

DMB

5711 Summerset Drive
Midland, MI 48640
May 10, 1984

Chairman Nunzio Palladino
Nuclear Regulatory Commission
1717 H Street
Washington, D.C. 20555

PRINCIPAL STAFF			
✓ RA	✓	PRP	
D/RA		DE	
A/RA		DRMSP	
RC		DRMA	
PAO		SCS	0117 x3 ✓
SGA		ML	
ENF		File	✓

Dear Chairman Palladino:

If you are ever to get the Nuclear Regulatory Commission's (NRC) house in order, then you cannot allow the kind of actions that Mr. James Keppler has taken on the Midland nuclear plant issues go unquestioned.

Last Friday, at a public meeting in Midland, Mr. James Keppler, Regional III NRC director, stated that he believed Consumers Power Co.'s (CPCo) projected schedule for finishing Unit 2 of the Midland nuclear plant by December, 1986, was "attainable". He then said that there would be no Caseload Forecast Panel evaluation of the plant's completion by the NRC at this time as has always occurred in the past when the utility has made its forecasts. Needless to say, the utility has never been right.

Thus, at a time when an objective evaluation of possible construction completion is most needed by the public, he is deliberately withholding it.

He has made this statement without confronting significant problems at this nuclear plant that are a matter of record, and that not only raise questions about whether the plant is licensable, but whether the plant can be completed at all.

Before Mr. Keppler could have, with any degree of integrity, told this community that the CPCo completion schedule was "attainable", he should have had answers to at least the following serious problems, some of which I had in my April 28, 1984 statement to the Commission. Some of these problems are insurmountable in the time period from now until December, 1986.

1) The diesel generator building (DGB) does not meet FSAR requirements, according to the report of the special task force selected by the NRC to study it, the Brookhaven Task Force. Previous to their study, Dr. Ross Landsman, chief soil inspector at Midland, and the Army Corps of Engineers, consultant to the NRC at Midland, both stated the building is inadequate. This makes that building unlicensable, if the NRC follows its regulations.

2) During underpinning, the soils bearing capacity under the concrete piers was found to be 1/2 the bearing capacity that was set out in the original analysis--the basis on which the engineering design for the underpinning was made. This is causing significant unanticipated problems on site.

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3) NRC standards for underpinning the auxiliary building called for holding the movement of the building to 1/8" tolerance. Yet there are now so many cracks developing in this building, that it has been necessary to establish criteria for which ones are to be mapped and reported to the NRC. (Stone and Webster Public Meeting, February 9, 1984).

4) Almost at the same time that the Construction Completion Plan (CCP) was approved last October, there were 9 Stop Work Orders that affected all safety systems because of design and document problems. This held up its implementation until the end of February, 1984.

5) At the present time, only 2% of the CCP has been implemented.

These are just a few of the many serious problems at Midland that make it questionable whether the plant can be completed. If Mr. Keppler says publicly that CPCo's December, 1986, schedule is attainable, isn't it essential that he explain how he will resolve these intractable issues in recommending that an operating license be given for this plant?

A good example of Mr. Keppler's own predictive powers can be found in his hearing testimony on May 3, 1983, a year ago, in which he thought that the CCP would be approved within 3 weeks of that date and that within 6 months of the date they would know how it was working (see Attachment 1). That would have been last October--the date when the CCP was finally approved. One year later, the project is only 2 months into its implementation.

In their lawsuit terminating their steam contract, the Dow Chemical Co. charged that CPCo kept 2 sets of books on construction completion and costs, -one for the public and Dow, and the other, an internal set, that reflected reality. Given these charges, why is Mr. Keppler so ready to believe CPCo at this late date on their construction completion date?

Dow also charged CPCo with having the knowledge that the soils were poorly compacted sitewide in 1977, and that, in fact, the soils' testing techniques were deliberately altered to provide favorable results (see Attachment 2).

Mr. Keppler should explain why he did not vigorously pursue this information which was also disclosed during the hearings several years ago. He should also explain to the Commission and to the public how such a key sitewide problem can be overcome and corrected to get this nuclear plant on line by December, 1986.

In my statement before the NRC on April 28, 1984, I asked that the Commission personally involve themselves in assisting the public to get a realistic assessment of the construction completion date for the Midland nuclear plant, if indeed it can be completed.

Page Three
Chairman Nunzio Palladino
May 10, 1984

It is hard for us to believe that you have sanctioned and that you support Mr. Keppler's position that he stated here in Midland on May 4.

I am asking you to require Mr. Keppler to reply to the issues discussed here and to explain to you and to the public how they can be resolved.

I am asking you again to give us an objective Caseload Forecast Panel evaluation of the Midland nuclear plant that takes into account the issues we have set forth here.

I deeply appreciate your attention to this problem.

Yours sincerely,

Mary Sinclair
Mary Sinclair

MS/jt

Enclosures (2)

cc: Commissioner Victor Gilinsky
Commissioner James Asselstine
Commissioner Frederick Bernthal
Commissioner Thomas Roberts
Judge Charles Bechhoefer
Judge Frederick P. Cowan
Judge Jerry Harbour
Secretary, U.S. NRC
Michael I. Miller, Esq.
William Paton, Esq.
Mr. Wendell Marshall
Ms. Barbara Stamiris
James E. Brunner
Governor James Blanchard
Attorney General Frank Kelley
Roger Fischer, PSC
Joe Tuchinsky, Michigan Citizens Lobby
Lynne Bernabei, GAP

Mr. James Keppler
Sen. Don Riegle
Sen. Carl Levin
Congressman Don Albosta
Representative M. Hayes
State Senator John Engler

James Keppeler
May 3, 1983

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1 be met in order for you to provide reasonable
2 assurance that the Midland plant can be completed
3 consistent with regulatory requirements. In your
4 opinion, how long will it take for these programs
5 to be implemented so that you can judge their
6 effectiveness?

7 J. Keppeler;

8 A I would say that we'd probably be in a
9 good position to judge their effectiveness within
10 six months.
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1 Q Within six months. Within six months of
2 the beginning of the program?

3 A Well, within six months from now.

4 Q But some of the programs have not yet been
5 either begun or implemented, is that correct?

6 A That's correct. But I believe that the --
7 I believe that the staff is close to approving the
8 IDVP-ICVP programs, and I think that Region III
9 should be in a position to -- well, let me qualify
10 it by saying that depending upon the acceptability
11 of the answers provided by Consumers Power Company,
12 which the staff really hasn't reviewed yet, that
13 if the questions that we've asked are answered we
14 should be in a position to approve the construction
15 completion program in another three weeks or so.

16 That will give us a period of five months
17 or so to observe how things are going, and I would
18 like to think that that would be a -- at least give
19 us an indicator as to how things are going.

20 But, by my answer, I'm not proposing that
21 we would stop any overview programs at that time,
22 or anything else. No qualifications on that
23 statement.

24 Q But in six months you could determine
25 whether the programs are performing as you would

1 expect or as you hope?

2 A That's my guess at this point.

3 Q Now, how long do you think it would take
4 a construction verification program to determine
5 the problems at Midland?

6 A To do the whole program? Oh, I have no
7 idea at the moment.

8 Q Well, given your experience at Zimmer and
9 your estimate of the comparison between the two
10 plants, how long would you estimate that process
11 would take simply to identify the existing problem?

12 A I can't say in case of Midland because
13 it's really a comparison of apples and oranges right
14 now.

15 Q Has your staff ever given you an
16 indication of how long they believe it will take?

17 A No.

18 Q Now, in answer to one of Judge Bechhoefer's
19 questions you mentioned that Midland would be -- in
20 any comparison of plants in Region III would be
21 considered poor in QA performance. I believe that
22 was your testimony?

23 MR. PATON: I object.

24 MR. MILLER: I don't believe that's a fair
25 characterization of his testimony. I believe he said

1 it would be one of the lower plants.

2 BY MS. BERNABEI:

3 Q Okay, one of the lower plants?

4 A Yes.

5 Q Now, you're familiar with the Commission
6 meeting in the summer of 1982 in which the
7 Commission examined the quality assurance performance
8 of -- well, quality assurance questions with the
9 staff, are you not? Quality assurance problems
10 in the industry.

11 A Yes.

12 Q And, at that meeting, five plants were
13 mentioned as the five -- I don't know how'd you say
14 it -- five bad plants in the United States in terms
15 of QA performance, is that correct?

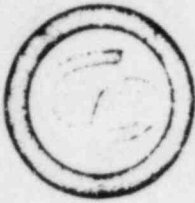
16 A In the testimony by the NRC to
17 Congressman Udall 18 months ago there were five
18 plants that were singled out as having major
19 quality assurance difficulties.

20 Q And Midland was one of those plants?

21 A That's correct.

22 Q Mr. Keppler, I believe your testimony was
23 that -- do you believe the third party overview
24 programs should -- well, I believe the -- one of
25 the -- well, two of the major factors in giving

ATTACHMENT 2



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April 30, 1984

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Gentlemen:

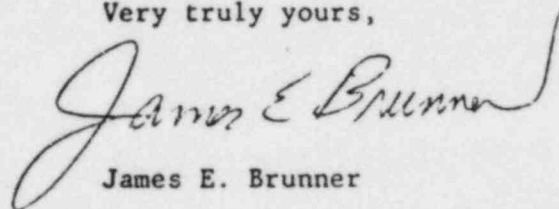
Consumers Power Company has become aware of apparent discrepancies in records of several borings made during the 1977 investigation of the settlement of the administration building at Midland. I have attached copies of records illustrating the differences. The documents attached have previously been provided or made available to the parties either in the soils hearings or by inclusion in responses to questions under 10 CFR 50.54(f) or in the FSAR. At least two of the boring records in question were introduced into evidence by Mrs. Stamiris in the soils proceedings in 1981. (Stamiris Ex. 27, identified at Tr. 4290, introduced August 13, 1981 at Tr. 4339 and Stamiris Ex. 19, ID at Tr. 3437, introduced August 13, 1981 at Tr. 4339)

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The apparent discrepancies in each instance relate to a parameter used in the "standard penetration test." The Board may recall that the standard penetration test is carried out by driving a sampler into the ground with known force and counting the number of blows needed to penetrate a pre-determined distance in the soil. The number of blows is referred to as the "blow count," which provides an indication of the density of the soil. A force is administered to the sampler by dropping a weight attached to the boring mechanism from a specified height, referred to in the boring records as the "fall." (See the space designated "sample hammer weight/fall" five boxes down on left of boring records.) Some of the versions of the boring records show a fall of 18 inches; others show a fall of 30 inches. I am advised that the applicable ASTM specification would call for a fall of 30 inches.

The Company has reached no conclusions as to the cause or significance, if any, of the differences in the records, and the matter is under investigation.

Very truly yours,

A handwritten signature in cursive script, reading "James E. Brunner". The signature is written in dark ink and is positioned above the printed name.

James E. Brunner

CC OL/OM Service List

BORING LOG

RECEIVED FOR THE

1995-1996

0.000 0.000

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

Evaporator & Auxiliary Side.

As Footing 1-C,

10-10-68

DATE	EMPLOYEE	DRILLER	DRILL NAME AND MODEL	HOIST SIZE	HYDROGRAPHIC	RECEIPT	TOTAL MILES
5/25/77	5/25/77	Singleton	1202 DRI-550	5"			16.0

CORE IDENTIFICATION NO.	CORE DEPTH	SAMPLES	SL. TOP OF LOGGING	GROUND SL.	DEPTH, GROUND WATER	DEPTH, SL. TOP OF LOG
		14		633.0	See Notes	

SAMPLE NUMBER WEIGHT/TAKE	ENGINE LEFT IN HOLE - SIG. ALTHST	LOGGED BY
140 lb/30 inches	None	J. B. Givens

PENETRATION BLOWS				ELEVATION	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING ETC.
15' 0"	15' 0"	15' 0"	15' 0"					
				633.0	0		0-3.5' Silty Sand, tan (Fill) (SP/SM)	5' auger to 3.5' Drilling with 4" tricone and recirculating water
				629.5	3.5		3.5-4.5' Concrete mudmat	Op1=4.5- TSF
SS	18	8	30	628.5	4.5		4.5-9.5' Clayey Sand to sandy Clay, gray, very stiff, slight to low plasticity, slight moisture (SC/CL) (Fill)	Op2=4.5+ TSF
SS	18	13	23				9.5-12.0' Clayey Silt, brown, peb pebbles to 1/2", rust stain, low moisture, low plasticity (ML)(Fill)	Op3=4.5- TSF
SS	18	16	33	623.5	9.5		12.0-15.5' Silty Clay, brown with trace gray, low plasticity, low moisture, pebbles to 1/8", hard (CL)	Op4=4.5+ TSF
SS	18	16	30	621.0	12		15.5-18.0' Sand, gray, medium grained, moist, trace silt, very dense (SP) (Fill)	Op5 (none-sand)
SS	18	18	58	617.5	15.5		18.0-19.0' Brown sandy Clay, with seams sand (CL) (Fill)	Op6=4.5+ TSF
SS	18	18	56	615.0	18		19.0-20.5' Gray Sand, dense (SP) (Fill)	Op7=4.5+ TSF
SS	18	12	32	614.0	19		20.5-24.5' Silty Clay, brown with reddish tint, very stiff (CL)	Op8=4 TSF
SS	18	12	32	612.5	20		24.5-26.0' Sandy Clay to clayey Sand, with seams of sand, stones to 1 inch (Fill)	Op9=4.5+ TSF
SS	18	12	29	608.5	23		26.0-28.0' Silty Sand, dark gray, dense, trace to little organics (SM) (Fill)	#8 Had problems with "donut" rubbing on rod when pounding. Told driller to stop and repair. After #8 redrove casing to 21.0' because water was rushing up sides and out hole.
SS	18	12	43	607.0	25		28.0-31.5' Silty Clay, brown, hard (CL) (Fill)	Op10 (sand)
SS	18	12	59	605.0	28		31.5-33.0' Sandy Clay, brown, hard, (CL) tan sand, seam at 32.0'	Op11=4.5+ TSF
SS	18	16	58		30		33.0-36.5' Fine to medium Sand, brown, very dense, trace clay, low moisture (SP)	Op12 (sand)
SS	18	12	55	600.0	33		Total Depth 36.5'	Op13 (sand)
SS	12	12	51	596.5	36.5		Elevation Bottom 596.5	Op14 (sand)
								Water at 3.4' while drilling water level at 5.1' after drilling.

95316529

SS - SILTY SAND; S - SAND; CL - CLAY; SM - SILT; M - MUD; C - COARSE; F - FINE; G - GRAVEL; B - BENTONITE

Evaporator and Auxiliary Boiler Building

HOLE NO. E

95316529

28-210-153

Revision 10

Diesel Generator Building				S 5186		E305		90°		N.A.				
DATE	COMPLETED	DRILLER	DRILL MARK AND MODEL		HOLE SIZE	OVERSAMPLING	DEPTH	TOTAL DEPTH						
9/29/77	9/30/77	Singleton	(Abel T-filling)		CME-550	5"	N.A.	N.A.	31.5'					
CORE RECOVERY (%)		CORE LOSS	SAMPLES	SL TOP OF CASING	GROUND SL	DEPTH/SL GROUND WATER		DEPTH/SL TOP OF ROCK						
N.A.		N.A.	12	N.A.	629.4	See notes		N.A.						
SAMPLE HAMMER WEIGHT/FALL			CASING LEFT IN HOLE - DIA. LENGTH			LOGGED BY								
140 lb/30 in.			None			Jerry B. Givens								
SAMPLE TYPE AND DIAMETER	SAMPLED ADVANCE	SAMPLE LENGTH	SAMPLE RECOVERY	SAMPLE LOSS	PERCENT CORE RECOVERY	PENETRATION BLOWS			ELEVATION	DEPTH	GEOTECH LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
						1ST 5'	5-10'	10-15'						
									629.4	0				
SS	1.5'	0.9'	21	17	10	11			624.9	4.5		1	0-4.5' Silty to sandy Clay, gray, slight to low plasticity, (CL)(Fill)	5" auger to 20.5', set casing, began drilling with 4" tricone roller bit and recirculating water.
SS	1.4'	1.4'	34+	10	10	24/4			622.0	7.4		2	4.5-7.4' Sand, tan, medium dense, slightly moist (Fill) (SP)	
SS	1.5'	0.8'	16	5	5	11			621.4	8		3	7.4-8' Concrete mudmat	
SS	1.5'	0.5'	31	16	17	14				10		4	8-25.5' Silty to sandy Clay, gray, little gravel, low moist. low plasticity, very stiff to hard (CL)(Fill)	Qm 1 = 4 TSF Qp 2 = (sand) Qp 3 = sample breaks up at 3.5 TSF Qp 4 = 4.5+ TSF Qp 5 = sample crumbles, low moisture Qp 6 = 4.5 TSF Qp 7 = 4.5 TSF Qp 8 = 4.5+ TSF Qp 9 (tip) = 4.5+ TSF Qp 10 (sand) Qp 11 (sand)
SS	1.5'	0.6'	26	10	10	16				15		5		
SS	1.5'	0.9'	47	10	22	25				20		6		
SS	1.5'	1.2'	65	15	29	36				25		7		
SS	1.5'	1.0'	57	16	25	32				30		8		
SS	1.5'	1.0'	58	20	33	25				35		9	23-24.2' Seam of clayey Sand, with trace organics, grayish brown	
SS	1.5'	0.9'	107	30	44	63			603.2	25.5		10	24.2' Tan, medium sand seam, low moist.	
SS	1.5'	0.6'	113	38	49	64				30		11	25.5-31.5' Silty Sand, brown, medium grained, wet, very dense (SM)	Hole caving in at 23' so used 3/4 bag quick gel.
SS	1.0'	0.8'	102+	44	102				597.9	31.5		12	Bottom of boring at 31.5'	Water level at 10.4' after drilling. Hole backfilled with soil after completion.

SS - SPLIT SPOON BY SHELLEY TUBE.
S - DENNISON-PITCHER. S - OTHER

Diesel Generator Building

HOLE NO
D

Revision 13
6/82

D.1-319

BORING LOG

MIDLAND NUCLEAR PLANT 7220 1-1 D

DATE DIESEL GENERATOR BLDG.		COORDINATES S. 5186 E. 305		ANGLE FROM NOBIS, BEARING 90°	
BORED 9/29/77	COMPLETED 9/30/77	DRILLER SINGLETON (ABEL DAIL)	DRILL MAKE AND MODEL CHE-550	HOLE SIZE 5"	TOTAL DEPTH 31.5'
CORE RECOVERY (FT./IN.)		CORE LOSS (IN.)	GROUND EL. 629.4	DEPTH/EL. GROUND WATER (SEE NOTES COL.)	
SAMPLE HAMMER WEIGHT/FALL 140 F/18"		CASING LEFT IN HOLE: DIA./LENGTH NONE		LOGGED BY: JERRY B. GIVENS	

SAMPLE TYPE AND NUMBER	SAMPLE ADVANCE (IN.)	SAMPLE CORRECTION (IN.)	SAMPLE RECOVERY (FT./IN.)	SAMPLE LOSS (IN.)	PENETRATION BLOWS	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
					1ST	2ND	3RD				
										0'-2.5' SILTY TO SANDY CLAY, GREY, SLIGHT TO LOW PLASTICITY (CL)	5" AUGER TO 20.5', 5" CASING, BECA DRILLING WITH 4" TRI-CONE ROLLER BIT AND RECIRCULATED WATER
										2.5'-7.4' SAND, TAN, MEDIUM DENSE, SLIGHTLY MOIST (SAND) (SP)	QD#1 = 4.5' F
										7.4'-25.5' SILTY TO SANDY CLAY, GREY, LITTLE GRAVEL, LOW MOIST, LOW PLASTICITY, VERY STIFF TO SAND (CL)	QD#2 = (SAND)
											QD#3 = SAMPLE TAKEN UP AT 3.5' TS
											QD#4 = 4.5' TS
										23'-24.2' SEAM OF CLAYEY SAND, IN TRACE ORGANICS, GREYISH BROWN, + 2' TAN MEDIUM SAND 3.5' PM LONG	QD#5 = SAMPLE CRUMBLES, LOW MOISTURE
										24.2'-31.5' SILTY SAND, BROWN, MEDIUM GRAINED, WET, VERY DENSE (SM)	QD#6 = 4.5' TS
											QD#7 = 4.5' TS
											QD#8 = 4.5' TS
											QD#9 (TIP) = 4.5'
											QD#10 (SAND)
											QD#11 (SAND)
											HOLE CAVING @ 23' SO USE 3/4 BAG QUIK GEL
											WATER LEVEL AT 10.4' AFTER DRILLING
											HOLE BACKFILL WITH SOIL AFTER COMPLETION

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LOG = SPLIT SPOON; ST = SPLIT TUBE; DIESEL GENERATOR BLDG D

BORING LOG										PROJECT		MIDLAND POWER PLANT		HOLE NO.		SHEET NO.		DATE					
SITE Diesel Generator Building										ELEVATION 5 5180		TYPE EXP		HOLE TYPE 9"		REMARKS							
LOG NUMBER 9/29/77										LOG DATE 9/30/77		DRILLER Simoleton		(7) DCI		CUT-ESS		5'		TOTAL			
CORE DESCRIPTION (ft)										CORE LOSS (%)		SAMPLES		FT TOP OF CASING		SPACING IN		BOTH END, SPACING NOTED		BATHYMETRIC SURFACE			
12														629.4		See notes							
MINIMUM SAMPLE WEIGHT (lb)										LASTING LEFT IN HOLE, DR. LENGTH		LUGGED BY											
140 lb. / 18 inches										None								Jerry D. Givins					
PENETRATION BLOWS										ELEVATION		DEPTH		GRANULAR LOG		DESCRIPTION AND CLASSIFICATION		NOTES ON WATER LEVEL, WATER TEMP., PRESSURE, CHARACTERISTICS, ETC.					
										629.4		0											
										624.9		1.5		0-4.5' Silty to sandy Clay, gray, slightly to low plasticity, (CL)(FI)		5' water level rising, drilling cuttings will disintegrate, no test and record blasting water							
										622.0		7.4		4.5-7.4' Sand, tan, medium dense, slightly moist (FI) (SP)									
										621.4		8		7.4-8' Concrete Rubble									
												10		8-22.5' Silty to sandy CLAY, gray, little gravel, low moist. low plasticity, very stiff to hard (CL)(FI)		Op 1 = 4 TSP Op 2 = (sand) Op 3 = sample breaks up at top Op 4 = 4.5- Op 5 = sample crumbles, moisture Op 6 = 4.5- Op 7 = 4.5- Op 8 = 4.5- Op 9 (top) 4.5- TSP Op 10 (sand) Op 11 (sand)							
										601.9		22.5		22-24.2' Seam of clayey sand, with trace organics, grayish brown									
												25		24.2' Tan, medium sand seam, low moist.									
										597.9		31.5		25.5-31.5' Silty sand, brown, medium grained, wet, very dense (SM)		Hole caving at 23' so u 3/4 bag quick							
												35		Total depth = 31.5' El. Bottom = 597.9		Water level 10.4' after drilling. Hole backfill with soil at completion							

* In Feet

SEE SPECIFICATIONS AT HOLELAY TUBE:
B - BORING; C - CUTTING; M - OTHER

SITE Diesel Generator Building

HOLE NO. D

REVISION 16
2/79

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