INTERIM SITE FOR DISPOSAL OF 3M CHEMOLITE WASTES

I. EXISTING SITE

II. SITE DEVELOPMENT & OPERATION

III. MONITORING PROGRAM

IV. CONTINGENCY PLAN

V. ULTIMATE LAND USE

I. EXISTING SITE

The existing landfill site is located in the southwestern portion of the 3M Company property in Cottage Grove, Minnesota. The landfill is constructed on the side of a hill and is contained by a 25 foot earth berm. a bermed volume of about 140,000 c About 30,000 cubic yards remains u in the southern quarter of the lan This is the proposed interim site of the 3M Chemolite wastes.

The existing 110,000 cubic yards c material consists mainly of boiler 3M's coal-fired boilers. The site drawing (3M Drawing Number CHEM-88 landfill site drawing (3M Drawing N CHEM-888-C-664) are enclosed for a reference.

sludge generation rate 1978

II. SITE DEVELOPMENT AND OPERATION

As stated previously, the unfilled the existing site, without additional excavation or berm construction, is approximately 30,000 cubic yards. This would provide about 16 months capacity at the present annual generation rate of wastewater treatment sludge (14,400 cubic yards), boiler ash (6,400 cubic yards), incinerator ash (1,000 cubic yards), and iron oxide sludge (1,000 cubic yards).

This unused portion of the landfill will be improved to collect and monitor the leachate. The monitoring system will consist of a leachate collection system, lysimeters, and nearby production and observation wells. The lysimeters and leachate collection system will monitor the leachate and soil moisture while the wells will monitor the groundwater. The leachate collection system is composed of a bentonite clay and soil collection surface, a perforated collection pipe, and manhole. Figure 1 shows the entire landfill site and Figure 2 is a smaller scale drawing of the proposed interim site. Figure 3 depicts the cross sections located and identified in Figure 2. The bentonite-soil mixture will facilitate the collection of the majority of the leachate for testing and the collection manhole (see Figure 4) will permit sampling of the collected leachate.

Preliminary design for the bentonite-soil mixture, collection pipe, and collection manhole has been completed.

The preliminary design for the interim landfill leachate collection system is as follows:

1. Grade and compact bottom of the disposal area to a concave cross-section draining to the leachate collection manhole as shown on the drawings.

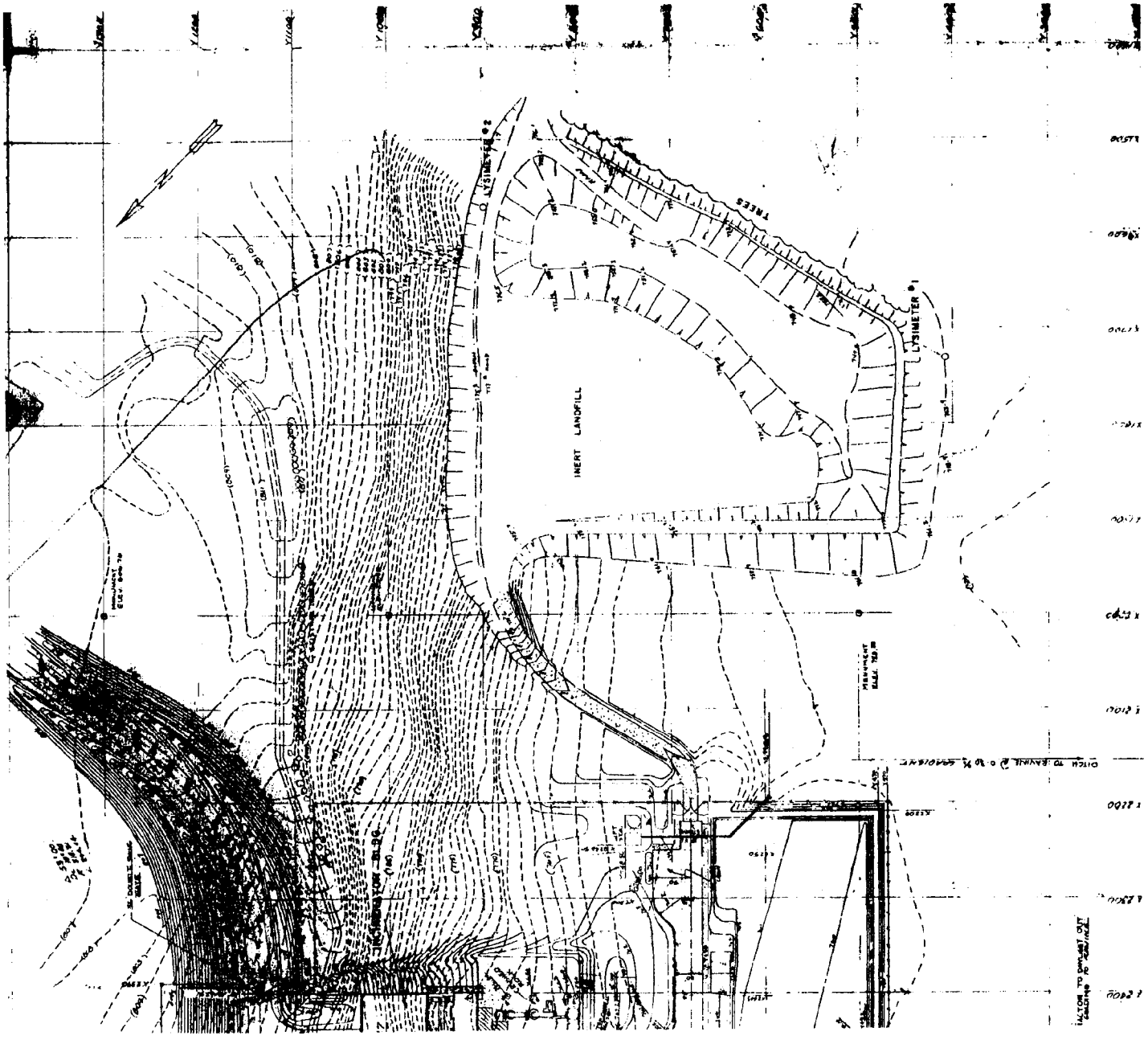
2. Construct reinforced concrete (ASTM C478) leachate manhole complete with ladder rungs (Neenah R-1981-T or equal) and reinforced concrete top with 27" diameter access opening as shown on the drawings. Joints shall have rubber compression type gasket (conforming to ASTM C443). Base shall be pre-cast concrete (Cretex or equal).

3. Place soil-bentonite mixture as shown on the drawings and compact to 85 to 88% of Modified Proctor density (ASTM D1557). The compacted seal thickness shall be four inches. The percentage of Volclay Bentonite PLS-50 in the mixture shall be determined by laboratory testing to result in a maximum seepage rate of 1×10^{-7} cm. per second corrected for evaporation, under 48 inches of head. Soil containing clay shall be obtained from the Chemolite site, if possible.

4. Construct subdrain with granular material as shown on the drawings. Perforated pipe diameter shall be six inches and conform to ASTM C508 or AASHTO M36 Type 111. Granular material shall be washed pea rock (3/8" size) and coarse concrete sand.

FIGURE 1

CHEMOLITE EXISTING LANDFILL SITE



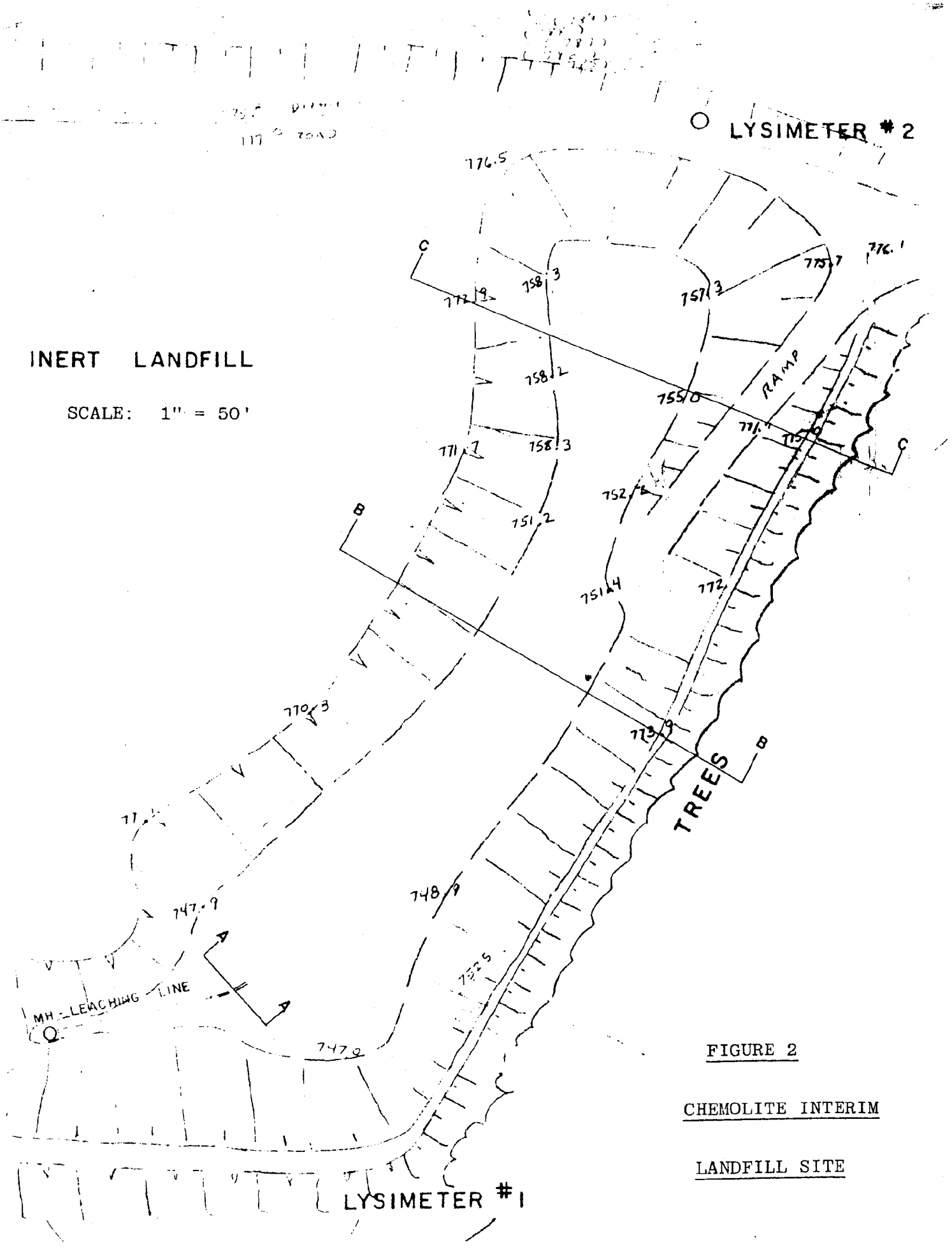
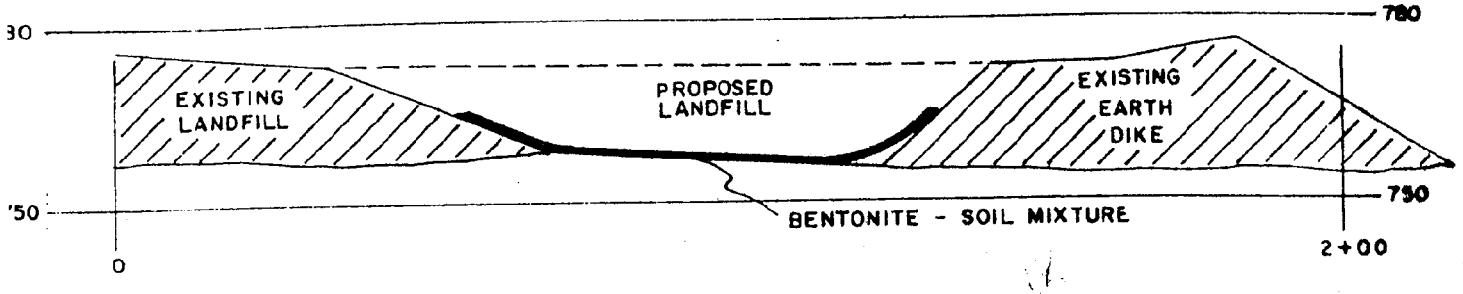


FIGURE 2

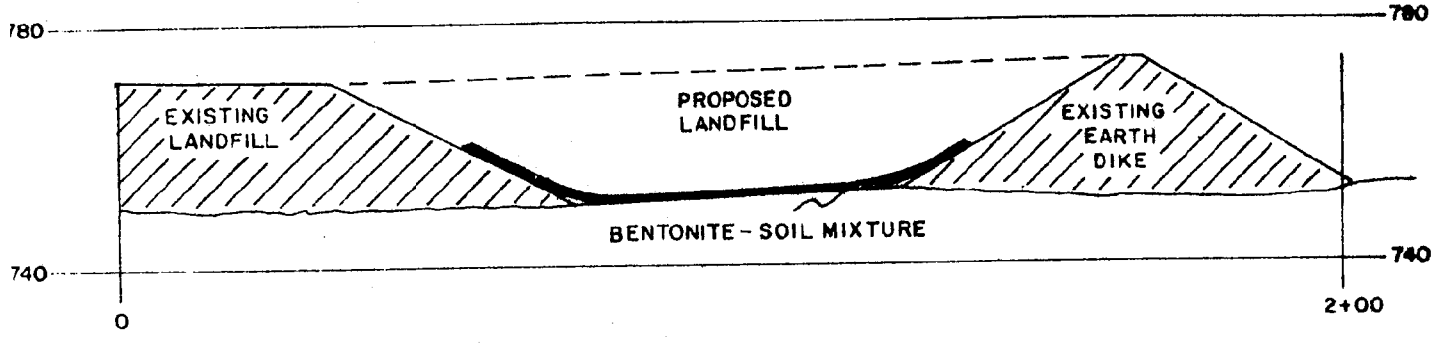
CHEMOLITE INTERIM

LANDFILL SITE

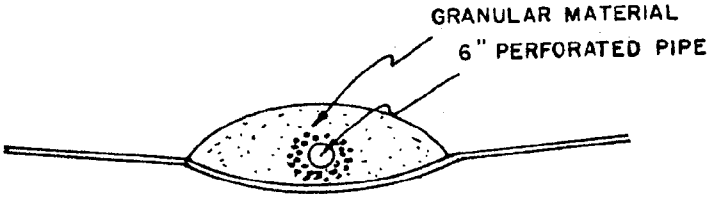
3MA00456679



SECTION C - C



SECTION B - B

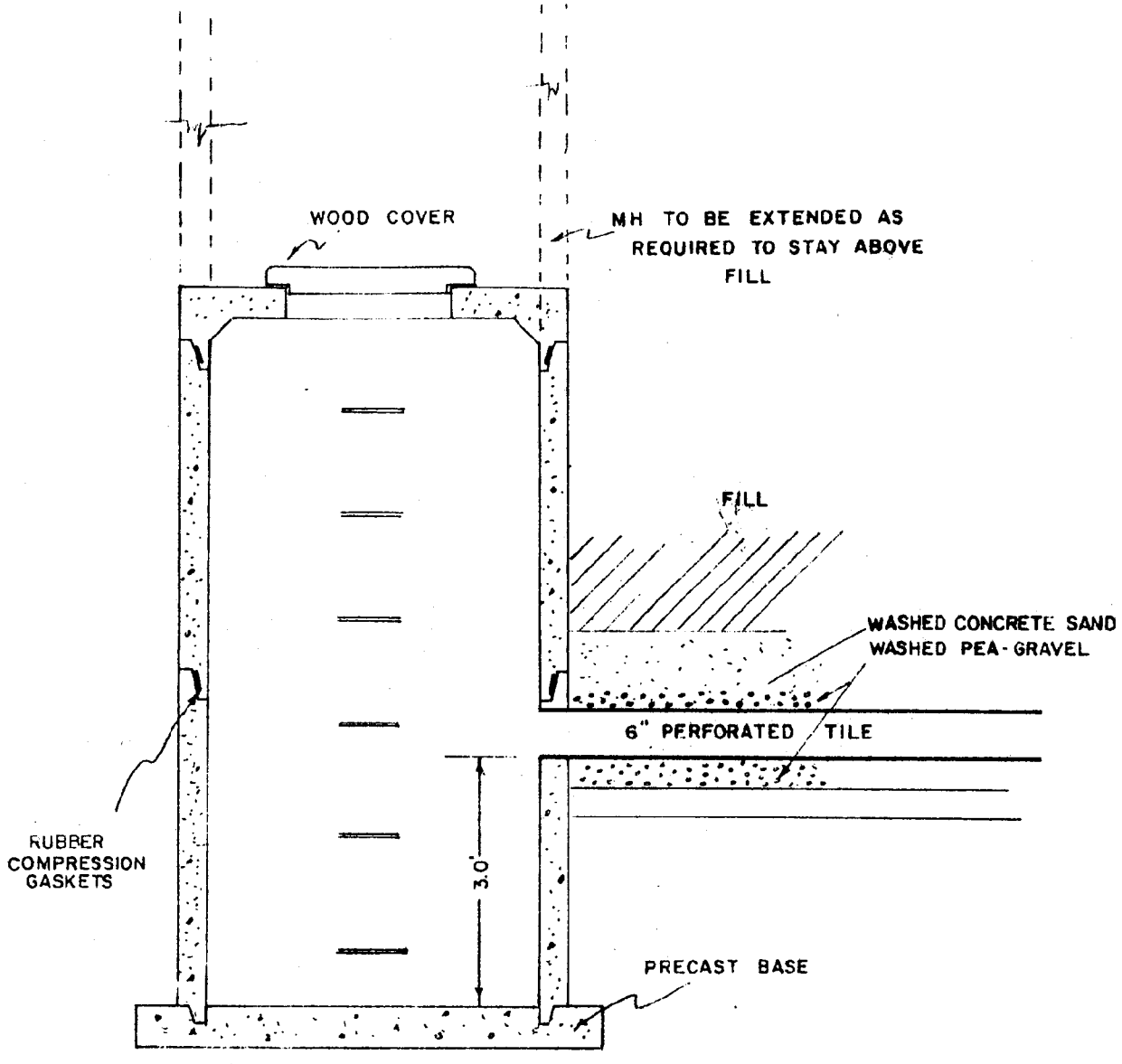


SECTION A - A

FIGURE 3

CROSS-SECTIONS OF

CHEMOLITE INTERIM LANDFILL



LEACHATE COLLECTION MANHOLE - DETAIL

FIGURE 4

DETAIL OF LEACHATE

COLLECTION MANHOLE

Operation of the landfill will be done in such a manner as to keep the landfill material in an alkaline condition, preventing solubilization of the metals contained in the wastewater sludge and boiler and incinerator ash. Boiler ash and the wastewater sludge will be mixed together at the end of each working day on the existing surface. This alkaline mixture will be pushed to and over the working face in the northeast part of the interim site. The current working face will be pushed southeast until the area is filled to the existing berm and then worked from the northeast to the southwest portion of the interim site.

The incinerator ash will be placed in the southwest part of the interim site. The ash will only fill a small portion of that area, approximately 1,300 cubic yards, before the current bermed volume is completely filled.

After the interim site is filled and if a final disposal site is not available the existing site can be expanded. To provide additional capacity the existing berm would be raised five feet and the existing landfill site further developed. The berm would be constructed from material taken from the hill on the eastern edge of the landfill. A five foot lift would add about 35,000 cubic yards or another 18 months capacity to the landfill.

III. MONITORING PROGRAM

Site monitoring will be provided by three lysimeters, two wells, and the leachate collection system. The wells are existing; one being Production Well #4 and the other Observation Well #8. Logs for the two wells are attached. Both the lysimeters and leachate collection system will be installed by October 1 assuming the required approvals are obtained by September 1. One lysimeter will be located near Observation Well #8 and would serve as the control. The other two lysimeters will be located as close as possible to the existing trench and slanted to intercept the maximum amount of soil moisture moving from the landfill area.

The lysimeter locations are shown on site plan (3M Drawing Number CHEM-888-C-001) and Lysimeters #1 and #2 are also shown in Figures 1 and 2. Lysimeters #1 and #2 will be situated below the bottom elevation of the proposed interim site and will be at elevations 745 feet and 755 feet respectively. Lysimeter #3 will be located near Observation Well #8 at an elevation of 740 feet. All the elevations are conditional upon the depth to bedrock.

Lysimeter #1 is located downstream consistent with local topography and the underlying bedrock. Lysimeter #2 is located between Production Well #4 and the landfill site consistent with subsurface groundwater flow.

Production Well #4 and Observation Well #8 are shown on the site plan, CHEM-888-C-001, and are located downstream and upstream respectively on the groundwater gradient. Figure 5 is a geologic cross section of the two wells, the landfill, and the adjoining area.

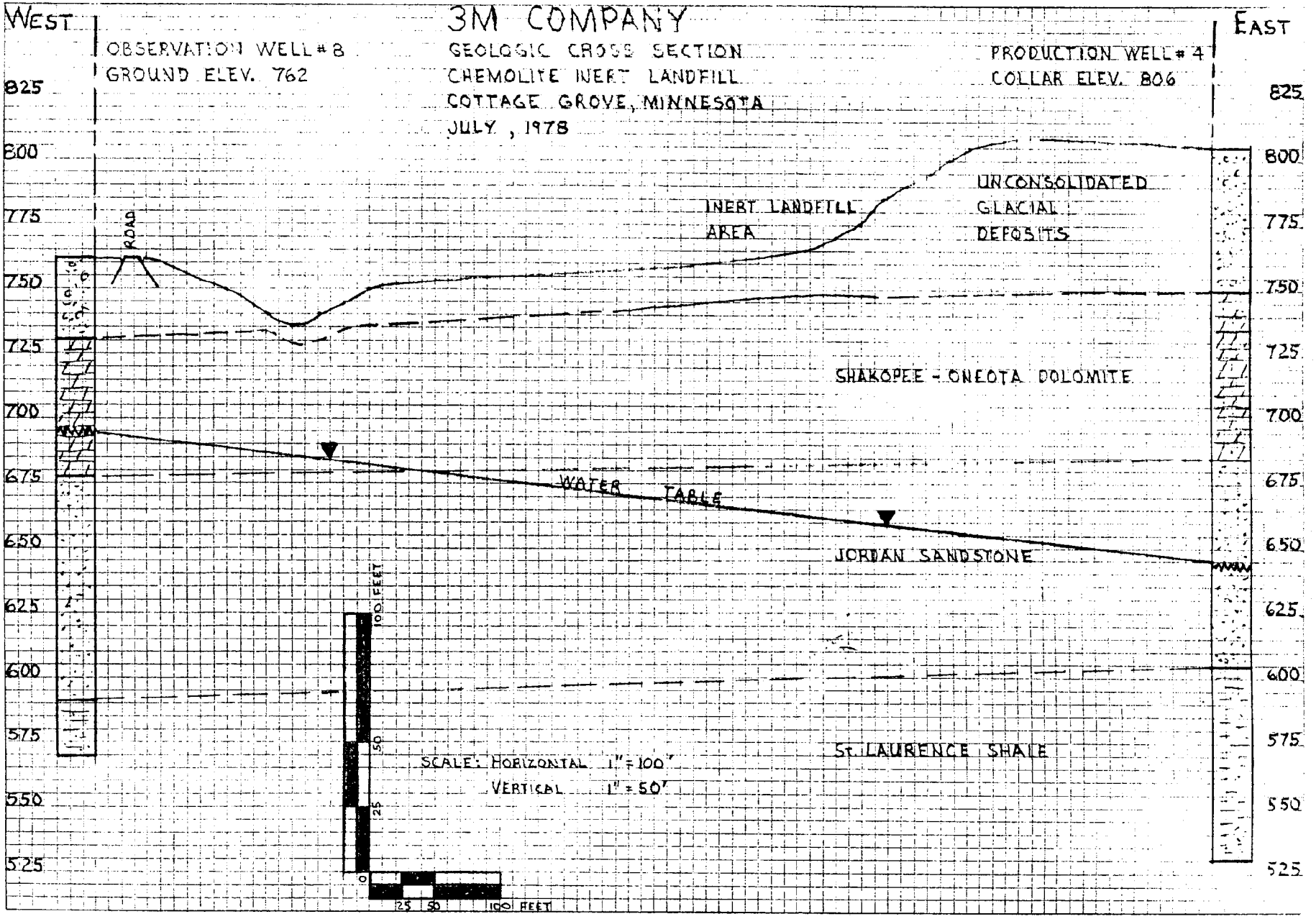
Production Well #4 is currently tested for water quality on a bimonthly basis. Observation Well #8 and the control lysimeter would be sampled quarterly and tested for pH, total solids, sulfates, and scanned for total metals. The other two lysimeters and the collection manhole would be sampled at least 12 times per year, coordinated with precipitation events. Each sample would be analyzed for pH, total solids, and sulfates. Every third sample would be scanned for heavy metals and also tested for Arsenic and Mercury.

IV. CONTINGENCY PLAN

A. Leachate Criteria

The determination will be made by the Minnesota Pollution Control Agency as to whether the potential existed for a significant pollution problem. Leachate data from the lysimeters, groundwater quality data from the wells, and the leachate criteria from the MPCA hazardous waste regulations would provide the basis for any such determination.

FIGURE 5



B. Acceptable Leachate

Operation of the existing interim site would continue until the final disposal alternative was operational. As waste quantities required, the berms would be raised five feet and the landfilling operation continued. No additional monitoring or leachate collection devices would be installed.

C. Unacceptable Leachate

Should the leachate quality be unacceptable, then the existing landfill area would be levelled and the surface sealed. If no other alternatives were available to dispose of the Chemolite waste material, the berms would be raised an additional five feet, but the inward slopes would also be sealed. A leachate collection system would be installed and the collected leachate would be either conveyed to the existing wastewater treatment facility or separate treatment equipment would be installed. Additional lysimeters would also be installed to more adequately monitor the larger landfill area.

The only other alternatives currently identified are hazardous waste landfills in Wisconsin, Iowa, and Illinois. If permits could be obtained and no other alternatives are found the material would be hauled to one of these sites for disposal. Sampling and treatment of the leachate would be continued until the material was moved to an acceptable disposal site.

V. ULTIMATE LAND USE

Once the final disposal alternative is selected and ready for use, the interim site would be covered with at least two feet of compacted earth. It would be sloped at a minimum of 2% to promote surface water drainage and shaped to conform to surrounding terrain. To minimize erosion, grass would be seeded and natural vegetation would be permitted to grow. Figure 5 is a plan view displaying the contours proposed for closing the interim site.

If the leachate is not determined to be a potential pollution problem and if it is agreeable to Cottage Grove then the monitoring of the site would continue on an annual basis for a minimum of five years until both 3M and the MPCA were confident that no problem existed with the landfilled material.

If the landfilled material is removed, the area would be restored to conform to the surrounding terrain. Grass would be seeded and natural vegetation would be permitted to grow.

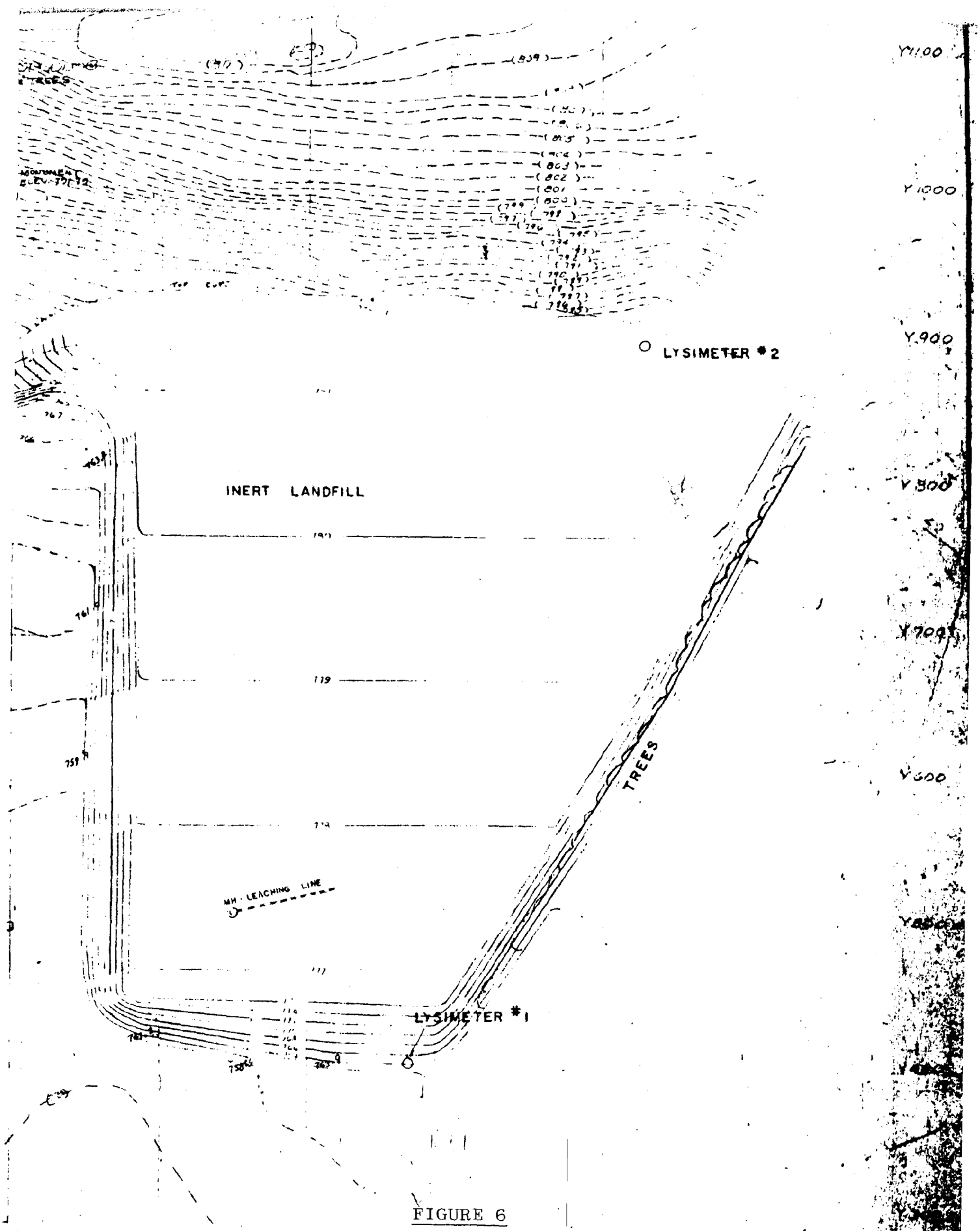


FIGURE 6

PROPOSED FINISHED GRADES