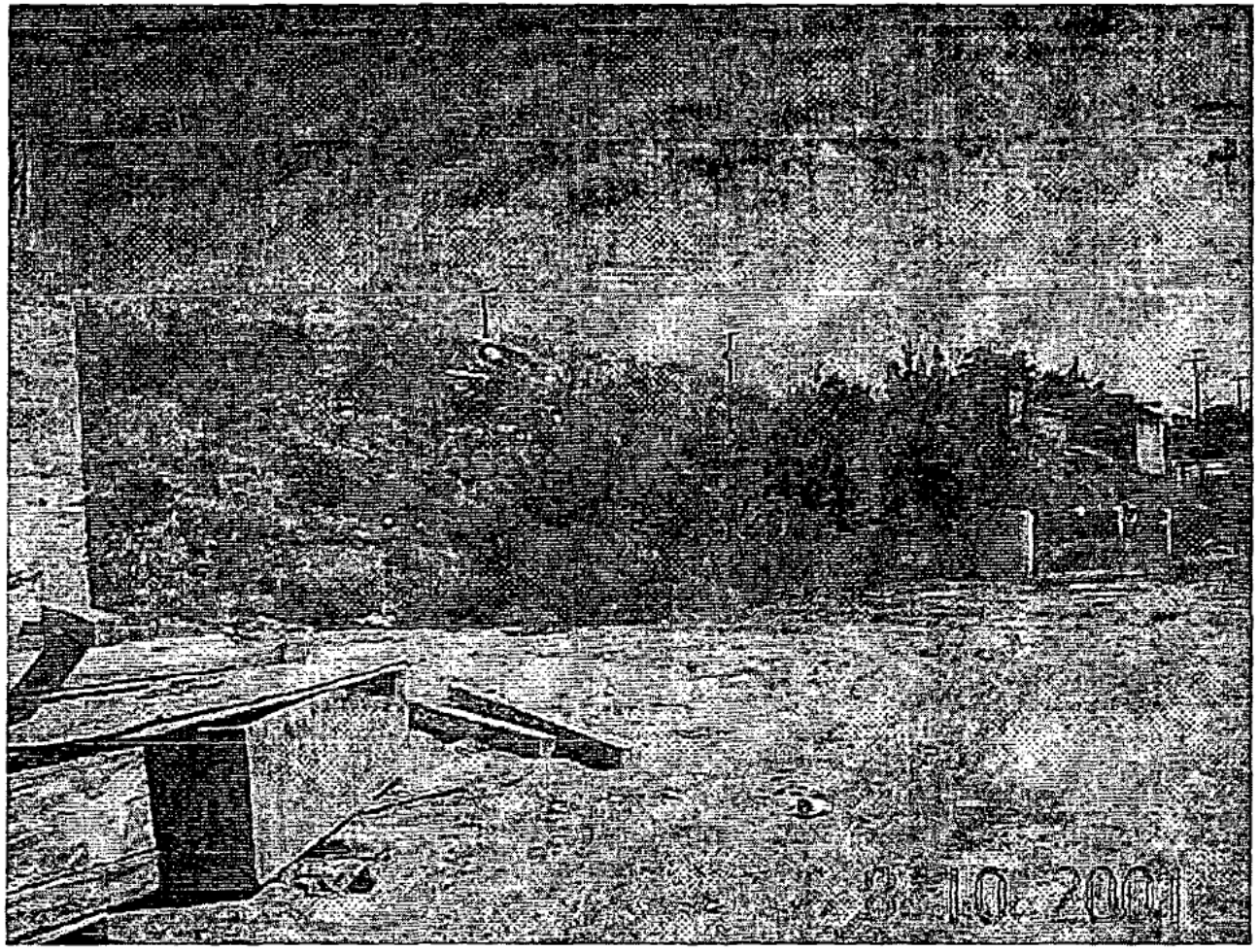
Vermiculite Northwest Removal Site Evaluation

1.08

Vermiculite Northwest Removal Site Evaluation

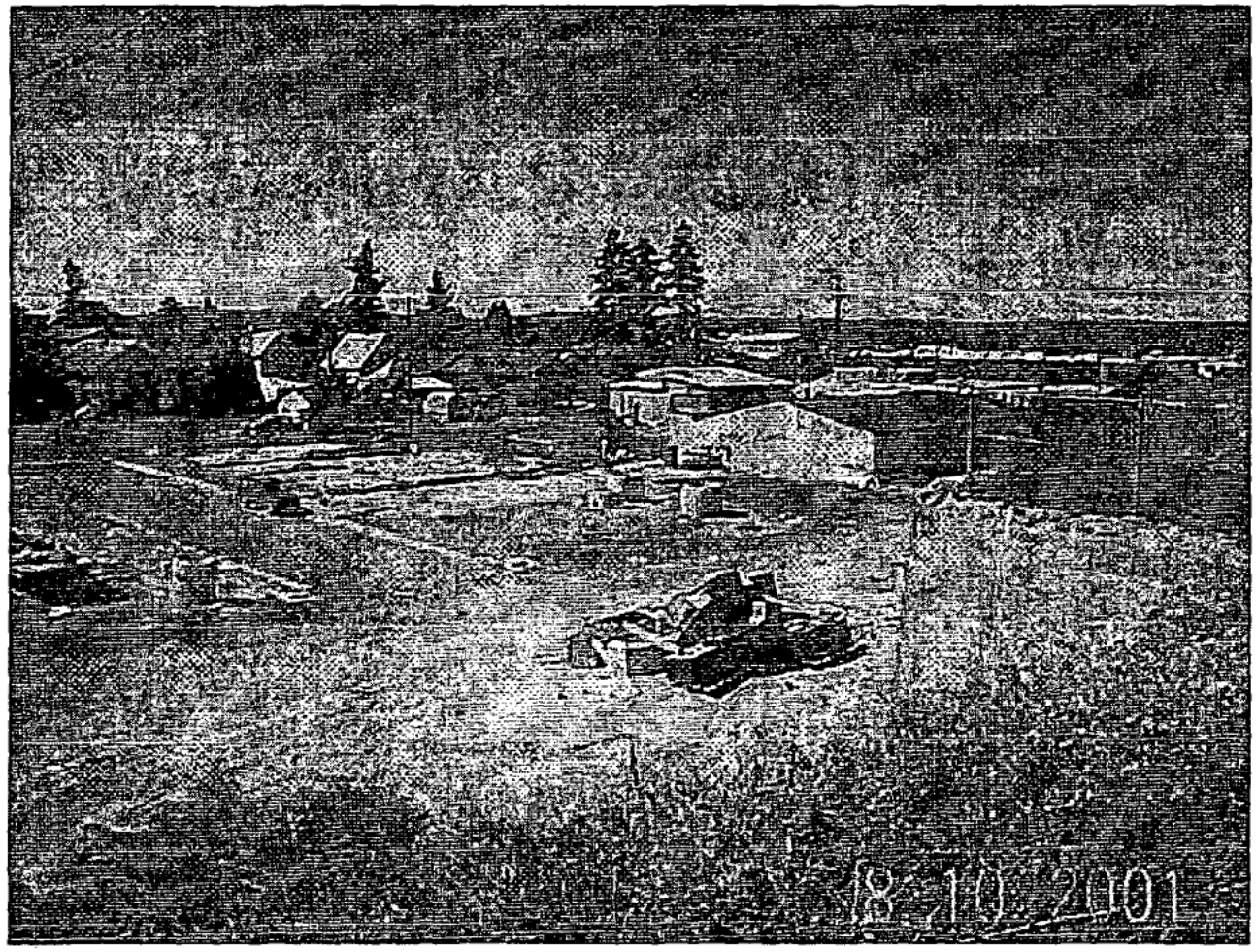
1.09

Vermiculite Northwest Removal Site Evaluation



1.10

Vermiculite Northwest Removal Site Evaluation

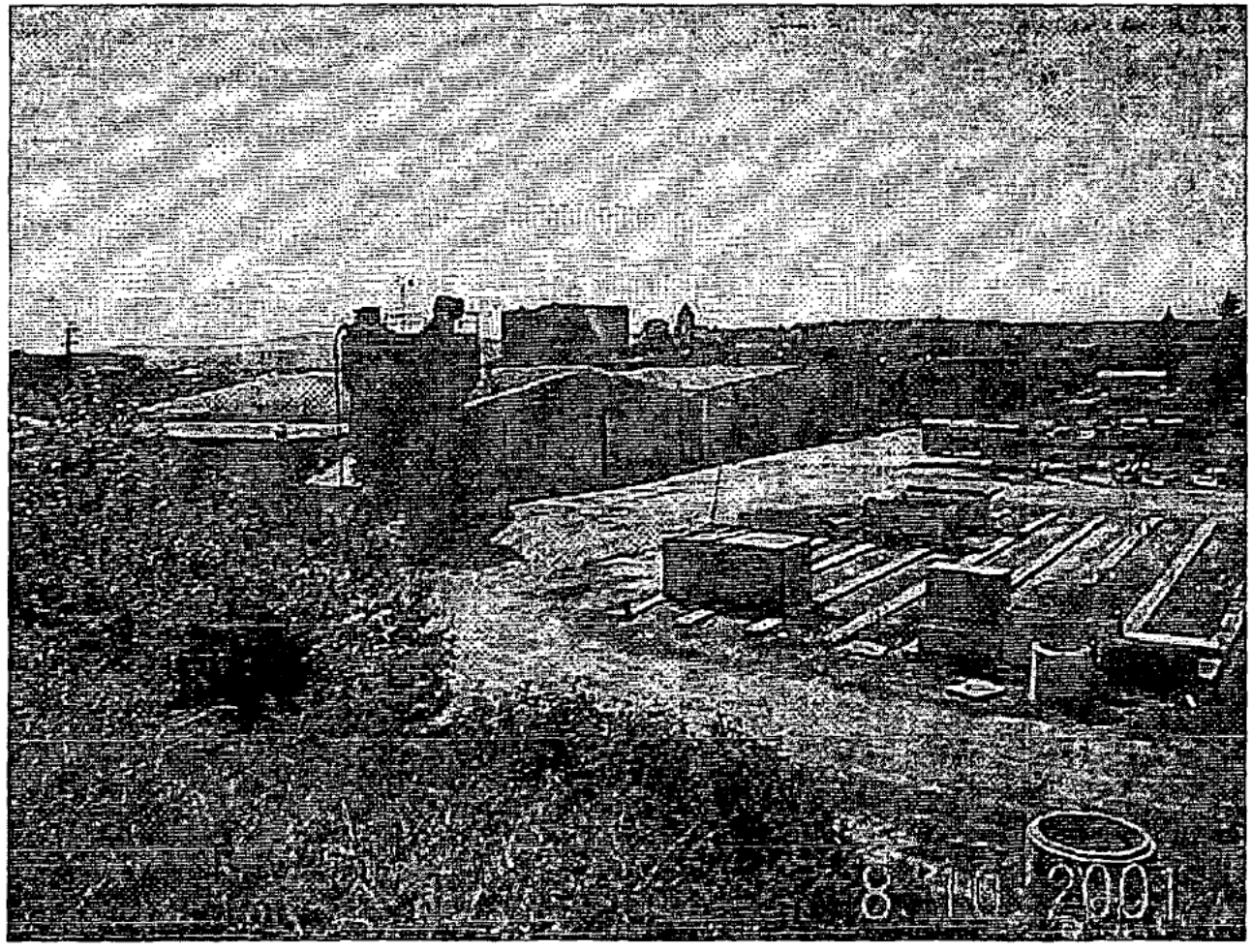


1.11

Vermiculite Northwest Removal Site Evaluation

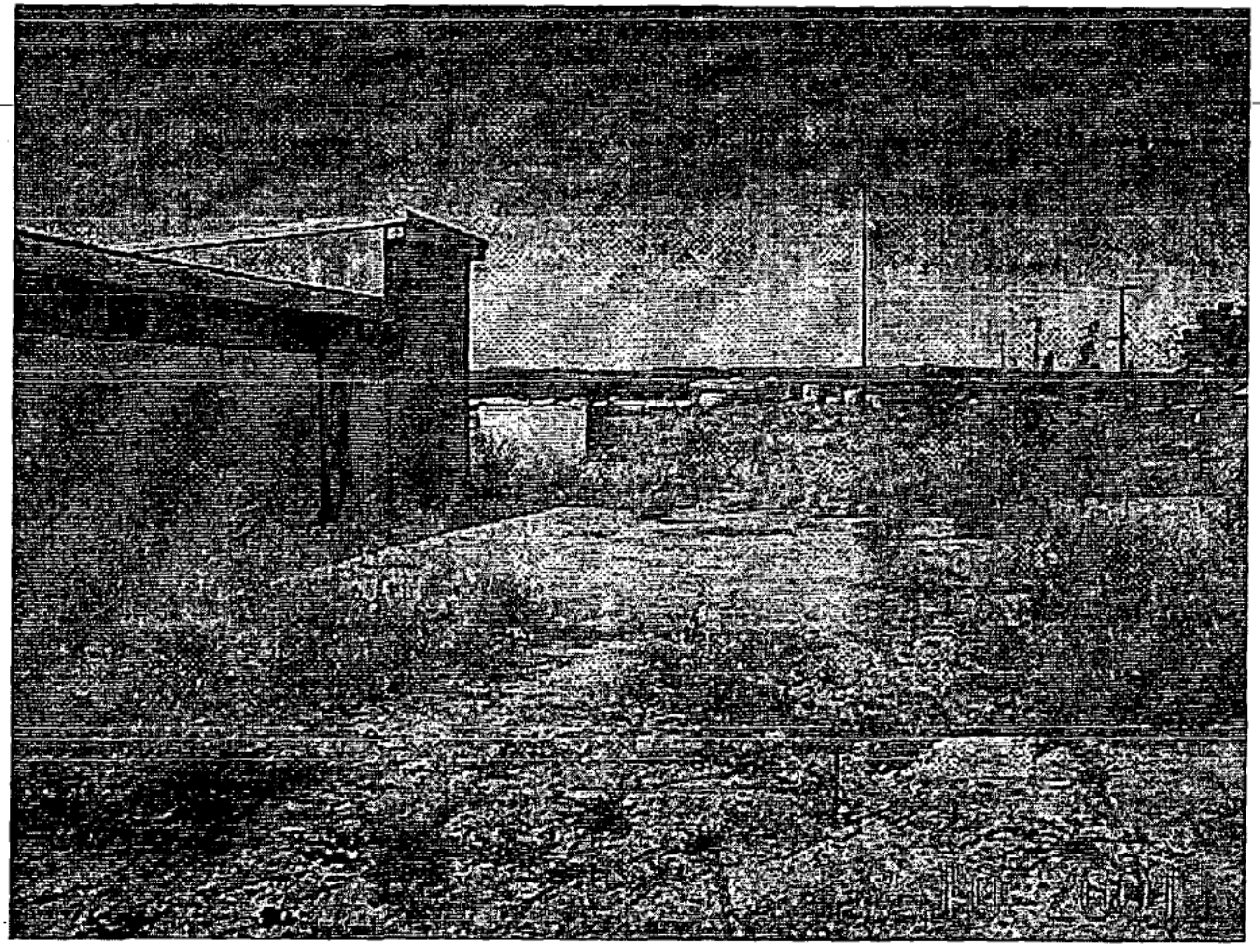
1.12

Vermiculite Northwest Removal Site Evaluation

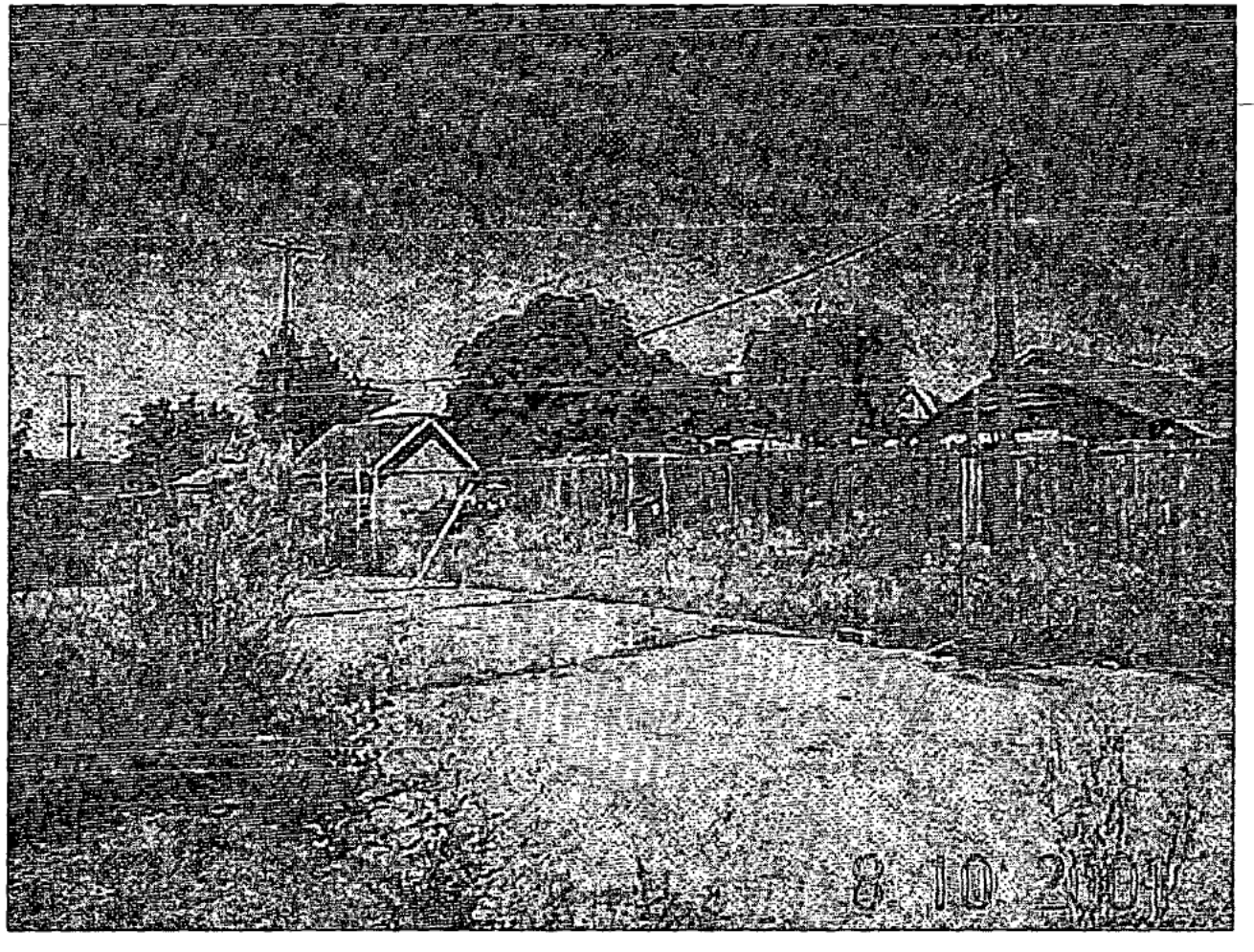


1.13

Vermiculite Northwest Removal Site Evaluation

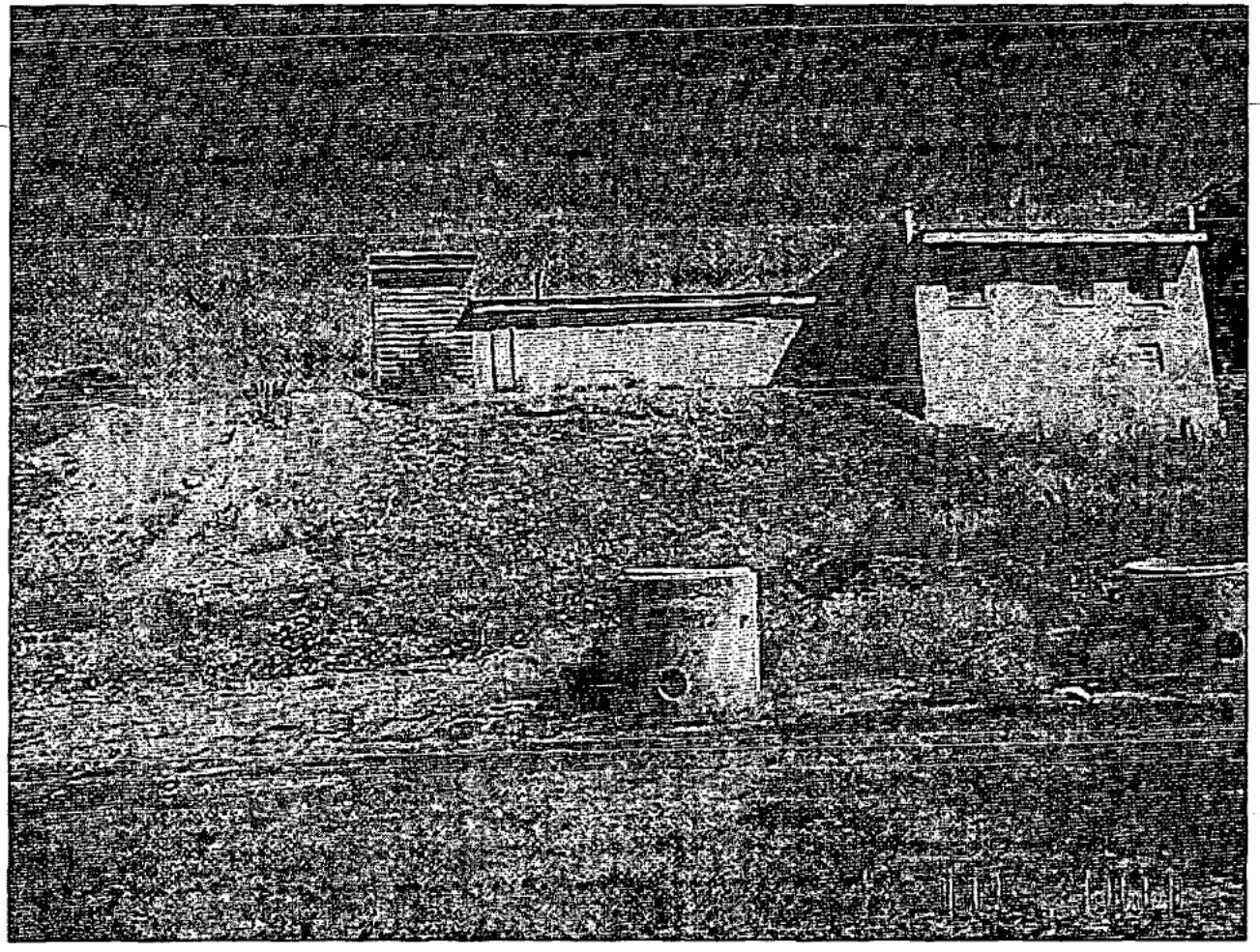


Vermiculite Northwest Removal Site Evaluation



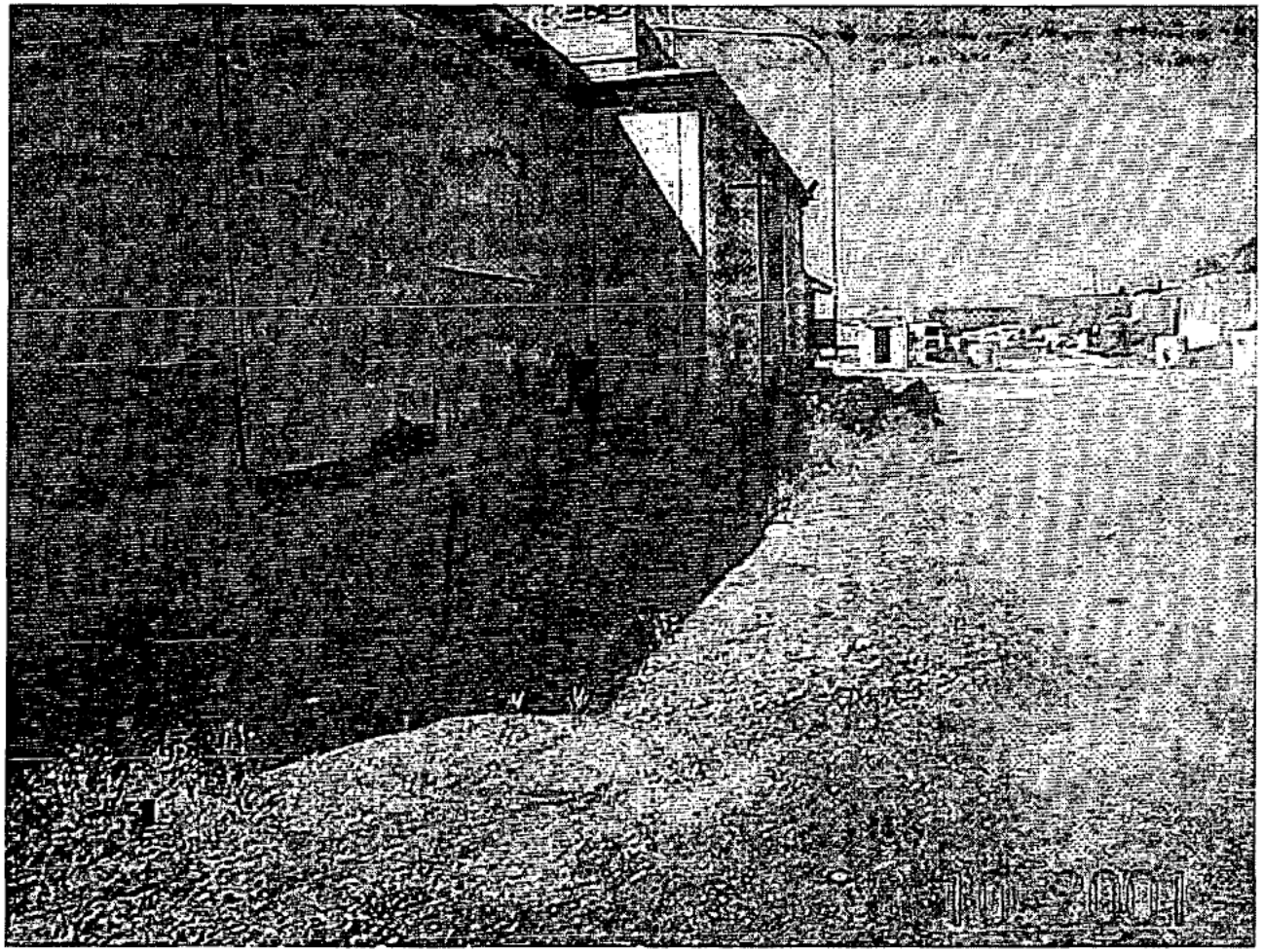
1.15

Vermiculite Northwest Removal Site Evaluation

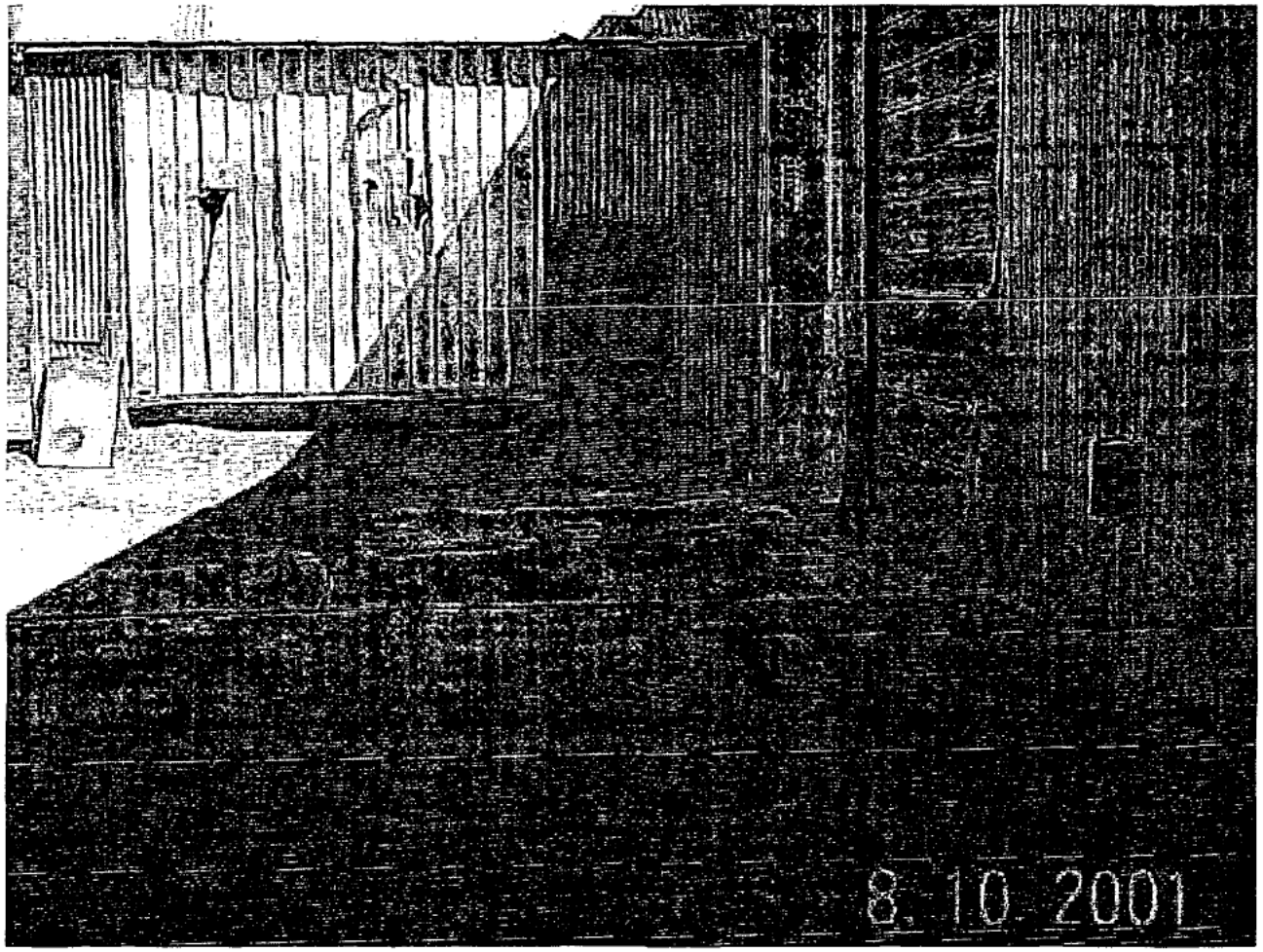


1.16

Vermiculite Northwest Removal Site Evaluation



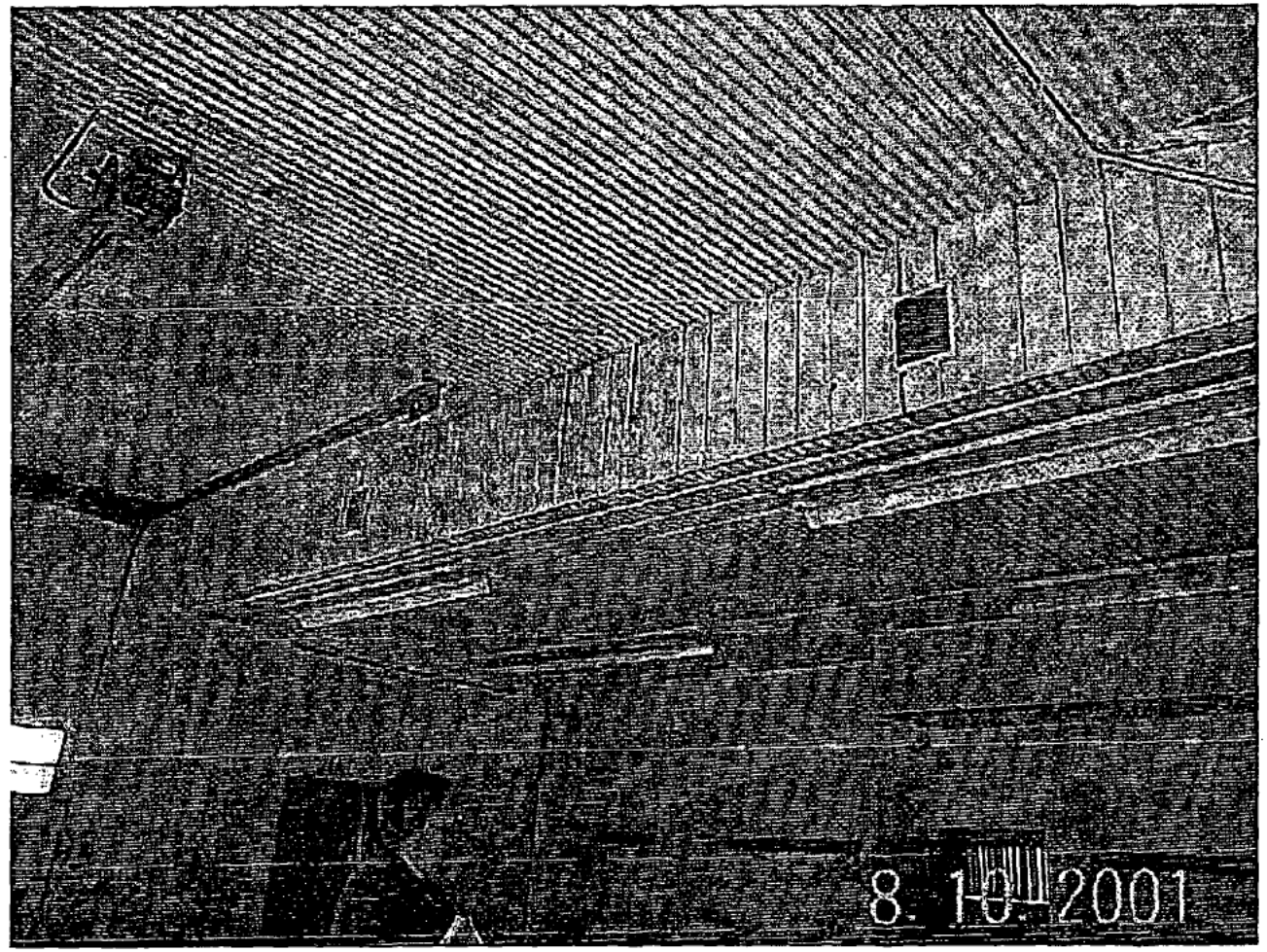
Vermiculite Northwest Removal Site Evaluation



1.18

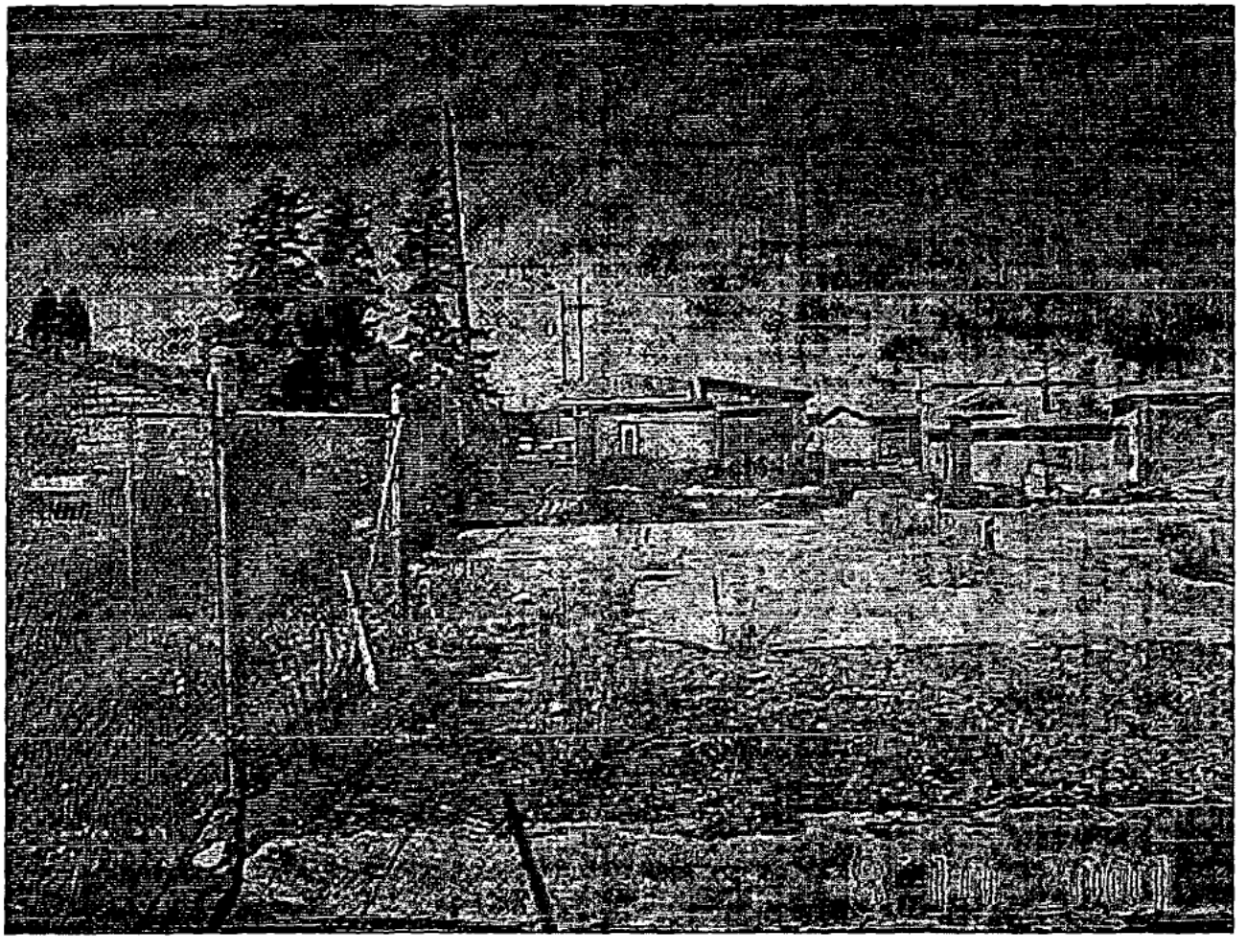
Vermiculite Northwest Removal Site Evaluation

Vermiculite Northwest Removal Site Evaluation

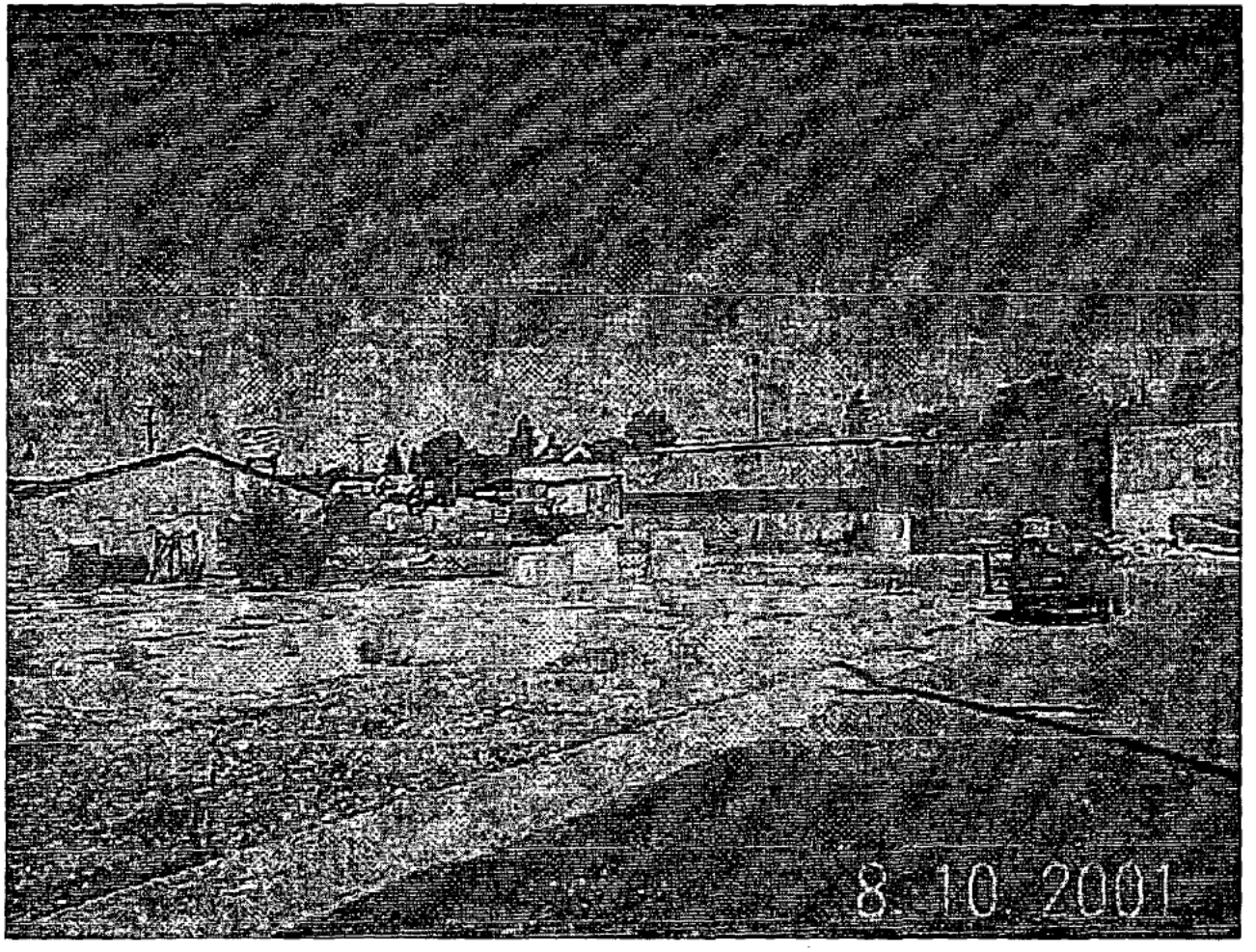


1.20

Vermiculite Northwest Removal Site Evaluation

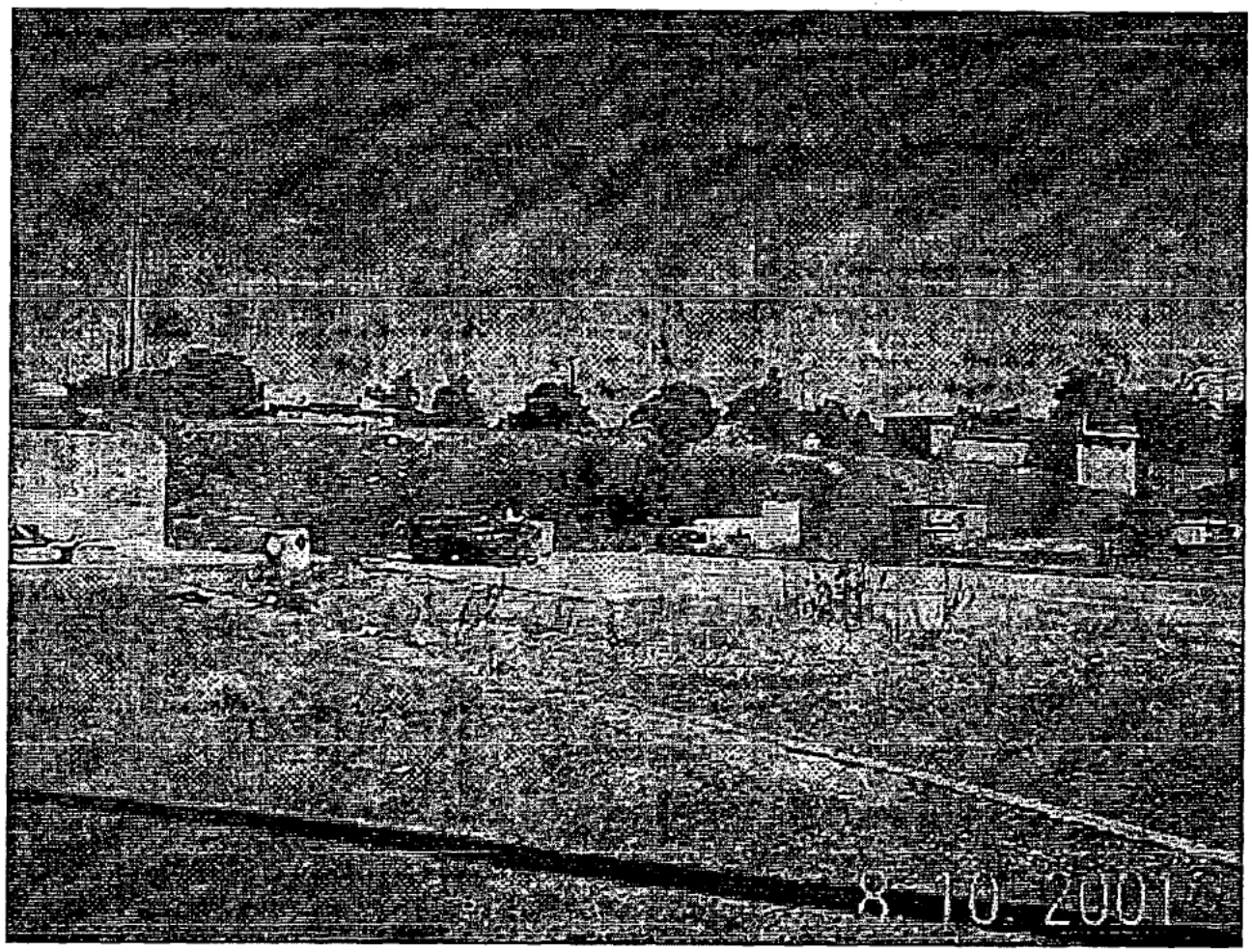


Vermiculite Northwest Removal Site Evaluation



1.22

Vermiculite Northwest Removal Site Evaluation



Vermiculite Northwest Removal Site Evaluation

1.24

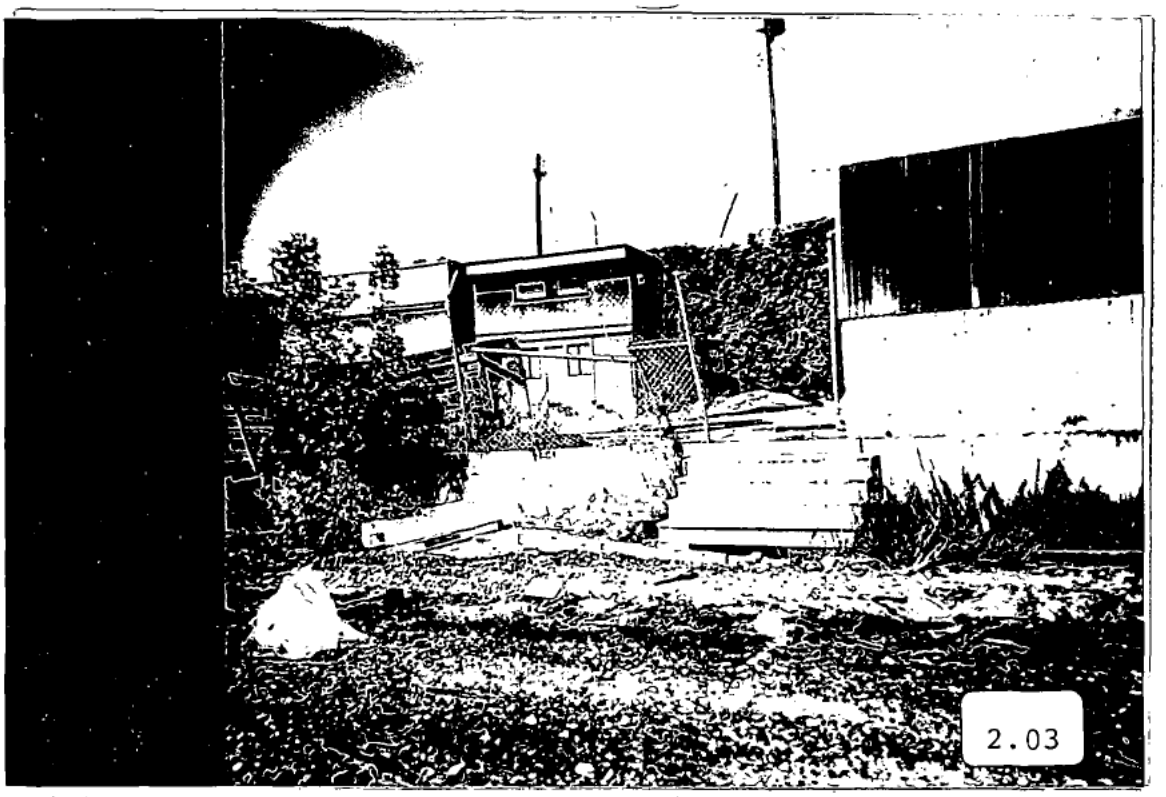
Vermiculite Northwest Removal Site Evaluation

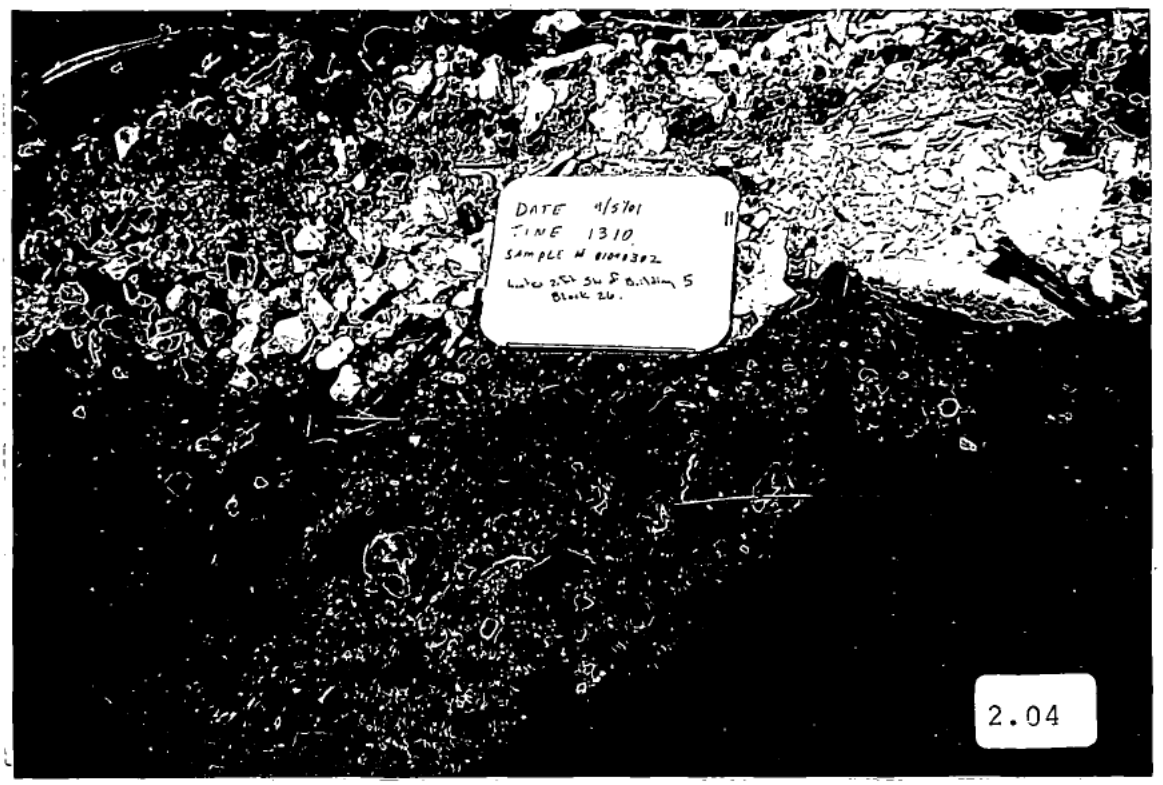
1.25

Vermiculite Northwest Removal Site Evaluation

2.01

DATE 9/5/01
TIME 1234
SAMPLE # 01090301
DESCRIP. Northeast Building #3
2.02

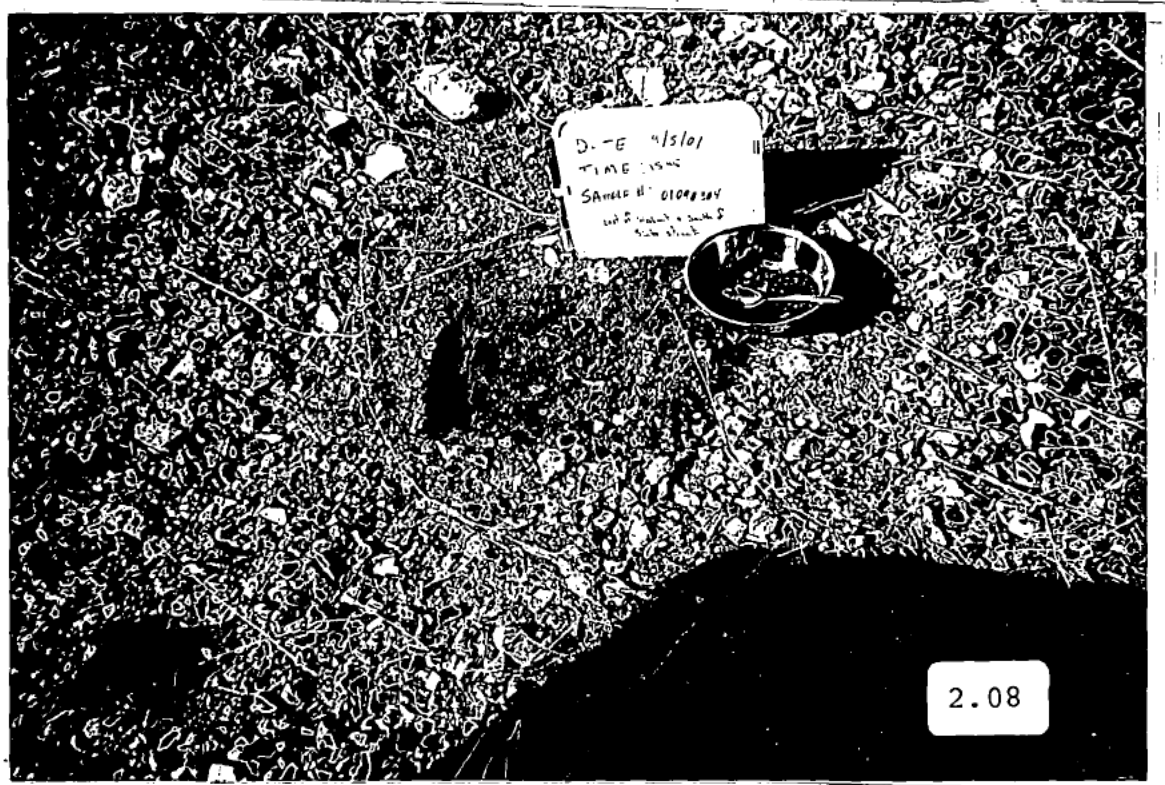

2.03


DATE 11/5/01
TIME 1310
2.04

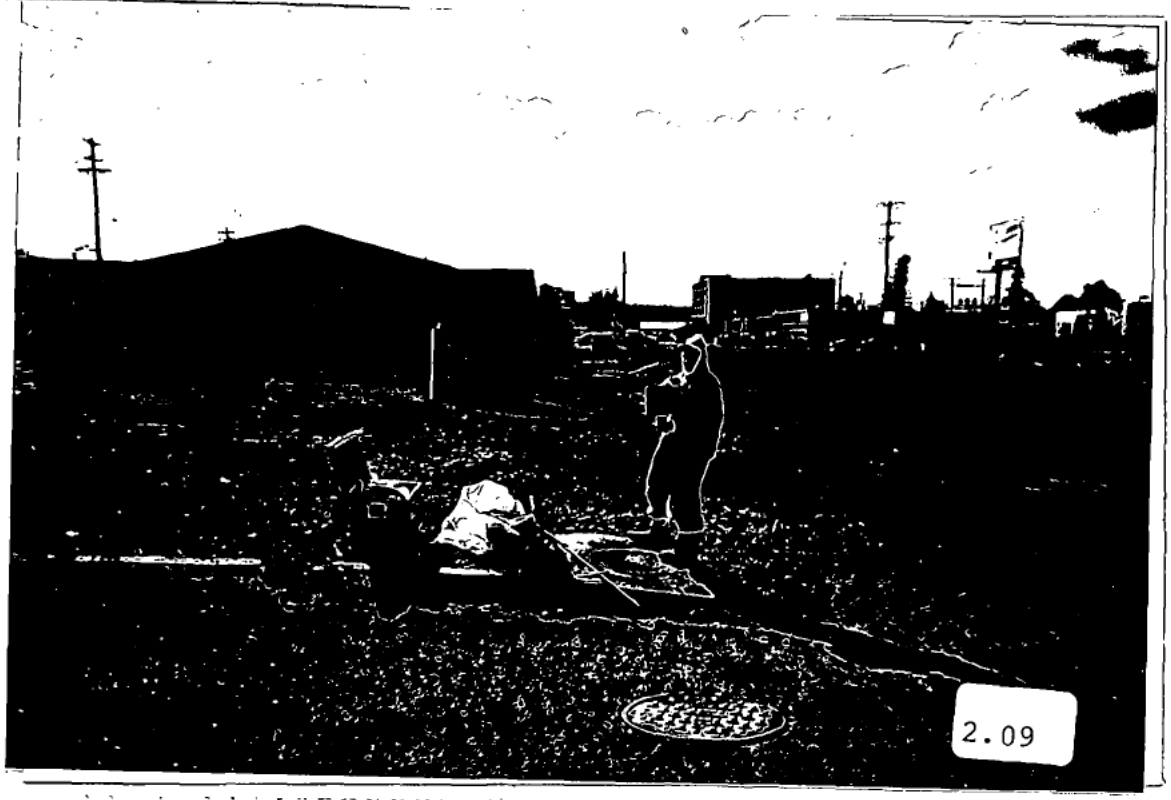
2.05

DATE: 4/5/01
TIME: 1320
SAMPLE #: 01090303
2.06

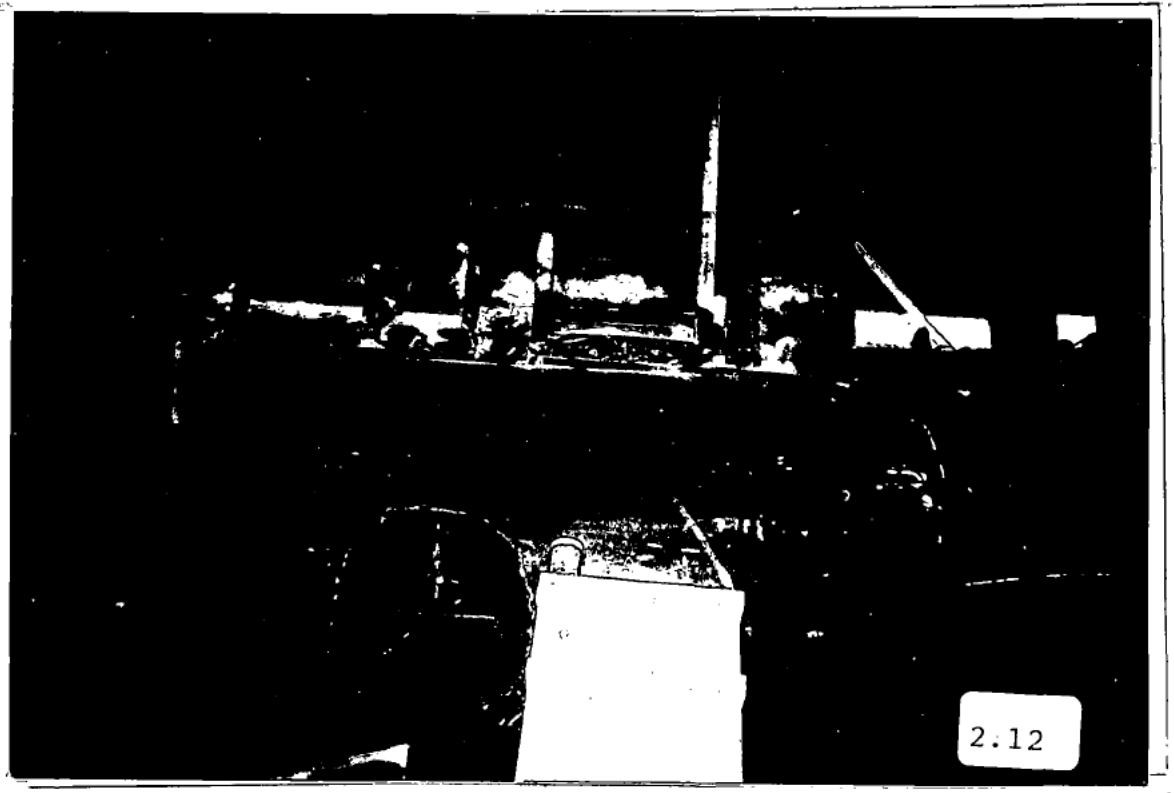
2.07



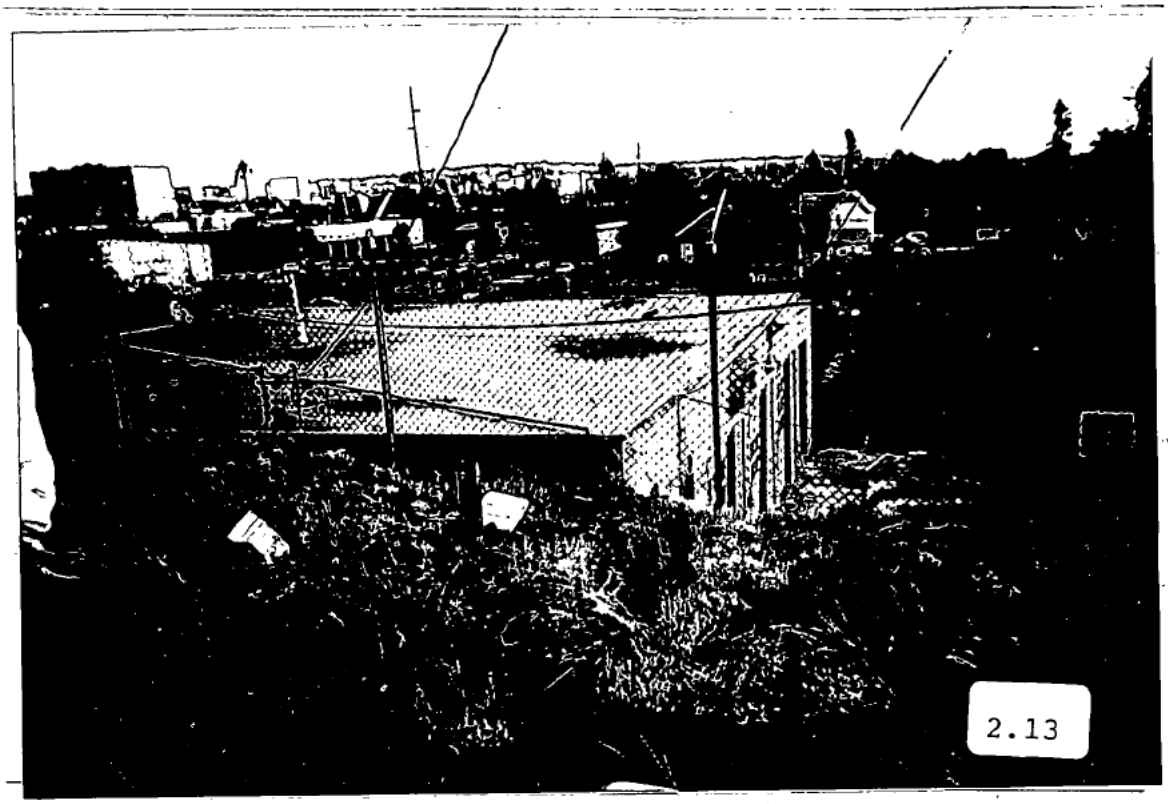
2.08


2.09

2.10

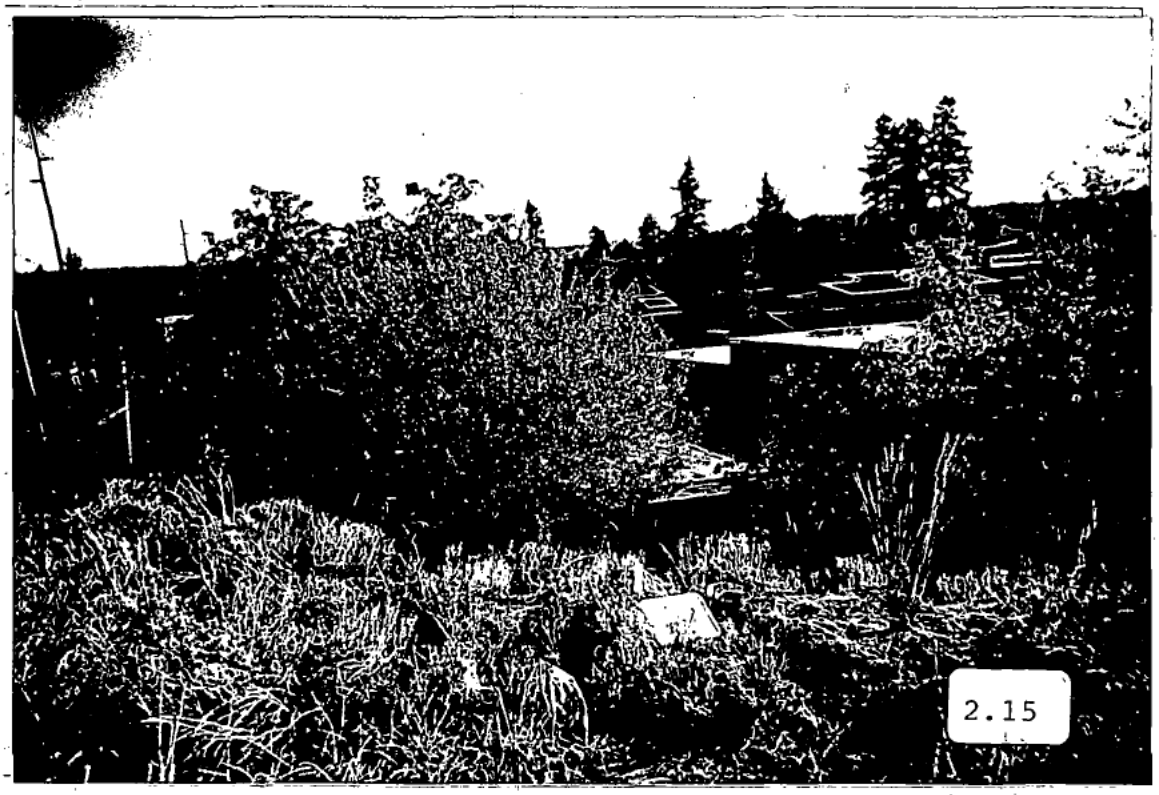


2.12



2.13

2.14



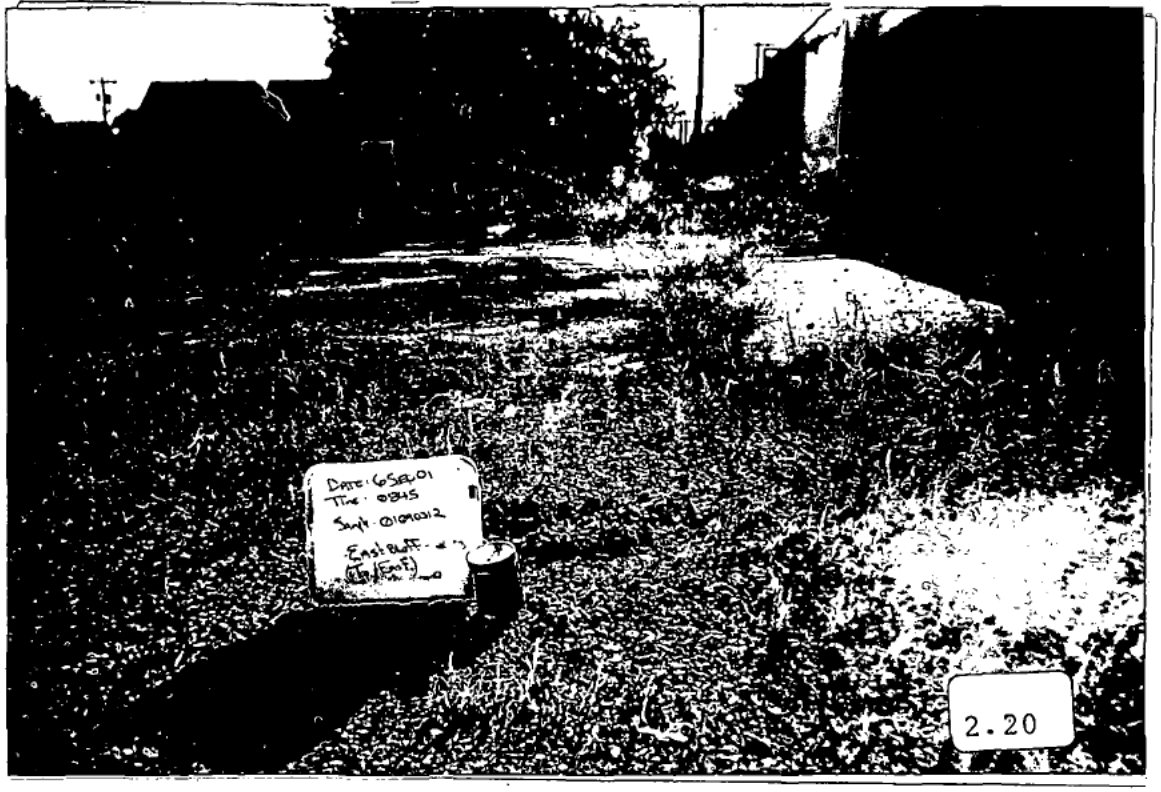
2.15

Date 05 Sep 01
Time 1730
Sample: 01090308
- Northwest Bluff

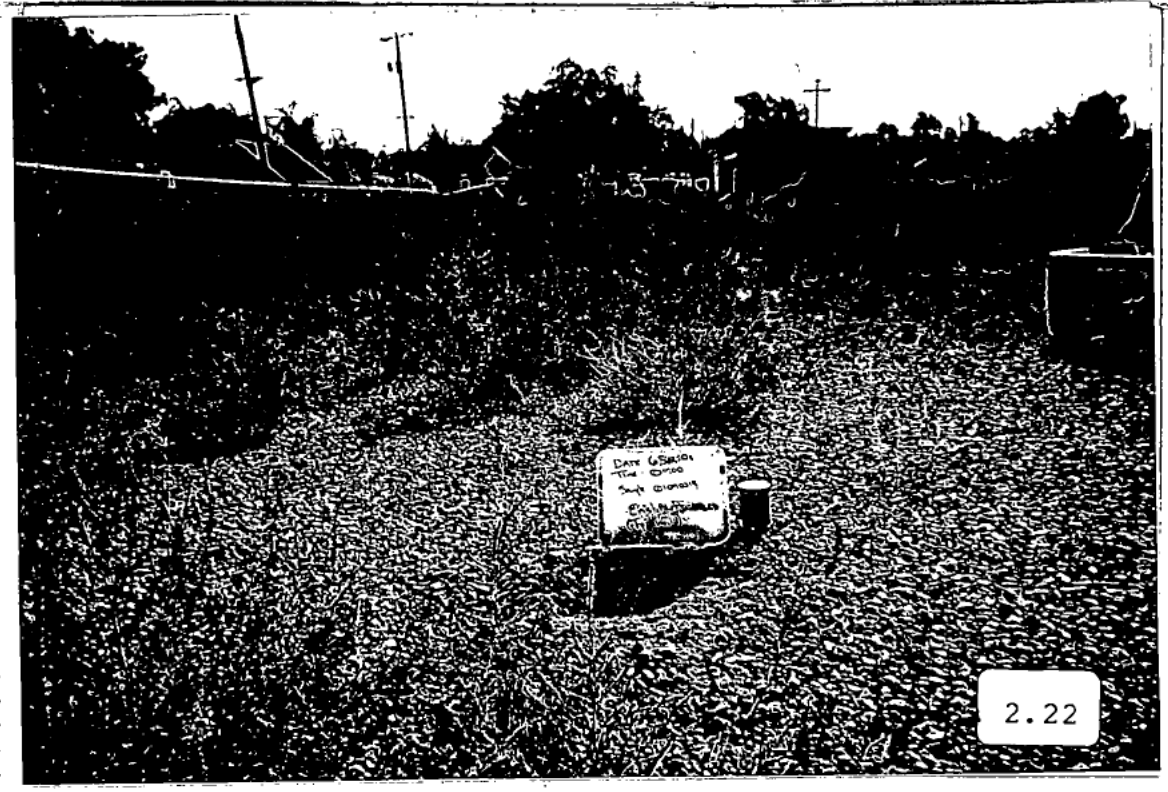
2.16

TIME:

2.17


DATE: 6SEP01
TIME: 0845
2.20

DATE: 6SEP01
TIME: 0850
2.21

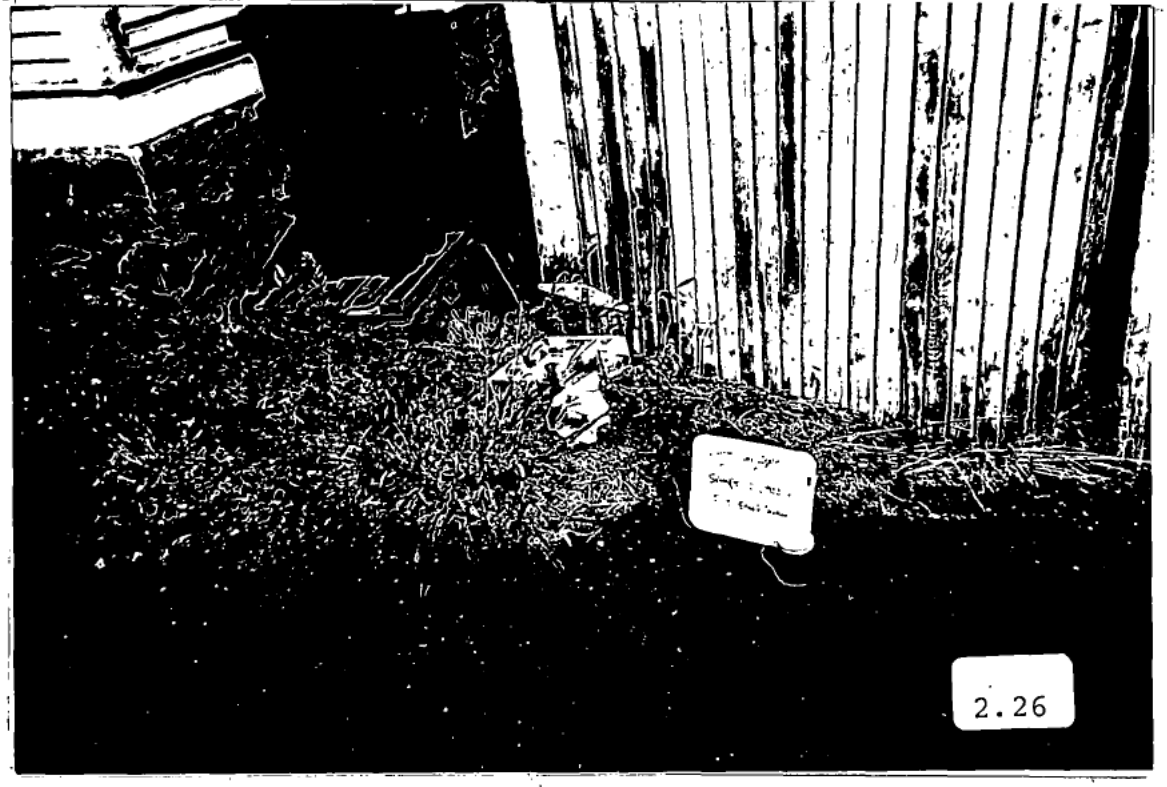


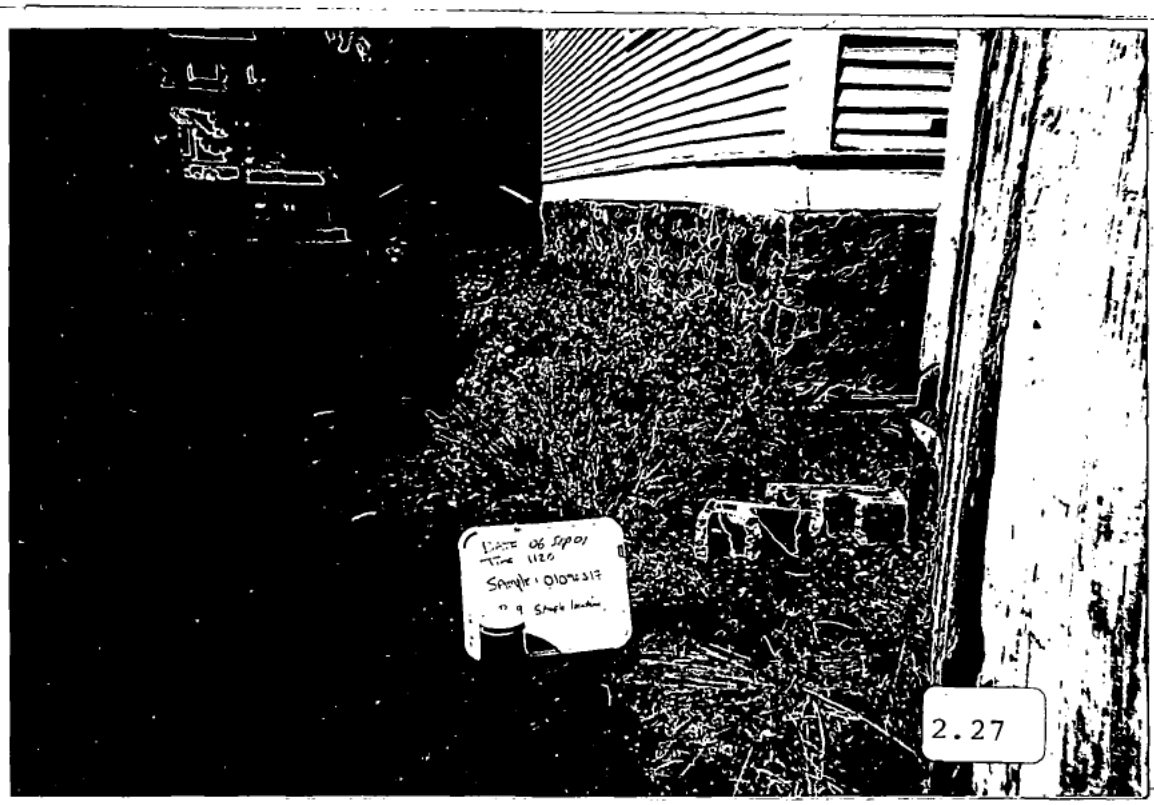
2.22

2.23

2.24

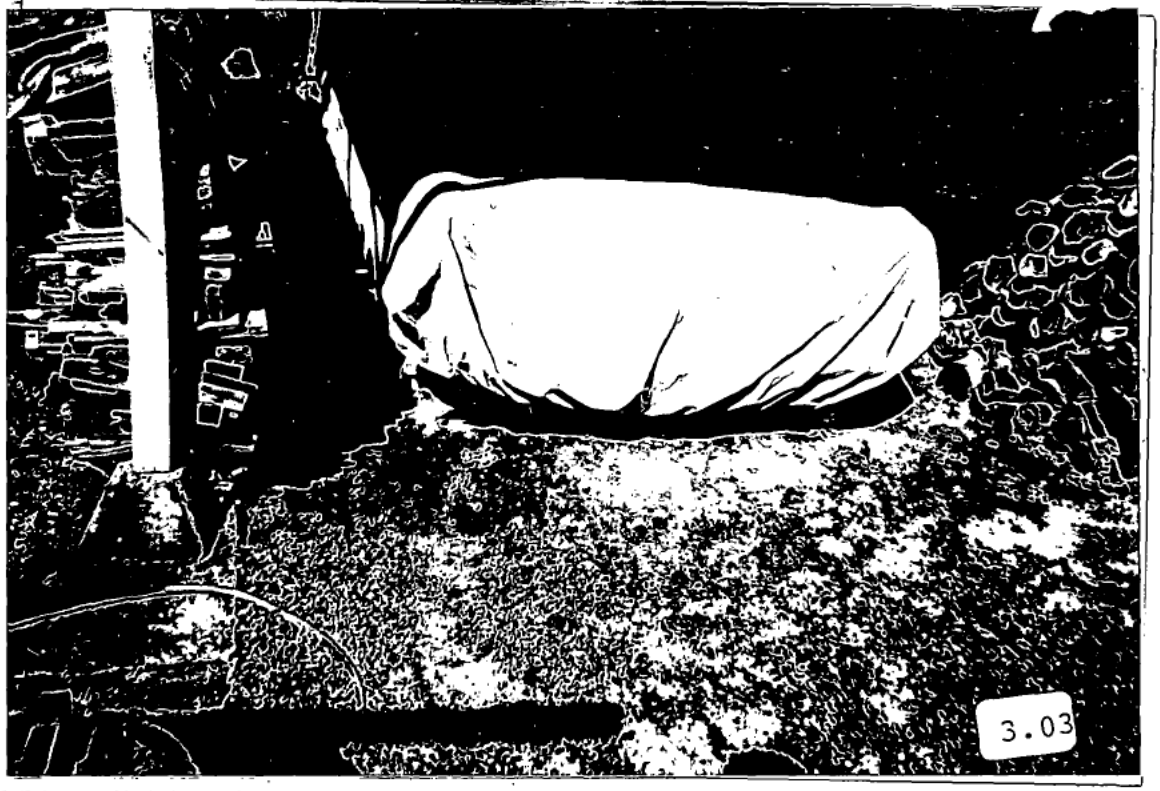
2.25


2.26

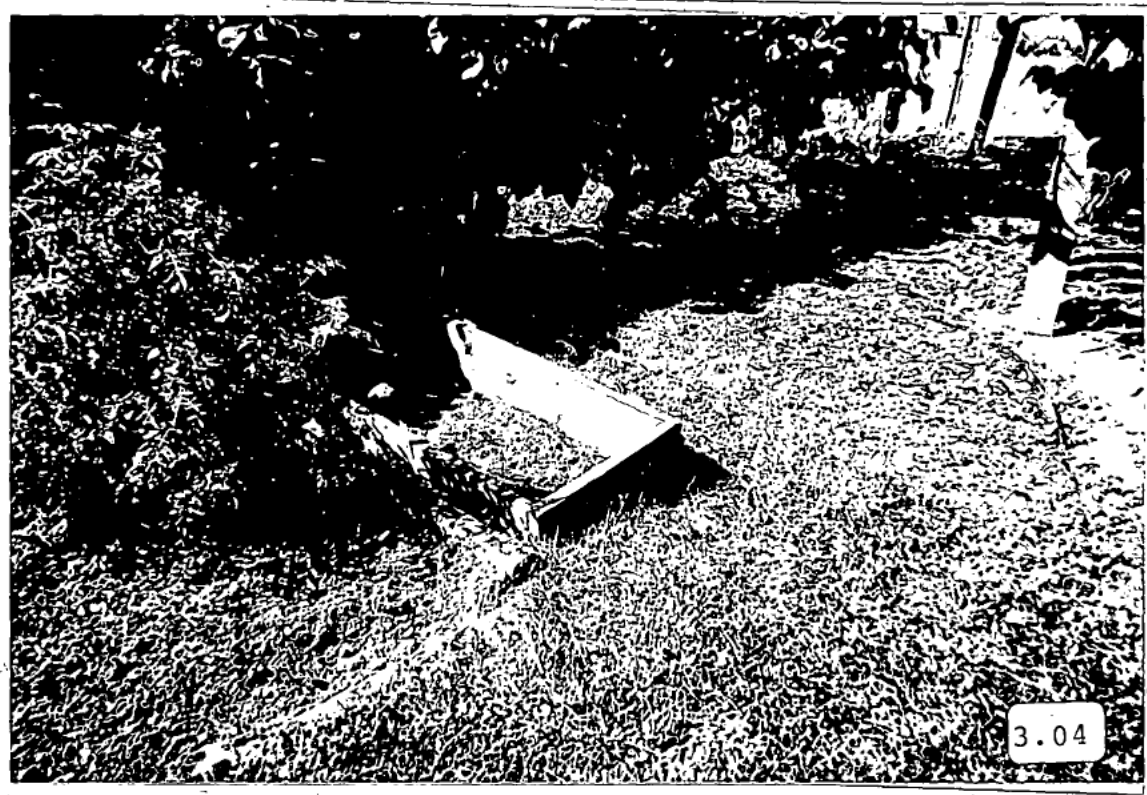

DATE 06 SEP 01
TIME 1120
Sample: 01092317
2.27

3.01

3.02

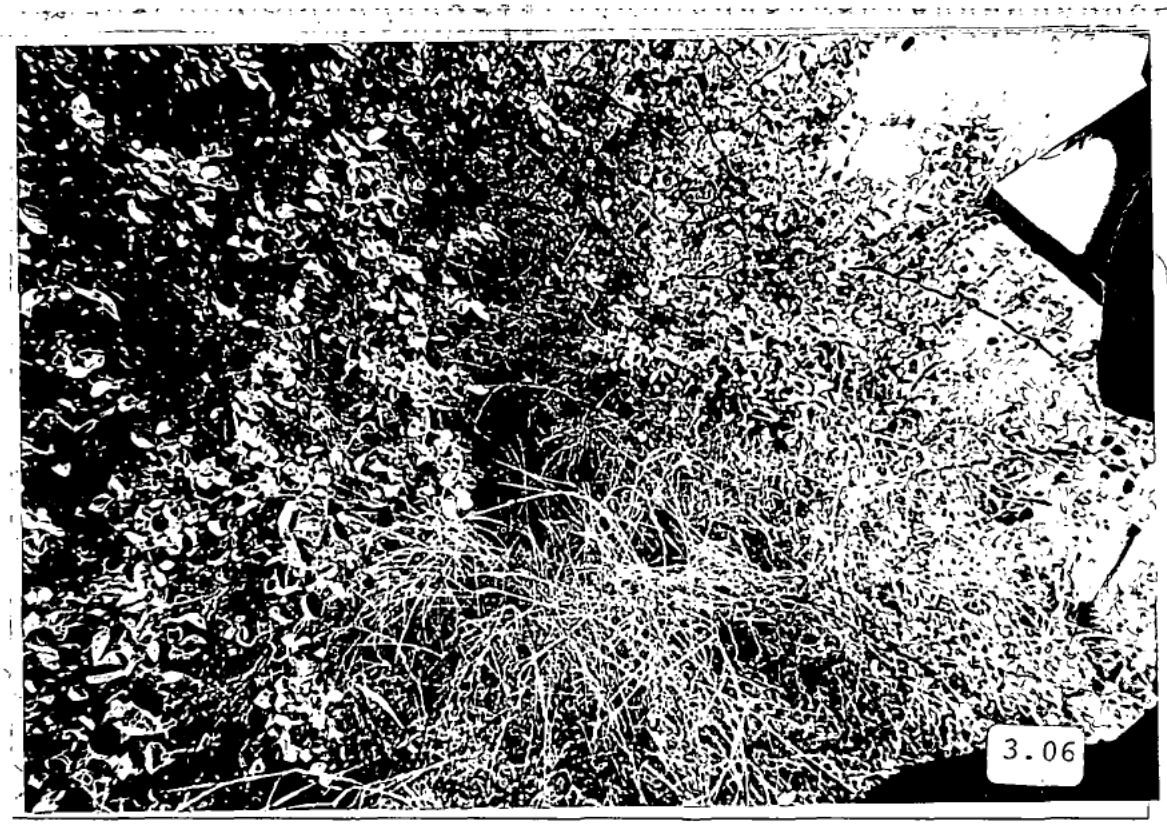


3.03

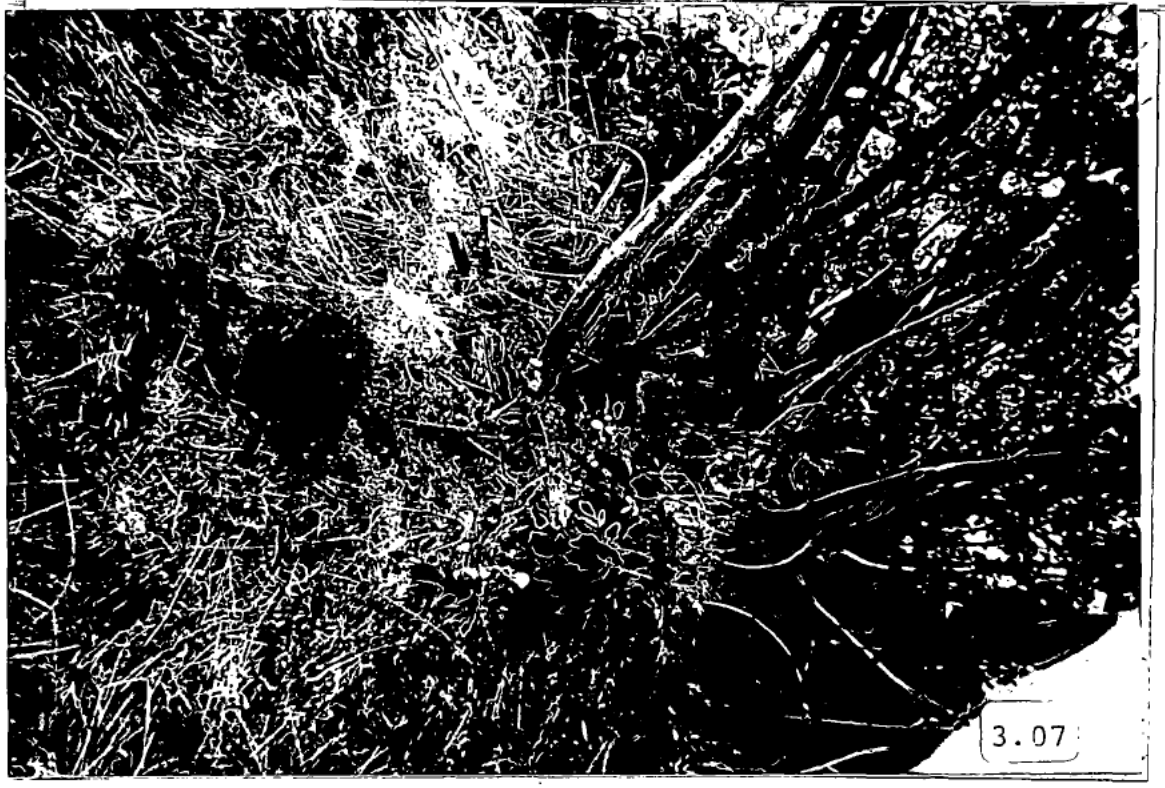


3.04

3.05

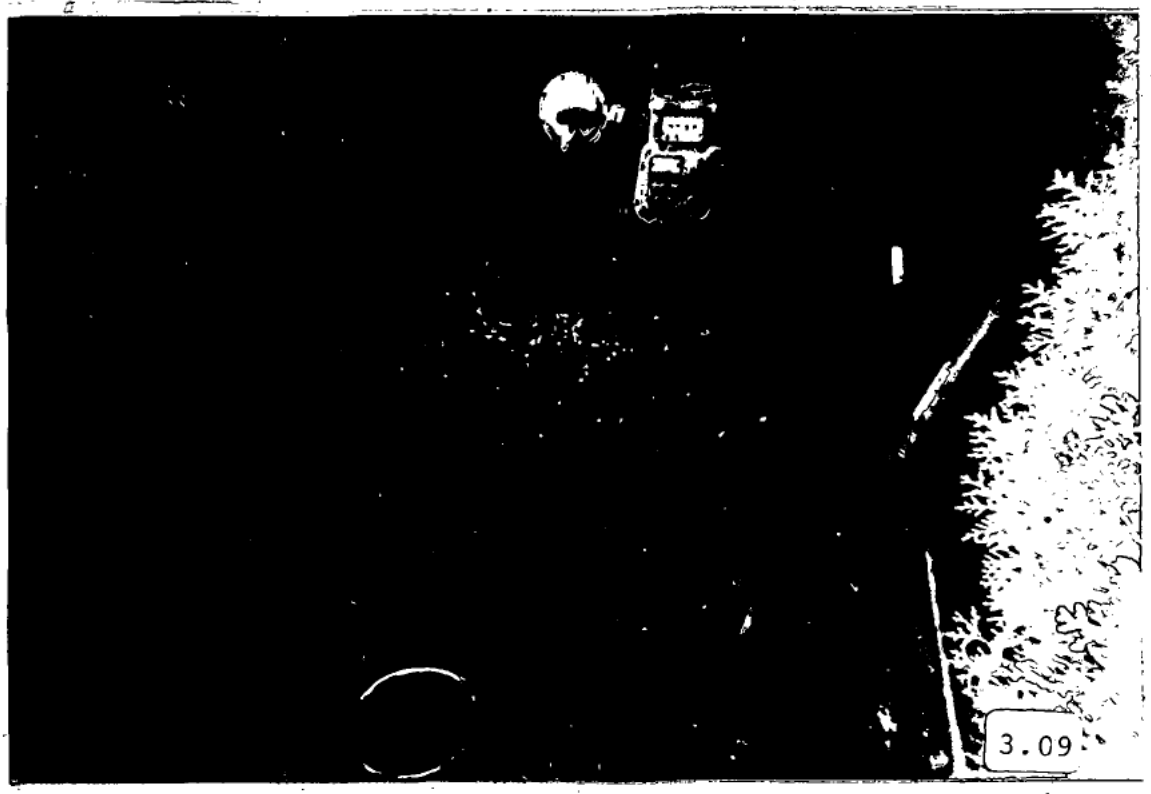


3.06



3.07

3.08



3.09

3.10

ATTACHMENT B
DATA VALIDATION MEMORANDUM

ecology and environment, inc.
International Specialists in the Environment
2101 Fourth Avenue, Suite 1900, Seattle, WA 98121
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: October 18, 2001

TO: Howard Zorzi, Project Manager, E & E, Boise, ID

FROM: Mark Woodke, Chemist, E & E, Seattle, WA MW

SUBJ: **Asbestos Data Quality Assurance Review, Vermiculite Northwest Site, Spokane, Washington**

REF: TDD: 01-07-0014 PAN: 001281.0110.01SF

The data quality assurance review of 27 solid samples collected from the Vermiculite Northwest site Industrial Site in Spokane, Washington has been completed. Asbestos analyses (Polarized Light Microscopy [PLM]-NIOSH Method 9002 and Transmission Electron Microscopy [TEM] - EPA Method 600/R-93/116) were performed by EMSL Analytical, Inc., Westmont, New Jersey.

The samples were numbered:

01090301	01090302	01090303	01090304	01090305	01090306
01090307	01090308	01090309	01090310	01090311	01090312
01090313	01090314	01090315	01090316	01090317	01090318
01090319	01090320	01090321	01090322	01090323	01090324
01090325	01090326	01090327			

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were collected on September 5 or 6, 2001, and were analyzed on September 13, 2001, following the PLM method and on September 20, 2001, following the TEM method.

2. Initial and Continuing Calibration: Acceptable.

Both instruments were calibrated daily with all results within acceptable limits. The PLM instrument monthly friable QC results were within QC limits. The TEM quarterly beam, monthly camera, semiannual K-factor, and monthly magnification calibrations were also acceptable.

3. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

4. **Performance Evaluation Sample Analysis: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

5. **Duplicate Analysis: Acceptable.**

A duplicate analysis was performed per 10 PLM samples. All duplicate results were within QC limits.

6. **Overall Assessment of Data for Use**

All calculations were verified as correct.

The overall usefulness of the data is based on the criteria outlined in the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical methods. Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: ssiegel@EMSL.com

Attn: Mark Woodke
Ecology & Environment, Inc.
2101 Fourth Ave, Suite 1500
Seattle, WA 98121
Fax: (206) 621-9832 Phone: 206-624-9537
Project: **1281.0110.01SF**

Customer ID: ECOL44
Customer PO:
Received: 09/10/01 10:10 AM
EMSL Order: 040114444
EMSL Project ID:
Analysis Date: 9/13/01

Polarized Light Microscopy (PLM) Performed by NIOSH Method 9002, Issue 2

Sample	Location	Appearance	Treatment	Non-Asbestos %	Fibrous	Non-Asbestos %	Non-Fibrous	Asbestos %	Type
01-09-0301 *040114444-0001*		Brown/Gray Fibrous Homogeneous	Teased QC	13%	Cellulose	85%	Non-fibrous (other)	2%	Amosite
								<1%	Chrysotile
01-09-0302 *040114444-0002*		Brown/Gray Fibrous Homogeneous	Teased	5%	Cellulose	95%	Non-fibrous (other)	<1%	Amosite
								<1%	Chrysotile
01-09-0303 *040114444-0003*		Brown/Gray Fibrous Homogeneous	Teased	2%	Cellulose	98%	Non-fibrous (other)	None Detected	
01-09-0304 *[illegible]14444-0004*		Brown/Gray Fibrous Homogeneous	Teased	5%	Cellulose	95%	Non-fibrous (other)	<1%	Tremolite/ Actinolite
01-09-0305 *040114444-0005*		Various Fibrous Homogeneous	Teased	5%	Cellulose	95%	Non-fibrous (other)	None Detected	
01-09-0306 *040114444-0006*		Brown Fibrous Homogeneous	Teased	5%	Min. Wool	95%	Non-fibrous (other)	<1%	Tremolite/ Actinolite
01-09-0307 *040114444-0007*		Brown Fibrous Homogeneous	Teased	20%	Cellulose	75%	Non-fibrous (other)	<1%	Tremolite/ Actinolite
				5%	Min. Wool				
01-09-0308 *040114444-0008*		Brown Fibrous Homogeneous	Teased	10%	Cellulose	85%	Non-fibrous (other)	<1%	Chrysotile
				5%	Min. Wool				
01-09-0309 *040114444-0009*		Brown Fibrous Homogeneous	Teased	5%	Cellulose	90%	Non-fibrous (other)	None Detected	
				5%	Min. Wool				
01-09-0310 *040114444-0010*		Various Fibrous Homogeneous	Teased	50%	Cellulose	40%	Non-fibrous (other)	<1%	Amosite
				2%	Hair			3%	Chrysotile
				5%	Min. Wool				

Analyst(s)
Dave Poitras (27)

MW 10-1-01

Stephen Siegel
Stephen Siegel, CIH
or other approved signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. EMSL suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: ssiegel@EMSL.com

Attn: Mark Woodke
Ecology & Environment, Inc.
2101 Fourth Ave, Suite 1500
Seattle, WA 98121
Fax: (206) 621-9832 Phone: 206-624-9537
Project: **1281.0110.01SF**

Customer ID: ECOL44
Customer PO:
Received: 09/10/01 10:10 AM
EMSL Order: 040114444
EMSL Project ID:
Analysis Date: 9/13/01

Polarized Light Microscopy (PLM) Performed by NIOSH Method 9002, Issue 2

				Non-Asbestos				Asbestos	
Sample	Location	Appearance	Treatment	%	Fibrous	%	Non-Fibrous	%	Type
01-09-0311 *040114444-0011*		Brown Fibrous Homogeneous	Teased QC	10% 5%	Cellulose Min. Wool	85%	Non-fibrous (other)	<1% <1%	Chrysotile Tremolite/ Actinolite
01-09-0312 *040114444-0012*		Brown/White Fibrous Homogeneous	Teased	8%	Cellulose	90%	Non-fibrous (other)	2%	Chrysotile
01-09-0313 *040114444-0013*		Brown Fibrous Homogeneous	Teased	5%	Cellulose	95%	Non-fibrous (other)	None Detected	
01-09-0314 *040114444-0014*		Brown Fibrous Homogeneous	Teased	5%	Cellulose	95%	Non-fibrous (other)	None Detected	
01-09-0315 *040114444-0015*		Brown Fibrous Homogeneous	Teased	20%	Cellulose	80%	Non-fibrous (other)	None Detected	
01-09-0316 *040114444-0016*		Brown Fibrous Homogeneous	Teased	30%	Cellulose	70%	Non-fibrous (other)	<1%	Tremolite/ Actinolite
01-09-0317 *040114444-0017*		Brown Fibrous Homogeneous	Teased	10%	Cellulose	90%	Non-fibrous (other)	<1%	Tremolite/ Actinolite
01-09-0318 *040114444-0018*		Brown Fibrous Homogeneous	Teased	20% 5%	Cellulose Min. Wool	75%	Non-fibrous (other)	None Detected	
01-09-0319 *040114444-0019*		Brown Fibrous Homogeneous	Teased	8% 2%	Cellulose Min. Wool	90%	Non-fibrous (other)	None Detected	
01-09-0320 *040114444-0020*		Brown Fibrous Homogeneous	Teased	8% 2%	Cellulose Min. Wool	90%	Non-fibrous (other)	None Detected	

Analyst(s)

Dave Poitras (27)

MW 10-8-01

Stephen Siegel, CIH
or other approved signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. EMSL suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

EMSL Analytical, Inc.

107 Haddon Ave., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-4960 Email: ssiegel@EMSL.com

Attn: Mark Woodke
Ecology & Environment, Inc.
2101 Fourth Ave, Suite 1500
Seattle, WA 98121

Fax: (206) 621-9832 Phone: 206-624-9537

Project: **1281.0110.01SF**

Customer ID: ECOL44
Customer PO:
Received: 09/10/01 10:10 AM

EMSL Order: 040114444
EMSL Project ID:
Analysis Date: 9/13/01

Polarized Light Microscopy (PLM) Performed by NIOSH Method 9002, Issue 2

				Non-Asbestos				Asbestos	
Sample	**Location**	**Appearance**	**Treatment**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
01-09-0321 *040114444-0021*		Brown Fibrous Homogeneous	Teased	5%	Cellulose	95%	Non-fibrous (other)	**None Detected**	
01-09-0322 *040114444-0022*		Brown Fibrous Homogeneous	Teased QC	10% 5%	Cellulose Min. Wool	85%	Non-fibrous (other)	**None Detected**	
01-09-0323 *040114444-0023*		Brown Fibrous Homogeneous	Teased	20%	Cellulose	80%	Non-fibrous (other)	**<1%**	**Tremolite/ Actinolite**
01-09-0324 *[illegible]14444-0024*		Brown Fibrous Homogeneous	Teased	15% 5%	Cellulose Min. Wool	80%	Non-fibrous (other)	**<1%** **<1%**	**Chrysotile** **Tremolite/ Actinolite**
01-09-0325 *040114444-0025*		Brown Fibrous Homogeneous	Teased	20%	Cellulose	80%	Non-fibrous (other)	**<1%**	**Tremolite/ Actinolite**
01-09-0326 *040114444-0026*		Brown Fibrous Homogeneous	Teased	20%	Cellulose	80%	Non-fibrous (other)	**<1%**	**Tremolite/ Actinolite**
01-09-0327 *040114444-0027*		Brown Fibrous Homogeneous	Teased	20% 5%	Cellulose Min. Wool	75%	Non-fibrous (other)	**None Detected**	

MW 10-18-01

Stephen Siegel

Analyst(s)

Dave Poitras (27)

Stephen Siegel, CIH
or other approved signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. EMSL suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108

Order ID: 040114444

Attn:	Mark Woodke Ecology & Environment 2101 Fourth Avenue, Suite 1500 Seattle, WA 98121	Customer ID: Customer PO: Received:	ECOL44 9/10/01 10:10 AM
Fax: Project:	206-621-9832 1281.0110.01SF	EMSL Order: EMSL Project ID:	040114444

Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Analytical Electron Microscopy

Sample ID	EMSL Sample ID	Asbestos Weight %	Asbestos Type(s)
01-09-0306	040114444-0028	0.66 <0.1	Chrysotile Actinolite
01-09-0310	040114444-0029	0.25	Chrysotile
01-09-0312	040114444-0030	<0.1	None Detected
01-09-0316	040114444-0031	<0.1	None Detected
01-09-0321	040114444-0032	<0.1	None Detected
01-09-0323	040114444-0033	<0.1	None Detected
01-09-0324	040114444-0034	<0.1 <0.1	Chrysotile Actinolite

Samples were prepped by CARB 435 procedures prior to TEM preparation and analysis.

MW 10-18-01

A.V. Samudra, Ph.D
Analyst

Stephen Siegel, CIH- Lab Manager
Or other approved signatory