

FNLSID42

Charlie Park

Key

22.5/25

# Mountain Fir Site Investigation Lab

B-1

The Mountain Fir Lumber Site is located at the southern edge of Independence, Or, in the central Willamette valley. The region receives about 40 - 45 inches of precipitation per year, mostly during the months from Nov to May. The Willamette River borders the town to the east. The river is subject to late winter and spring floods, primarily due to rain on snow events. During the spring of 1996, the streets of downtown Independence were under water.

The Willamette valley floor is made up of high permeability sedimentary unconsolidated surficial deposits overlain by low permeability Willamette Silts from the from the Missoula Floods. The valley is bounded on its east and west margins by basalts of the Western Cascades and the Coast Range, respectively.

The region is a wide flood plain with very little topographical relief locally. However, just across the river to the east are the South Salem Hills (CRB's). To the north are the Eola Hills (CRB's). The Coast range is only ten miles west and Johnson Hills to the south.

B-2

The aquifers beneath Independence are within these unconsolidated surficial gravels overlain by a low permeability clayey layer making it a confined aquifer. The aquifer will have high porosity and permeability. Groundwater flow is generally from west to east (coast to the river).

Task - 1

1-1 72.5 ft.

1-2 11 inches

1-3 Top of perforated pipe does not necessarily equal the static water level.

Using Table 1 Data, I-1 30 ft. I-2 ?ft., I-3 30 ft., I-4 55 ft., I-5 55 ft.

M-1 51 ft., M-2 41ft., M-5 28 ft.

On our field trip we were told static water level is about 45 ft. bgs.

1-4 Distance from Mountain Fir to Indep. Well Field approx. 2300 ft.

Mountain Fir to M-4 approx. 2800 ft.

Mountain Fir to M5 approx 3300 ft.

The wells are between site and Willamette River, but not in a shortest distance direction.

MT 117/125

Presentati 40/40

summary 69.1/72

LAB 47/50

273.1/287 =

95%

Task 2

2-1 See attached sheets.

well logs

2-2 S means shallow

D means deep

2-3 Shallow would be needed to see if water is in vadose zone above the aquitard and in the surface water. Deep wells needed to see if contamination in entering the confined aquifer.

2-4 Average shallow is 36.8 ft bgs

Average Deep is 64.6 ft bgs

Screened intervals for deep wells 46 to 52.5, so would expect water depth about 50 ft.

2-5 2 " for monitoring wells and piezometers

6" for extraction well

8" for pumping wells

Smaller diameter wells are to collect samples, establish presence or absence of contaminants and to establish aquifer characteristics. The larger wells are for either extracting contaminants for treatment or altering the flow properties of the aquifer (by pumping out or in) to help contain the contaminants.

### Task 3

3-1 Pentachlorophenol and Tetrachlorophenol. The "penta" is an organic Chemical used in the past to treat wood to prevent staining by fungus. It has been found to cause health problems and is toxic to all forms of life. This substance was sprayed onto the wood without any containment device, resulting in soil contamination. Infiltration into the soil would allow contamination of the surface water or vadose zone and potentially into the confined aquifer below. Given the proximity to the city wells of Independence and Monmouth, this would be of great concern.

3-2 1 liter of water is the same as 1000 ml (or cc). Therefore 1 liter equals

1000 gms which is the same as 1 kg

1 mg is  $1 \times 10^{-3}$  gm which is the same as  $1 \times 10^{-6}$  kg

1 mg in 1 l then equals 1 part per million

10 ppb equals  $1 \times 10^{-8}$  grams per ml or 10 micrograms per liter

Mass of contaminant per kg is the same as mass per liter.

### Task 6 Final Summary

The Mountain Fir lumber Co. has been operating at the site for over 50 years. Toxic chemicals have been used for lumber treatment as well as petroleum products for operation of machinery and PCB's for transformers. Identification of the site as a contamination area has led to increased surveillance of the facility in the 1990's. Wells have been placed to not only follow the movement of the contaminants, but also for remediation purposes. The main concern at this point is contaminant movement towards the city wells of Independence and Monmouth. These wells are in line with the path of groundwater flow (see attached groundwater flow maps). They are down gradient of the site. They supply a majority of the city water for Independence and also a significant amount for Monmouth. Therefore, there is significant health risk for the citizens of the area should this area become contaminated. The company also must be concerned with the potential future liability and litigation issues.

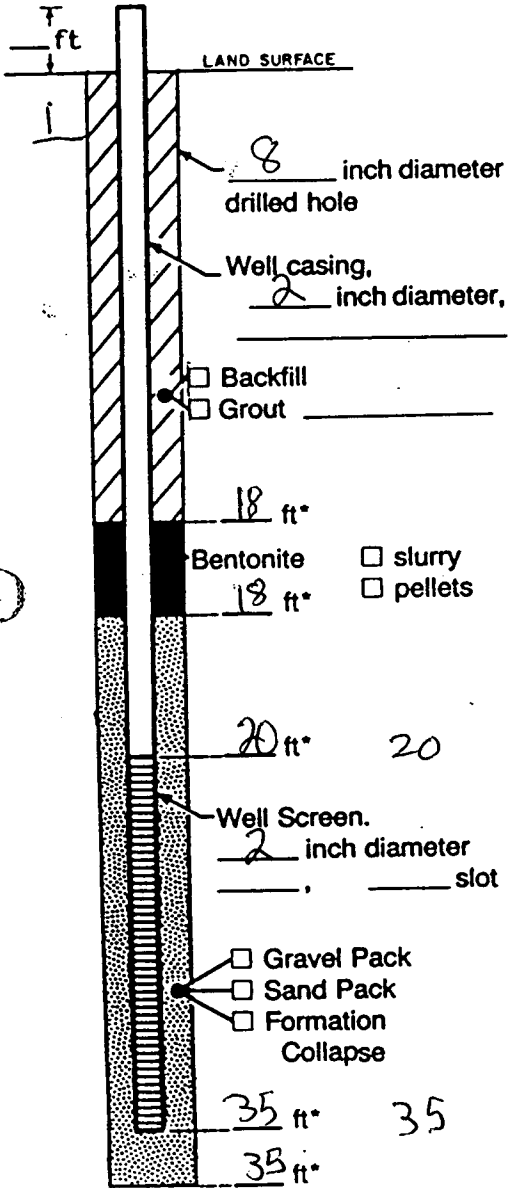
Currently the contaminants are confined to the shallow zone, the region above the aquifer. There is minimal to no contamination of the water bearing aquifer, even in the areas of greatest surface water concentrations. However, it is clear that there needs to be

concern about the future potential for such an occurrence. Also, there is off site migration into shallow wells into the residential areas due east of the facility and this could potentially be contaminating South Fork Ash Creek.

There are many ways to approach this problem. Consultation with DEQ representatives to gain their input and approval is of great importance. Using the existing wells, it seems reasonable that adequate data can be obtained to monitor the contaminants' movements and concentrations. At time periods of the year when the ground is saturated (i.e. late fall to early summer) extraction of surface water would assist to remove the shallow contaminants. During dry periods, shallow wells could be used to pump in water and use the extraction wells to further remove contaminants. Natural attenuation might be beneficial in this region also, and this strategy has been shown to have success elsewhere. I do not feel that altering the hydrologic properties of the confined aquifer (by pumping in or out) is necessary at this time given the minimal to non-existent contamination. Should the contaminants enter the confined aquifer, such strategies would need to be considered.



# WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

\*Depth Below Land Surface

Project Mountain Fir Monitoring Well Well MW-2S

Town/City Independence

County Dolk State OR

Permit No. \_\_\_\_\_

Land-Surface Elevation and Datum 168 feet

surveyed

estimated

Installation Date(s) 6/24/93

Drilling Method HSA - hollow stem auger

Drilling Contractor \_\_\_\_\_

Drilling Fluid \_\_\_\_\_

Development Techniques(s) and Date(s) \_\_\_\_\_

Fluid Loss During Drilling \_\_\_\_\_ gallons

Water Removed During Development \_\_\_\_\_ gallons

Static Depth to Water \_\_\_\_\_ feet below M.P.

Pumping Depth to Water \_\_\_\_\_ feet below M.P.

Pumping Duration \_\_\_\_\_ hours

Yield \_\_\_\_\_ gpm Date \_\_\_\_\_

Specific Capacity \_\_\_\_\_ gpm/ft

Well Purpose \_\_\_\_\_

Remarks \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

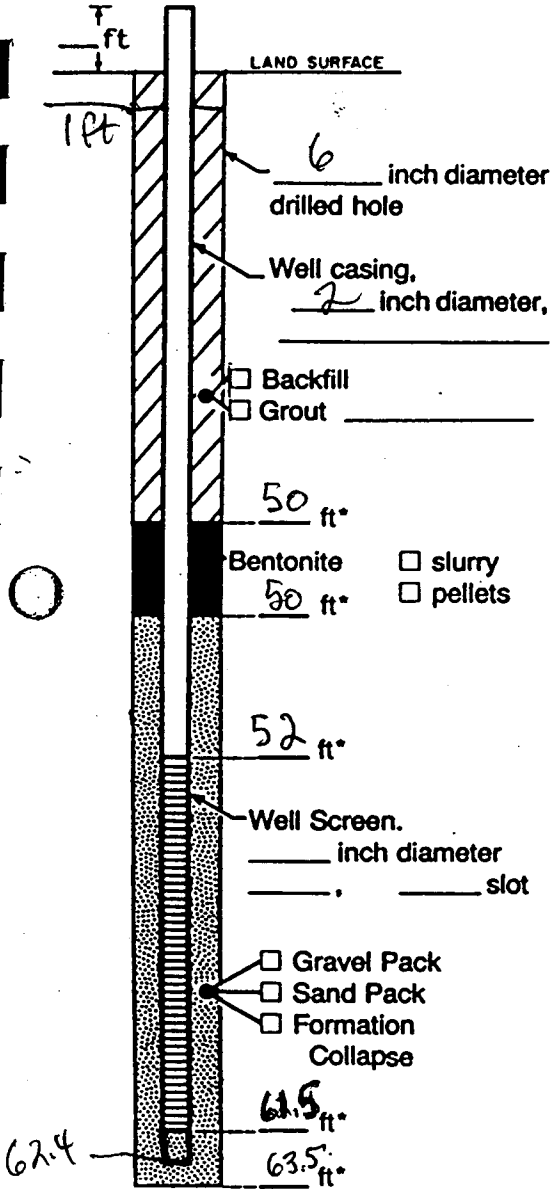
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Prepared by \_\_\_\_\_

# WELL CONSTRUCTION LOG



Measuring Point is Top of Well Casing Unless Otherwise Noted.

\*Depth Below Land Surface

Project Mc Fir MW Well MW 2D

Town/City Indef

County Polk State OR

Permit No. \_\_\_\_\_

Land-Surface Elevation and Datum 167.8 feet

surveyed  
 estimated

Installation Dates(s) 12/1/93

Drilling Method AR (air rotary)

Drilling Contractor \_\_\_\_\_

Drilling Fluid \_\_\_\_\_

Development Techniques(s) and Date(s) \_\_\_\_\_

Fluid Loss During Drilling \_\_\_\_\_ gallons

Water Removed During Development \_\_\_\_\_ gallons

Static Depth to Water \_\_\_\_\_ feet below M.P.

Pumping Depth to Water \_\_\_\_\_ feet below M.P.

Pumping Duration \_\_\_\_\_ hours

Yield \_\_\_\_\_ gpm Date \_\_\_\_\_

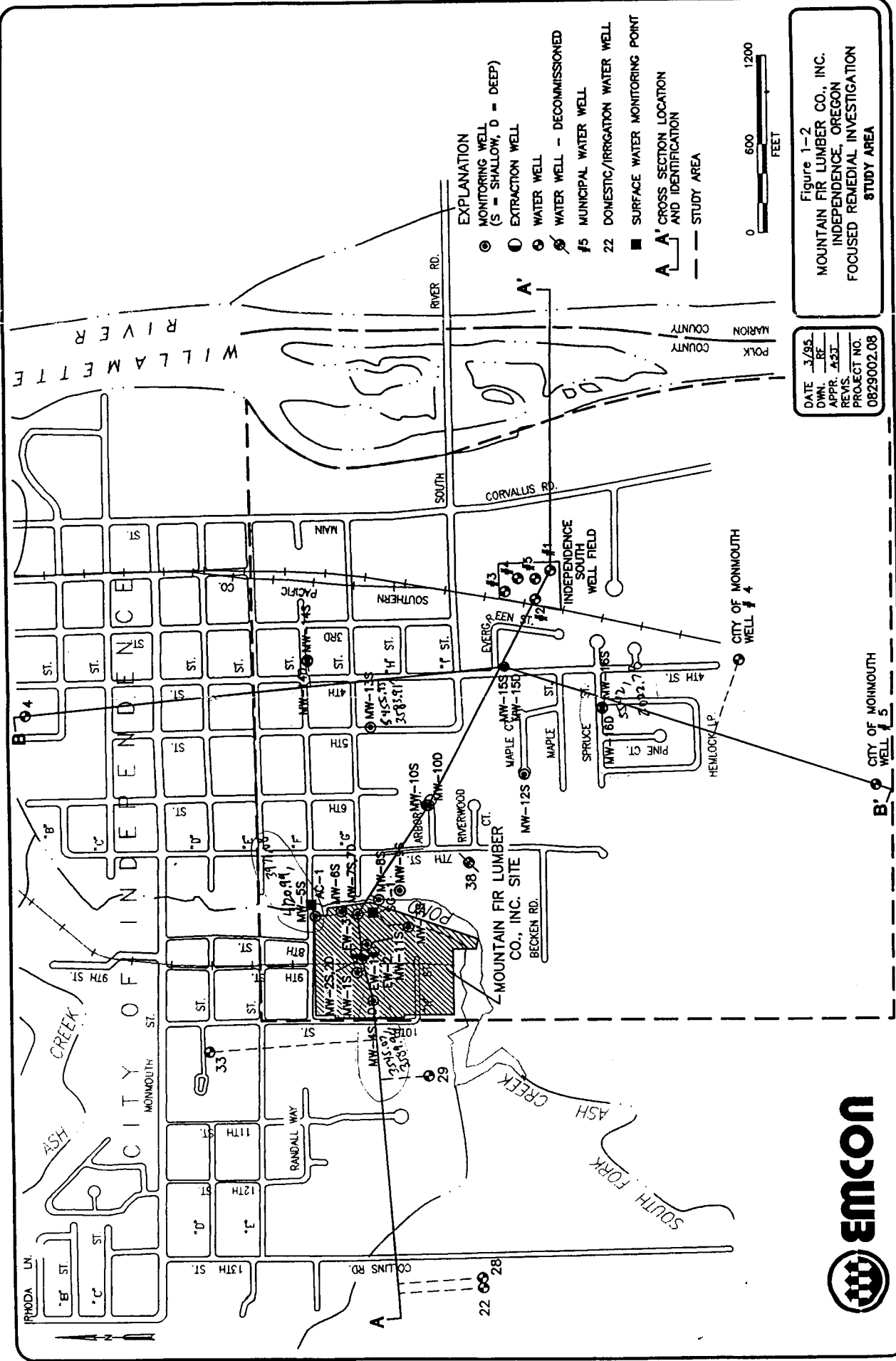
Specific Capacity \_\_\_\_\_ gpm/ft

Well Purpose \_\_\_\_\_

Remarks \_\_\_\_\_

Prepared by \_\_\_\_\_

ORANGE DENOTES  
SIGNIFICANT  
contamination



- EXPLANATION
- MONITORING WELL (S = SHALLOW, D = DEEP)
  - EXTRACTION WELL
  - WATER WELL
  - WATER WELL - DECOMMISSIONED
  - #5 MUNICIPAL WATER WELL
  - 22 DOMESTIC/IRRIGATION WATER WELL
  - SURFACE WATER MONITORING POINT
  - A-A' CROSS SECTION LOCATION AND IDENTIFICATION
  - - - STUDY AREA

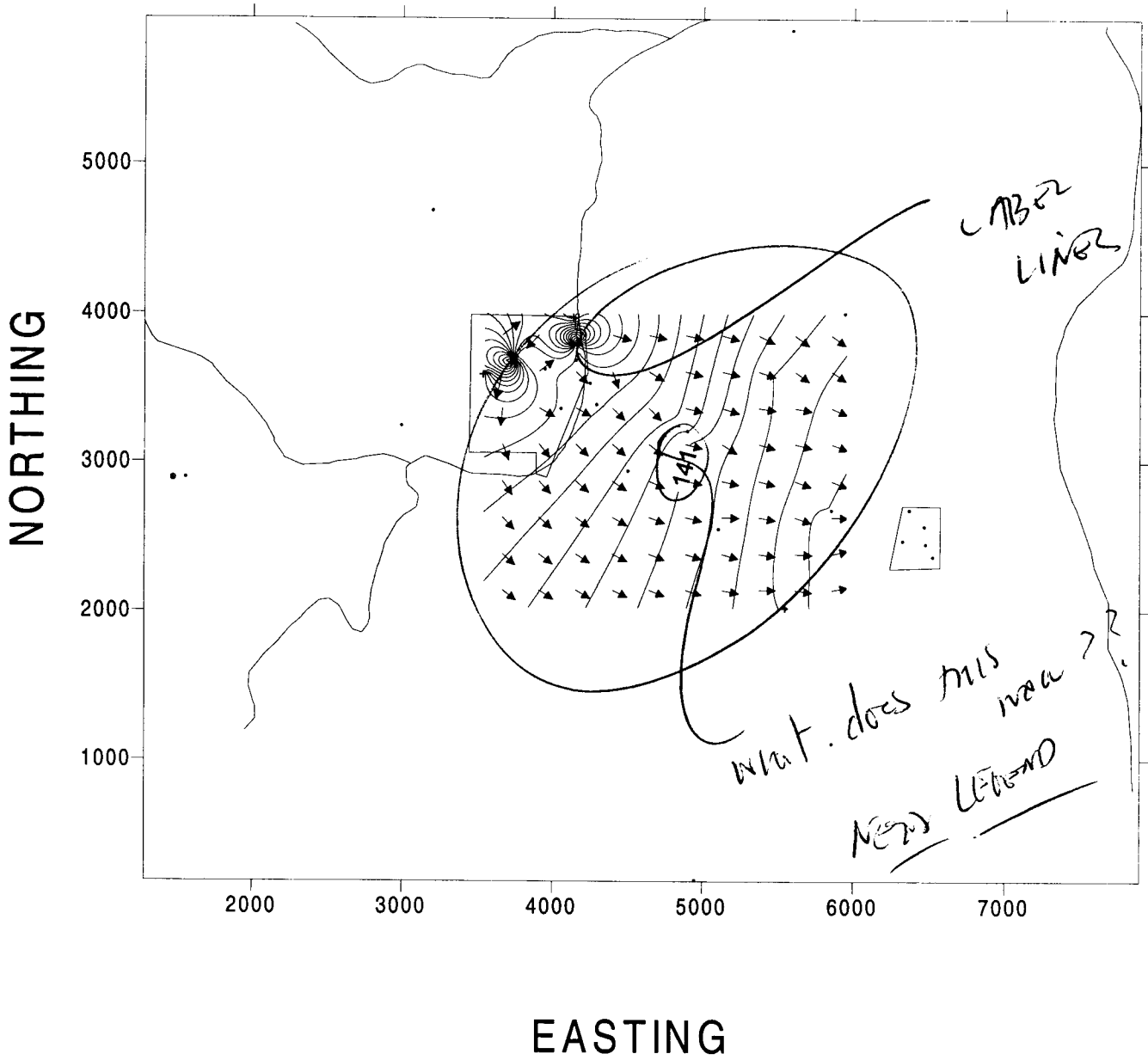


DATE 3/85  
 DWN. RF  
 APPR. AJT  
 REVIS.  
 PROJECT NO. 0829002.08

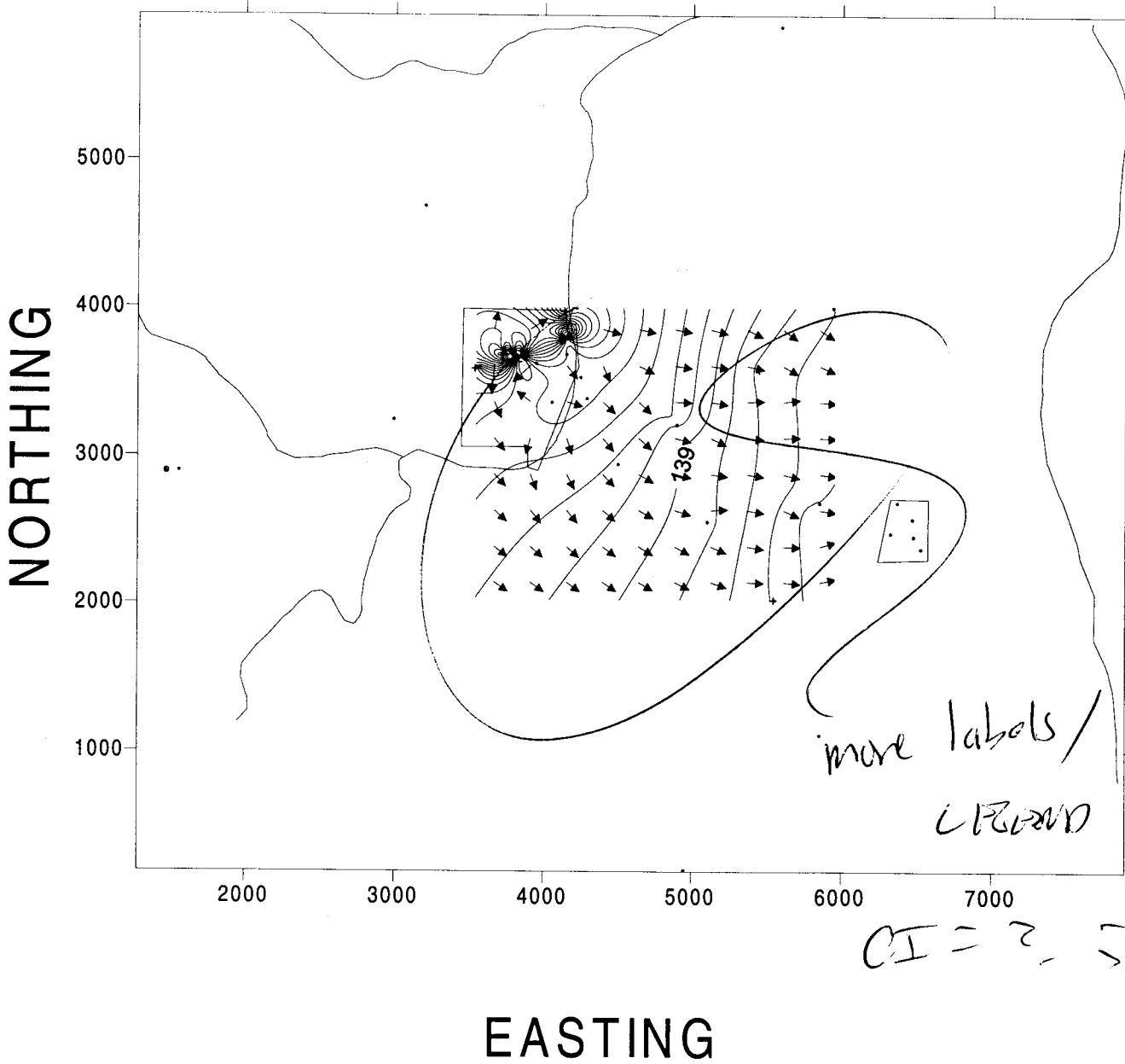
Figure 1-2  
 MOUNTAIN FIR LUMBER CO., INC.  
 INDEPENDENCE, OREGON  
 FOCUSED REMEDIAL INVESTIGATION  
 STUDY AREA



# GROUND WATER ELEVATION CONTOUR MAP JUNE 1995

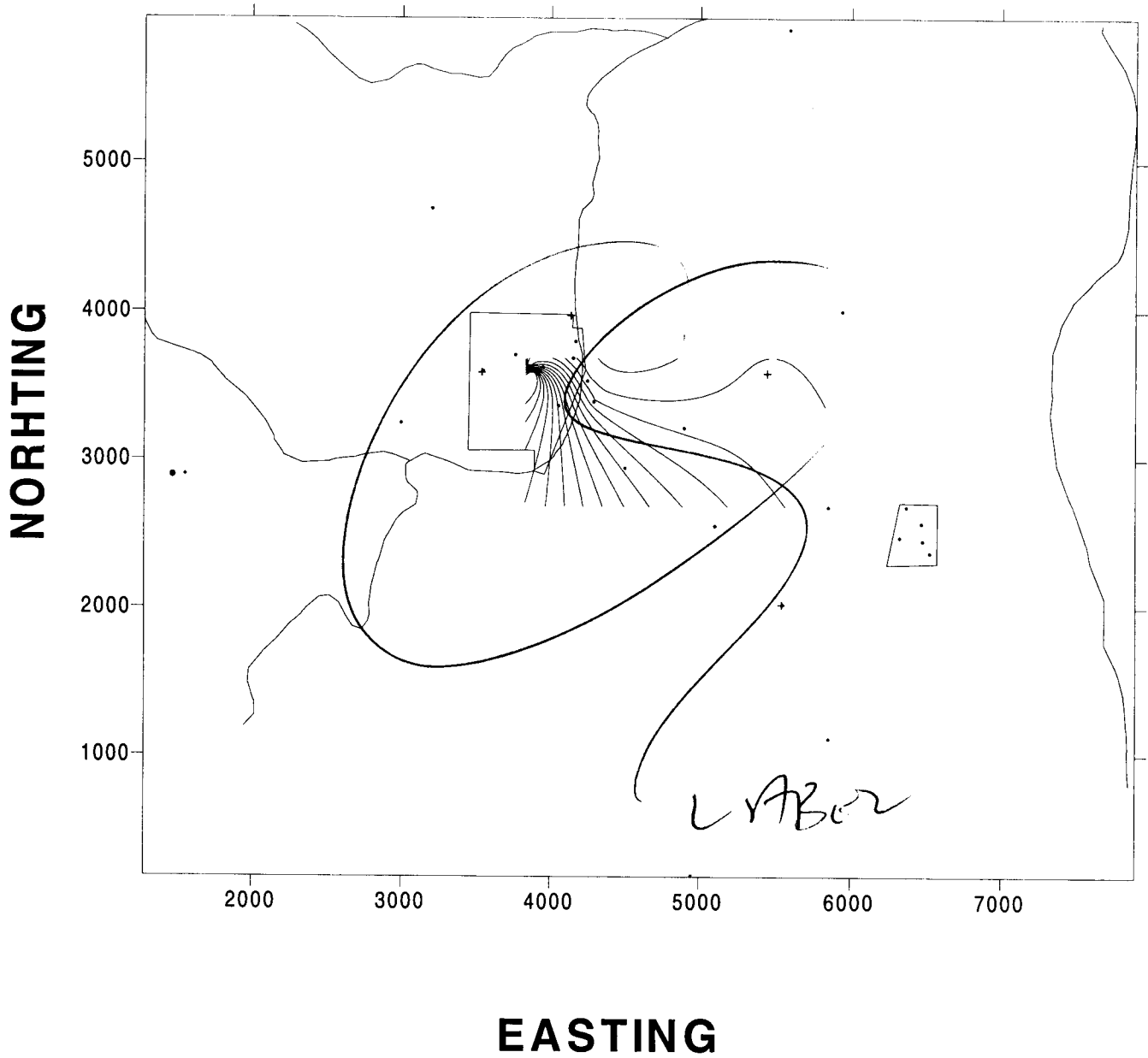


# GROUND WATER ELEVATION CONTOUR MAP NOVEMBER 1995





# PENTACHLOROPHENOL CONCENTRATION GRADIENT MAP JULY 1995



# PENTACHLOROPHENOL CONCENTRATION GRADIENT MAP OCTOBER 1995

