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PLANT NAME: NINE MILE PT # 2

ENCLOSURE

APPENDIX SUMMARIZING THE WORK AND THE INTERPRETATIONS OF APPLICANTS INVESTIGATIVE PROGRAM..

(4 PAGES)

ACKNOWLEDGED

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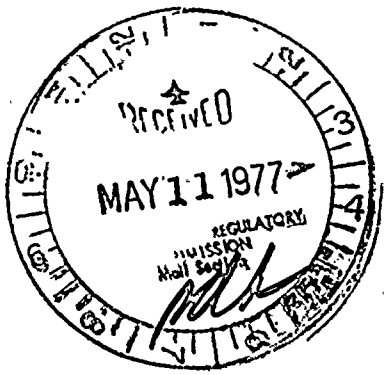


May 6, 1977



Mr. Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Nine Mile Point Unit 2
Docket No. 50-410

Dear Mr. Case:

We have previously informed members of your staff and the Office of Inspection and Enforcement of certain geologic features at our Nine Mile Point Unit 2 construction site. On April 11 and 12, 1977, we discussed additional discontinuities observed in the cooling water intake-discharge shaft and on April 29 and May 2, 1977 we discussed a discontinuity observed in the walls of a drainage ditch constructed adjacent to and parallel to our east property line.

Observations of these discontinuities and comparison with other on-site features lead to the conclusion that these newly discovered features are also inactive and of no seismo-tectonic significance. These new observations are entirely consistent with the earlier interpretation of other on-site features.

Evaluation of these new observations will be considered in the context of the investigative program described in my letter of January 24, 1977. The program is expected to continue for several more months and to address the combination of geologic features noted at the site to date, including the discontinuity found in the walls of the drainage ditch.

During our meeting with members of your staff on April 14, 1977, Dames and Moore provided additional information to support earlier interpretations of the cooling tower features. We have attached hereto an Appendix which summarizes to date the work and the interpretations of our investigative program. As indicated in the Appendix, Dames and Moore continues to interpret the evidence as supporting the position that the cooling tower fault has no seismo-tectonic significance and does not represent a hazard to the operating units at the site.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

Gerald K. Rhode
Vice President - Engineering

/sjz

Attachment

Xc: Mr. T. K. DeBoer, Director
Technical Development Programs
New York State Energy Office

# APPENDIX

Progress Review of Program for Evaluation of Geologic Structural Discontinuities at Nine Mile Point as of April 30, 1977 - Cooling Tower Fault

1. Excavation of Trenches - To date a series of five trenches and an exploratroy pit have been excavated across the trace of the fault exposing the offsets in the bedrock for a distance of approximately 2500 feet (Figure 1). Trenches No. 1 and 2 to the northwest of the cooling tower area were excavated to bedrock and the fault zone was not present at either of these locations. Pit No. 1 was excavated over the fault to bedrock. Trenches No. 3 and 4 have been excavated to bedrock and a slot approximately 3'x10'x8' deep has been cut into the bedrock across the fault zone at each location. Trench No. 5 has been excavated to bedrock and a similar rock slot is presently being cut.

   The last significant episode of faulting appears to have occurred during the Cretaceous Period with no tectonic movements within the last 70 to 100 million years. The most recent surficial movements involving sediments have been placed within the last 13,000 years. We believe, at the present time, that sufficient evidence can be obtained at the existing exploratory sites for an evaluation of the possible mechanisms of surficial deformation and the probability of reactivating this zone.

2. Drilling - A drilling program to explore the nature and orientation of the faulting has been in progress since late February. To date ten NX boreholes have been drilled to an average depth of approximately 200 feet. These holes are positioned at two separate locations and are patterned to profile the rock strata across the fault zone. Rock cores and downhole gamma ray logs are being combined to produce stratigraphic logs for each boring to aid in the detailed correlation of bedrock units across the fault.

3. Mapping - Geologic mapping and structural analysis of the bedrock and overlying materials has been completed for the walls and floors of Trenches No. 3, 4, and 5. The mapping in Pit No. 1 is to commence shortly. Slots cut into the bedrock to expose the fault in cross section have been mapped in Trenches No. 3 and 4. Similar mapping in Trench No. 5 will be performed when that rock slot is completed.

4. Sampling and Analysis - Rock cores have been extracted from both the sandstone and shale units and laboratory tested for a determination of the strength characteristics of these rocks.

5. Age Dating - Detailed sampling has been completed in Trenches No. 3 and 4 and a pollen analysis has been initiated for correlation purposes and to ascertain the relative ages of deposition of the sediments overlying the bedrock fault. Samples from the overlying peat bog have been taken and are being dated by radiocarbon methods.

   Rock cores have been collected and analyzed for mineralogical content. Geochemical analyses have been performed on mineral crystals sampled from the fault zone. These data aid in evaluating the depth of burial, temperature of formation and age of the materials.

6. Geomorphology and Stratigraphy of Glacial and Post Glacial Deposits - Regional geologic and geomorphic literature searches have been conducted. These studies investigated the possibility of similar geologic structures in the area and the relationship of the structures at the site to the geologic history. Emphasis has been placed on the geologic history of the area for the last 15,000 years. Lake and land levels for this period have been plotted and studied to evaluate the rebound characteristics resulting from unloading the glacial ice and water that covered the area. The possible relevance of pop-ups during this time of unloading is also under investigation.

7. Stress Measurement - Stress conditions in the region have been evaluated and a program is underway to measure in situ stress conditions at the site. The measurement of stresses in the bedrock utilizes the overcore and the overcore/undercore techniques. One overcore borehole has been completed to a depth of 95 feet and drilling at a second location is in progress.

8. Seismicity - A review of seismic events in the region has begun. This study will assess the history of seismotectonic events in the area and its relationship to the site.

INTERPRETATION AND CONCLUSIONS - Dames & Moore began its preliminary investigation of the cooling tower fault soon after its September 29, 1976 discovery. On December 13, 1976 a detailed geologic investigation was initiated. This investigation is ongoing and is scheduled to continue for several more months. A great many of the planned tasks have been

completed. A major part of the incompleted work, as of this date, is related to the boring program. NX core borings across the fault zones are approximately 80 percent complete. The overcore stress measurements are 15 percent complete and the surface overcore/undercore program is just getting underway. The completion of these tasks will provide an understanding of the in situ stress field and its relationship to past and any possible future recurrence of movement at the fault zone.

An analysis and evaluation of the evidence to date continues to support major portions of our earlier interpretation. There appear to be three distinct movements associated with the fault zone. The first movement was the formation of the strike slip fault during the Paleozoic Era, more than 200 million years ago. This fault experienced about 3 feet of left lateral strike-slip movement. A second movement produced the monoclinal flexuring. Analysis of minerals that coat dip slip slickensides suggest this movement may have occurred during the Cretaceous Period, 70 to 100 million years ago. The third and last movement was previously judged as a pop-up along a pre-existing fault. It is characterized by smooth folding in the bedrock close to the fault zone, folded brecciated zones, bedding plane slip, and small high-angle reverse faults in the glacial and post-glacial deposits. Although these features were probably produced by the same conditions that are thought to produce pop-ups (glacial ice and lake unloading and horizontal stresses), the rate of release is considered to be distinctly different from that commonly associated with pop-ups. We interpret this difference to be a slow energy release that could not produce a perceptable seismic event instead of the almost instantaneous stress release generally associated with the formation of pop-ups.

Dames & Moore continues to interpret the evidence as supporting the position that the fault has no seismo-tectonic significance to the site and we feel, at this time, that there is no reason to suggest that the fault represents a hazard to the operating units at the site.

PROJECT Niagara Mohawk JOB NO. 5-1107 ISSUE DATE 5/3/77

DRAWING TITLE Plot Plan NO: 95

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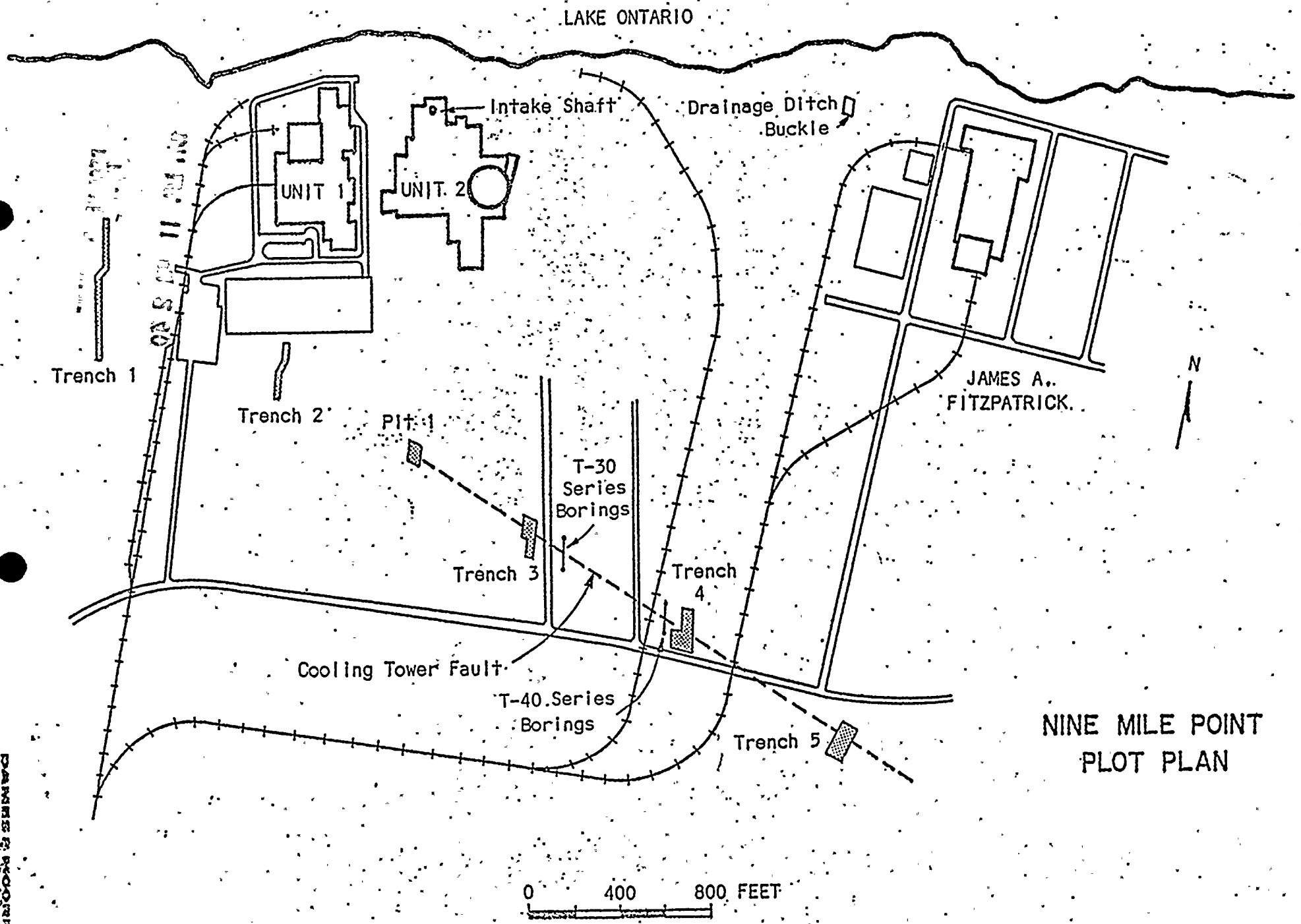


NINE MILE POINT
PLOT PLAN

FIGURE 1

DAMES & MOORE